Provideam 4.18

Manufacturing Productivity Solutions

Disclaimer

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Welcome to Provideam

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1 Welcome to Provideam

Welcome to Provideam Manufacturing Productivity Solutions

Provideam is an easy to use, yet extremely powerful solution designed to help you to identify and eliminate the real causes of manufacturing productivity loss in your company. Provideam gathers production data from your equipment and enables you to analyse this data through a wide selection of reports and views. All the industry standard KPIs are available to use in your reports.

Provideam is an intranet based application. All operator interaction with the application is through a standard web browser. You do not need to install special software on the client side to access the application. All you require is a web browser and the appropriate Provideam Access permissions.

The main components of Provideam are;

OEE/Downtime Monitoring Module

The Provideam OEE/Downtime Monitoring Module is a complete data capture and analysis engine built on the OEE model. In the OEE model all losses are analyzed in terms of the time (or good units) lost from the available production time. Using the OEE model it is easy to compare the overall impact of losses due to downtimes, defects or slow running.

Provideam enables you to;

- o capture data, both automatically and manually, from your production equipment;
- o analyze this data through a wide selection of reports and views;
- o create customized KPI reports.

Event Monitoring Module

The Provideam Event Monitoring Module monitors and logs Machine Events. Typically you may wish to log events associated with a particular process. For example you may wish to log the transition of steps in a sequence. Alternatively you may wish to monitor the fluctuations of a process parameter over time.
Alarm Events may be created for parameters which are out of range or for sequence steps which fail to occur within a specified time.

The following plug-ins are available for the Provideam Event Monitoring Module;

Alarm Annunciation Plug-in

Alarm Events which are created in the Event Monitoring Module may be annunciated to a user group via email or SMS with the Alarm Annunciation plug-in.

Section II:

Provideam 4.18 Technology

Provideam 4.18

Manufacturing Productivity Solutions

2 Provideam 4.18 Technology

With the release of Provideam 4.18 we underline our commitment to the ethos of continuous improvement. Right since the original release of Provideam in 1999, we have continually striven to add new features and improve the user's ability to analyse and assess productivity data.

Provideam 4.18 Design:

Technology

Provideam is a software application which collects production data directly from the control systems which control production machines. The data collected from these control systems is stored in an enterprise class database. Internal Provideam logic blocks pre-process this data for use in reports and views etc. Users interact with Provideam via the Provideam web based intranet interface.

Coding

This version has been coded entirely in Microsoft .NET Framework version 4.8. The Microsoft .NET Framework version 4.8 provides several major benefits including; robust reliability, ease of maintenance, scalability and future proofing.

Database

Provideam data is stored in a Microsoft SQL Server Database. SQL Server Versions 2016 to 2022 are supported. The Provideam Application connects to the Provideam Database using native Microsoft .NET Framework SQL drivers.

Services

Provideam Windows Services are used to collect data from the machine control systems. Provideam services are also used to monitor the data for alarms and to generate various tasks on user defined schedules.

Middleware

To interface with 3rd party control systems Provideam uses OPC (Open Process Control) middleware technology from leading OPC vendors such as Kepware.

Section III:
Introduction

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3 Introduction

Provideam is a complete, integrated solution for analysing the productivity of your company's manufacturing equipment.

Provideam's Key Features are;

Easy to Configure

Provideam is simple to deploy and can often be implemented, generating useful data, within a couple of hours of installation.

Data Collection from Any Machine

Provideam interfaces to PLC/PC based systems using OPC technology which is a middleware that creates the communications link between PLCs and Windows applications.
In circumstances where the machine is very old or very manual the Provideam Realtime Interface can be used as a means of collecting operator entered data for the Machine.

Available Anywhere in Plant

Provideam is an intranet application. Any PC with a suitable web browser on the LAN can access Provideam. Provideam is therefore available to anyone, anywhere in the plant.

Rich Customisable Reports

Provideam provides over 50 KPI functions, enabling you to analyse productivity data in many different ways. This helps significantly to expose hidden losses.

Scheduled Reports

Reports can be delivered by scheduled email at the end of each shift, day, week etc. Thus all members of a Lean Team are kept in formed without necessarily having to log on to Provideam.

Provideam works by collecting productivity data in real-time from manufacturing equipment, saving the data in the Provideam Database and then analysing the data in a wide variety of views and reports.

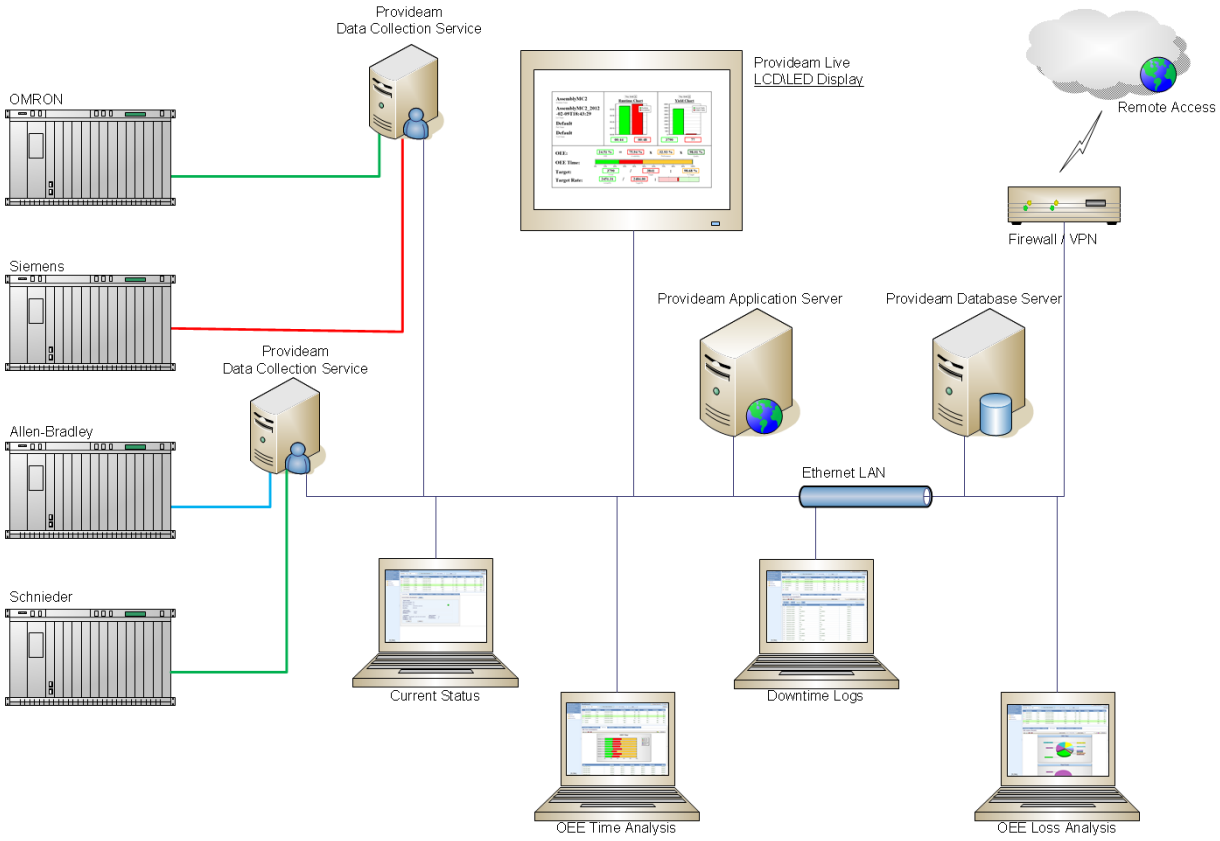

Fig. Provideam Data Collection Schema

In the figure above you will see the layout of a typical enterprise-level Provideam implementation. To the right hand side of the figure you will notice the Data Collection PCs running the Provideam OEE Monitoring Service. This service collects data in real-time from the machine control systems and logs the data to the Provideam Database. The Provideam Application is installed on the Provideam Application Server. The Provideam Application Server hosts the Provideam web-based interface which you can see on the Client PCs shown at the bottom of the figure. At the top of the figure a plasma display shows various charts which update in real-time. The plasma display would normally be used on the production floor to give users an indication of how well production was performing. In the top right of the figure a VPN is shown which indicates that Provideam may be accessible outside the plant if the appropriate IT infrastructure is in place.

3.1 The Provideam Suite

Provideam is designed to be accessible to both small users, with perhaps a couple of machines, and large users, with potentially hundreds of machines. To that end the system can be used to monitor one machine, up to monitoring hundreds of machines.

Provideam Features

The table below highlights the main features available in Provideam

	Feature	Provideam
Provideam		
User Security	User Security	✓
Dictionary	Language Support	✓
	Customisable Dictionary	✓
Event Mon Module	Event Limit	None
Event Admin	Event Admin	✓
Event Reporting	Event Reporting	✓
	Scheduled Reports	✓
Event Alarming	Event Alarms Email	✓
	Event Alarms SMS	✓
OEE Mon Module	Machine Limit	None
OEE Admin	Machine Admin	✓
	Shift Admin	✓
OEE Dashboard	Real-time Shift Data	✓
	Historical Shift Data	✓
OEE Manual Entry	Manual Entry of Production Data	✓
OEE Reporting	Customisable Reports	✓
	Scheduled Reports	✓
OEE Plug-ins	RESTful API Interface	✓
	KPI to OPC Export	✓
	Customisable Functions	✓
	Plan Adherence Management	✓
	Real-time Operator Interface for Pad or Thin client	✓
Integration Services	Distributed Processing	✓
	Active Directory Integration	✓
	Single Sign-on (SAML 2.0) Integration	✓

Fig. Provideam Features Table

Provideam

Provideam is built on a technological framework which supports collection of large volumes of data. In effect this means distributing the processing effort over a number of servers. Implementing Provideam in an Enterprise environment may require integration services which are provided by your Provideam integration partner. Provideam can be used to monitor an unlimited number of machines (typically 100+)

Provideam Integration Services include;

- Distributed Processing
- Active Directory Integration
- Single Sign-on (SAML 2.0) Integration

Provideam OEE

Provideam OEE is our downtime monitoring solution. It's fully configurable to your requirements and includes an OEE Dashboard which allows you to analyse real-time and historical production data by shift. From the Dashboard, it's easy to print, export and email shift production data.

It also includes a wizard based reporting interface which lets you create customised productivity reports over various periods, such as day, week, month and so on. You can also compare time periods, such as the day shift and the night shift, or objects, such as two different machines. The reporting interface allows you to create schedules for automatically emailing reports to a mailing list, for example at the end of a shift.

Provideam has been designed to collect large volumes of data and supports distributed processing over a number of servers. Implementing a distributed Provideam solution generally requires integration services, which are provided by your Provideam integration partner.

Provideam Event

Provideam Event is our event monitoring and alarming module. It's another way of helping you to stay in control at all times, including letting you know when a machine malfunctions.

It allows you to log digital or analogue event items to the Provideam database, either on a poll time or data change event. In addition, Provideam Event can monitor alarms and pass on these alarms to a user group via email or text message.

Section IV:
Installation

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4 Installation

The Provideam installation process is a simple procedure which extracts the application files from the compressed download file and installs them on to your computer. Read the following sections carefully and follow the procedures as described.

4.1 Prerequisites

Provideam is an intranet application which is designed to operate on an IBM compatible PC running one of the specified Microsoft Windows Operating Systems.

The hardware and software requirements listed below are minimum requirements. Provideam is an analysis tool which, depending on how you use it, may have intensive processing demands on the host server. Performance will be improved, e.g. the time to create a report, if you choose hardware of a higher specification.

It is strongly advised that you install Provideam on a dedicated server. The intensive nature of the processing required to collect data and generate reports etc. will have a negative impact on the performance of any other application running on the server.

4.1.1 Hardware Requirements

The table below lists the minimum recommended Server hardware to support the Provideam Application:

	Provideam (up to 30 machines)	Provideam (more than 25 machines)
CPU	Intel® Xeon® E5-2609 v2 Processor or higher	Intel® Xeon® E5-2440, 2.4GHz or higher
RAM	8 GB	16 GB
Free Space on Hard Disk	100GB	200 GB
Network Interface Card	1 Gbps	1 Gbps

For superior Enterprise Level Database performance a RAID 10 Configuration of Local Hard Disks is recommended. In a RAID 10 configuration 4 or more Hard Disks are used to create a mirrored RAID, RAID 1 for redundancy plus a RAID 0 for performance - combining the best of both worlds. This is an excellent comprise between cost and performance

SAN (Storage Area Network) hosting of database files is not recommended. While a SAN is a good place to store backups it is generally not a good place to mount your

Database. This is because the SAN will probably be used as a file server and the Database Server will have to share resources with other clients. This will reduce the IO available to the Database Server and consequently the performance will typically be slower than expected.

The table below lists the minimum recommended Client PC hardware to access the Provideam Application:

	Provideam Client
CPU	Intel® Core™ i5-3470 Processor or higher
RAM	8 GB
Free Space on Hard Disk	100 GB
Network Interface Card	100 Mbps
Mouse	Scroll Mouse
Screen Resolution	1280 x 1024

4.1.2 Software Requirements - Server

The table below lists the minimum recommended Server operating system and software requirements to operate all the features of Provideam:

	Provideam (up to 30 machines)	Provideam (more than 25 machines)
Operating System	MS Windows 10+ Professional	MS Windows® 2016+ Server
Web Server	MS Internet Information Services	MS Internet Information Services
Database Engine	MS SQL Server 2016+ Express	MS SQL Server 2016+ Std. Ed.
Web Client	MS Edge	MS Edge
	Google Chrome	Google Chrome
Microsoft .NET Framework Runtime Engine	Version 4.8	Version 4.8
Microsoft .NET Core Hosting Bundle	ASP.NET Core Runtime 6.0.18+	ASP.NET Core Runtime 6.0.18+
Email Client	MS Outlook	MS Outlook

Note: Provideam supports the MS Windows 10+ Professional and Windows 2016+ Operating Systems.

4.1.3 Software Requirements - Client

The table below lists the minimum recommended Client operating system and software requirements to access the Provideam Application:

	Provideam Client
Operating System	MS Windows 10+ Professional
Web Client	MS Edge
	Google Chrome
Email Client	MS Outlook
Screen Resolution	1280 x 1024

4.2 Installing Provideam

The simple installation procedures in this section describe the installation of the Provideam Application. There is no requirement to install any Provideam software on the client PCs. To access the Provideam Application from a client PC simply requires one of the recommended Web Browsers.

The self-extracting Provideam Setup Application is specifically designed to install the Provideam Application. This includes the Provideam Database Engine, the Kepware OPC Server Suite, the Microsoft .NET Framework Runtime Engine version 4.8, the Provideam Application itself and the Provideam Demo Application.

Note: The MS Internet Information Services Web Server Engine is a Windows component and must be added prior to the installation of Provideam. If it is not installed the installation process will stop.

Note: Additional instructions are included to describe the setup of the Provideam Demo Application which provides demonstration data, in real-time, to Provideam and allows you to view Provideam in a simulated real-time mode.

4.2.1 Internet Information Services Installation

Before installing Provideam you must ensure that the MS Internet Information Services (IIS) Web Server Engine has been installed. IIS is a component of the MS Windows Operating System and is installed in the same way any other component would be installed. The instructions below describe how IIS is installed on an MS Windows 10 Professional machine and then on an MS Windows 2016 Server.

Windows 10 Professional:

Step 1: Open the Windows Settings Panel

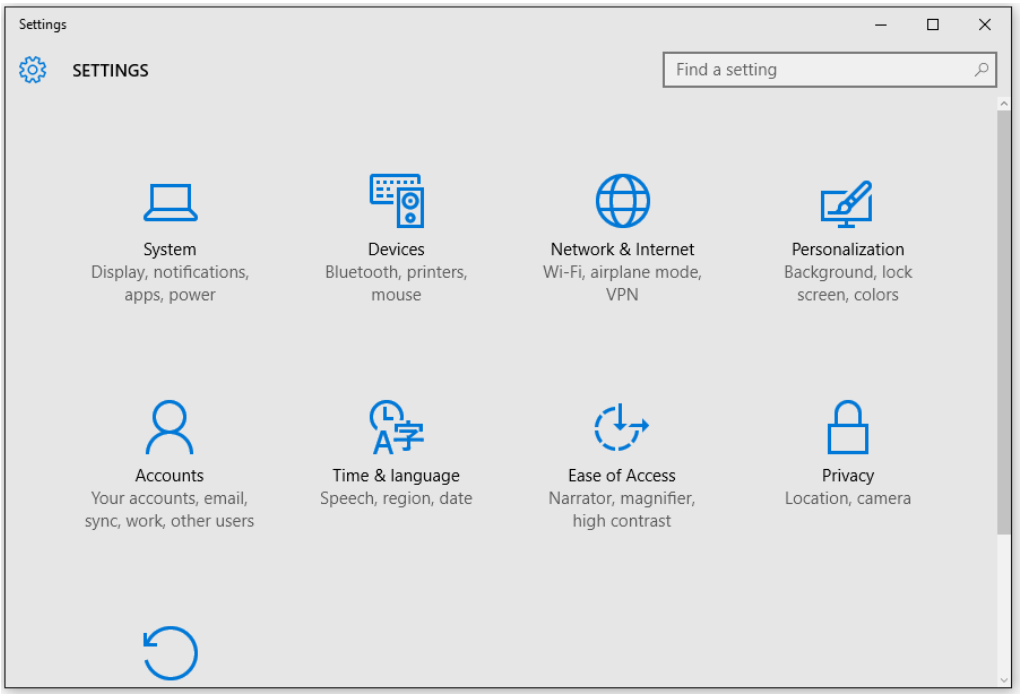


Fig. Win10 Settings Panel

Step 2: Click on **System, Display, notifications, apps, power**

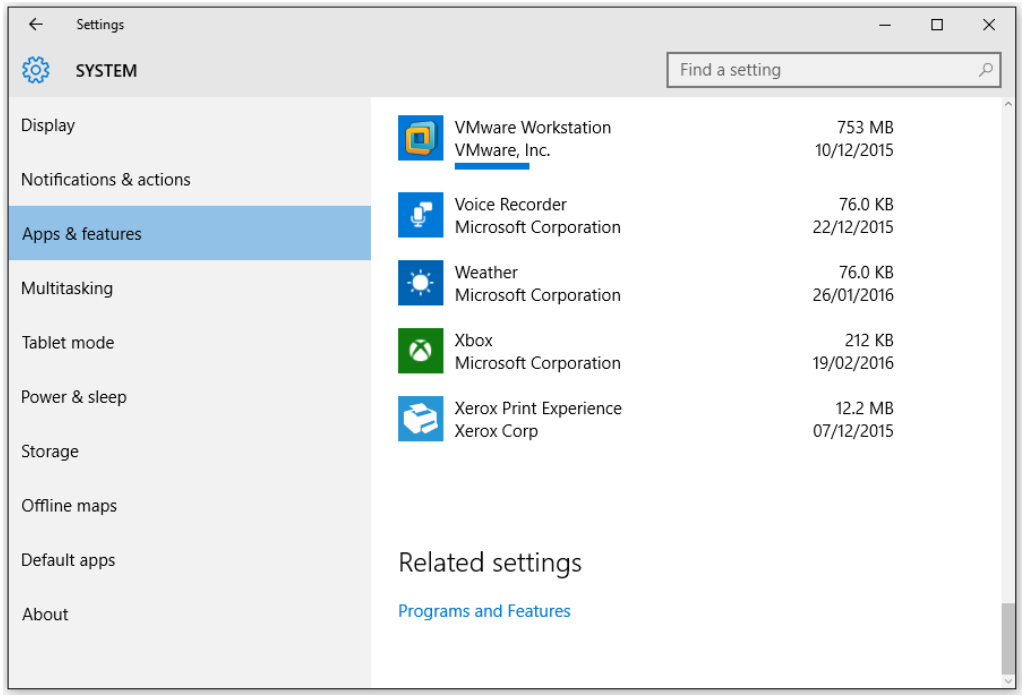


Fig. Win10 Settings - System

Step 3: Click **Apps & features** and scroll to the bottom of the display until you see **Programs and Features**.

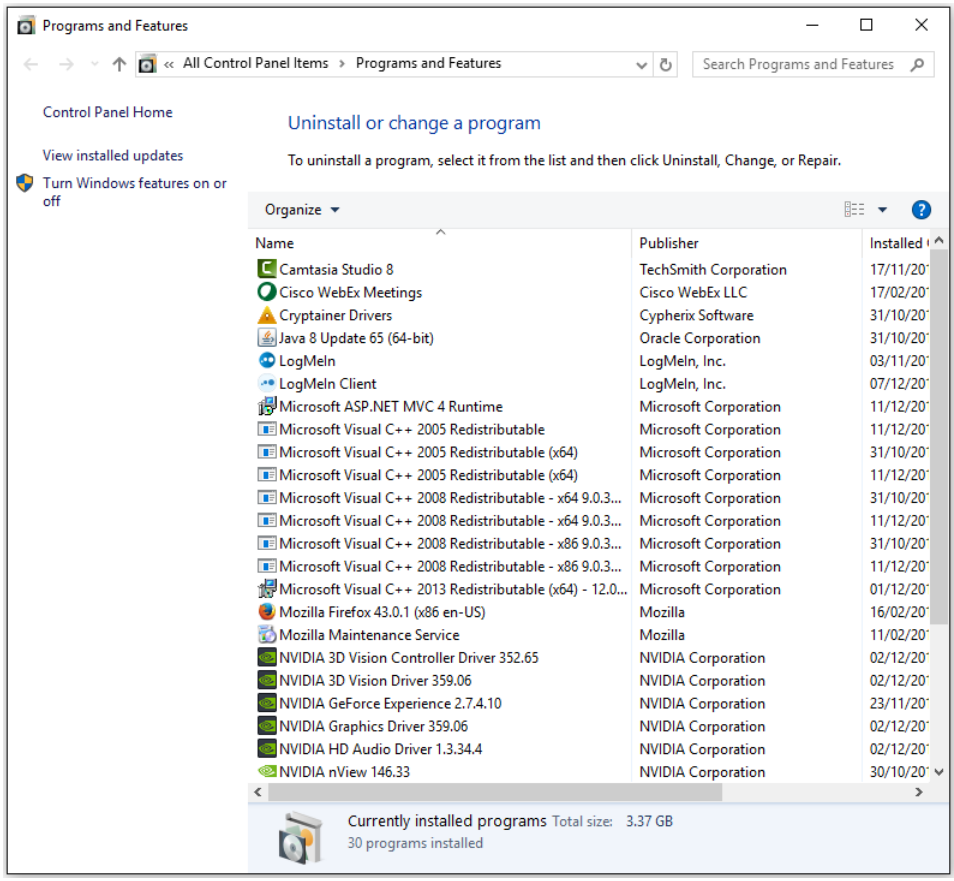


Fig. Win10 Settings - Programs and Features

Step 4: Select **Turn Windows features on or off** from the menu on the left hand side of the screen.

Step 5: Select the Internet Information Services (IIS) feature

Step 6: Ensure that ASP.Net and the other features of **Application Development Features** shown in the figure below are selected;

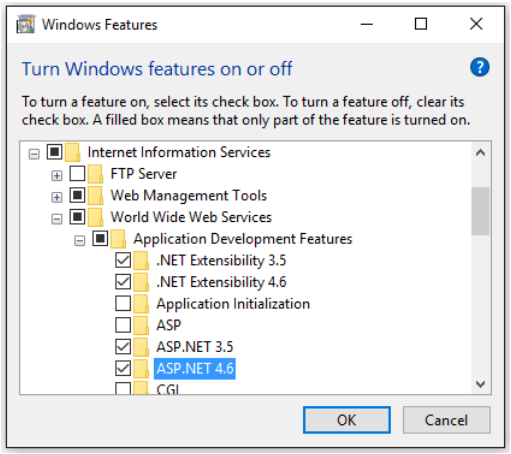


Fig. Select ASP.Net from the **Application Development Features**

In addition make sure you have enabled Static Content. This is enabled by default but may have been switched off inadvertently.

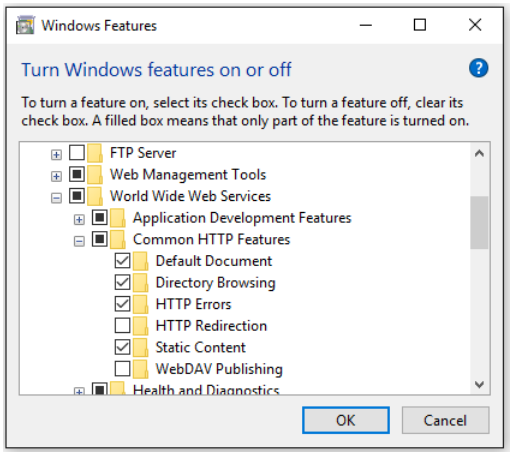


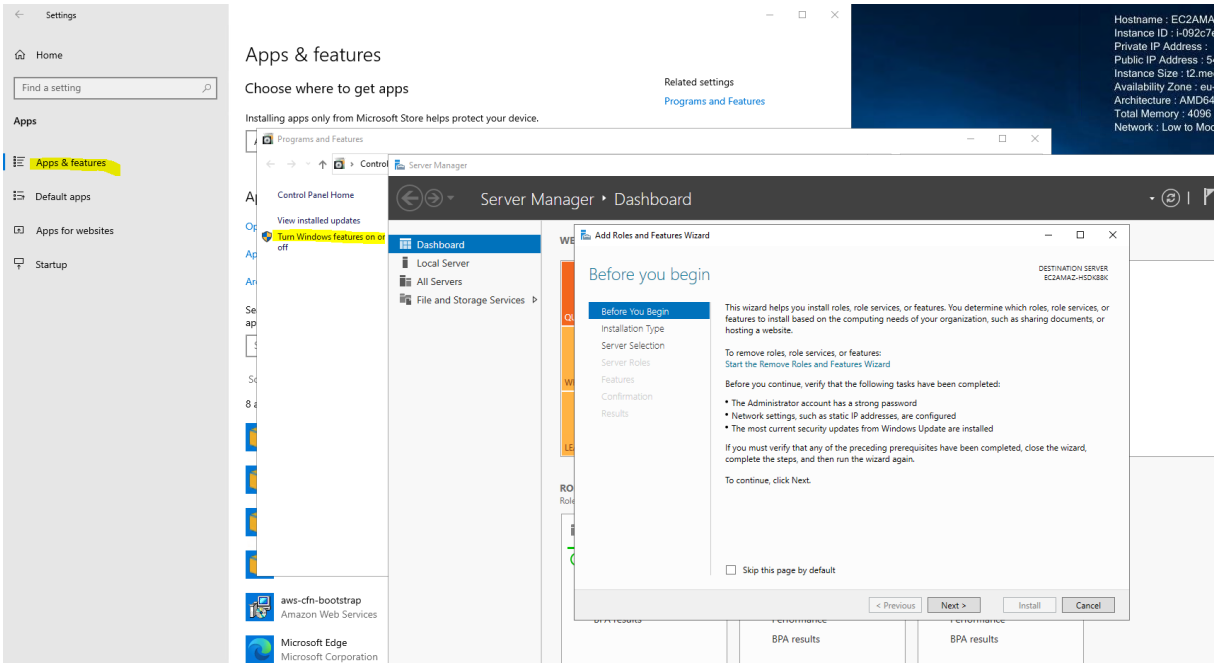
Fig. Ensure that Static Content from the **Common HTTP Features** *has been enabled.*

Step 7: Click **OK** and follow the Microsoft instructions to complete the installation

Note: You may need the Windows Installation files to complete the installation of IIS.

Windows 2016 Server:

Step 1: Open the Server Manager Dashboard (Settings > Apps & Features > Turn Windows Features on or off)



Step 2: Click the **Next** button.

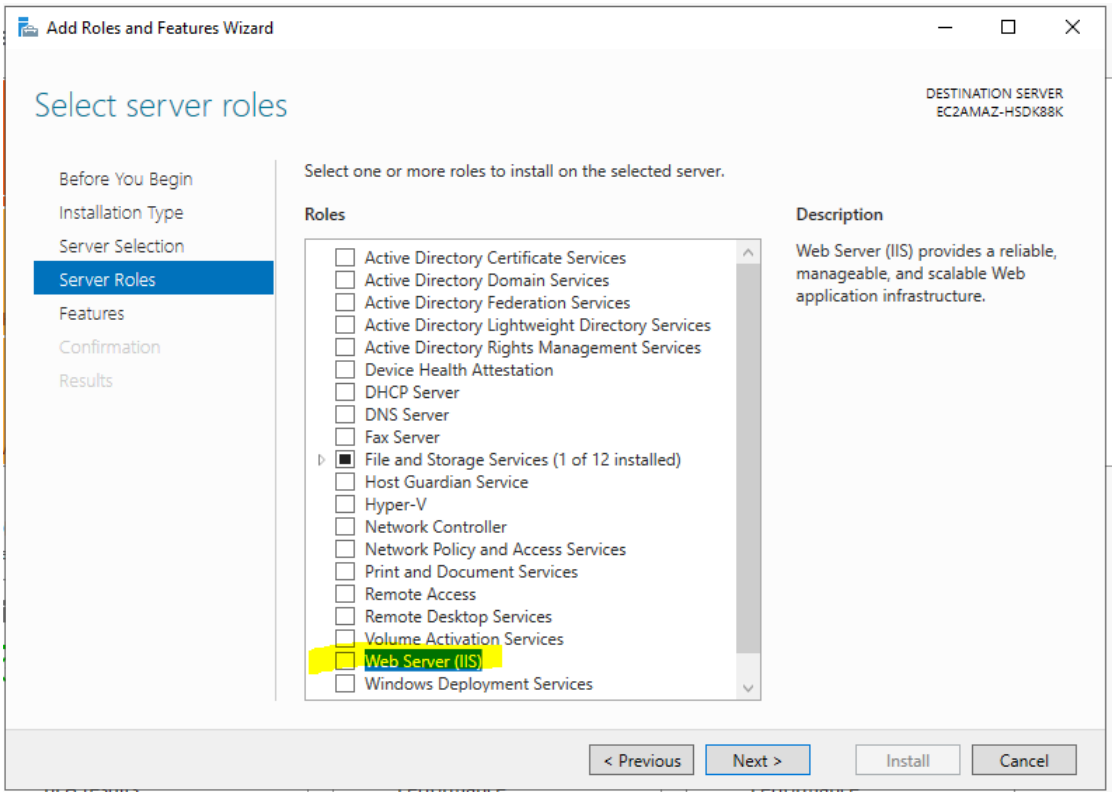
Step 3: Choose Role-based or feature-based installation.

Step 4: Click the **Next** button.

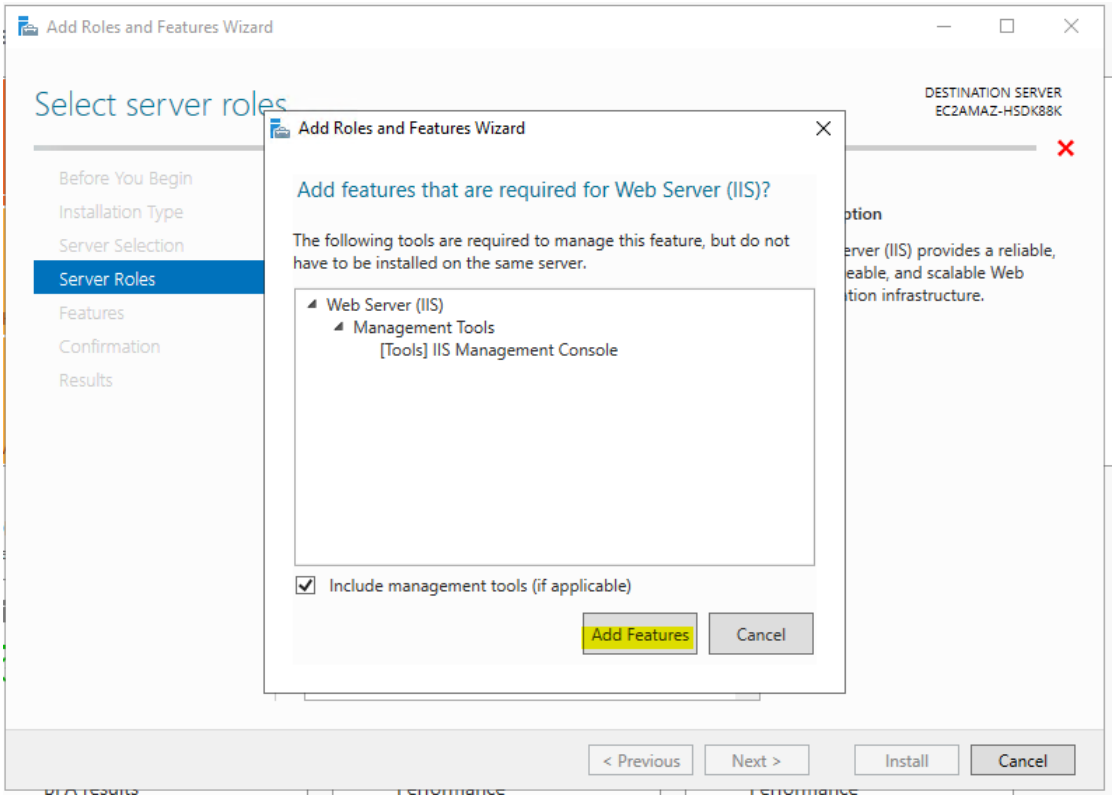
Step 5: Choose Select a server from the server pool (there will only be one server in the pool).

Step 6: Click the **Next** button.

Step 7: Check the Web Server (IIS) Entry



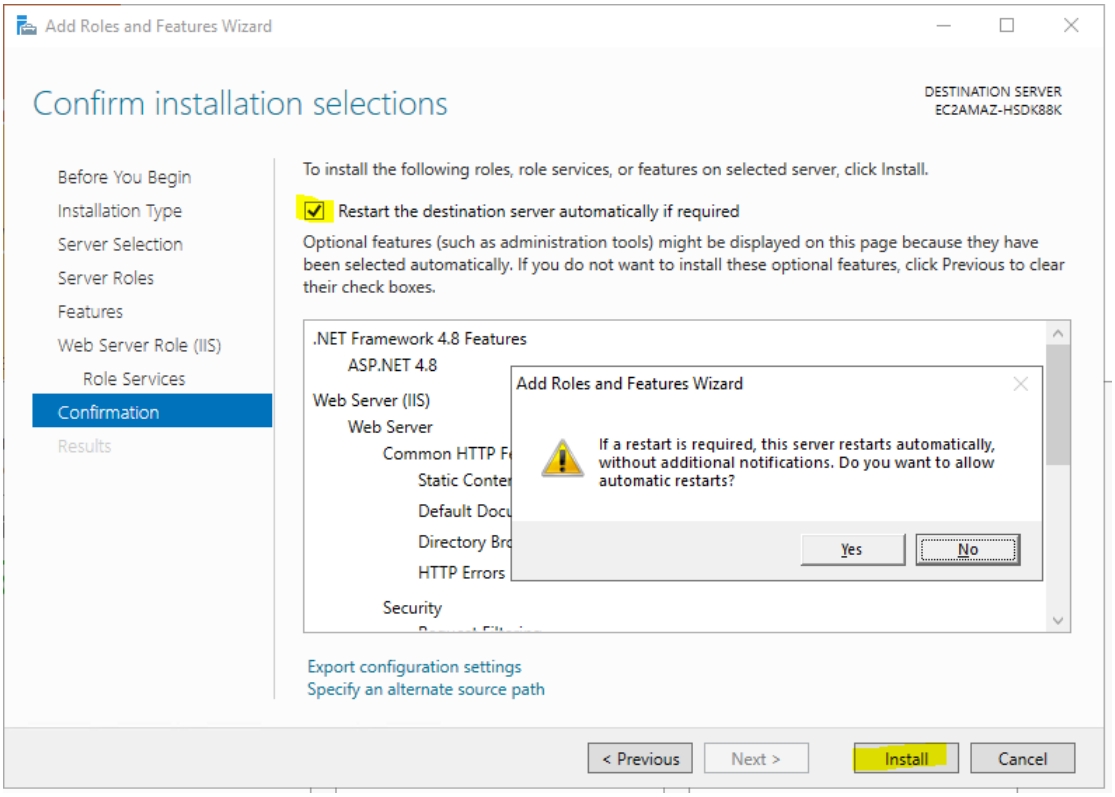
Step 8: Select **Add Features.**



Step 9: Click the **Next** button.

Step 10: Check "ASP.NET 4.8" from the "Application Development" group

Step 11: Click Add Features.
Step 12: Click the **Next** button.
Step 13: Check "Restart the destination server automatically if required".
Step 14: Click Install.
Step 15:Complete the installation



4.2.2 DotNetCore Installation

Installing .NET Core

The Provideam API and ProvideamApps depend on the MS dotNet Core 6 runtime.

The runtime can be downloaded here;

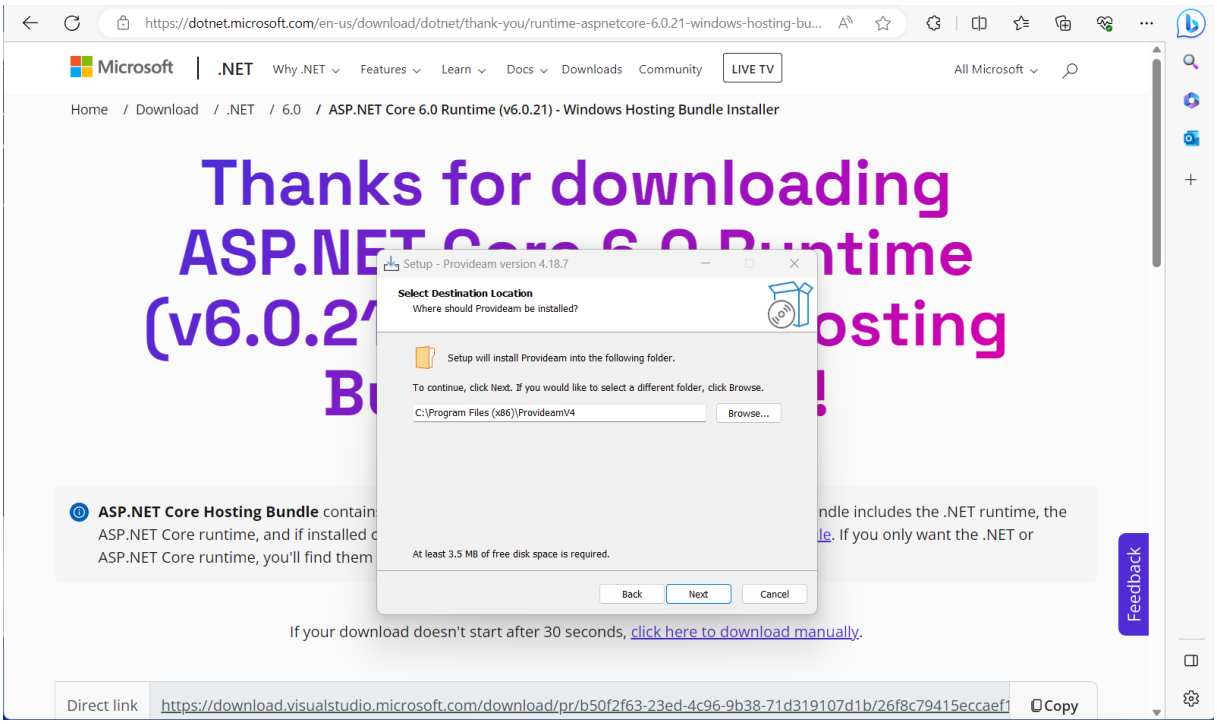
https://dotnet.microsoft.com/en-us/download/dotnet/thank-you/runtime-aspnetcore-6.0.21-windows-hosting-bundle-installer

Copy the link to the MS Edge Browser on the server. The runtime will download automatically.

Open the downloads folder

Run the "dotnet-hosting-6.0.21-win.exe"

Check the box to agree to licences terms, and complete the install



4.2.3 Provideam Server Installation

Step 1: Download the Provideam Setup Files to your Provideam Server PC.

https://download.provideam.com/ProvideamSetup.exe

Step 2: Right-click on the ProvideamSetup file and select to 'Run As Administrator'.

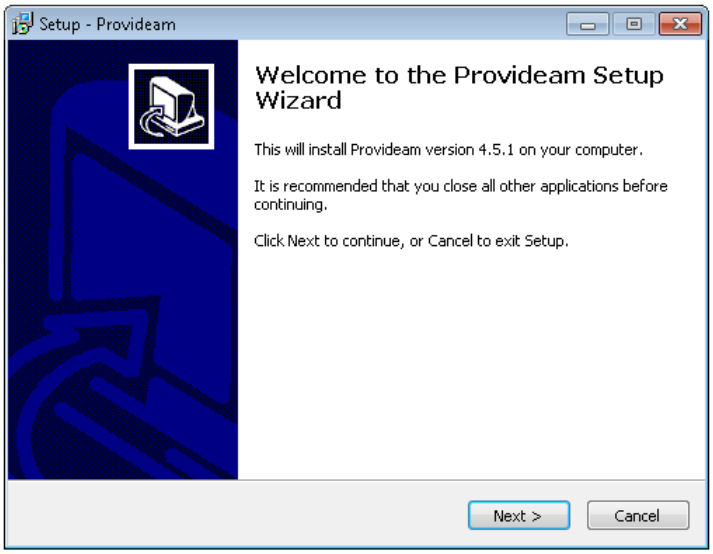


Fig. Provideam Installer - Start Installation

Step 3: Click **Next**. The Provideam End User License Agreement will be displayed.

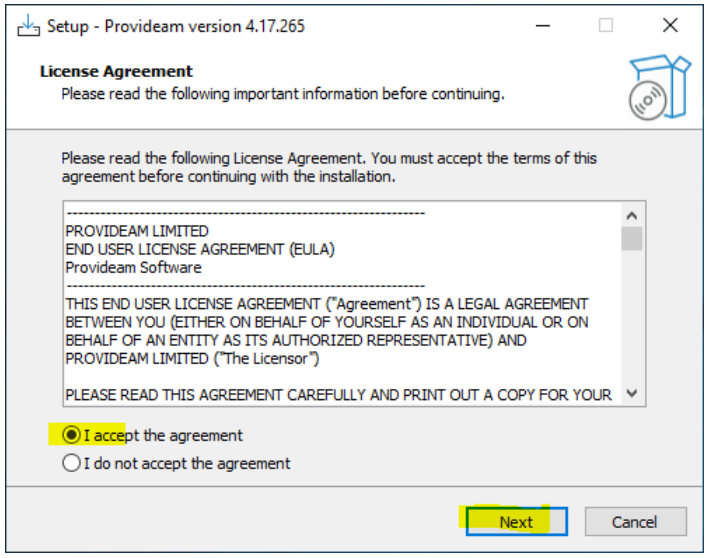


Fig. Provideam Installer - End User Licence Agreement

Step 4: Check the **I accept agreement** button and then click **Next**. The component selection screen will be displayed.

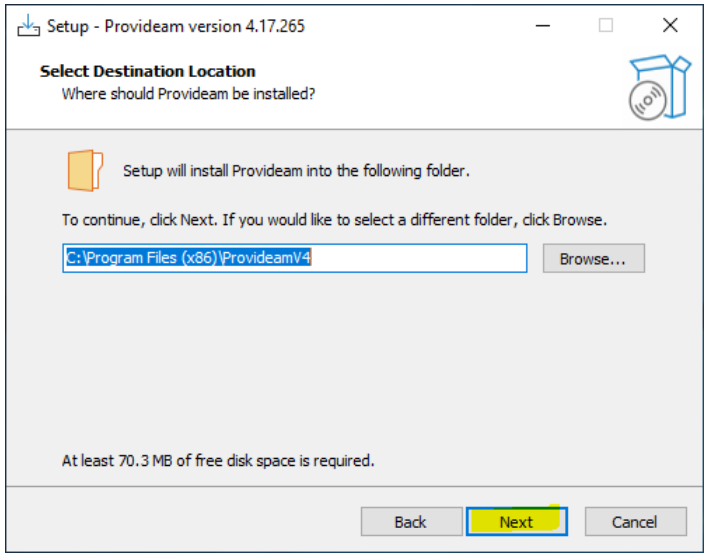


Fig. Provideam Installer - Select Destination Folder

Step 5: Select the Destination Folder for the Provideam Application and then click **Next**. The component selection screen will be displayed.

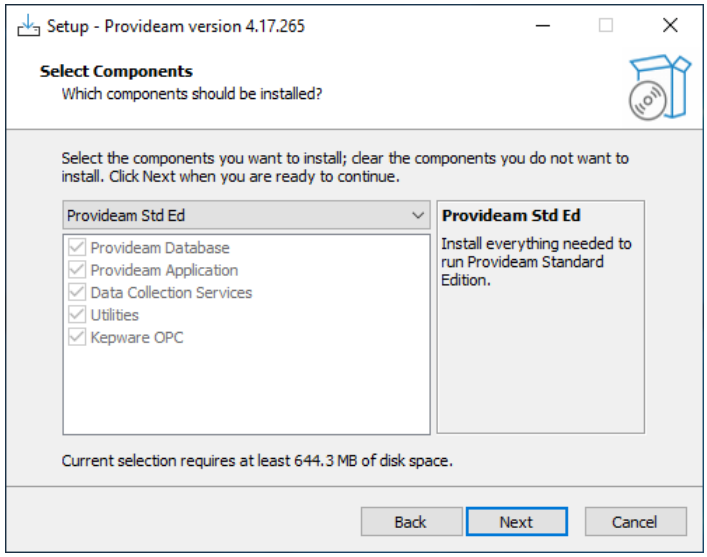


Fig. Provideam Installer - Select Components

Note: The installer includes all components required for a Provideam Installation. The user may install the complete application or only selected components. By selecting the **Provideam Std Ed** option the user chooses to install the complete application on a single PC. By selecting **Provideam Ent Ed**, the user has the option to install selected components. The **Provideam Ent Ed** option is only appropriate for the users that have purchased an Enterprise Licence.

Note: If the following components are not already installed the Provideam Std Ed Installer will install them;

1. Microsoft .NET Framework version 4.8.
2. Provideam SQL 2016 Database Engine Instance
3. Kepware OPC Server

Step 6: Select the components you wish to install and then click **Next**. The Web Port No. selection screen will be displayed.

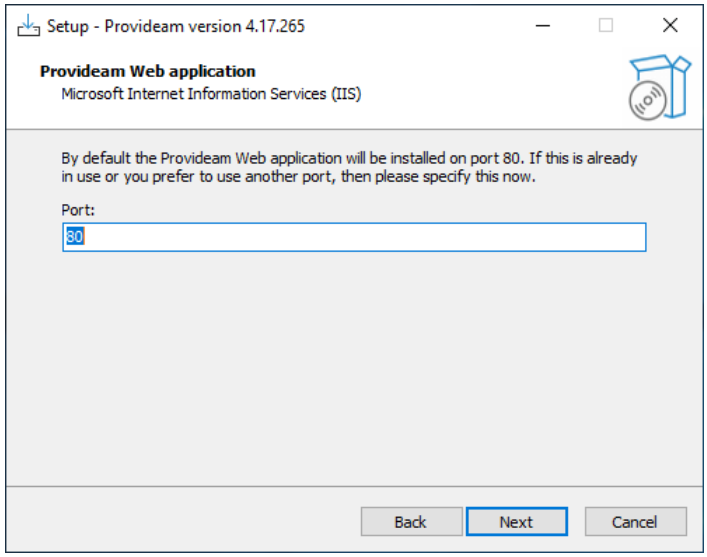


Fig. Provideam Installer - Select Web Port Number

Note: In most cases you will install Provideam on a dedicated server in which case you will not need to change the Web Port Number. However if you install on a server which hosts a number of web sites then each website must have a unique Port Number assigned. In this case you must assign a Web Port Number to Provideam which is not being used by any of the other Web Sites hosted on that server. To browse to Provideam, if you have changed the Port Number, use the following URL address format: *http://ProvideamServer:XX/* , where *ProvideamServer* represents the name of the Server(PC) on which the Provideam Application has been installed, and *XX* represents the Port Number.

Step 7: Select **Language** and **Demo Data** options.

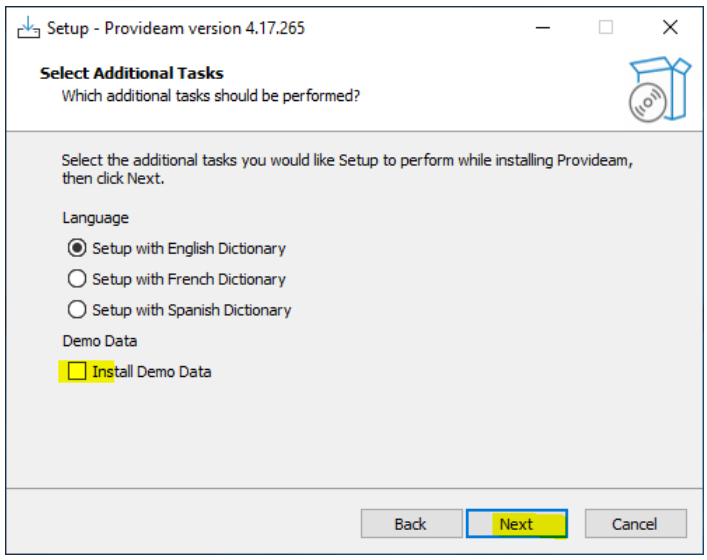


Fig. Provideam Installer - Select Language and Demo Data

Provideam is pre-loaded with English and Spanish dictionaries. Choose the default language for the application. It is possible to change the language settings after installation. In addition you may choose to install Provideam with or without the Demo configuration. Provideam will install without any OEE or Event configuration data if you do select not to install the Demo Data. Click **Next** to continue.

Step 8: Provideam is now ready to install. Click **Next** to continue, or **Back** to modify your selections.

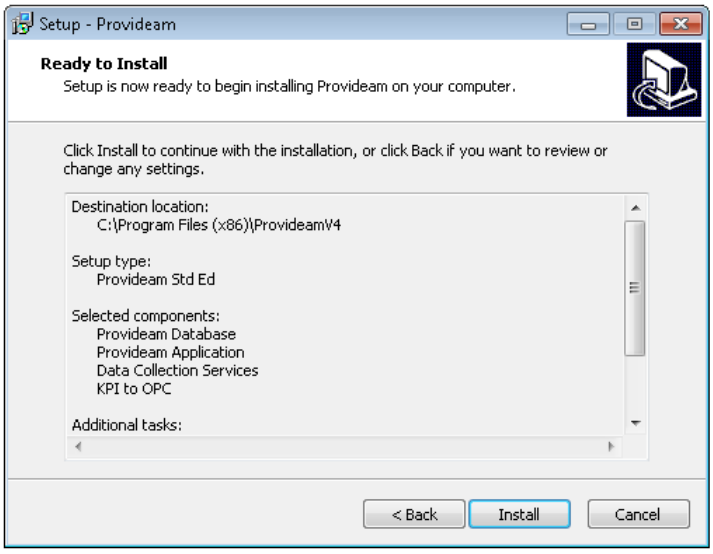


Fig. Provideam Installer - Provideam is now ready to Install

Step 9: Click **Install** and Provideam will be installed with your selections.

The Database Engine and .Net Framework Engine are installed first.

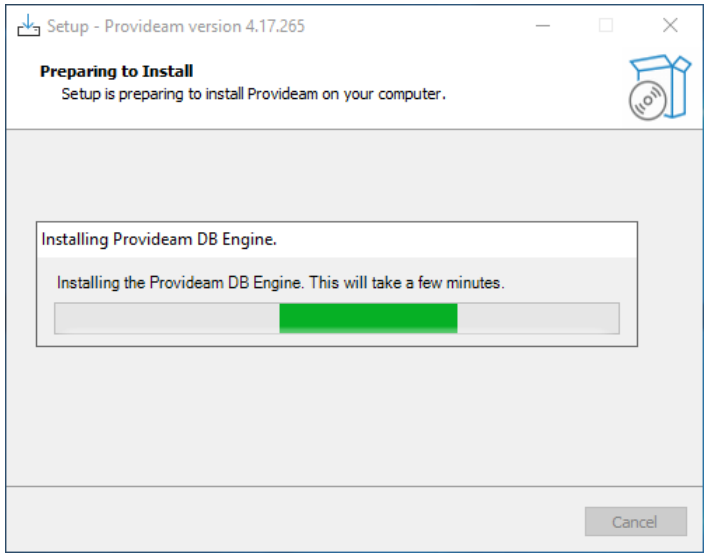


Fig. Provideam Installer - Progress

Once the Database Engine and .Net Framework Engine have been installed the installer proceeds to the install of the Provideam Application. See figure below.

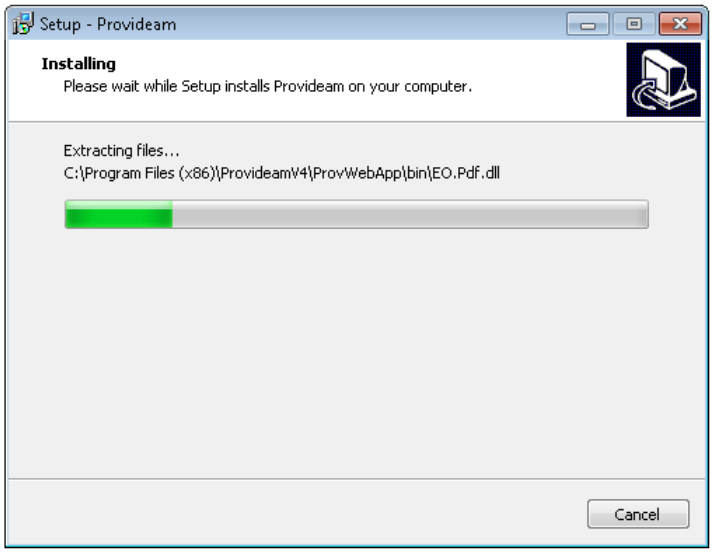


Fig. Provideam Installer - Progress

The Provideam application files are copied to the "*C:\Program Files (x86)\ProvideamV4*" folder and a Provideam 1 month trial license is created.

Once the application installation has completed the final screen, see figure below, will be displayed.

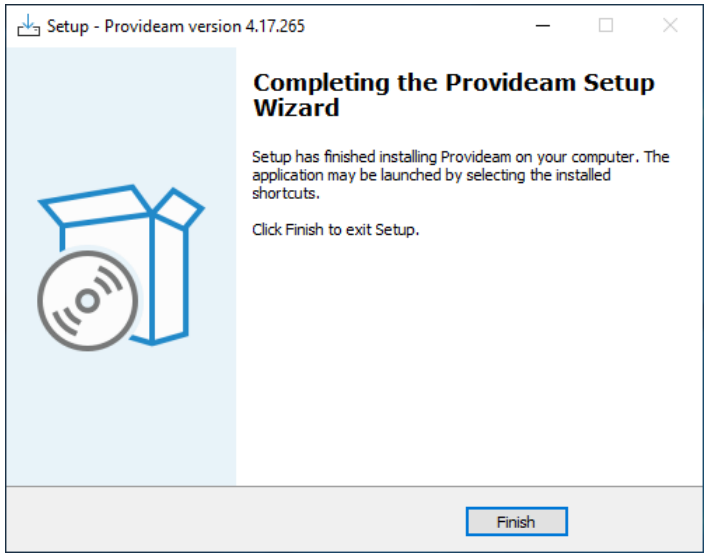


Fig. Provideam Installer - Completion

Step 10: On completing the installation you may be requested to restart the PC. It is recommended that you do this to ensure that all components are installed correctly. Click **Finish** to continue.You are now ready to begin using Provideam.

Note: If the Database Engine fails to install for any reason then you will see the following error message.

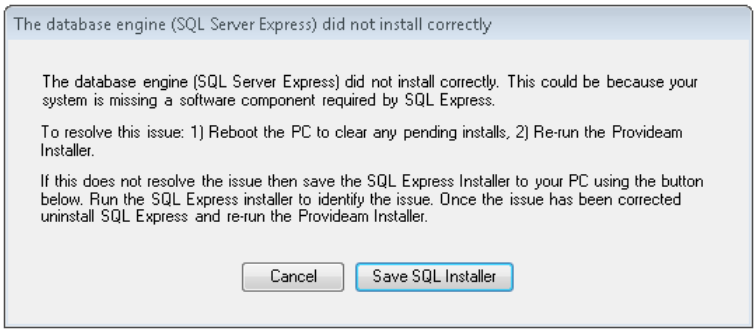


Fig. Provideam Installer - Progress

There are several reasons why the Database Engine might not install correctly. A common one is because there is already a Windows Installer application running.

To clear the error you should try the following;

1) Reboot the PC to clear any pending installs

2) Re-run the Provideam Installer to see if it will install.

Otherwise you may have to debug the SQL Server install by running the SQL Server installer manually. The Provideam gives you the opportunity to save the SQL Installer to your PC. Run the installer and correct any issues identified by the installer. Then uninstall SQL Server and re-run the Provideam installer.

4.2.4 Provideam Demo Installation

If you selected the option to install Demo Data then the Provideam Database will have been pre-loaded with demonstration data. If you log on to Provideam and browse through the OEE Admin pages you will notice that two Areas have been configured, 'Assembly' and 'Moulding'. Associated with these Areas you will see several Machines. These Machines have been set up to operate in conjunction with the Provideam Demo Application.

The Provideam Demo Application simulates real-time data for the 'Assembly' and 'Moulding' Machines. The simulated data is written to a simulation driver in an OPC Server. The Provideam Data Collection Services then read this data from the OPC Server and store the data in the Provideam Database as if it was actual real-time machine data. The Provideam Demo Application requires that an OPC Server be installed. By default the Provideam Installer installs the Kepware OPC Server and configures the OPC server with the appropriate settings.

Note: Kepware is a leading supplier of 3rd Party PLC Communications Drivers. Provideam relies on 3rd Party drivers such as those from Kepware Technologies to communicate with machine control systems.

4.2.5 Kepware Installation

The Provideam Installer will install and configure Kepware's V6 OPC Server with default settings. If you wish you may install the Kepware OPC Server. separately as described below;

When installing Kepware manually you must ensure that you install the "Simulation Drivers".

Follow Kepware's instructions to install the Kepware Server Suite. During the Kepware install you will be asked to select the features to install. It is recommended that you install all drivers. See figure below where all Drivers and the OPC Quick Client have been selected.

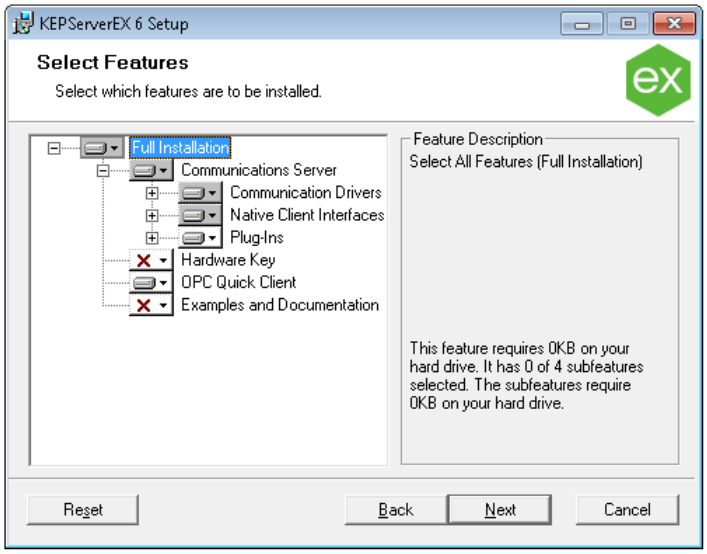


Fig. Kepware Install Select Features

The Provideam Application requires that you install your OPC Server to run as a Windows Service. KepServerEx V6 is installed as a service by default.

Step 1: Open Kepware Settings

Step 2: Select **Runtime Process**

Step 3: Ensure that the Selected mode is: **System service**

Step 4: Click **Ok** to save the Kepware Settings.

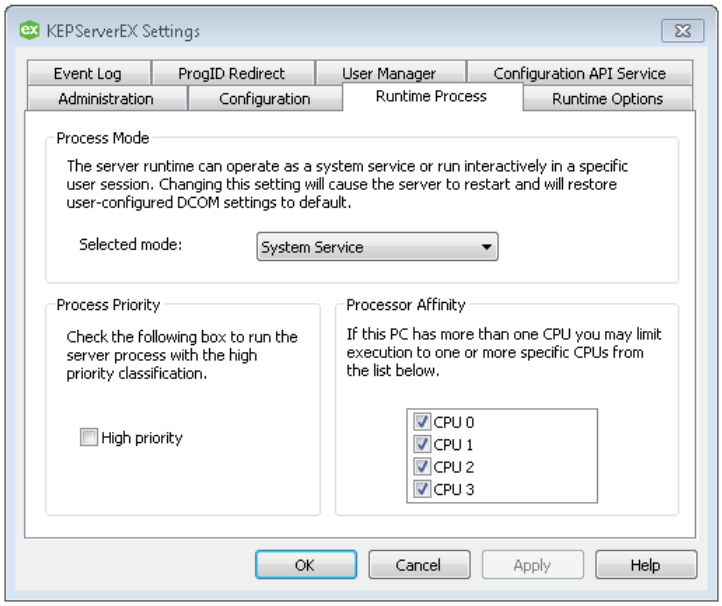


Fig. Kepware Settings - System Service

Section V:
Getting Started

Provideam 4.18
Manufacturing Productivity Solutions

5 Getting Started

Provideam is an easy to use, web based intranet application. To access Provideam you need to use one of the recommended web browsers.

5.1 Opening Provideam

Type the Provideam Application address in the address bar. In the example shown in figure below the address is: *http://ProvideamServer/* , where *ProvideamServer* represents the name of the Server(PC) on which the Provideam Application has been installed.

If you assign a Port Number, other than the default web Port Number of 80, to the website then you also need to include this. In which case your address would be: *http://ProvideamServer: XX/* . Where XX represents the Port Number.

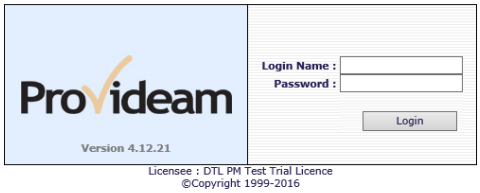


Fig. Provideam Login Page

To log on you must enter your user name and password. These will initially be set by the Provideam Administrator.

The default User Login is:

User ID: *User*

Password: *User*

The default Administrator Login is;

User ID: *Admin*

Password: *Admin*

Once you enter your login details successfully the main Provideam Window page will be displayed. By default Provideam opens to the OEE Monitoring Module Dashboard.

Tip: To the left of the Provideam Application address in the figure above you can see the Provideam Icon  . By clicking on, and dragging this icon to the Windows Desktop, you can create a shortcut to the application on your Desktop.

Note: Once you have logged on successfully you may change your password. Click on the **Your Account Settings** button on the top right hand corner of the Provideam Window. See figure below.

Warning: If a user attempts to log in three times in a row with an incorrect password their account will be locked-out for 20minutes. An Administrator can reset the locked-out flag from the User Admin section.

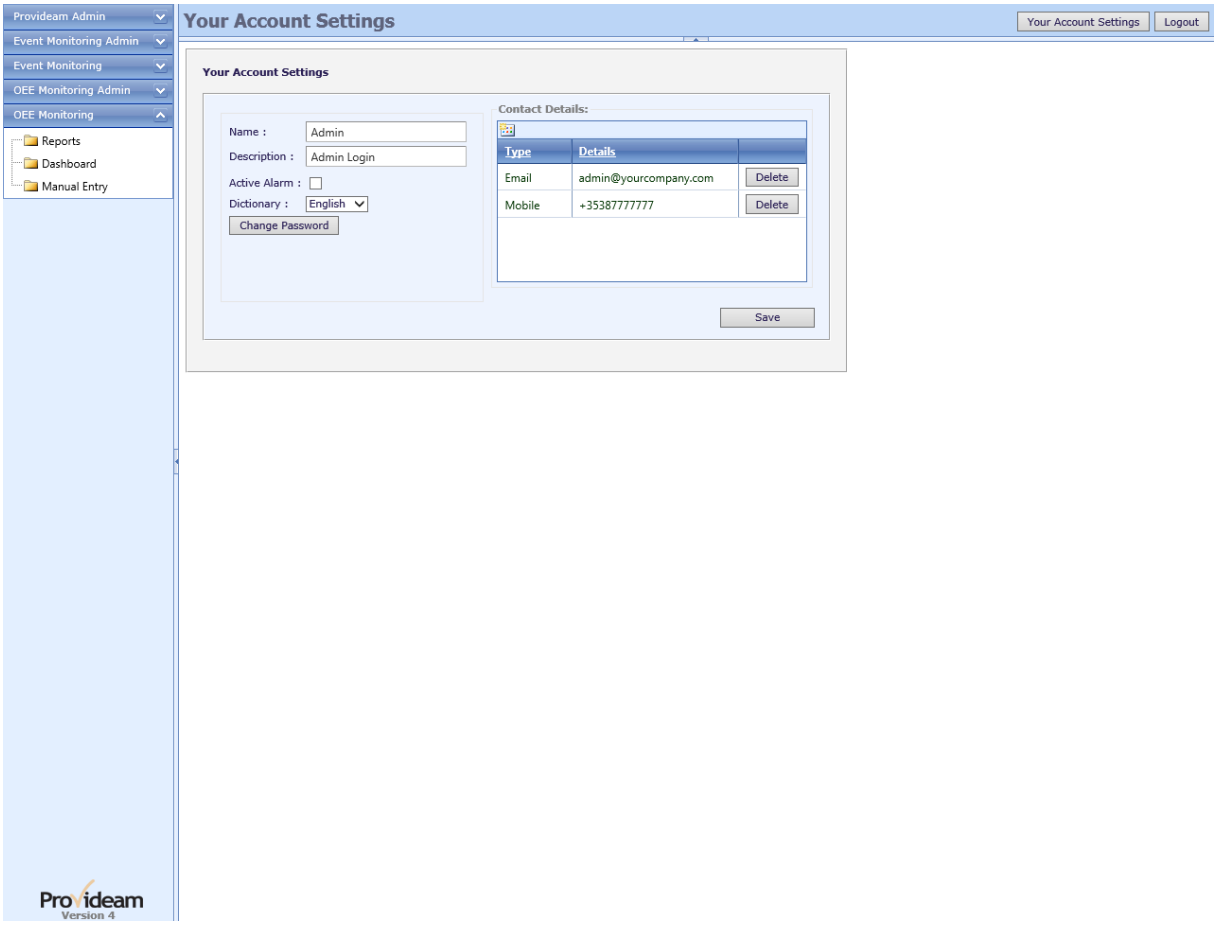


Fig. Provideam Your Account Settings Page

This page allows you to update your personal details. To change your password click on the **Change Password** button.

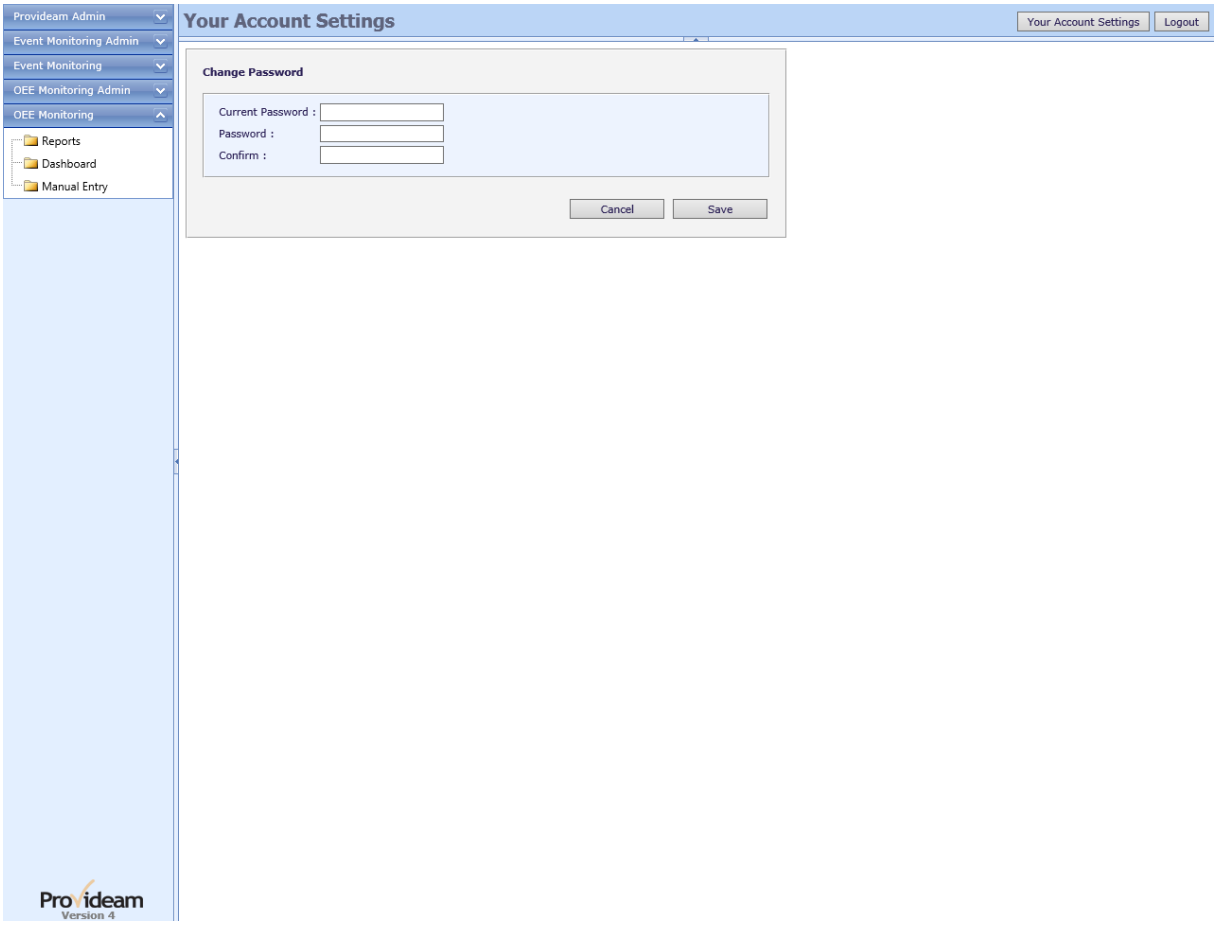


Fig. Provideam Change User Password Page

5.2 The Provideam Window

The Provideam Window is divided into 3 main sections. On the left hand side there is a Module Menu to enable navigation between the various modules.

On the upper right hand side the Overall Data Table shows general or summary data. On the lower right hand side the Detailed Data Table shows more detailed data related to the selected record in the Overall Data Table.

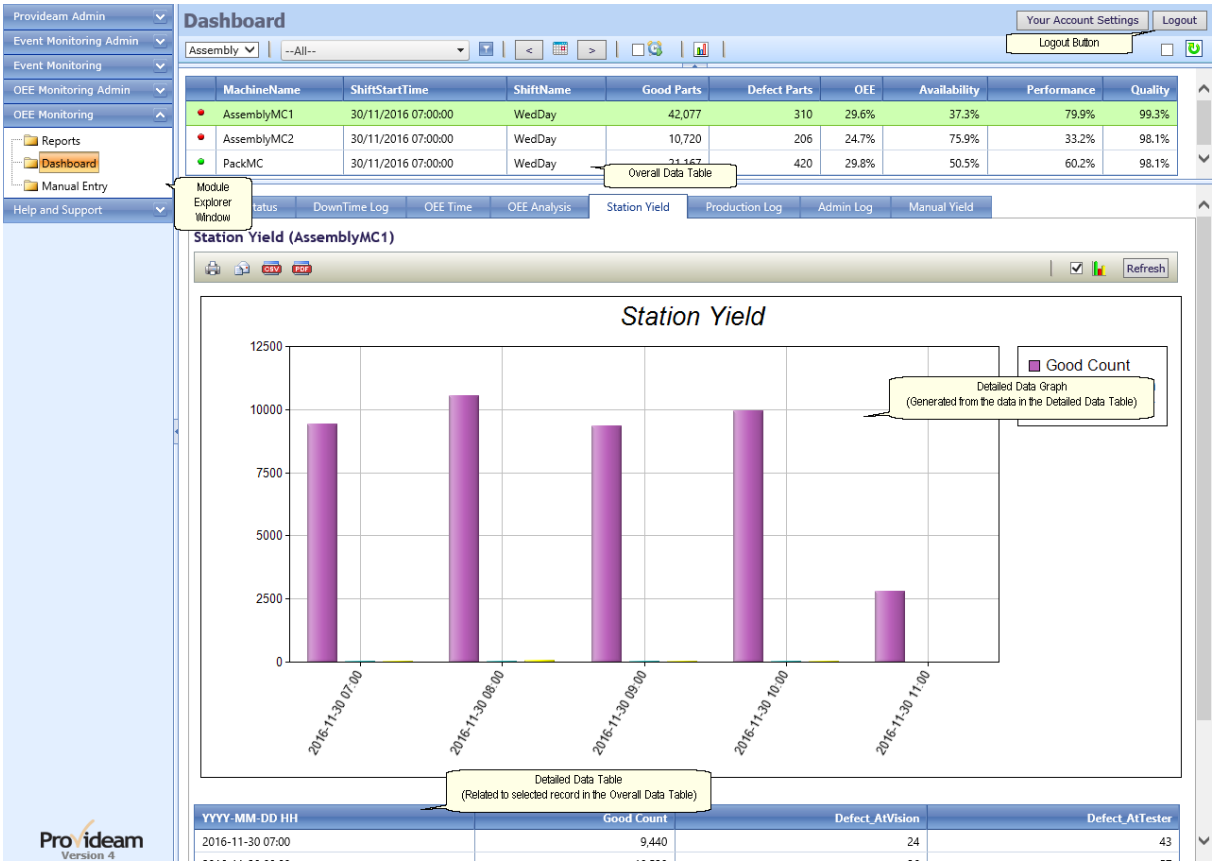


Fig. The Provideam Window

5.2.1 Modules Menu

The Modules Menu shows the available Modules. Only those Modules for which you have been licenced and to which your login details allow access will be visible.

Provideam Modules Toolbar;

Provideam Admin

This menu allows you to configure Provideam Settings.

Plant Admin

This menu allows you to configure Plant (or Site) Settings.

Event Monitoring Admin

This menu allows you to configure the Events which you wish to monitor.

Event Monitoring

This menu allows you to monitor and analyse the Event data collected by Provideam.

OEE Monitoring Admin

This menu allows you to configure the Machines and Areas etc. which you wish to monitor.

OEE Monitoring

This menu allows you to monitor and analyse the OEE data collected by Provideam

Plan Adherence Plug-in

(This module is scheduled to be retired in March 2024. It will be replaced by a new App in the ProvideamApps Suite.)
This menu allows you to manage the Plan Adherence Plug-in. This Plug-in Module is designed to work in conjunction with the OEE Monitoring Module. The plug-in provides an analysis of how well production is adhering to the Planned Production Schedule.

Custom Pages Menu Plug-in

This menu allows you to browse external pages within the Provideam application.

5.3 Demonstration Data

During Provideam Installation you are given the option to pre-load the database with Demonstration Data. This data is a sample configuration for the OEE and Event Monitoring Modules. Some demo Machines are configure to accept 'manual' data entry and some to accept 'automatic' data entry. The 'automatic' machines are designed to work in conjunction with the ProvideamDemo Application and the Kepware OPC Server Suite, which provides demo data to the application in real-time.

You will see the demonstration configuration as you browse the Event and OEE Monitoring Admin Modules.

Note: When you are ready to create your own configuration you can wipe the database clean or simply modify the existing demo configuration to suit your own requirements. To wipe the database you can run the ProvClearDemoData Application located in "<Install Folder>\ProvDemo\".

WARNING: The ProvClearDemoData Application will delete all OEE and Event Data in your database, including Machine and Event Configurations.

5.3.1 Starting Provideam Demo

Start the Provideam Demo Application from **Start>All Programs>Provideam>Provideam Demo Application**.

Warning: The Provideam Demo Application will shutdown and reconfigure your OPC Server. Do not run the Provideam Demo if the OPC Server is being used by another application

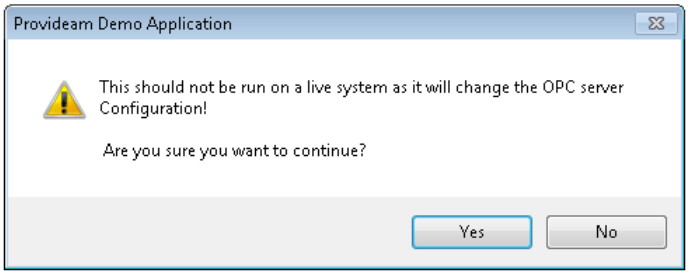


Fig. Provideam Demo - Warning Do Not Use on Live System

The Provideam Demo Application is compatible with the latest (version 5) Kepware (KepServerEx V6) OPC Servers. The Provideam Demo Application will scan your PC to find compatible OPC Servers and, if more than one is installed, will give you the option of which one to use with the Demo.

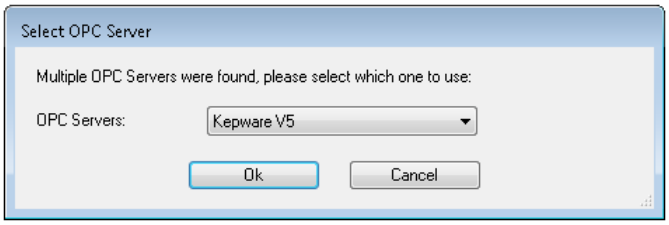


Fig. Provideam Demo - Select Compatible OPC Server

Once you have selected an OPC Server the Provideam Demo Application will reconfigure the OPC Server, re-start the Provideam Data Collection and then display the Provideam Demo GUI.

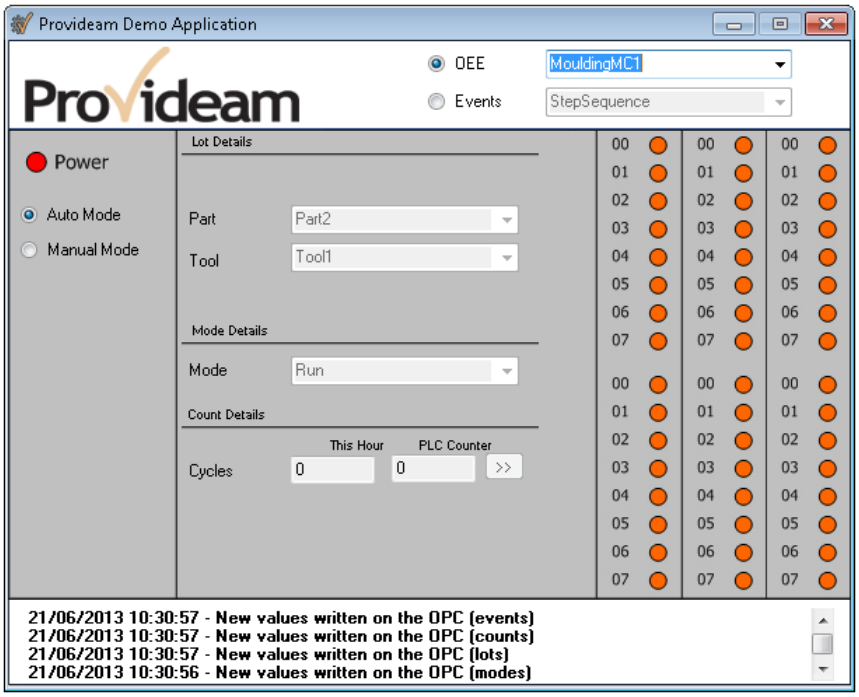


Fig. Provideam Demo - GUI

The Provideam Demo Application writes simulated Mode and Count values to the OPC Server. The Provideam Data Collection Services (ProvOEEMon and ProvEventMon) read these values and log the data as if it was derived from a real machine. After approximately one minute, demo data should begin to appear in the OEE Monitoring Dashboard Window. Machine Modes will cycle between Running and Stopped as you would expect in a real machine.

Note: The Areas, Machines etc. provided for Provideam Demo purposes can be modified, copied or deleted as you require.

See also:

Getting Started: Demonstration Data

5.3.2 ProvideamDemo

In the figure below the Tags which have been pre-configured for the AssemblyMC1 are shown. The Provideam Demo Application writes demonstration data to these Tags in real-time.

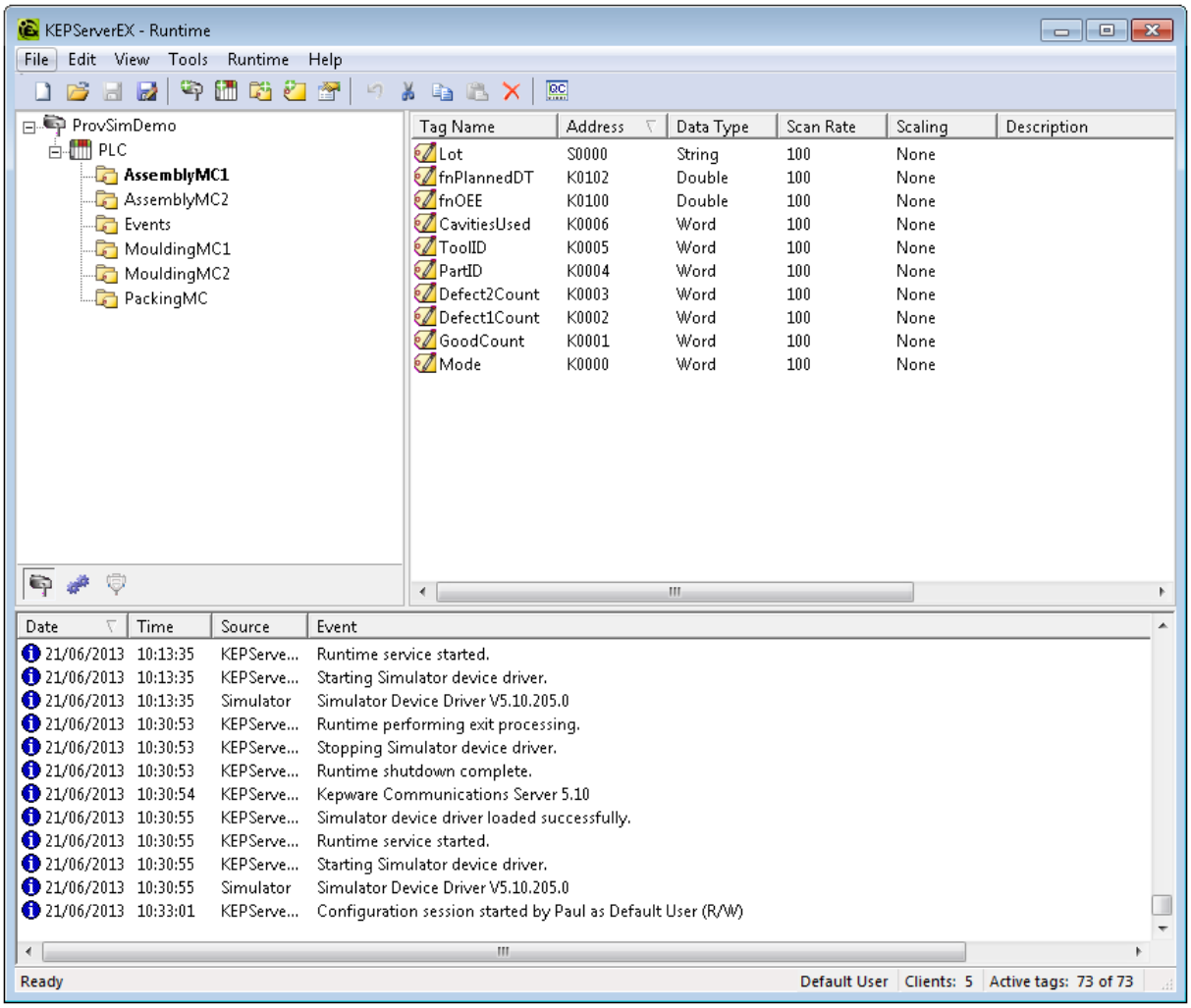


Fig. Kepware Server - Demo Configuration

Using the Kepware OPC QuickClient we can display the data written into the 'AssemblyMC1' Tags in real-time. The 'AssemblyMC1.Mode' value is currently 1. This value is related to an actual Mode in the OEE Monitoring Admin - see the next section, OEE Sample Data, below for more details.

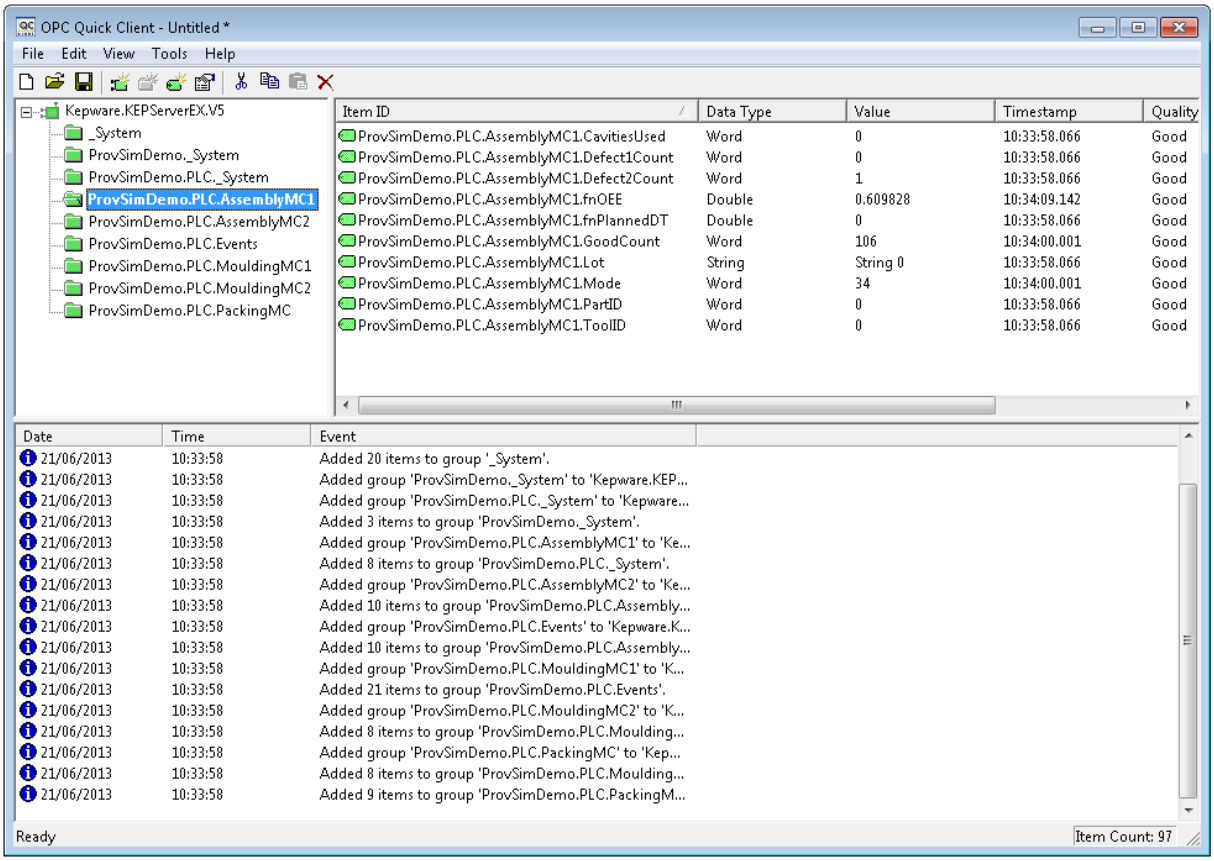


Fig. Kepware OPC QuickClient with OEE Data

The Provideam Demo Application also generates demo data for the Event Monitoring Module. In the figure below two analogue values are displayed.

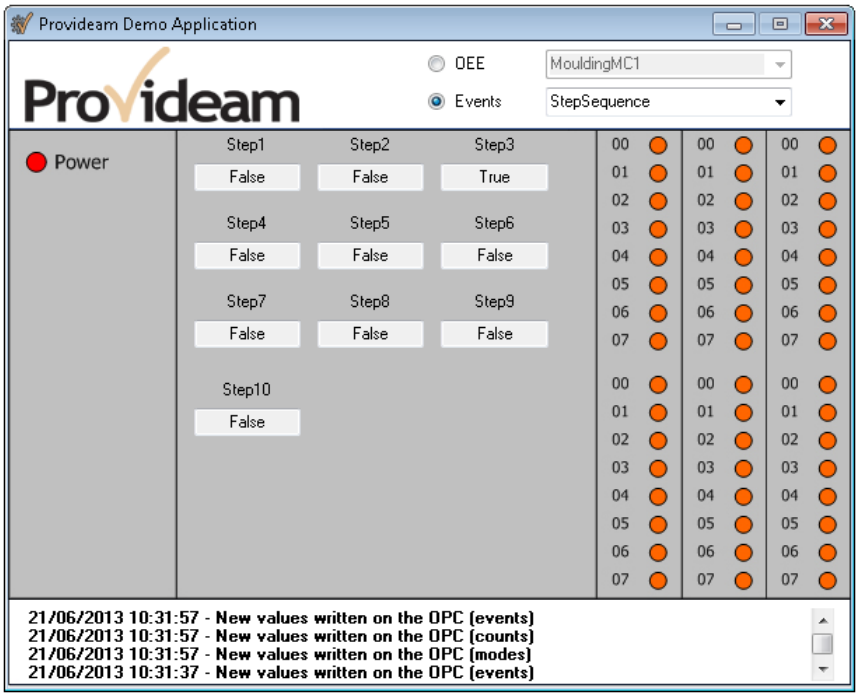


Fig. Provideam Demo Application - Event Monitoring Data.

Below the Kepware OPC QuickClient shows the data for the Events. The value in Event Item 'Analog1' is currently 140.

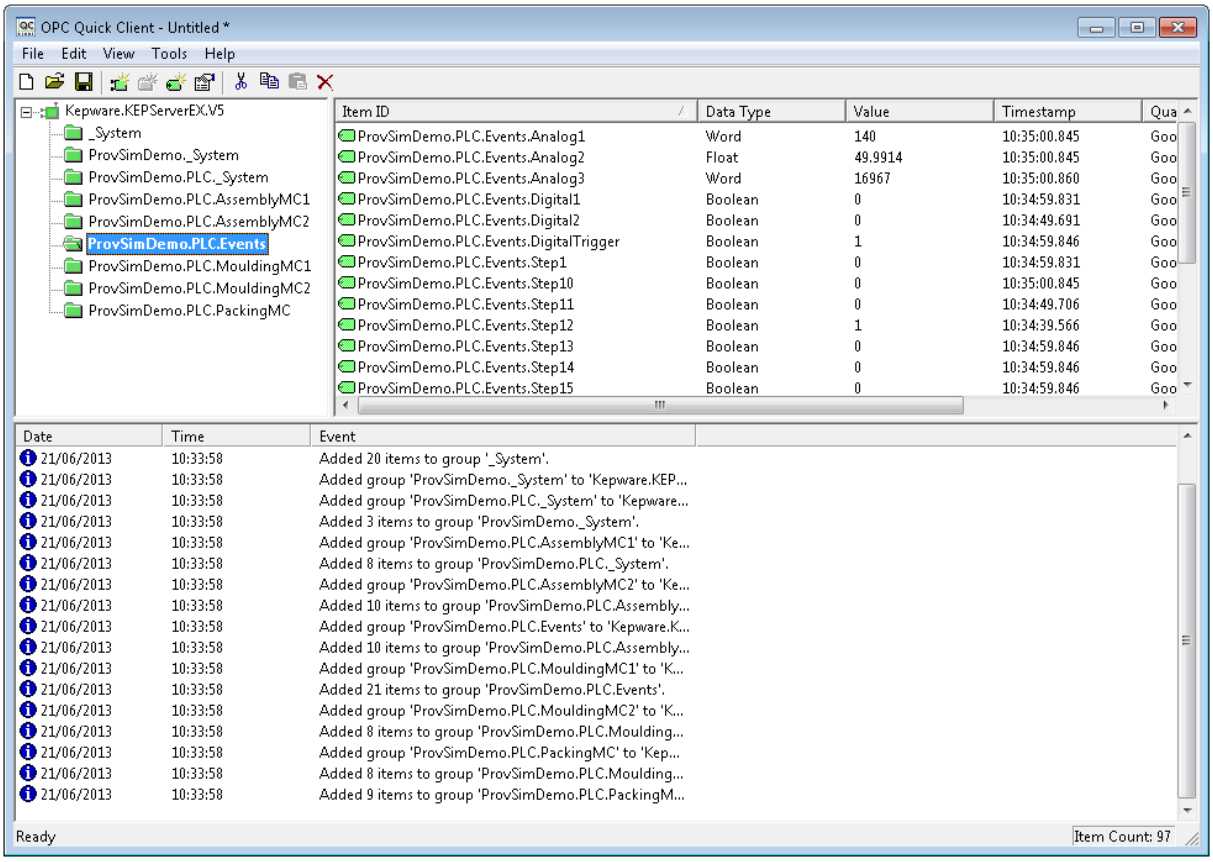


Fig. Kepware OPC QuickClient with Event Data

5.3.3 OEE Sample Data

In the Demo configuration two Areas have been created. See figure below.

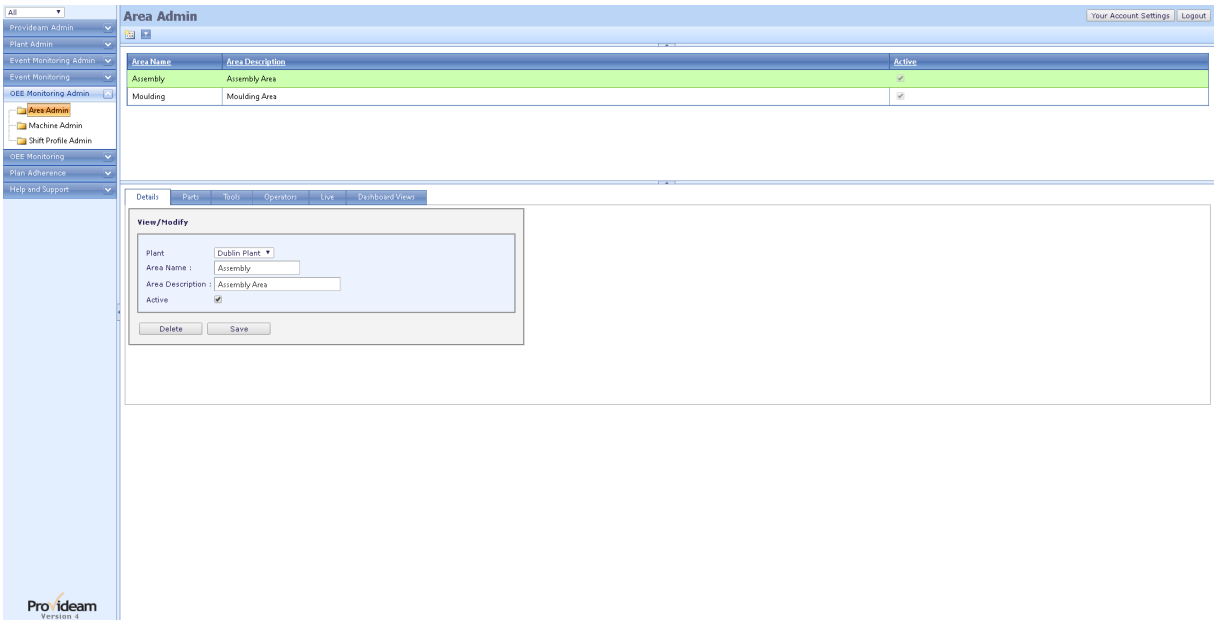


Fig. Area Admin - Area Details

For each of these Areas several Parts have been created.

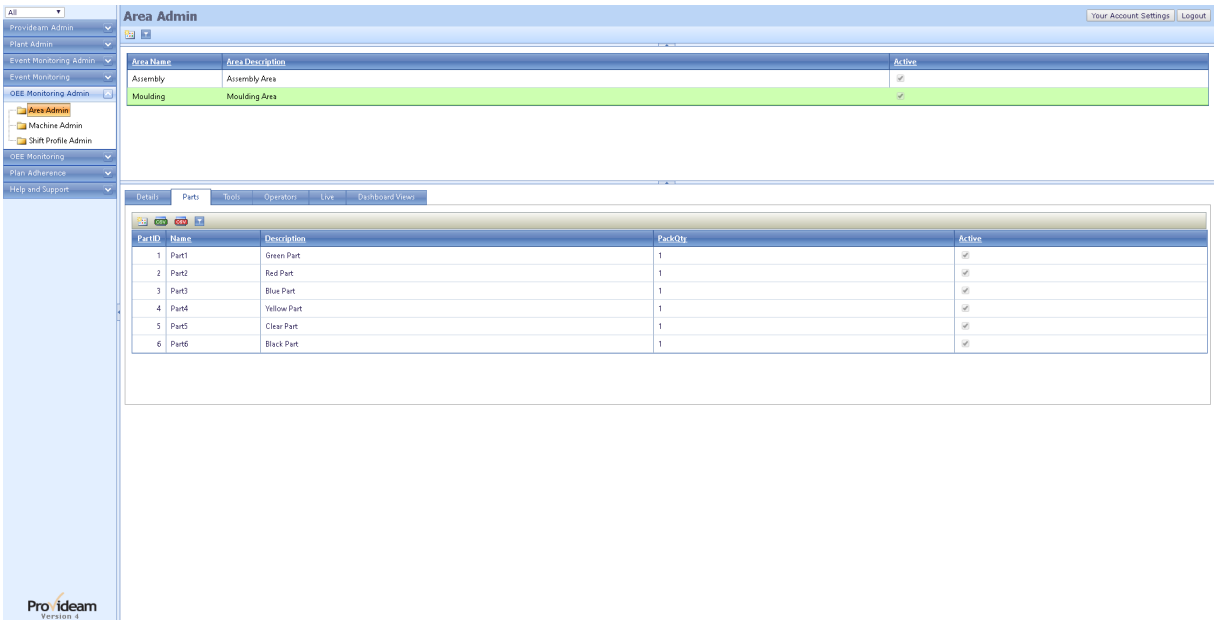


Fig. Area Admin - Parts

Sample Tools and Operators have also been configured.

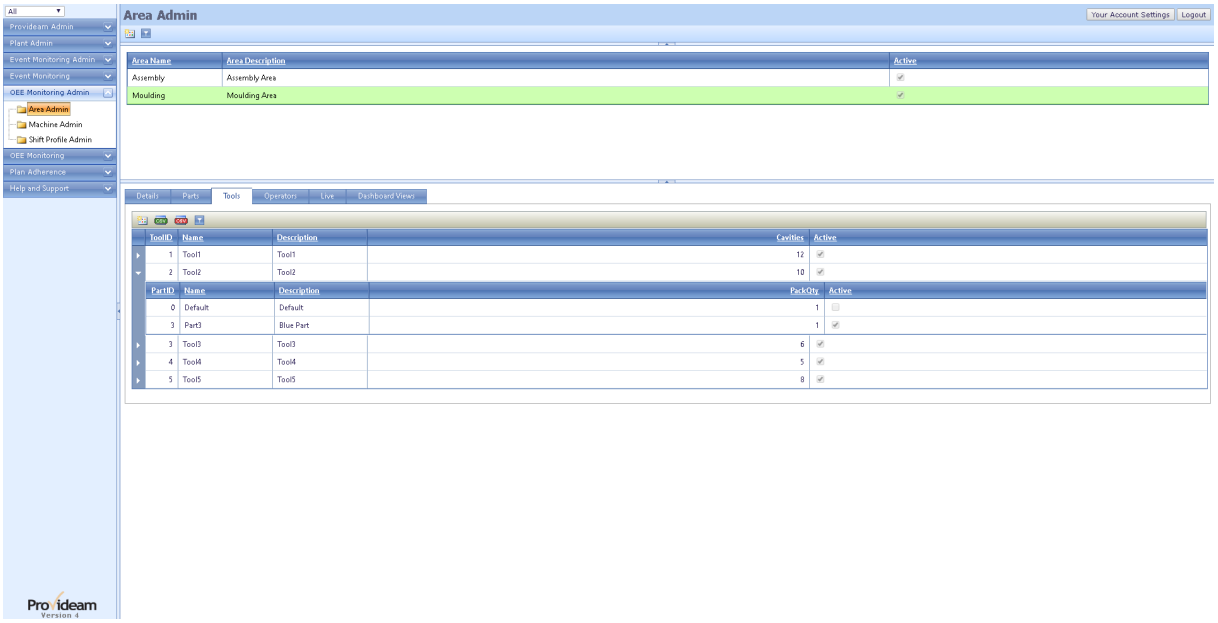


Fig. Area Admin - Tools

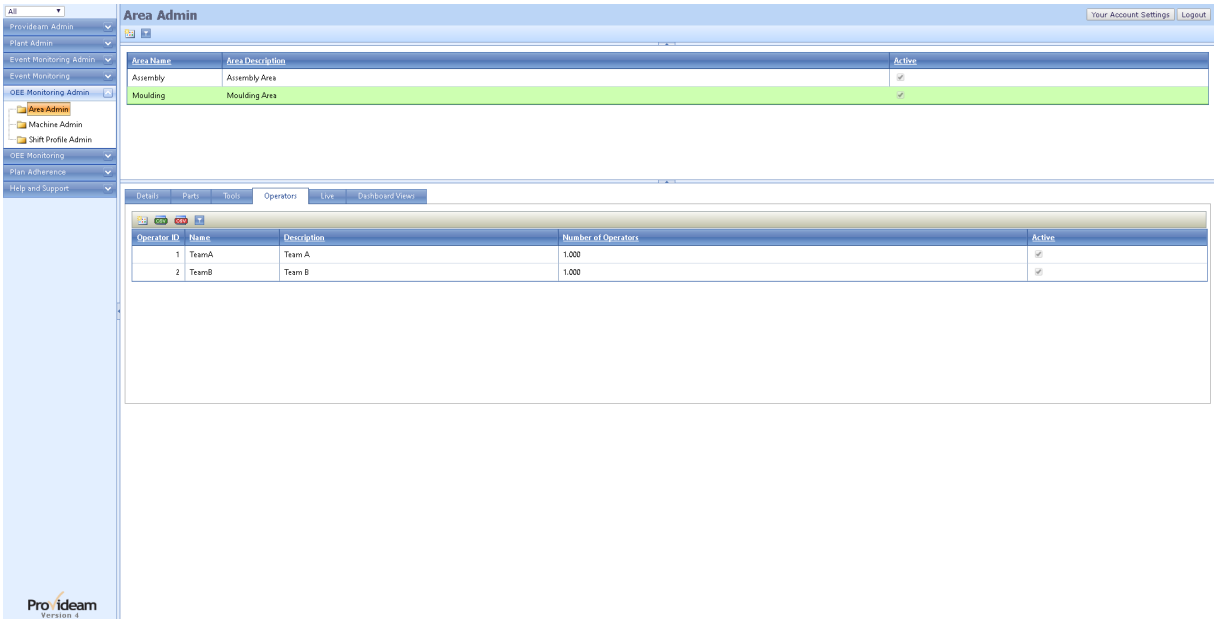


Fig. Area Admin - Operators

Two default Shift Profiles have been created. In figure below you can see the sample 3 Shift Cycle.

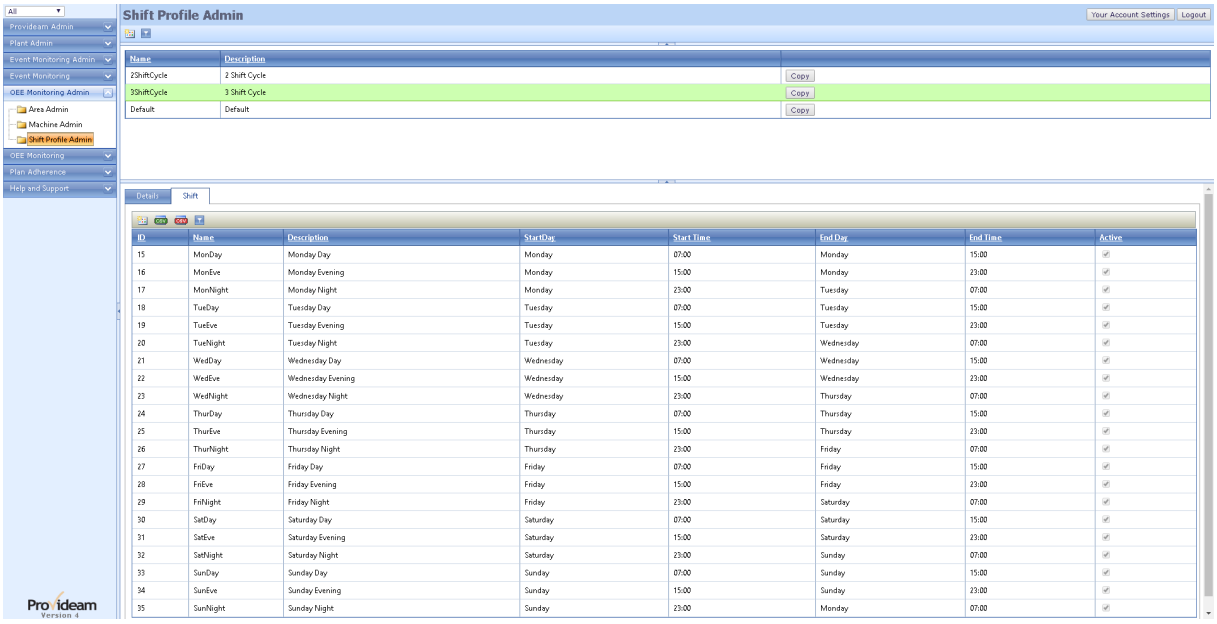


Fig. Shift Profile Admin - Shifts

The figure below shows the AssemblyMC1 Machine configuration. You will see that AssemblyMC1 is operated on a 3 Shift Cycle.

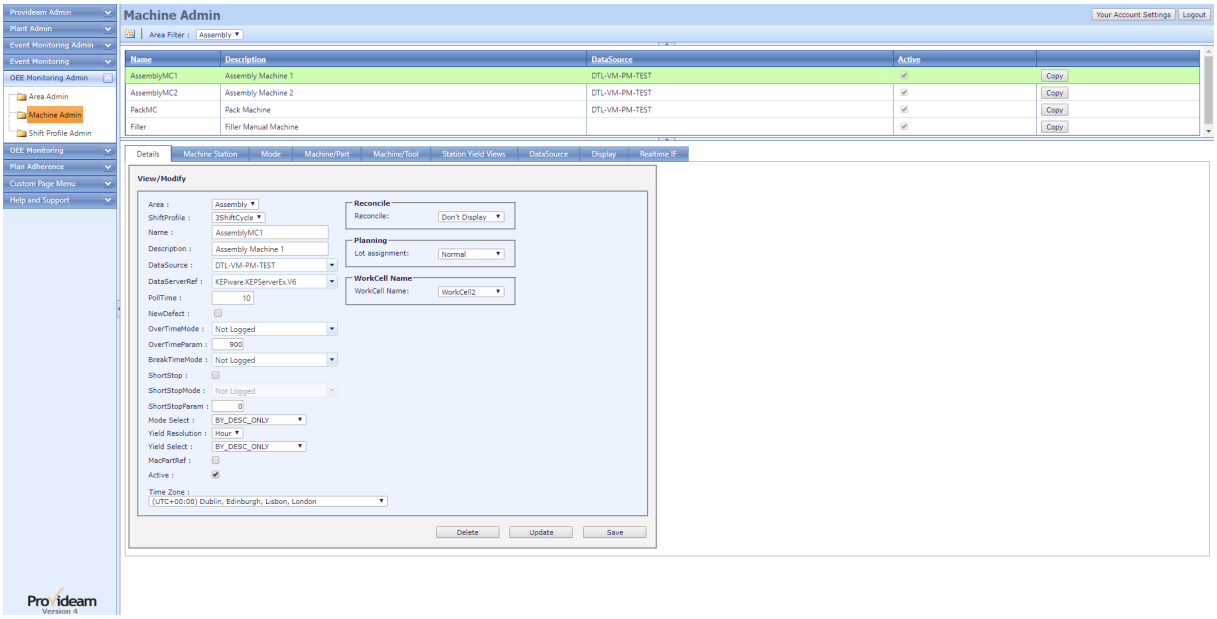


Fig. Machine Admin - Machine Details

In the screenshot below you will notice that the **ModeID** is referenced to the tag *ProvSimDemo.PLC.AssemblyMC1.Mode*. This tag is referenced to a Kepware OPC server on *ProvideamServer*.

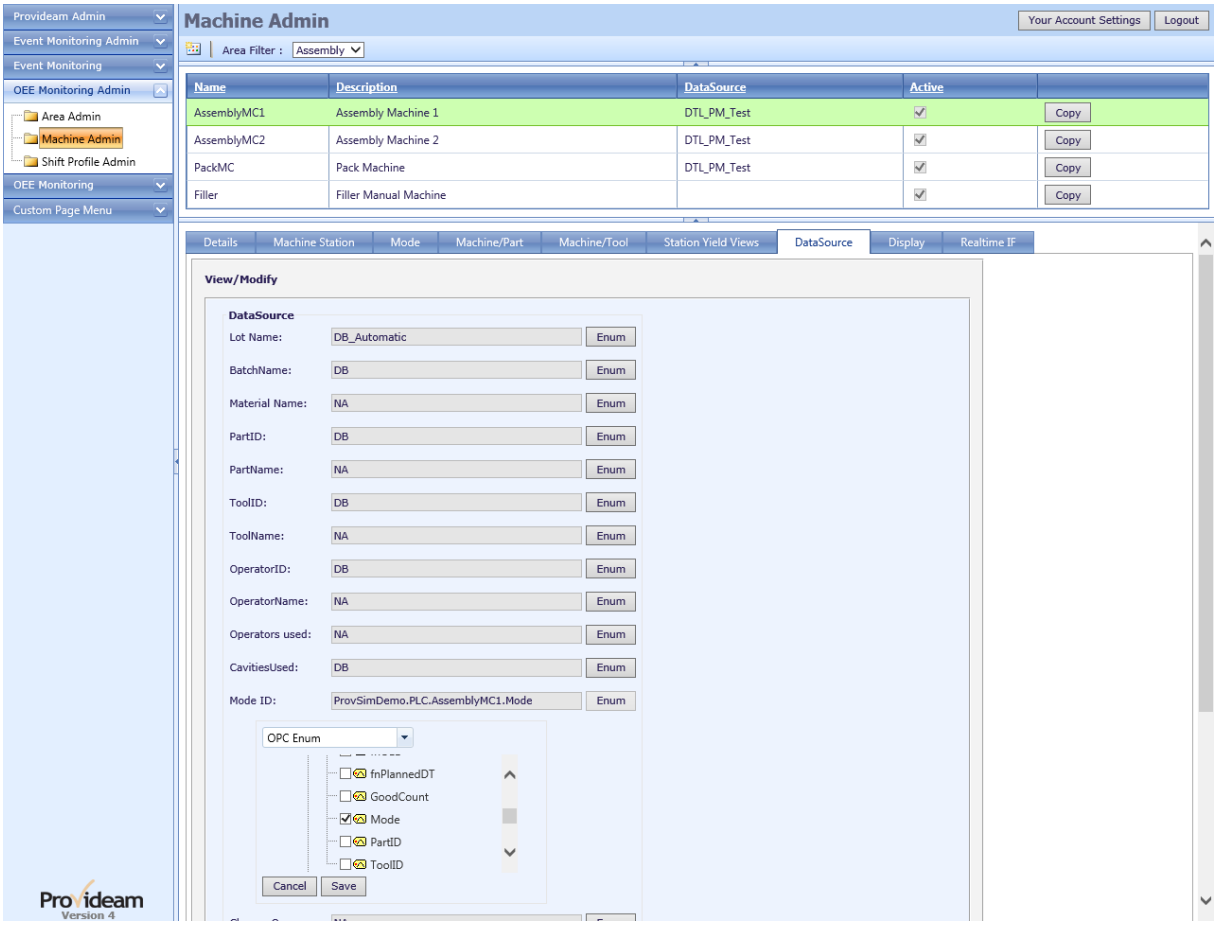


Fig. Machine Admin - Machine DataSource OPC Enum

Several Modes have been created for each Machine.

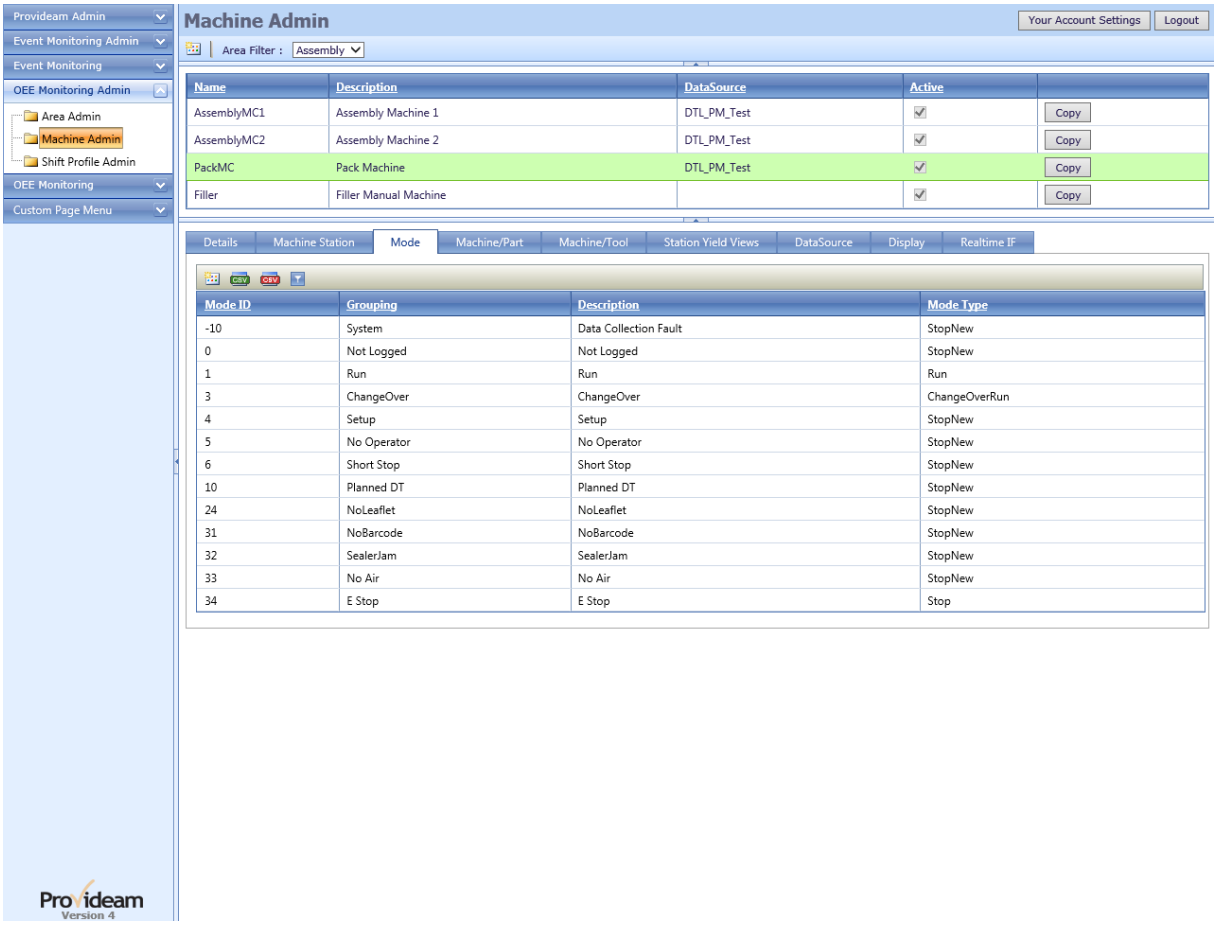


Fig. Machine Admin - Modes

Each Machine has a number of associated Counts. In the figure below we see that the PackMC has 2 counts; *GoodParts* and *Defect*.

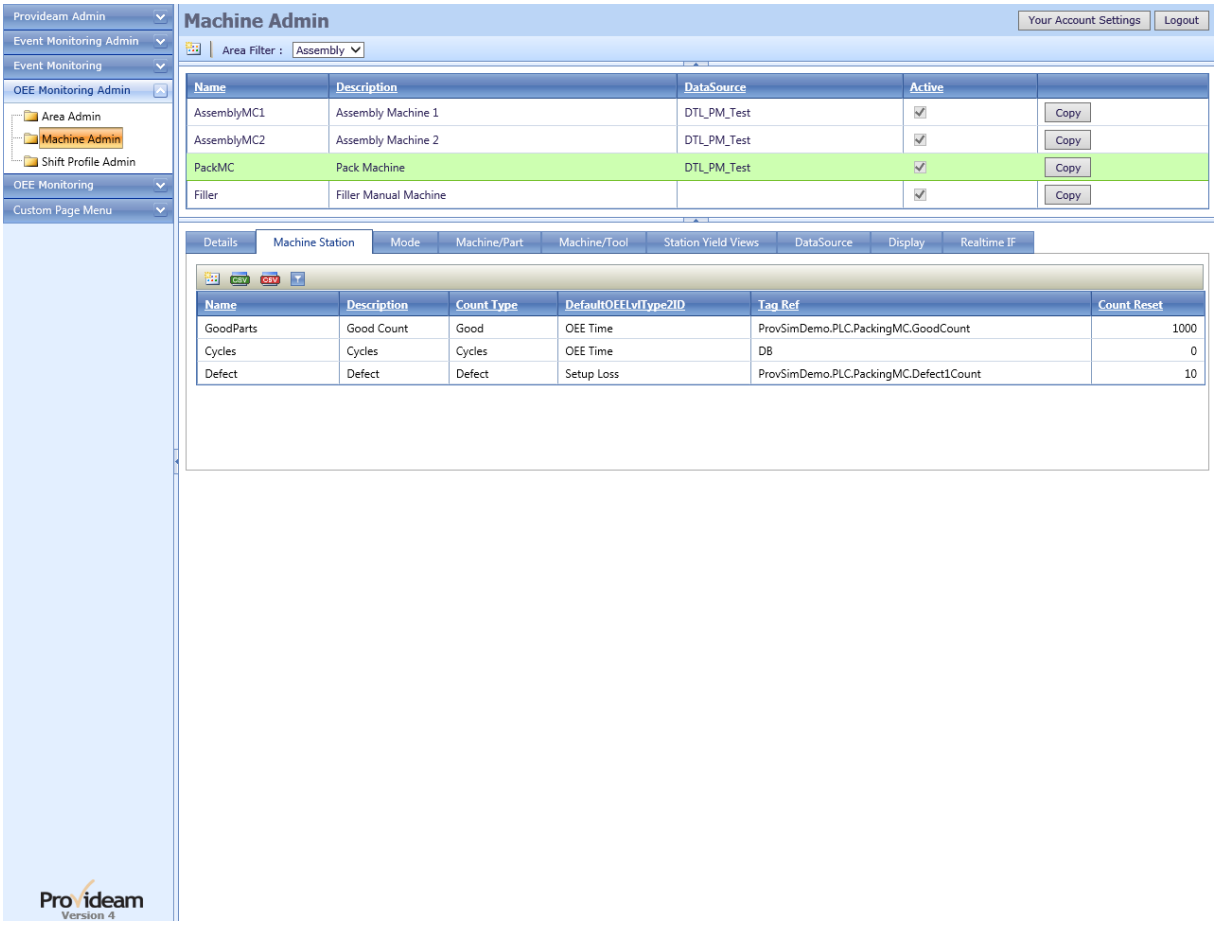


Fig. Machine Admin - Machine Station

A Standard Time for each Part related to each Machine is defined. This is the minimum time (seconds) required to make that Part on that Machine.

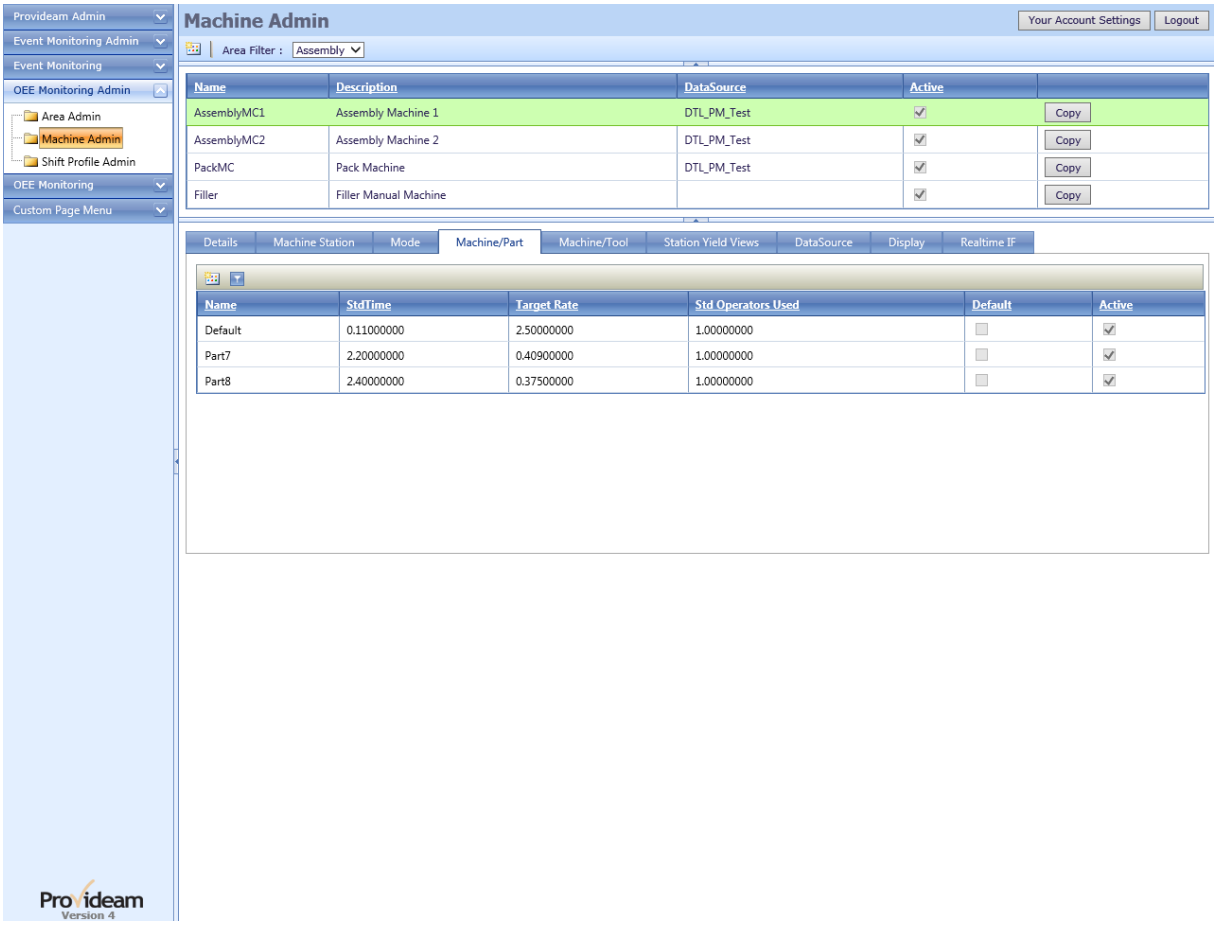


Fig. Machine Admin - Machine/Parts Standard Times

5.3.4 Event Sample Data

In the Demo configuration three Tag Groups have been created, StepSequence, AnalogValues and DigitalValues -see figure below.

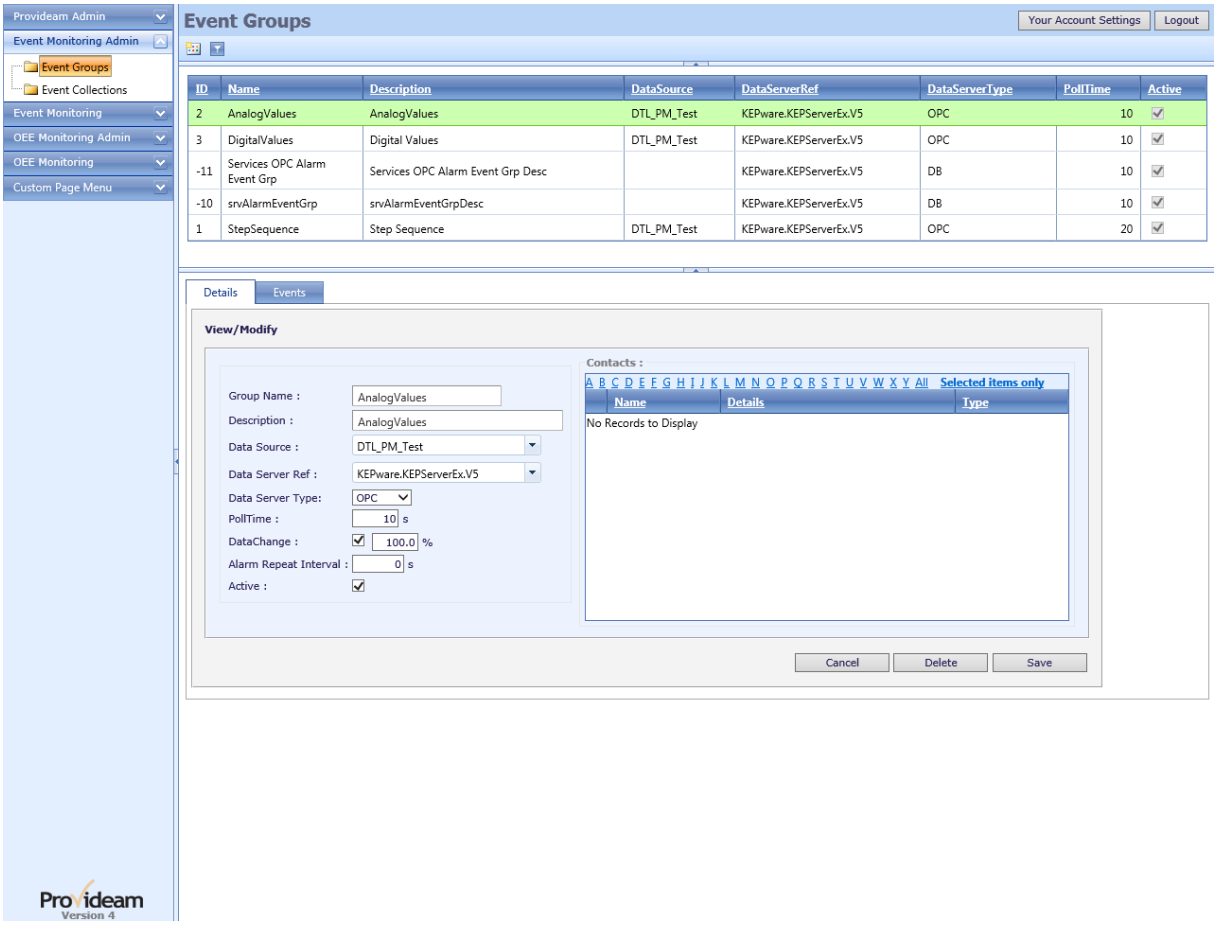


Fig. Event Group Admin - Event Group Details

Event Groups define general properties for a group of Event Items. In the figure above we can see that the data for the 'AnalogValues' Event Group is derived from a Kepware OPC Server on the *DTL_PM_Test* PC. The PollTime defines how often the current value of each Event Item is updated.

The individual Event Items for the 'AnalogValues' Event Group are shown in the figure below.

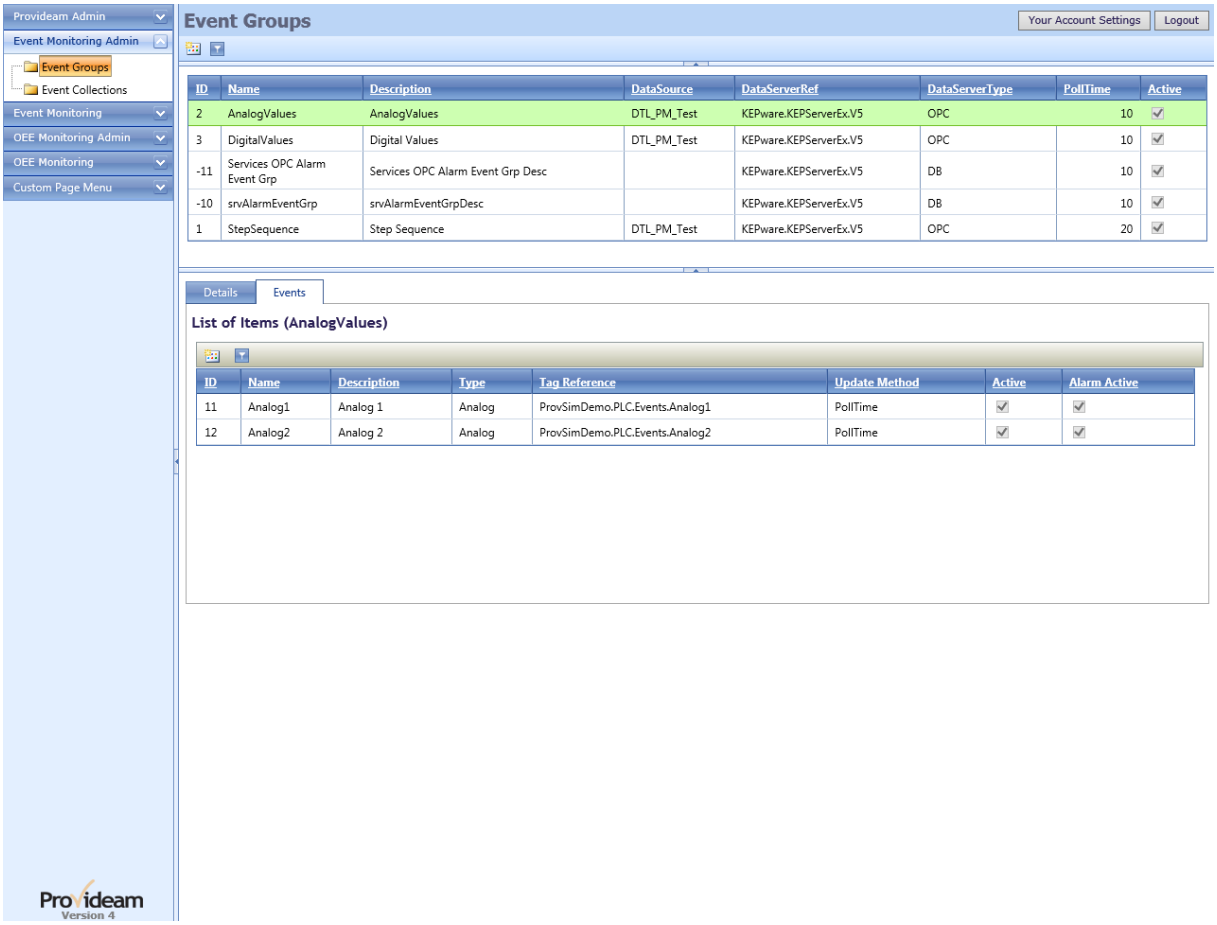


Fig. Event Group Admin - Events

The Digital Tag shown below is logged to the Provideam Database on a Data Change - in this case when the value changes by 100%.

Note: PollTime in Event Group Details defines when the Current Value of the Event Item is updated. Update Method in Event Item Details defines when the Event Item Current Value will be logged to the Database.

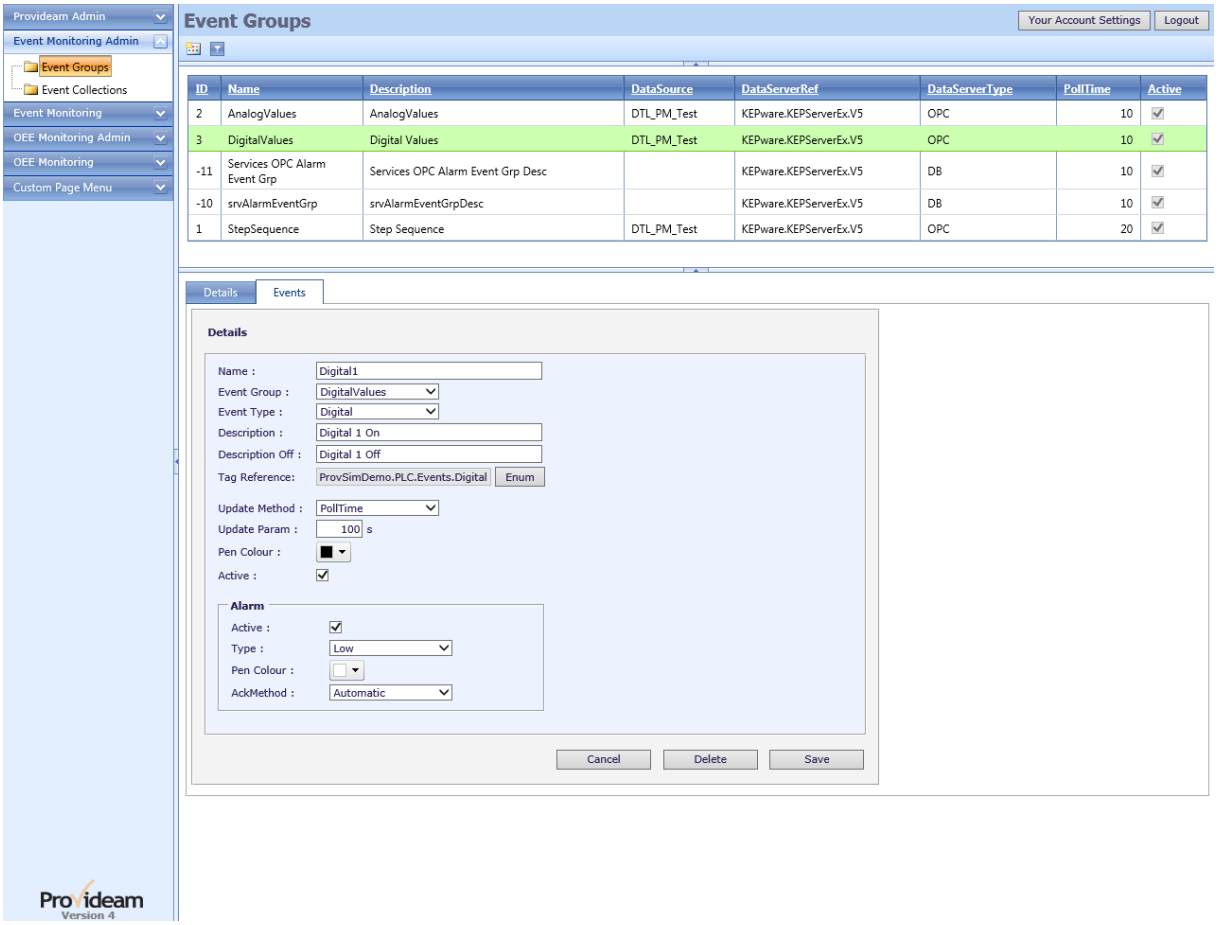


Fig. Event Group Admin - Event Details

Event Collections define how Event Items (Tags) are grouped for the purposes of reports. For the Demo we have configured three Event Collections.

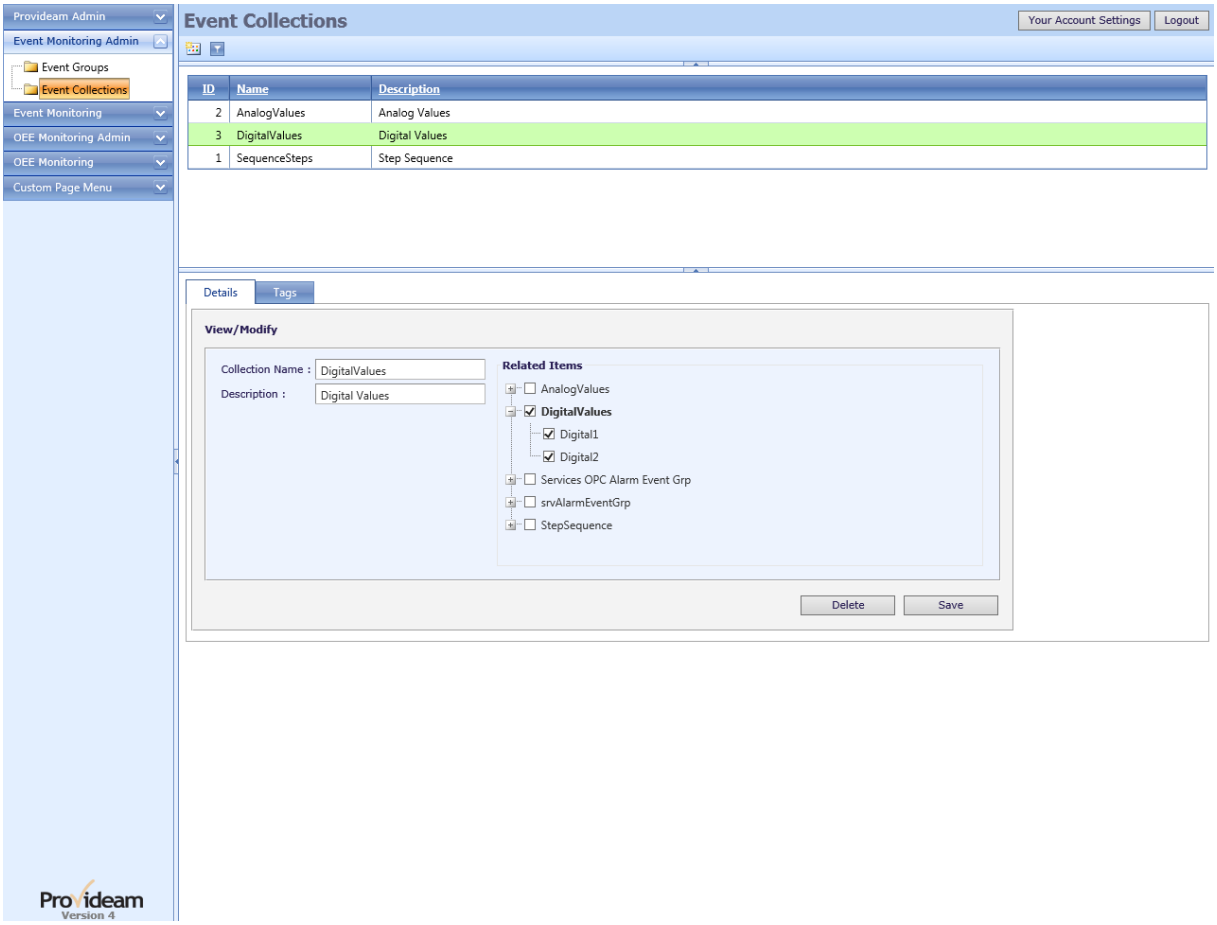


Fig. Event Collection Admin - Event Collection Details

The Tag Details define how the Items will be displayed on a Chart. In the example below the Tag 'Digital2' will be scaled by 1.0 and will be drawn using a Red Pen.

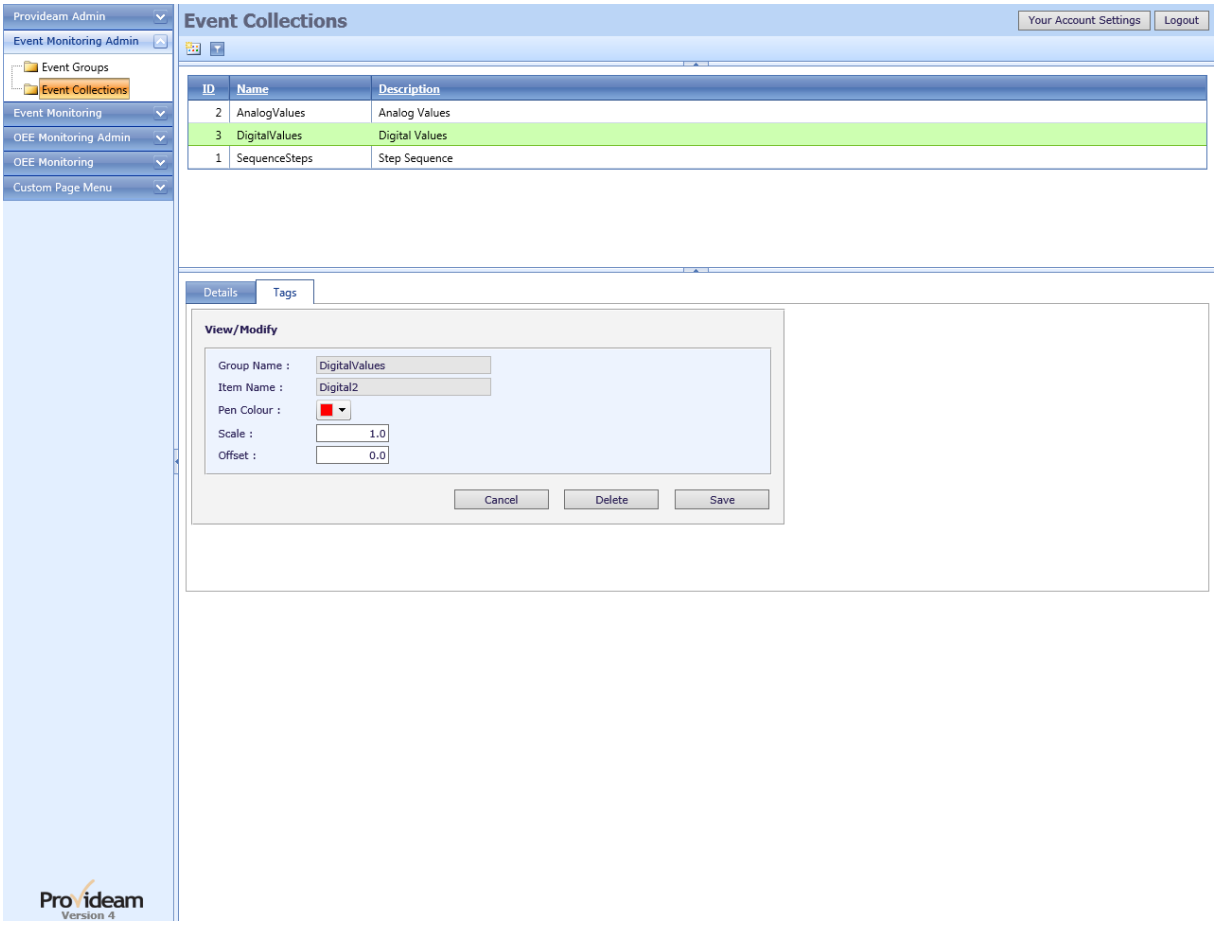


Fig. Event Collection Admin - Event Collection Tags

5.3.5 Data Collection Services

Running the ProvideamDemo Application automatically starts the Provideam Data Collection Services. These services collect the data generated by the ProvideamDemo Application and log the data to the Provideam Database. In the figure below we can see that both the Provideam OEE and Event Monitoring Data Collection Services are running.

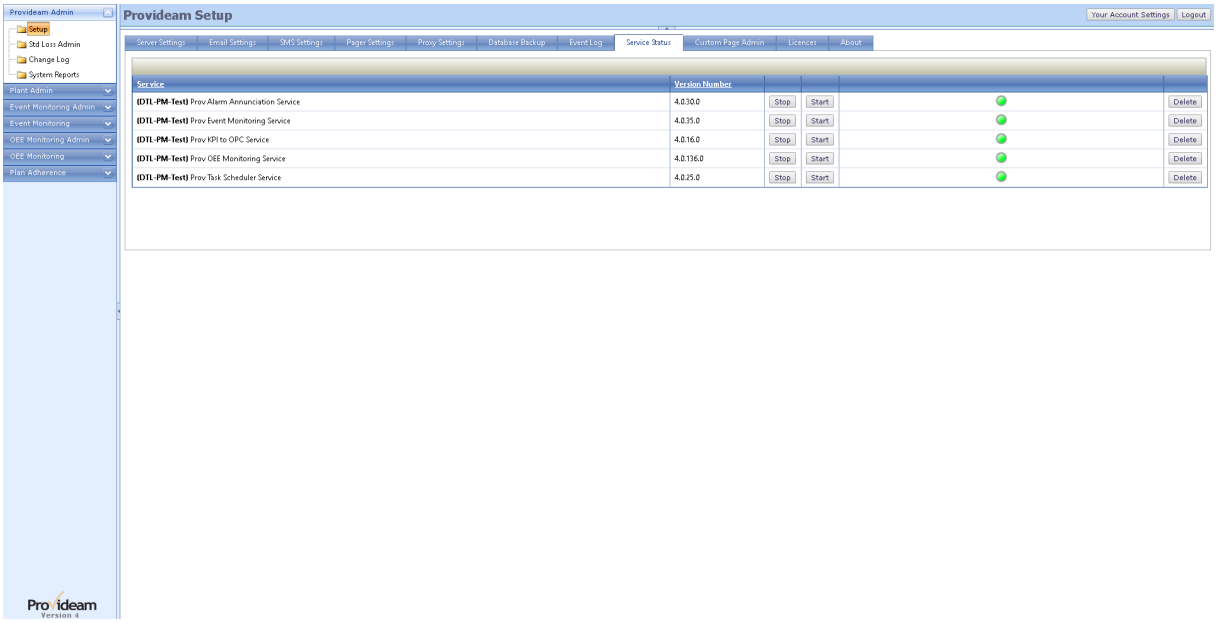


Fig. Provideam Admin - Data Collection Services

5.4 Configuring Provideam

Provideam is an intranet application and as such can be accessed from any client connected on the same Local Area Network (LAN). If you wish to connect Provideam to your factory's LAN you will need to enter some general IT settings, specific to your LAN, with the help of your IT Department. Being on your LAN enables such features as emailing reports.

5.4.1 General Settings

Firstly you need set some basic server settings.

Change **Company Name** to the name of your company.

Change **Administor's Email** to a suitable address. This is the address used by Provideam when sending emails. Thus if an email is sent from Provideam the sender will appear as the entry you use here.

Tip: It can be useful to set the Administrator's Email Address to "Provideam@*YourDomain.com*". Thus recipients of the mail will immediately recognise the sender and the nature of the email.

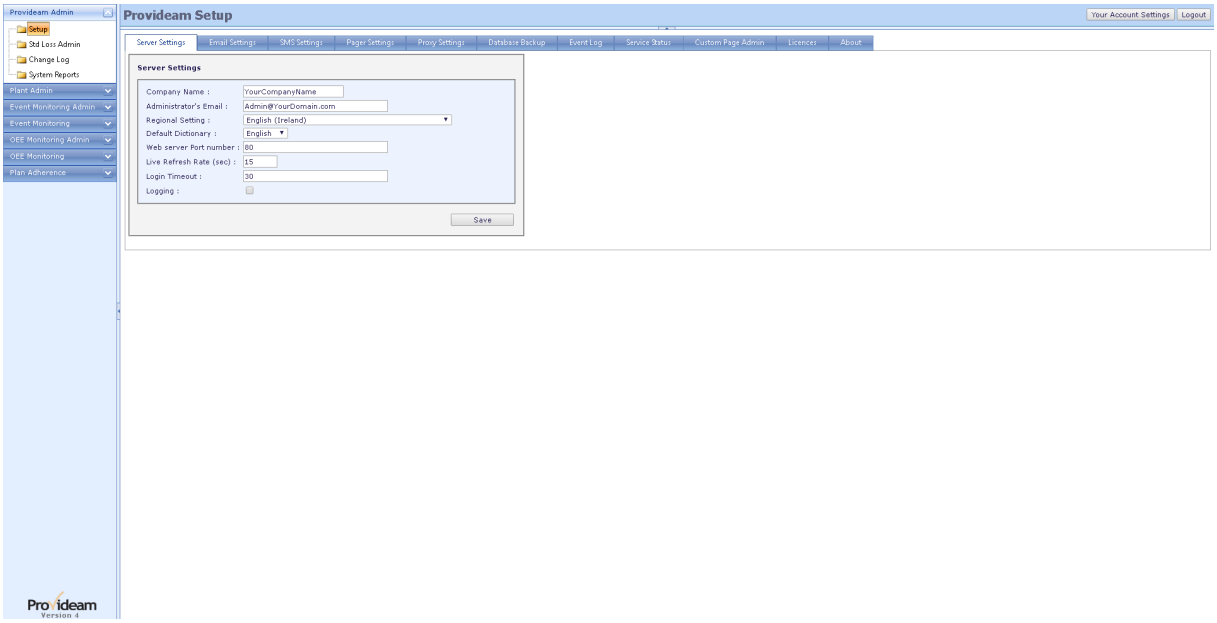


Fig. Provideam Admin - Server Settings

To enable you to send emails from Provideam you must enter an SMTP address. This is the name or IP address of the server which handles SMTP mail for your company.

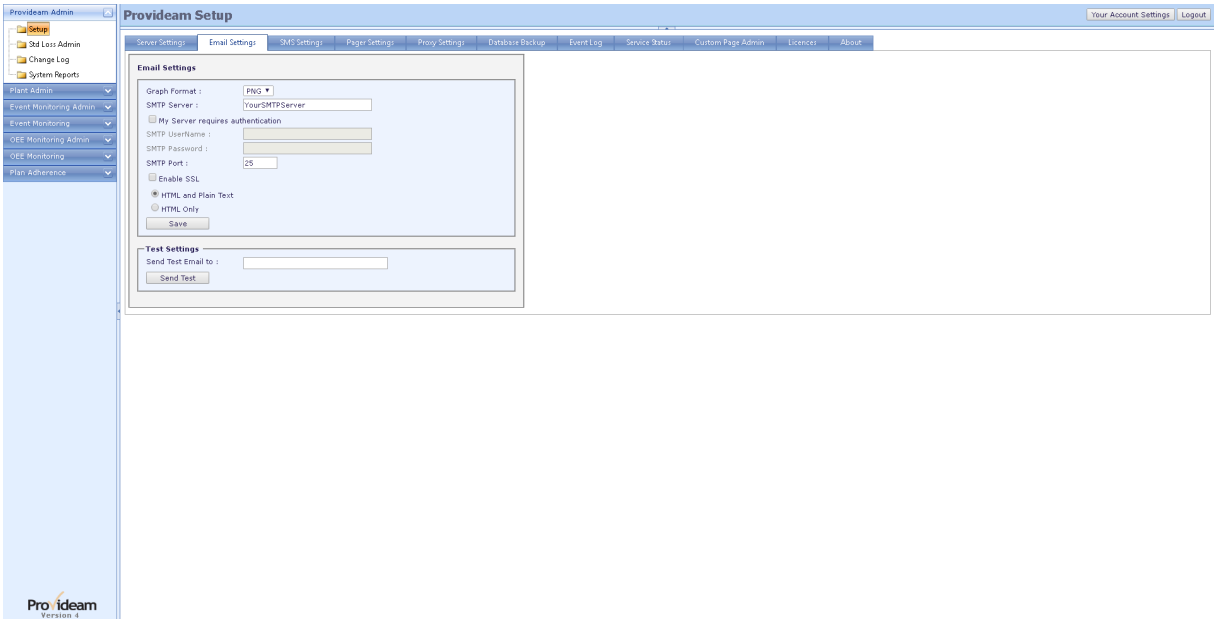


Fig. Provideam Admin - Email Settings

It is not generally necessary but depending on how your LAN is configured you may need to enter some HTML Proxy Settings. For example you may need to use Proxy Settings to allow Provideam connect to external service providers such as the SMS provider. Your IT Department will be able to advise on this.

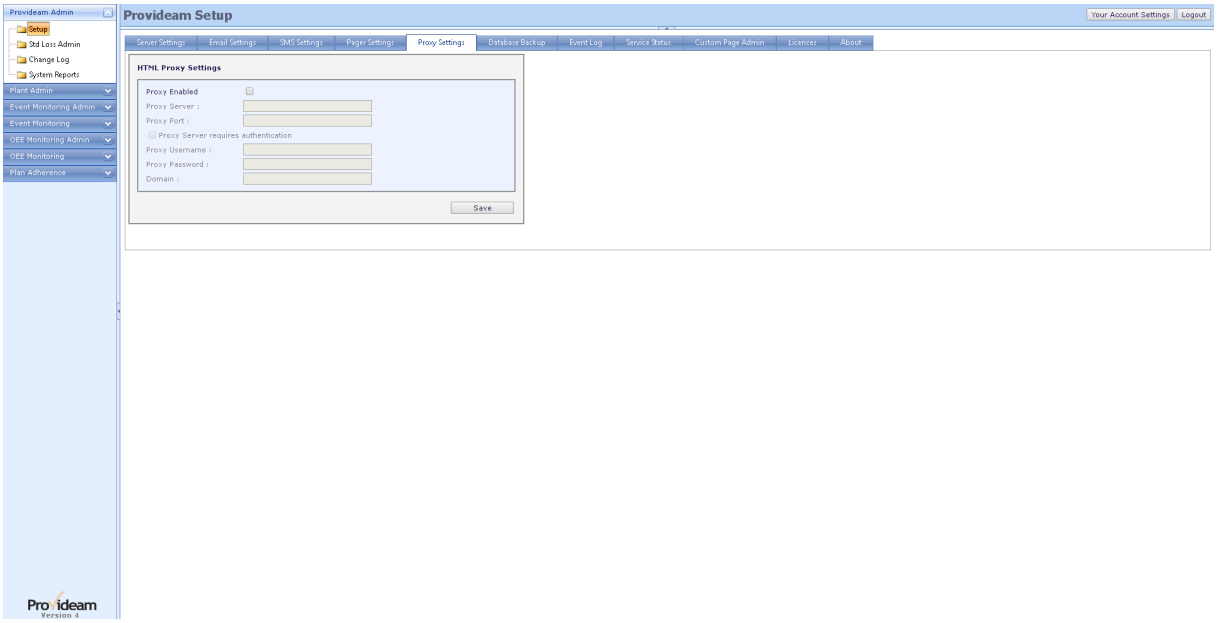


Fig. Provideam Admin - Proxy Settings

Section VI:
Routine Operation

Provideam 4.18
Manufacturing Productivity Solutions

6 Routine Operation

Provideam is specially designed for companies that operate Lean Manufacturing Management or Continuous Improvement Management Systems. Provideam enables such companies to analyse real-time and historical data through a variety of easy-to-use views and reports.

OEE Dashboard

The OEE Dashboard is the direct interface to real-time production data. Several predefined views provide a simple method of accessing key data related to the productivity of your machinery. These views update in real-time allowing you to track production as it is happening.

The Dashboard is not limited to real-time data and a calendar function has been included to enable you to look up historical data.

The data in the Dashboard views is related to shift and cannot be analysed over a longer time period unless exported to a 3rd Party product such as MS Excel. Within Provideam you must use the OEE Reporting functions to analyse data over longer time periods.

OEE Reports

The OEE Reporting functions allow you, in a highly flexible way, to configure reports over shifts, days, weeks, months or customised time periods. These reports can be saved as templates for future use.

Reports which have been saved as templates can be delivered to a list of users via email on a predefined schedule.

Event Reports

The Event Reporting functions allow you to view logged Event Item data either in trended chart or tabular format.

Event Report templates can be delivered to a list of users via email on a predefined schedule.

The following sections demonstrate the features of the OEE Dashboard, OEE Reporting and Event Reporting using sample data generated by the Provideam Demo Application.

6.1 OEE Dashboard

The OEE Dashboard is your direct means of analysing 'automatic' production data in real-time.

Note: The User Security settings in Provideam allow the Administrator to configure which Areas and Machines are visible to each User. Also some functions may not appear due to a restriction in your User Security settings.

There are two sections to the display. The upper window is called the Overall Data Window and shows all the Shifts for the selected day for the selected Area. By default the selected day will be the current day. The lower window is called the Detailed Data Window and, depending on the pane selected, shows specific data related to the Shift Record selected in the upper window.

Note: If there has been a Shift Change you will see more than one Shift Record for the Machine in the Overall Data Window. In the example below the first shift started at 07:00:00. This shift is currently in progress so no other shift start times appear in the Overall Data Table.

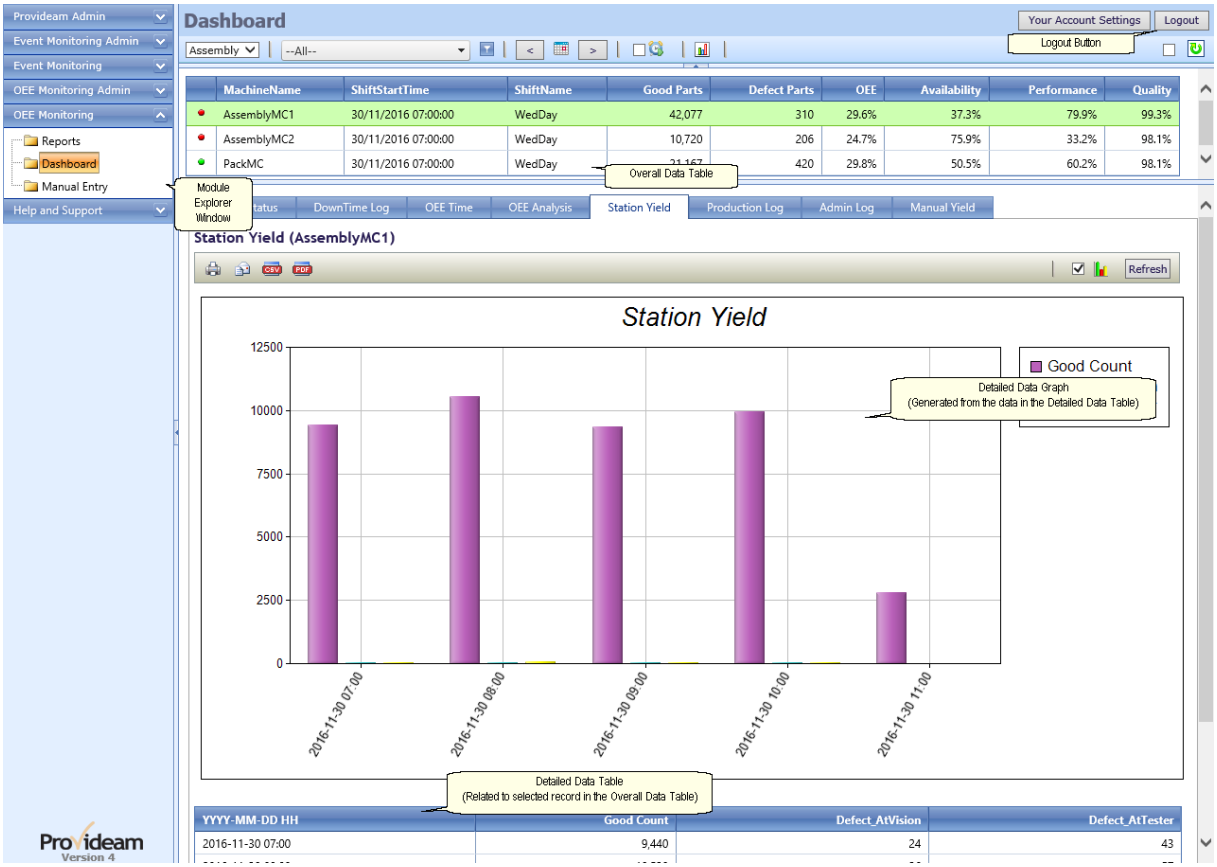


Fig. OEE Dashboard

Item	Description
Area Select	Select Area filter. Only Machines from the selected Area will be displayed.
Machine Select	Select Machine filter. Only the selected Machines will be displayed once the filter is applied.
Machine Filter	Apply Machine Selection Filter. Only selected Machines will be displayed.
Show Date Selection	Opens Date Selection Filter Window. Select dates by clicking on appropriate date on calendar. Shifts from the selected dates will appear in the Overall Data Window. The Show Date Selection Filter Window can be expanded by clicking on the Advanced Button.
< (Previous Day)	Moves the selected Dates Range back one Day. Shifts from the selected Dates Range will appear in the Overall Data Window.
< (Next Day)	Moves the selected Dates Range forward one Day. Shifts from the selected Dates Range will appear in the Overall Data Window.
Current Record	The Display will only show the current Lot/Shift Record
View Selection	Select View filter. The Overall Data Table fields and functions will be defined by the selected View.
Live Button	Click this button to launch the 'Live' display which is suitable for use on large plasma or LED monitors. The Live display shows a selection of charts which update in real-time.
Auto Update	The display will be updated every 15s while the checkbox is checked.
Refresh Button	Click Refresh for an immediate refresh of the displayed data.
Overall Data Window	Shows table of shift records for selected Machines on selected dates.

The Date Selection Filter Window

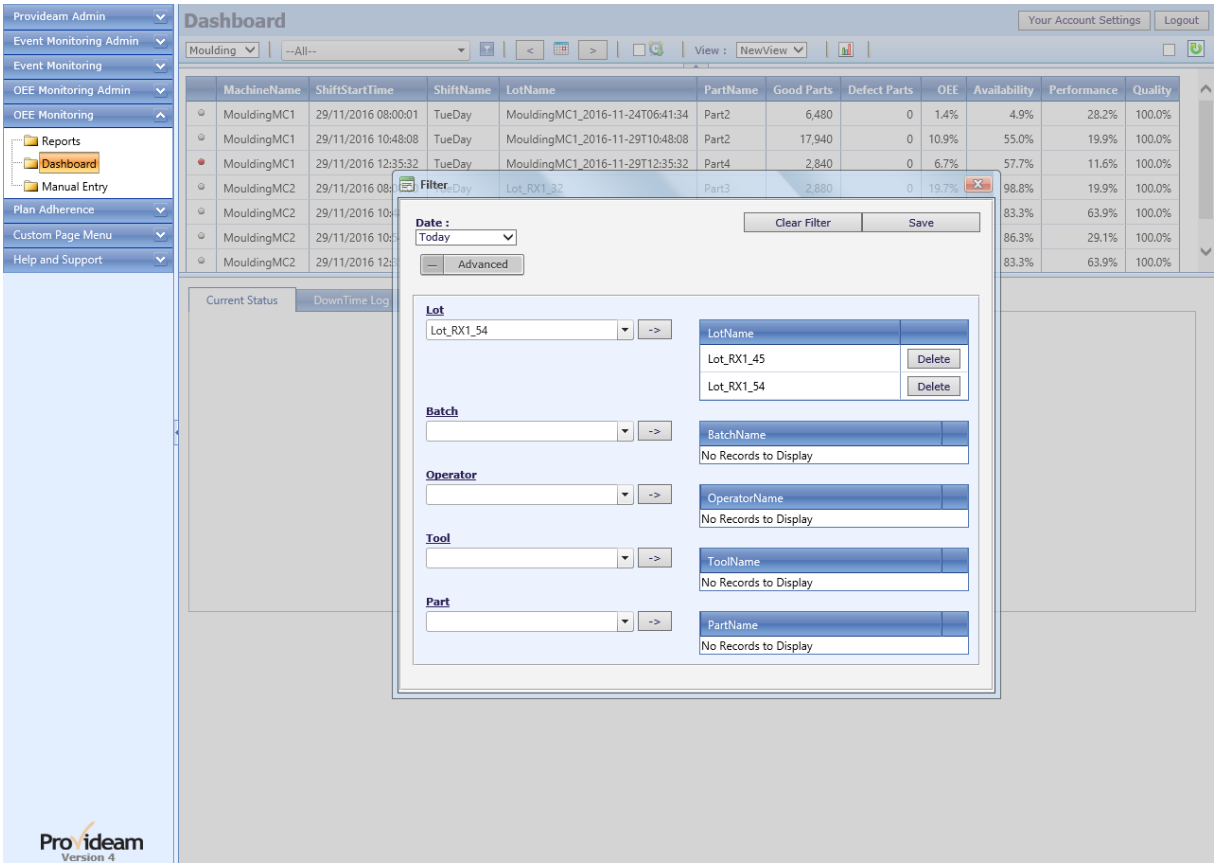


Fig. Dashboard - Dates Selection Filter - Advanced Options

Item	Description
Date Selection	The Date Selection Dropdown Box allows you to select the Date Range your require. A number of 'quickpick' options are provided such as Today, or Previous Day. For a Custom Date Range select the Custom Period option. This option allows you to select any Start and End Date. The maximum allow Date Range Period is 31 days. This limit is to protect the application from excessively broad queries.
= Advanced Button	Maximise Advanced Filter Window
- Advanced Button	Minimise Advanced Filter Window
Clear Filter Button	Clears all the Filter Settings
Save Filter Button	Saves the selected Filter Settings
Filter Selections Boxes	On the Left Handside of the Window a number of Selection Boxes are provided. In the relevant Selection Box type your Selection, and then use the '->' Button to add your Selection to the Filter. (Note. At this point you can use the Delete Button to remome the item from the Filter.) Once you have made your Selections click the Save Button to apply the Filter.

6.1.1 Current Status

The Current Status allows you to see the current Mode, Part, Lot etc. for a selected Machine.

In figure below the *Assembly* Area has been selected. In this example the Assembly Area does not use Parts, Lots etc. so these items are hidden.

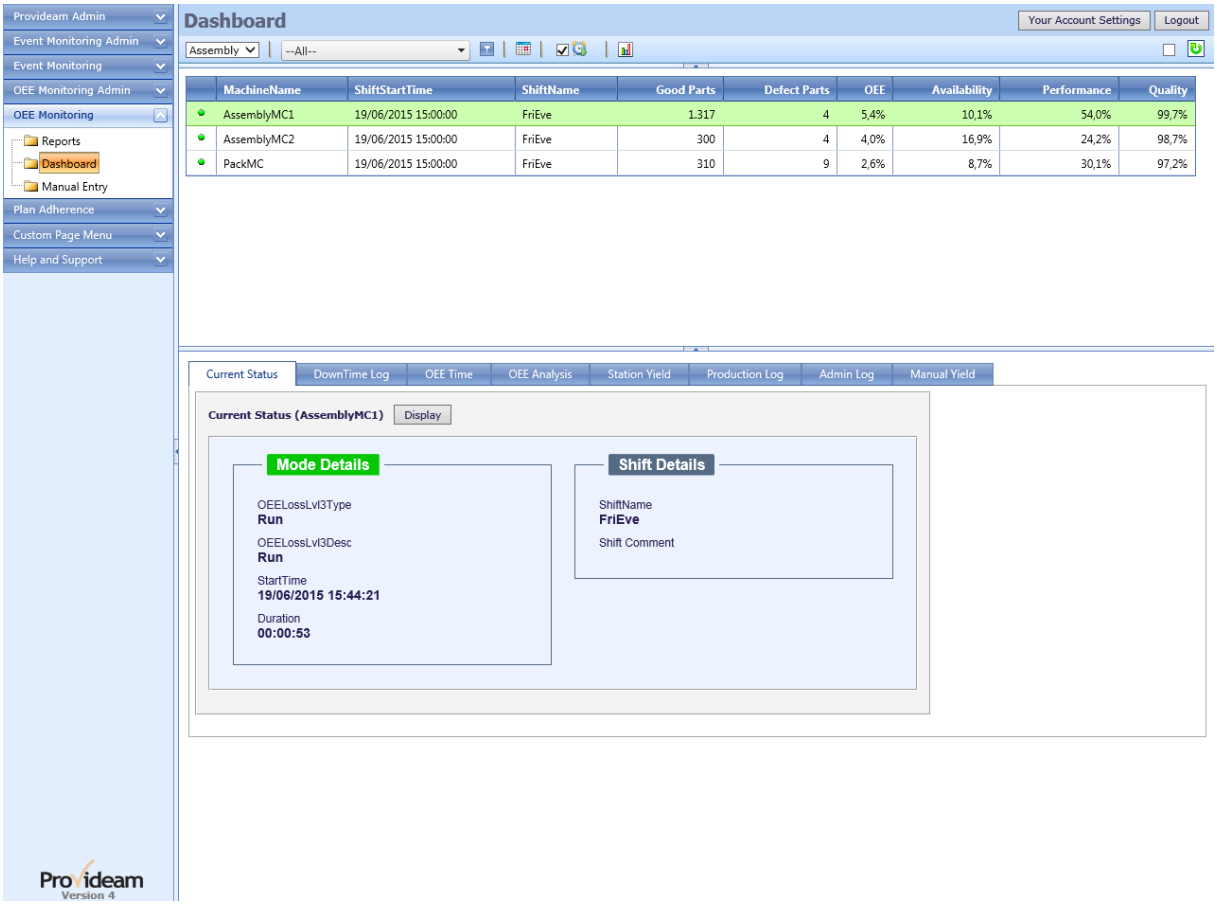


Fig. Current Status View - Simple Example

Item	Description
Current Status View	Real-time display of current Machine status.
Display Button	Click the Display button to show a sample AndOn dashboard which updates in real-time and is suitable for large plasma or LED monitor.

In figure below the *Moulding* Area has been selected. Typically Moulding Areas will track Lot, Tool, Part, Cavities etc.. In the example below we can see more detailed information than in the case of the Assembly Area.

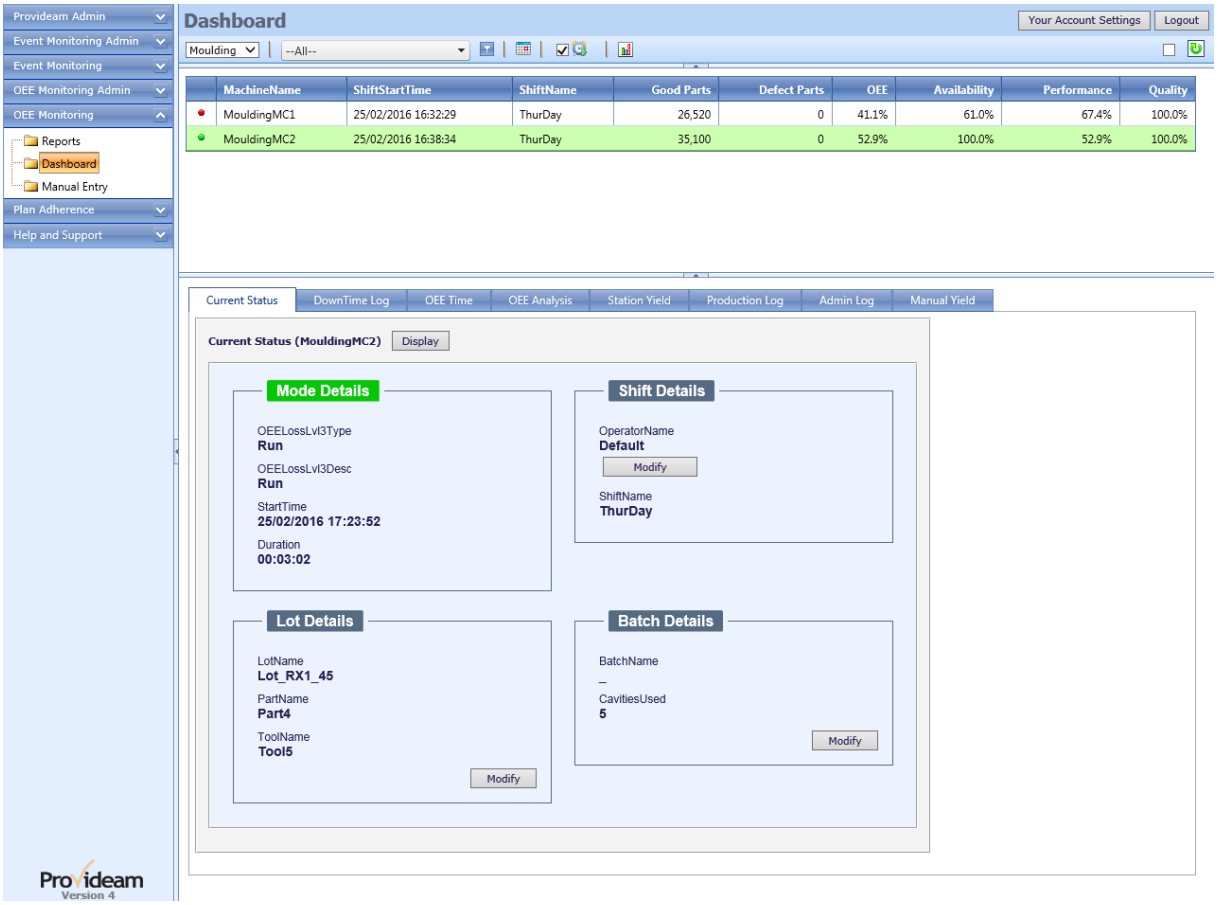


Fig. Current Status View - Complex Example

Item	Description
Current Status View	Real-time display of current Machine status.
Display Button	Click the Display button to show a sample AndOn dashboard which updates in real-time and is suitable for large plasma or LED monitor.
Operator Change Button	Allows you to change the Operator for the current Shift.
Lot New Button	Allows you to manually create a new Lot record.
Lot Modify Button	Allows you to change the Lot details for the current Lot record.
Batch New Button	Allows you to manually create a new Batch record.
Batch Modify Button	Allows you to change the Lot details for the current Batch record.

Note:

1. The Current Status View only shows the current data. To access historical Lot data switch to the Production Log View.

2. A Lot may have one or more associated Batches. You might use more than one Batch for a Lot where you changed the number of Cavities in the Tool during production. In this case each Batch would hold the actual number of Cavities used during the relevant production period. If you Modify the Lot record in the Current Status View you will overwrite the data for all previous Batches.

3. Creating a new Batch allows you to create a new production run, attached to the current Lot but with different production parameters - for example a different number of Cavities.

6.1.2 Downtime Log

The Downtime Log allows you to view a log of the operational modes for the selected Shift.

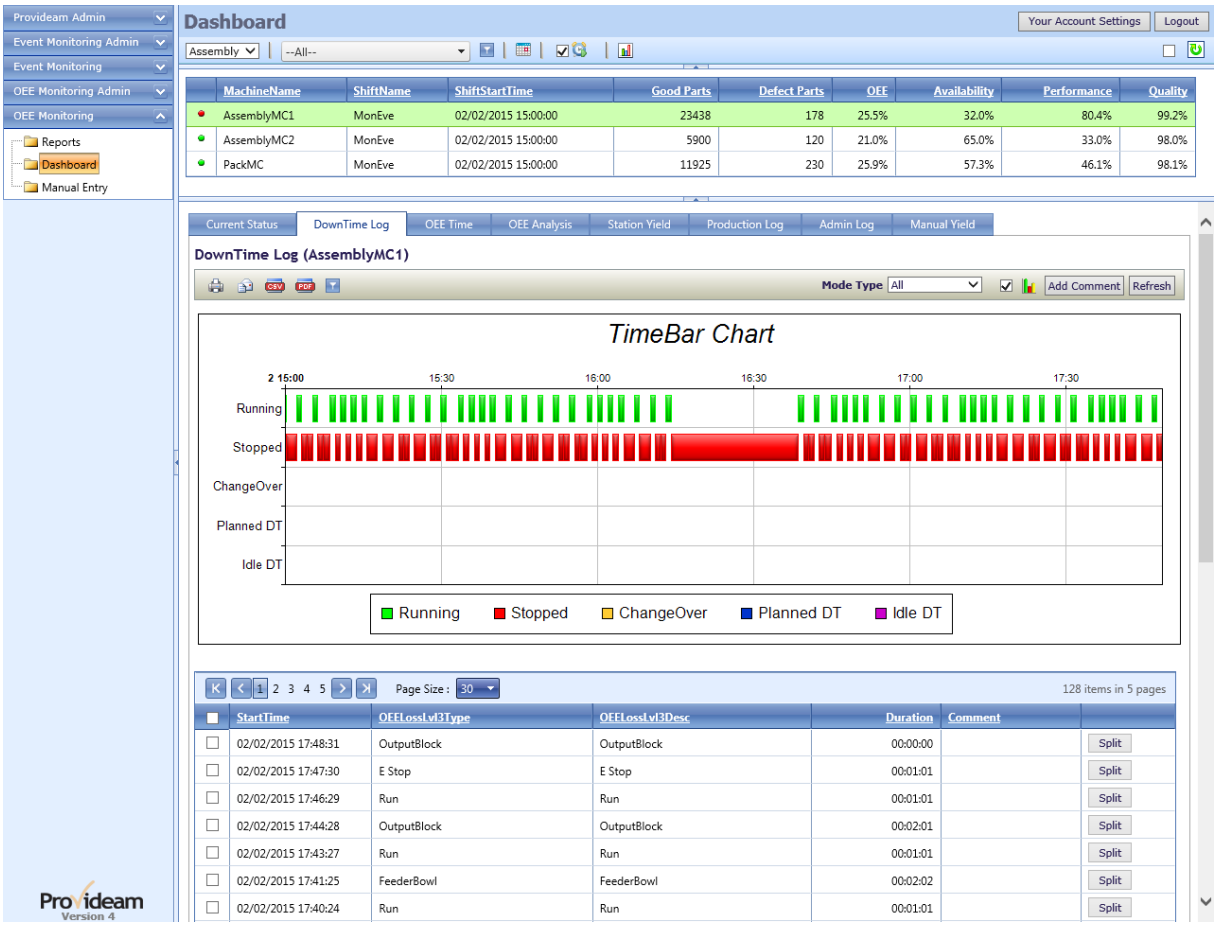


Fig. Downtime Log

Item	Description
Downtime Log	Ordered log of operational Modes of selected Machine.
Export Buttons	You have the option to export the log to a Printer, Email, CSV file or PDF file.
Filter Button	The Filter button opens a window in which you can define a filter for the Downtime Log data.
Mode Type	Allows you to filter the log by various Mode Types.
Graph Select	Checking the Graph Select box causes a graph of the data to be generated.
Add Comment Button	You may add a comment to the selected Mode record (ie checked). This feature also allows you to modify the Mode. Multiple Mode records may be selected. Be careful as you will not be able to undo any changes once they have been committed. The Add Comment Button is at the end of the Downtime Log.
Refresh Button	Refresh the log.
Page Size Selection	By default the log is limited to the 30 most recent records. You may adjust the page size to suit your screen resolution. If you return a large number of records the update time may be slow.

6.1.3 OEE Time

The OEE Time View allows you to view a table of hourly records which show how the time for that hour was divided amongst the various OEE categories for the selected Shift. In the example below the graph option  has been selected.

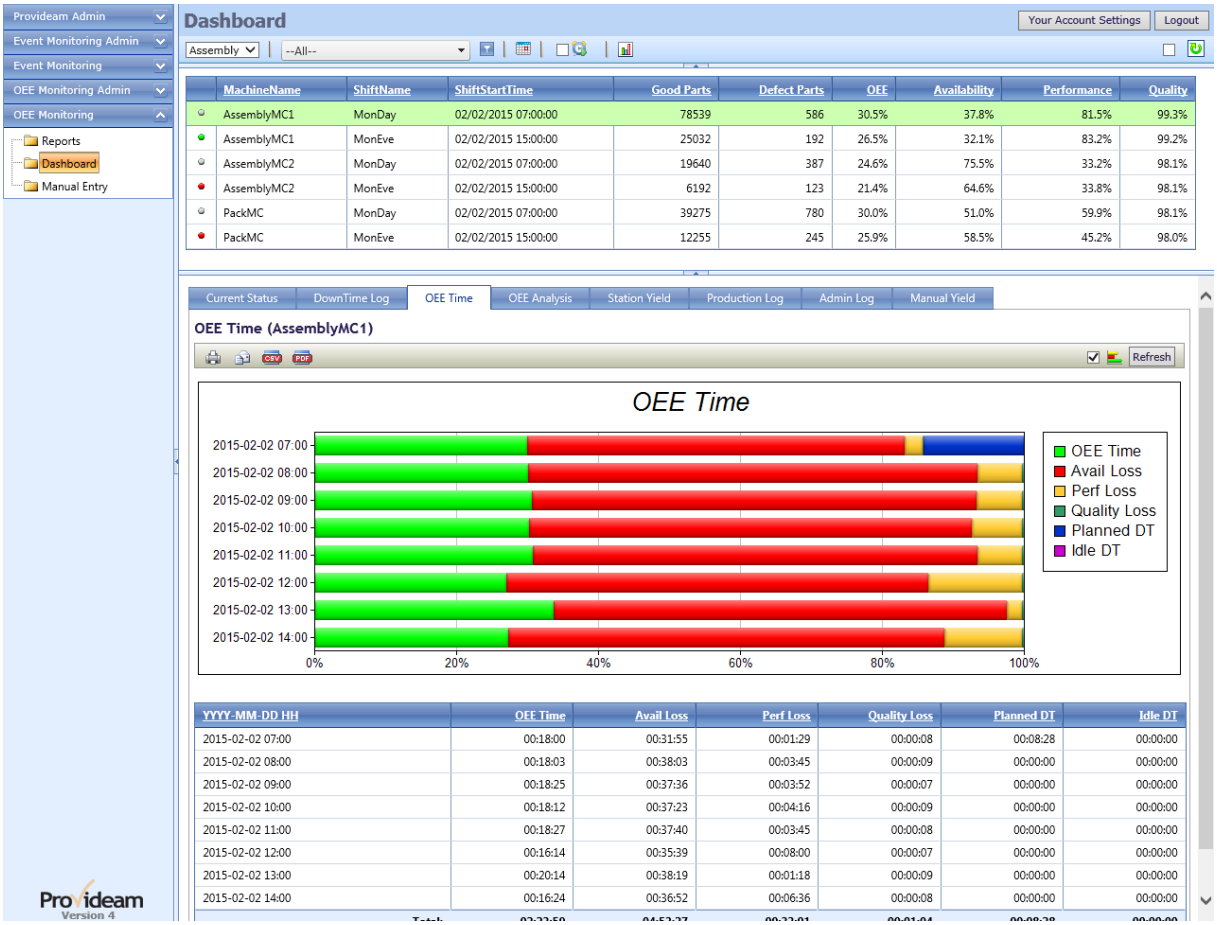


Fig. OEE Time with Graph

Item	Description
OEE Time Table/Graph	Table of time categorised by OEE Level 1 loss types for selected Shifts.
Graph Select	Checking the Graph Select box causes a graph of the data to be generated.
Export Buttons	You have the option to export the data to a Printer, Email, CSV file or PDF file.
Refresh Button	Refresh the log.

6.1.4 OEE Analysis

The OEE Analysis View allows you to view a table of the losses, grouped by loss and in descending order, for the selected Shift.

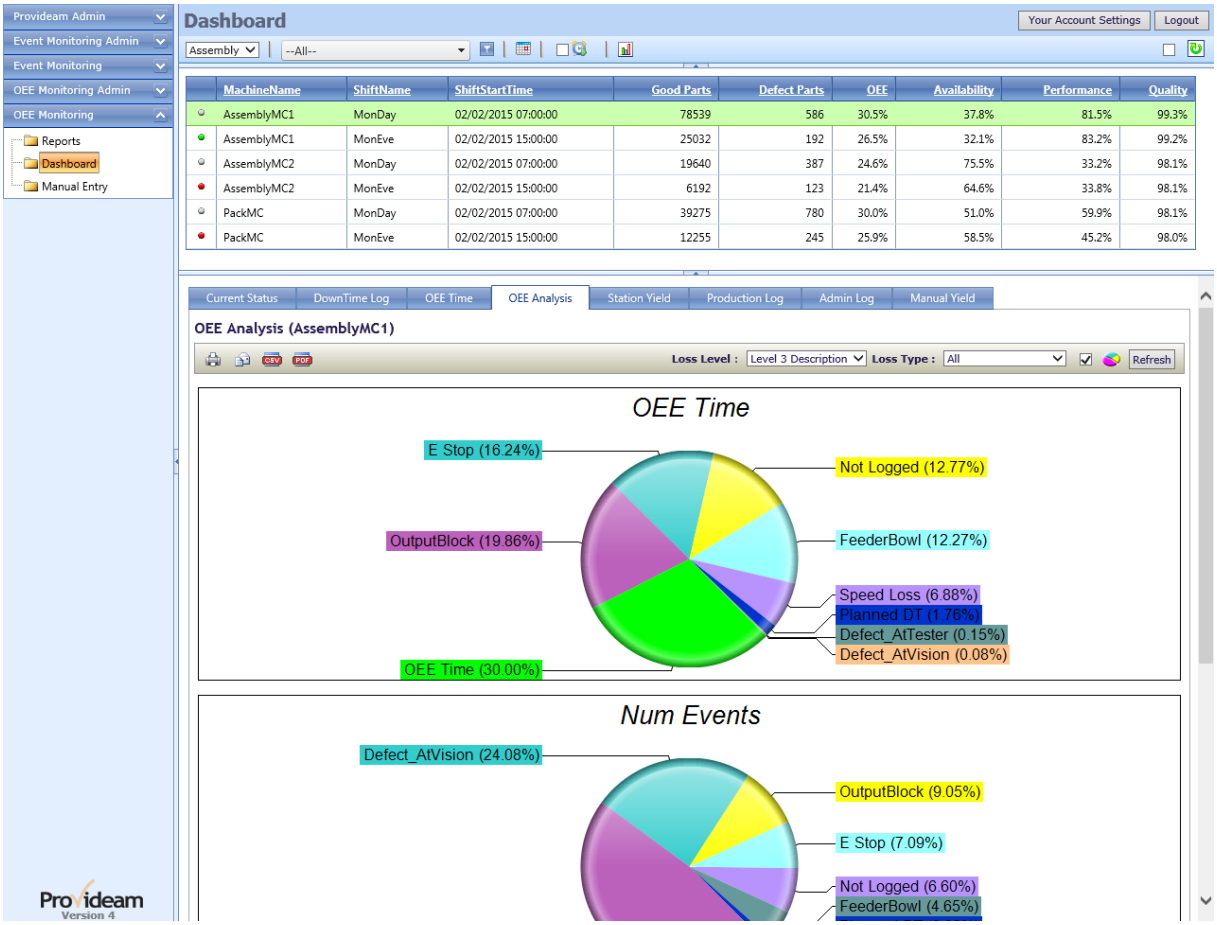


Fig. OEE Analysis

Item	Description
OEE Analysis Table/Graph	Table of time categorised by OEE Level 1 loss types for selected Shifts.
Export Buttons	You have the option to export the data to a Printer, Email, CSV file or PDF file.
Loss Level Select	Select the OEE Loss Level, 1, 2 or 3 into which the losses should be grouped.
Loss Type Select	Filter the losses by Loss Type, All Stops, Short Stops etc.
Graph Select	Checking the Graph Select box causes a graph of the data to be generated.
Refresh Button	Refresh the log.

By clicking on any of the segments of the OEE Loss Pie (or rows in the table), you can drill down to when the selected loss occurred.

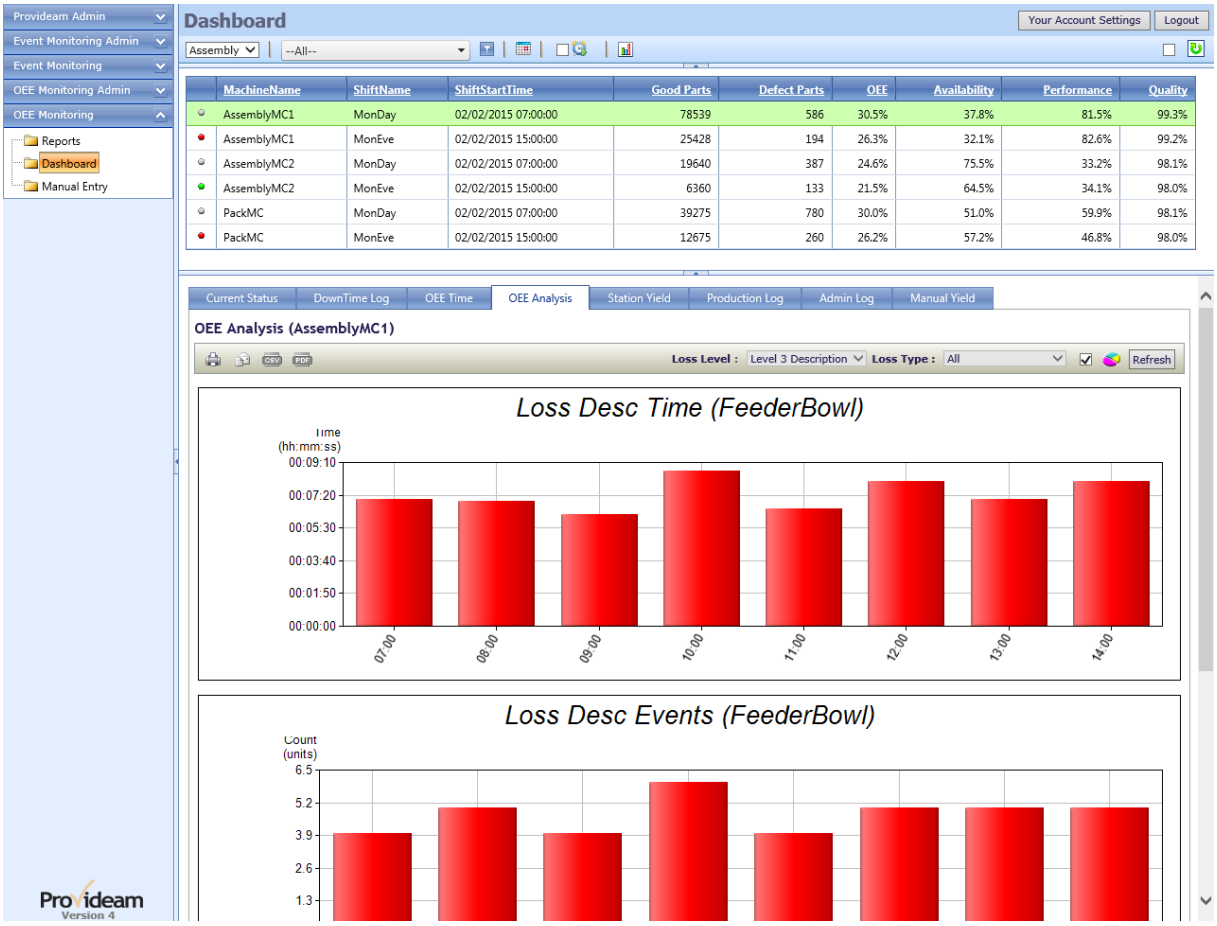


Fig. OEE Analysis Drilldown

The above screenshot shows when the selected loss (Feeder Bowl) occurred during the shift.

6.1.5 Station Yield

The Station Yield View allows you to view a table of hourly records which show the Good Parts, Defect Parts counts etc.for the selected Shift. In the example below the graph option has been selected.

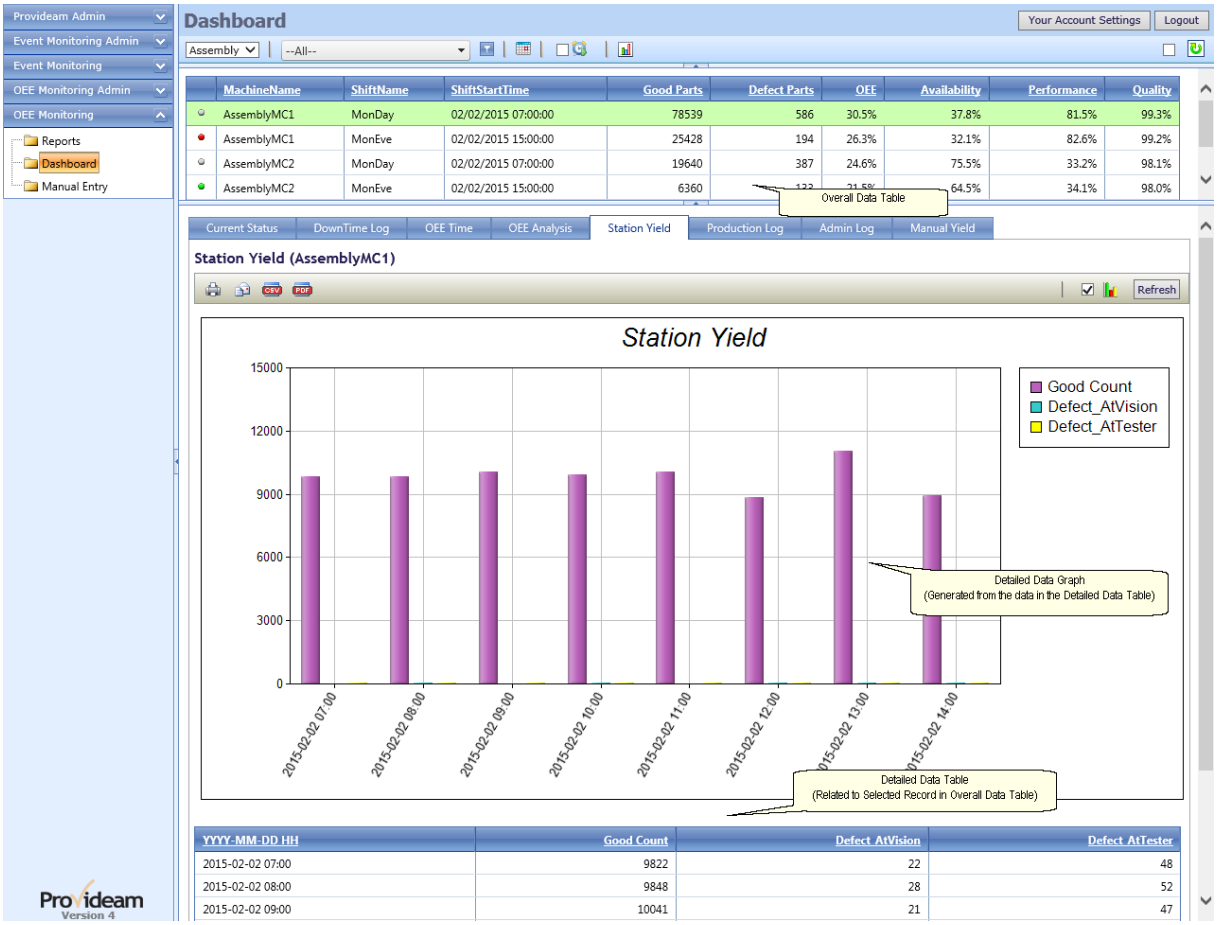


Fig. Station Yield with Graph

Item	Description
Station Yield Table/Graph	Table of hourly Yield values for selected Shifts.
Export Buttons	You have the option to export the data to a Printer, Email, CSV file or PDF file.
Graph Select	Checking the Graph Select box causes a graph of the data to be generated.
Refresh Button	Refresh the log.

6.1.6 Production Log

The Production Log allows you to view a log of the Production records for the selected Shift. The main purpose of the Production Log is to allow the user update and reconcile Lot records.

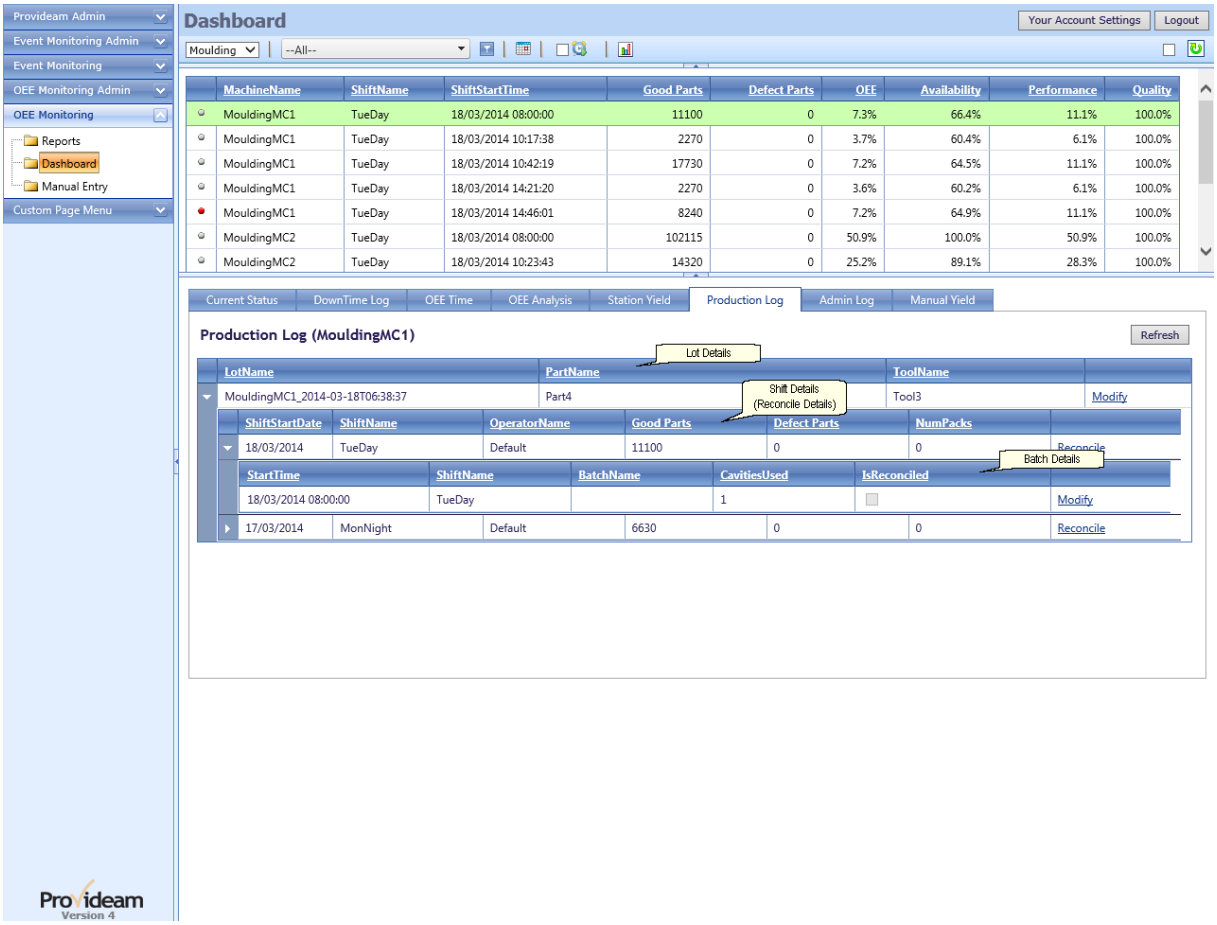


Fig. Production Log

Item	Description
Production Log	Log of Lot Records for selected Machine.
Refresh Button	Refresh the log.
Lot Details	The Lot Details record shows details of the Lot. The Modify Lot Details hyperlink allows you to update the Lot details. Updating the Lot Details will update all Batch records. Thus if several Batches have been created you must be careful not to overwrite the Batch Details.
Reconcile Details	The Reconcile Details record shows the yield details for the Lot. Before Reconciling a Lot the Potential Good Qty (Cycles * Num Cavities) is displayed as the Good Qty. The Reconcile hyperlink allows you to modify the actual Good Qty (Num Packs) produced by the machine. You may also assign the remaining Defect Qty between the available Defect types.
Batch Details	The Batch Details record shows the Batch Details of the Lot. A Batch is a subset of the Lot. The Batch is linked to the Lot via the Lot Name. If the Lot Name is changed then the Batch Details will transfer to the new Lot Name. The Batch Details hyperlink allows you to modify individual Batch Records.

6.1.7 Admin Log

The Admin Log gives you two views, 1) a structured log of the operational modes and 2) a structured log of the station yield counts, for the selected Shift. This is a useful tool for Provideam maintenance but is not intended for the ordinary user.

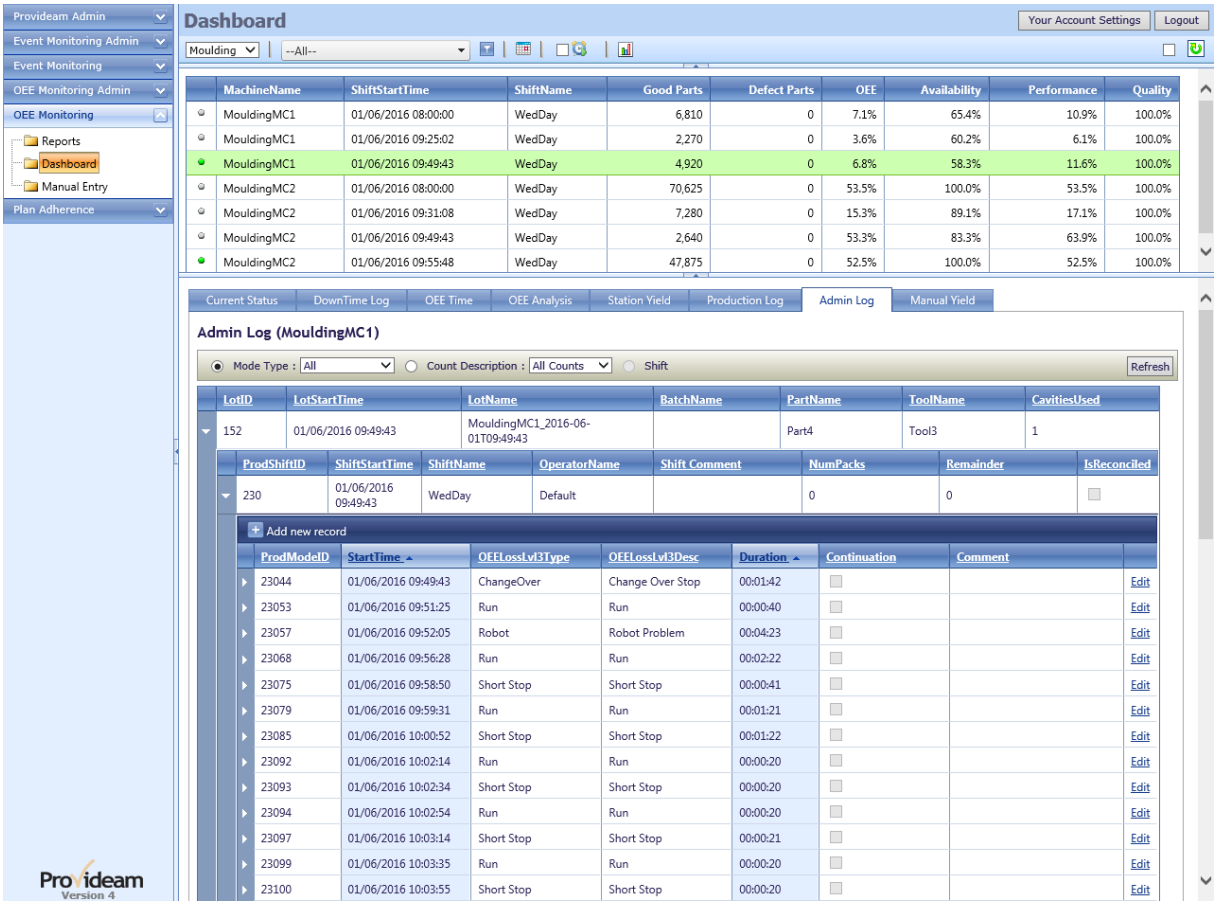


Fig. Admin Log - Mode Log

Item	Description
Admin Log	Structured Log of Operational Modes for selected Machine.
Mode Type	Allows you to filter the log by various Mode Types.
Count Description	Allows you to filter the log by various Count Types.
Refresh Button	Refresh the log.
Add New Record(Mode)	Allows you to insert a new Mode record into the log.
Mode Edit	Allows you to modify or delete and existing Mode record.

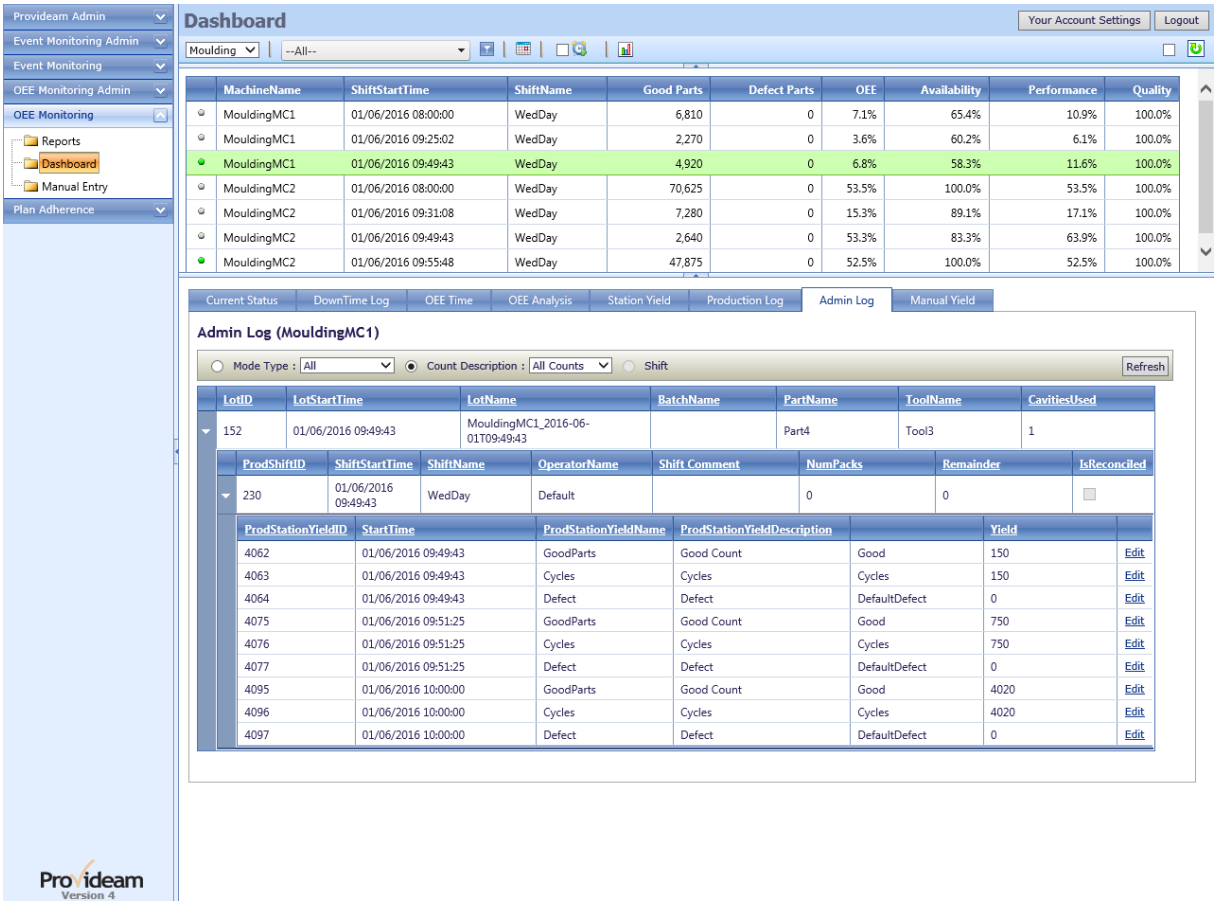


Fig. 9 Admin Log - Count Log

Item	Description
Count Edit	The Count Edit hyperlink allows you to change a Yield value. This is a useful maintenance feature which enables you to fix incorrect data.

6.1.8 Manual Yield

The Manual Yield pane allows you to add Manual Yield data to the production record. This is a useful method of accounting for Defects which are not recorded automatically. For example if parts are jammed in the machine and need to be manually removed.

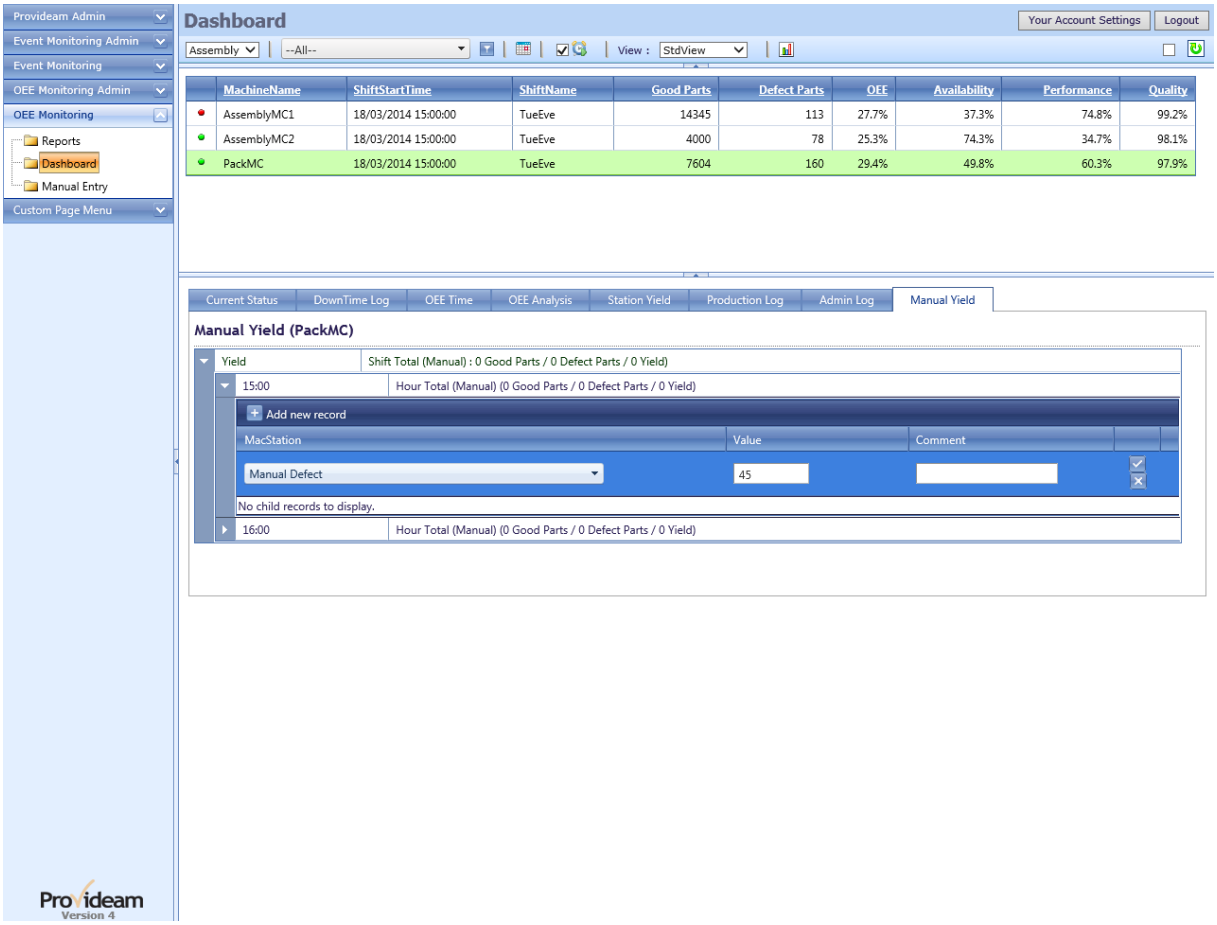


Fig. Manual Yield Pane - Add Manual Defects

Item	Description
Manual Yield Pane	Shows a Table of Yield Values which have been entered Manually by the User. The table is segmented either by Hour or by Shift depending on a setting in the Machine Admin configuration.
Add new record	Allows you to add a new Yield record.

6.1.9 Historical Data

By opening the Date Selection Calendar it is possible to select historical data. More than one date can be selected allowing you to compare data from several Shifts.

To select a date click on that date. To unselect a date click on the date again.

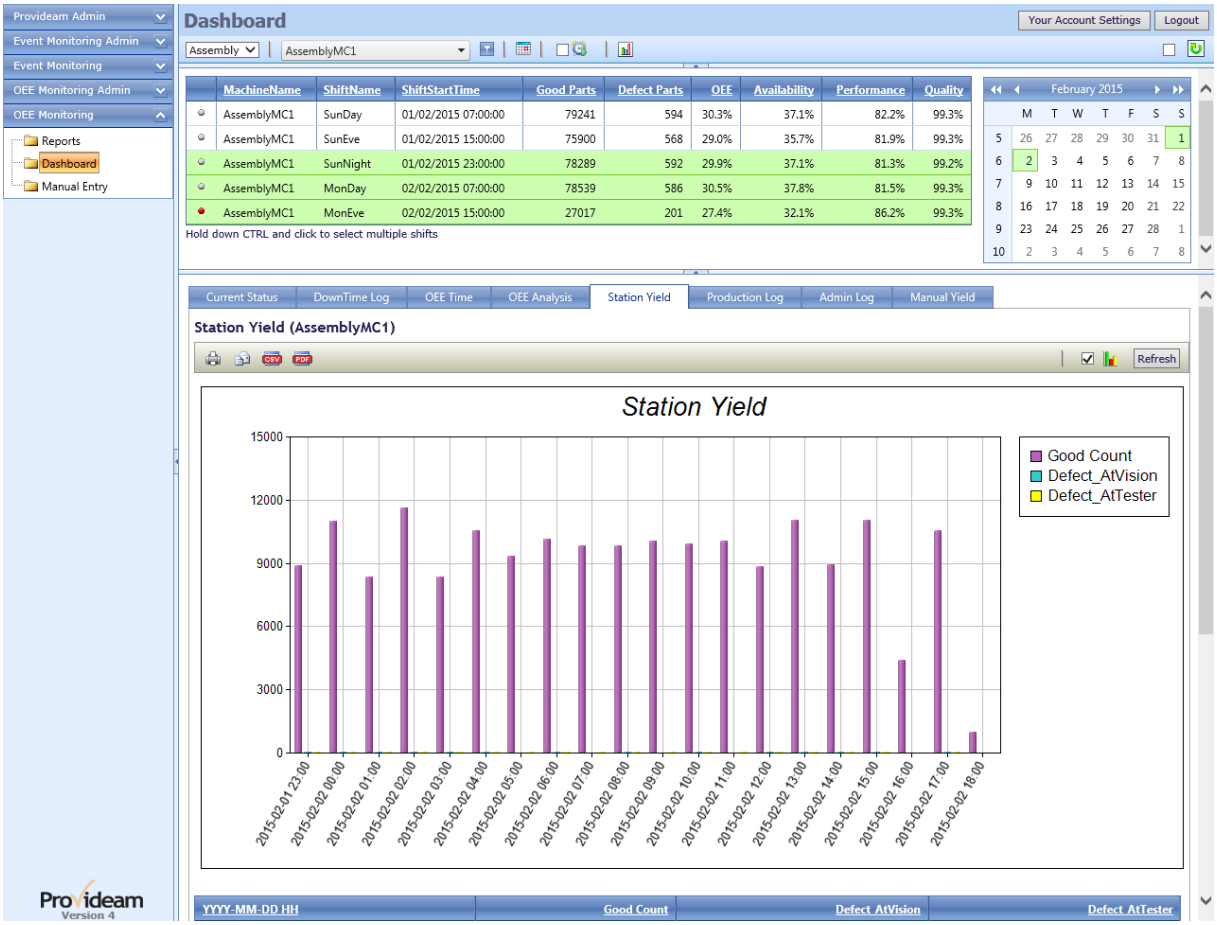


Fig. Date Selection Calendar

In figure above the user has selected data for the Current Shift plus the preceding Night Shift.

You will also notice that the Machine selection is limited to *AssemblyMC1*. An interesting feature here is that when you limit the display to one Machine it is possible to select multiple Shifts by holding down the CTRL key on your keyboard. The data for multiple Shifts will then be displayed in the Detailed Data Window. In the example above you will see a Yield value for every hour for the 'MonNight', 'TueDay' and 'TueEve' shifts.

6.2 OEE Manual Entry

The OEE Manual Entry Section allows you to enter production data for 'manual' machines, during or after the current Shift. By 'manual' we mean machines for which downtime/yield data is not captured automatically.

Note: The User Security settings in Provideam allow the Administrator to configure which Areas and Machines are visible to each User. Also some functions may not appear due to a restriction in your User Security settings.

There are two sections to the display. The upper window is called the Overall Data Window and shows all the Shifts you have entered for the selected day for the selected Area. By default the selected day will be the current day. The lower window is called the Detailed Data Window and, depending on the pane selected, shows specific data related to the Shift Record selected in the upper window.

Note: You may see more than one Shift Record for each Machine in the Overall Data Window. For example, you may see a Day and Night Shift. Also, if there has been a Changeover from one Lot to another you will create a separate Shift Record for each Lot.

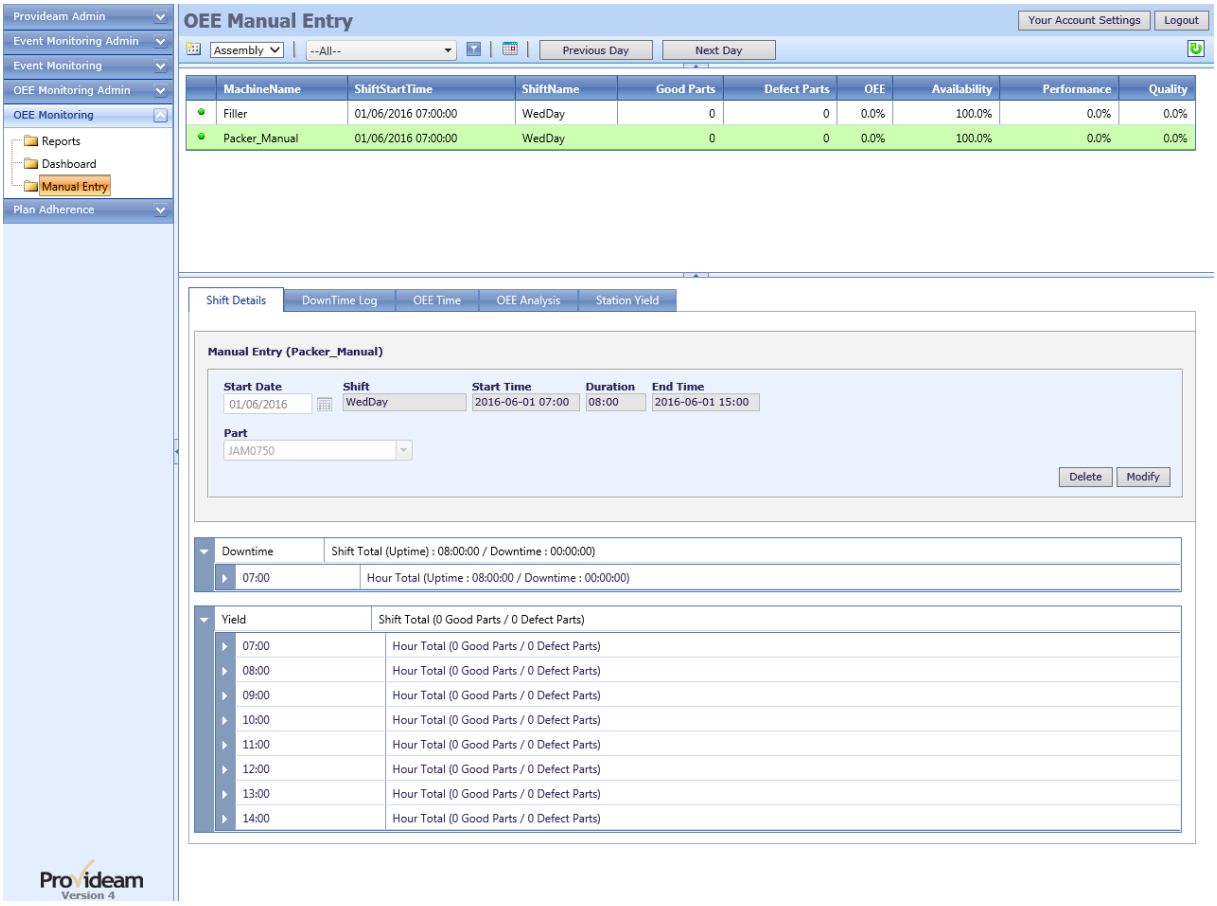


Fig. OEE ManualEntry

Item	Description
Area Select	Select Area filter. Only Machines from the selected Area will be displayed.
Machine Select	Select Machine filter. Only the selected Machines will be displayed once the filter is applied.
Machine Filter	Apply Machine Selection Filter. Only selected Machines will be displayed.
Show Date Selection	Opens Date Selection Calendar. Select dates by clicking on appropriate date on calendar. Shifts from the selected dates will appear in the Overall Data Window.
< (Previous Day)	Moves the selected Dates Range back one Day. Shifts from the selected Dates Range will appear in the Overall Data Window.
> (Next Day)	Moves the selected Dates Range forward one Day. Shifts from the selected Dates Range will appear in the Overall Data Window.
Refresh Button	Click Refresh for an immediate refresh of the displayed data.
Overall Data Window	Shows table of shift records for selected Machines on selected dates.

The Date Selection Filter Window

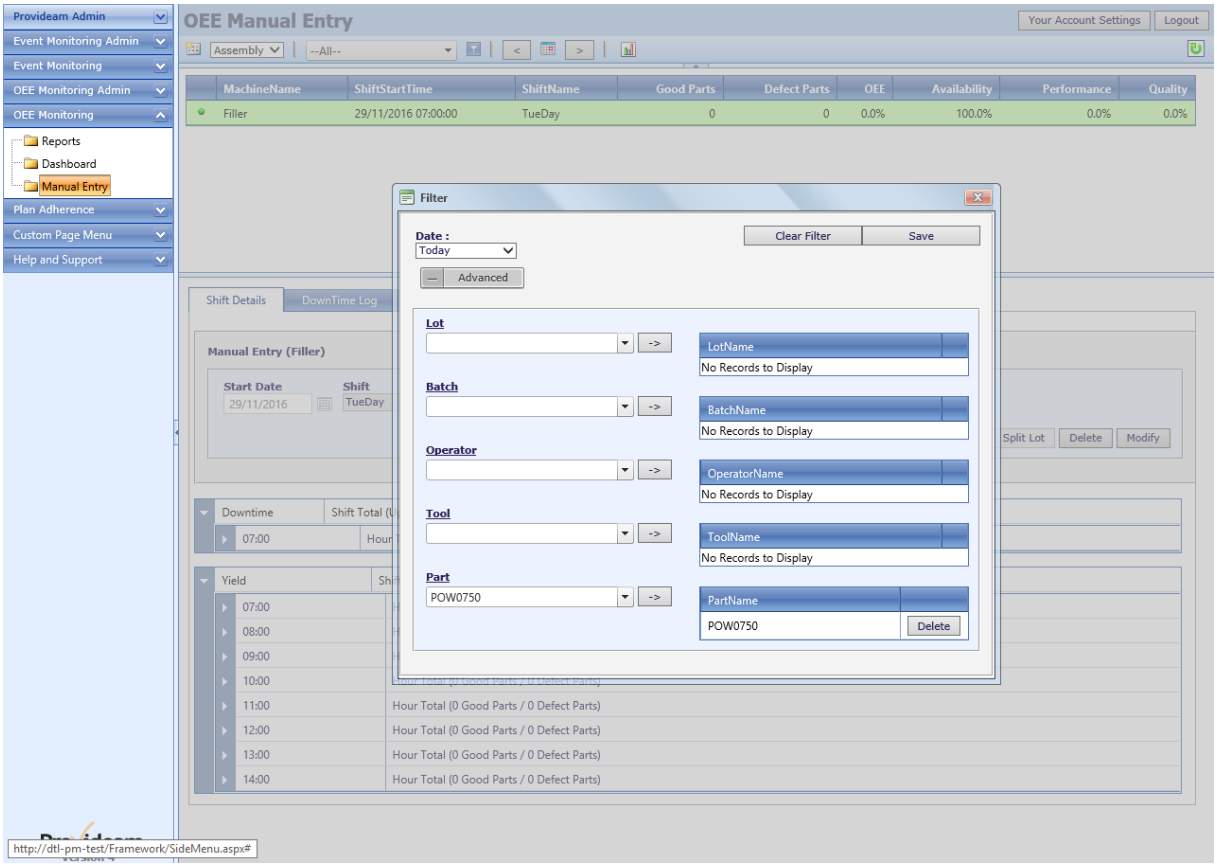


Fig. Manual Yield Dashboard - Dates Selection Filter - Advanced Options

Item	Description
Date Selection	The Date Selection Dropdown Box allows you to select the Date Range your require. A number of 'quickpick' options are provided such as Today, or Previous Day. For a Custom Date Range select the Custom Period option. This option allows you to select any Start and End Date. The maximum allow Date Range Period is 31 days. This limit is to protect the application from excessively broad queries.
= Advanced Button	Maximize Advanced Filter Window
- Advanced Button	Minimize Advanced Filter Window
Clear Filter Button	Clears all the Filter Settings
Save Filter Button	Saves the selected Filter Settings
Filter Selections Boxes	On the Left Handside of the Window a number of Selection Boxes are provided. In the relevant Selection Box type your Selection, and then use the '->' Button to add your Selection to the Filter. (Note. At this point you can use the Delete Button to remove the item from the Filter.) Once you have made your Selections click the Save Button to apply the Filter.

6.2.1 Manual Entry

The Shift Details Pane allows you to see enter Shift Details for 'manual' Machines.

In figure below the *Assembly* Area has been selected. One Shift has been created for the 1st.

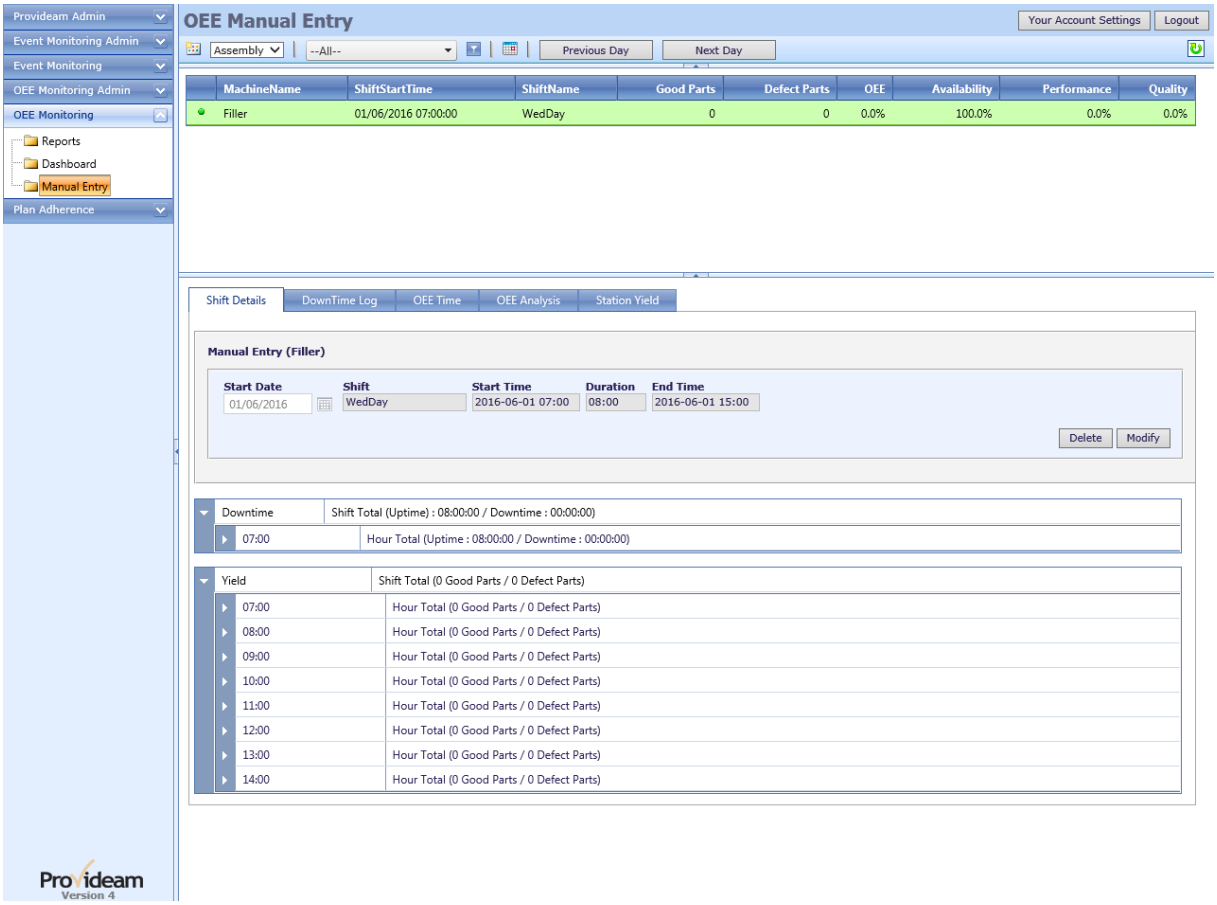


Fig. ManualEntry - Shift Details

Item	Description
Shift Details View	Shows details of currently selected Shift.

Note: The Provideam Administrator must configure 'manual' machines before you can begin to enter manual data. As with the 'automatic' machines, the Administrator must define the various Shift Profiles, Modes and Station Counts. He must also decide which optional items need to be displayed. By default Lot, Part, Tool etc. are not displayed. This is to de-clutter the user interface. If these items are required then the Administrator must enable them in the Machine Administration section of Provideam.

In the figure below we show an example of a Machine for which Parts have been enabled. In this example the user can also enter the current Part.

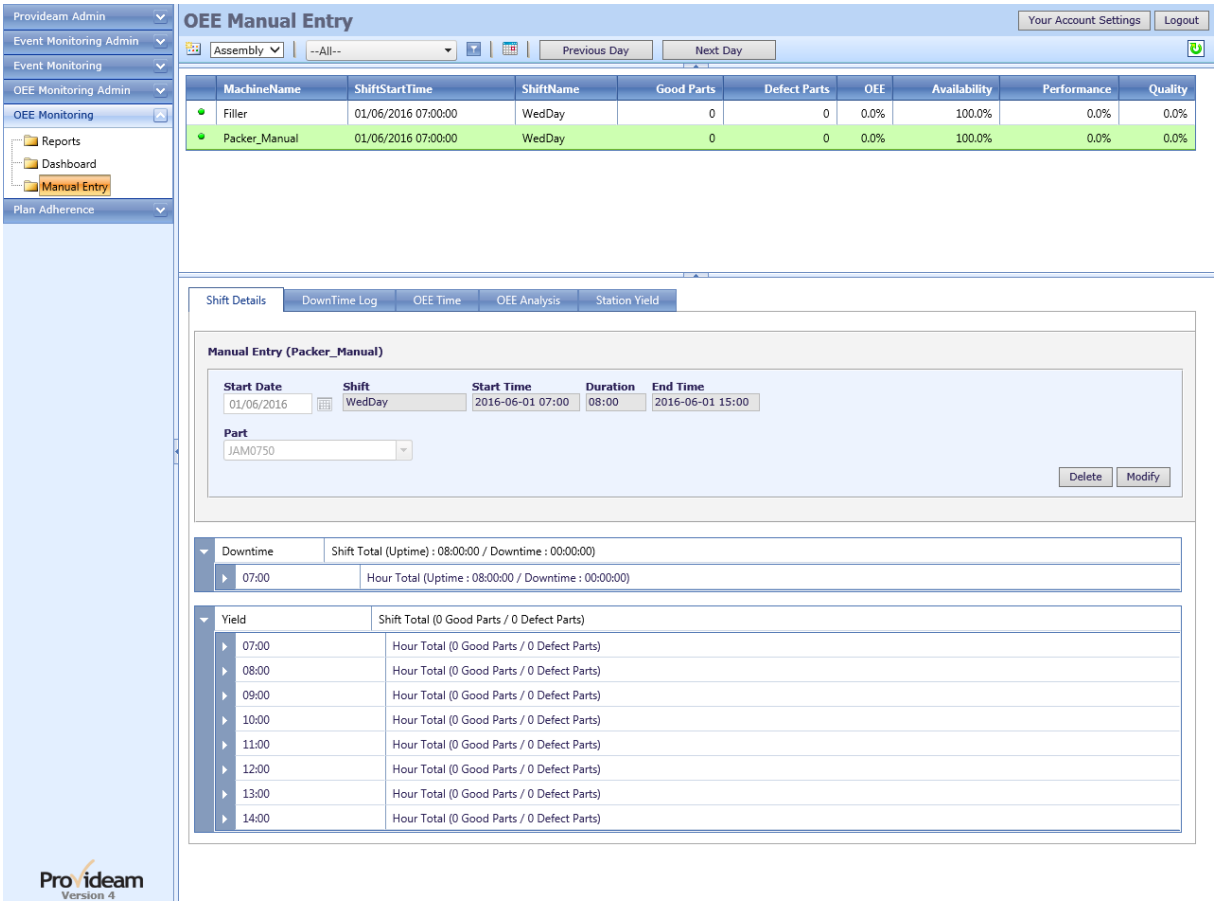


Fig. ManualEntry - Shift Details with Part

Note: Only one part can be tracked per shift record. If you wish to track multiple parts per shift then you will need to create a separate shift record for each part. The shift should start at the time the part was put on the machine and end when the part was taken off the machine.

Example 1: Creating a new Manual Shift

Step 1: Click on the 'New Shift' icon 

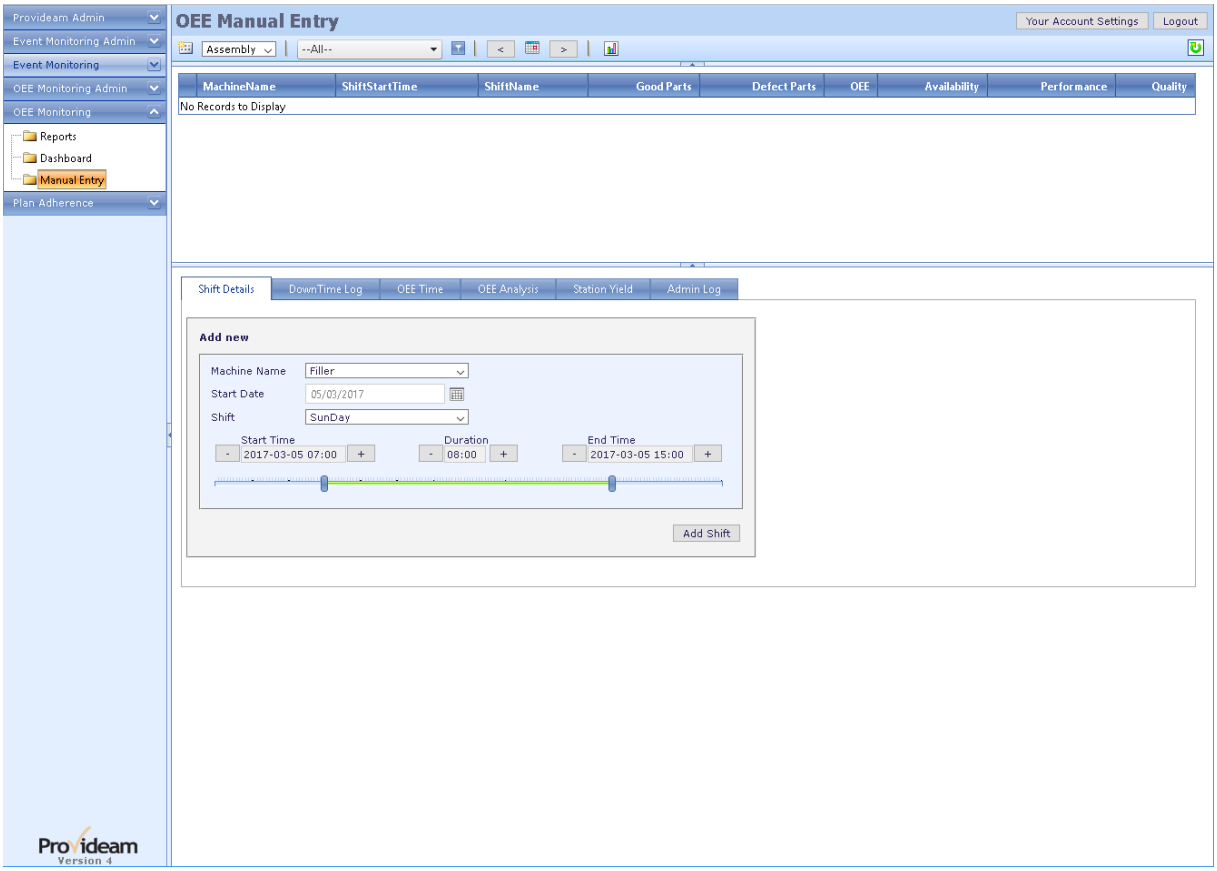


Fig. ManualEntry - New Shift Details

Step 2: Select *Filler* from the list of available **Machine Names**.

Step 3: Use the calendar control to select the **Start Date** of the shift.

Step 4: Select the appropriate **Shift**. For a two shift cycle you may be able to choose between a Day Shift and a Night Shift.

Step 5: Provideam will prompt you with the normal **Start Time** for the selected shift. You may adjust the start time up or down in 1minute increments.

Step 6: Provideam will prompt you with the normal **Duration** for the selected shift. You may adjust the start time up or down in 1minute increments.

Step 7: Click **Add Shift** to create a shift record with these details.

The figure below shows the shift details before any downtime or yield data has been entered.

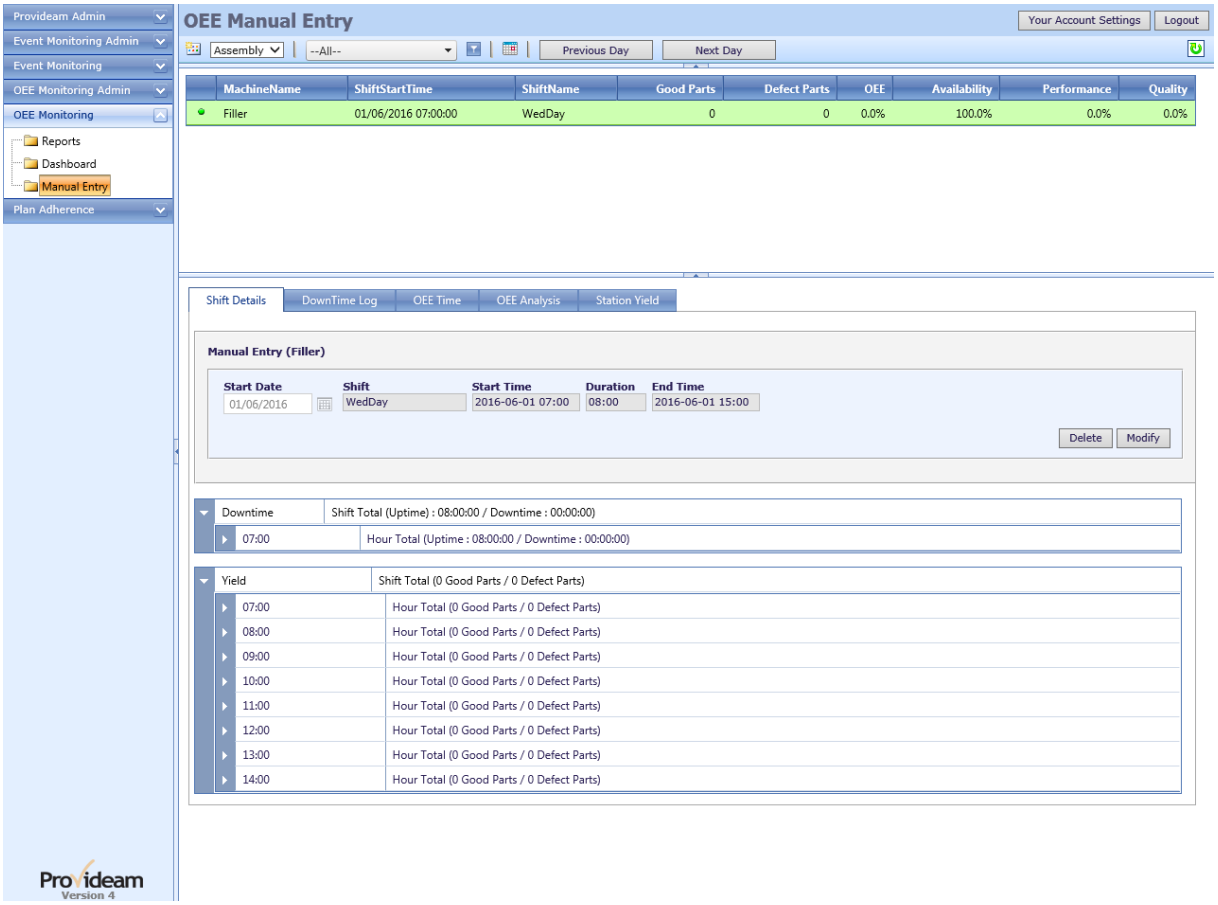


Fig. ManualEntry - Shift Details

Example 2: Adding Downtime Data to Manual Shift

Step 1: Select the *Filler* Machine shift record in the Overall Data Table.

Step 2: Expand the *07:00* downtime record in the Downtime Table.

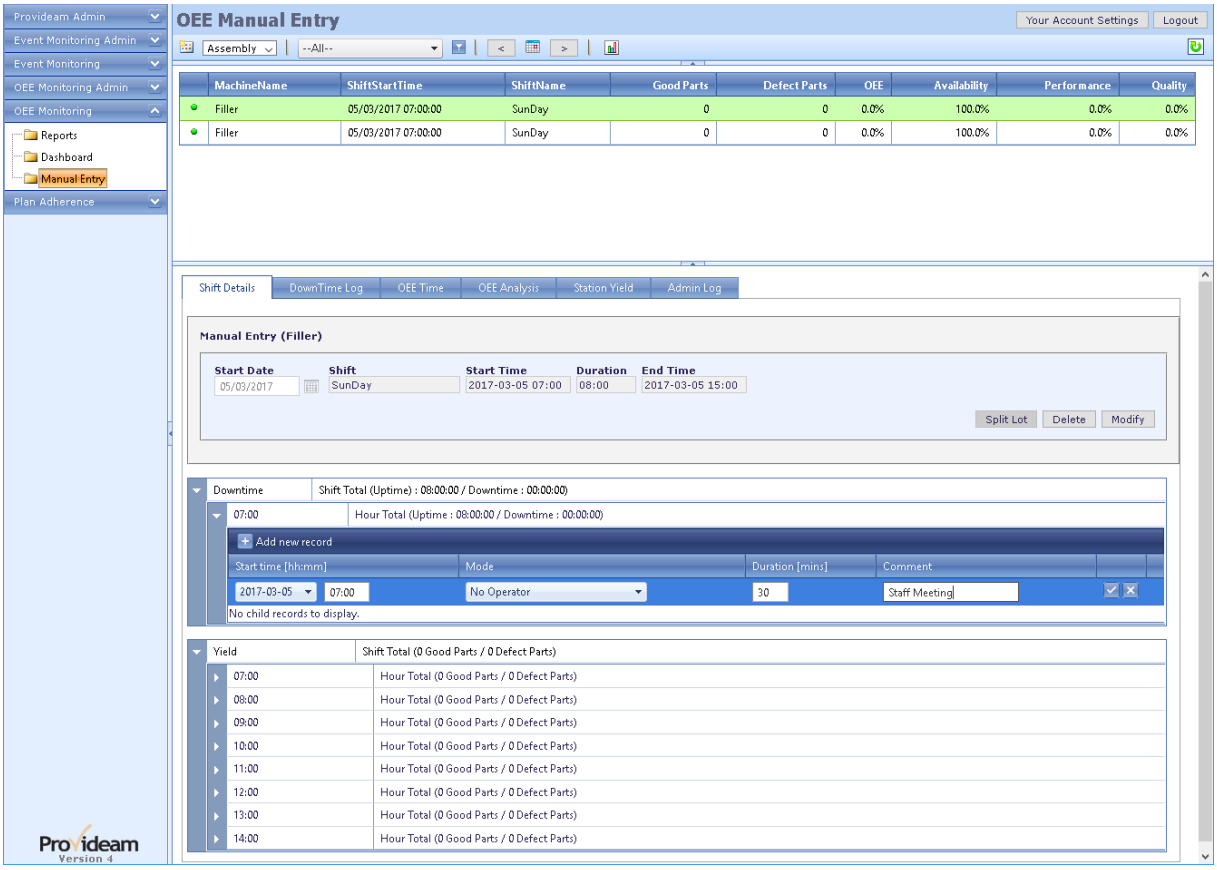


Fig. ManualEntry - Add Downtime Record to Shift Details

Step 2: Click the **Add new record** to open the pane to allow you to enter downtime details.

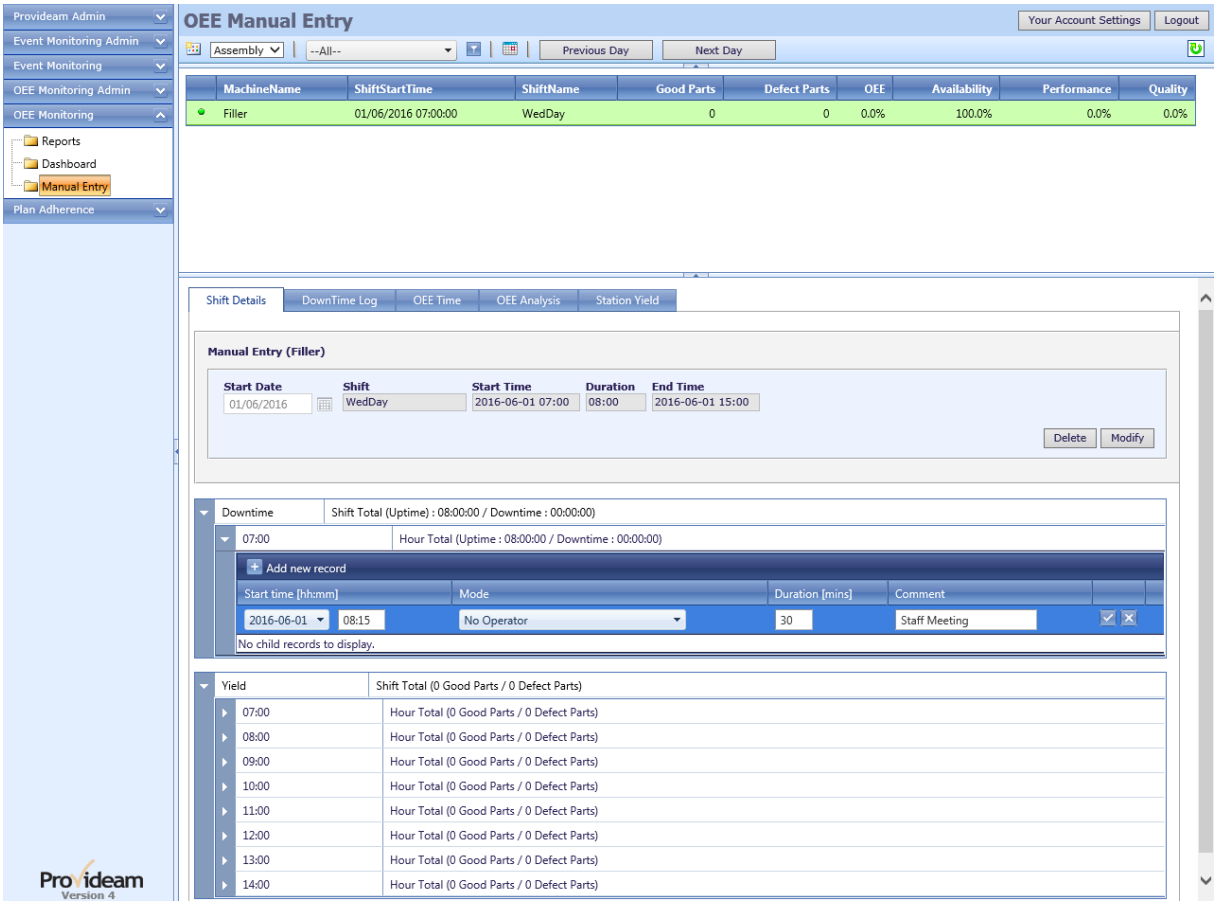


Fig. ManualEntry - Enter Downtime Details

Step 3: Select *No Operator* from the list of available **Modes**.

Step 4: Edit the **Duration** to 30minutes.

Step 5: Edit the **Comment** to be *Staff Meeting*.

Step 6: Click the icon to save the record.

Note: Only Modes which have been flagged as 'active' in the Mode Admin section will be available for selection.

Example 3: Modifying Downtime Data

In this example we will demonstrate how to modify a downtime record.

Step 1: Expand the Downtime Section and click the icon beside the first downtime record to edit the record.

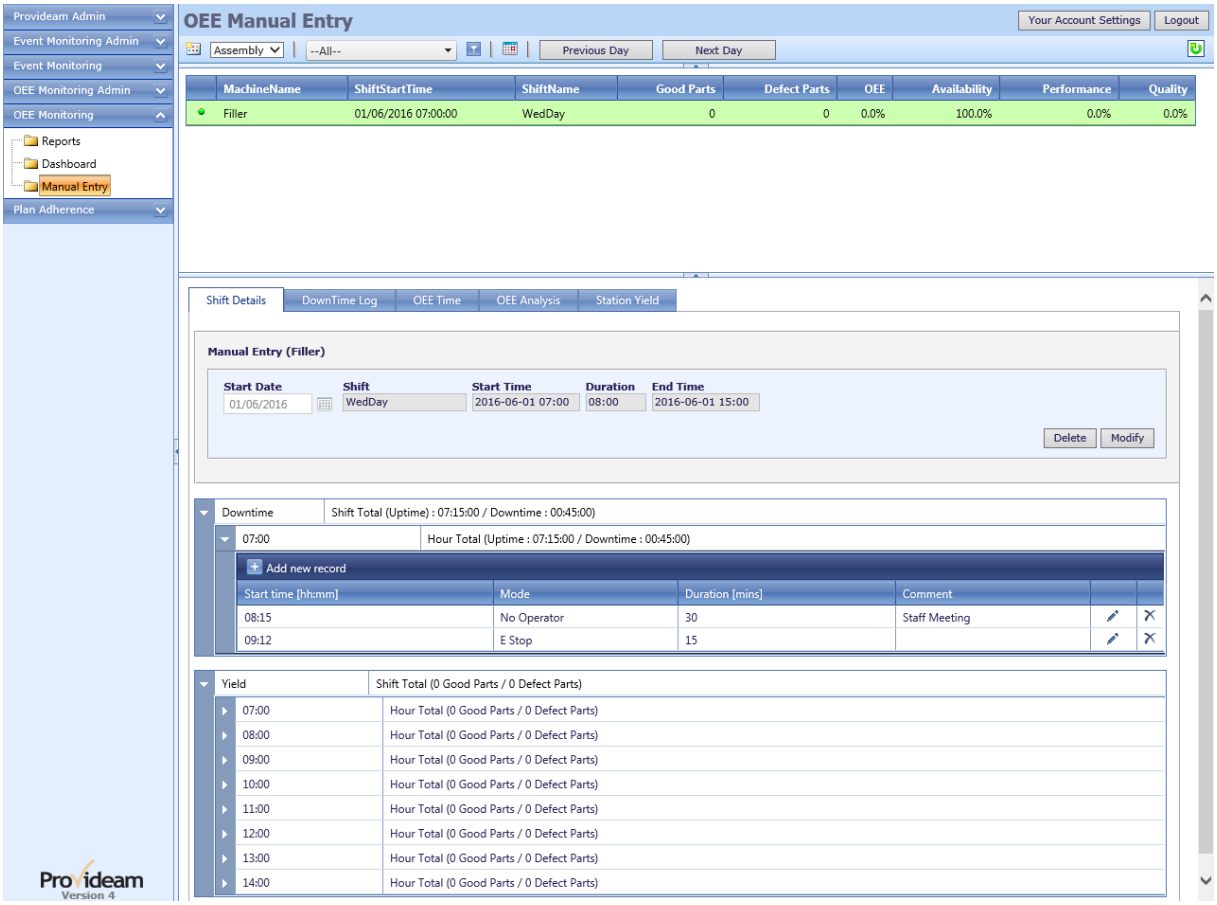


Fig. ManualEntry - Downtime Records

Step 2: Modify the **Start Time** to 08:00.

Step 3: Click the icon to save the record.

The figure below shows the downtime record being modified

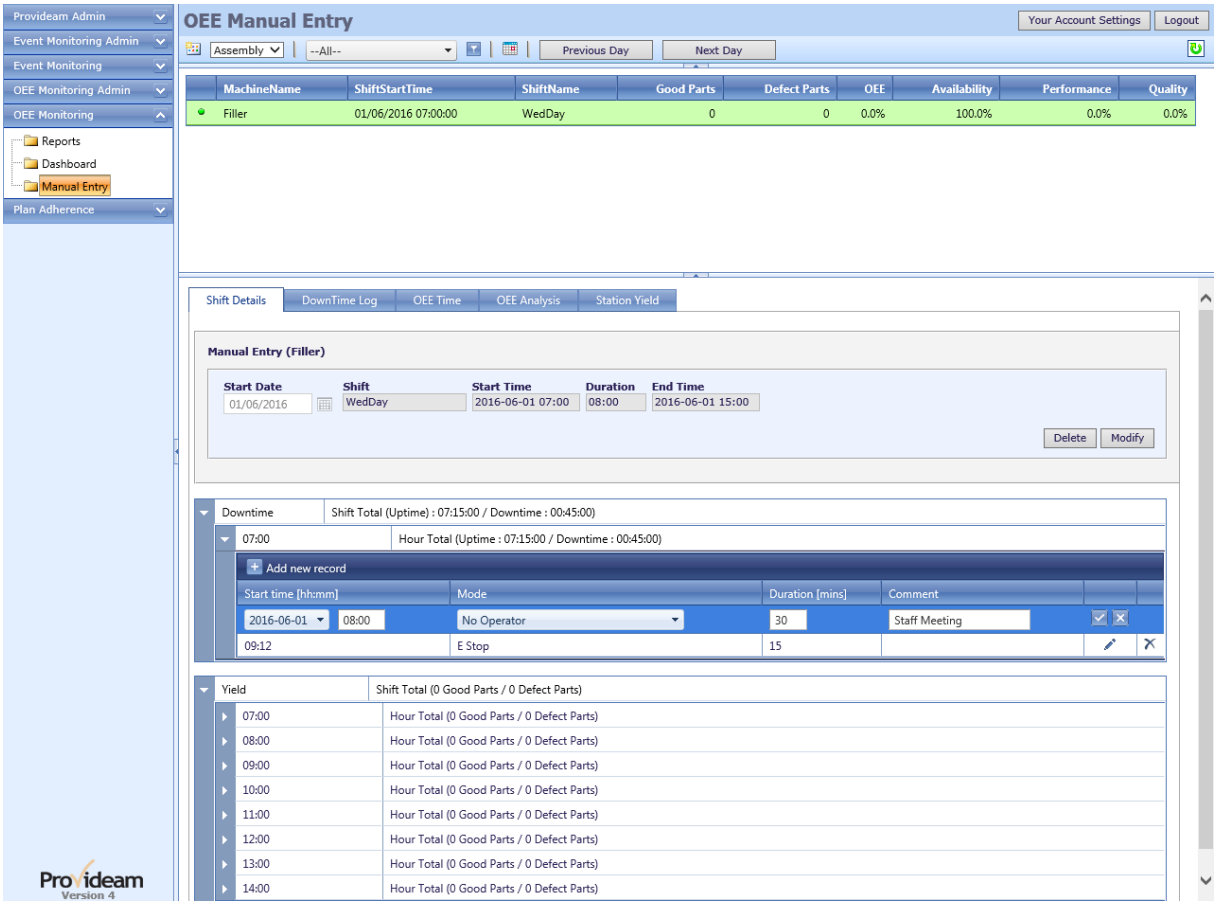


Fig. ManualEntry - Modify Downtime Records

Example 4: Adding Yield Data to Manual Shift

Step 1: Select the *Filler* Machine Shift record in the Overall Data Table.

Step 2: Expand the *07:00* yield record in the Yield Table.

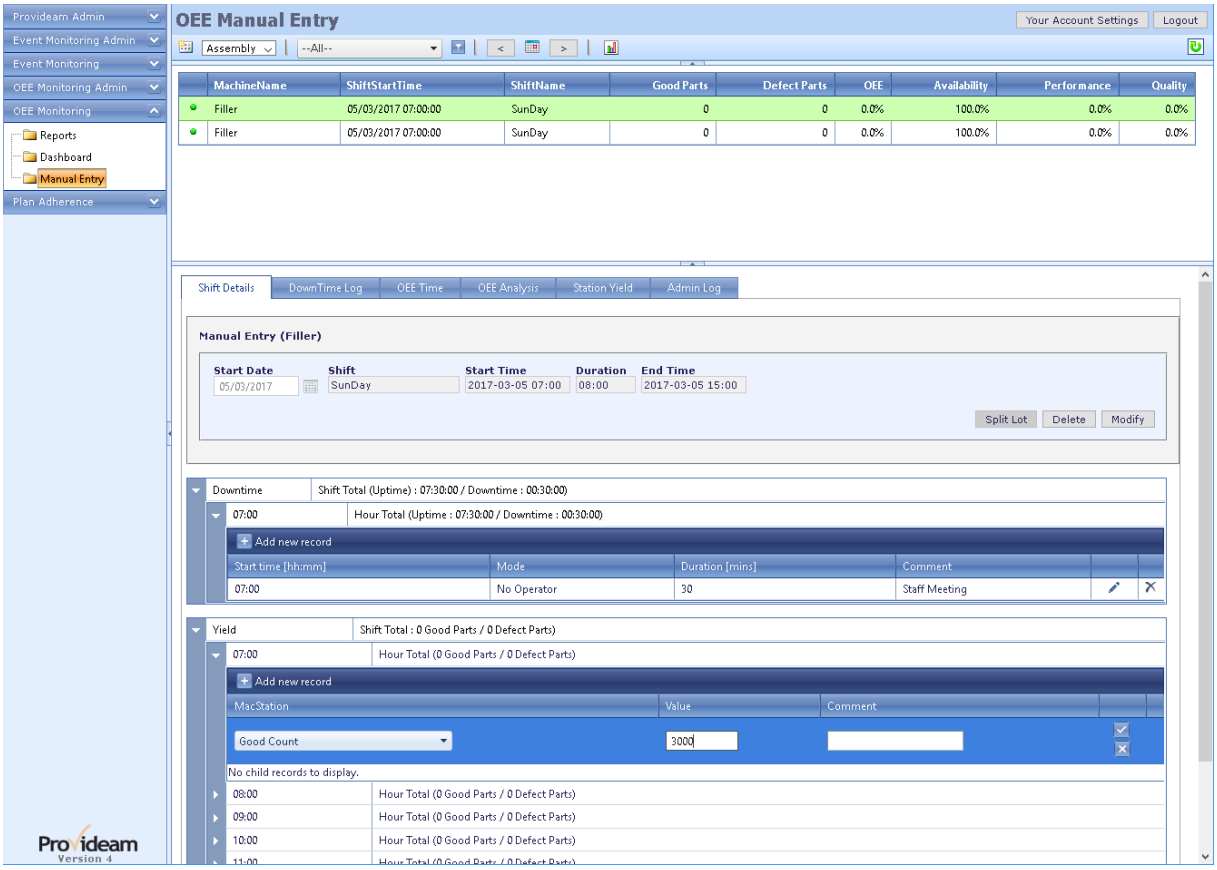


Fig. ManualEntry - Add Yield Record to Shift Details

Step 3: Click the **Add new record** to open the pane to allow you to enter yield details.

Step 4: Select *Good Count* from the list of available **MacStations**.

Step 5: Edit the **Value** to 3000.

Step 6: Click the icon to save the record.

Note: Only Yields which have been flagged as 'active' in the Machine Station Admin section will be available for selection.

6.2.2 Downtime Log (Manual)

The Downtime Log View allows you to view a table of the downtime records recorded for the selected Shift. In the example below the graph option has been selected.

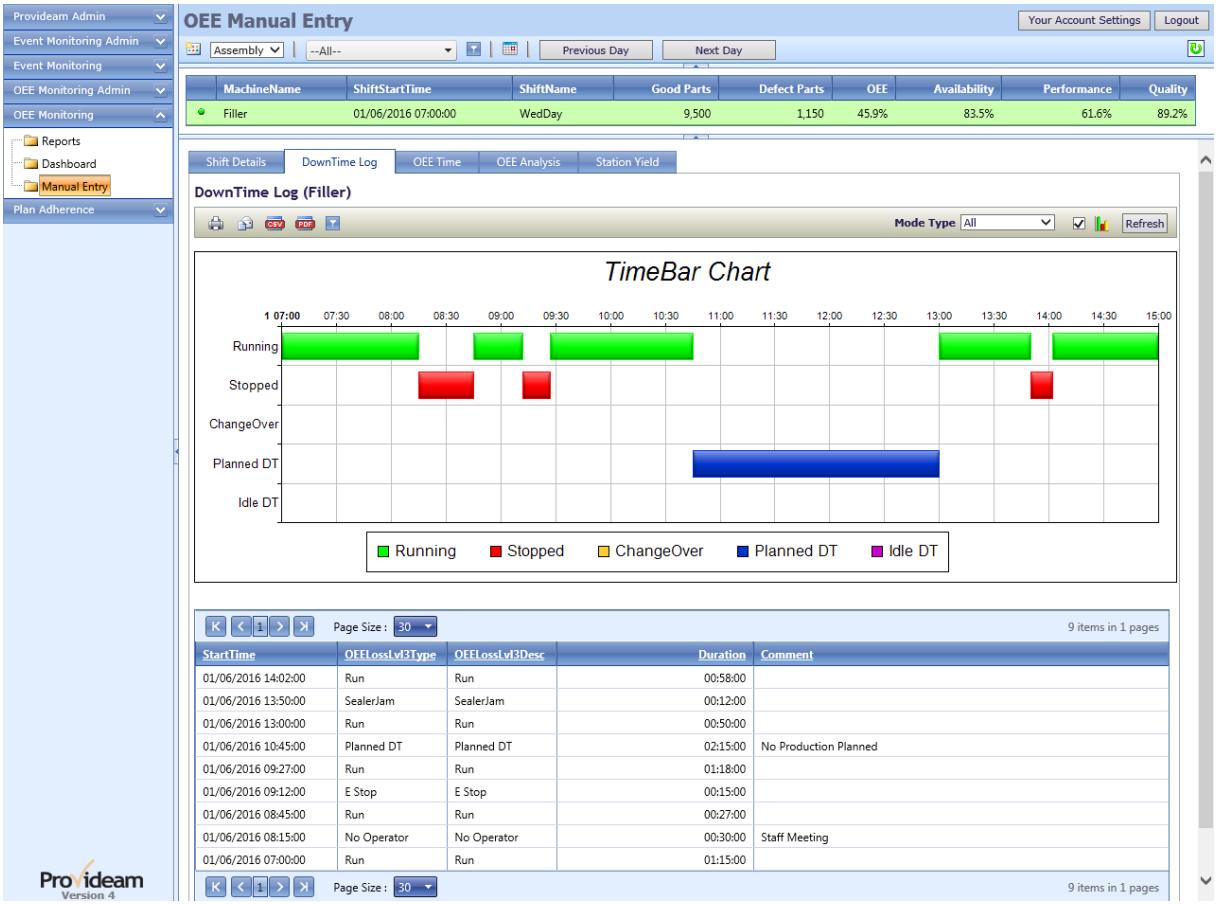


Fig. Downtime Log with Graph

Item	Description
Downtime Log Table/Graph	Table of logged Downtime for selected Shifts.
Export Buttons	You have the option to export the data to a Printer, Email, CSV file or PDF file.
Mode Type Select	Filter the records by Mode Type, All, Run Only, All Stops, Short Stops etc.
Graph Select	Checking the Graph Select box causes a graph of the data to be generated.
Refresh Button	Refresh the log.

6.2.3 OEE Time (Manual)

The OEE Time View allows you to view a table of hourly records which show how the time for that hour was divided amongst the various OEE categories for the selected Shift. In the example below the graph option has been selected.

Fig. OEE Time with Graph

Item	Description
OEE Time Table/Graph	Table of time categorised by OEE Level 1 loss types for selected Shifts.
Export Buttons	You have the option to export the data to a Printer, Email, CSV file or PDF file.
Graph Select	Checking the Graph Select box causes a graph of the data to be generated.
Refresh Button	Refresh the log.

6.2.4 OEE Analysis (Manual)

The OEE Analysis View allows you to view a table of the losses, grouped by loss and in descending order, for the selected Shift.

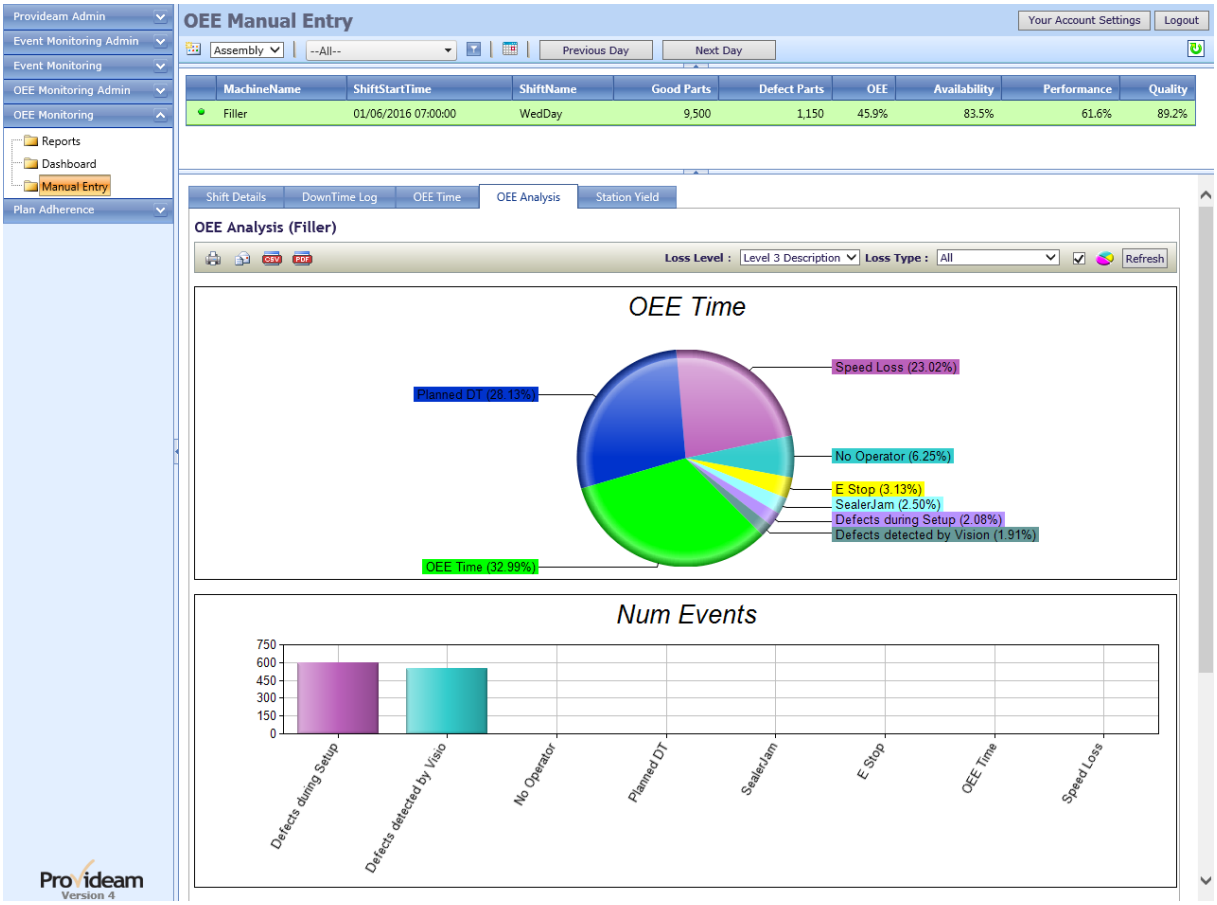


Fig. OEE Analysis

Item	Description
OEE Analysis Table/Graph	Table of time categorised by OEE Level 1 loss types for selected Shifts.
Export Buttons	You have the option to export the data to a Printer, Email, CSV file or PDF file.
Loss Level Select	Select the OEE Loss Level, 1, 2 or 3 into which the losses should be grouped.
Loss Type Select	Filter the losses by Loss Type, All Stops, Short Stops etc.
Graph Select	Checking the Graph Select box causes a graph of the data to be generated.
Refresh Button	Refresh the log.

6.2.5 Station Yield (Manual)

The Station Yield View allows you to view a table of hourly records which show the Defect Parts counts etc.for the selected Shift. In the example below the graph option has been selected.

Note: You can create your own customised Station Yield Views in the **OEE Monitoring Admin** > **Machine Admin** > **Station Yield Views** section of Provideam.

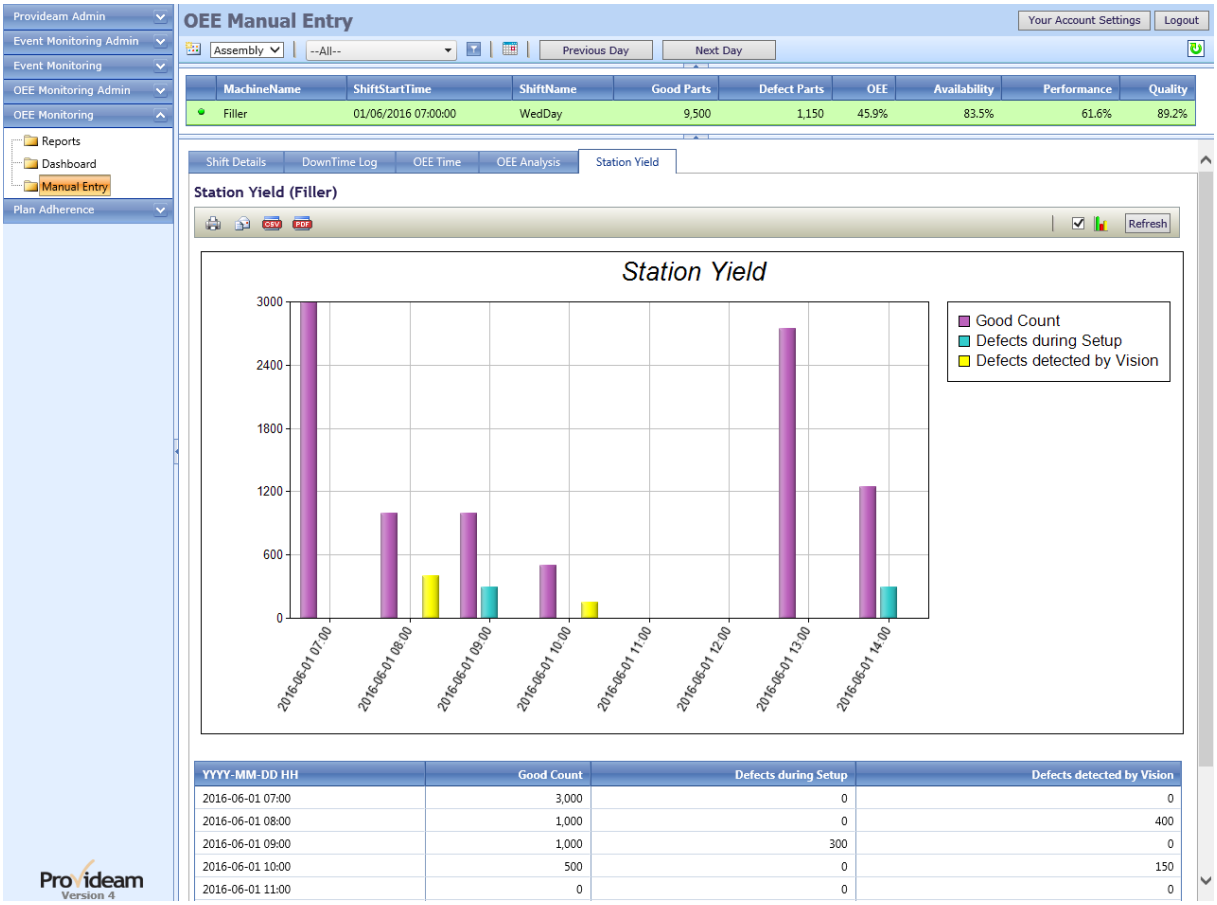


Fig. Station Yield with Graph

Item	Description
Station Yield Table/Graph	Table of hourly Yield values for selected Shifts.
Graph Select	Checking the Graph Select box causes a graph of the data to be generated.
Refresh Button	Refresh the log.
Export Buttons	You have the option to export the data to a Printer, Email, CSV file or PDF file.

6.3 OEE Reports

The OEE Reports Section enables you to create various OEE Reports and to save the structure of the Reports you create as Report Templates. Report Templates define all the parameters required to generate a Report.

Report Templates which you create can be;

- Previewed and then Emailed, Printed, Exported as CSV or Exported as PDF.
- Made available to other Provideam Users.
- Copied - thus forming the basis for other similar Report Templates.
- Scheduled to be run at predefined times and the Reports thus created to be delivered to a mailing list via Email.

Report Types

Provideam offers five basic report types;

Production Trend \ Object by Period

Production Trend reports allow you to trend data over time. For example you could trend the OEE and Yield values for a Machine over a Day, hour by hour.

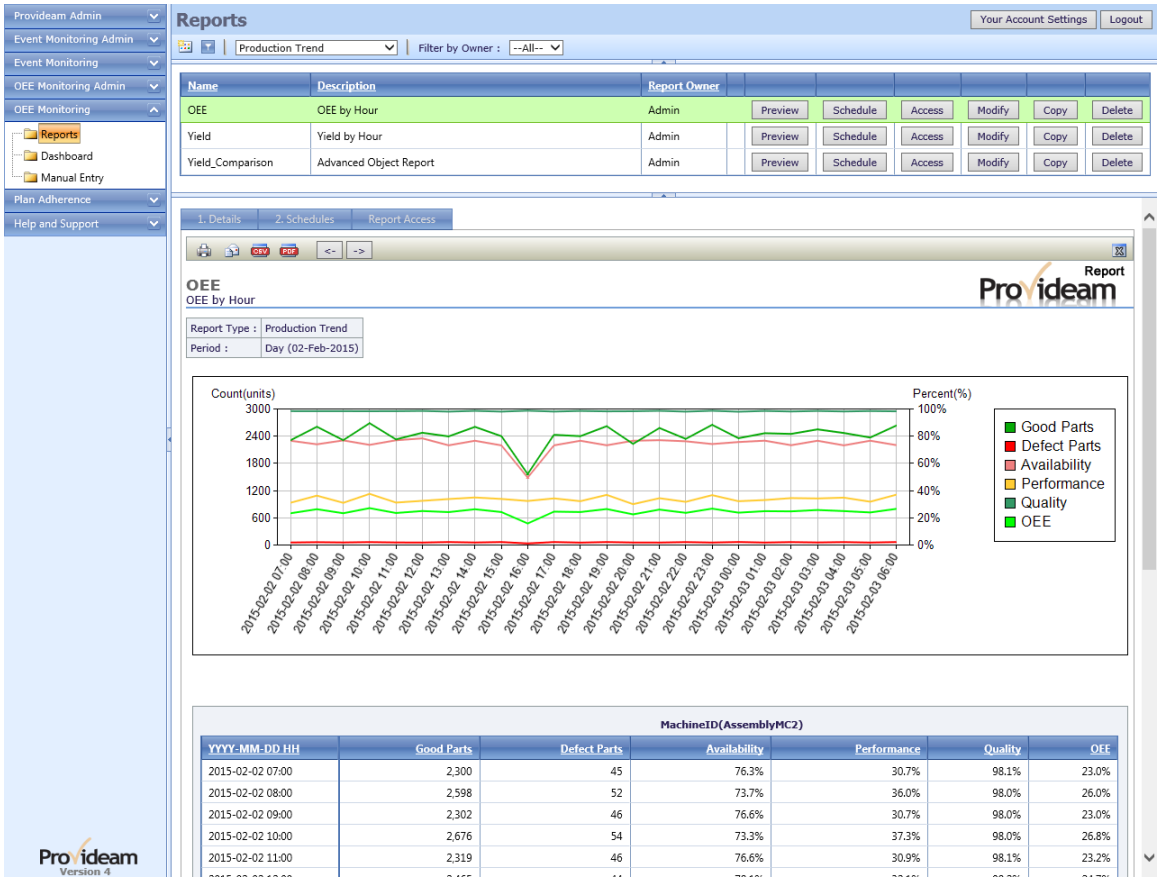


Fig. Sample Production Trend Report

Production by Object \ Period by Object

Period by Object reports allow you to analyze data for a defined set of Objects for a defined Period. For example you could, for a particular Day, create a table which shows the OEE value for each Machine in an Area.

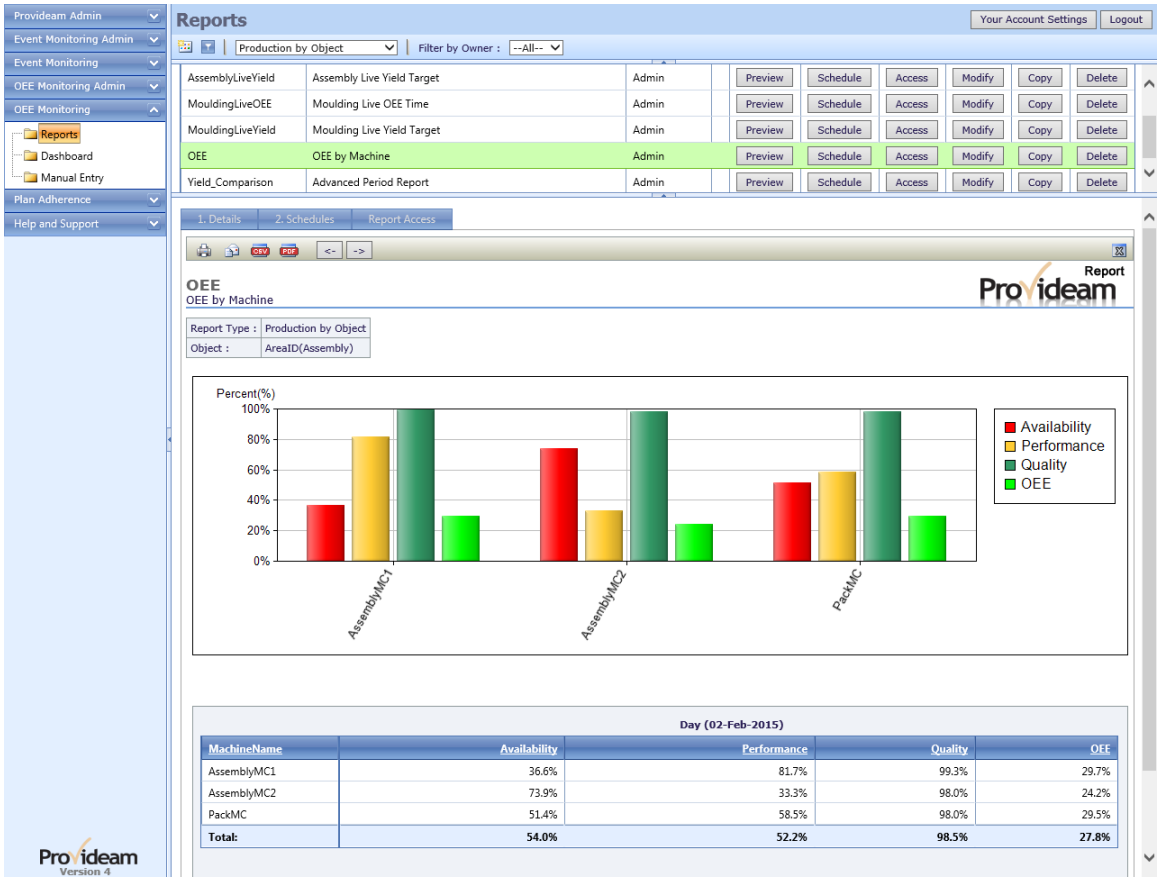


Fig. Sample Period by Object Report

OEE Loss (Group by Object) \ Period by Object and Loss

OEE Loss (Group by Object) reports allow you to create Pareto/Pie reports for any Period for a range of Objects. For example you could create a report which shows a table of the Losses for a Machine for a particular Shift. If you also choose to Show the Object field, e.g. the Machine Name, the report will show an ordered table of the losses for each Machine.

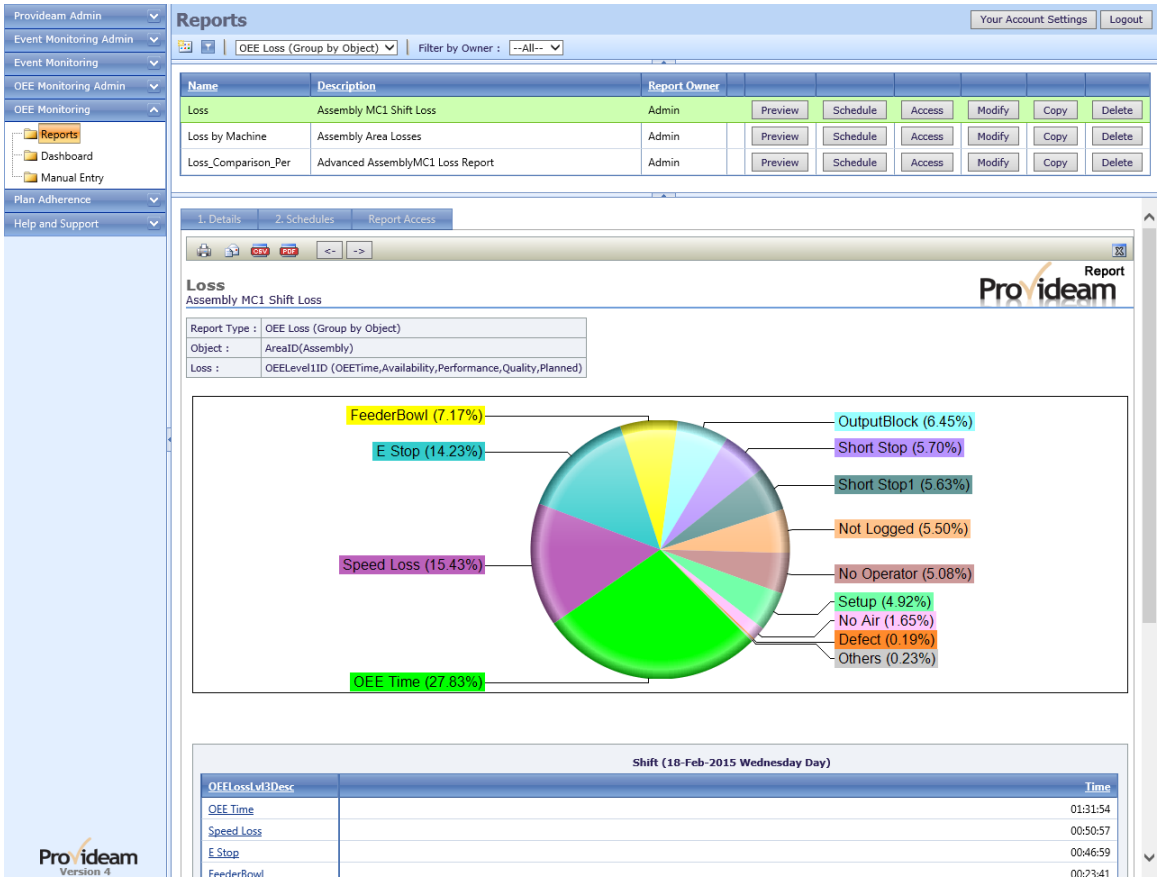


Fig. Sample OEE Loss Report

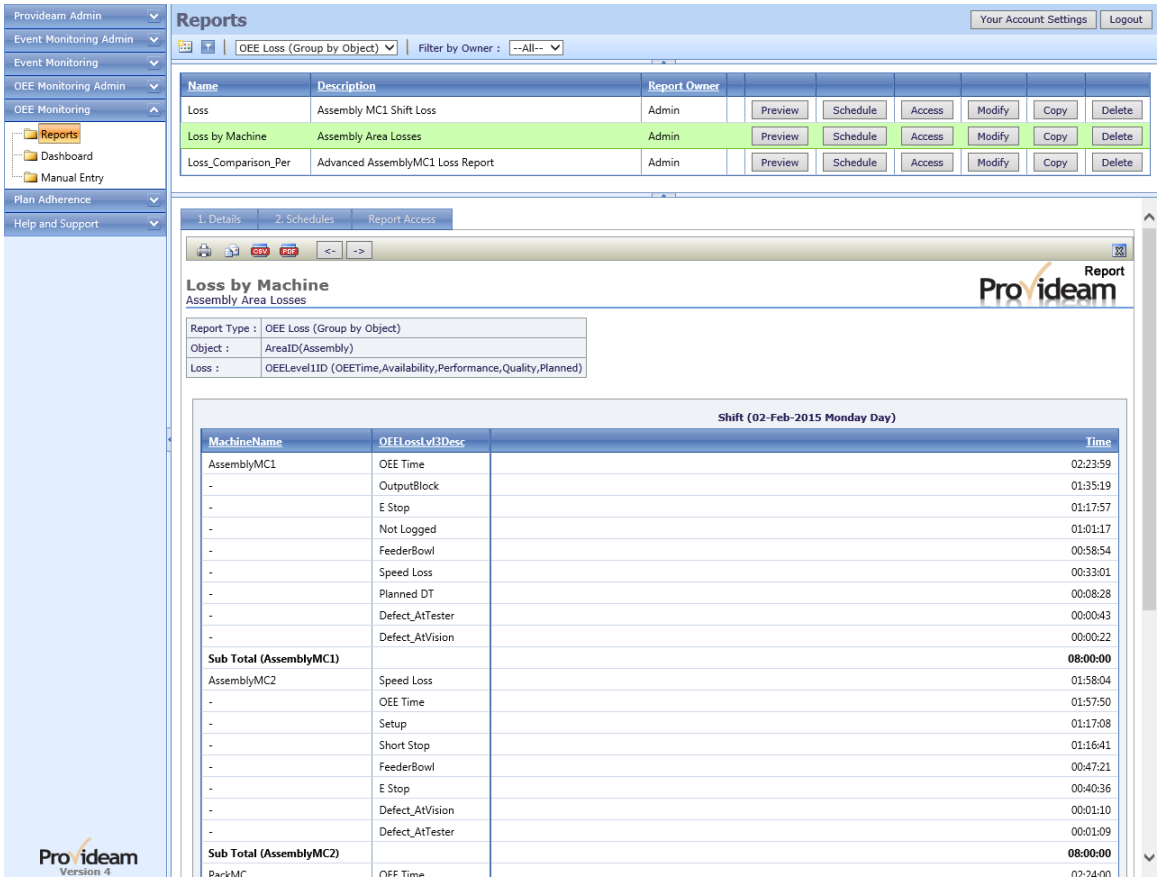


Fig. Sample OEE Loss Report including Object Field (MachineName)

OEE Loss (Group by Period) \ Object by Period and Loss

OEE Loss (Group by Period) reports allow you to create Pareto/Pie reports for any Period for a range of Periods. For example you could create a report which shows a table of the Losses for a Machine for a particular Day. If you also choose to Show a Period field, e.g. the Shift, the report will show an ordered table of the losses for each Shift.

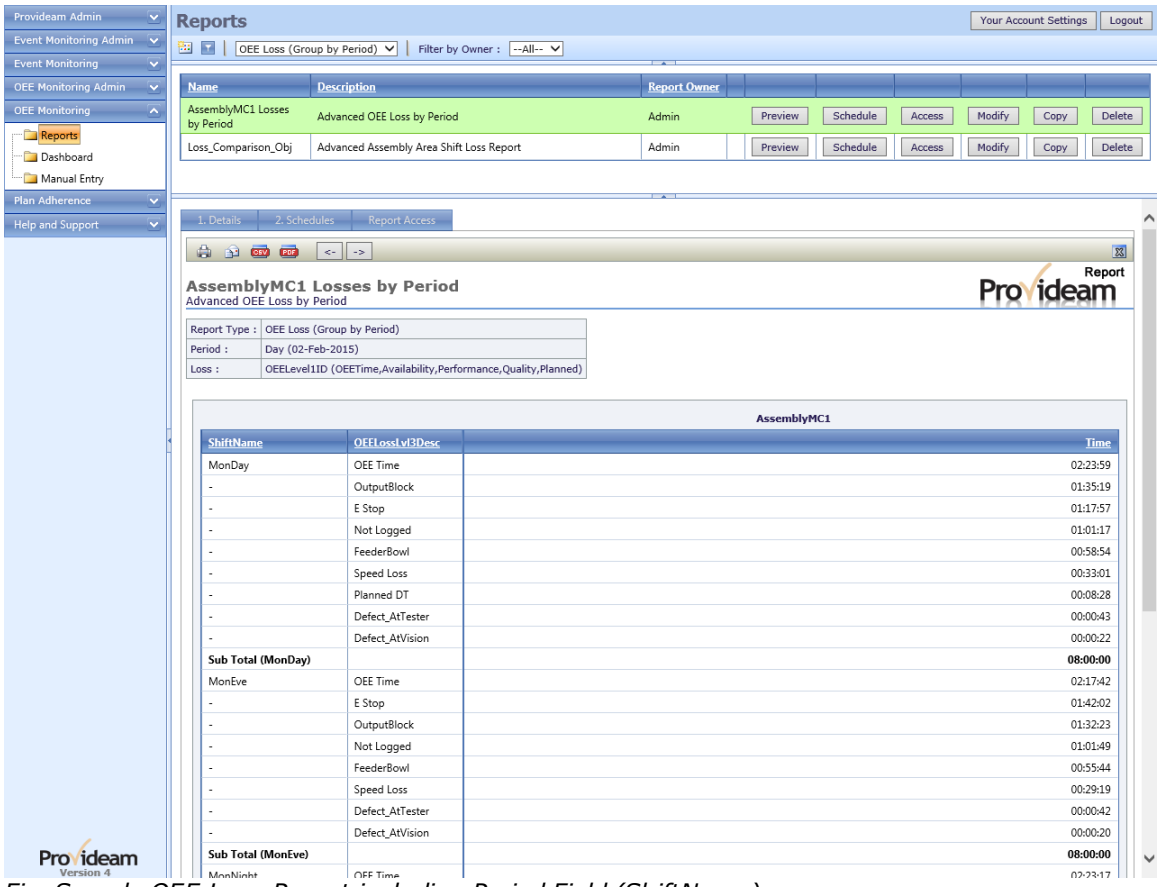


Fig. Sample OEE Loss Report including Period Field (ShiftName)

Mode Log

Mode Log reports allow you to create Log Reports for a range of Periods. For example you could create a report which shows a table of the Downtime Modes for a Machine for a particular Day.

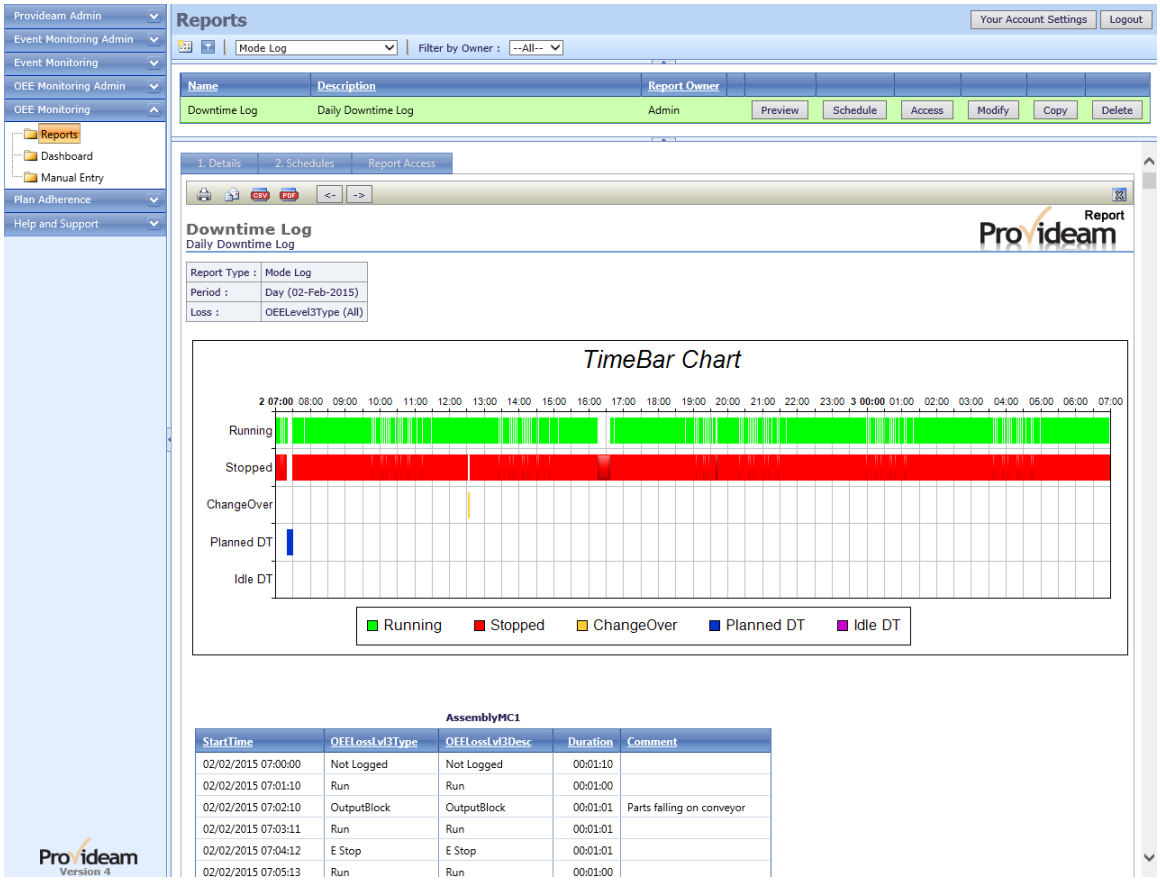


Fig. Sample Mode Log Report

Report Templates

The Report Section allows you to Preview, Modify and Schedule Report Templates. In the figure below you will see two 'Production Trend' style Report Templates have been created; OEE and Yield. By clicking on the Report Template Record you automatically cause the Period Selection (Preview) interface for the Report Template to be displayed.

The Report Template display is filtered by Report Type and Report Owner. To see other Report Templates choose another Report Type from the Report Type Selection filter.

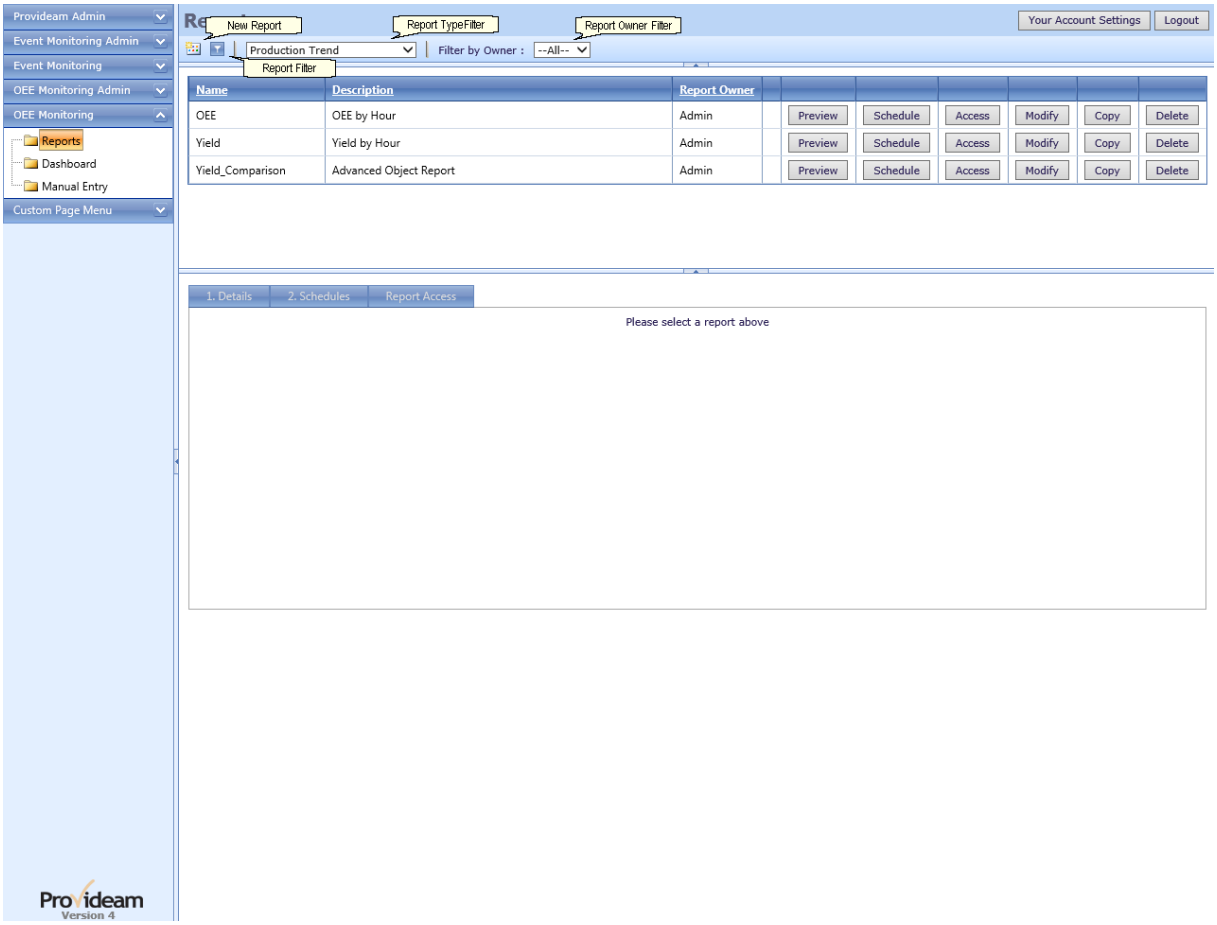


Fig. Reporting Interface

Item	Description
Reports View	Interface which allows you to create a Report, save a Report Template and create Schedules to automatically send Reports to a mailing list via Email.
New Report	Button to initiate the Report Configuration Wizard.
Report Filter	Filter to limit the visible list of Report Templates
Report Type Filter	Filter to limit the visible list of Report Templates to those of the selected Type.
Owner Filter	Filter to limit the visible list of Report Templates to those owned by the selected User.

6.3.1 Production Trend

In this section we will demonstrate how to create a Production Trend (Object by Period) Report.

Example 1: Production Trend Shift Report with Graph

Step 1: Click on the 'New Report' icon

Step 2: Select the *Production Trend* option

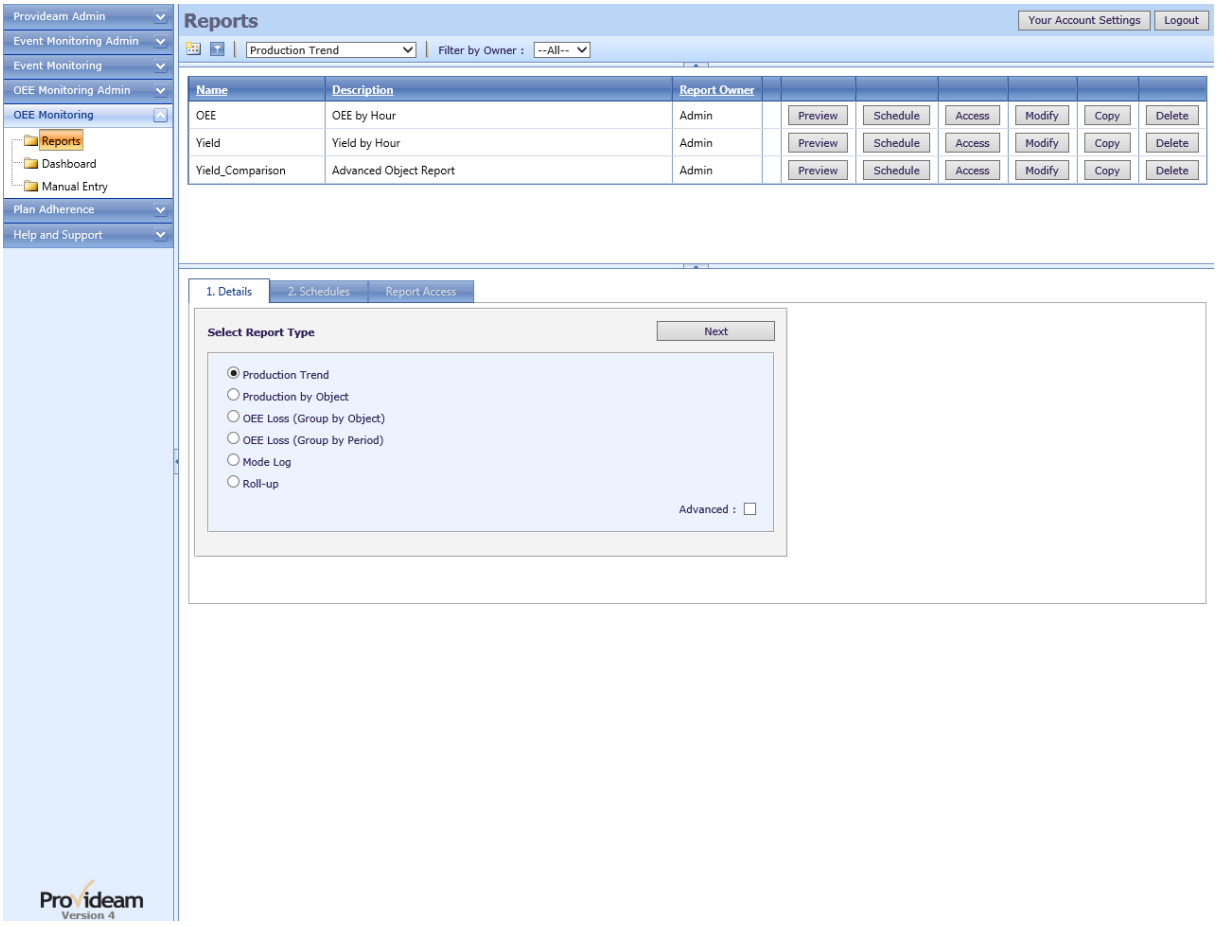


Fig. Production Trend Report - New Production Trend Report

Step 3: Click **Next** to move on to Period selection.

Step 4: Select the **Shift** period option.

This sets the Period range over which your report will be generated. When running this report you will be asked to chose a specific Shift.

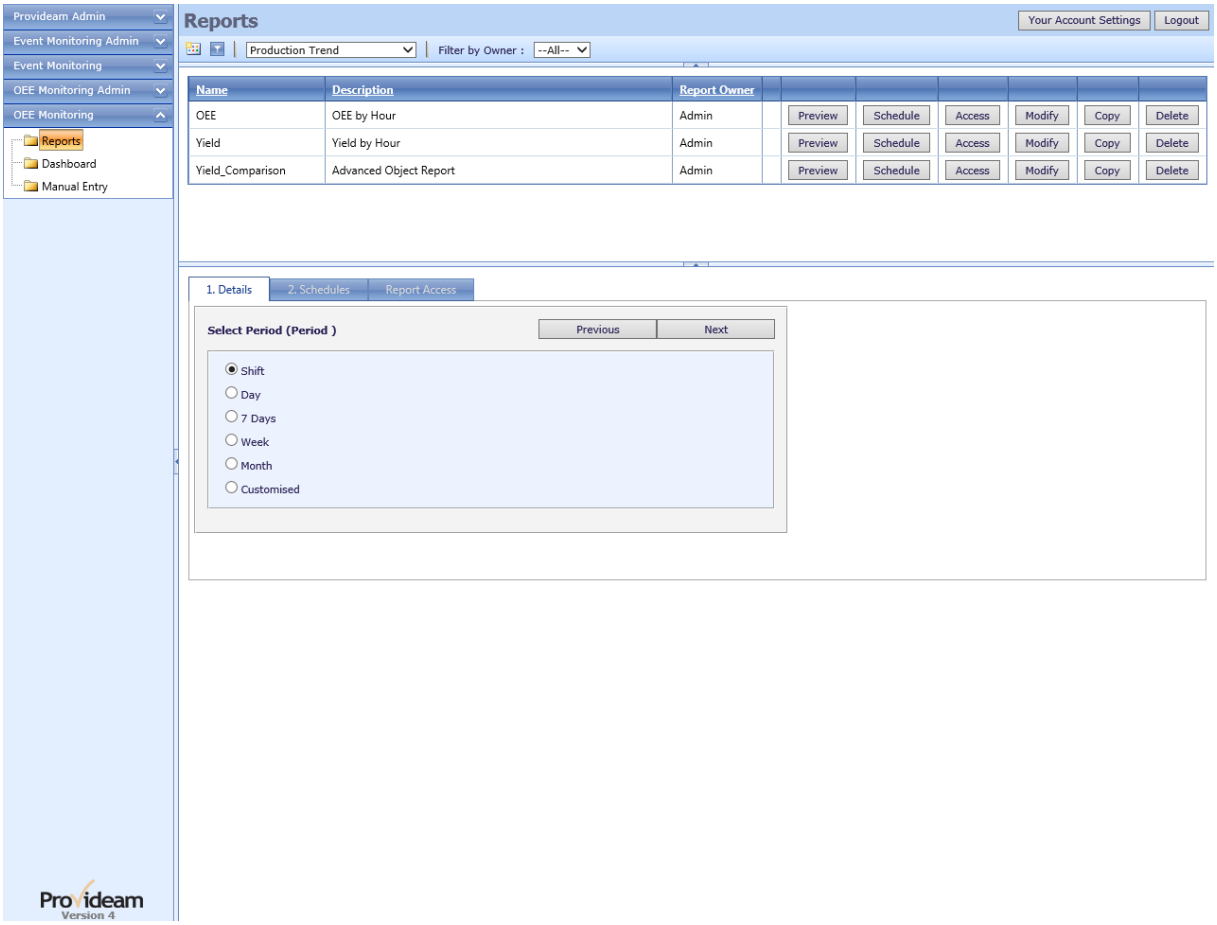


Fig. Production Trend Report - Select Period

Step 5: Click **Next** to move on to the Object selection.

Step 6: Select *AssemblyMC1* from the list of available Machine items.

This sets the range of Objects over which your report will be generated.

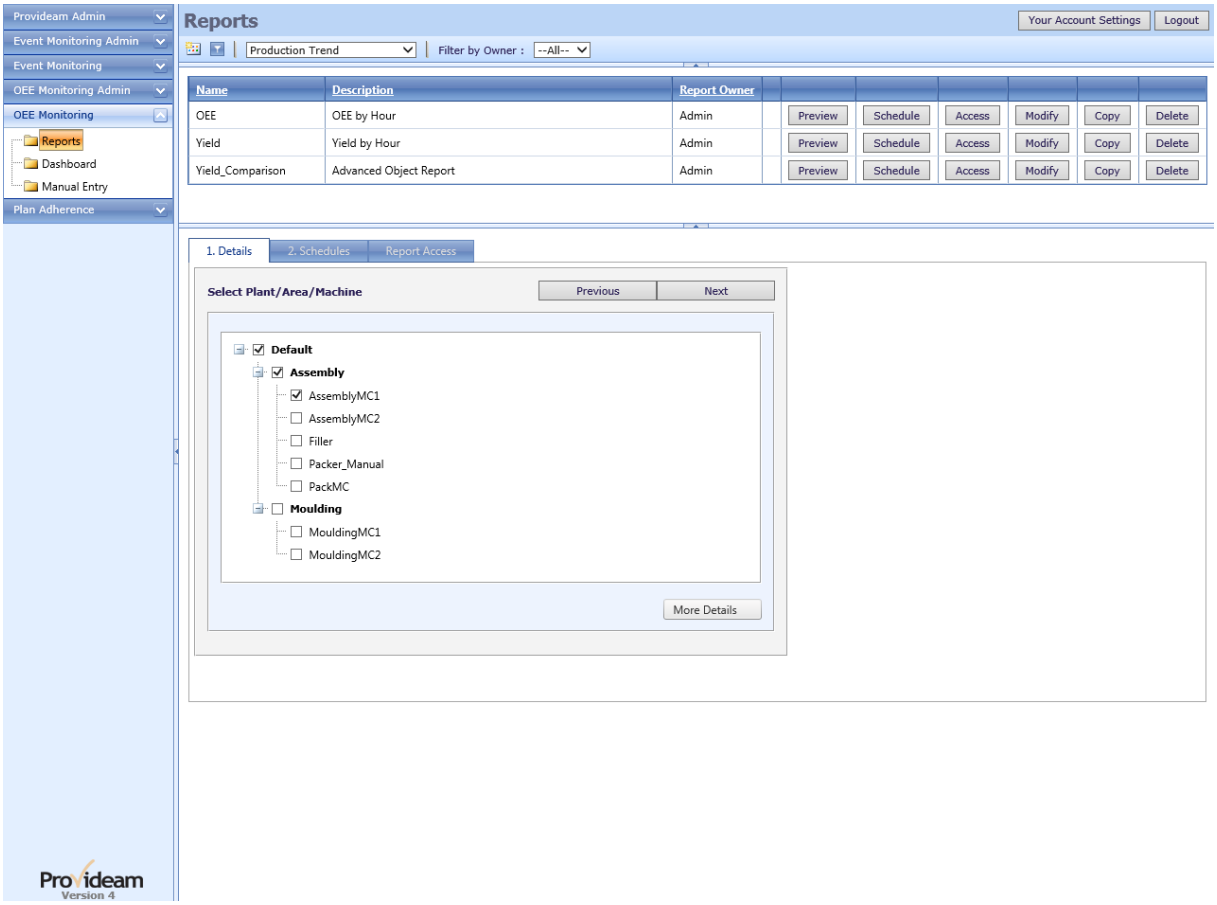


Fig. Production Trend Report - Select Object

Step 7: Click **More Details** to select additional Object details.

This allows you to limit your Object range to specific Lots, Batches, Tools Parts, etc.

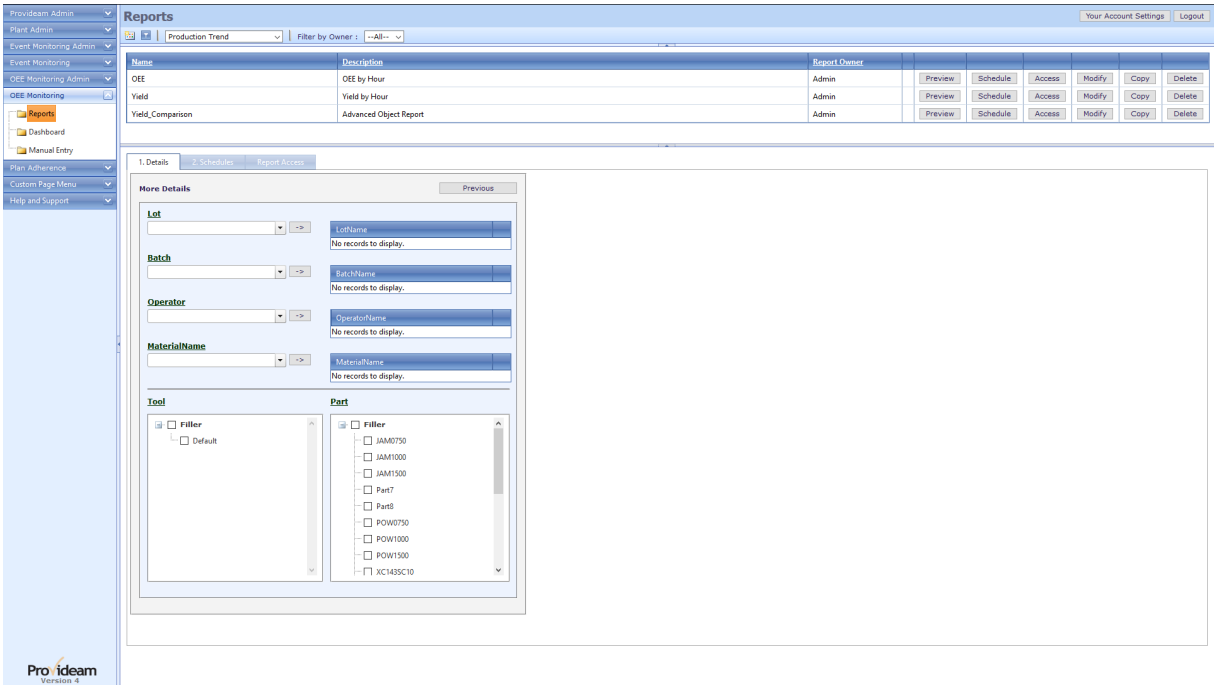


Fig. Production Trend Report - Select Additional Object Details

In this example we will not select any other details. The Object selection defines the object on which the report data will be generated. In this case it's all data for AssemblyMC1. In another example it could be all data related to Part7 running on the PackMC.

Step 8: Click **Previous** to return to the previous step and then **Next** to move on to name the Object.

By default the Report Wizard enters the Object Description shown below. You may edit this if you wish.

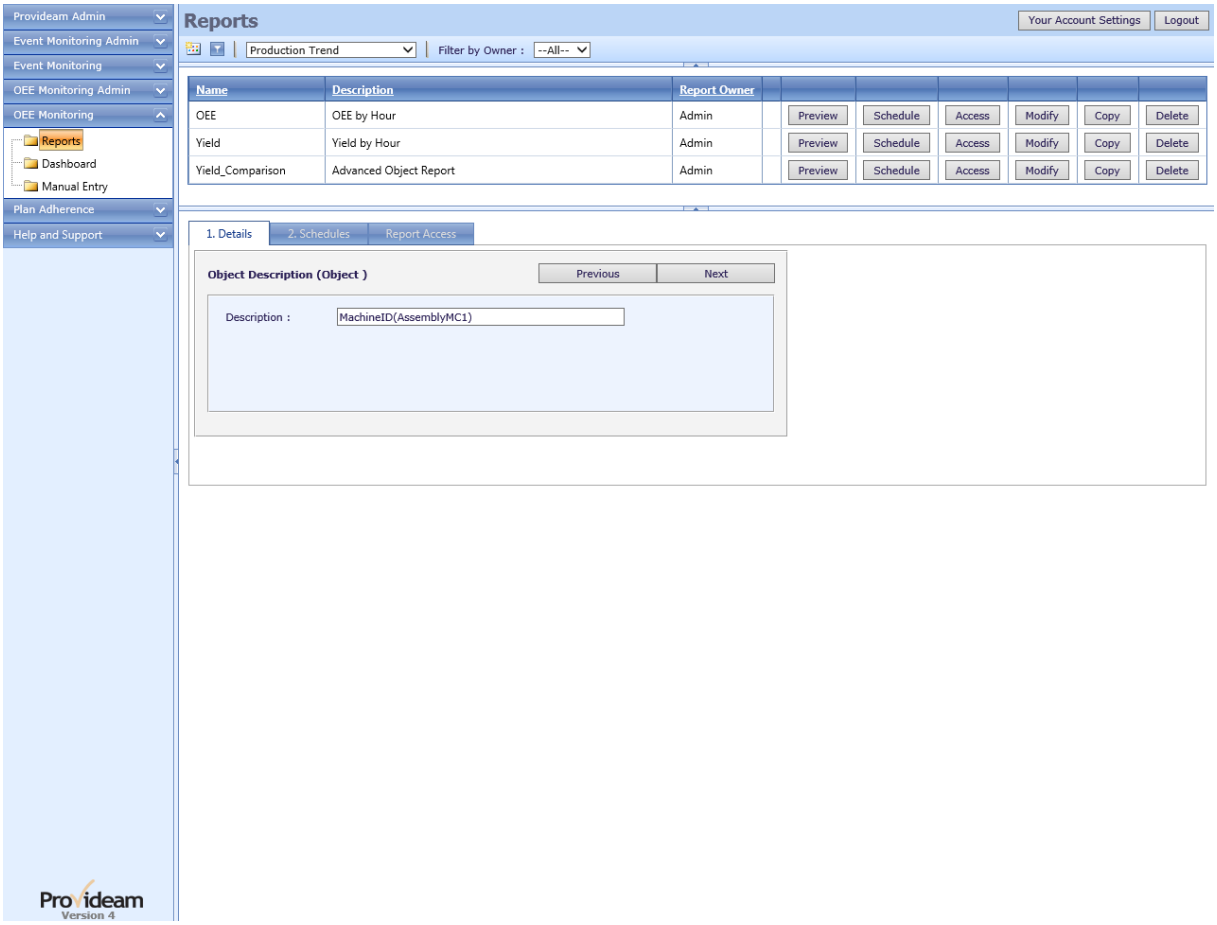


Fig. Production Trend Report - Edit Object Description

Step 9: Click **Next** to move on to Fields selection.

Step 10: Select *YYYY-MM-DD HH* & *MachineName* from the list of available Field items. To select a Field click and hold the record grabber icon of the required Field in the **Available Fields** list and drag it across to the **Selected Fields** list.

Note:

1. The order in which the Field columns occur in the **Selected Fields** lists determines how the data will be sorted in your report. The data will be sorted first by the first column and then by the next column and so on. To change the order simply click and hold on the icon of the relevant record and drag it to the appropriate position in the list.
2. To remove a Field from the **Selected Fields** list, drag it back to the **Available Fields** list.
3. To apply a background color to the Field column on the report, select the Field in the **Selected Fields** list, select the **Table Color** from the **Format** box and then click the **Apply Format** button.
4. Click the **Clear** button to reset formatting of the selected Field to default format.

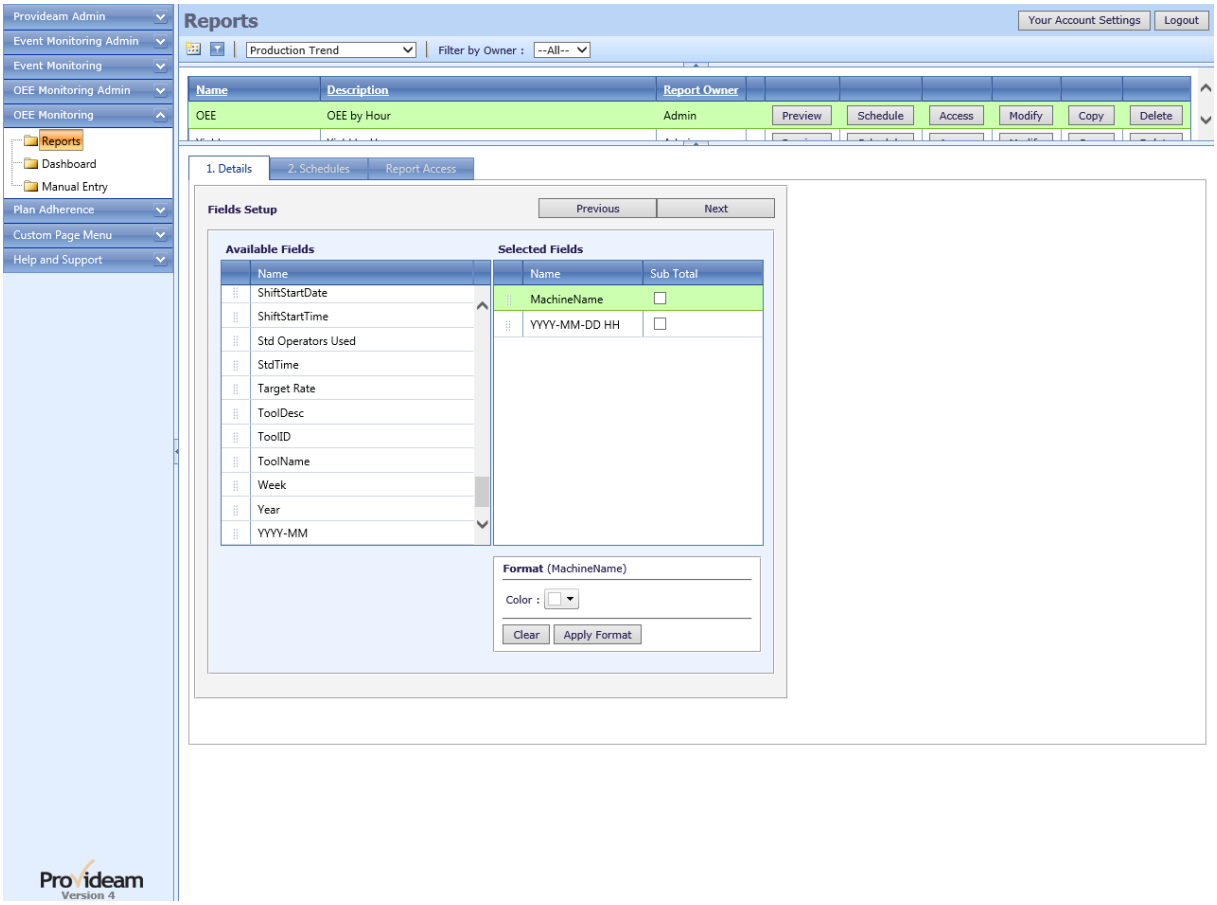


Fig. Production Trend Report - Select Fields

Step 11: Click **Next** to move on to Functions selection.

Step 12: Select *Good Parts*, *Defect Parts, OEE, Availability, Performance* and *Quality* from the list of **Available Production Functions** items. To select a Function click and hold the required Function in the **Available Production Functions** list and drag it across to the **Selected Functions** list.

Notes:

1. The order in which the Functions columns occur in the **Selected Functions** lists determines the order in which the Functions will appear in your report. To change the order simply click and hold on the icon of the relevant record and drag it to the appropriate position in the list.
2. To remove a Function from the **Selected Functions** list, simply drag it back to the **Available Production Functions** list.
3. To apply a formatting to the a Function, select the Function in the **Selected Functions** list, select the format options you require from the **Format** box and then click the **Apply Format** button.
4. Click the **Clear** button to reset formatting of the selected Function to default format.

5. See Parameterized Functions section of this chapter for details on adding Parameterized Functions.
6. See Customized Functions section of this chapter for details on adding Customized Functions.

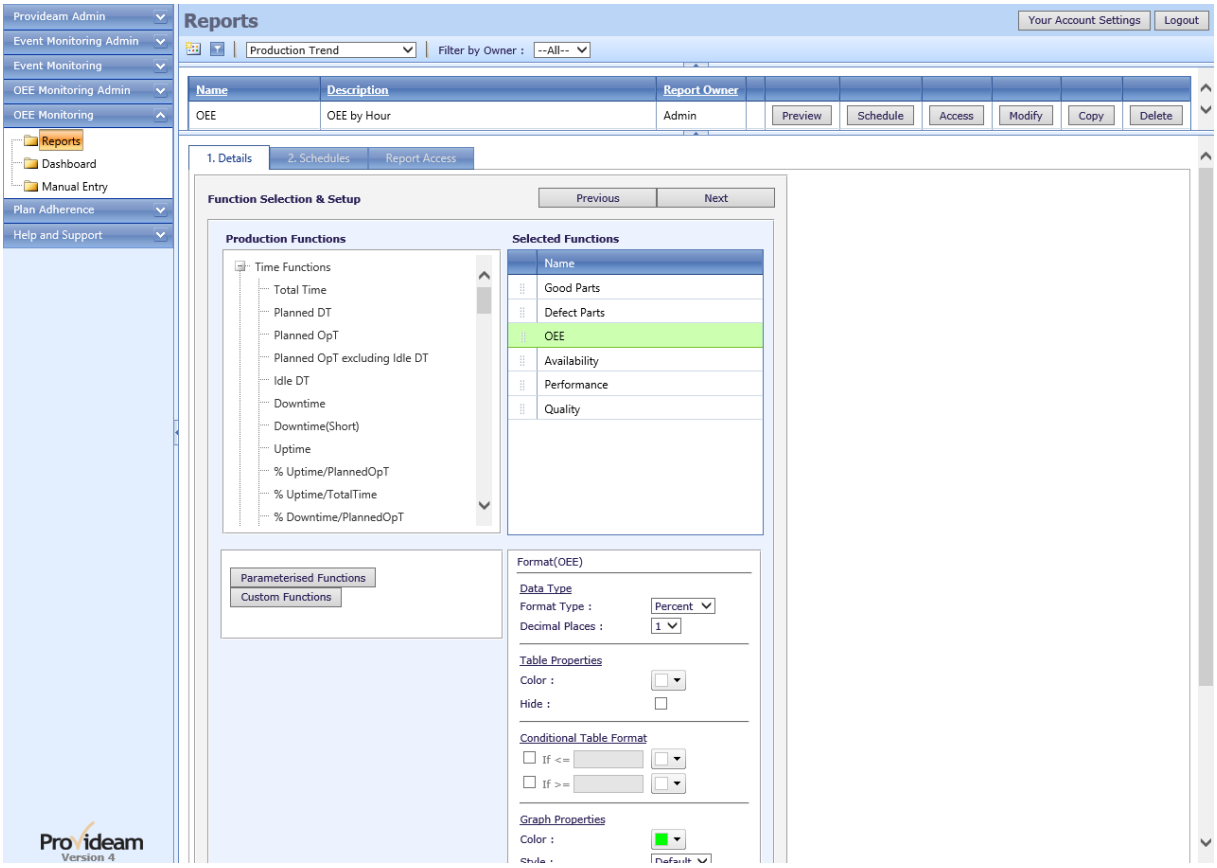


Fig. Production Trend Report - Select Functions

Step 13: Click **Next** to move on to the final screen in the Report Wizard.

Step 14: Select the **Trend Chart** Graph option.

Step 15: Check the **Show** Graph option.

Step 16: Check the **Show Grand Totals** checkbox.

Step 17:Click **Run Report** to run this Report.

Notes:

1. To include a grand-total on the report, check the **Show Grand Totals** checkbox.
2. You may save the report definition as a Report Template at this stage. Report Templates can be shared with other users and also scheduled for automatic delivery by email.

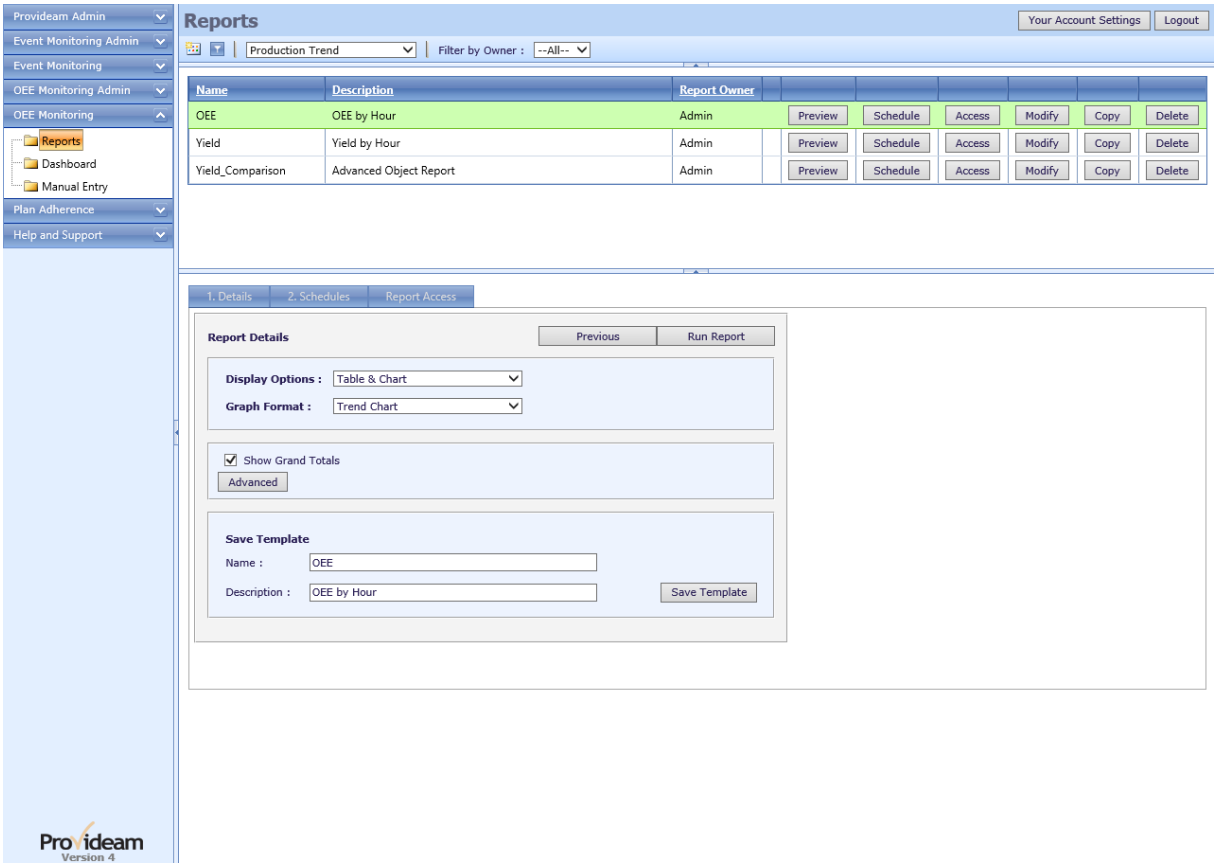


Fig. Production Trend Report - Select Graph Style

Step 18: Select a **Date** and **Shift**.

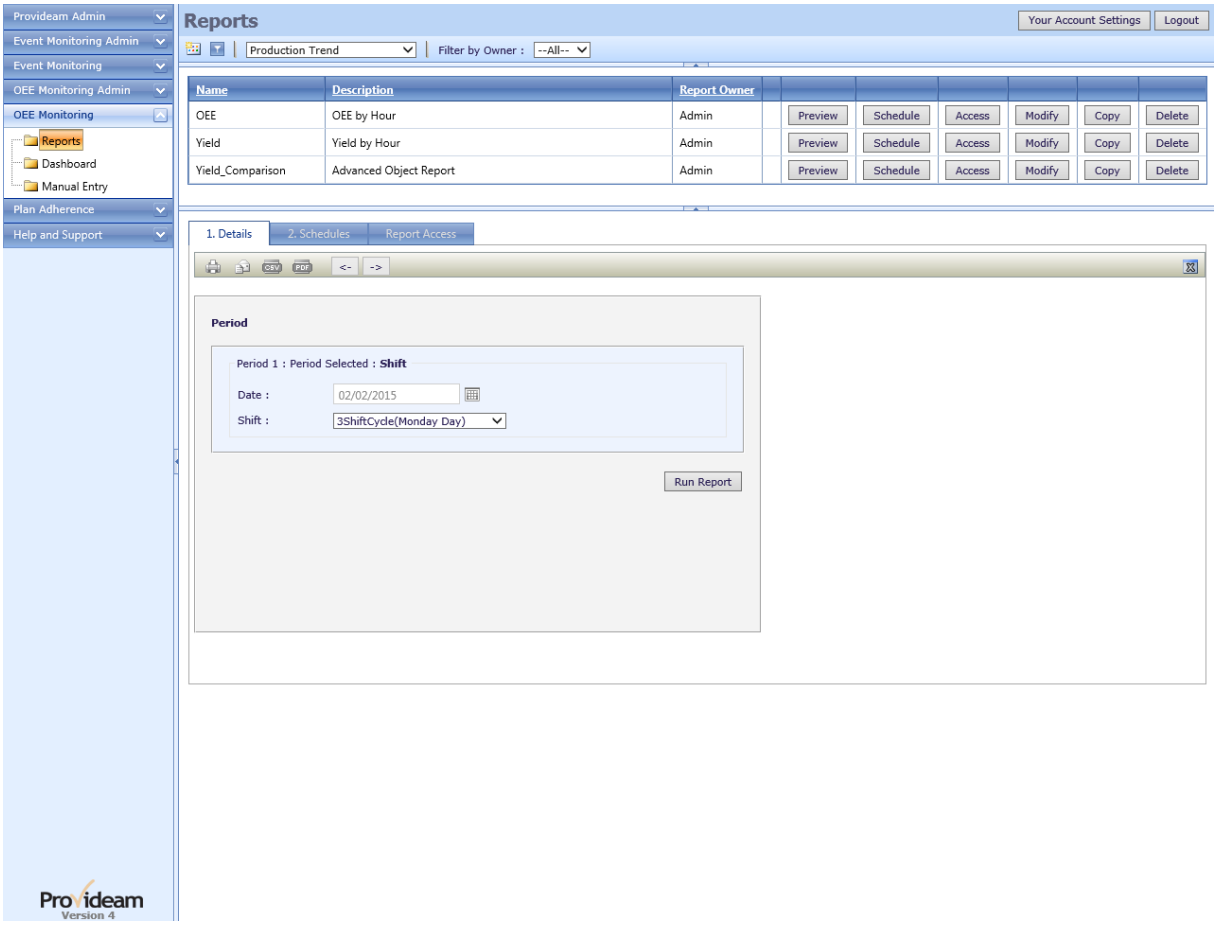
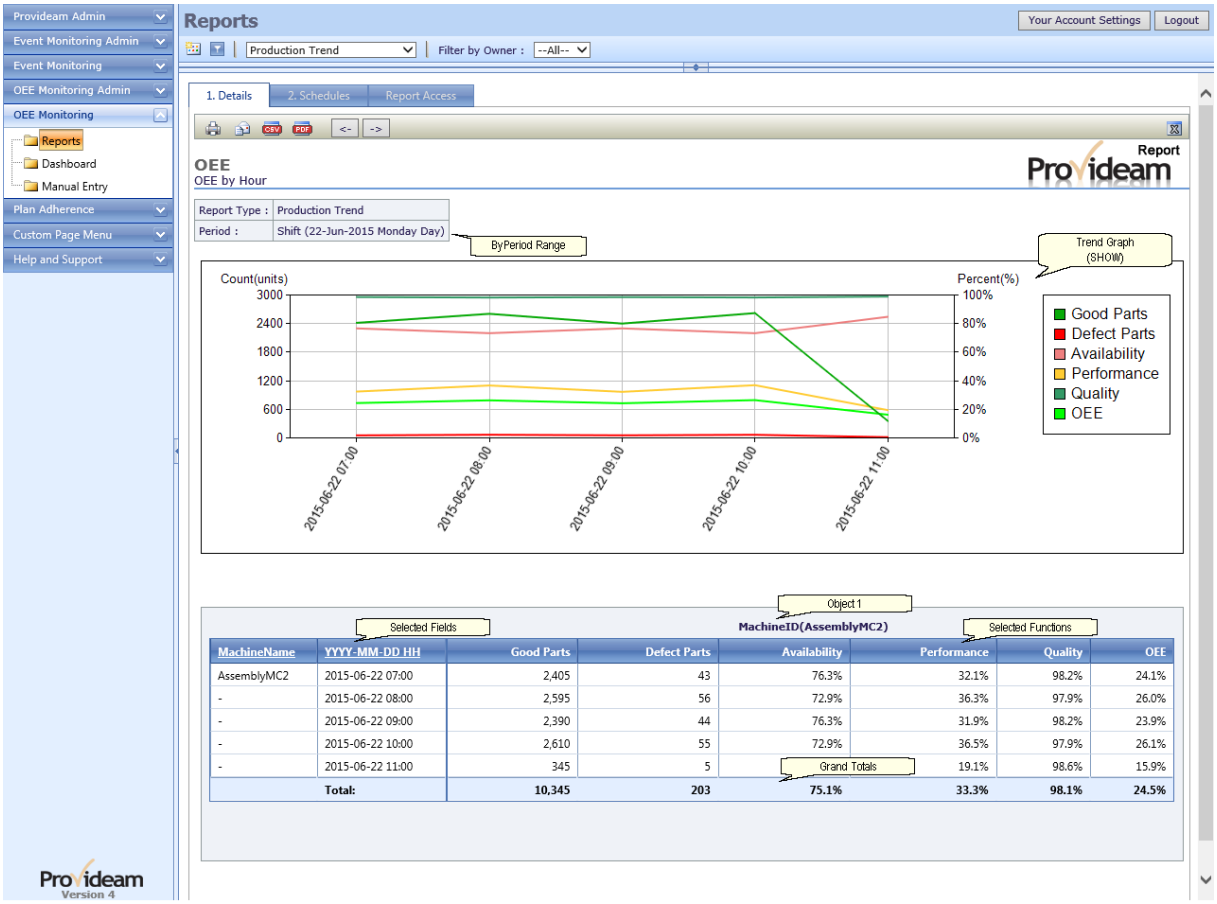


Fig. Production Trend Report - Select Report Period Parameters

Step 19: Click **Run Report** to generate a report preview.



MachineName	YYYY-MM-DD HH	Good Parts	Defect Parts	Availability	Performance	Quality	OEE
AssemblyMC2	2015-06-22 07:00	2,405	43	76.3%	32.1%	98.2%	24.1%
-	2015-06-22 08:00	2,595	56	72.9%	36.3%	97.9%	26.0%
-	2015-06-22 09:00	2,390	44	76.3%	31.9%	98.2%	23.9%
-	2015-06-22 10:00	2,610	55	72.9%	36.5%	97.9%	26.1%
-	2015-06-22 11:00	345	5	75.1%	19.1%	98.6%	15.9%
	Total:	**10,345**	**203**		**33.3%**	**98.1%**	**24.5%**

Fig. Production Trend Report - Preview Shift Report

Example 2: Production Trend Report with Multiple Objects

In Example 1 above we have generated a Shift report with one Object: Object 1. It is possible to compare up to 5 Objects on a Production Trend Report. In this example we will compare the data for *AssemblyMC1* and *AssemblyMC2*.

Step 1: Create a *Production Trend* Report as before. This time check the **Advanced** checkbox on the first Report Wizard screen.

Step 2: Click **Next** to move on to the Period selection.

Step 3: Select *Shift* from the list of available Period options.

Step 4: Click **Next** to move on to the Object selection.

Step 5: Click on the **Add new** button to add a new Object.

Step 6: Select *AssemblyMC1* from the list of available Machine items for Object 1.

Step 7. Edit the **Object 1 Description** to be *AssemblyMC1*

Step 8: Click on the **Add new** button to add a new Object.

Step 9: Select *AssemblyMC2* from the list of available Machine items for Object 2.

Step 10. Edit the **Object 2 Description** to be *AssemblyMC2*

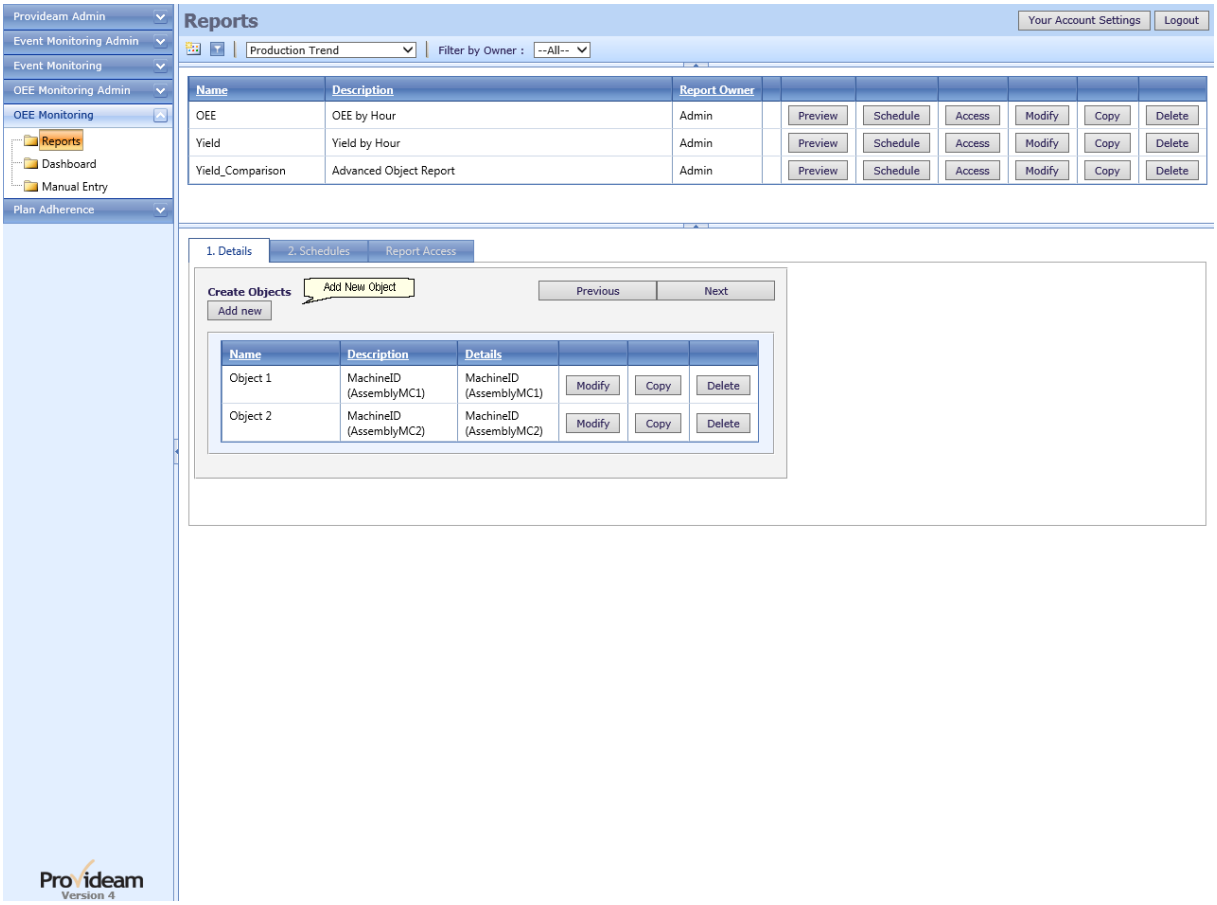


Fig. Production Trend Report - Multiple Object Definition

Step 11: Click **Next** to move on to the Field selection.

Step 12: Select *YYYY-MM-DD HH* from the list of available Field Items.

Step 13: Click **Next** to move on to the Function selection.

Step 14: Select *Good Parts* and *Defect Parts* from the list of available Function Items.

Step 15: Click **Next** to move on to the Report Template page.

Step 16: Generate the report as before, this time with a Bar Graph chart.

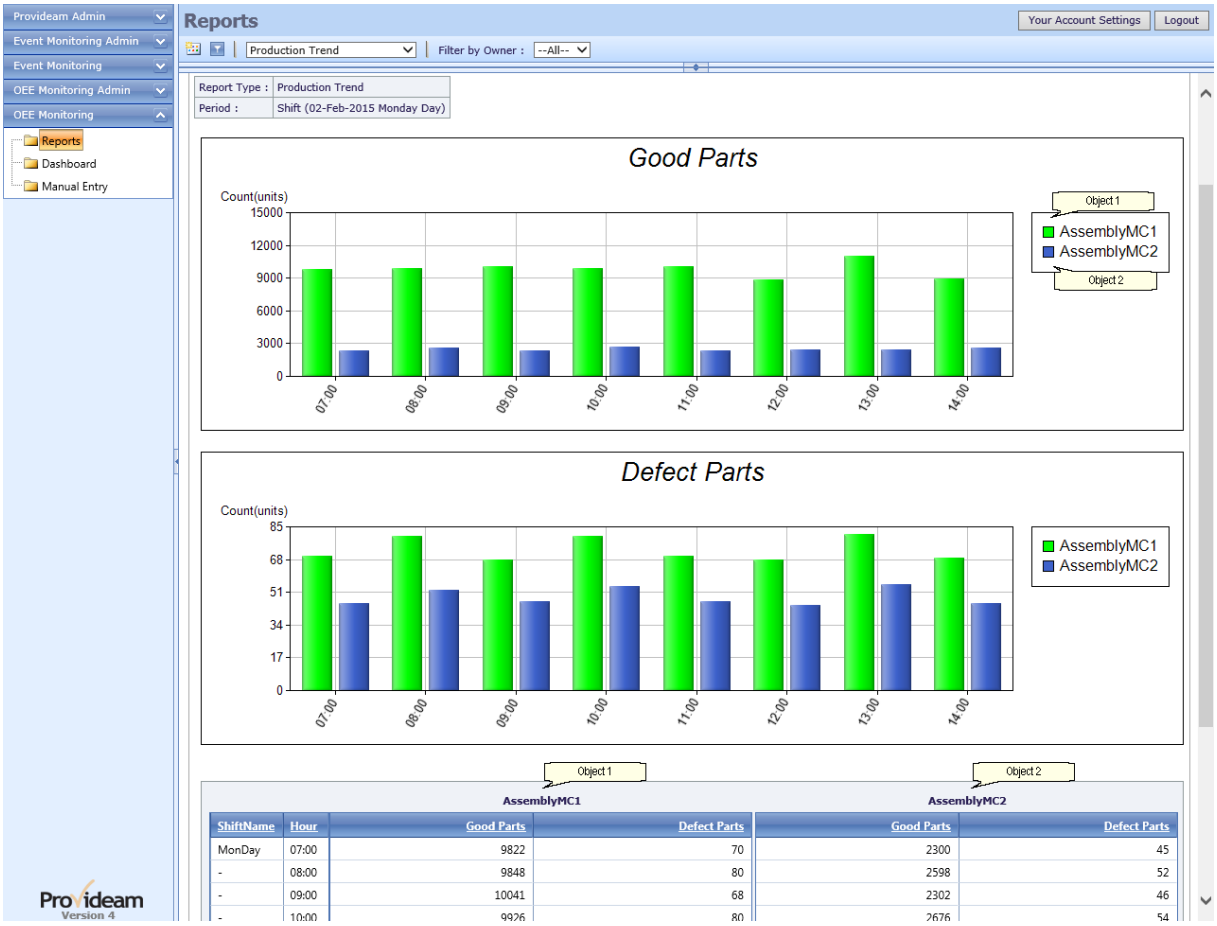


Fig. Production Trend Report - Preview Multiple Object Shift Report

6.3.2 Production by Object

In this section we will demonstrate how to create a Production Object (Period by Object) Report.

Example 1: Production Object Shift Report with Graph

Step 1: Click on the 'New Report' icon

Step 2: Select the *Production by Object* option

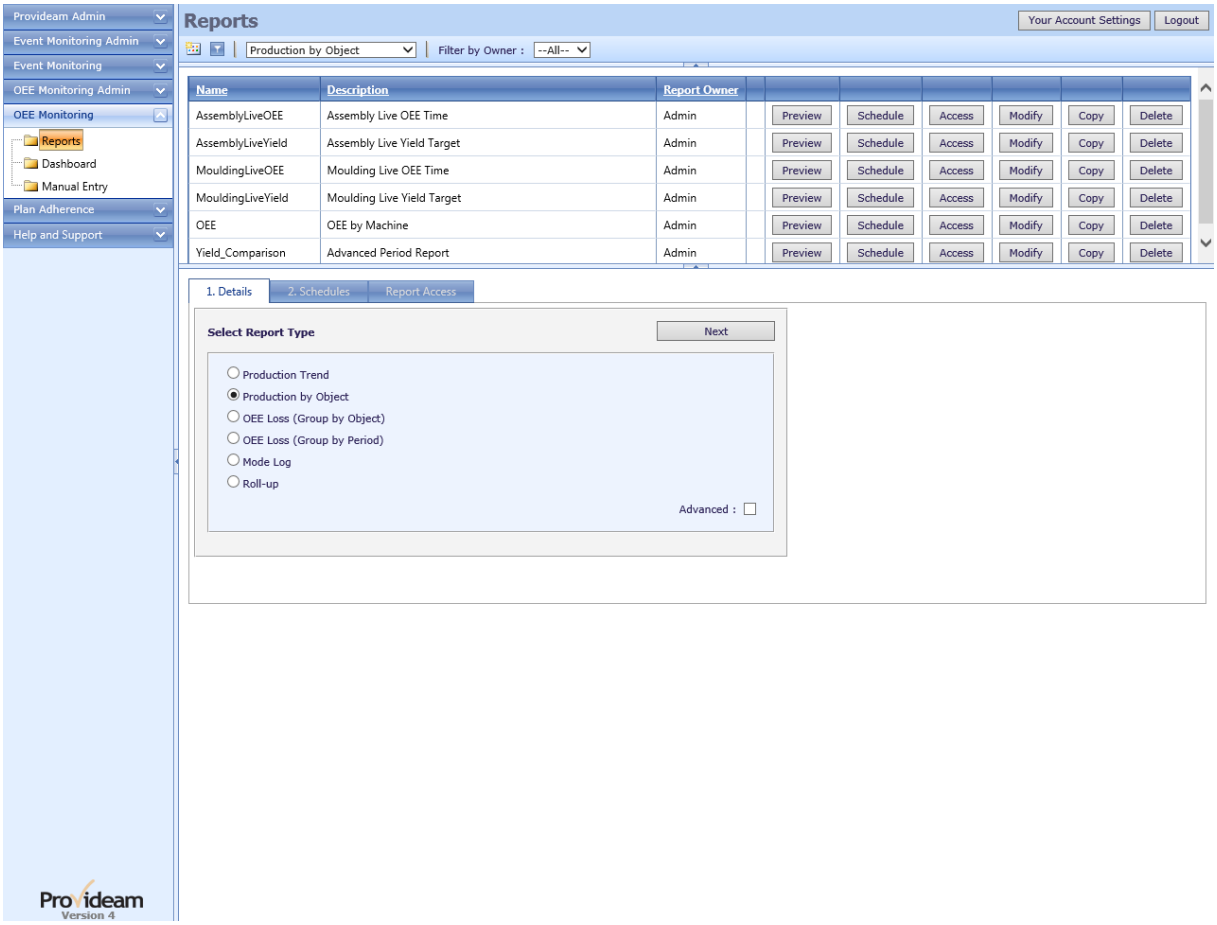


Fig. Production Object Report - New Production Object Report

Step 3: Click **Next** to move on to Period selection.

Step 4: Select the **Shift** period option.

This sets the Period range over which your report will be generated. When running this report you will be asked to chose a specific Shift.

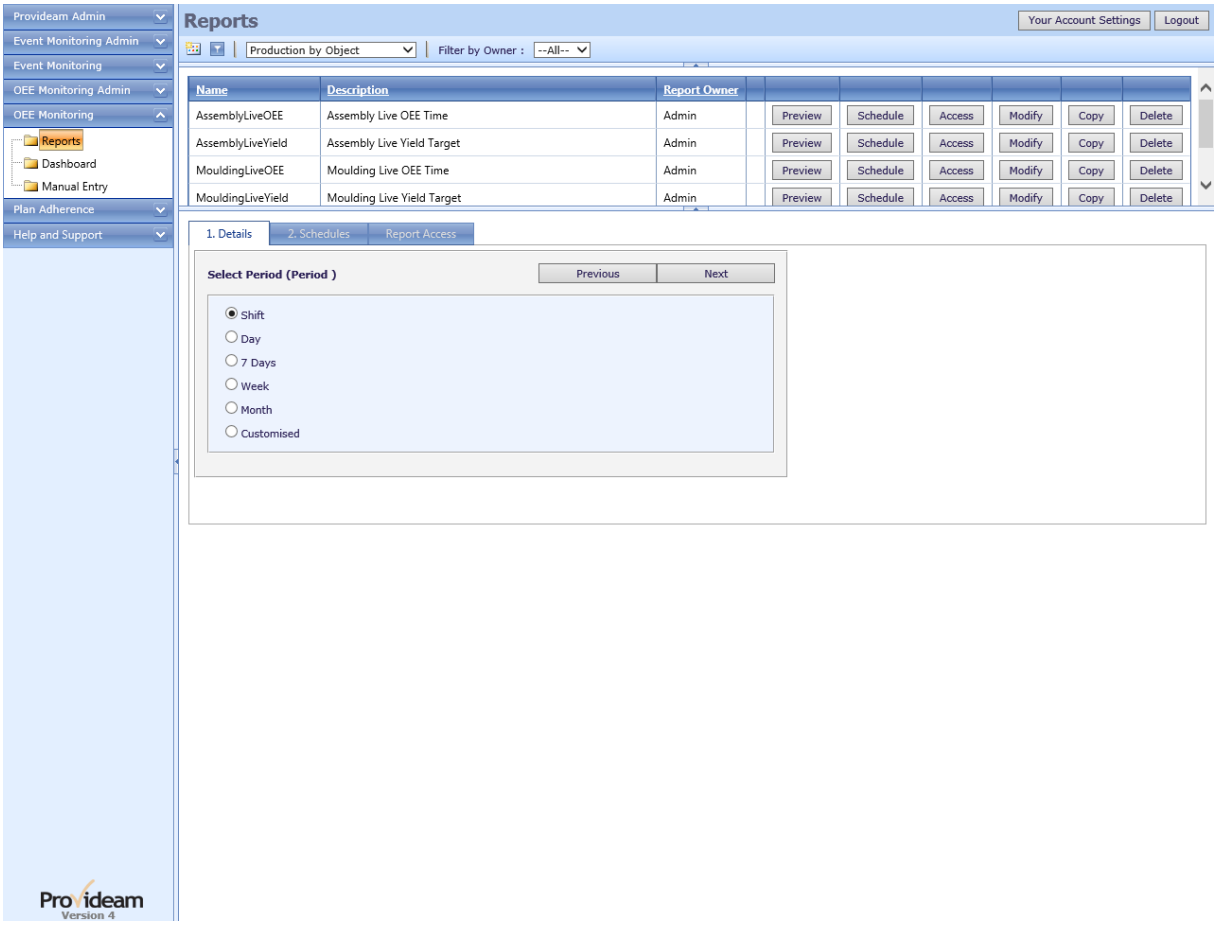


Fig. Production Object Report - Select Period

Step 5: Click **Next** to move on to the Object selection.

Step 6: Select all Machines from the list of available Machine items for the *Assembly* Area.

This sets the range of Objects over which your report will be generated.

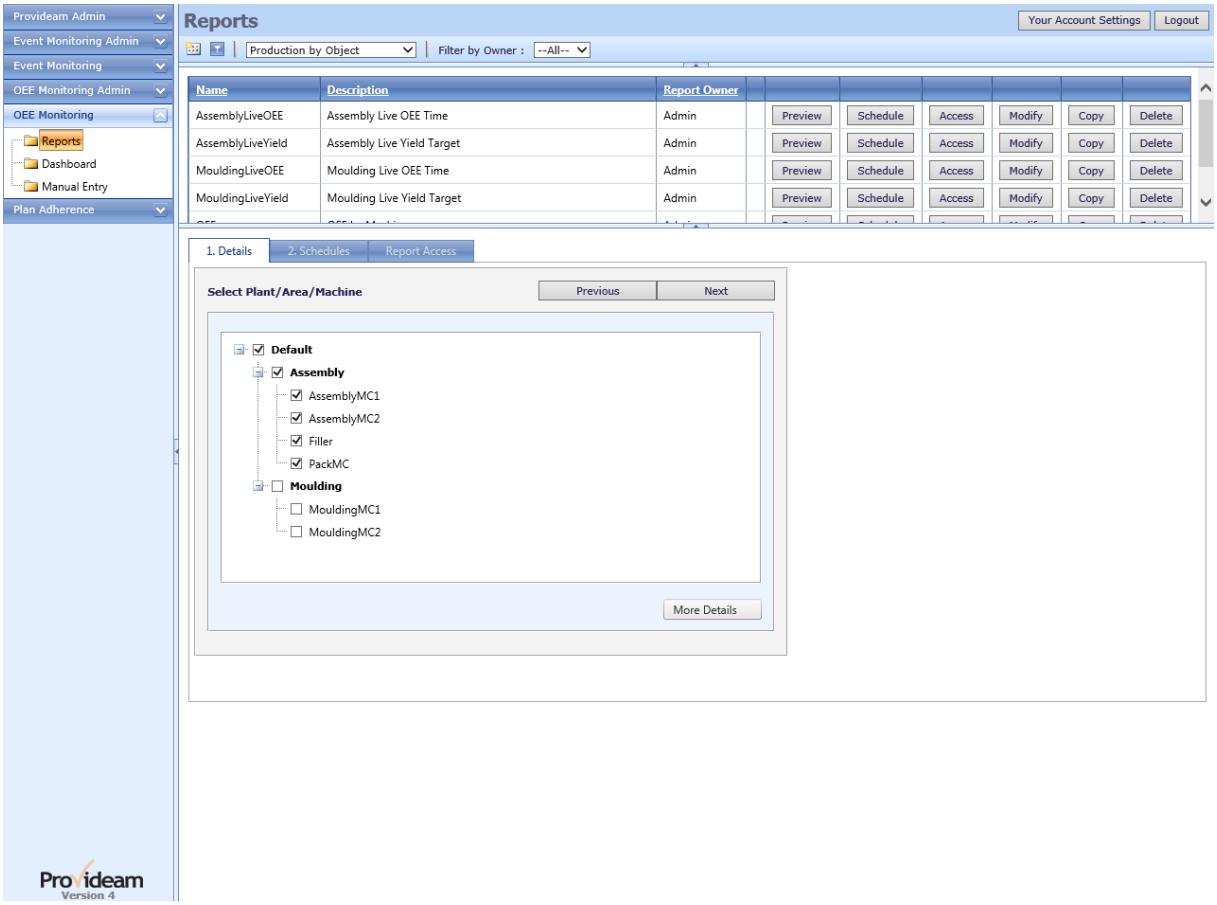


Fig. Production Object Report - Select Object

Step 7: Click **Next** to move on to name the Object.

By default the Report Wizard enters the Object Description shown below. You may edit this if you wish.

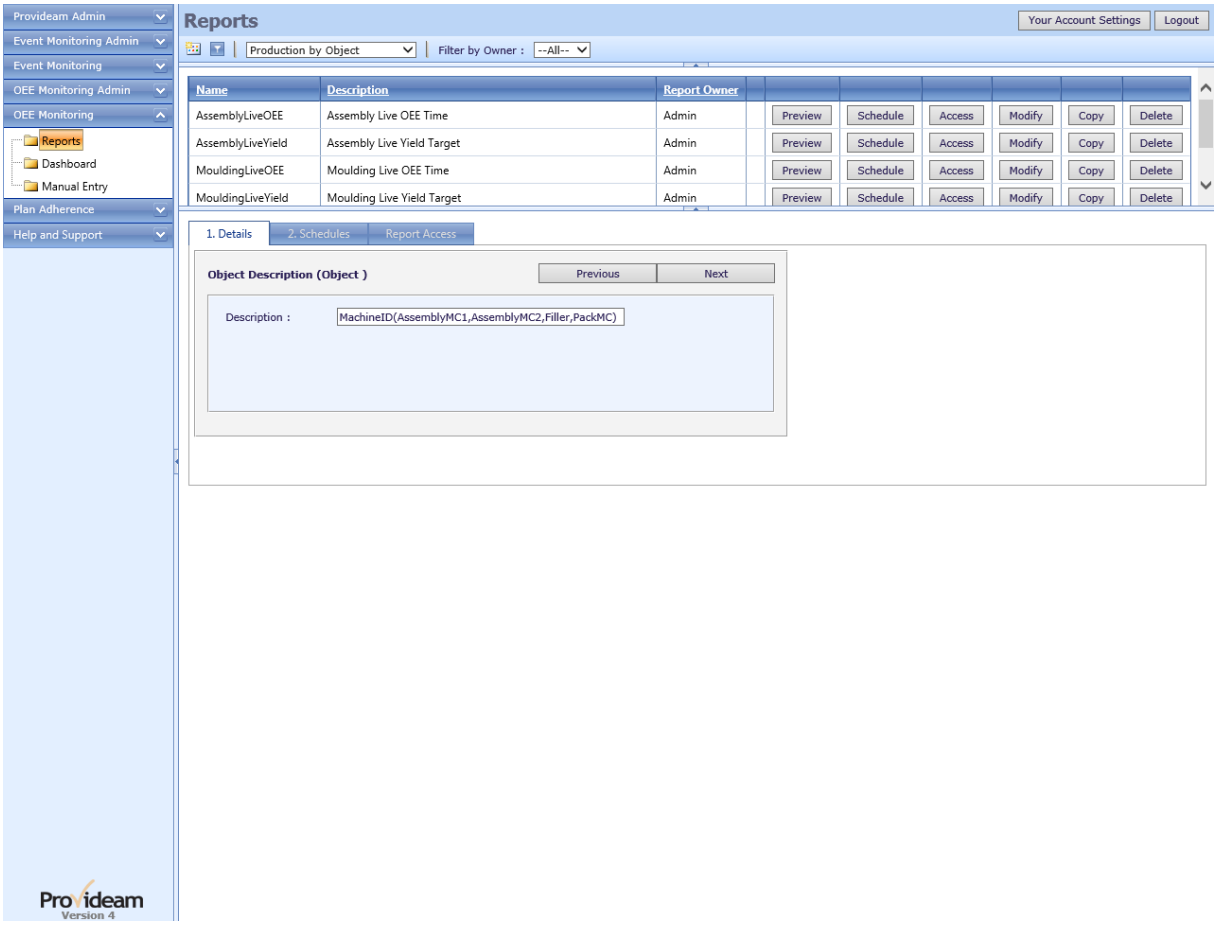


Fig. Production Object Report - Edit Object Description

Step 8: Click **Next** to move on to Fields selection.

Step 9: Select *MachineName* from the list of available Field items. To select a Field click and hold the record grabber icon ⁞⁞ of the required Field in the **Available Fields** list and drag it across to the **Selected Fields** list.

In the Production Trend Report section we wanted to show a Production Trend Report with Period Fields. In this example we will remove the Period Field and only have an Object Field - *MachineName*. Hence our data will be displayed by Object only - not by Period.

Note:

1. The order in which the Field columns occur in the **Selected Fields** lists determines how the data will be sorted in your report. The data will be sorted first by the first column and then by the next column and so on. To change the order simply click and hold on the ⁞⁞ icon of the relevant record and drag it to the appropriate position in the list.
2. To remove a Field from the **Selected Fields** list, drag it back to the **Available Fields** list.

3. To apply a background color to the Field column on the report, select the Field in the **Selected Fields** list, select the **Table Color** from the **Format** box and then click the **Apply Format** button.
4. Click the **Clear** button to reset formatting of the selected Field to default format.

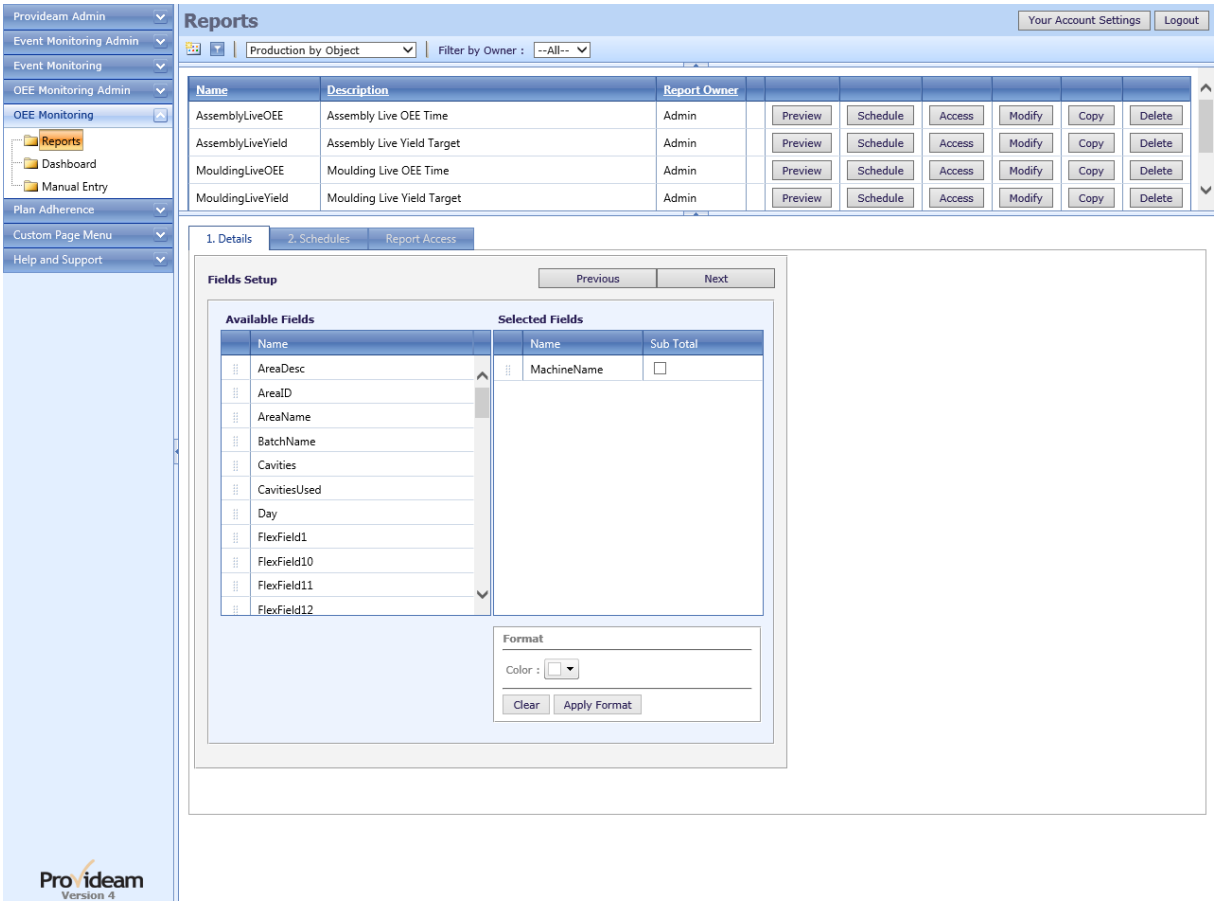


Fig. Production Object Report - Select Fields

Step 10: Click **Next** to move on to Functions selection.

Step 11: Select *Availability, Performance, Quality* and *OEE* from the list of **Available Production Functions** items. To select a Function click and hold the required Function in the **Available Production Functions** list and drag it across to the **Selected Functions** list.

Notes:

1. The order in which the Functions columns occur in the **Selected Functions** lists determines the order in which the Functions will appear in your report. To change the order simply click and hold on the icon of the relevant record and drag it to the appropriate position in the list.
2. To remove a Function from the **Selected Functions** list, simply drag it back to the **Available Production Functions** list.

3. To apply a formatting to the a Function, select the Function in the **Selected Functions** list, select the format options you require from the **Format** box and then click the **Apply Format** button.
4. Click the **Clear** button to reset formatting of the selected Function to default format.
5. See Parameterized Functions section of this chapter for details on adding Parameterized Functions.
6. See Customized Functions section of this chapter for details on adding Customized Functions.

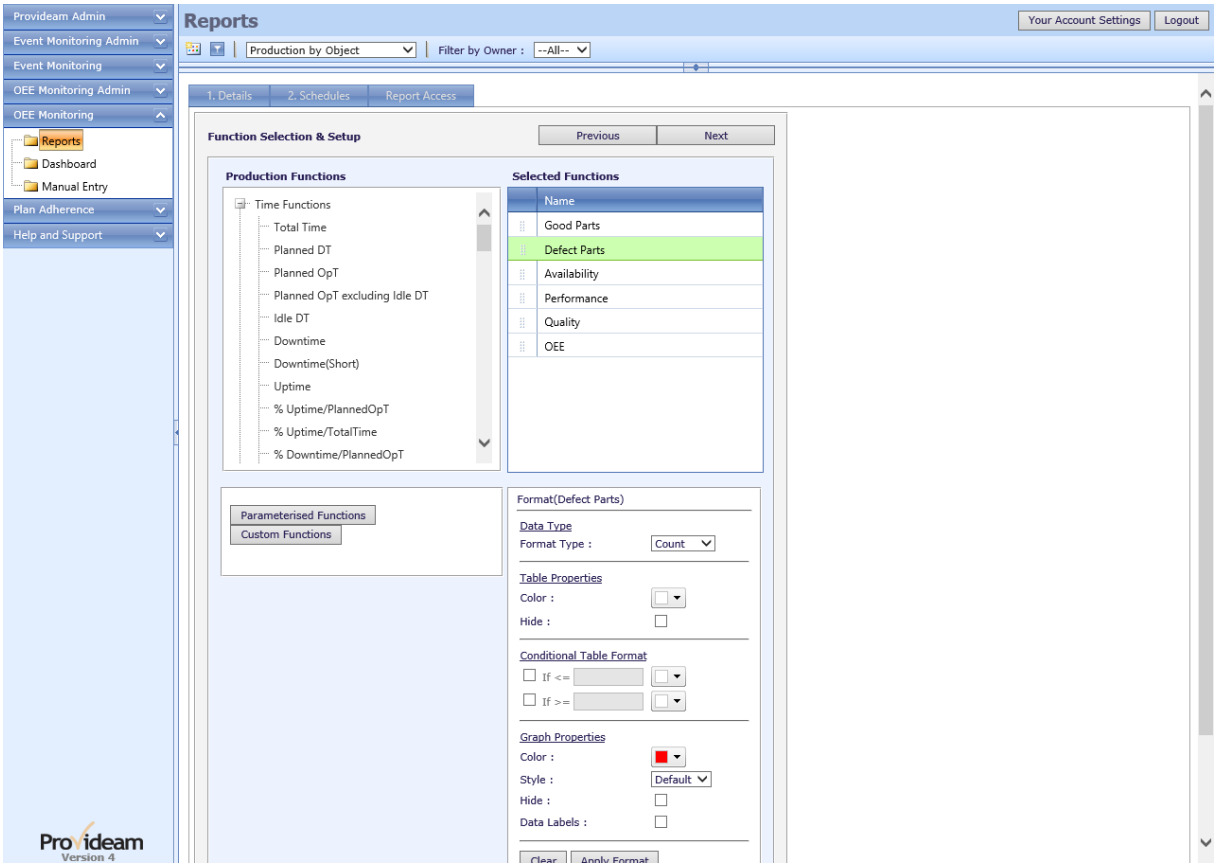


Fig. Production Object Report - Select Functions

Step 12: Click **Next** to move on to the final screen in the Report Wizard.

Step 13: Select the **Bar Chart** Graph option.

Step 14: Check the **Show** Graph option.

Step 15: Check the **Show Grand Totals** checkbox.

Step 16:Click **Run Report** to run this Report.

Notes:

1. To include a grand-total on the report, check the **Show Grand Totals** checkbox.
2. You may save the report definition as a Report Template at this stage. Report Templates can be shared with other users and also scheduled for automatic delivery by email.

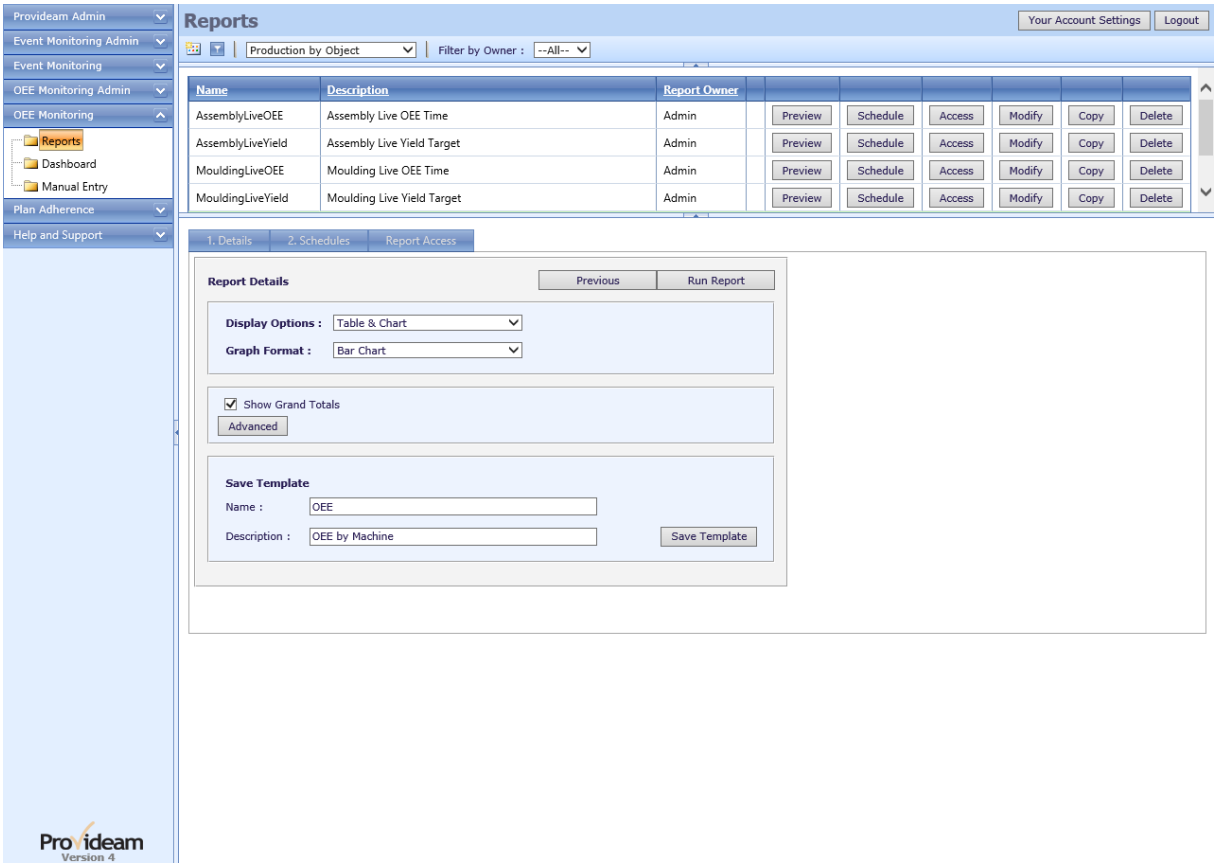


Fig. Production Object Report - Select Graph Style

Step 17: Select a **Date** and **Shift**.

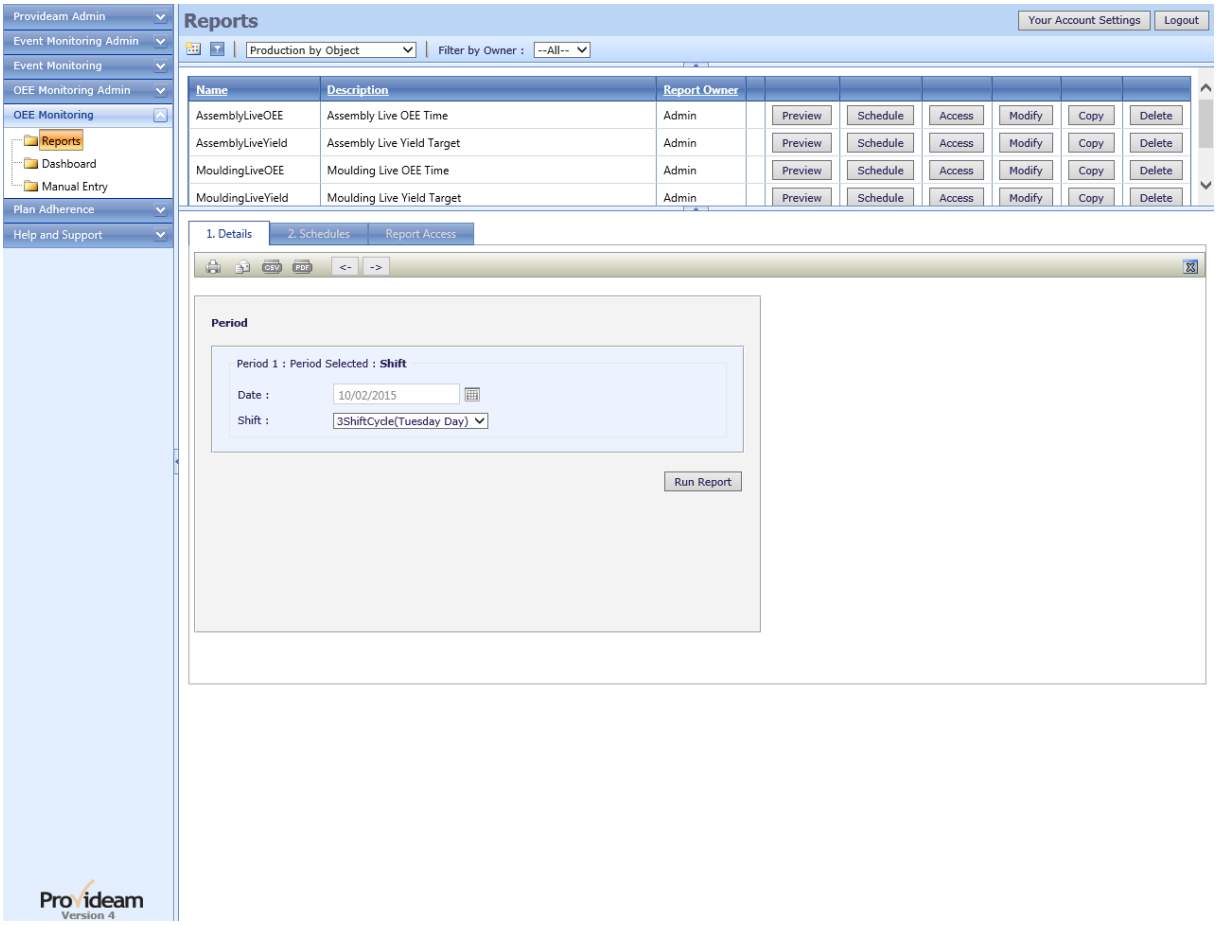


Fig. Production Object Report - Select Report Period Parameters

Step 18: Click **Run Report** to generate a report preview.

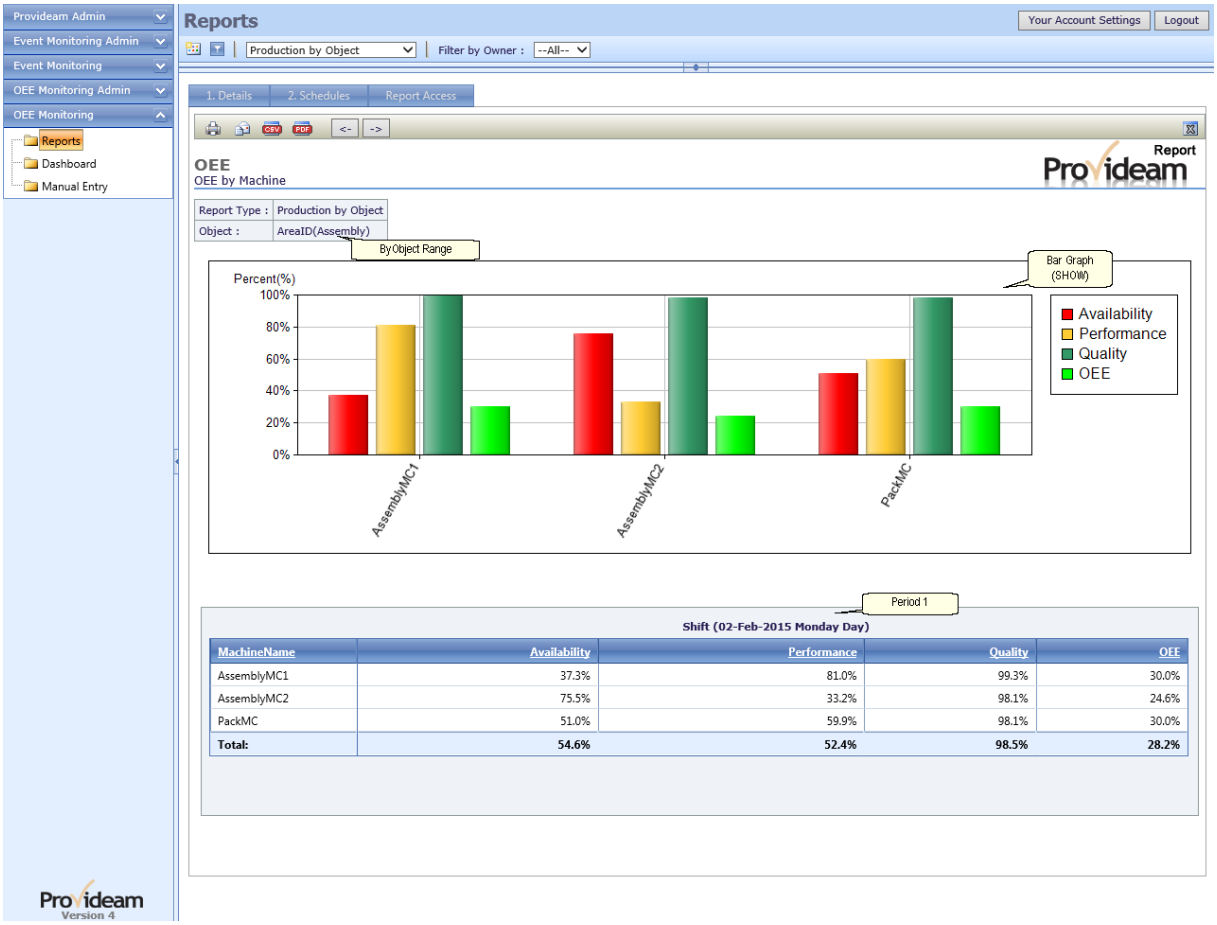


Fig. Production Object Report - Preview Shift Report

Example 2: Production Object Report with Multiple Periods

In Example 1 above we have generated a Shift report with one Period: Period 1. It is possible to compare up to 5 Periods on a Production Object Report. In this example we will compare the data for Shift 1 and Shift 2.

Step 1: Create a *Production Object* Report as before. This time check the **Advanced** checkbox on the first Report Wizard screen. Display only the GoodParts and DefectParts Functions.

Step 2: Click **Next** to move on to the Period selection.

Step 3: Click on the **Add new** button to add a new Period.

Step 4: Choose the *Shift* option from available Period options for Period 1.

Step 5: Click on the **Add new** button to add a new Period.

Step 6: Choose the *Shift* option from available Period options for Period 2.

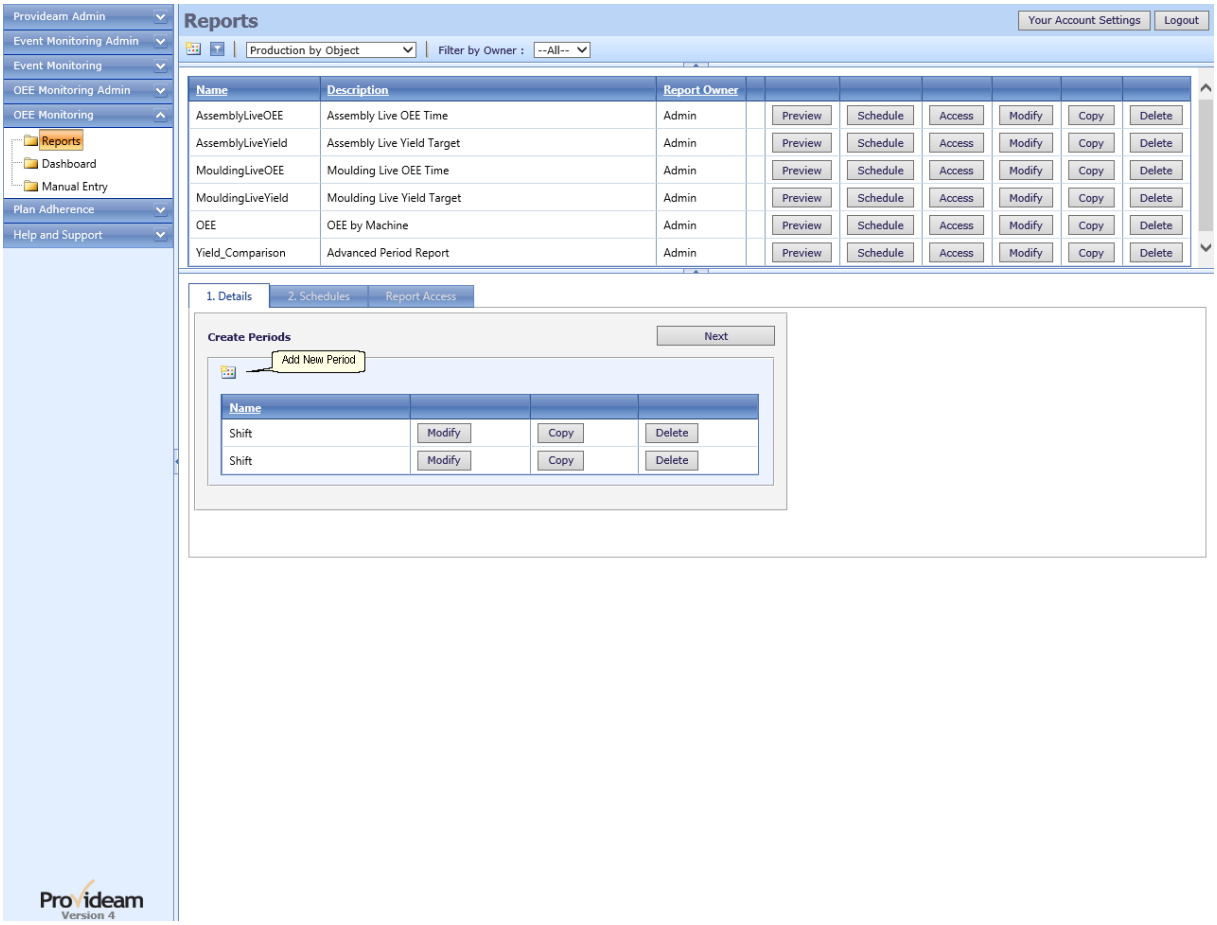


Fig. Production Trend Report - Multiple Period Definition

Step 7: Generate the report as before, this time with a Bar Graph and with Functions *Good Parts* and *Defect Parts*.

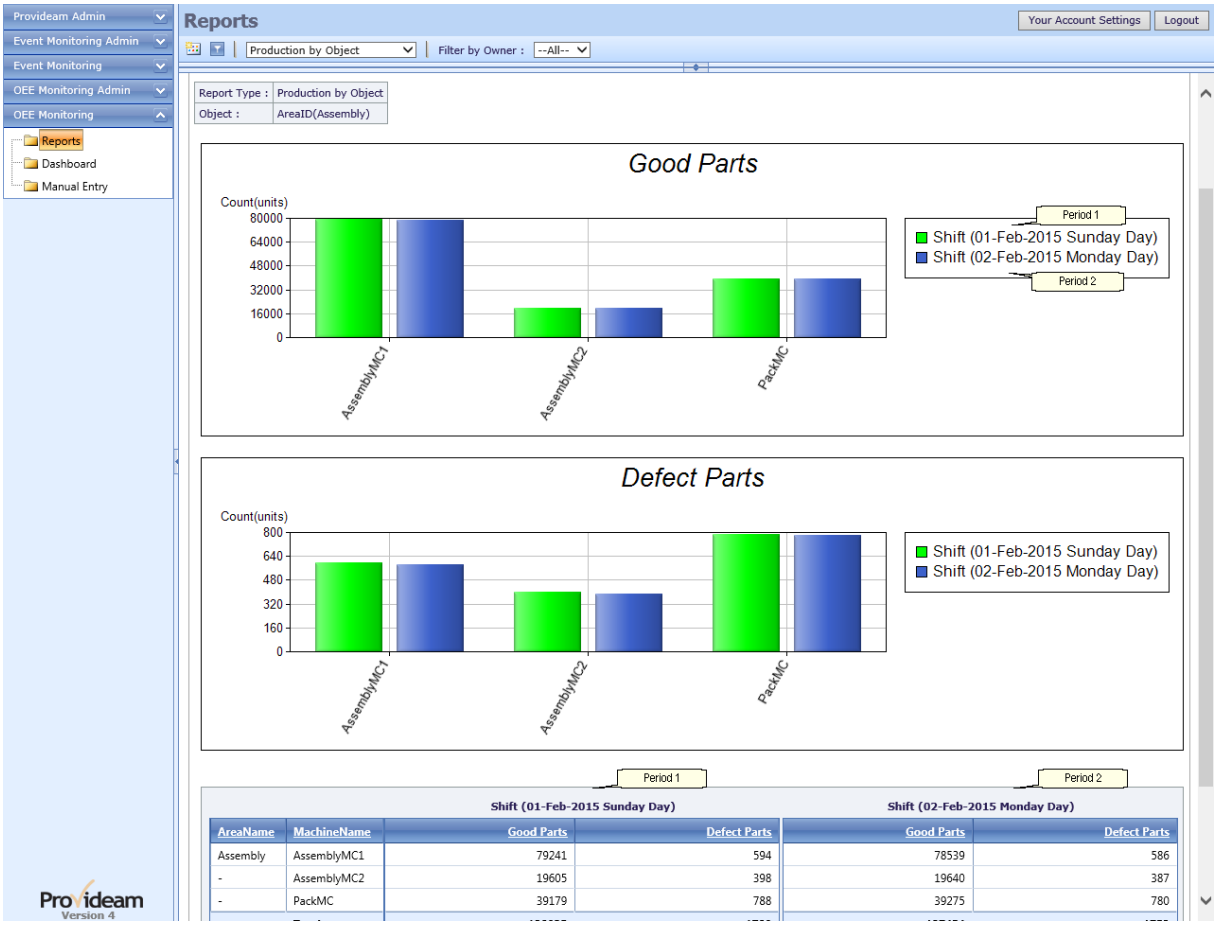


Fig. Production Trend Report - Preview Multiple Period Report

6.3.3 OEE Loss (Grouped by Object)

In this section we will demonstrate how to create an OEE Loss (Grouped by Object) Report.

Example 1: OEE Loss by Object Shift Report with Pie Chart

Step 1: Click on the 'New Report' icon

Step 2: Select the *OEE Loss (Group by Object)* option

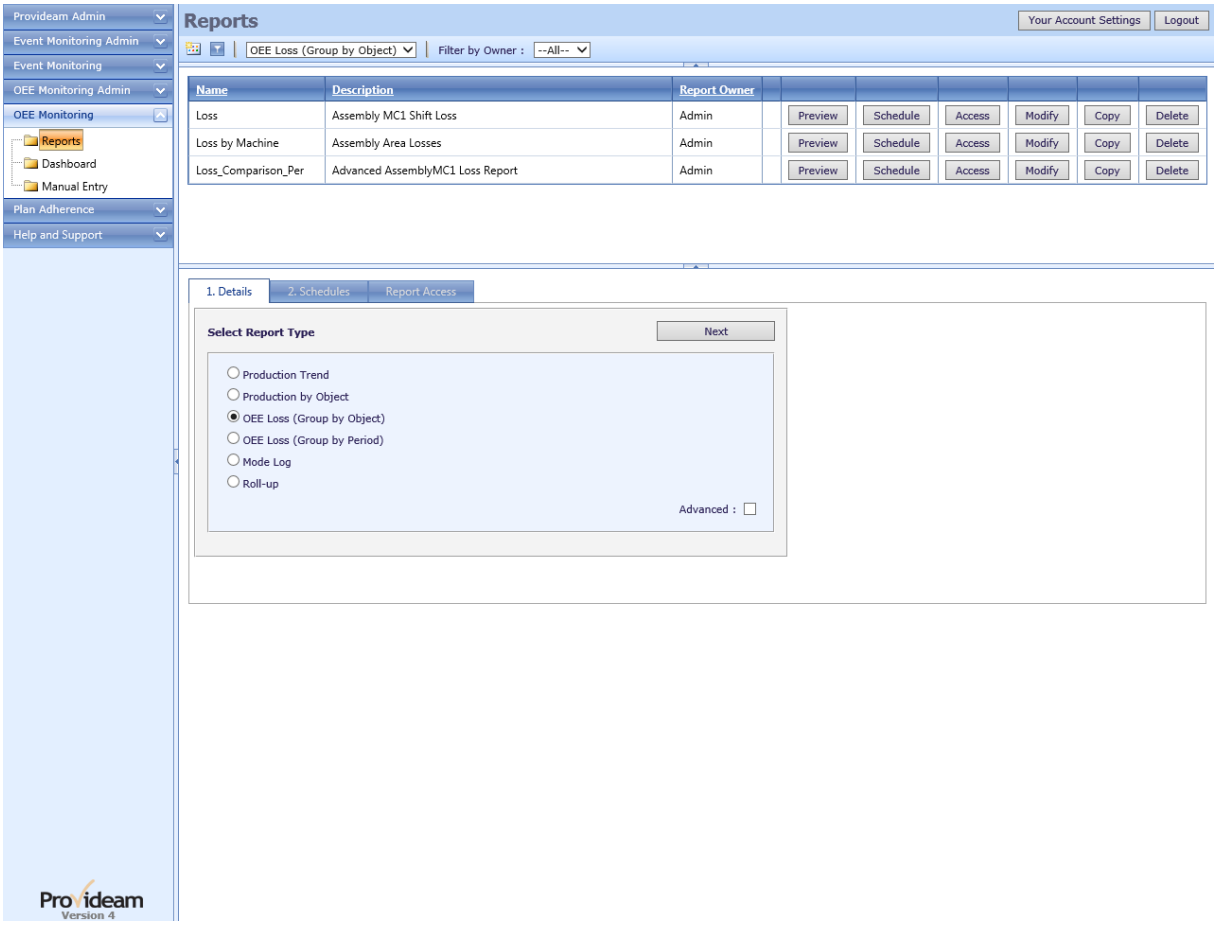


Fig. OEE Loss by Object Report - New OEE Loss Report

Step 3: Click **Next** to move on to Period selection.

Step 4: Select the **Shift** period option.

This sets the Period range over which your report will be generated. When running this report you will be asked to chose a specific Shift.

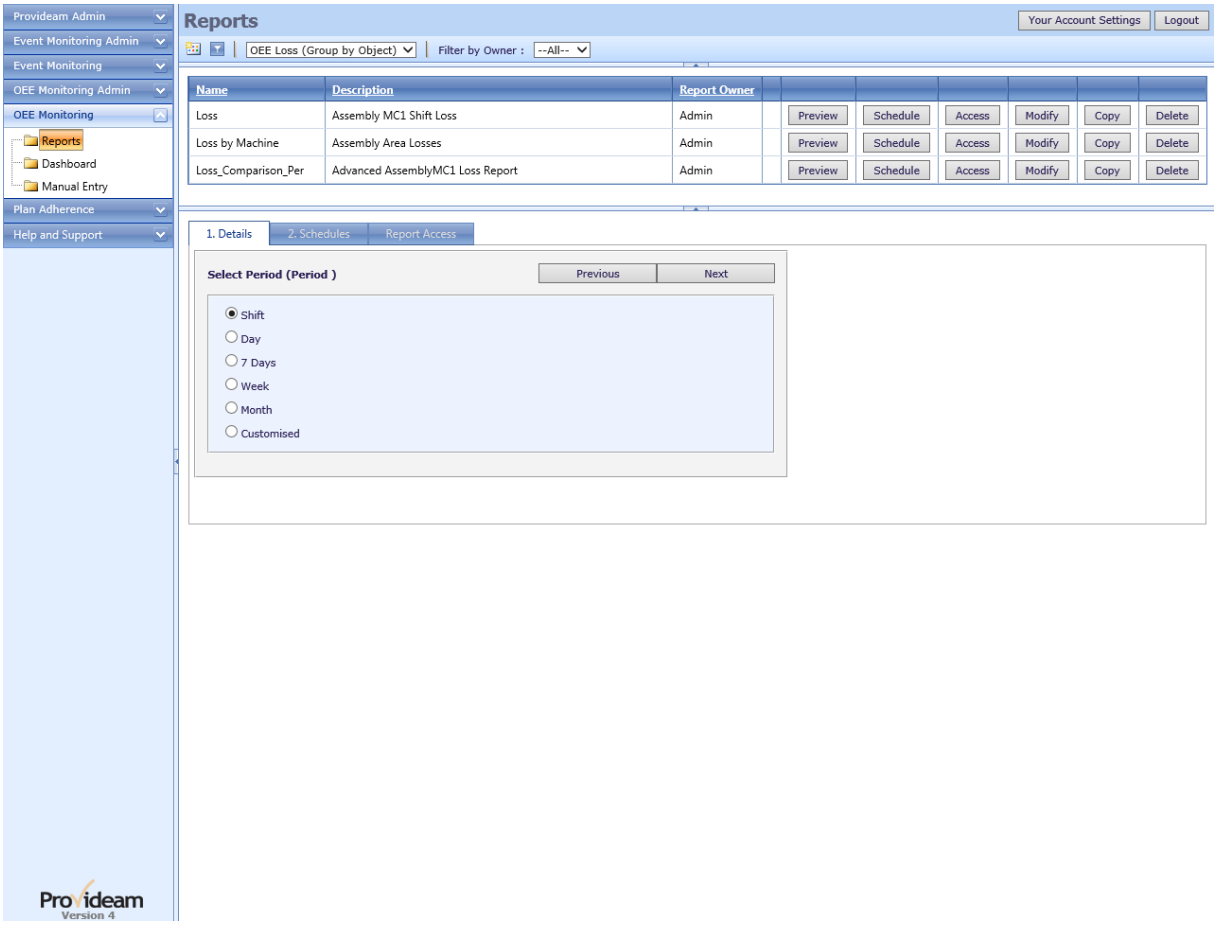


Fig. OEE Loss by Object Report - Select Period

Step 5: Click **Next** to move on to the Area/Machine (Object 1) selection.

Step 6: Select *AssemblyMC1* from the list of available Machine items.

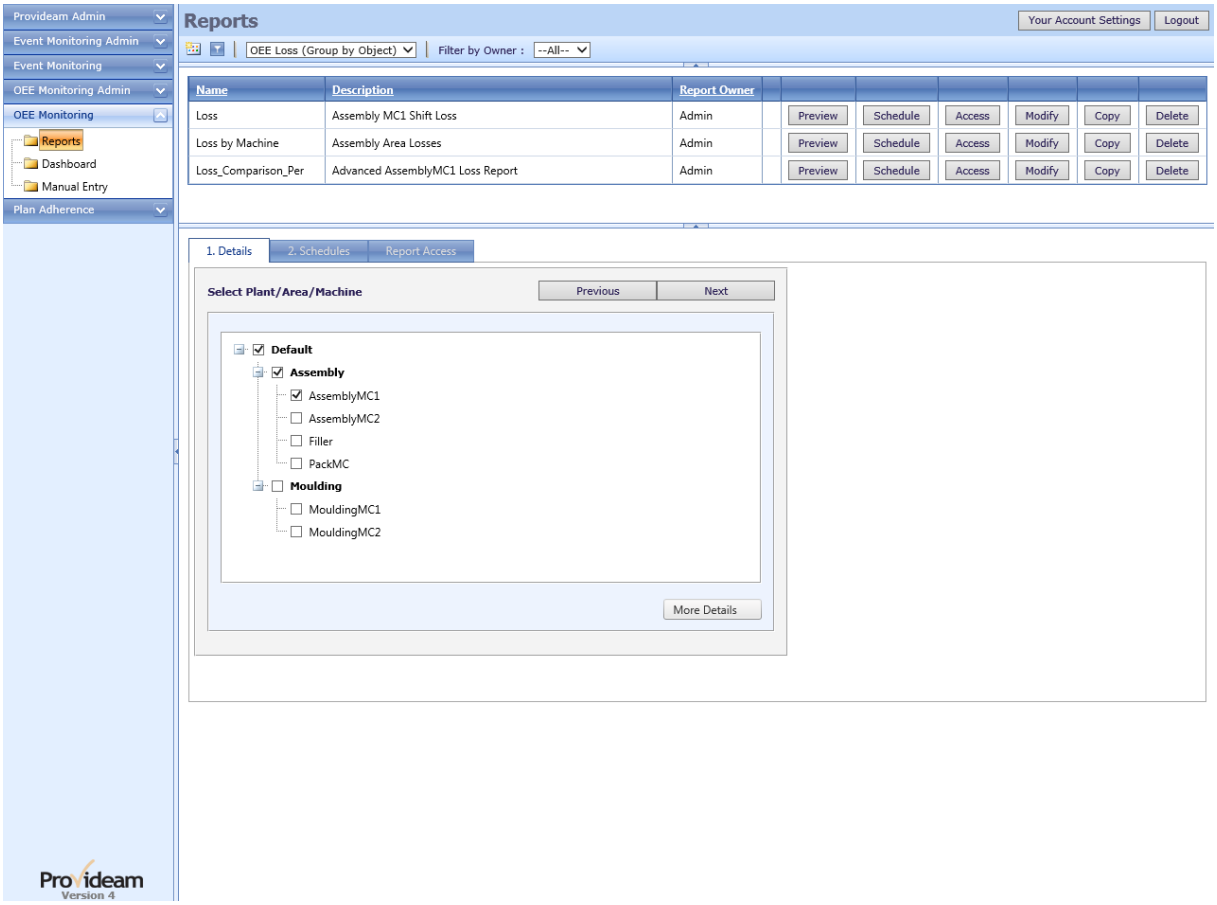


Fig. OEE Loss by Object Report - Select Object

Step 7: Click **Next** to move on to name the Object.

By default the Report Wizard enters the Object Description shown below. You may edit this if you wish.

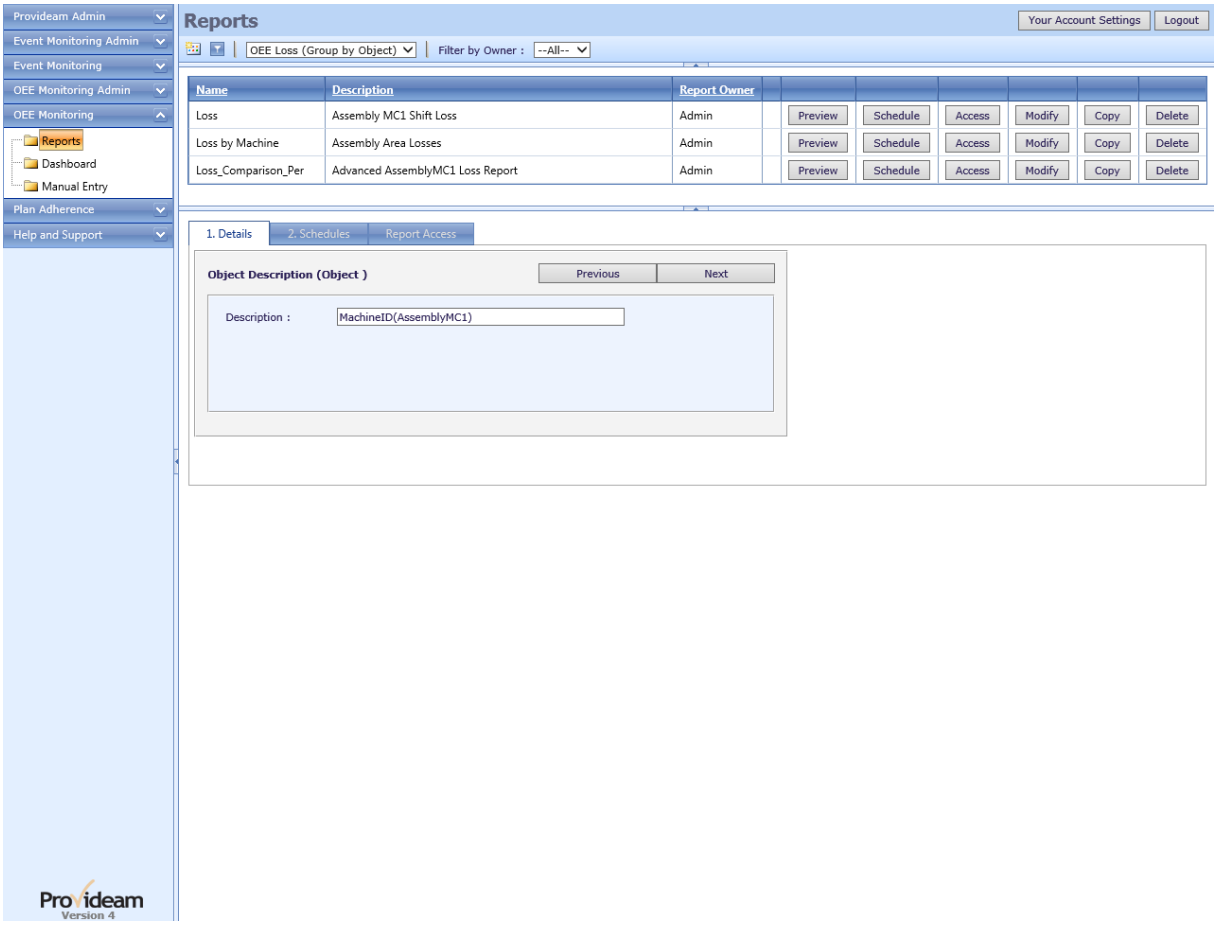


Fig. OEE Loss by Object Report - Edit Object Description

Step 8: Click **Next** to move on to on to the Loss selection.

Step 9: Choose *Level 1* Loss. This will, by default, select all items from the list of available Level 1 Loss items. This option results in all time, from OEE Time to Planned Downtime, being included in the Loss Report.

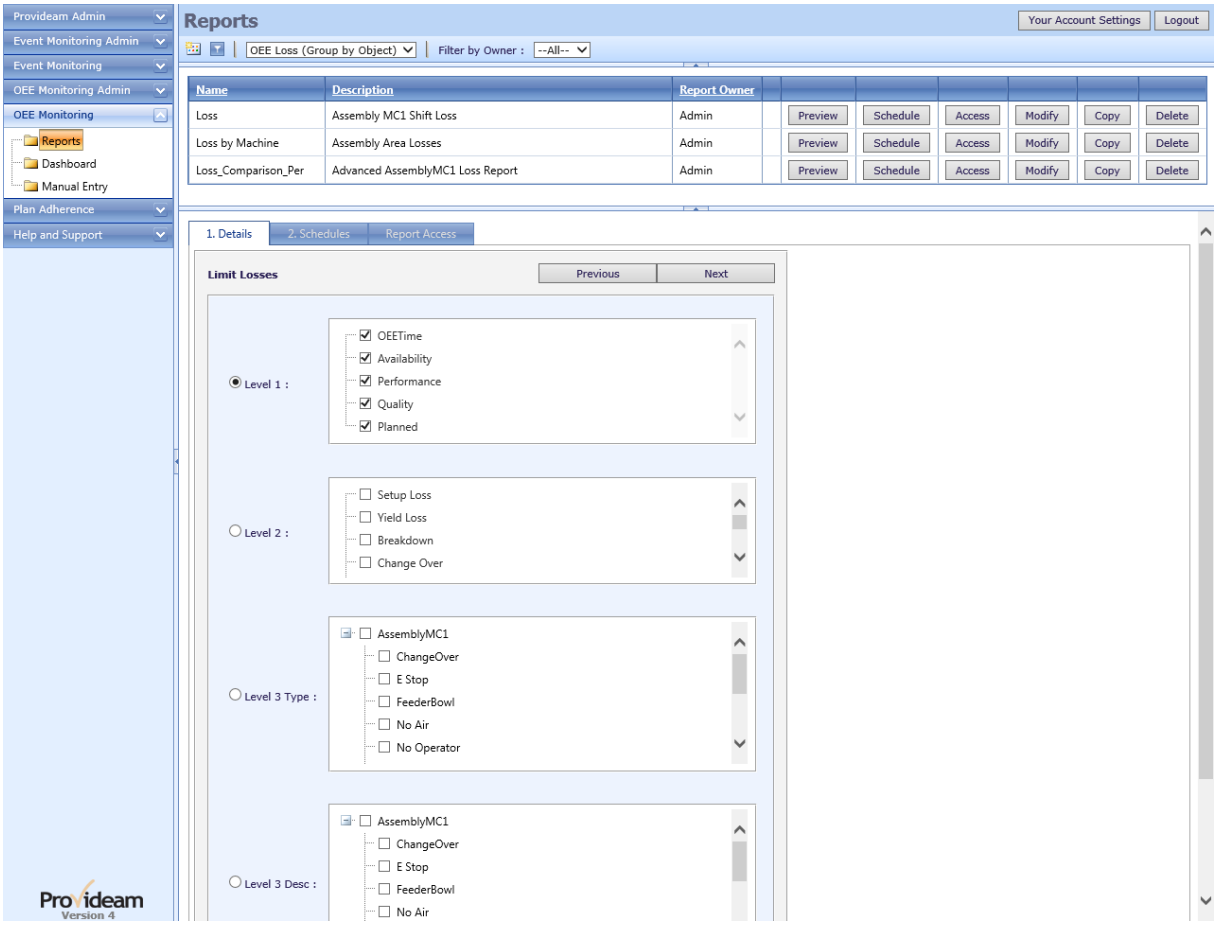


Fig. OEE Loss by Object Report - Select Loss

Step 10: Click **Next** to move on to on to the Fields selection.

Step 11: Select *OEELossLvl3Desc*. This results in a breakdown by OEE Loss Level 3 Description on the final report.

Note:

1. The order in which the Field columns occur in the **Selected Fields** lists determines how the data will be sorted in your report. The data will be sorted first by the first column and then by the next column and so on. To change the order simply click and hold on the icon of the relevant record and drag it to the appropriate position in the list.
2. To remove a Field from the **Selected Fields** list, drag it back to the **Available Fields** list.
3. To apply a background color to the Field column on the report, select the Field in the **Selected Fields** list, select the **Table Color** from the **Format** box and then click the **Apply Format** button.
4. Click the **Clear** button to reset formatting of the selected Field to default format.

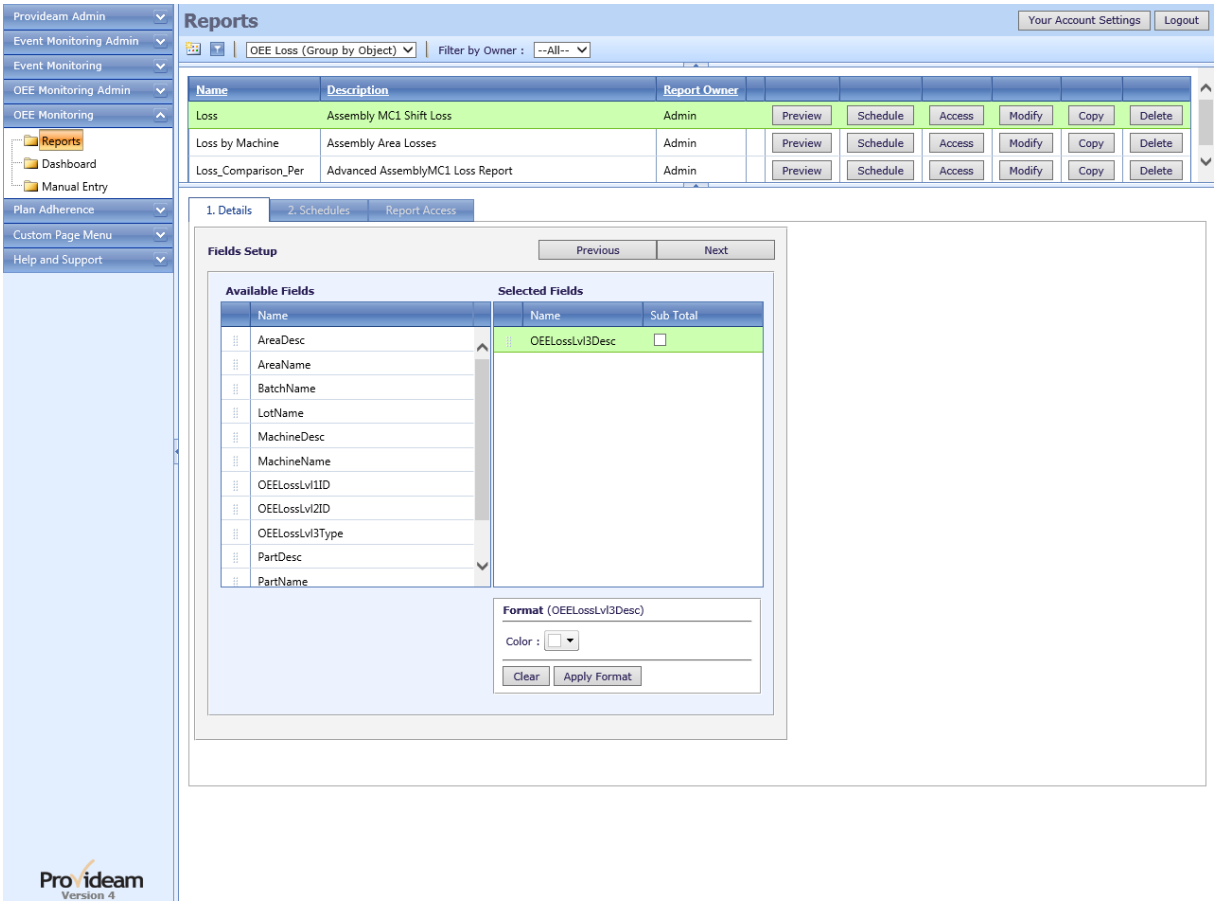


Fig. OEE Loss by Object Report - Select Fields

Step 12: Click **Next** to move on to Functions selection.

Step 13: Select *Time* from the list of available Loss Function items.

Step 14: Select *PlannedOpT, UpTime, Downtime, Good Parts* and *Defect Parts* from the list of available Production Function items.

Notes:

1. The order in which the Functions columns occur in the **Selected Functions** lists determines the order in which the Functions will appear in your report. To change the order simply click and hold on the ⣿ icon of the relevant record and drag it to the appropriate position in the list.
2. To remove a Function from the **Selected Loss Functions** list, simply drag it back to the **Available Loss Functions** list. The same applies to Production Functions.
3. To apply formatting to the a Function, select the Function in the **Selected Loss Functions** / **Selected Functions** list, select the format options you require from the **Format** box and then click the **Apply Format** button.
4. Click the **Clear** button to reset formatting of the selected Function to default format.

5. See Parameterized Functions section of this chapter for details on adding Parameterized Functions.
6. See Customized Functions section of this chapter for details on adding Customized Functions.

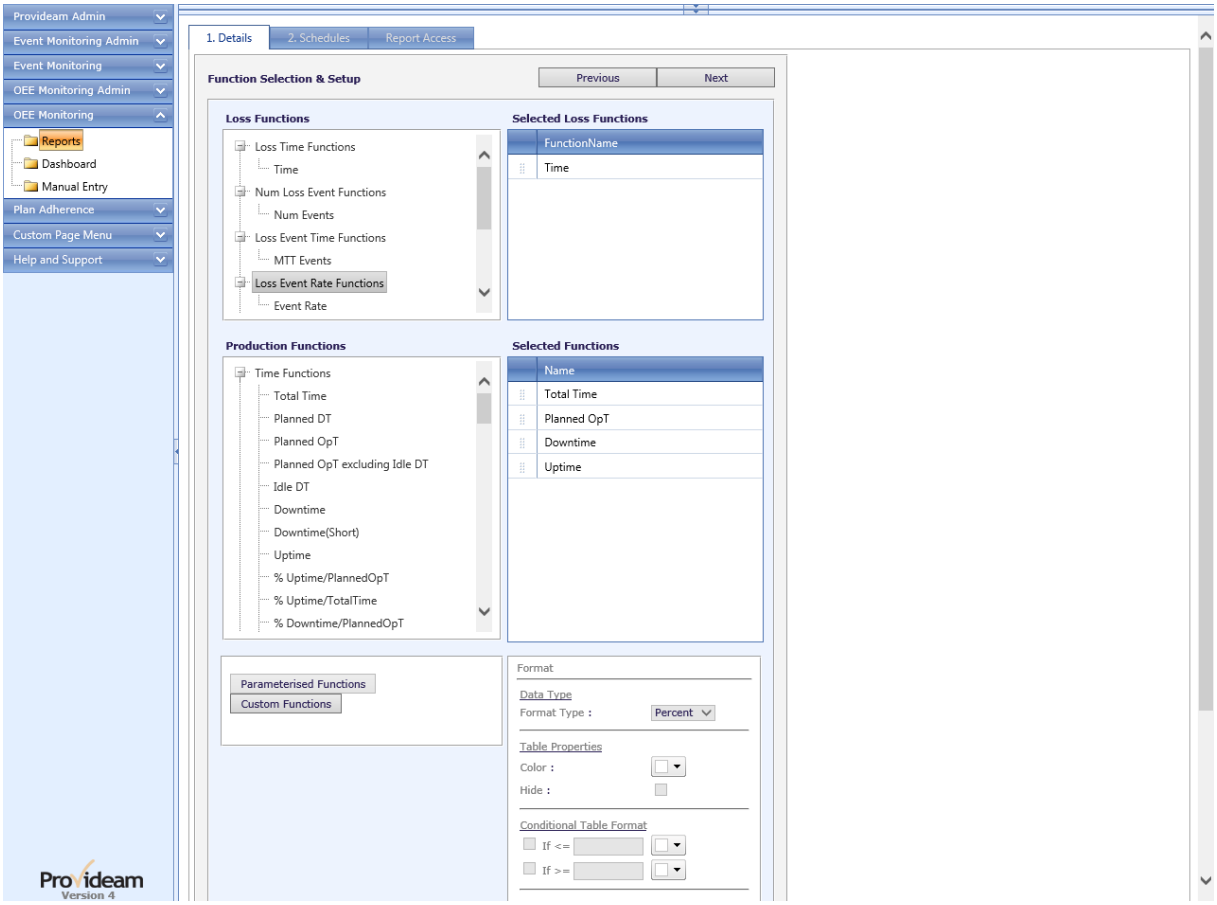


Fig. OEE Loss by Object Report - Select Functions

Step 15: Click **Next** to move on to the final screen in the Report Wizard.

Step 16: Select the **Pie Chart** Graph option.

Step 17: Check the **Show** Graph option.

Step 18: Check the **Show Grand Totals** checkbox.

Step 19:Click **Run Report** to run this Report.

Notes;

1. To include a grand-total on the report, check the **Show Grand Totals** checkbox.

2. You may save the report definition as a Report Template at this stage. Report Templates can be shared with other users and also scheduled for automatic delivery by email.

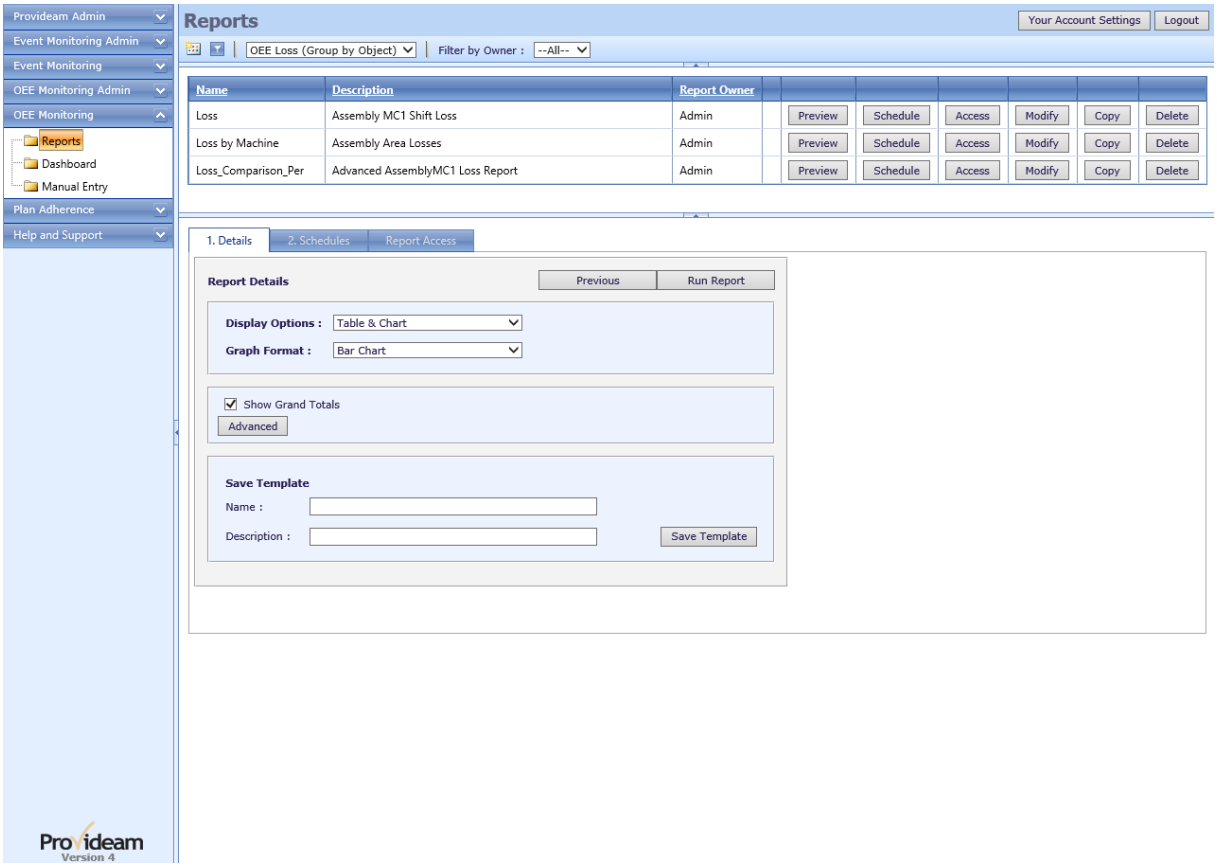


Fig. OEE Loss by Object Report - Select Graph Style

Note:

The Advanced Options includes the option to limit the number of losses displayed. This option, **Limit to the Top X Losses** allows the user to limit the number of losses displayed on the Loss Report to the top X losses. In this case the parameter is set to 0 in which case all losses are displayed.

Step 20: Select a **Date** and **Shift**.

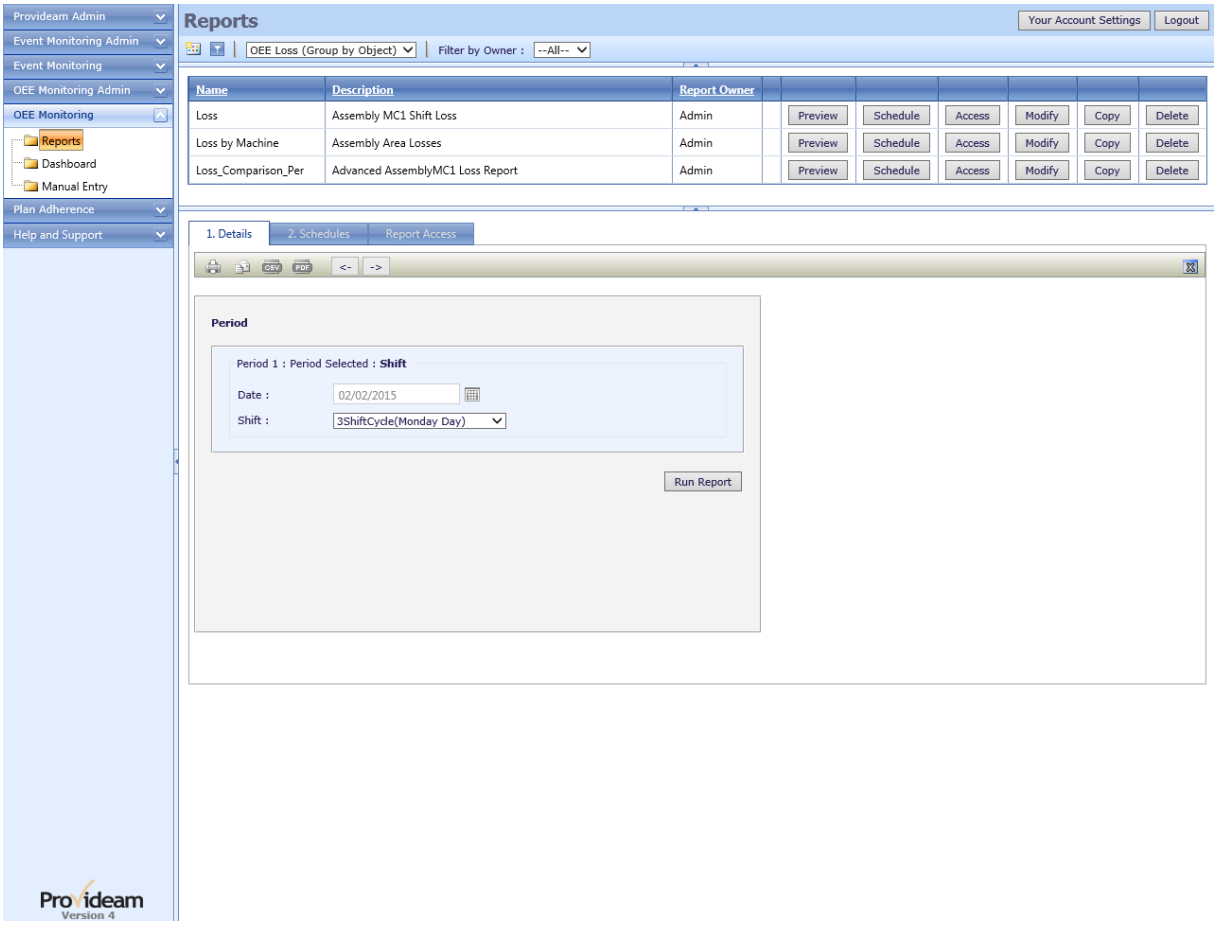


Fig. OEE Loss by Object Report - Select Report Period Parameters

Step 21: Click **Run Report** to generate a report preview.

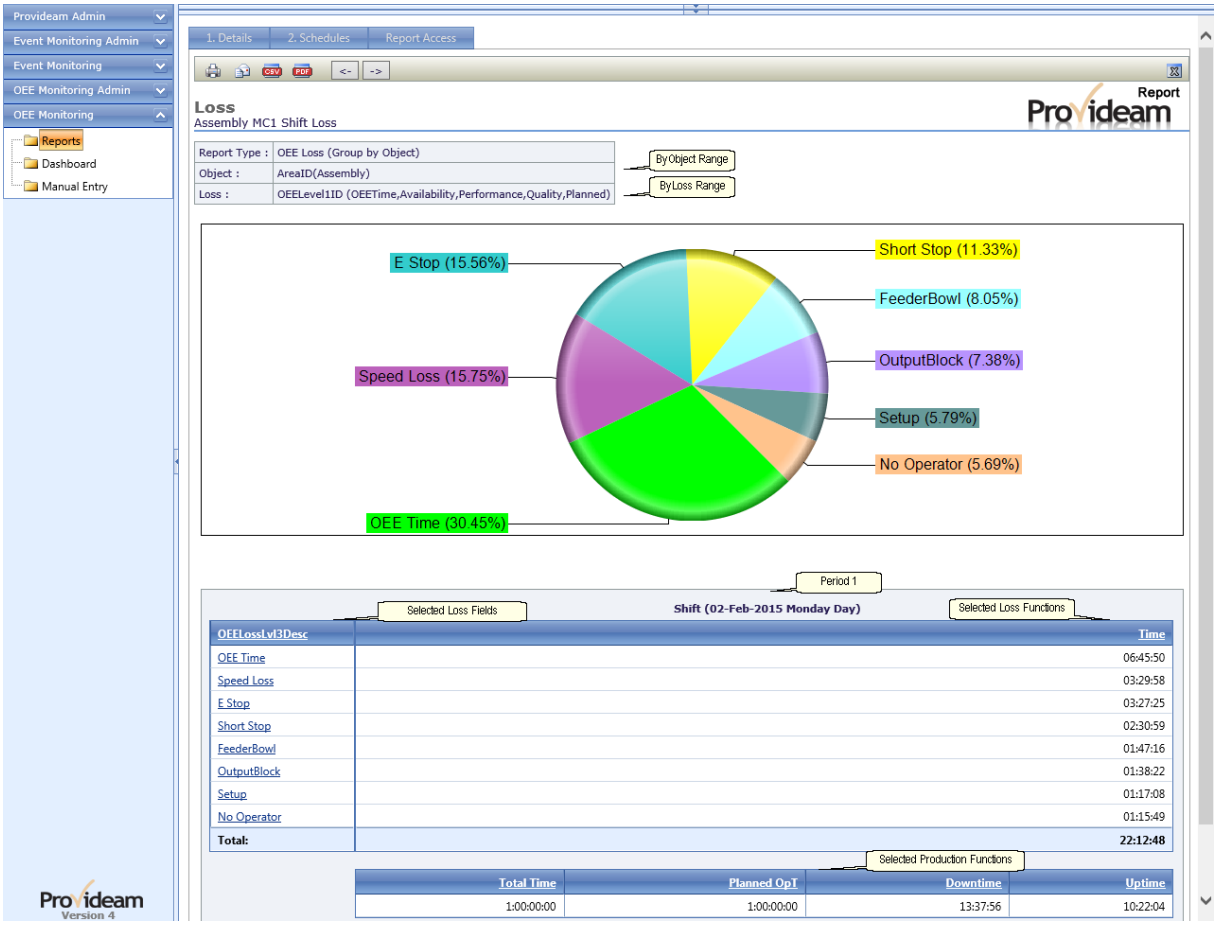


Fig. OEE Loss by Object Report - Preview Shift Report, Example 1

Example 2: OEE Loss by Object Report with an Object Field

In Example 1 above we have generated a Shift report with one Loss Field, Loss Lvl3 Desc. It is possible to include one Object Field (typically MachineName). This results in the Loss Time being grouped first by MachineName and then by OEE Loss Level 3 Description. In this example we will generate report to show the OEE Level 3 Description Losses by Machine Name.

Step 1: Create an *OEE Loss (Grouped by Object)* Report as before.

Step 2: This time in the Machine Object selection select all the *Assembly* Area Machines.

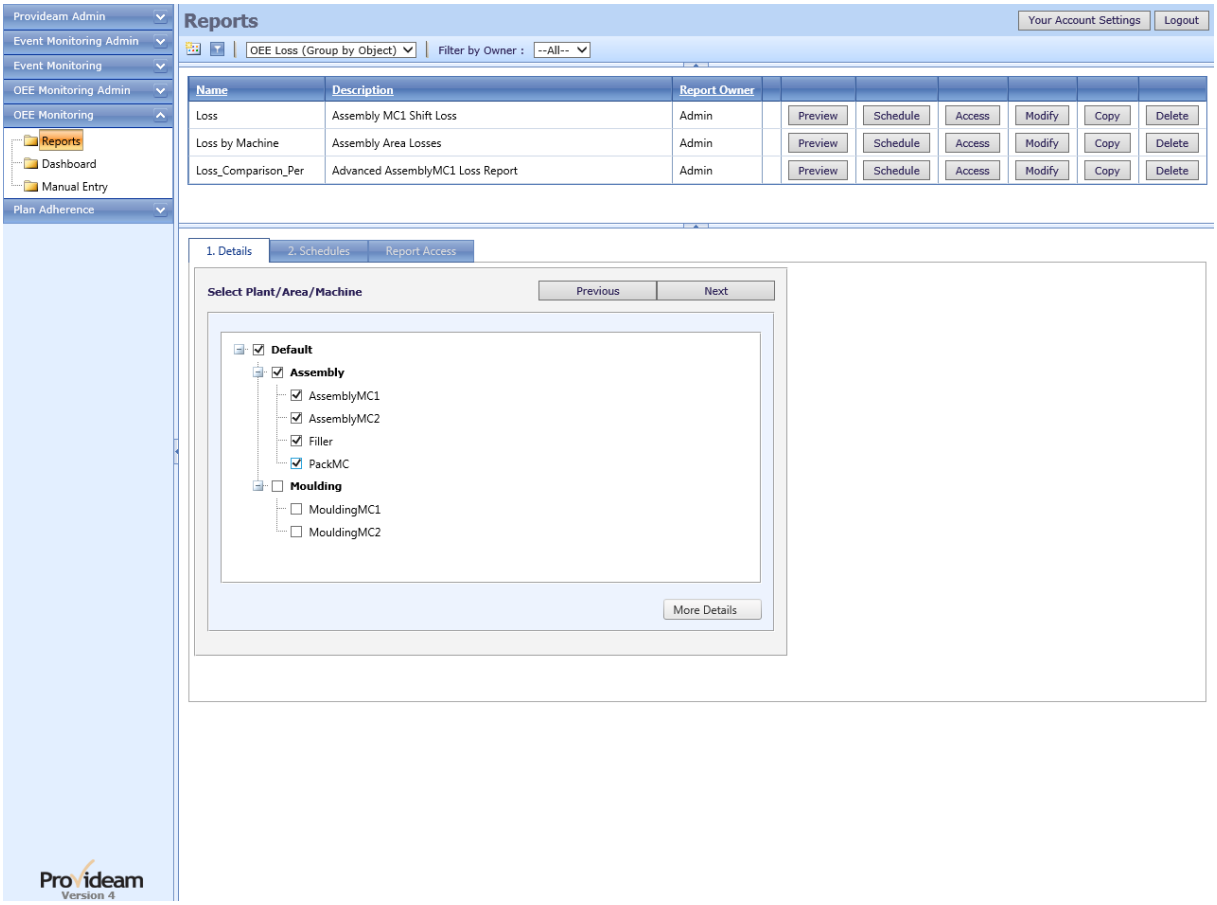


Fig. OEE Loss by Object Report - Select Object Parameters, Example 2

Step 3: Select *MachineName* & *OEELossLvl3Desc* from the list of available Field items. To select a Field click and hold the record grabber icon ⠿ of the required Field in the **Available Fields** list and drag it across to the **Selected Fields** list.

Step 4: Check the **Sub Total** checkbox for the *MachineName* Field. This will create a sub-total row on the report after each Machine.

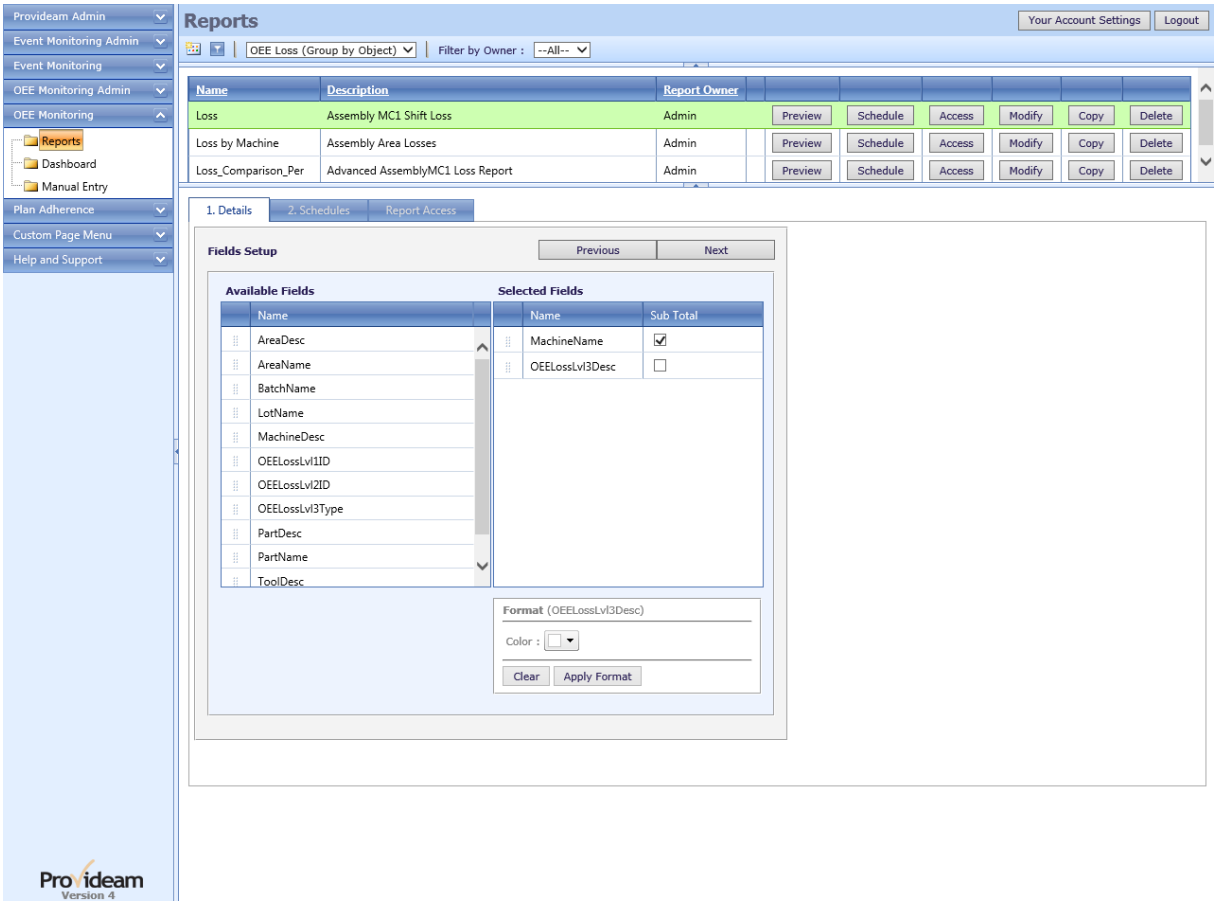


Fig. OEE Loss by Object Report - Select Field Parameters, Example 2

Step 5: Generate the Report as before, this time with out a graph.

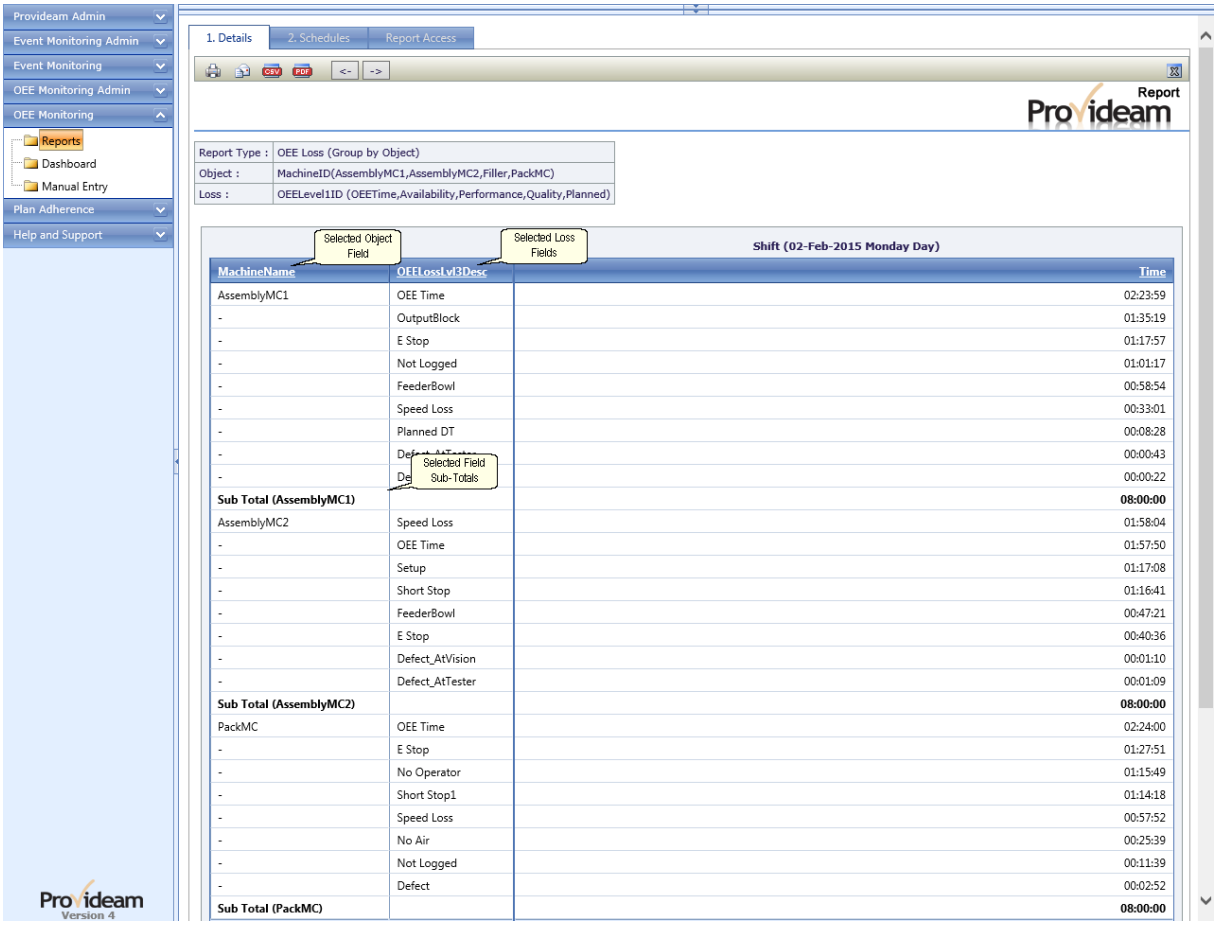


Fig. OEE Loss by Object Report - Preview Report with Object Field, Example 2

Example 3: OEE Loss by Object Report with Multiple Periods

In Example 1 above we have generated a Shift report with one Period: Period 1. It is possible to compare up to 5 Periods on a OEE Loss by Object Report. In this example we will compare the data for Shift and Day.

Step 1: Create a *OEE Loss (Grouped by Object)* Report as before. This time check the **Advanced** checkbox on the first Report Wizard screen.

Step 2: Click **Next** to move on to the Period selection.

Step 3: Click on the **Add new** button to add a new Period.

Step 4: Choose the *Shift* option from available Period options for Period 1.

Step 5: Click on the **Add new** button to add a new Period.

Step 6: Choose the *Day* option from available Period options for Period 2.

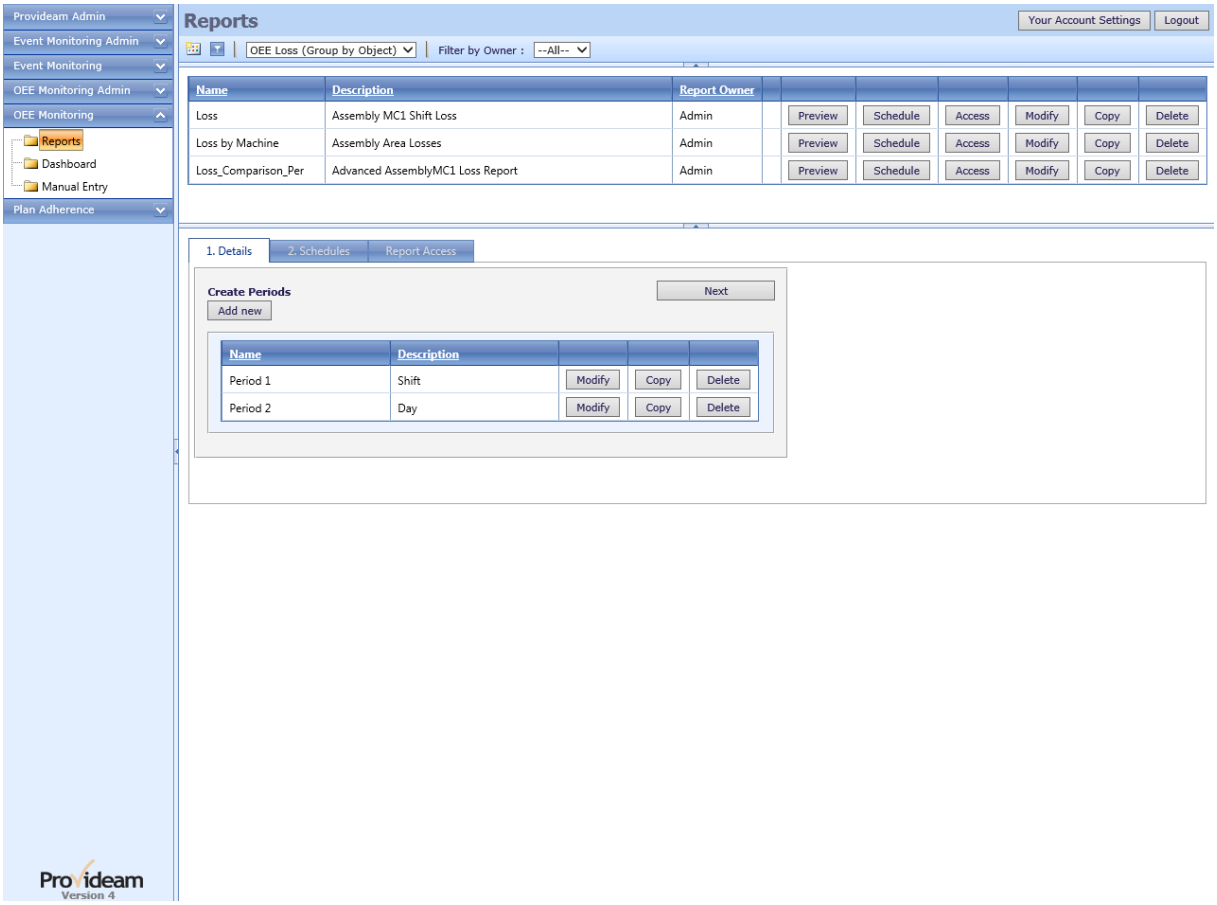


Fig. OEE Loss by Object Report - Multiple Period Definition

Step 7: Generate the report as before, this time with a Graph.

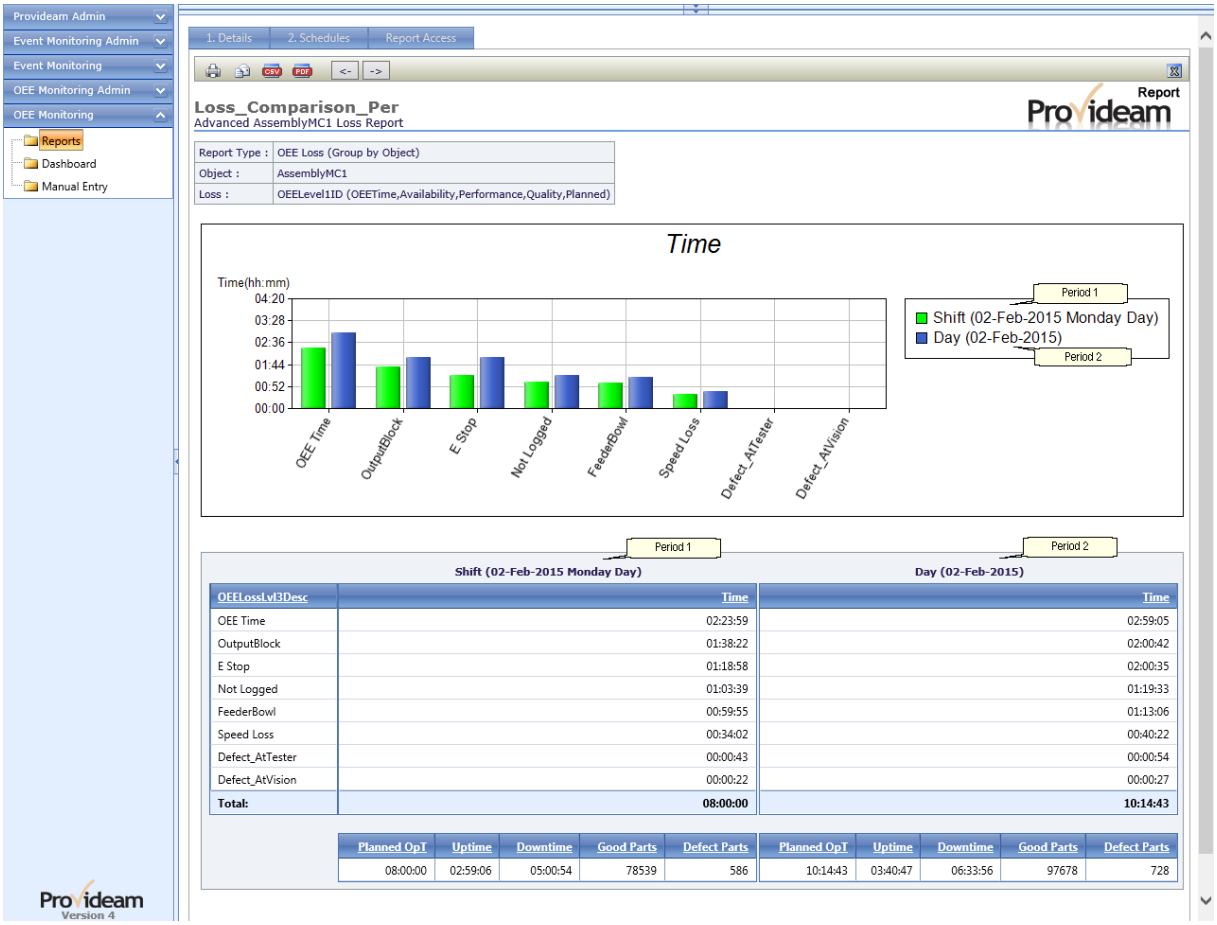


Fig. OEE Loss by Object Report - Preview Report with Multiple Periods, Example 3

6.3.4 OEE Loss (Grouped by Period)

In this section we will demonstrate how to create an OEE Loss (Grouped by Period) Report.

Example 1: OEE Loss by Period Shift Report with Pie Chart

This report is identical to example 1 in the previous, OEE Loss by Object Report, section.

Example 2: OEE Loss by Period Shift Report with a Period Field

The OEE Loss by Period version of Example 2 in the previous section results in a report which lists the OEE Loss grouped by a Period. For example if you selected the Period Day by Shift you would get a report which groups OEE Loss for a Day grouped by Shift.

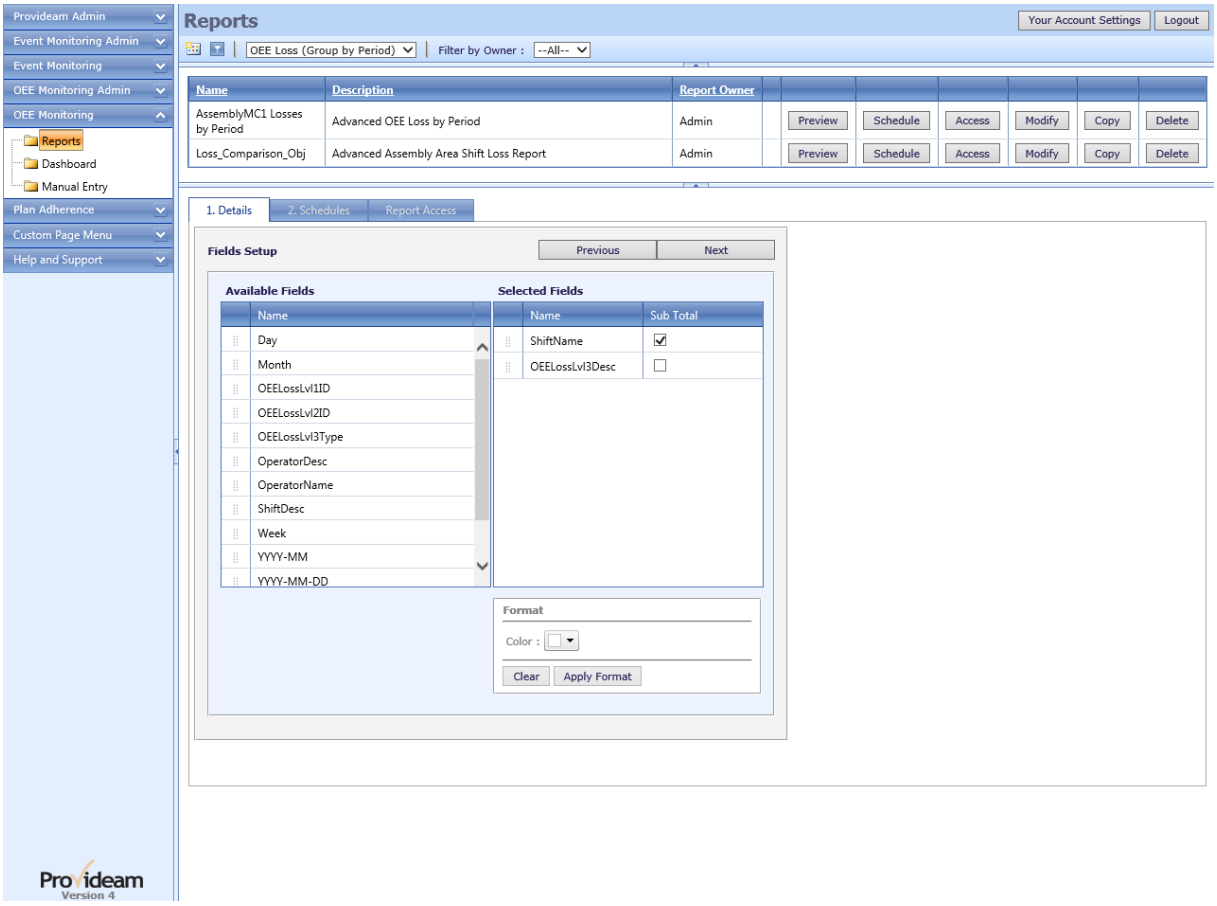


Fig. OEE Loss by Period Report - Select Period Field

The report will look like the example in the figure below.

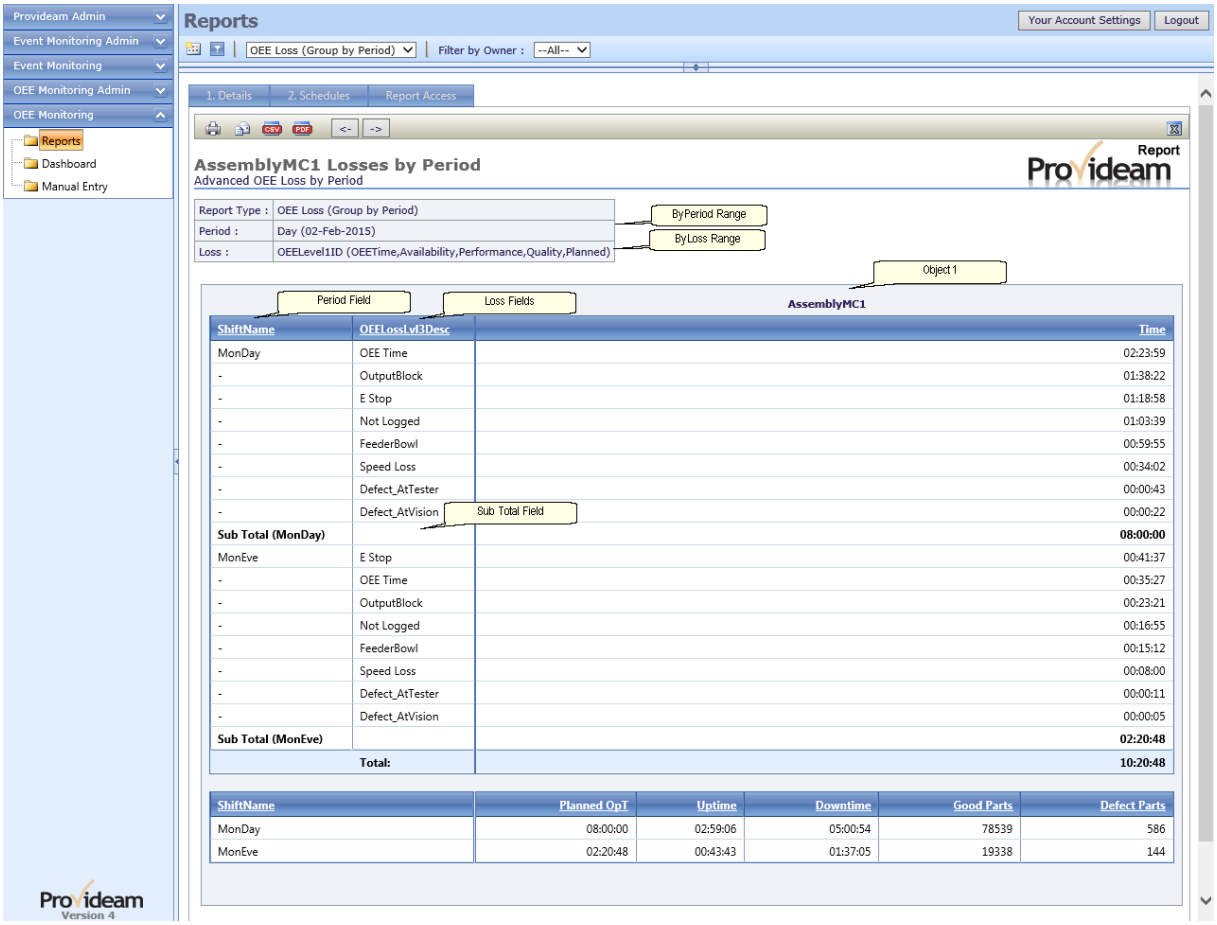


Fig. OEE Loss by Period Report - Preview Report, Example 2

Example 3: OEE Loss by Period Report with Multiple Objects

In Example 1 above we have generated a Shift report with one Object: Object 1. It is possible to compare upto 5 Objects on a OEE Loss by Period Report. In this example we will compare the data for AssemblyMC1 and AssemblyMC2.

Step 1: Create a *OEE Loss (Grouped by Period)* Report as before. This time check the **Advanced** checkbox on the first Report Wizard screen.

Step 2: Click **Next** to move on to the Object selection.

Step 3: Click on the **Add new** button to add a new Object.

Step 4: Choose the *AssemblyMC1* option from available Machine options for Object 1.

Step 5: Save Object 1 with the Object Description 'AssemblyMC1'

Step 6: Click on the **Add new** button to add a new Object.

Step 7: Choose the *AssemblyMC2* option from available Machine options for Object 2.

Step 8: Save Object 2 with the Object Description 'AssemblyMC2'

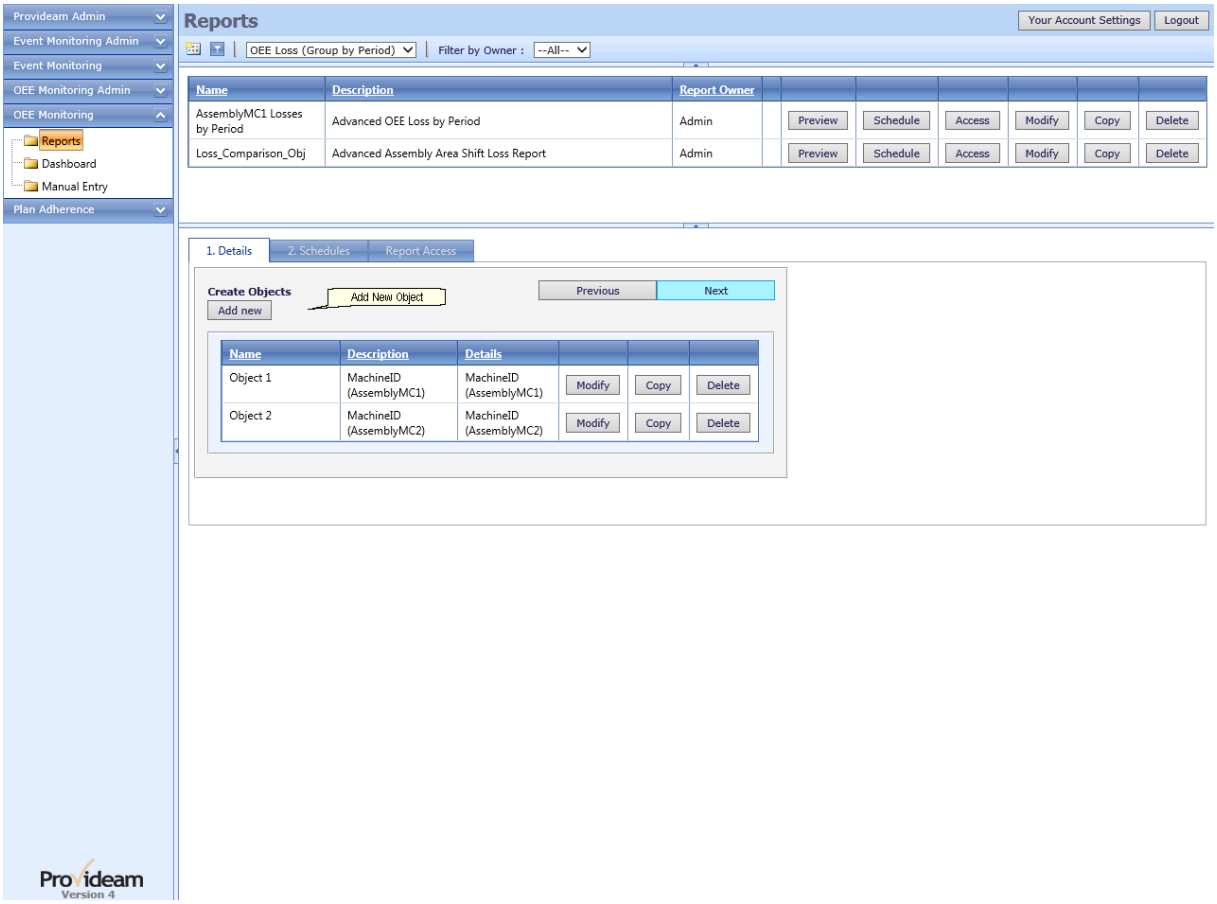


Fig. OEE Loss by Period Report - Multiple Objects Definition

Step 9: Generate the report as before, this time with a Bar Graph and with Functions *Good Parts* and *Defect Parts*.

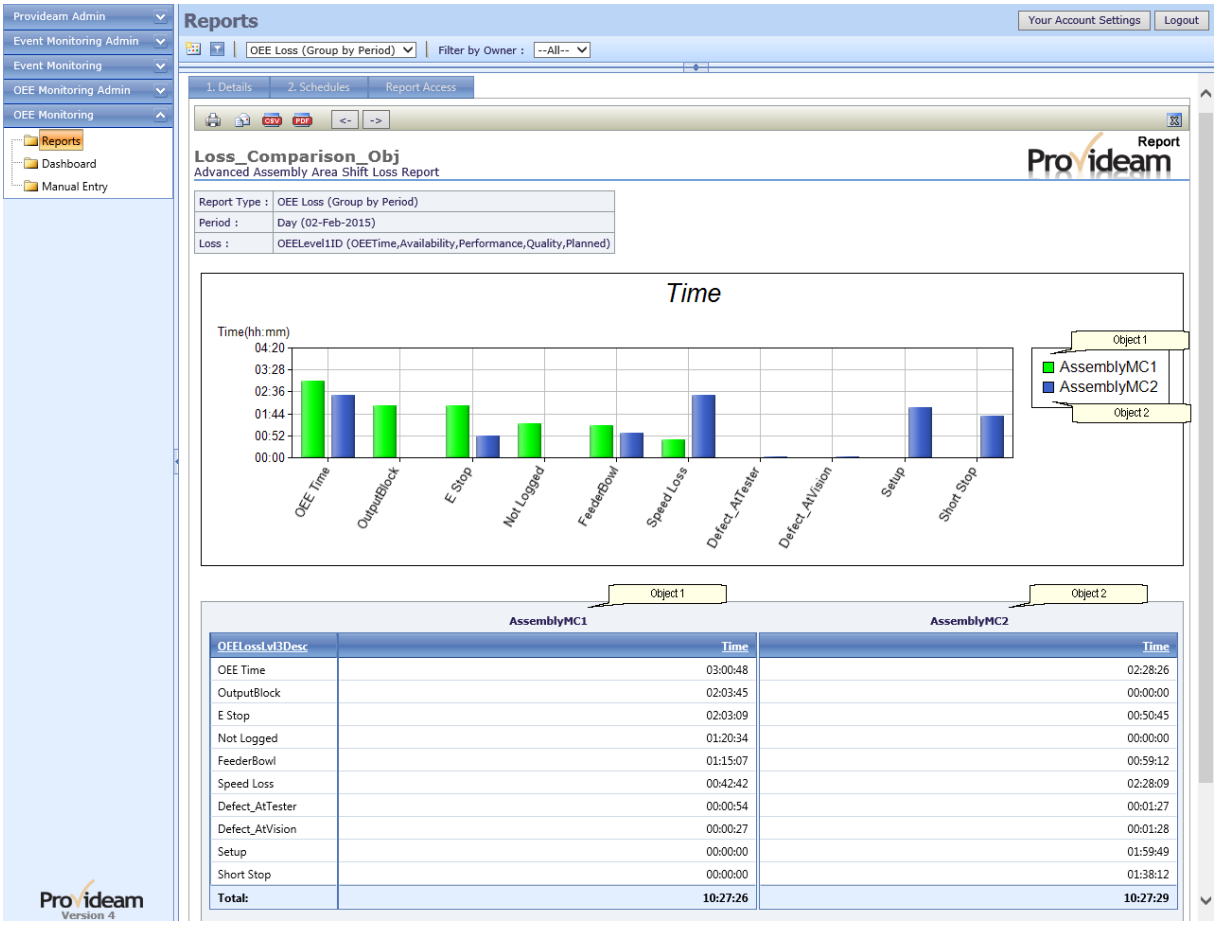


Fig. OEE Loss by Period Report - Preview Report with Multiple Objects, Example 3

6.3.5 Mode Log

In this section we will demonstrate how to create a Mode Log Report.

Example 1: Mode Log Report

Step 1: Click on the 'New Report' icon

Step 2: Select the *Mode Log* option

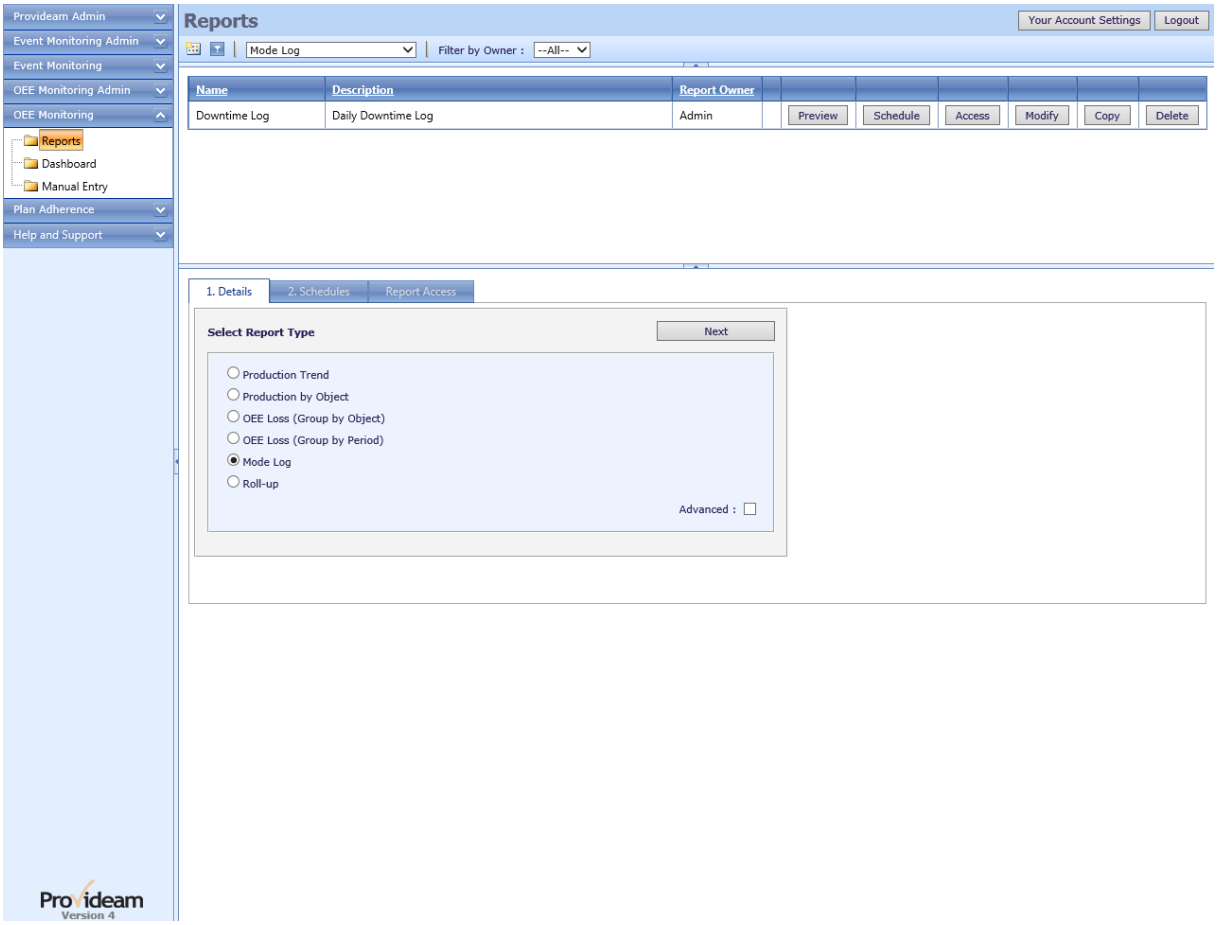


Fig. Mode Log Report - New Mode Log Report

Step 3: Click **Next** to move on to Period selection.

Step 4: Select the **Day** period option.

This sets the Period range over which your report will be generated. When running this report you will be asked to chose a specific Day.

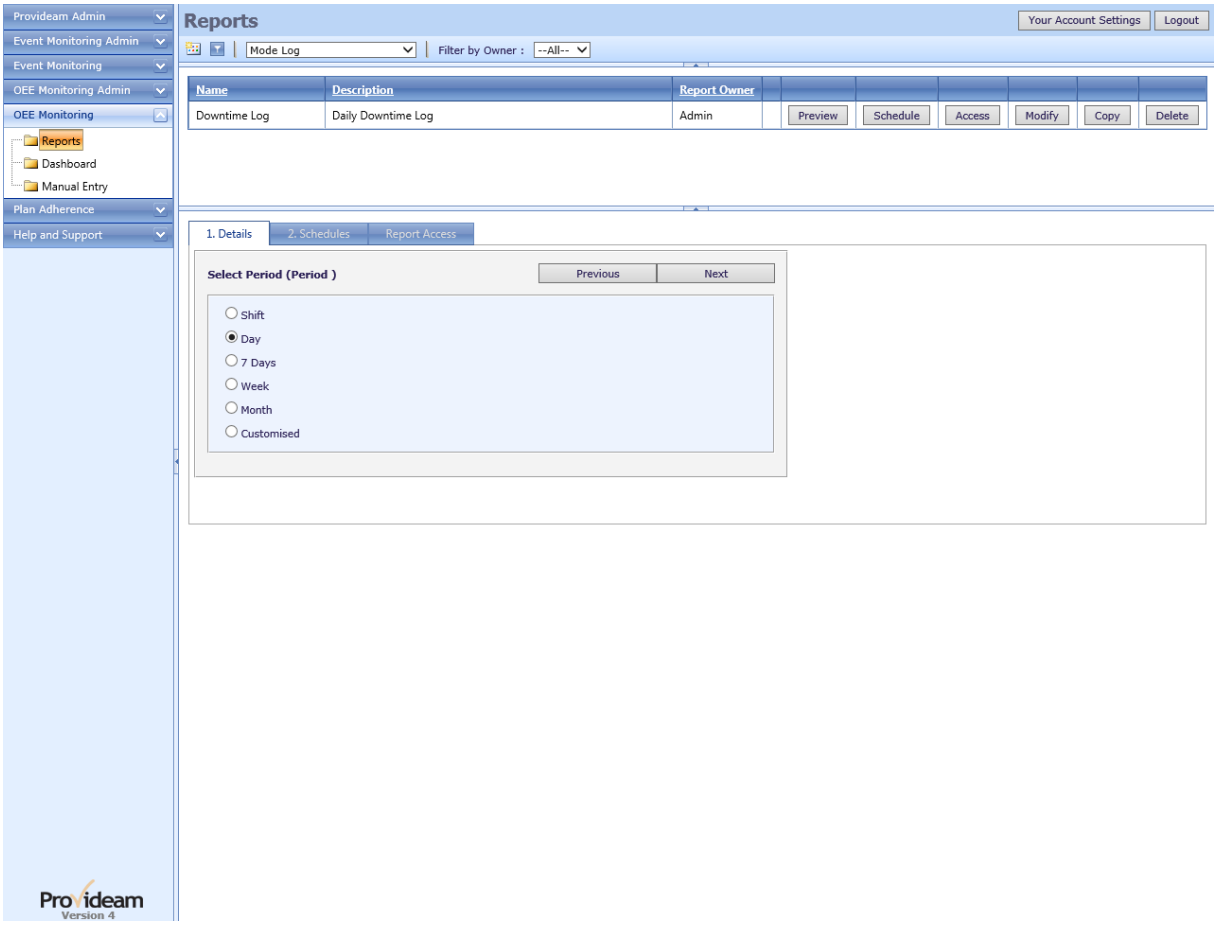


Fig. Mode Log Report - Select Period

Step 5: Click **Next** to move on to the Object selection.

Step 6: Select *AssemblyMC1* from the list of available Machine items.

This sets the range of Objects over which your report will be generated.

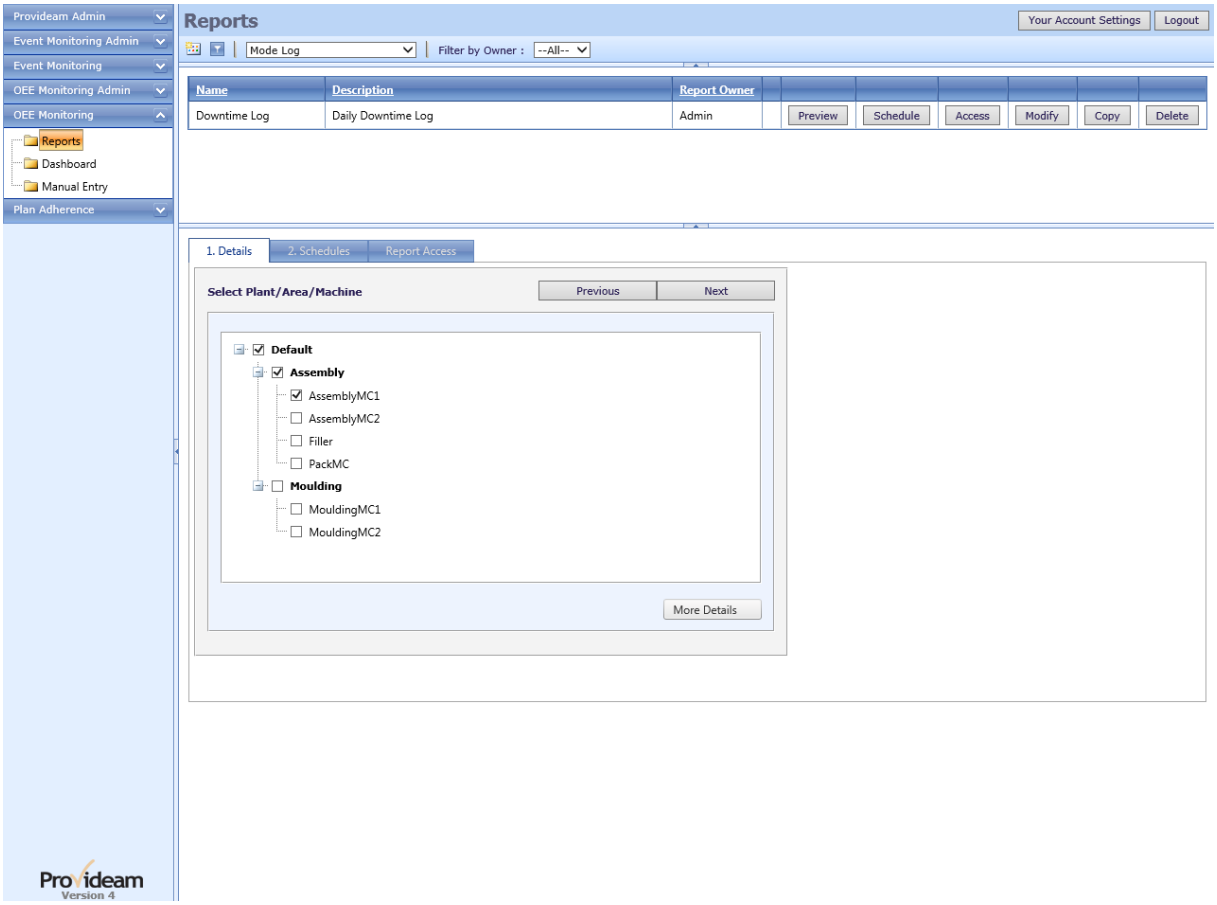


Fig. Mode Log Report - Select Object

Step 7: Click **More Details** to select additional Object details.

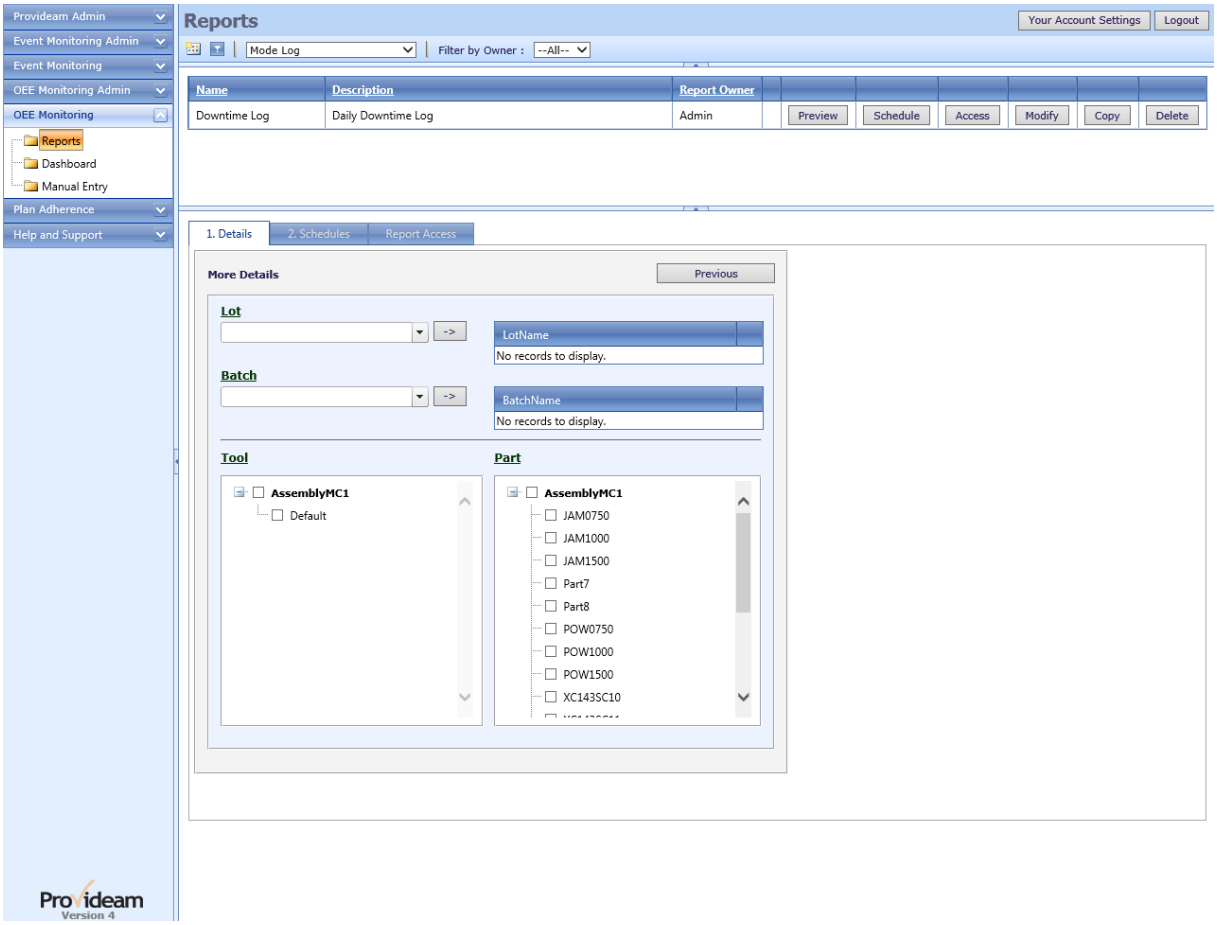


Fig. Mode Log Report - Select Additional Object Details

In this example we will not select any other details. The Object selection defines the object on which the report data will be generated. In this case it's all data for AssemblyMC1.

Step 8: Click **Previous** to return to the previous step and then **Next** to move on to name the Object.

By default the Report Wizard enters the Object Description shown below. You may edit this if you wish.

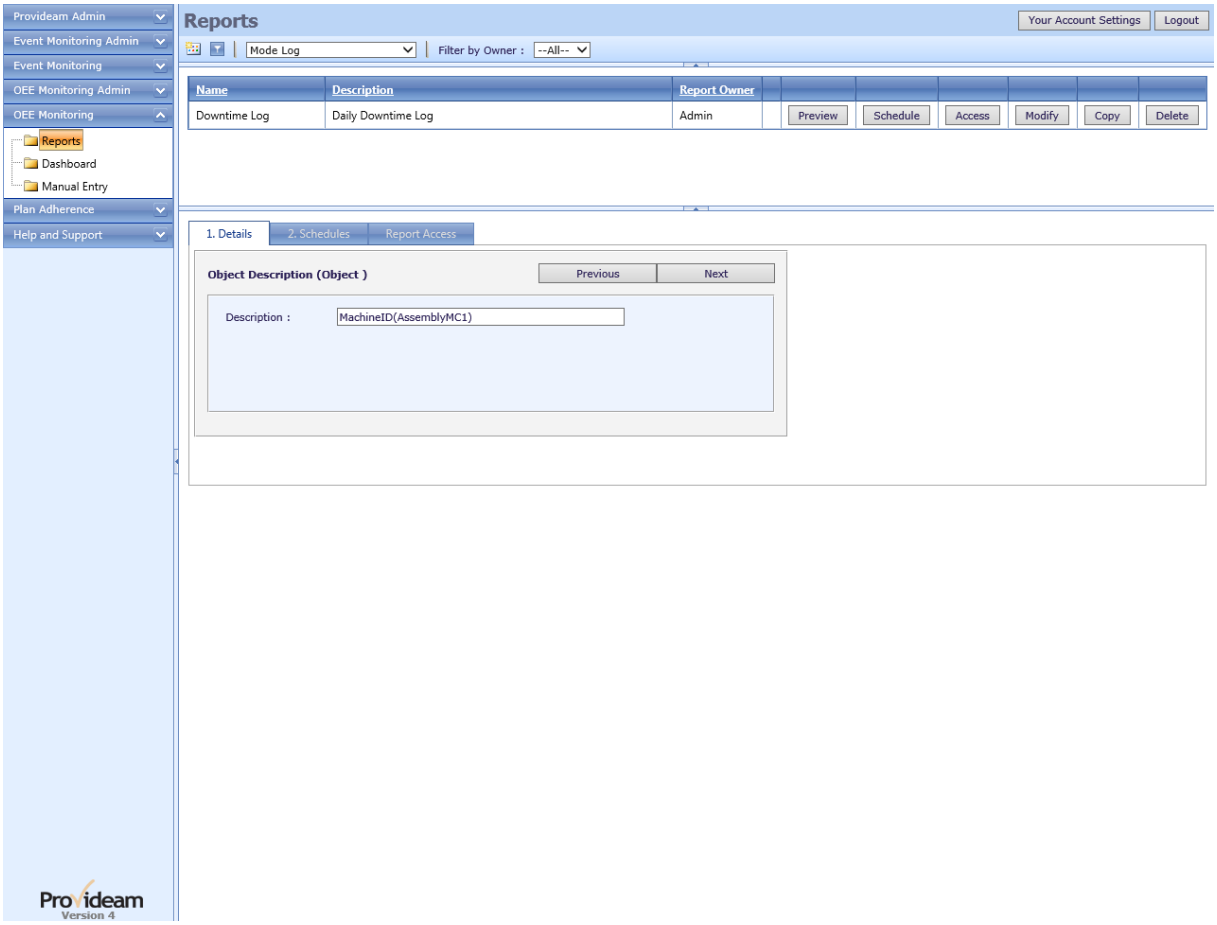


Fig. Mode Log Report - Edit Object Description

Step 9: Click **Next** to move on to on to the Loss selection.

Step 10: Choose *Level 3 Desc* Loss and select all items from the list of available Loss items. In this example we will remove the *Run* Mode. This option results in all time except *Run* being included in our Log.

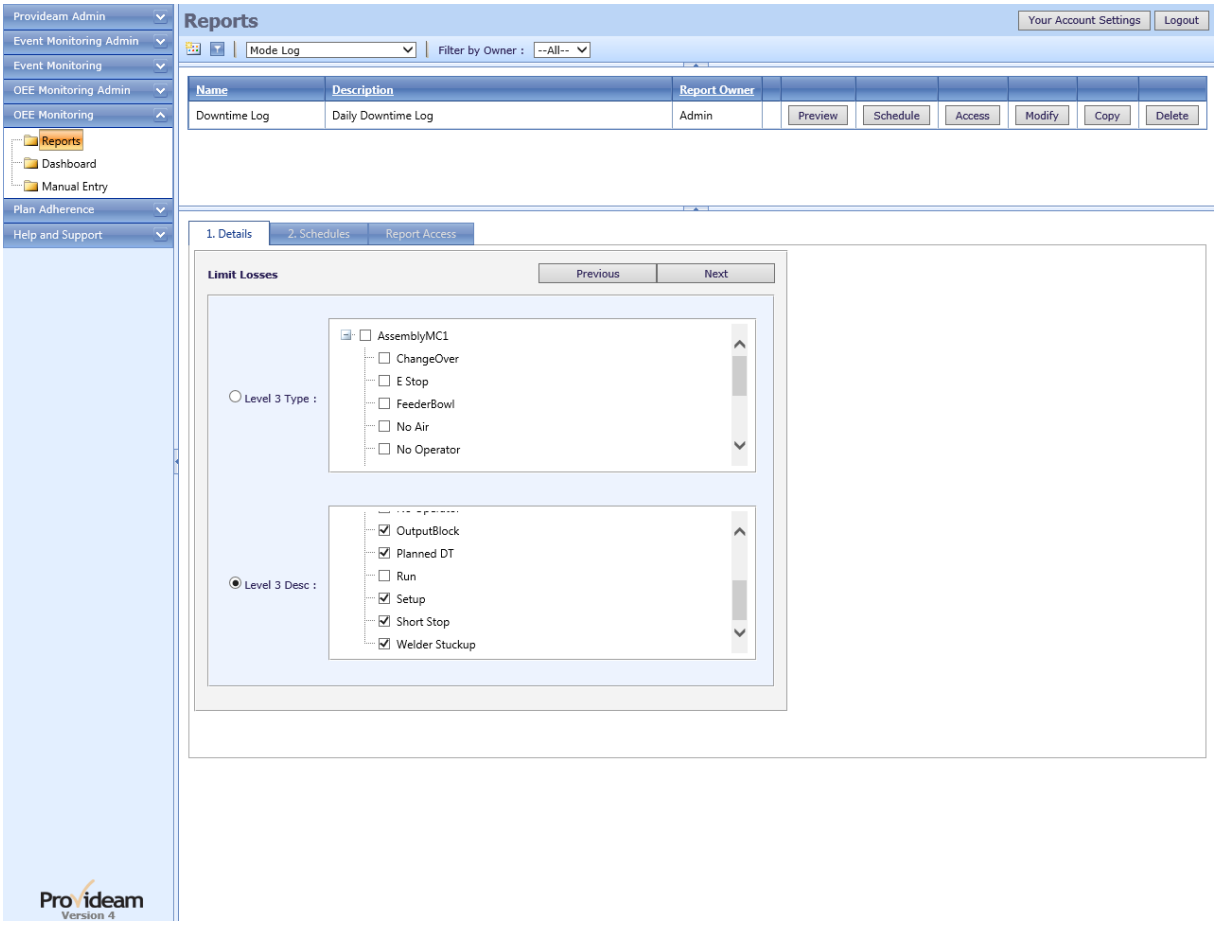


Fig. Mode Log Report - Select Loss

Step 11: Click **Next** to move on to Fields selection.

Step 12: Select *StartTime, OEELossLvl3Type, OEELossLvl3Desc* & *Duration* from the list of available Field items. To select a Field click and hold the record grabber icon of the required Field in the **Available Fields** list and drag it across to the **Selected Fields** list.

Step 13: Add the *Comment* Field to the **Selected Fields** list. This results in Comments which were entered by an operator on the Dashboard Downtime Log being displayed in the Mode Log Report.

Notes:

1. 1. The *Continuation* Field item is a flag to indicate that the current record is a continuation of a previous record. Provideam creates an artificial break in the recordset every hour. If the Machine was stopped over the period of the change from one hour to the next, then even though no new Mode occurred, a second record would be created on the hour and this record would have it's *Continuation* flag set to true.
2. Click the **Clear** button to reset formatting of the selected Field to default format.

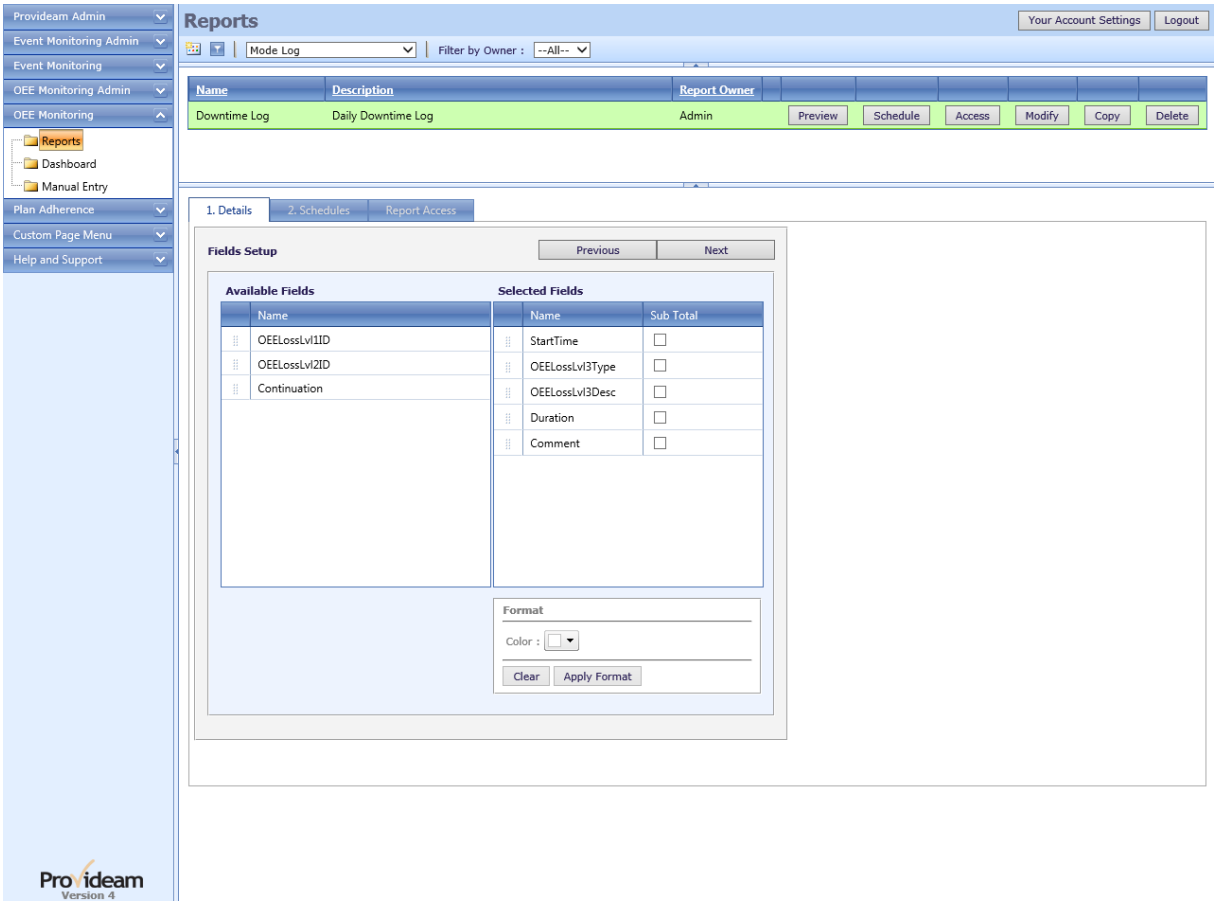


Fig. Mode Log - Select Fields

Step 14: Click **Next** to move on to the final screen in the Report Wizard.

Step 15: Select the **Bar Chart** Graph option.

Step 16: Check the **Show** Graph option.

Step 17: Check the **Show Grand Totals** option.

Step 18:Click **Run Report** to run this Report.

Notes:

1. To include a grand-total on the report, check the **Show Grand Totals** checkbox. The *Show Grand Totals* calculates the total duration of all displayed Modes.
2. You may save the report definition as a Report Template at this stage. Report Templates can be shared with other users and also scheduled for automatic delivery by email.

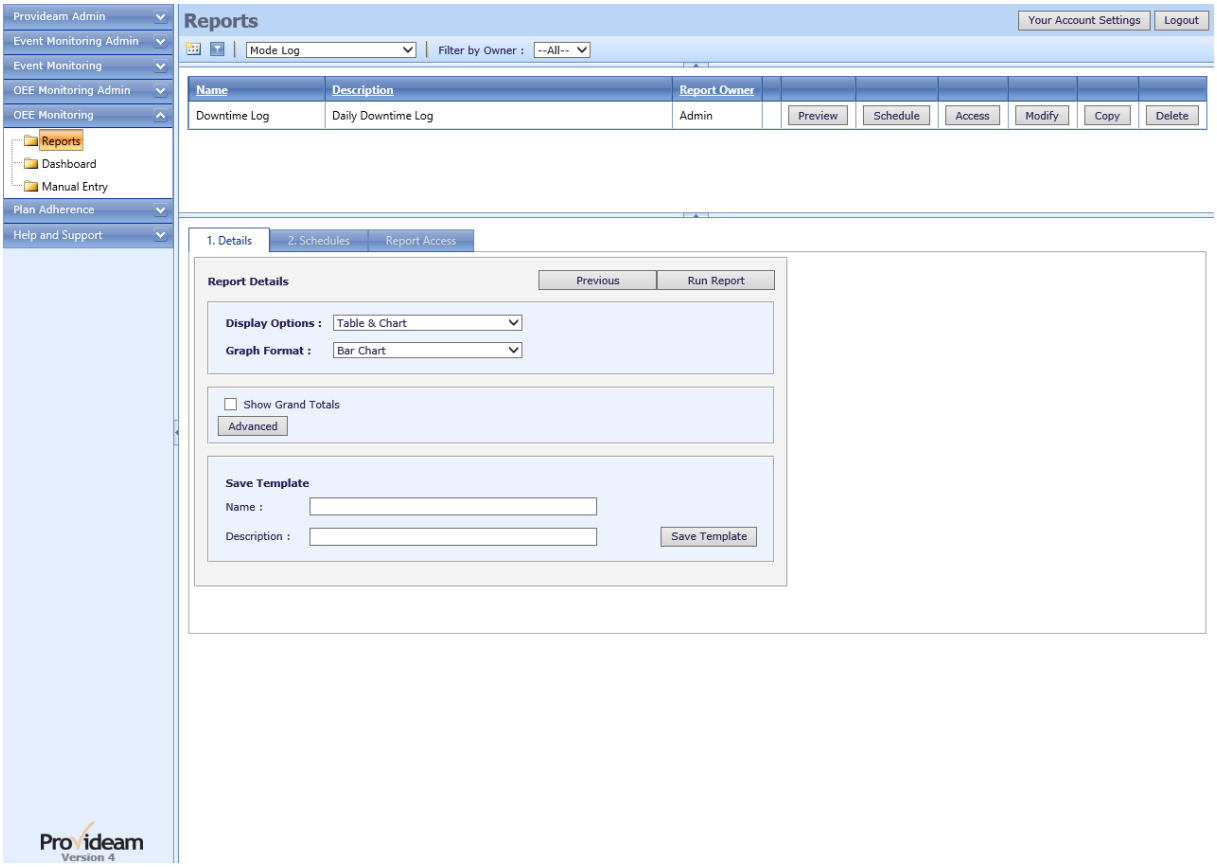


Fig. Mode Log Report - Save Template

Step 18: Select a **Date**.

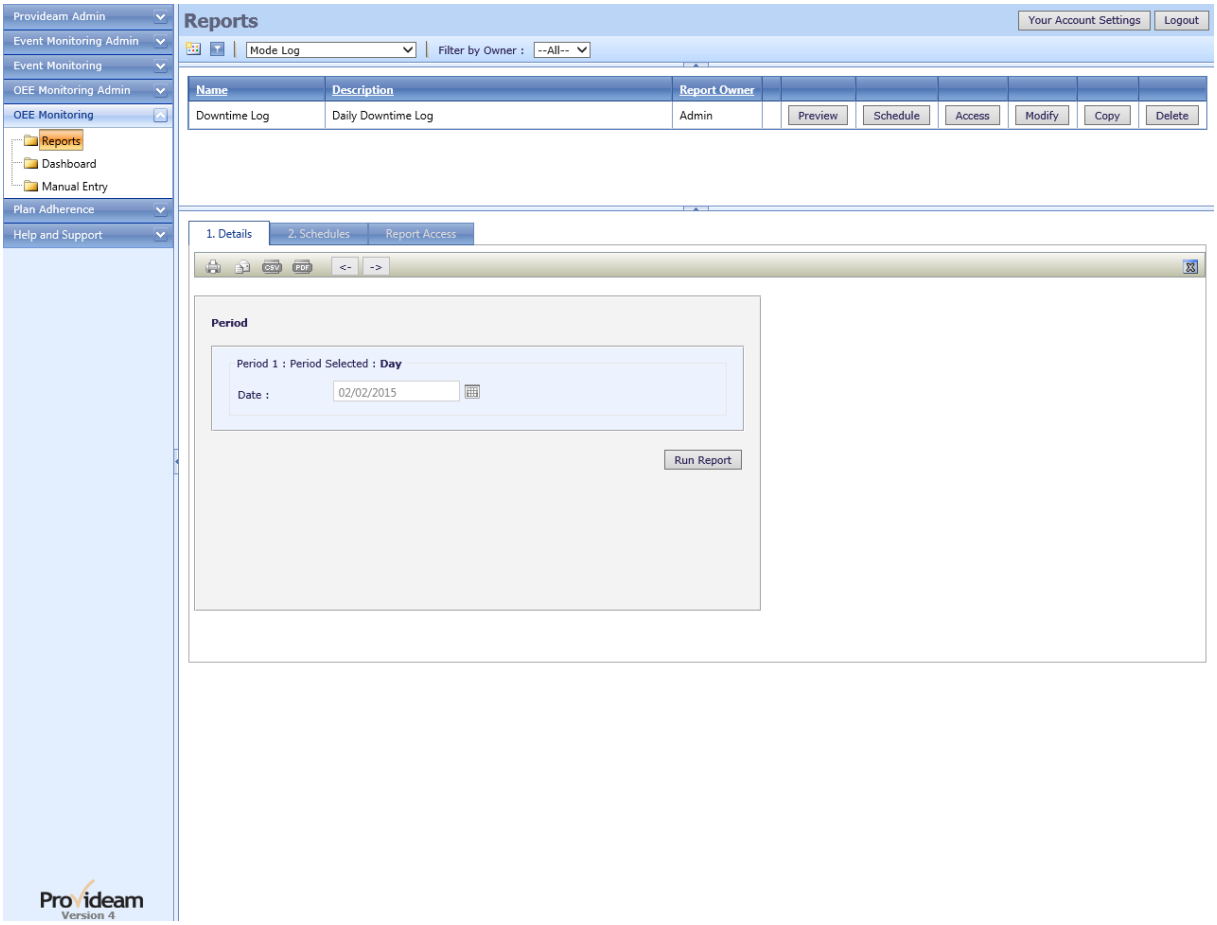


Fig. Mode Log Report - Select Report Period Parameters

Step 19: Click **Run Report** to generate a report preview.

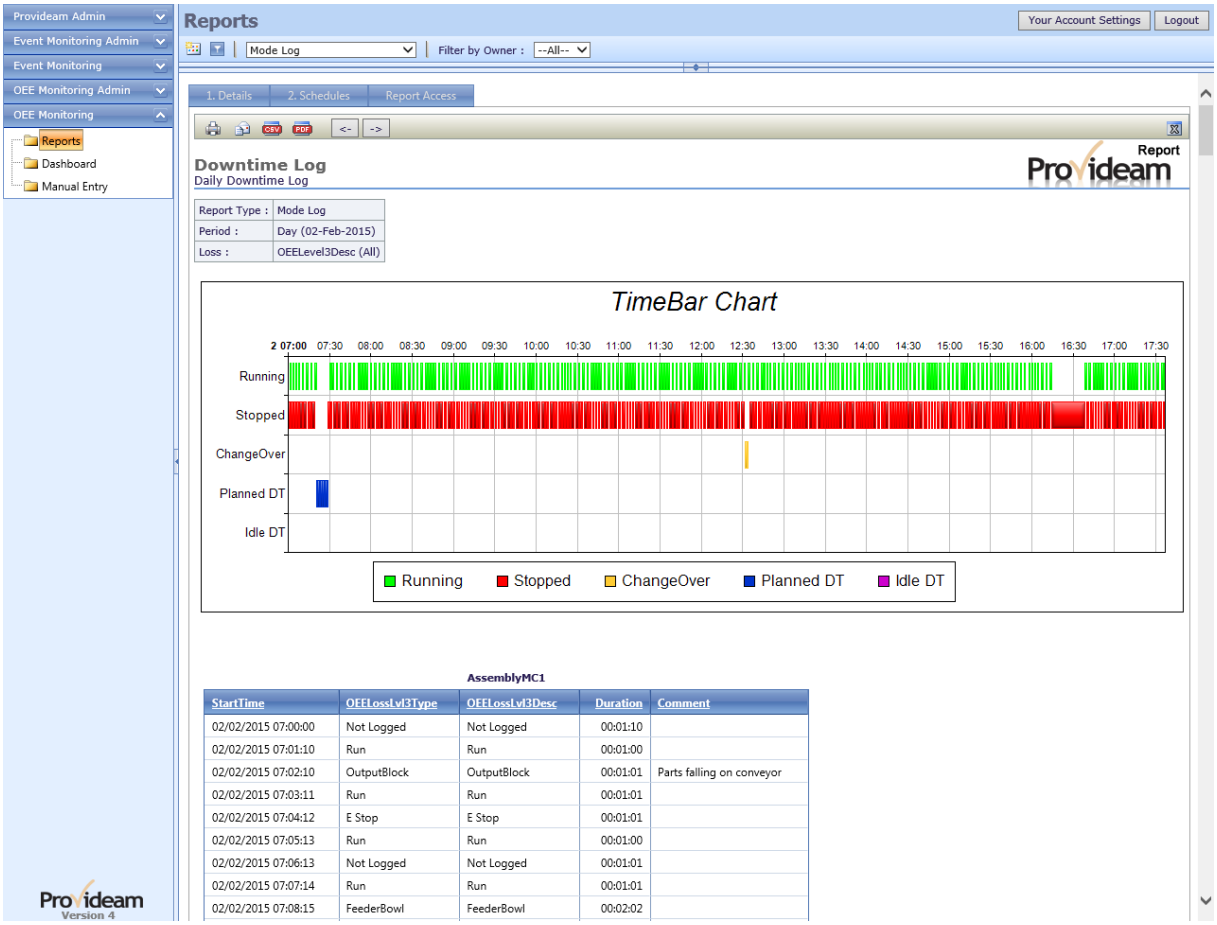


Fig. Mode Log Report - Preview Day Report

6.3.6 Yield Log

In this section we will demonstrate how to create a Yield Log Report.

Example 1: Yield Log Report

Step 1: Click on the 'New Report' icon

Step 2: Select the *Yield Log* option

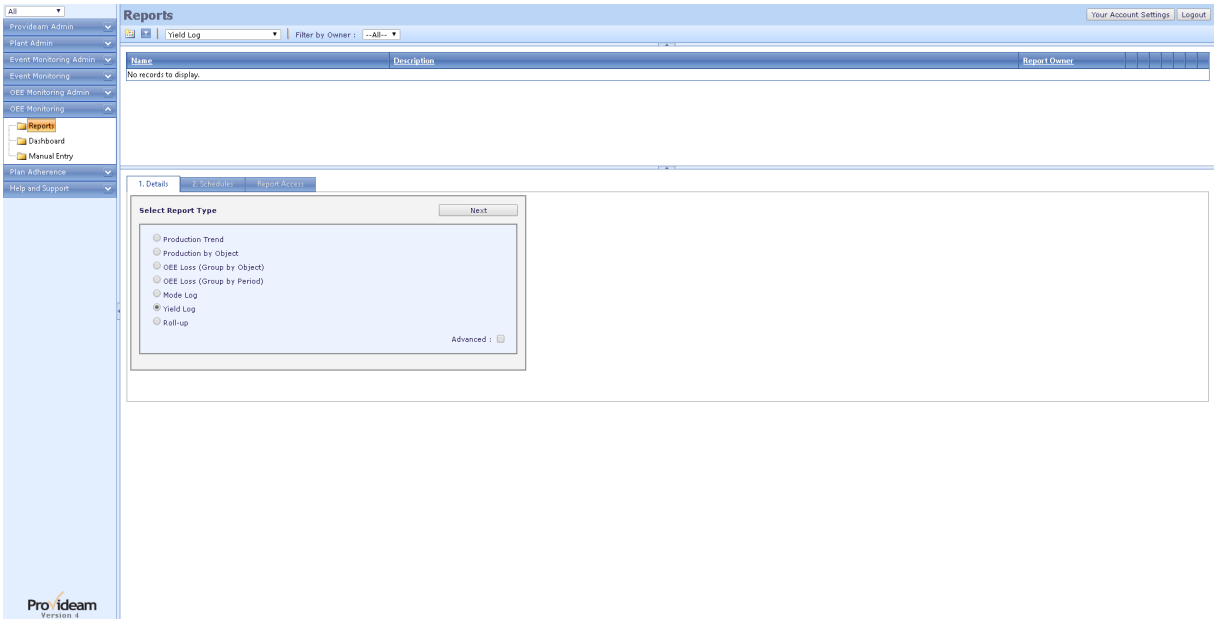


Fig. Yield Log Report - New Yield Log Report

Step 3: Click **Next** to move on to Period selection.

Step 4: Select the **Day** period option.

This sets the Period range over which your report will be generated. When running this report you will be asked to chose a specific Day.

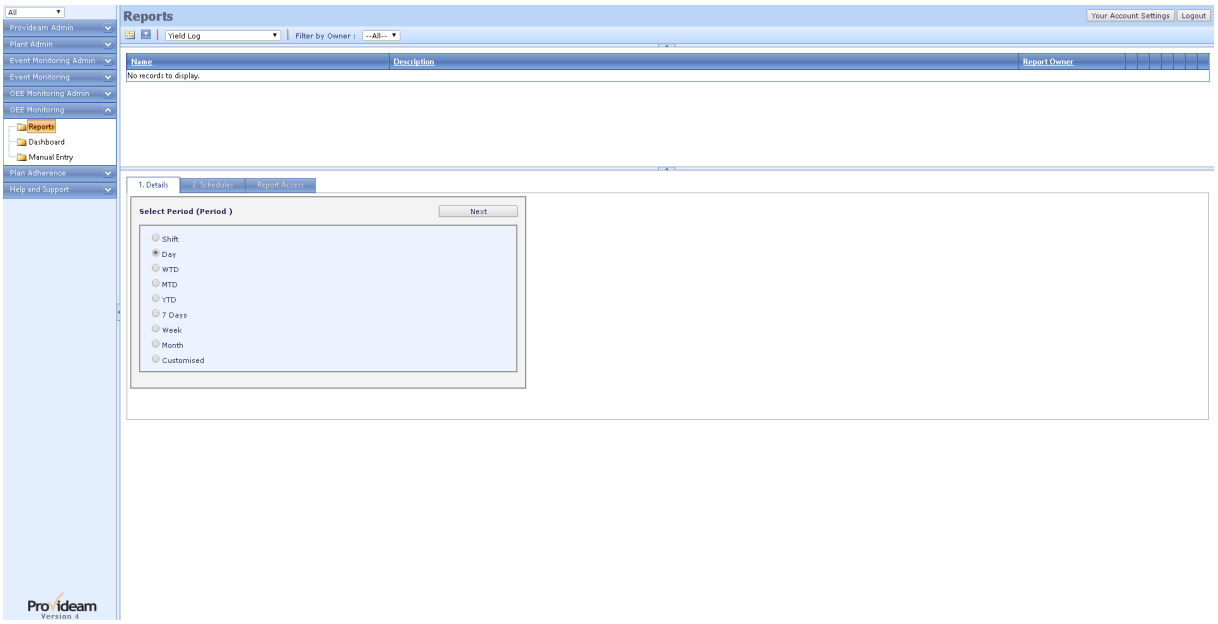


Fig. Yield Log Report - Select Period

Step 5: Click **Next** to move on to the Object selection.

Step 6: Select *AssemblyMC1* from the list of available Machine items.

This sets the range of Objects over which your report will be generated.

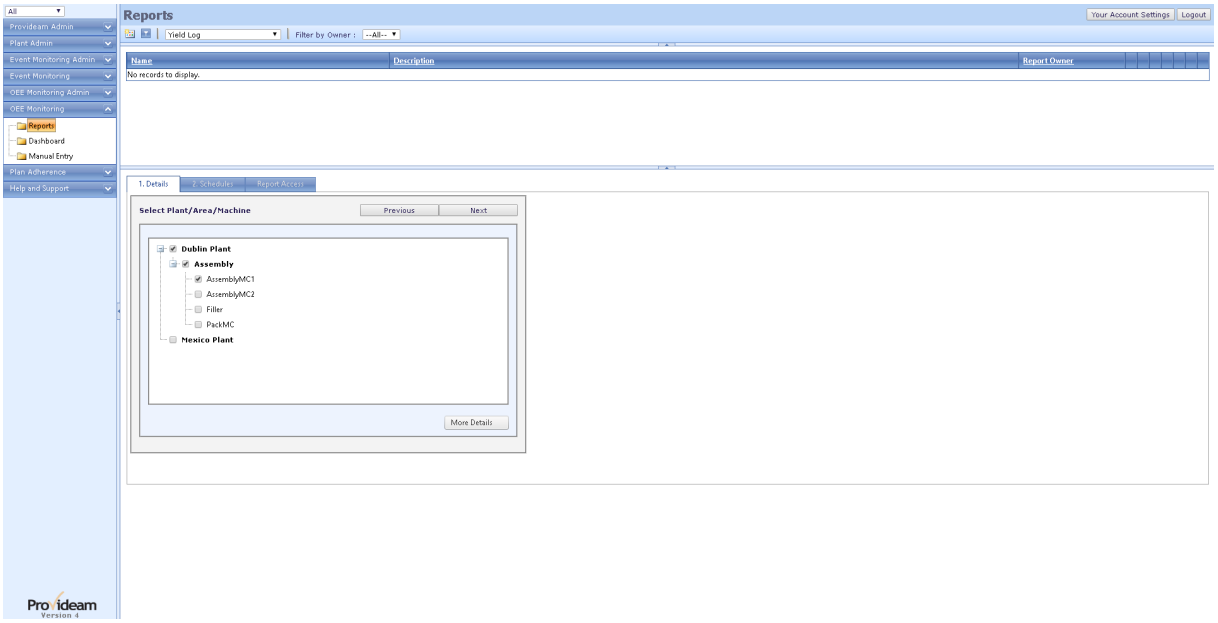


Fig. Yield Log Report - Select Object

Step 7: Click **More Details** to select additional Object details.

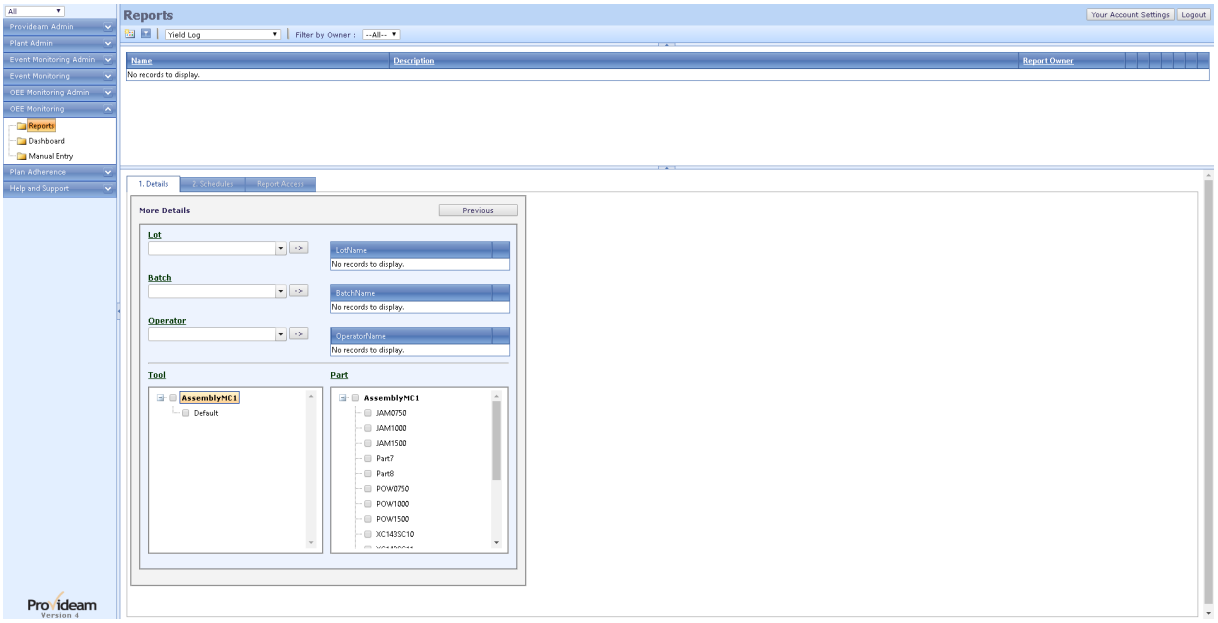


Fig. Yield Log Report - Select Additional Object Details

In this example we will not select any other details. The Object selection defines the object on which the report data will be generated. In this case it's all data for AssemblyMC1.

Step 8: Click **Previous** to return to the previous step and then **Next** to move on to name the Object.

By default the Report Wizard enters the Object Description shown below. You may edit this if you wish.

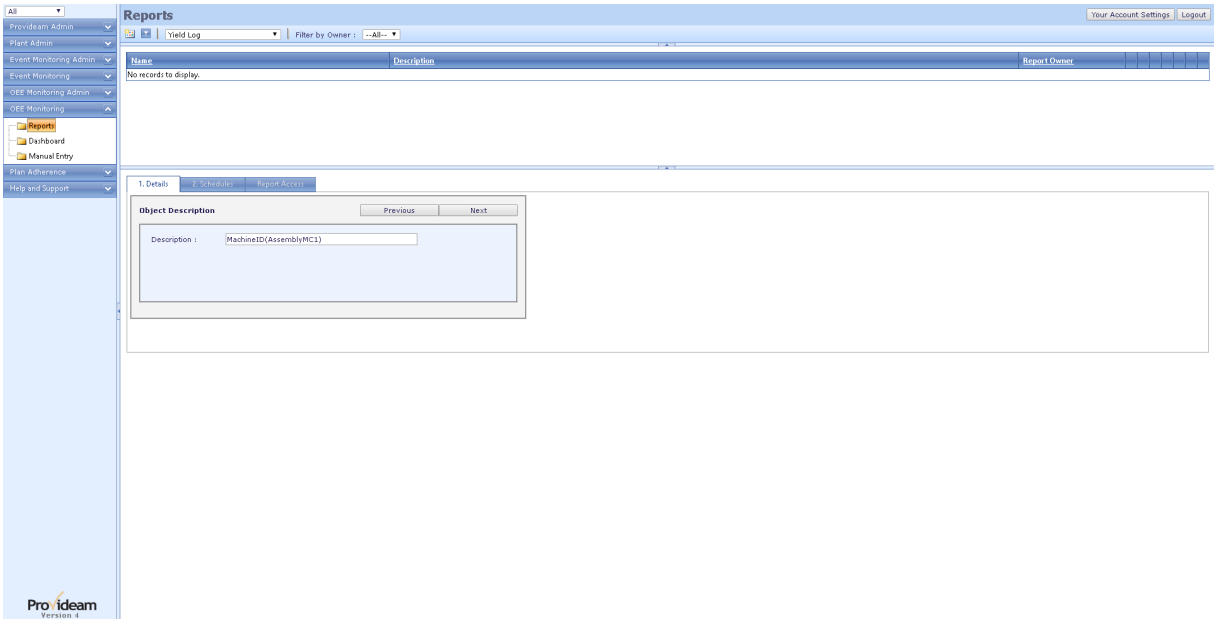


Fig. Yield Log Report - Edit Object Description

Step 9: Click **Next** to move on to on to the Loss selection.

Step 10: Choose *Level 3 Type* and select all items from the list of available items that you would like in your report. In this example we will choose *GoodParts* Count only.

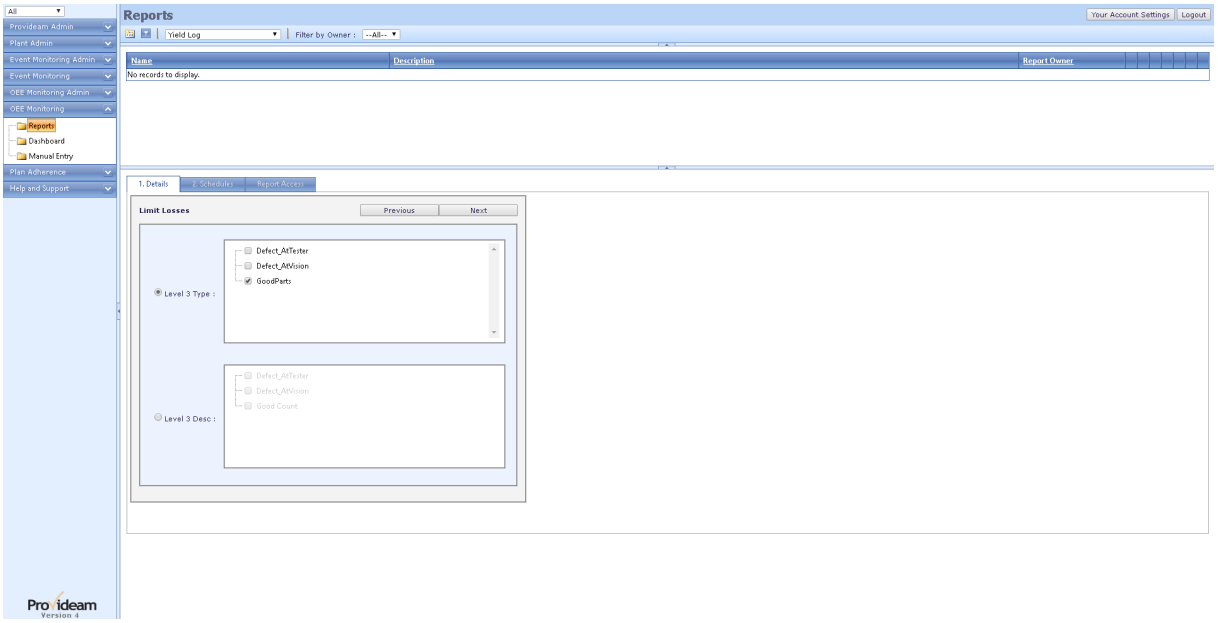


Fig. Yield Log Report - Select Count

Step 11: Click **Next** to move on to Fields selection.

Step 12: Select *StartTime, OEELossLvl3Type* & *NumEvents* from the list of available Field items. To select a Field click and hold the record grabber icon ⋮⋮ of the required Field in the **Available Fields** list and drag it across to the **Selected Fields** list.

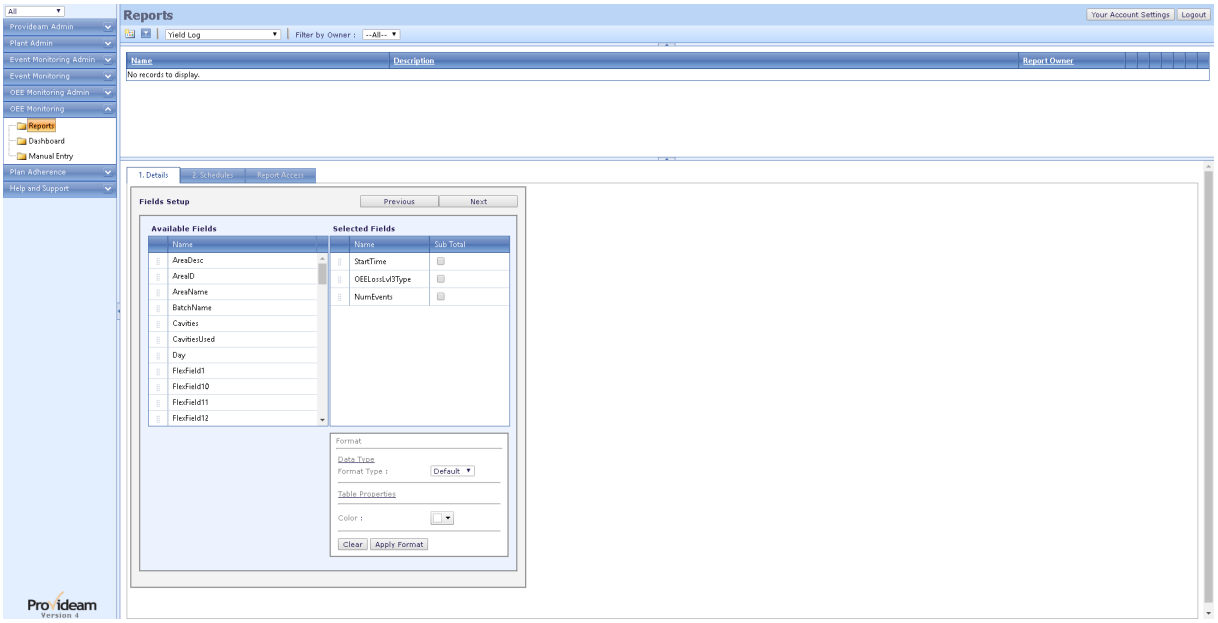


Fig. Mode Log - Select Fields

Step 13: Click **Next** to move on to the final screen in the Report Wizard.

Step 14:Click **Run Report** to run this Report.

Notes:

1. To include a grand-total on the report, check the **Show Grand Totals** checkbox. The *Show Grand Totals* calculates the total duration of all displayed Modes.
2. You may save the report definition as a Report Template at this stage. Report Templates can be shared with other users and also scheduled for automatic delivery by email.

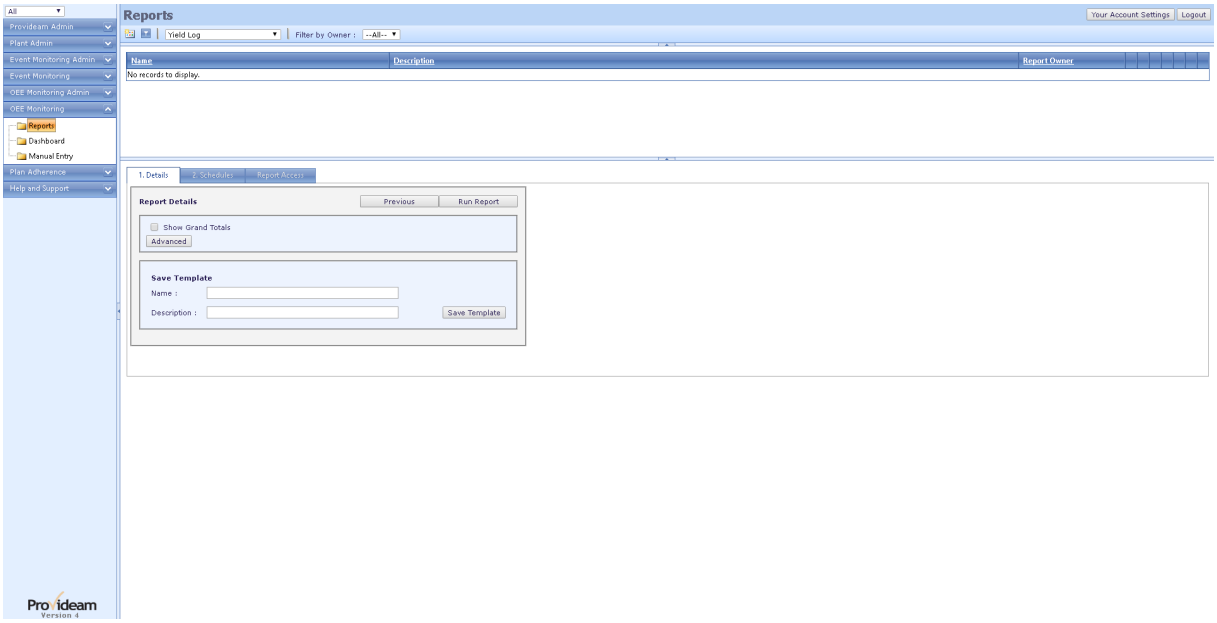


Fig. Yield Log Report - Save Template

Step 15: Select a **Date**.

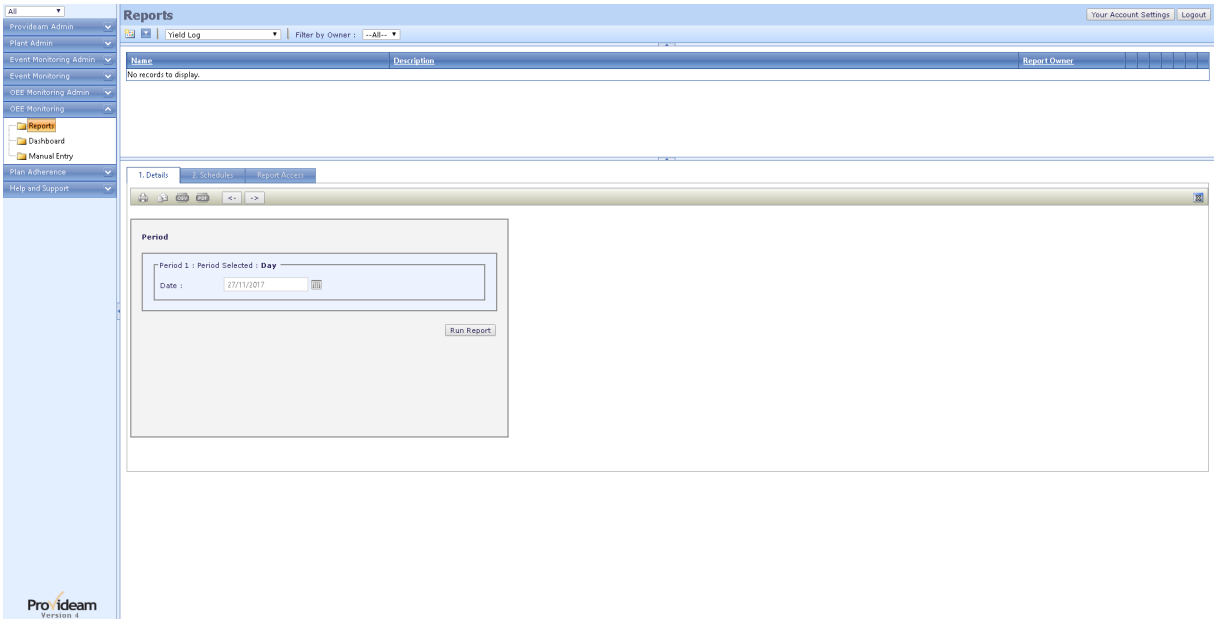


Fig. Yield Log Report - Select Report Period Parameters

Step 16: Click **Run Report** to generate a report preview.

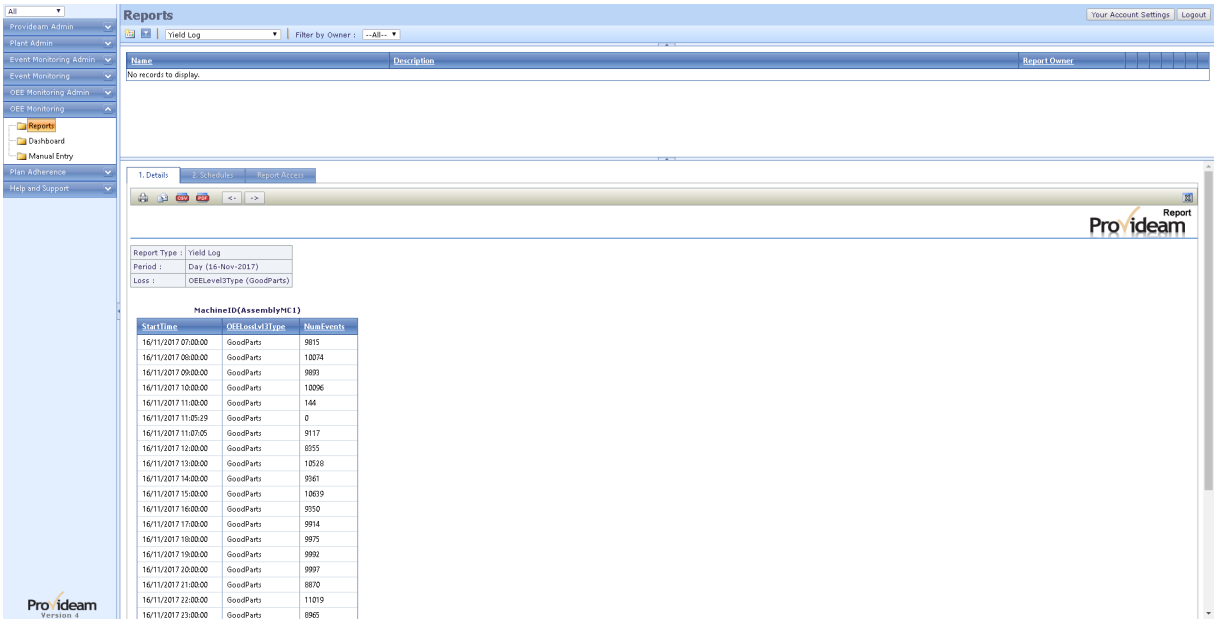


Fig. Yield Log Report - Preview Day Report

6.3.7 Roll-up

In this section we will demonstrate how to create a Roll-up Report.

Example 1: Roll-up Report

Step 1: Click on the 'New Report' icon

Step 2: Select the *Roll-up* option

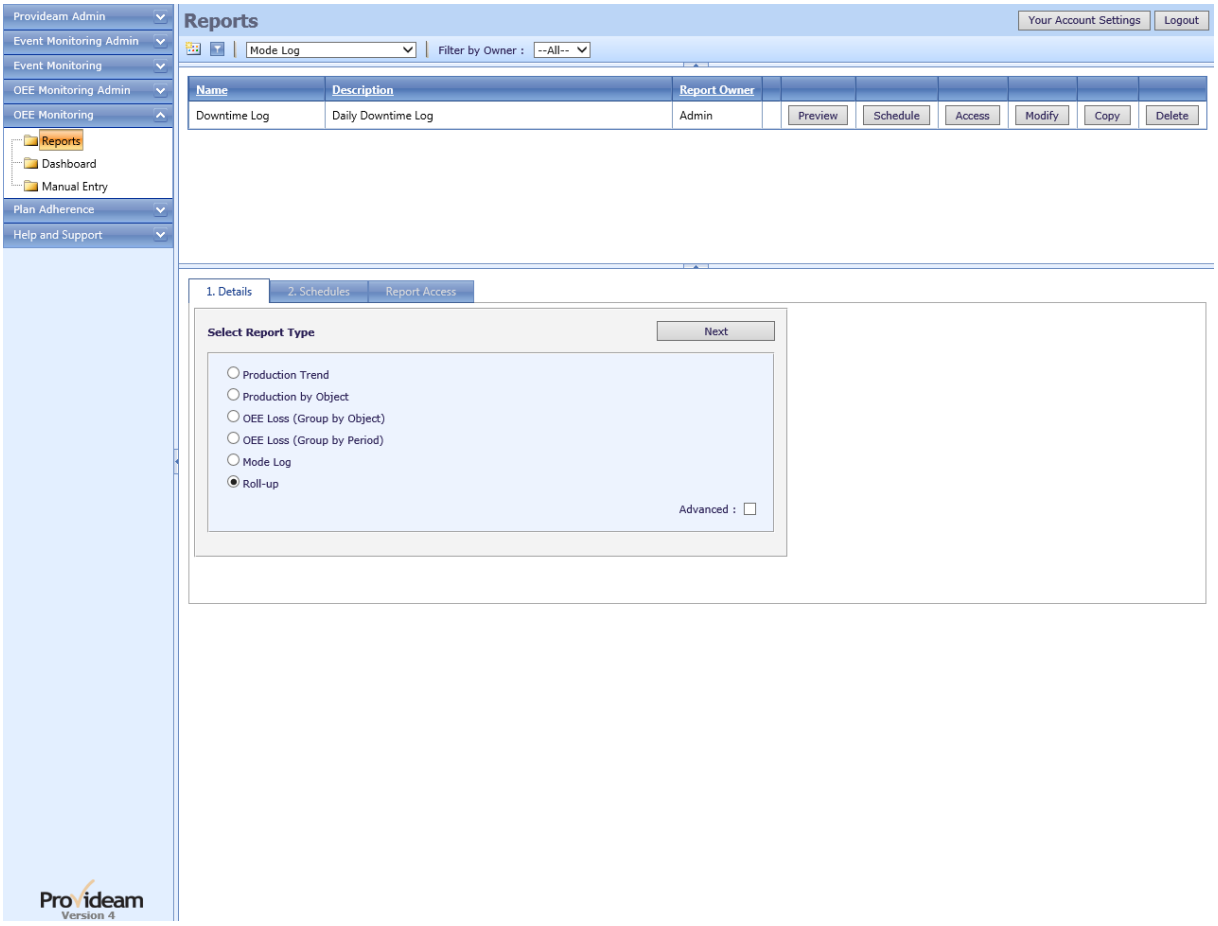


Fig. Roll-up Report - New Roll-up Report

Step 3: Click **Next** to select the Period over which the Report will be generated.

Step 4: Select the 7 **Day** Period option.

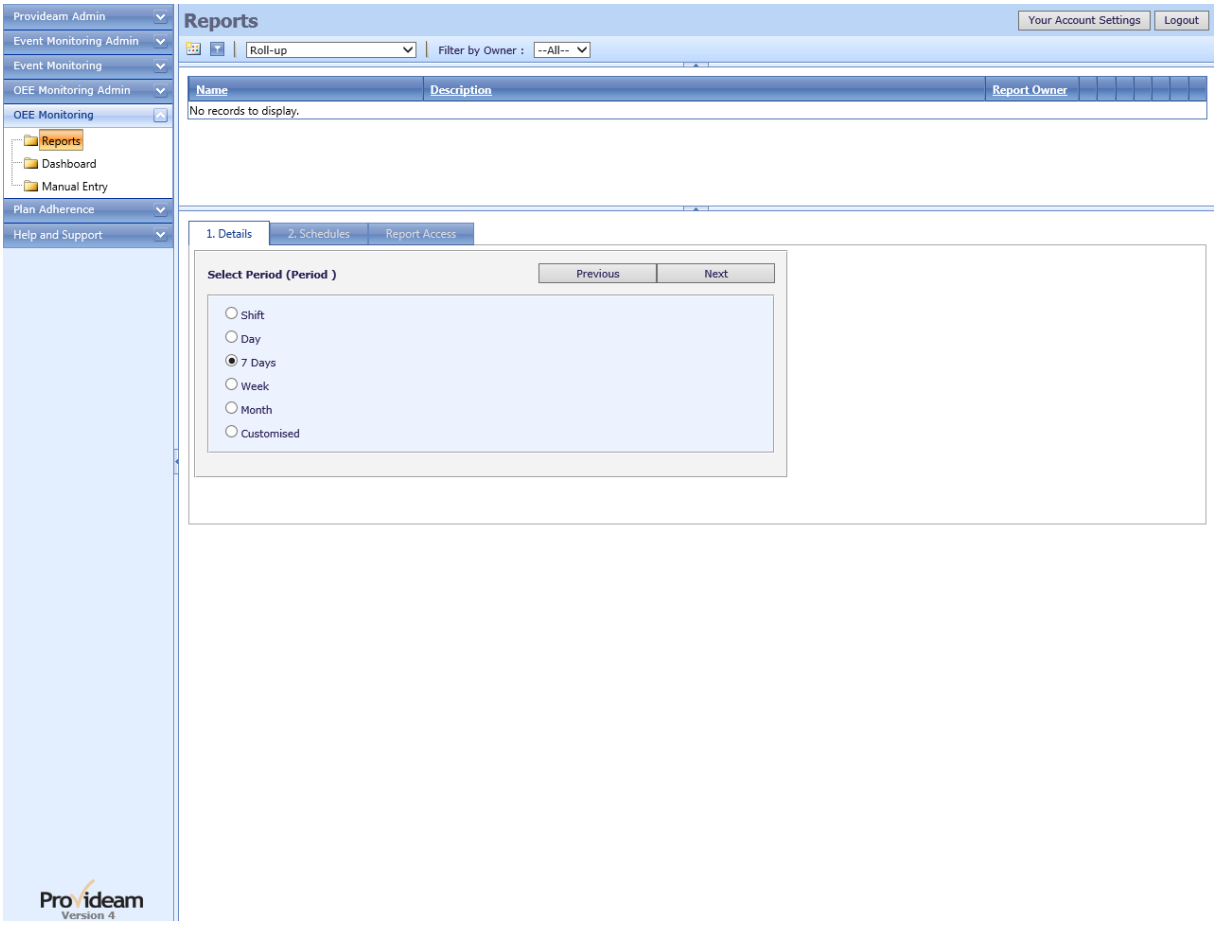


Fig. Roll-up Report - Select Period

Step 5: Click **Next** to move on to the Area/Machine (Object) selection.

Step 6: Select all the available Machine items.

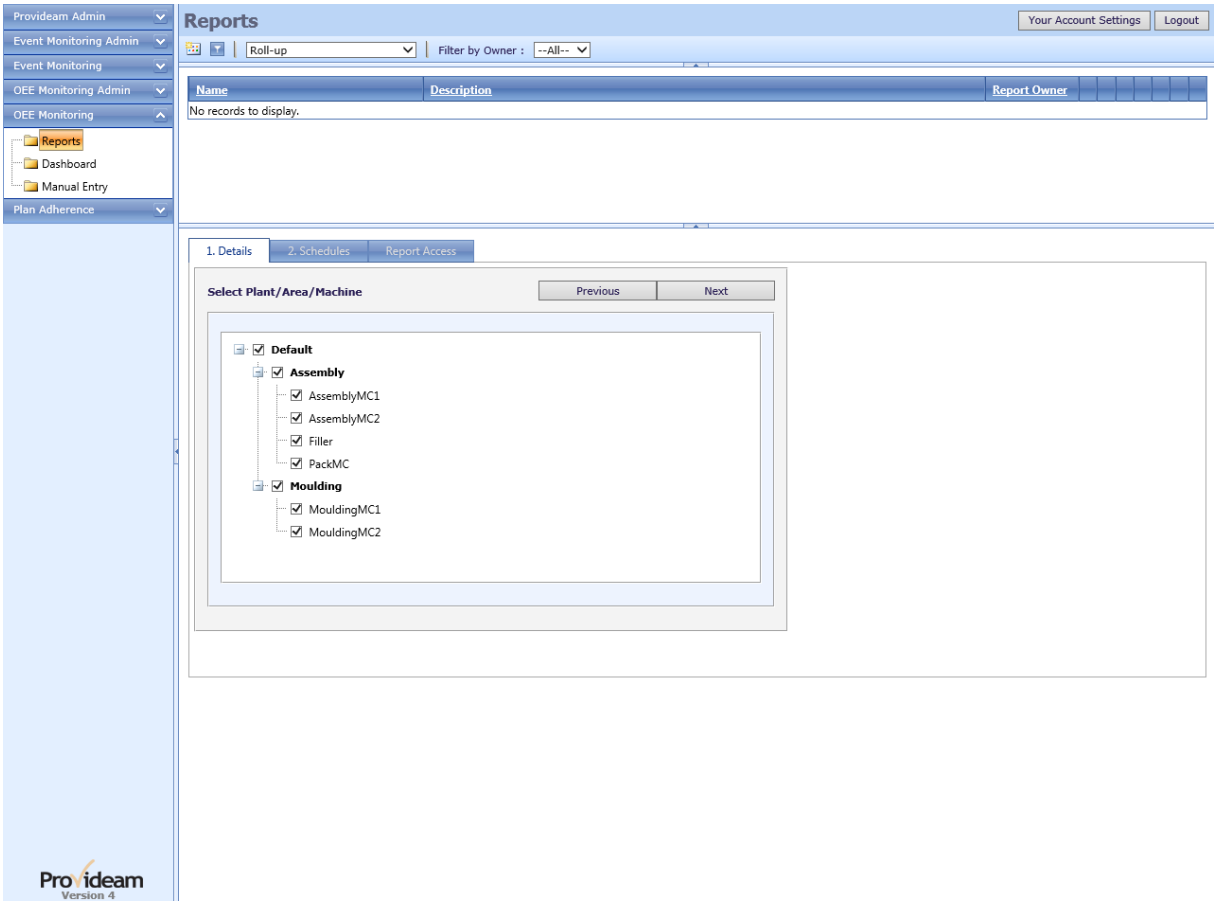


Fig. Roll-up Report - Select Machines/Areas

In this example the Roll-up Report for the entire Plant is required. The overall Plant OEE is, in this case, is calculated by combining the OEE for each Machine.

Note: These Machines are independent and are not configured as part of a Production Line. The OEE of a Production Line is not the combined OEE of each Machine in the Line.

Step 7: Click **Next** to select the Report Resolution, Sub-Total and Total options, and to save the Report Template.

Step 8: Select *By Shift* as the Report Resolution.

Step 9: Check the **Show Grand Totals** and **Show Area Totals**. These options will cause the Report to include a section for each Area Total and an Overall Total (in this case a Plant Total).

Step 10: Enter a **Name** and **Description** for the Report Template name and click the **Save Template** button.

Note:

1. Check the **Table** checkbox if you wish to include tabular results with the standard rollup charts.

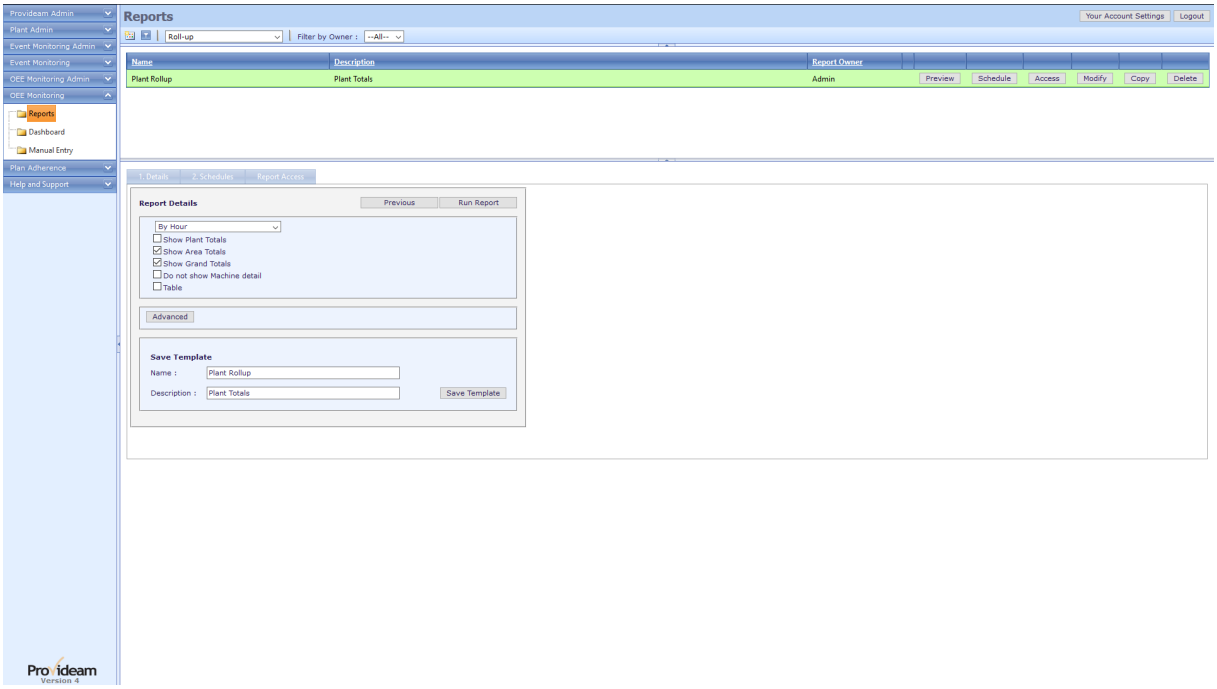


Fig. Roll-up Report - Select Total, and Template options

Note: If

Step 11:Click **Run Report** to run this Report.

Step 12: Select a **Date**.

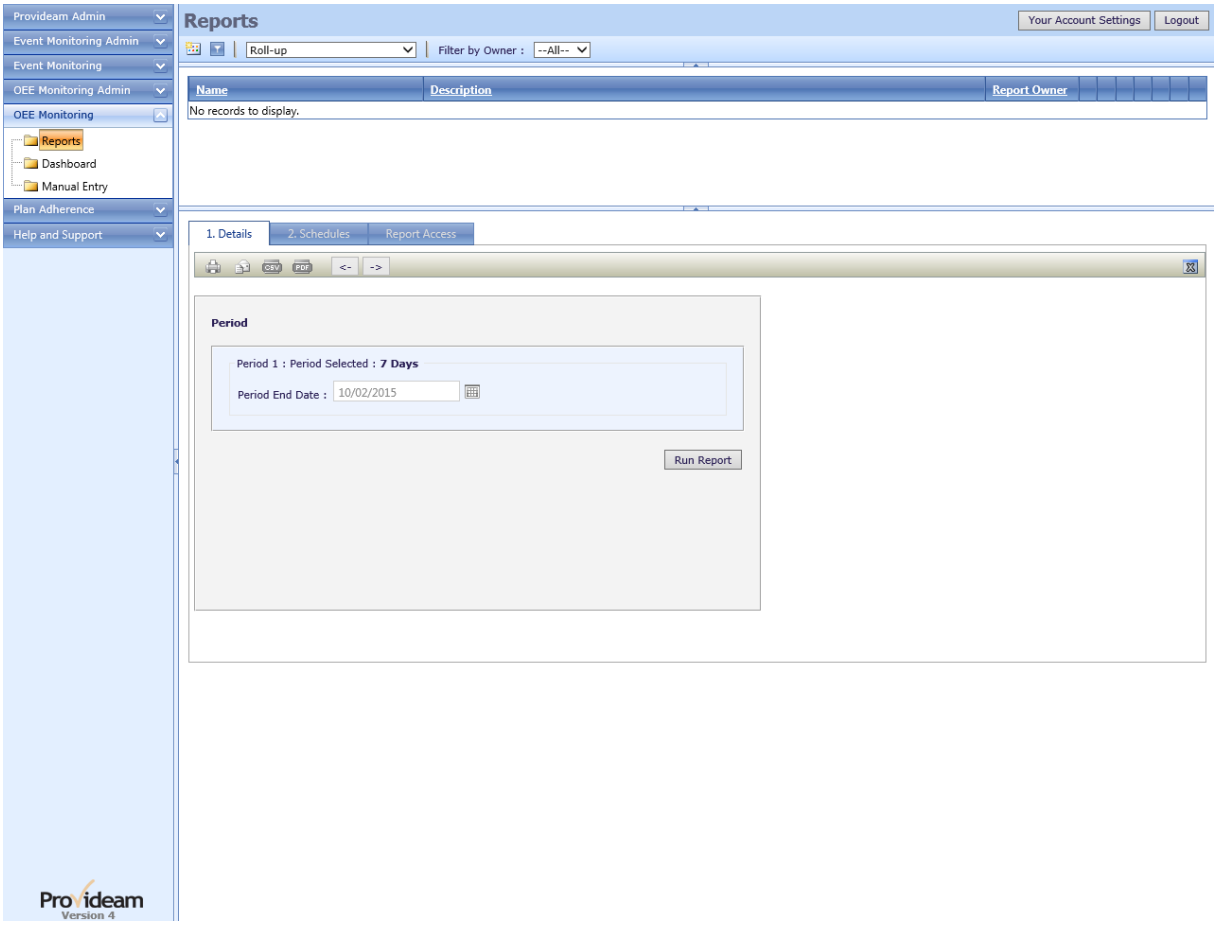


Fig. Roll-up Report - Select Total, and Template options

Step 13: Click **Run Report** to generate a report preview.

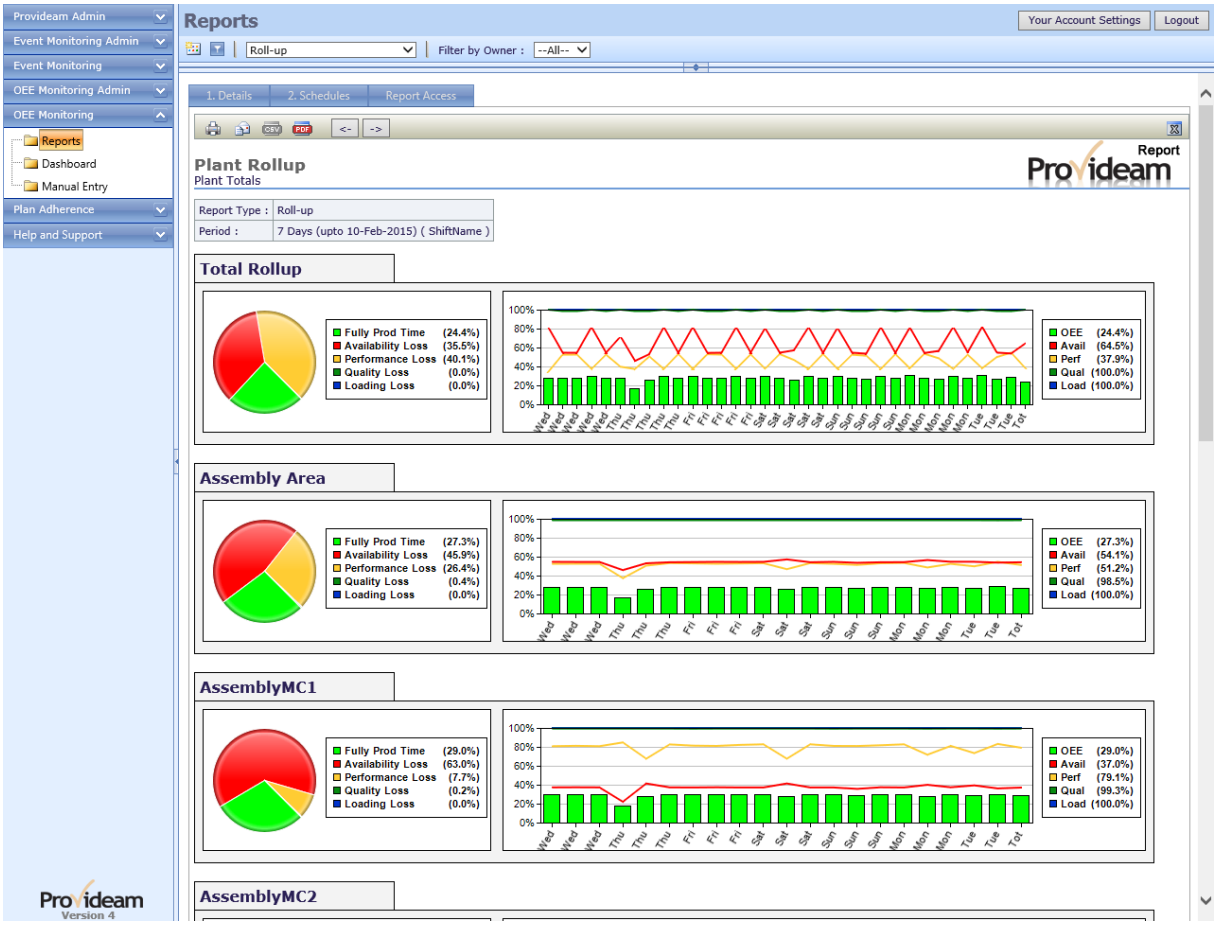


Fig. Roll-up Report - Preview 7 Day Report

6.3.8 Scheduled Report Delivery

To schedule a report to be delivered to an email address click on the **Schedule** button. A list of the existing schedules appears. In the example below we will create the *Day Shift* schedule.

To create a new schedule, click on the 'Add New Schedule' icon and enter the details.

To modify an existing schedule, click on the schedule and it's details will appear.

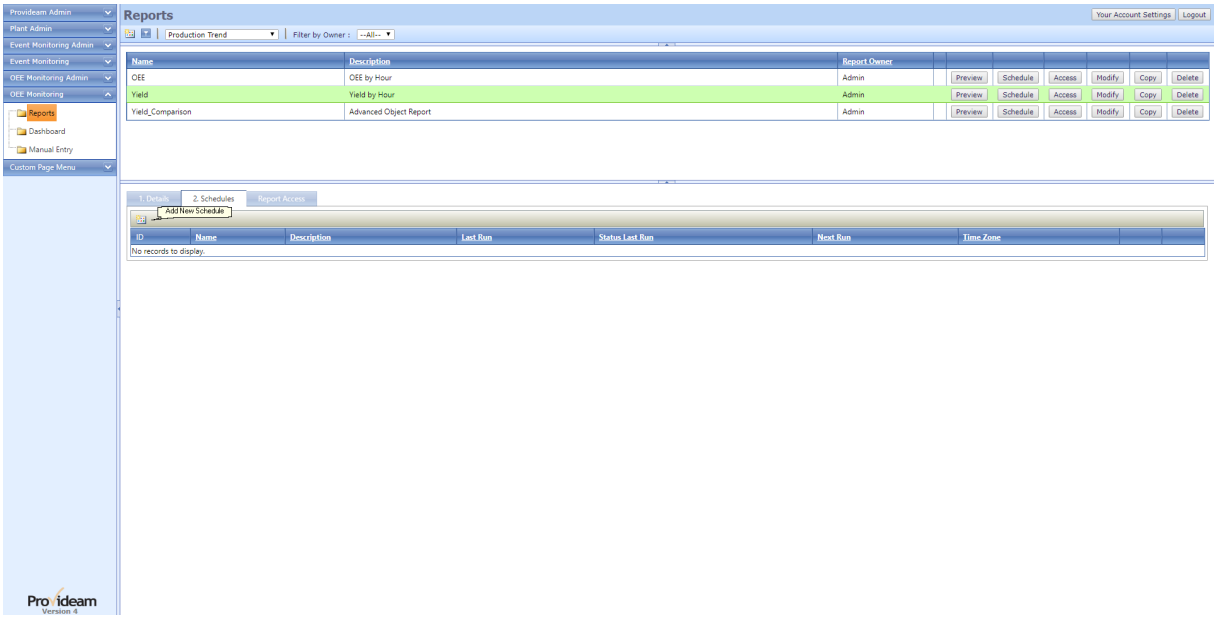


Fig. Scheduled Task Page

Example 1: Create a new Schedule Task

Step 1: Click on the 'New' icon

Step 2: Enter *Day Shift* for the **Name** and *Day Shift Schedule* for the **Description**.

Step 3: Select *15:05:00* for the **TaskStartTime** and *Previous* for the **Period**. This will cause the last completed report to be generated. In this case the Day Shift Report which ended at 15:00hours.

Step 4: Select *Monday, Tuesday, Wednesday, Thursday* and *Friday* for the Weekdays. This will result in the task being run on these days.

Step 5: Check the Admin User's email address in the **Email Report to** table.. This will add the Admin User's email address to the list of email recipients of the report. Note: You may select multiple Email Addresses as well as Email Contact Lists in this box.

Step 6: Save the Task.

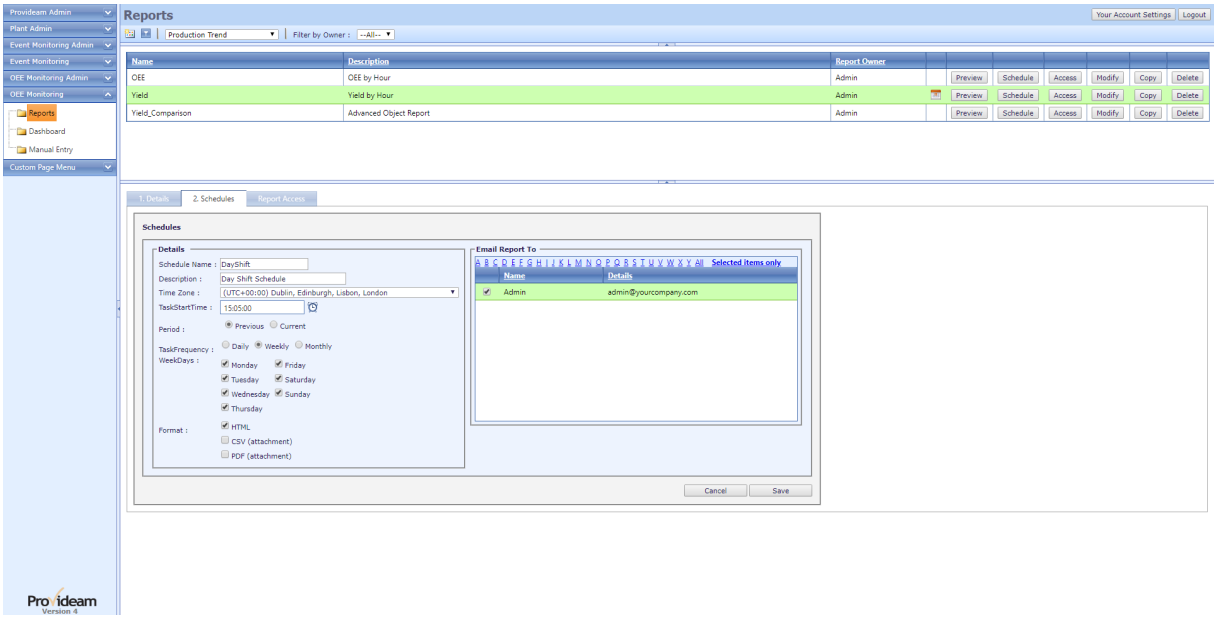


Fig. Scheduled Task Parameters

Step7: To Test your Scheduled Task click on the Run Button.

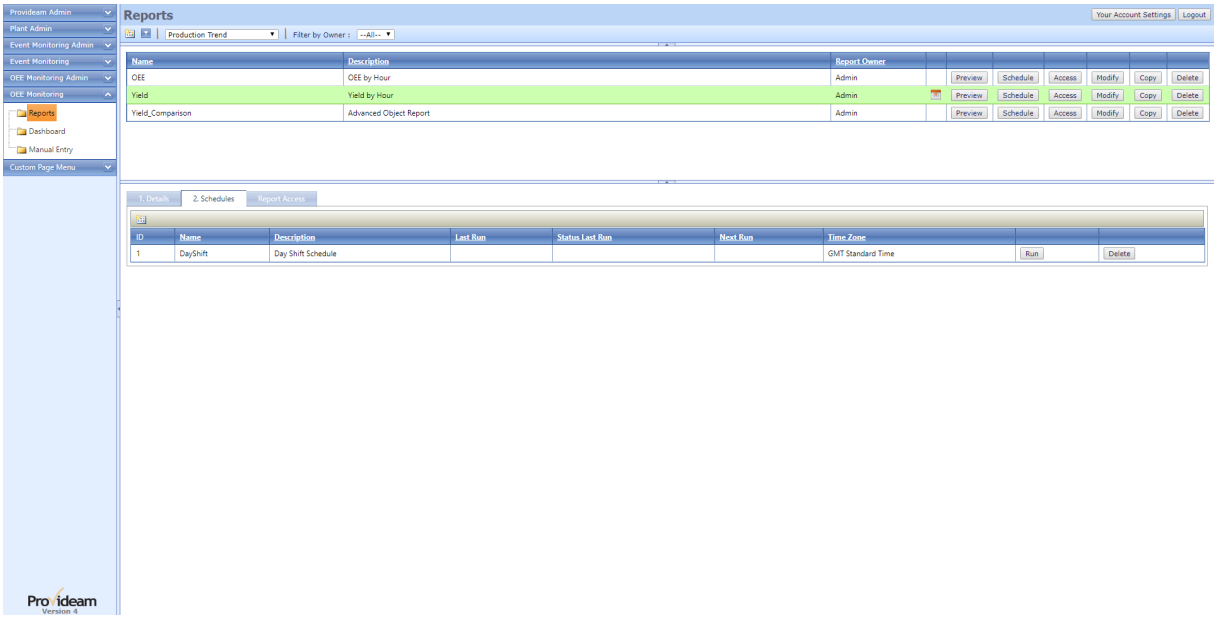


Fig. Scheduled Task Test

6.3.9 Report Ownership

Current Owner

Only the Owner of a report, or a Report Administrator, is allowed to modify a report. To change the Owner of a report, the current Owner, or Report Administrator must log on and change the Current Owner.

Step 1: Log On as Report Administrator or Report Owner.

Step 2: Select the Report and click the **Access** button.

Step 3: Select the new Owner from the **Current Owner** selection box.

Step 4: Click the **Save** button.

Report Access

You can allow other users access to your reports. When the other users log on to Provideam they will be able to generate reports using the templates you have created, but will not be able to modify the templates.

Step 1: Log On as Report Administrator or Report Owner.

Step 2: Select the Report and click the **Access** button.

Step 3: In the **Report Assigned to** section check individual Users (or a Report Access Contact List) to allow those specified Users access to the Report. Alternatively check the **Open Access** checkbox to allow all Users access the Report.

Step 4: Click the **Save** button.

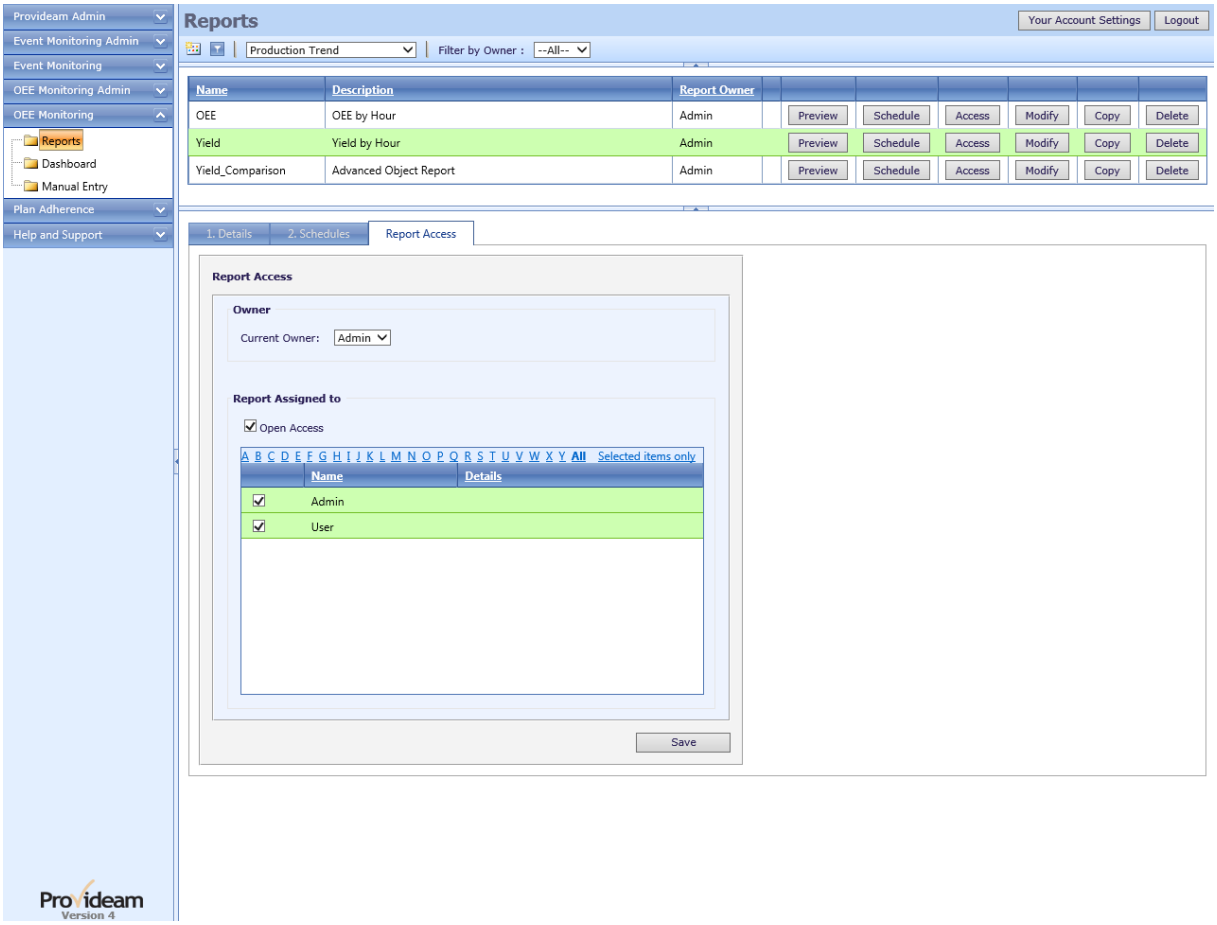


Fig. Object by Period Report - Assign Users

Remember if you are not the Report Owner or a Report Administrator you will not be able to Modify the Report.

6.3.10 Parameterized Fuctions

Parameterized Functions are typically Loss or Yield Functions where you can specify which Losses or Yields to include in the calculated value. Parameterized Functions are available in OEE Dashboard Overall Views, OEE Dashboard Station Yield Views, and in OEE Reports.

In the example below a Parameterized Function is created which calculates the number of defects of specified types for a Production Trend Report. Once created the Parameterized Functions can be displayed in the same way as Standard Functions.

Parameterized Functions are added to a Report by clicking on the **Add Parameterized Function** button on the **Function Selection & Setup** page of the Report Wizard.

Step 1: Click the **Add Parameterized Function** button to open the Parameterized Functions Page.

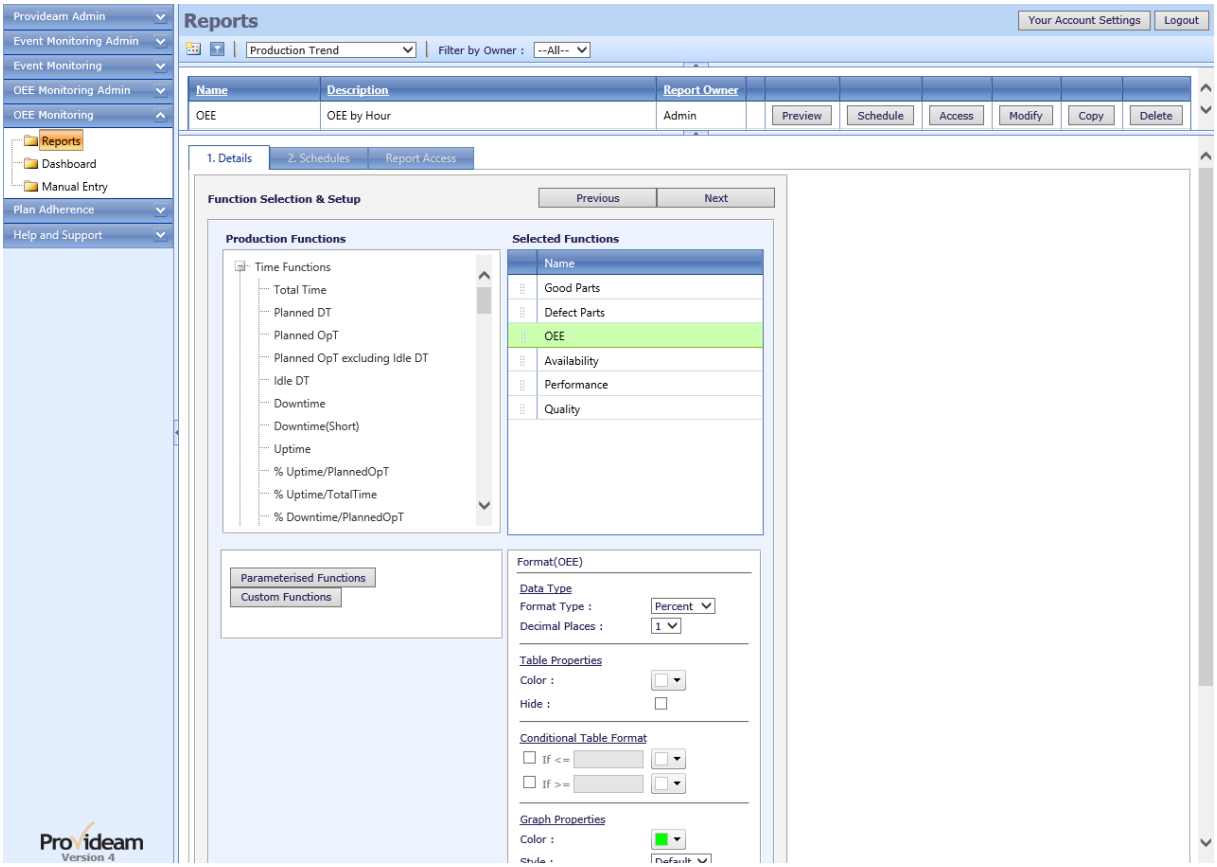


Fig. Production Trend Report - Select Functions, Add Parameterized Function

Step 2: Click the **Add New** button to add a new Parameterized Function

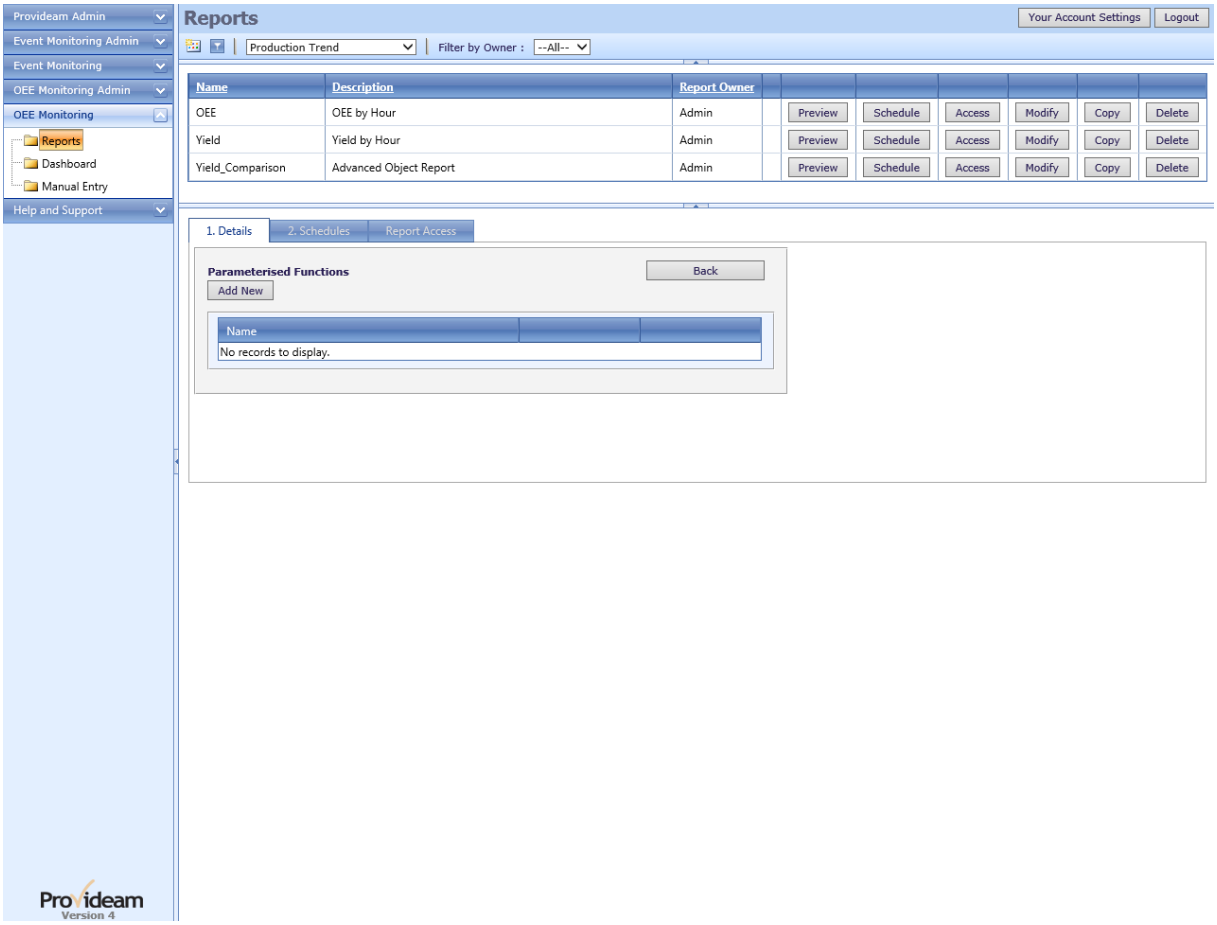


Fig. Production Trend Report - Add New Parameterized Function

Step 3: Select the type of Parameterized Function you require. In this example we will select the *Yield,* Yield Function. This function calculates the sum of the selected Yield Counts for the selected Period. Click on *Yield* in the functions selection tree list.

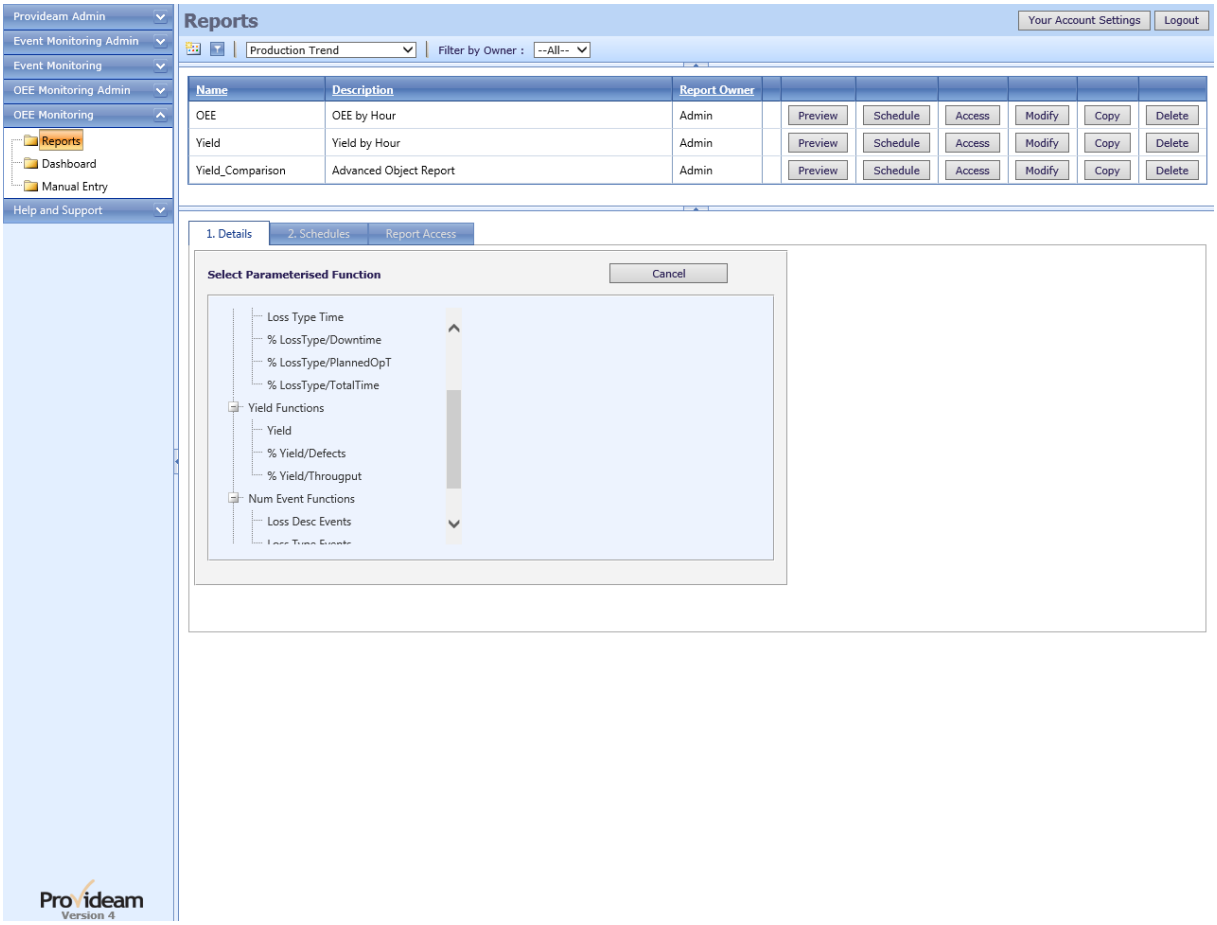


Fig. Production Trend Report - Select Required Parameterized Function

Step 4: Now specify the Function Parameters you require. In our example we select *Defect_AtTester* and *Defect_AtVision*. This will provide a sum of the these defects.

Step 5: Enter *DefectsTotal* as the unique name for the function.

Note: This example is somewhat facile as the standard Defects Function will generate the same result.

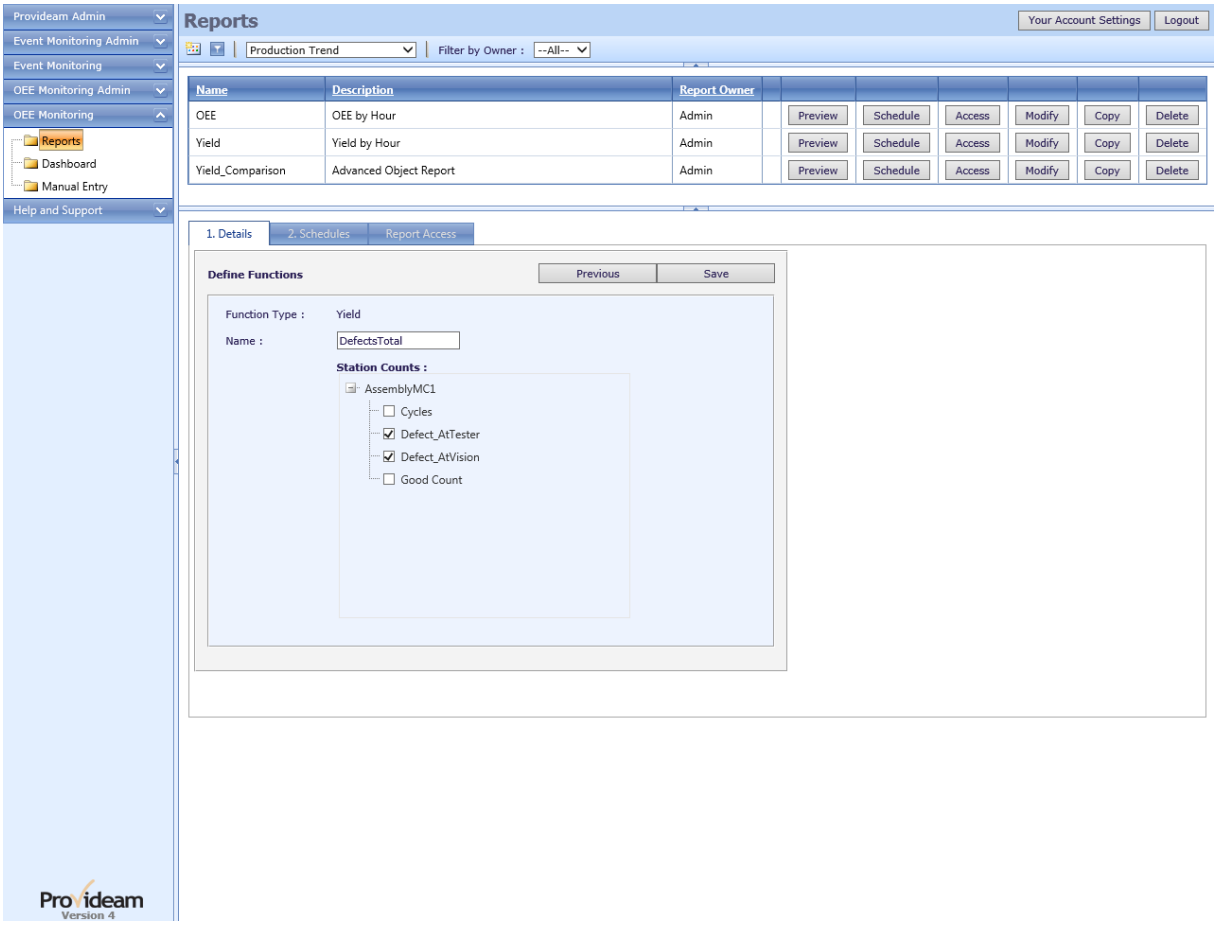


Fig. Production Trend Report - Specify Function Parameters

Step 6: Click the **Save** button to save the function definition and return to the Parameterized Functions Management Page.

Note: From this page you can modify or delete the Parameterized Functions you have defined for this Report.

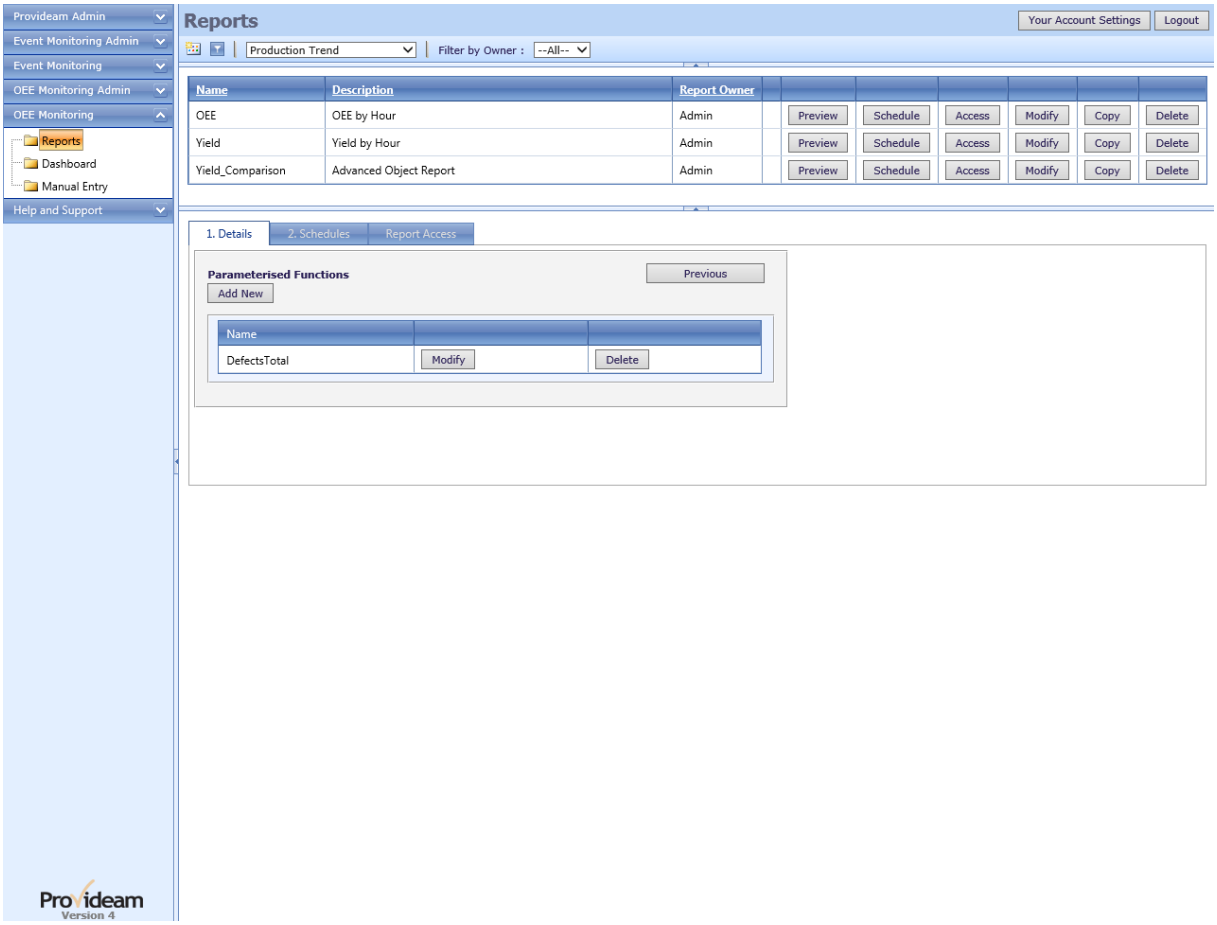


Fig. Production Trend Report - Edit or Delete Parameterized Functions

Step 7: Click the **Previous** button to return to the Report Wizard **Function Selection & Setup** page.

Note: Now you will see that the Parameterized Function has been added to your report.

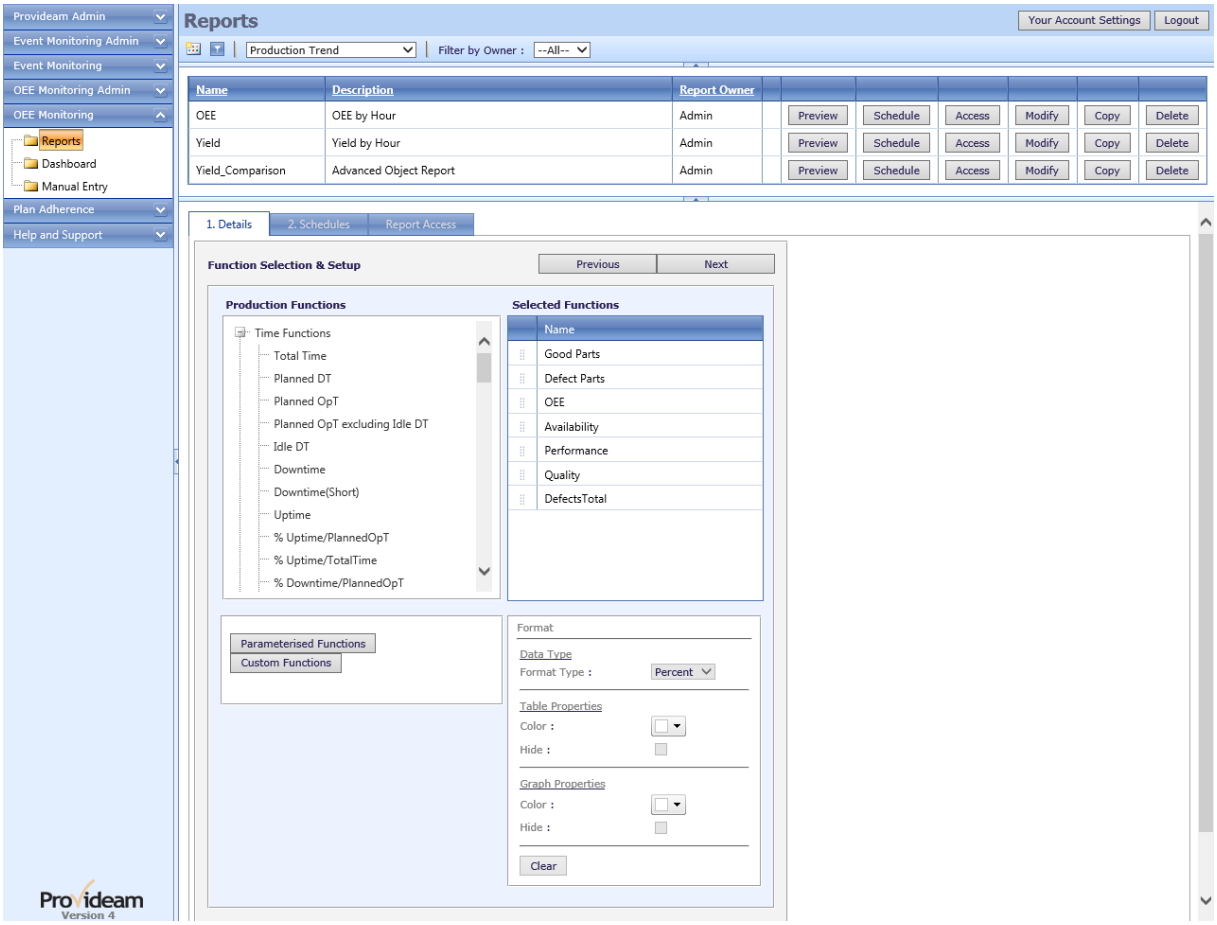


Fig. Production Trend Report - with Parameterized Functions

6.3.11 Customized Functions

The Customized Functions feature allows you to create functions of your own design by entering a simple scripted equation which defines the function.

There are two types of Customized Function. A scripted function and a static function. The purpose of scripted functions is to allow you to derive complex report functions based on standard functions. The purpose of static functions is to allow you to assign constants to field values in a report. For example you could assign a value of 20 to a static function when the MachineName field is 'AssemblyMC1'. This in turn could be used as the basis of Conditional Formatting.

In the Example 1 below a scripted Customized Function is created which calculates the Throughput as being '[Good Parts] + [Defect Parts]'

Example 1:

Scripted Customized Functions are added to a Report by clicking on the **Custom Functions** button on the **Function Selection & Setup** page of the Report Wizard.

Step 1: Click the **Custom Functions** button to open the Custom Functions Page.

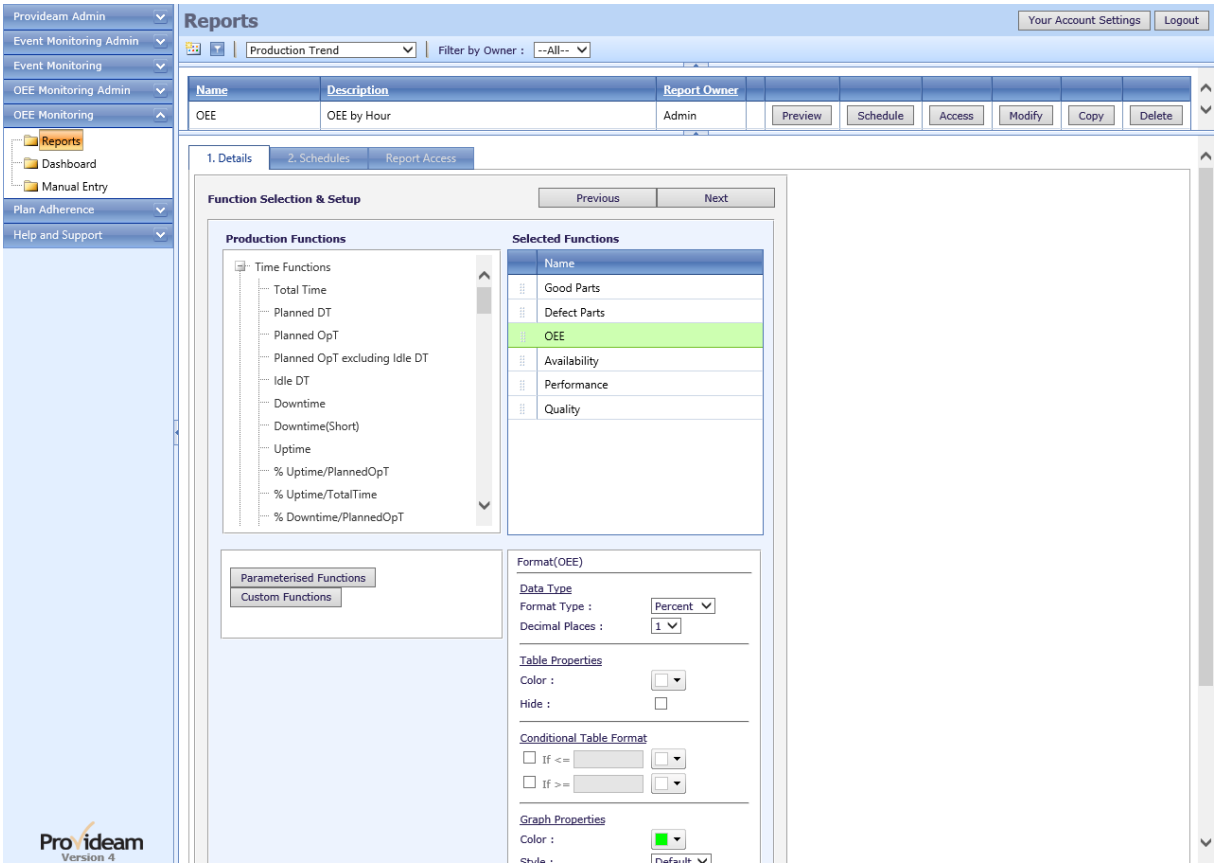


Fig. Production Trend Report - Select Functions, Add Custom Function

Step 2: Click the **Add New** button to add a new scripted Customized Function

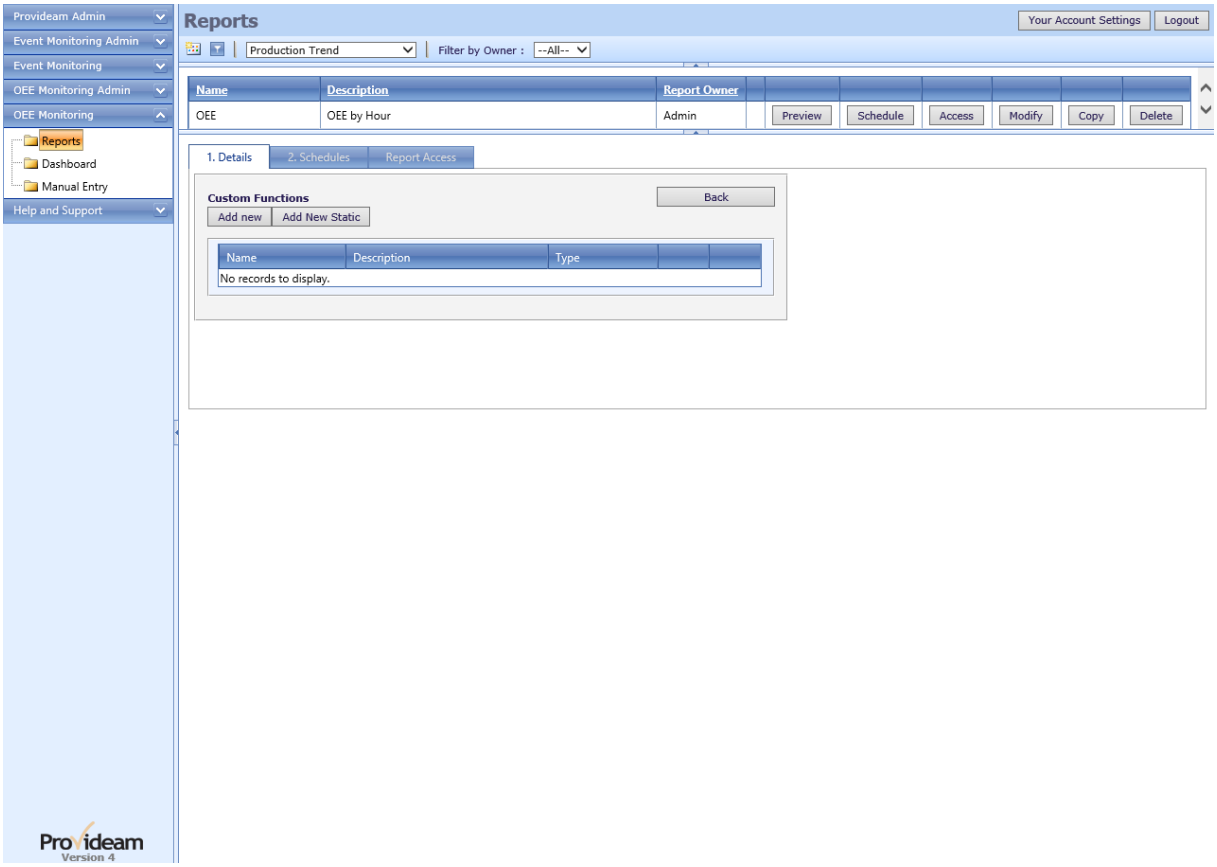


Fig. Production Trend Report - Add New Scripted Customized Function

Step 3: Now enter the function definition by combining the characters '()+-/*' with the exiting standard Functions. Drag and drop the [Good Parts] and [Defect Parts] functions to the Function Definition window. Click on the + button to add the '+' operator. Drag and drop the '+' operate to lie between the [*Good Parts*] and [*Defect Parts*] records, so that the **Final Custom Function** window shows '*Good Parts* + *Defect Parts*'. This will provide a sum of the [Good Parts] plus [Defect Parts].

Step 4: Enter *Throughput* as the unique name for the function.

Note:

1. Constant values can be add using the text box and **Add** button.
2. This example is somewhat facile as the standard Throughput Function will generate the same result.

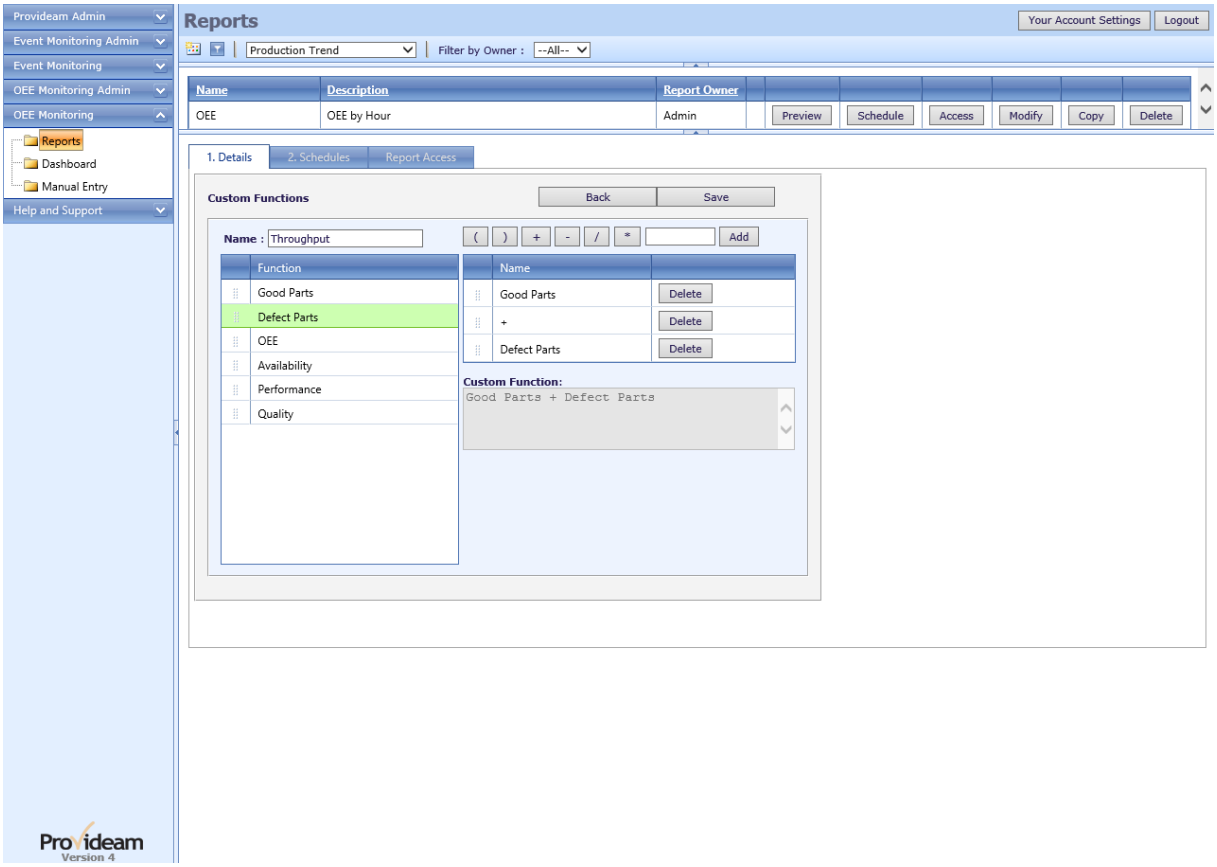


Fig. Production Trend Report - Create Scripted Custom Function Definition

Step 5: Click the **Save** button to save the function definition and return to the Custom Functions Management Page.

Note: From this page you can modify or delete the Custom Functions you have defined for this Report.

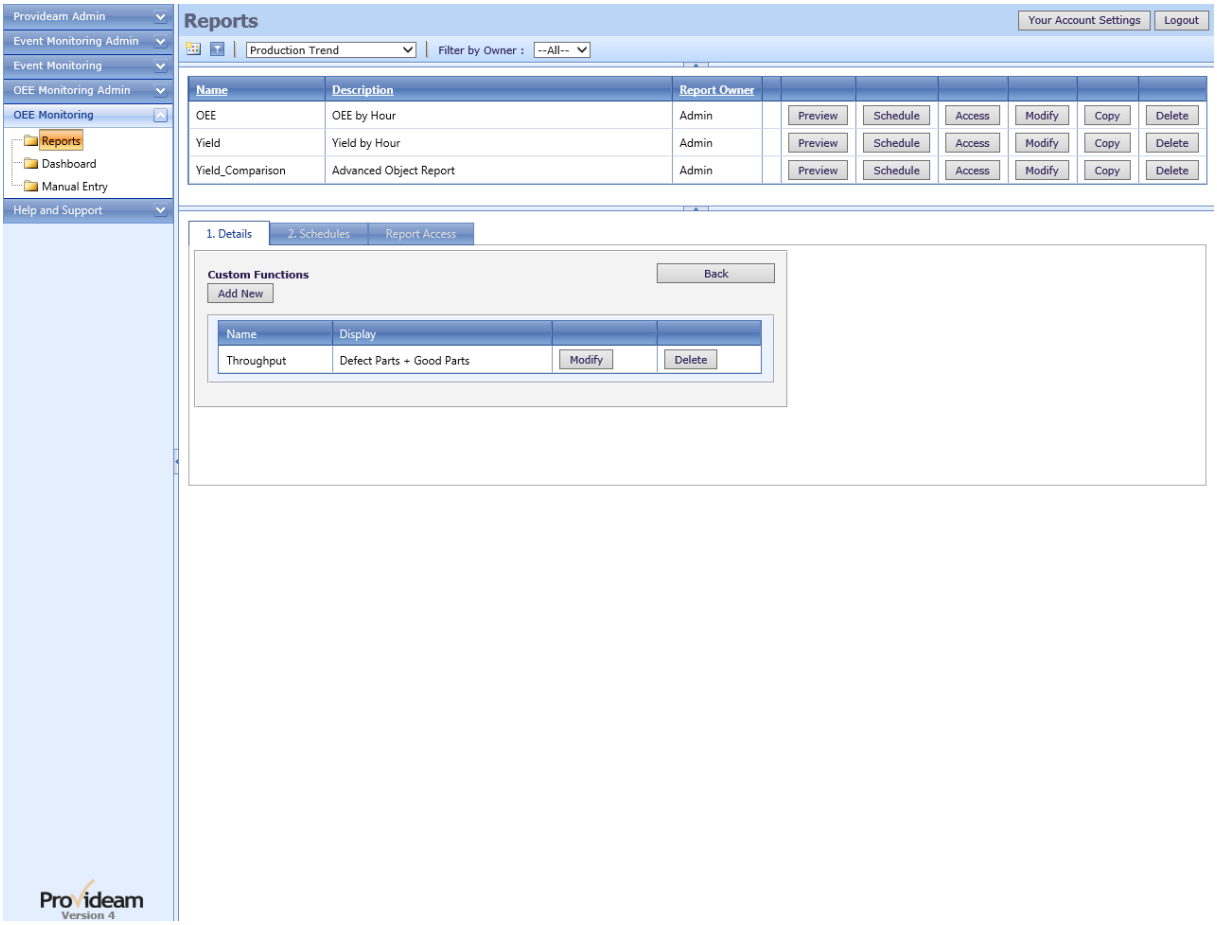


Fig. Production Trend Report - Edit or Delete Customized Functions

Step 6: Click the **Previous** button to return to the Report Wizard **Function Selection & Setup** page.

Note: Now you will see that the Customized Function has been added to your report.

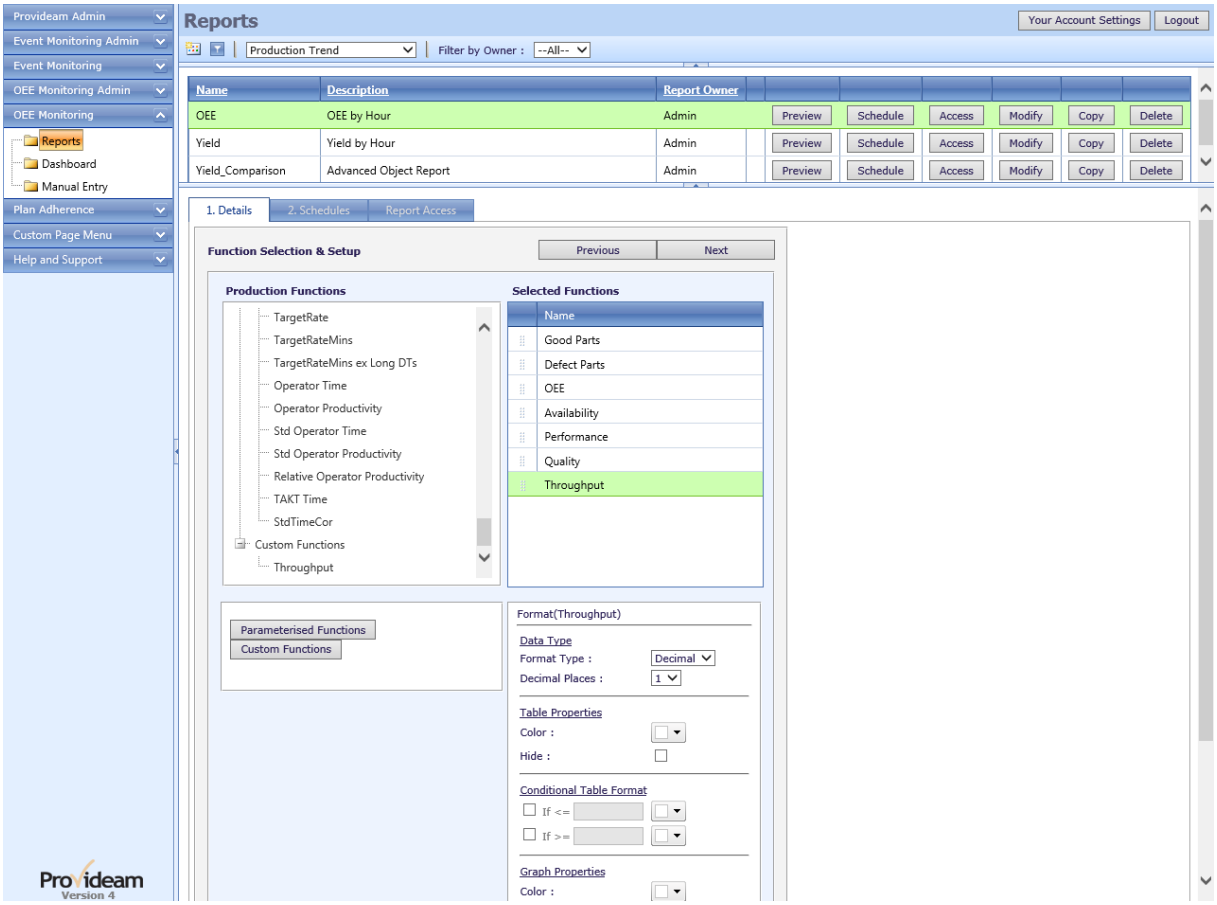


Fig. Production Trend Report - with Customized Functions

In the Example 2 below a static Custom Function is created to provide an individual OEE Target value for each MachineName.

Example 2:

To add a Static Customized Functions click the **Add New Static** button.

Step 2: Click the **Add New Static** button to add a new static Customized Function

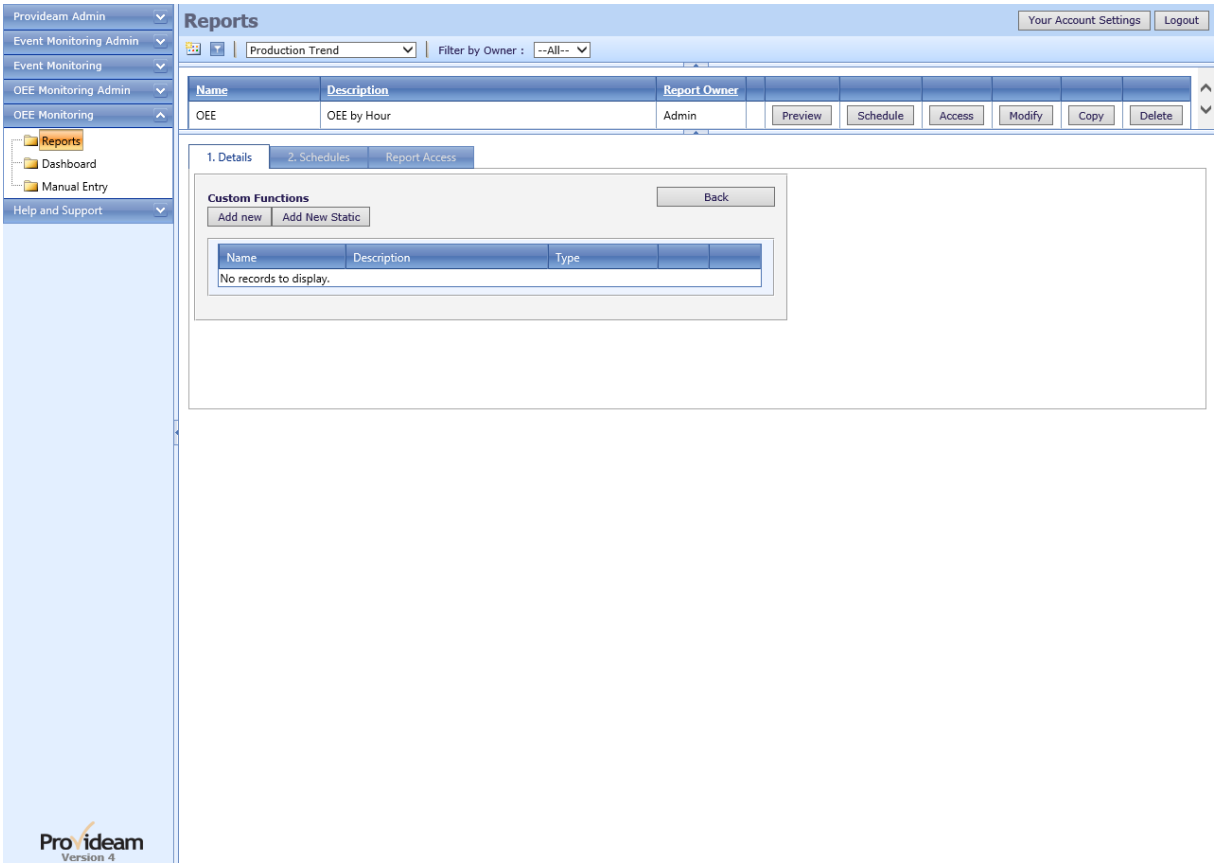


Fig. Production Trend Report - Add New Static Customized Function

Step 3: Enter *OEE Target* as the unique name for the function.

Step 4: Now click Add new button and select a Field Name [MachineName] and assign the Case and Value parameters.

Note:

1. The Seed button will generate a record for each value of the selected type that you have included in your Report. So, if for example, you select the MachineName type, and you have three Machines to be included in your report, the Seed function will create a record for each Machine, with the Seed Value you provide.
2. The Modify Multiple button allows you to edit the value of all selected rows at the same time. The button is enabled when multiple rows are selected. Hold down the CTRL key and Left Click the Mouse to select multiple rows.

When this Function is displayed on a Report, a Value will appear for each row in which the Field Name Case match occurs. The Function Cases will be processed in the order that they appear in the configuration.

For example, to resolve our Function, each row in the DataSet will be scanned until the first matching case is found. If the first row contains a value 'AssemblyMC1' in the MachineName field then the value 22 will be assigned to the Function on that row. If the

first Case does not match, then the function will continue to try to find a match by testing the remaining Case statements until all options are exhausted. If the DataSet row is a SubTotal on the Field Name 'Area' then the match may be made on the AreaName Case.

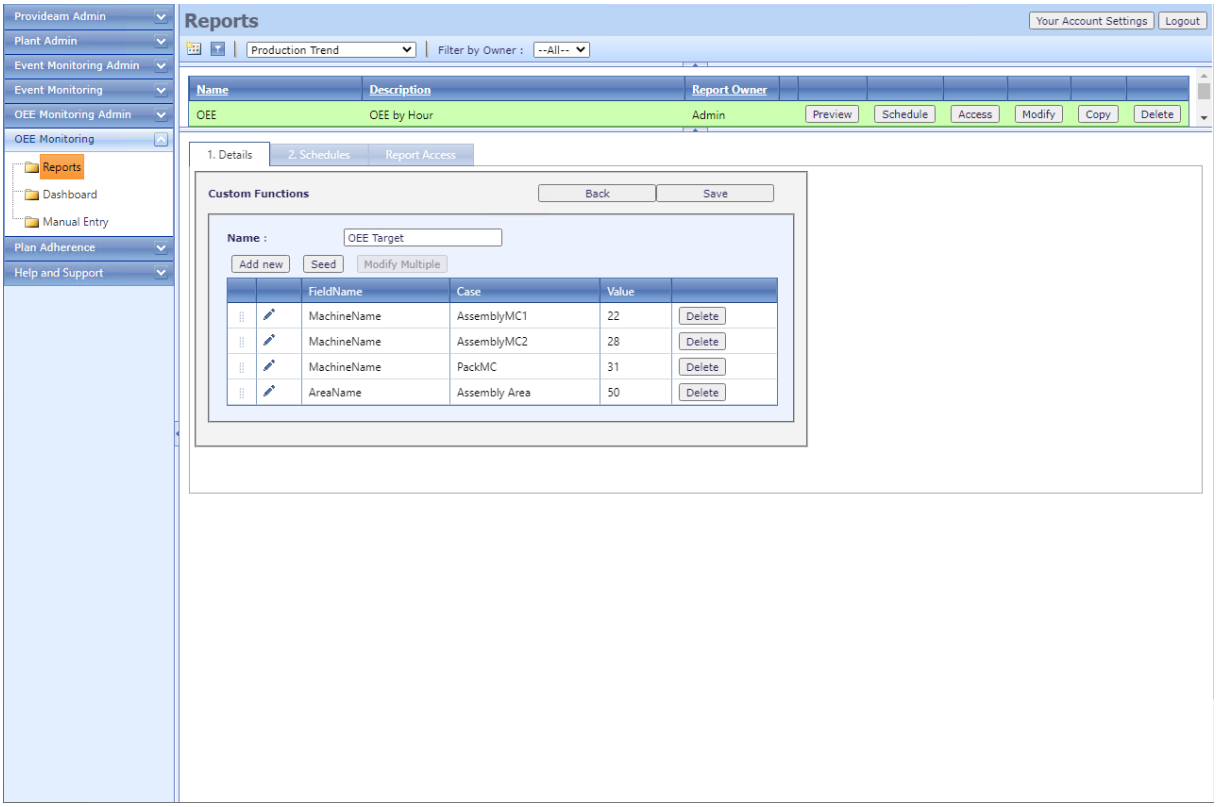


Fig. Production Trend Report - Create Static Custom Function Definition

6.3.12 Report Drilldown

The Report Drilldown feature allows the User to redraw the selected report using the same configuration details but with a more refined period. For example if your report configuration creates a new record for each week, it's possible to drill down on a selected week record so that the data is subsequently displayed by Day, Shift or Hour.

In the example below a standard OEE Report is created. The Report shows a record for each day of the selected week.

The Drilldown feature allows us the drilldown to a more refined period. For example in the example below we can drilldown from daily records, to shift or hour records.

Step 1: Click the icon to view the drilldown options.

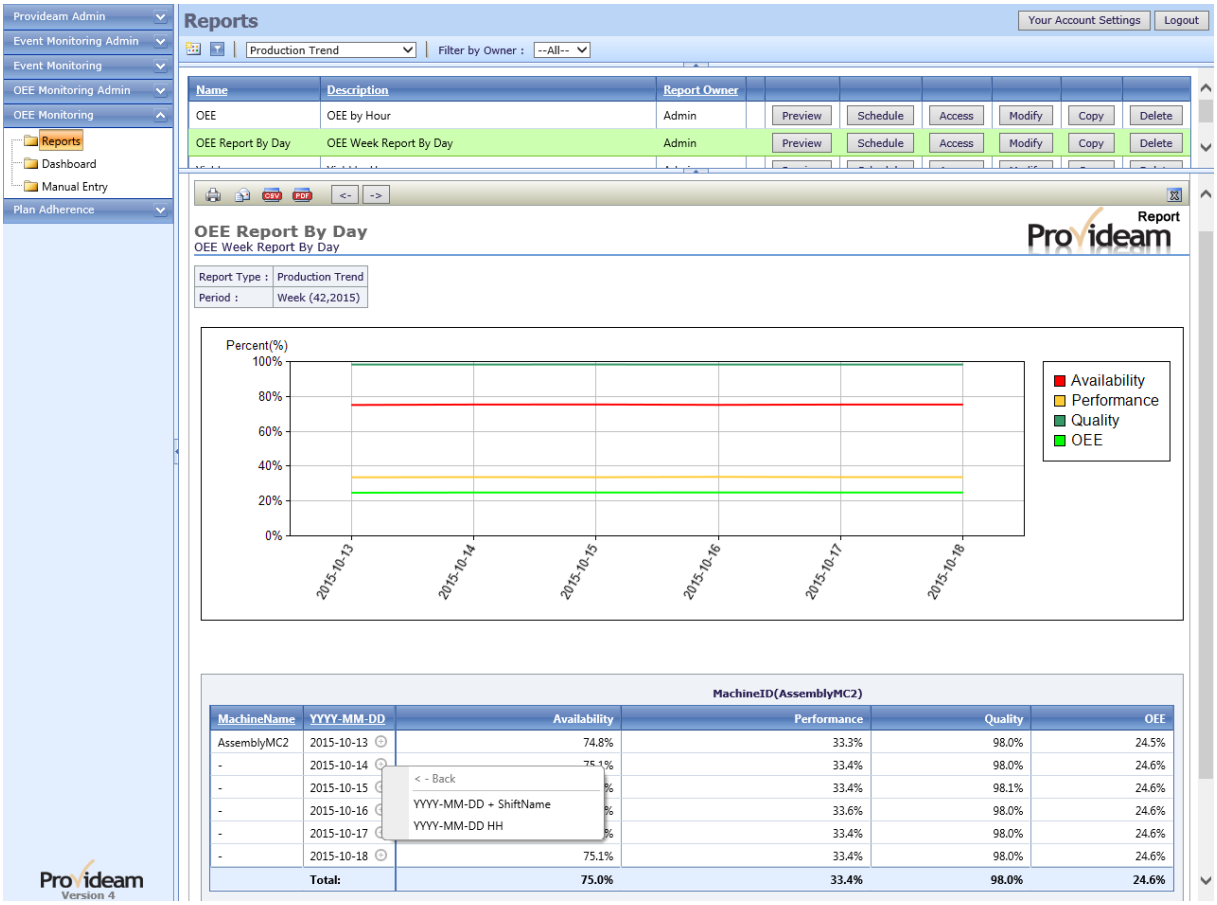


Fig. Production Trend Report - Click Drilldown icon to view drilldown options.

Step 2: Select the required drilldown level, or **Previous** to return to the previous level.

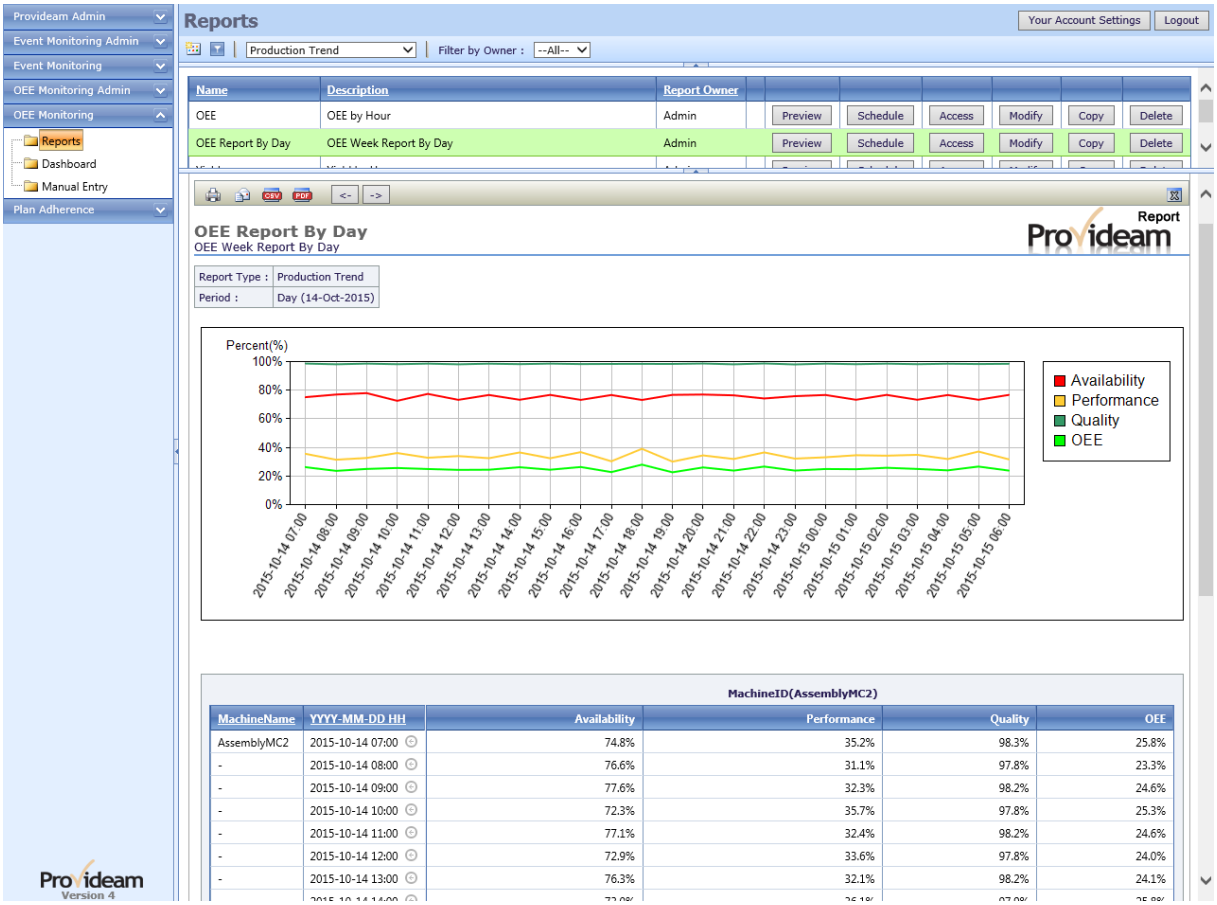


Fig. Production Trend Report - Drilldown selected Day record to show values by Hour.

6.3.13 Customized Formats

The Customized Formats feature allows you to apply your own formats to selected Fields or Functions.

Fields or Functions to which a Customized Format has been apply will appear in bold font in the Selection Box.

OEE Fields

In the example below a Customized Format has been applied to a Field

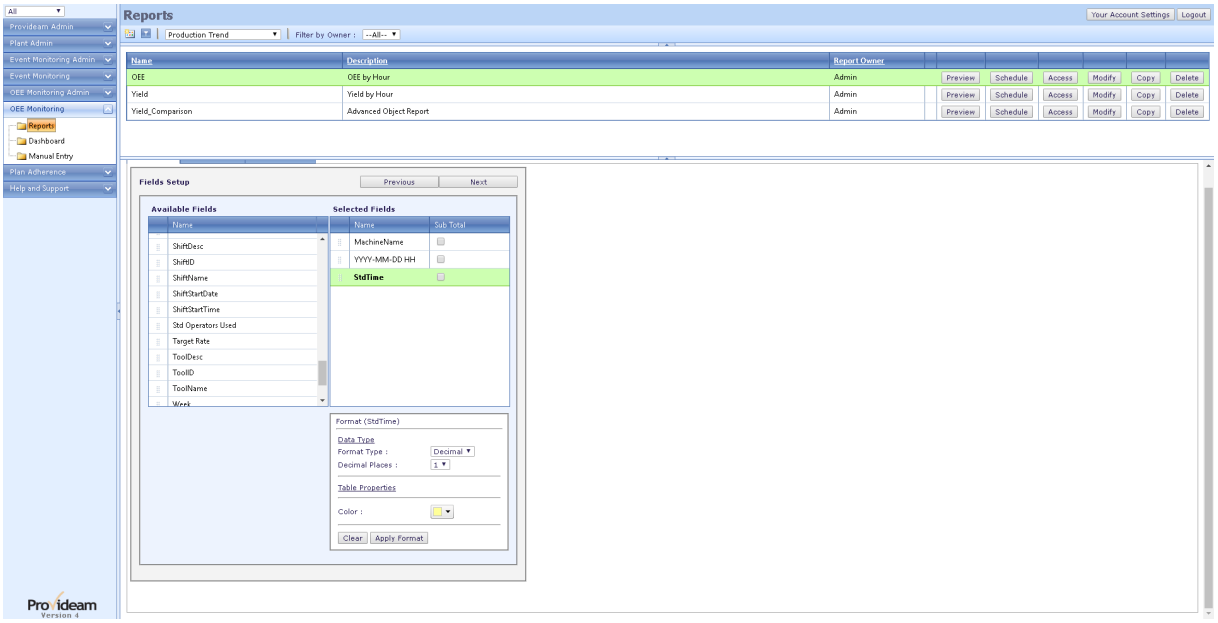


Fig. Production Trend Report - Add Custom Format to OEE Field

Item	Description
Format Type	The selection box allows you to set how the Field will be Formatted. Choices include Default, Text, Decimal, Percent & Count
Decimal Places	If Decimal or Percent are selected for the Format Type then you can set the number of Decimal Places using this selection box.
Count Format	If Count has been selected for the Format Type then the Field will be displayed, if possible as an integer.
Default Format	If Default has been selected for the Format Type then the Field will be displayed in the format which Provideam normally uses to display the selected Field.
Table Color	The selection box allows you to choose the default background color for the Function in Tables.
Clear Button	Clicking this button will remove all Customized Formatting.
Apply Format Button	Clicking this button will apply the selected Customized Formatting.

OEE Functions

In the example below a Customized Format has been applied to the OEE Function.

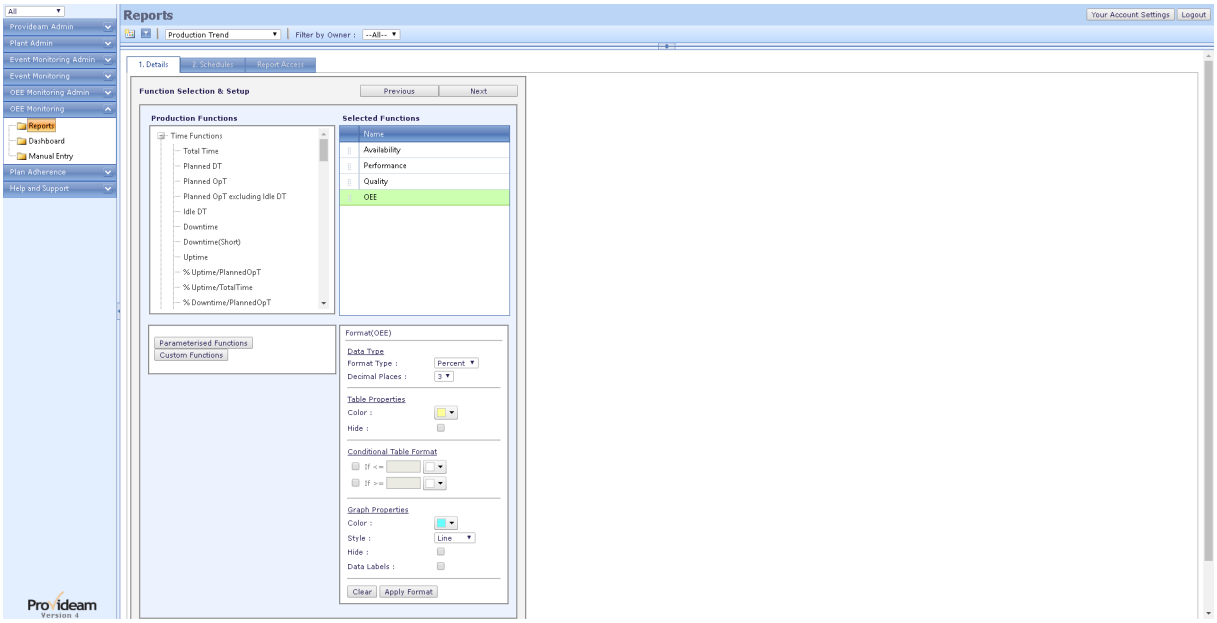


Fig. Production Trend Report - Add Custom Format to OEE Function

Item	Description
Format Type	The selection box allows you to set how the Function will be Formatted. Choices include Count, Decimal, Percent & Time
Decimal Places	If Decimal or Percent are selected for the Format Type then you can set the number of Decimal Places using this selection box.
Time Format	If Time has been selected for the Format Type then you can set the specific format using this selection box. Choices include; Hours, Minutes, Seconds, mmm:ss, hhh:mm:ss & ddd hh:mm:ss.
Table Color	The selection box allows you to choose the default background color for the Function in Tables.
Table Hide	The checkbox allows you to choose to hide the Function from the Table.
Table Conditional Format	Check the checkboxes to enable Conditional Formatting. When Conditional Formatting is enabled you can choose to have the background Table colors change for the selected Function as the value of the Function exceeds or falls below the set points you enter. If you have created Static Custom Functions these can be used in Conditional Formatting. This enables you to assign different Conditional Formatting Targets depending on the values of Fields in the Data Table.
Graph Color	The selection box allows you to choose the default color of the Function when drawn on a chart.
Graph Style	The selection box allows you to choose how the Function is presented on a Line (Trend) or Bar Chart. The choices are Default, Line or Bar. If you choose Default then the Function will be drawn in the default style of the Chart. However if you choose Line and the Chart is a Bar Chart, then the Function will appear as a Line on the Bar Chart. Likewise if you choose Bar and the Chart is a Line Chart, then the Function will appear as a Bar on the Line Chart.
Graph Hide	The checkbox allows you to choose to hide the Function from the Chart.
Graph Data Labels	The checkbox allows you to choose to display Data Labels for the selected Function on the Chart.
Clear Button	Clicking this button will remove all Customized Formatting.
Apply Format Button	Clicking this button will apply the selected Customized Formatting.

In the screenshot below you will see how Static Functions can be used in Conditional Formatting. In this case the Custom Static Function OEE Target has been created and

this gives additional options in the Conditional Format Section. Now any function can be formatted with respect to a Static Function.

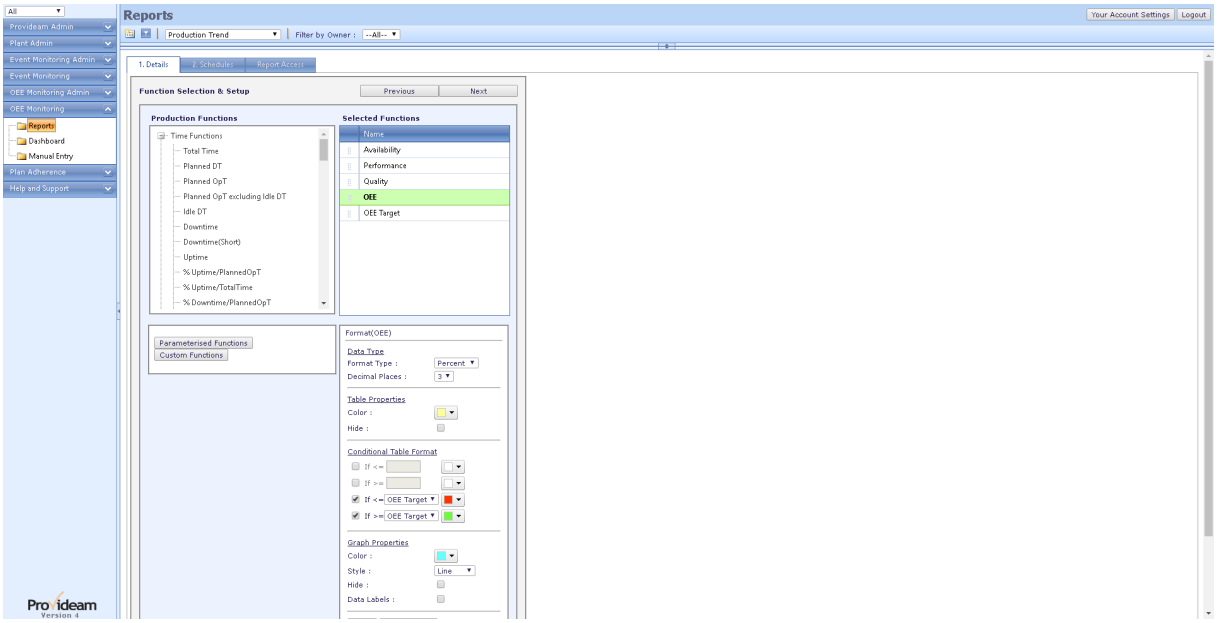


Fig. Production Trend Report - Conditional Formatting with Static Functions

6.4 Event Reports

The Event Reports Section enables you to create various Event Report Templates. These Report Templates define all the parameters, apart from the actually date, required to generate a Report. Each of the Report Types is based on an Event Collection which you must first create in the Event Monitoring Admin Section.

Report Templates which you create can be;

- Previewed and then Emailed, Printed, Exported as CSV or Exported as PDF.
- Scheduled to be run at predefined times and sent to a mailing list via Email.

Report Types

Provideam offers three basic report types;

Current Status

The Current Status report shows a table of the current value of each Item in the Event Collection.

Active Alarms

The Active Alarm report shows a table of the each Item, which is currently in an alarm state, in the Event Collection.

Simple Log

The Simple Log shows a Table and/or Graph of the data logged for each Item in the Collection over a defined period.

Simple Group

The Simple Group shows a Table of the data logged for each Item and Function in the Collection over a defined period (differently from the Simple Log, the Simple Group only allows you to choose one Field from the Fields section).

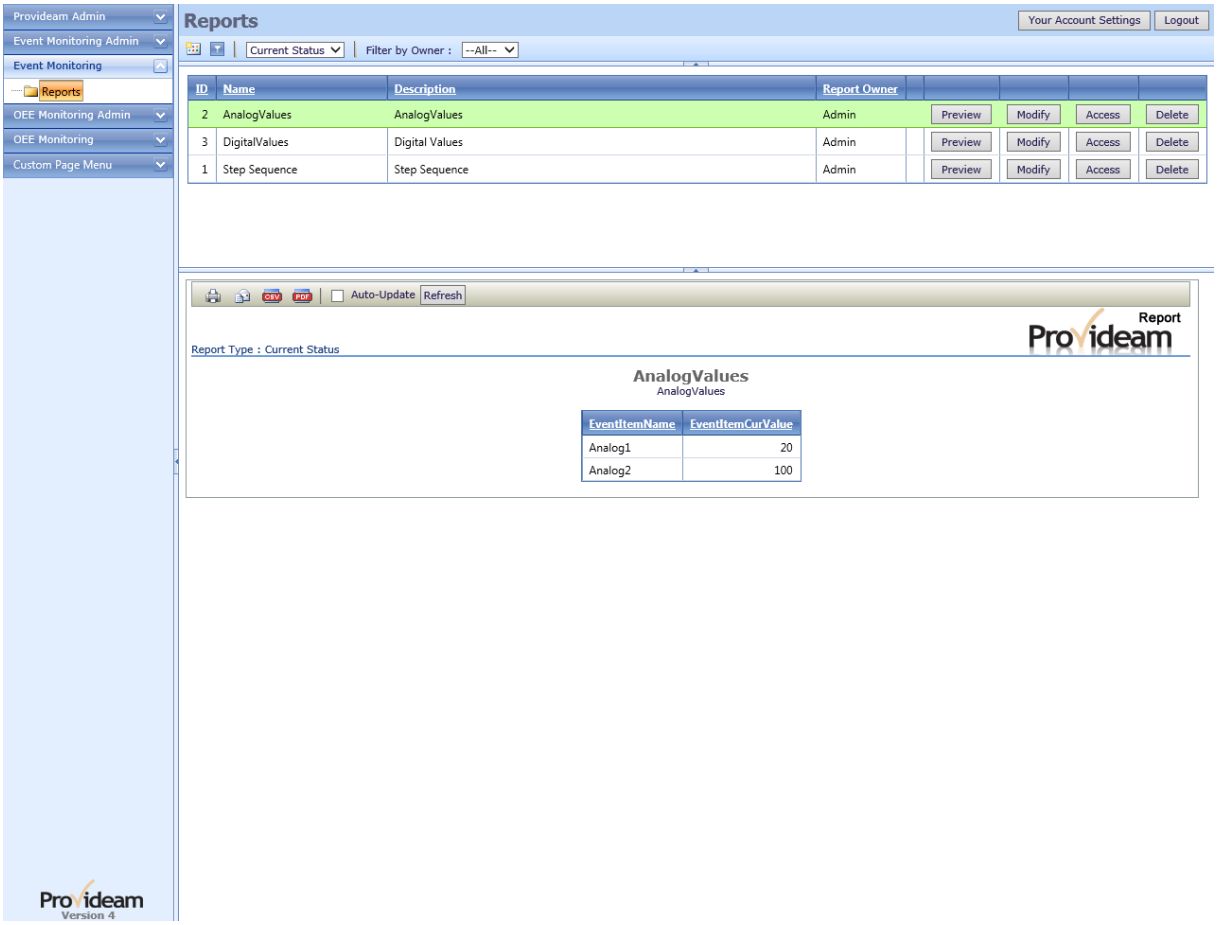


Fig. Reports View

Item	Description
Reports View	Interface which allows you to define Report Templates, run existing Reports, and create Schedules to automatically send Reports to a mailing list via Email
Report Type Selection	Filter to select the Type of Report you wish to configure.

6.4.1 Simple Log Report

In this section we will demonstrate how to create Simple Log Reports.

Example 1: Simple Log, Day Report with Graph

Step 1: Select *Simple Log* from the **Report Type** Filter

Step 2: Click on the 'New' icon and enter the details;

Name: *AnalogLog*

Description: *AnalogLog*

Select the *AnalogValues* **Event Collection** option.

Select the *Graph* **Report Type** option.

Check *EventComment* and *EventItemCurValue* **Field**. (EventID, EventStartDate etc., are required Fields and are therefore checked by default).

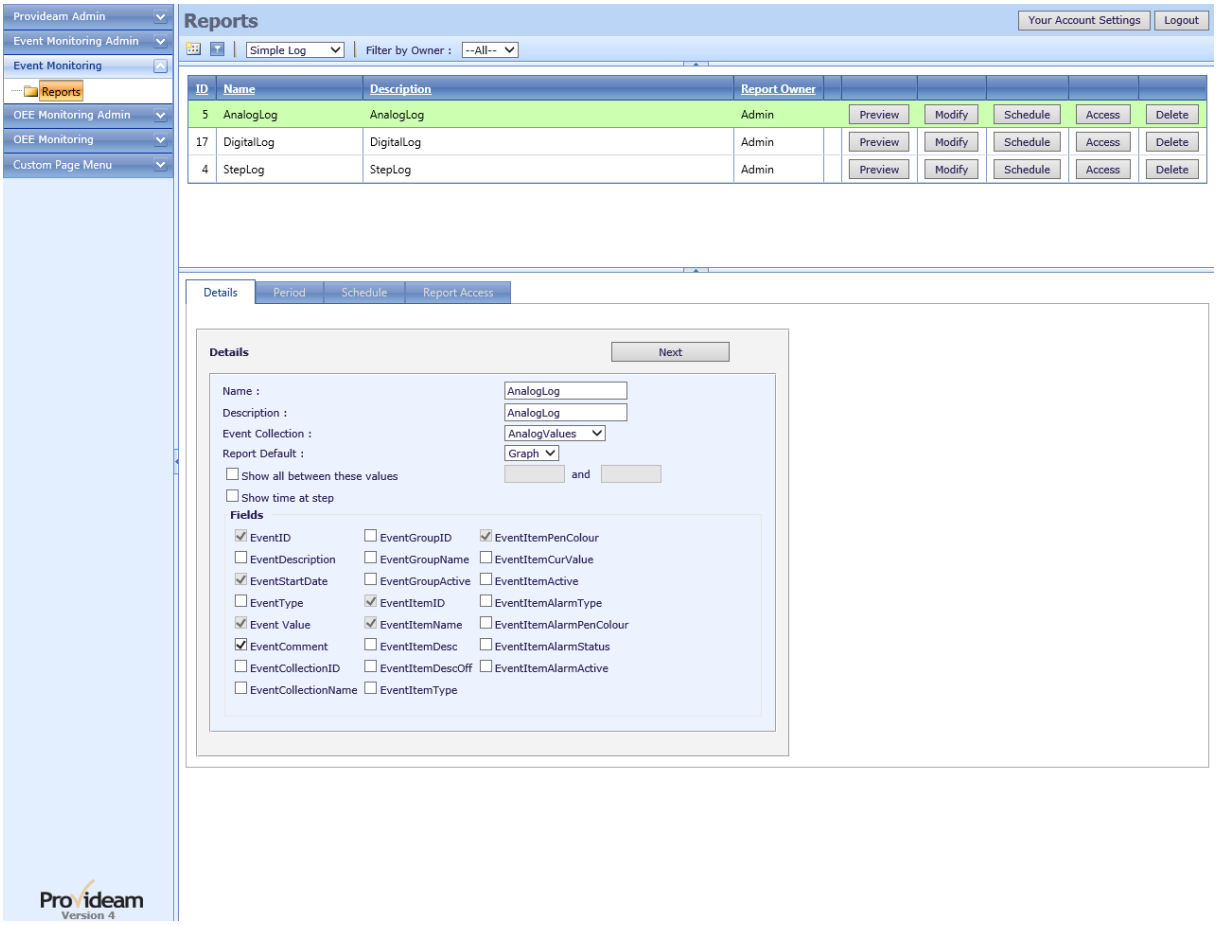


Fig. Simple Log Report - New Report

Step 3: Click **Next** to move on to the Period selection.

Step 4: Select the *Day* option button.

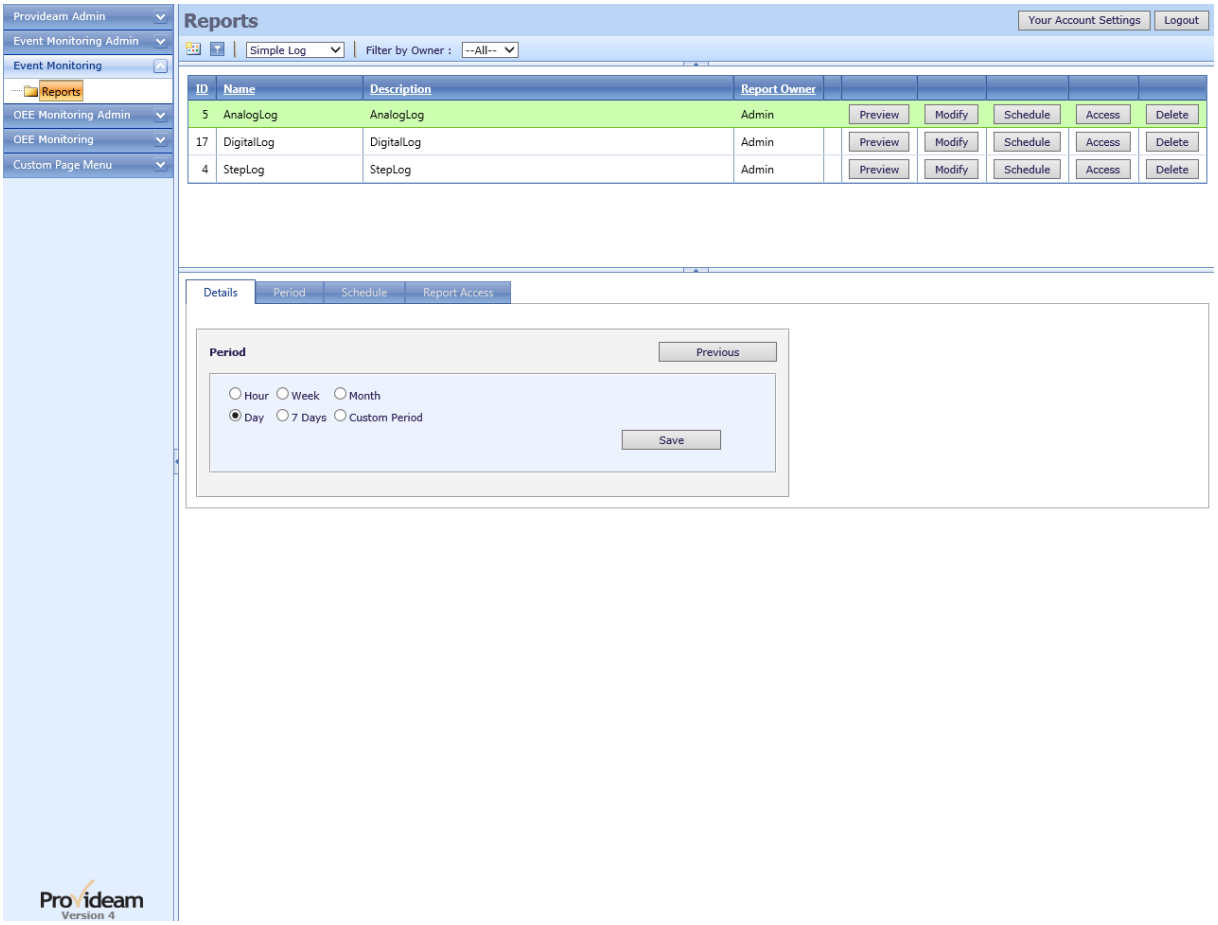


Fig. Simple Log Report - Select Period

Step 5: Click **Add New** to save this Report Template.

Step 6:Click on the report record in the upper table to run this Report Template.

Step 7: Select a **Date**.

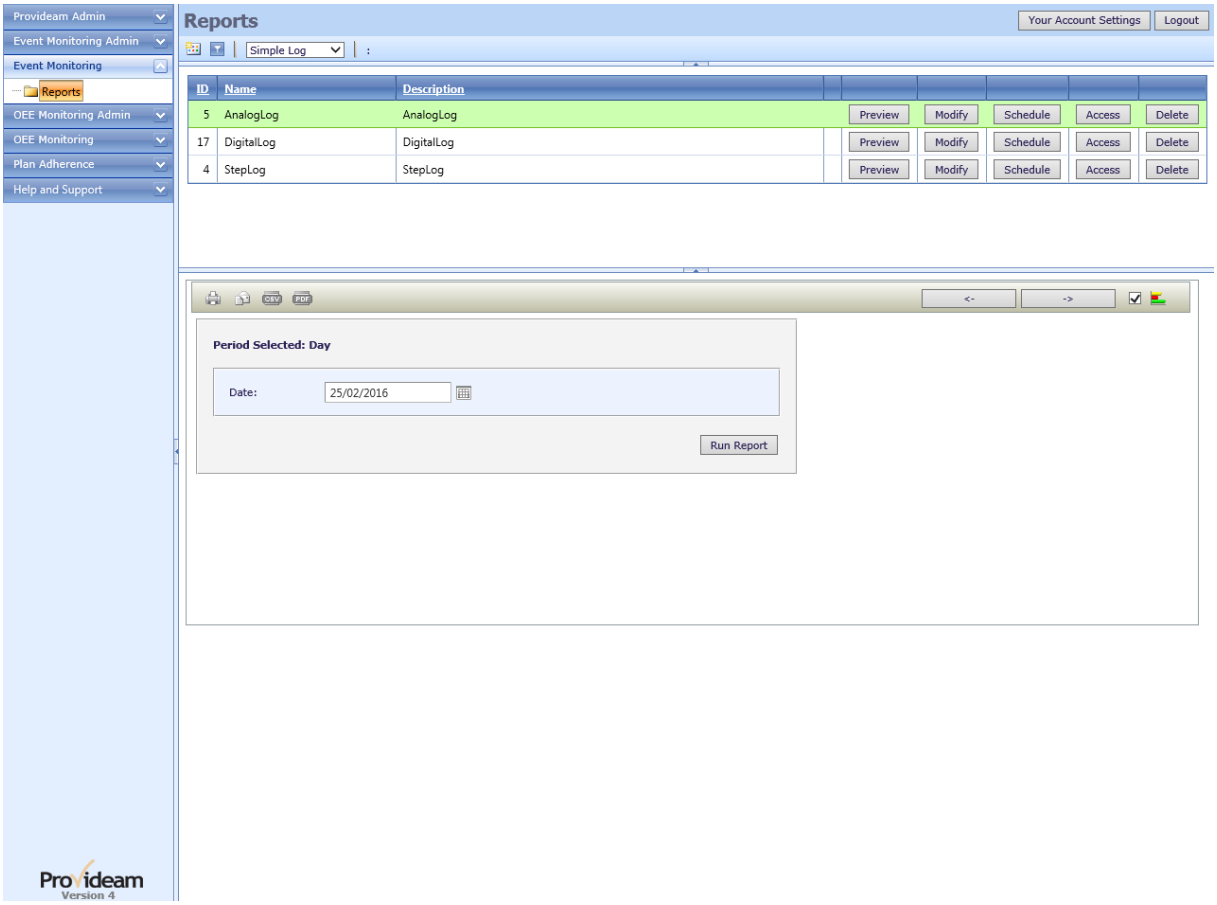


Fig. Simple Log Report - Select Report Period Parameters

Step 8: Click **Run Report** to generate a report preview.

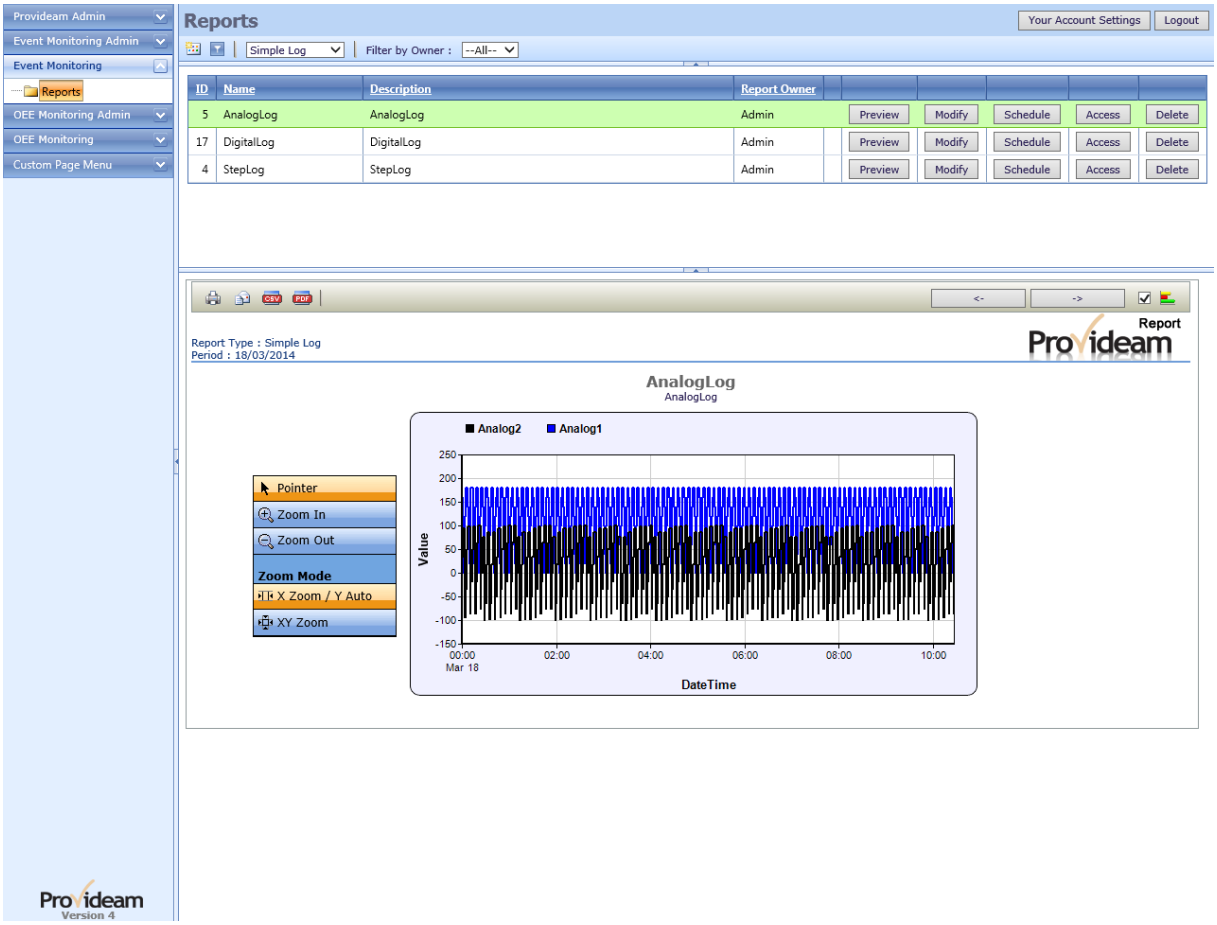


Fig. Simple Log Report - Preview Simple Log Report

6.4.2 Simple Group

In this section we will demonstrate how to create Simple Group Reports.

Example 2: Simple Group, Day Report

Step 1: Select *Simple Group* from the **Report Type** Filter

Step 2: Click on the 'New' icon and enter the details;

Name: *AnalogLog*

Description: *AnalogLog*

Select the *AnalogValues* **Event Collection** option.

Check *EventComment* **Field**.

Check *EventStdDev* **Function.**

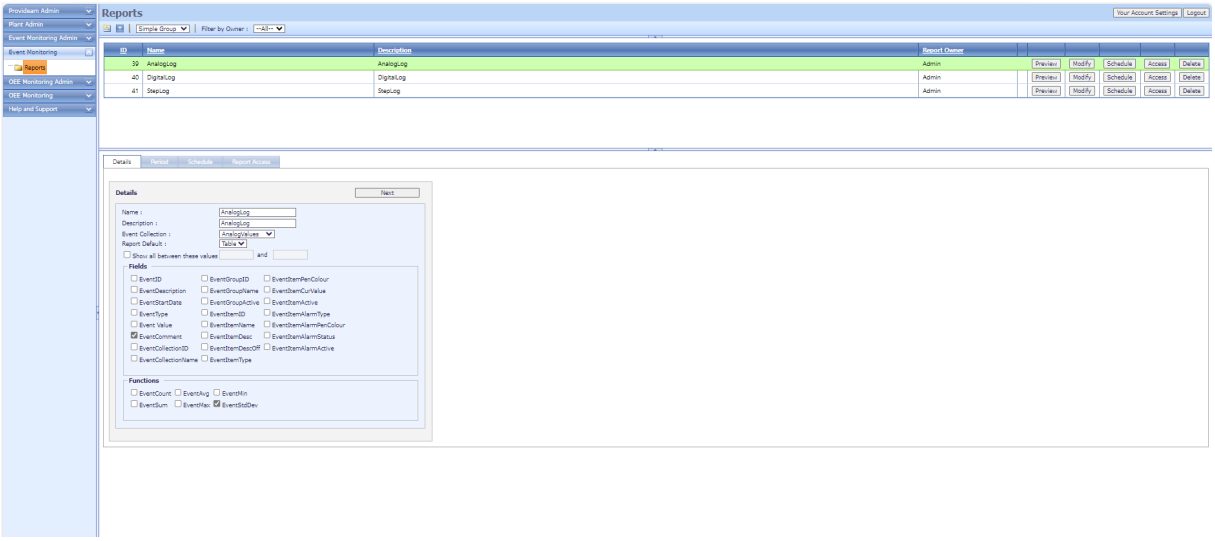


Fig. Simple Group Report - New Report

Step 3: Click **Next** to move on to the Period selection.

Step 4: Select the *Day* option button.

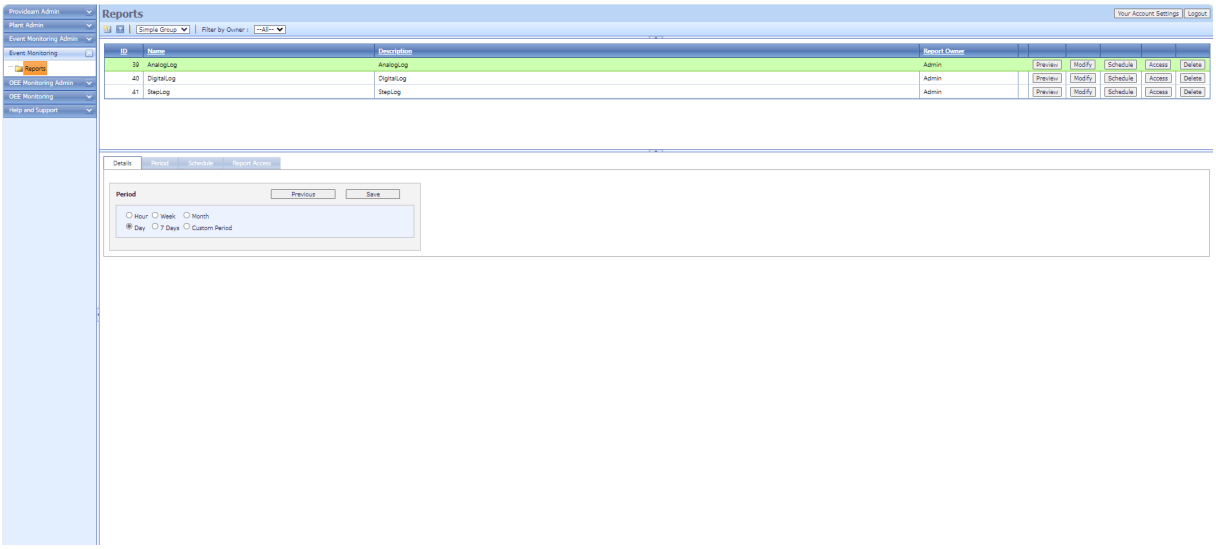


Fig. Simple Group Report - Select Period

Step 5: Click **Add New** to save this Report Template.

Step 6:Click on the report record in the upper table to run this Report Template.

Step 7: Select a **Date**.

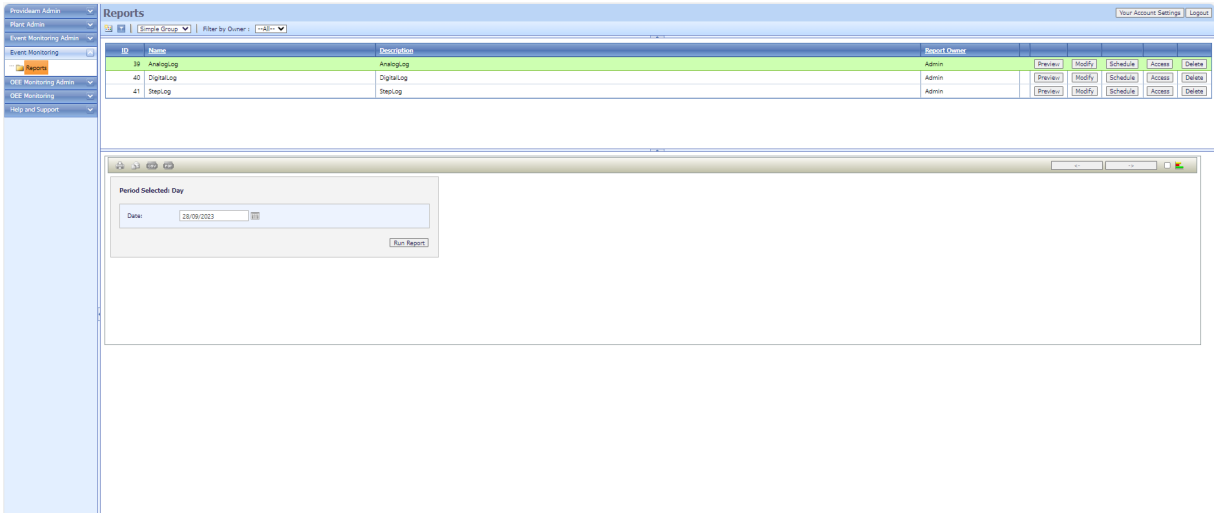


Fig. Simple Group Report - Select Report Period Parameters

Step 8: Click **Run Report** to generate a report preview.

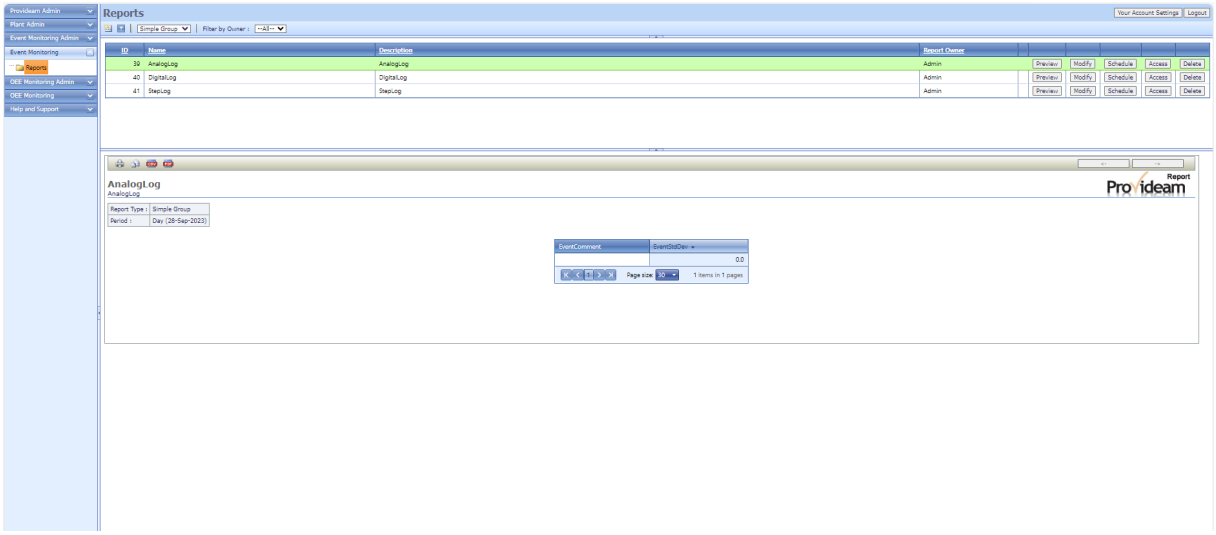


Fig. Simple Group Report - Preview Simple Log Report

6.5 Filter Function

The Filter Function is used throughout Provideam and provides an easy to use, yet extremely powerful method for filtering your data.

Example 1: Simple Filter

The following screenshot shows a simple example of a one term filter

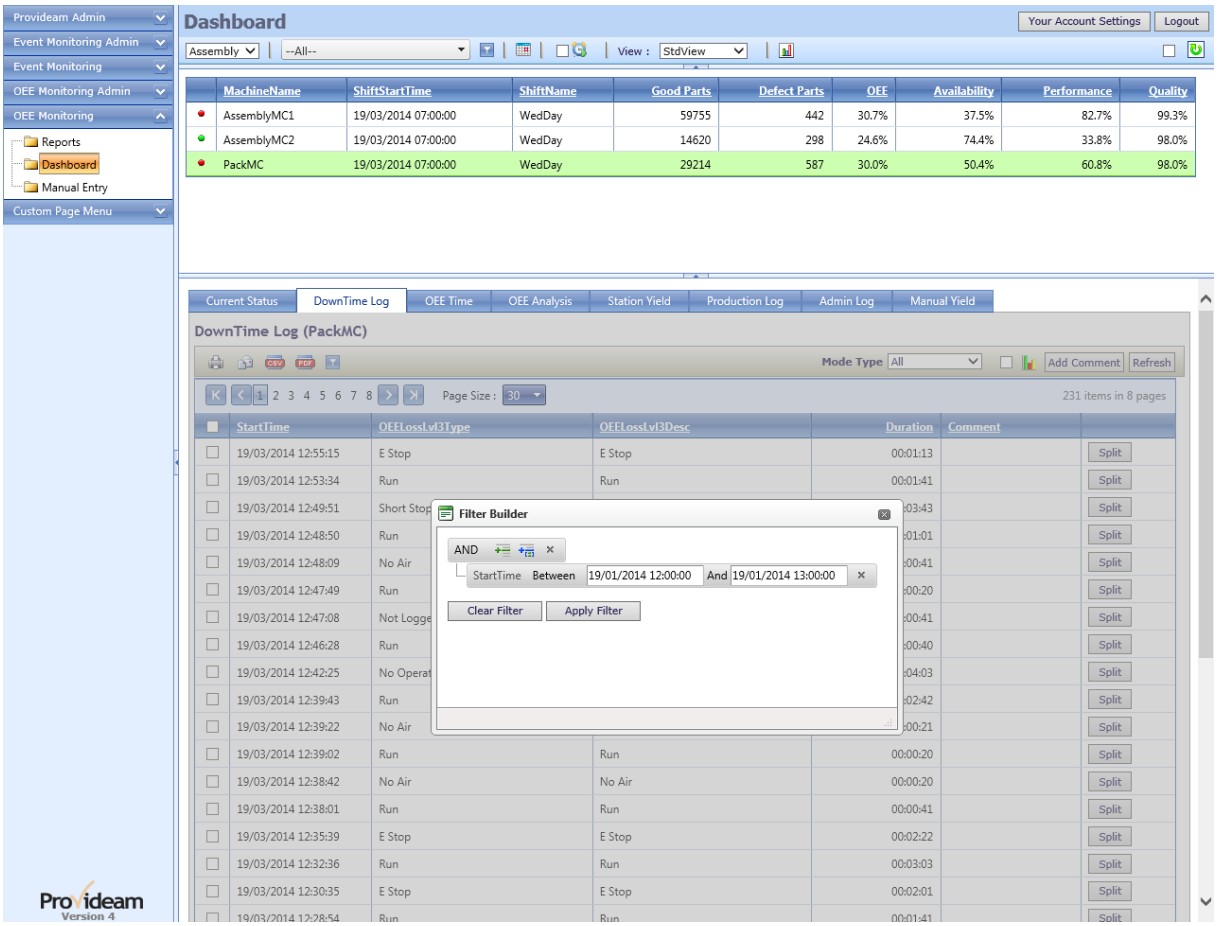


Fig. Simple One Term Filter

Filter Expression:

WHERE (StartTime BETWEEN 19/03/2014 12:00:00 AND 19/03/2014 13:00:00)

The filter expressions are built up Term by Term. Terms can be combined in Sub Groups to make more complex expressions.

The following screenshot shows the tools used to build a filter.

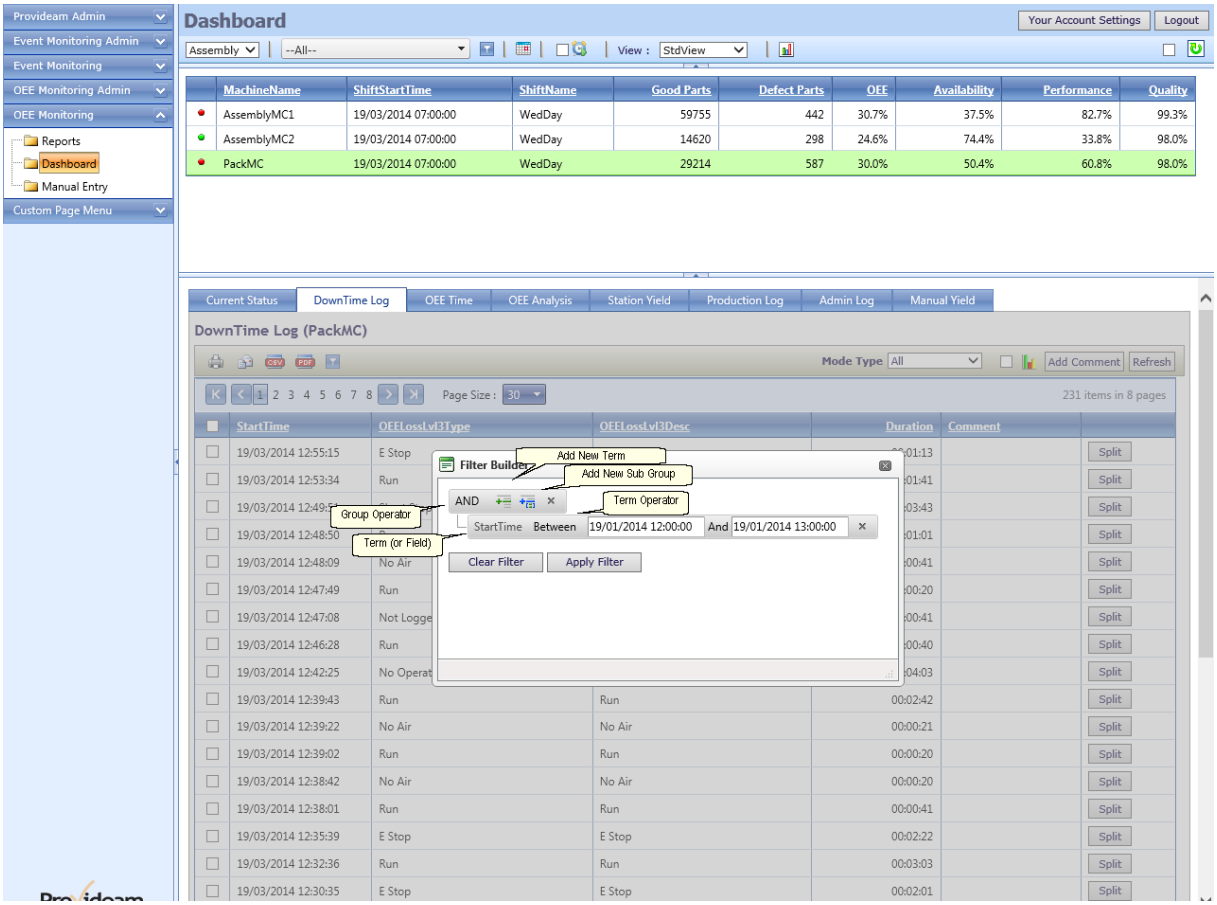


Fig. Filter Tools

Example 2: Simple Filter with AND Group Operator

The following screenshot shows a simple example of a filter using the AND Group Operator.

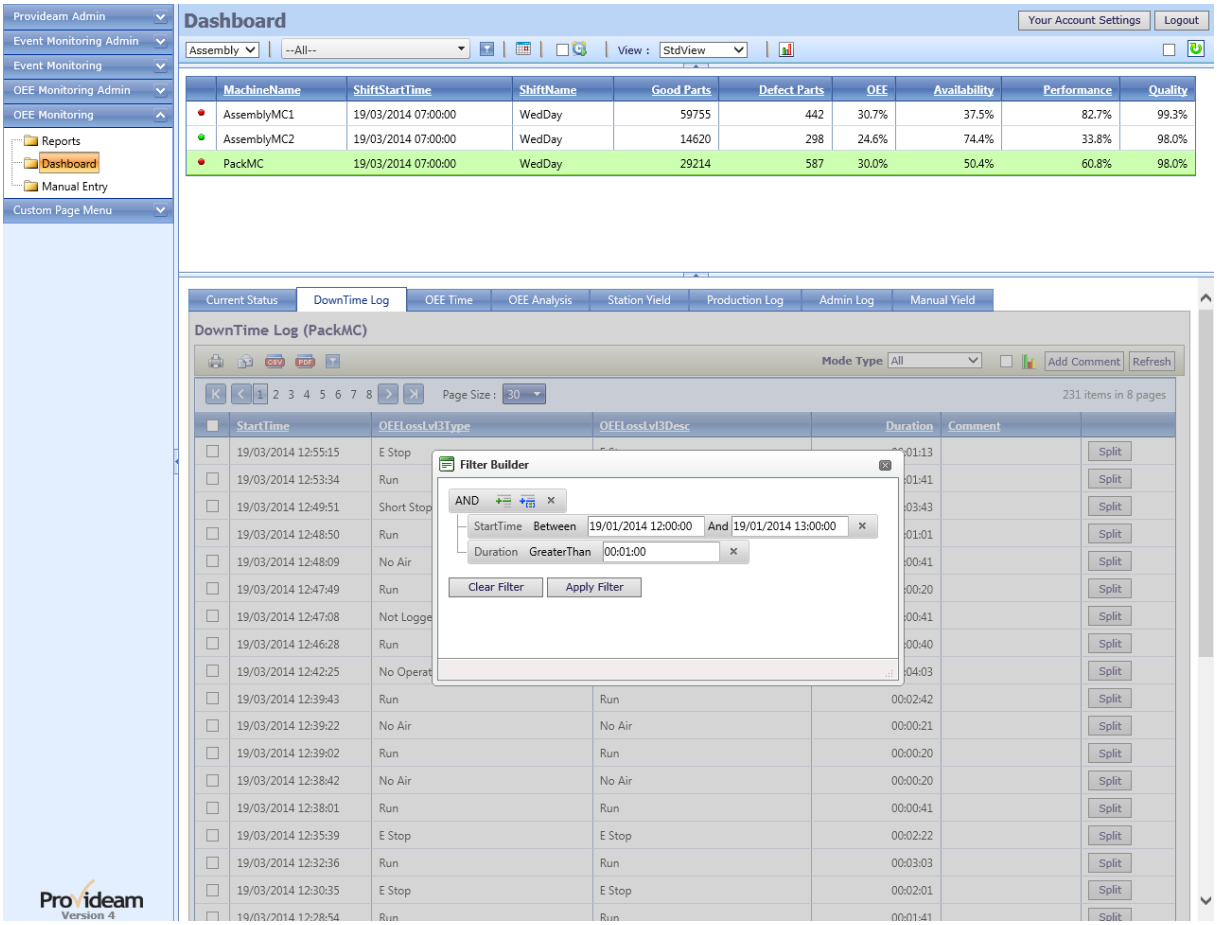


Fig. Simple Two Term Filter with AND Group Operator

Filter Expression:

WHERE (StartTime BETWEEN 19/03/2014 12:00:00 AND 19/03/2014 13:00:00)

AND (Duration GREATER THAN 00:01:00)

Example 3: Filter with Sub Group

The following screenshot shows an example of a filter using the AND Group Operator with a Sub Group with the OR Group Operator.

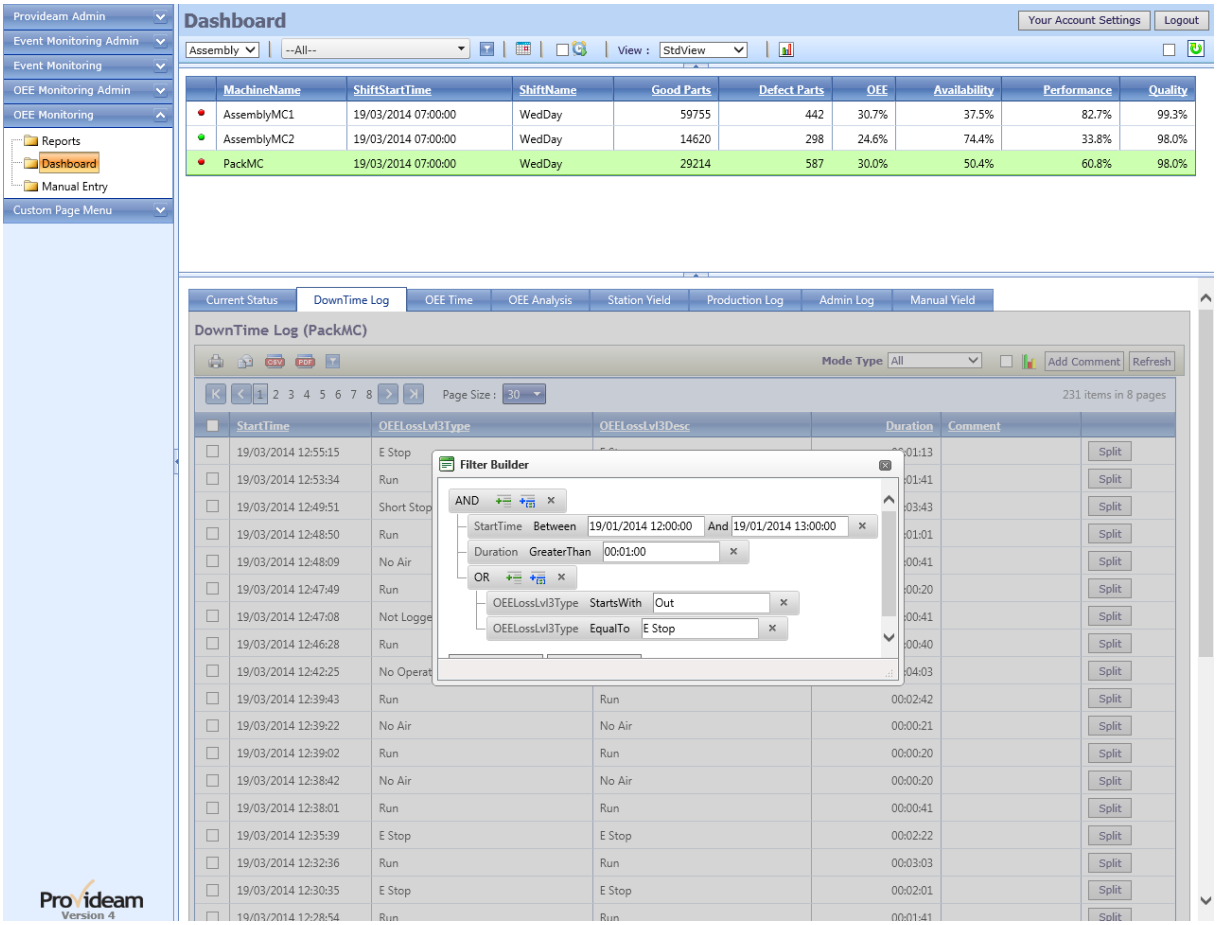


Fig. Filter with Sub Group

Filter Expression:

WHERE (StartTime BETWEEN 19/03/2014 12:00:00 AND 19/03/2014 13:00:00)

AND (Duration GREATER THAN 00:01:00)

AND ((OEELossLvl3Type STARTS WITH "Out") OR (OEELossLvl3Type EQUAL TO "E Stop"))

Example 4: Complex Filter with Multiple Sub Groups

The following screenshot shows a complex example of a filter using multiple Sub Groups.

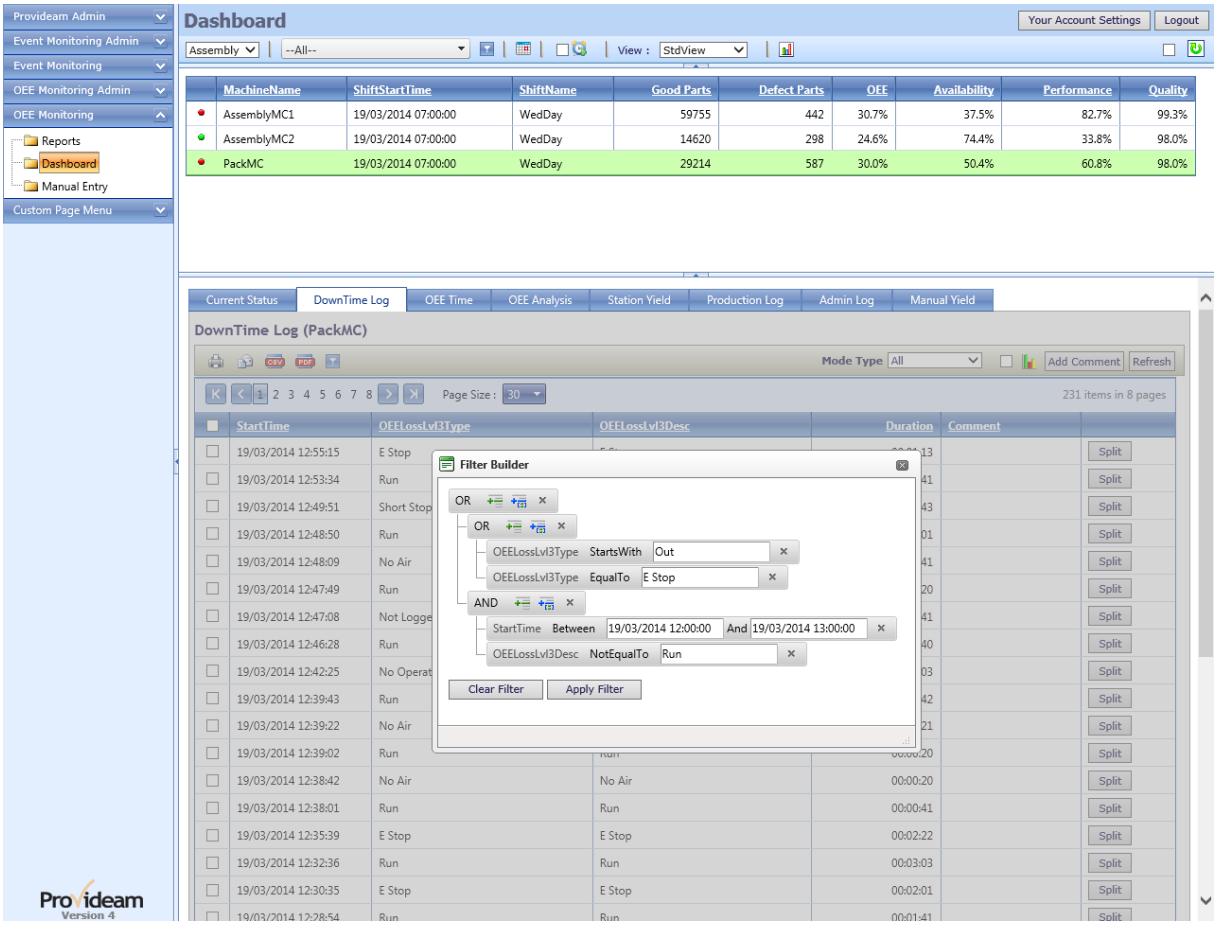


Fig. Complex Filter with Multiple Sub Group

Filter Expression:

WHERE ((OEELossLvl3Type STARTS WITH "Out") OR (OEELossLvl3Type EQUAL TO "E Stop"))

OR ((StartTime BETWEEN 19/03/2014 14:00:00 AND 19/03/2014 13:00:00)

AND (OEELossLvl3Desc NOT EQUAL TO "Run"))

Section VII:

Provideam Reference Guide

Provideam 4.18

Manufacturing Productivity Solutions

7 Provideam Reference Guide

This chapter aims to provide a comprehensive reference guide to the structure and features of Provideam.

- Section 1 details the structure of the Provideam Application.
- Section 2 describes how to modify the Provideam Database connection string.
- Sections 3, 4 and 5 describe the features of the User Interface in relation to Provideam Admin, the OEE Monitoring Module and the Event Monitoring Module.
- Section 6 explains how to configure Provideam to collect data from an OMRON PLC using a Kepware OPC Server.

7.1 Provideam Components

The Provideam Application is made up of of several component modules, each of which has a specific set of tasks. The following pages will describe the relationships between the various components.

7.1.1 Provideam Application Server

The figure below shows the components which combine together to form a Provideam Solution. The central area represents the Provideam Server PC. At the heart of the Server resides the Provideam Database. Provideam is a web-based intranet application. The Provideam User Interface is a web-site hosted on the Provideam Server. Client PCs, shown at the top of the figure, interact with the Provideam GUI using a web-browser application. Provideam Services are used for tasks such as Data Collection, Running Scheduled Tasks and Alarm Annunciation. Provideam Data Collection Services interface with Machine Control Systems (PLCs/PCs) using OPC Server technology as the communications middleware.

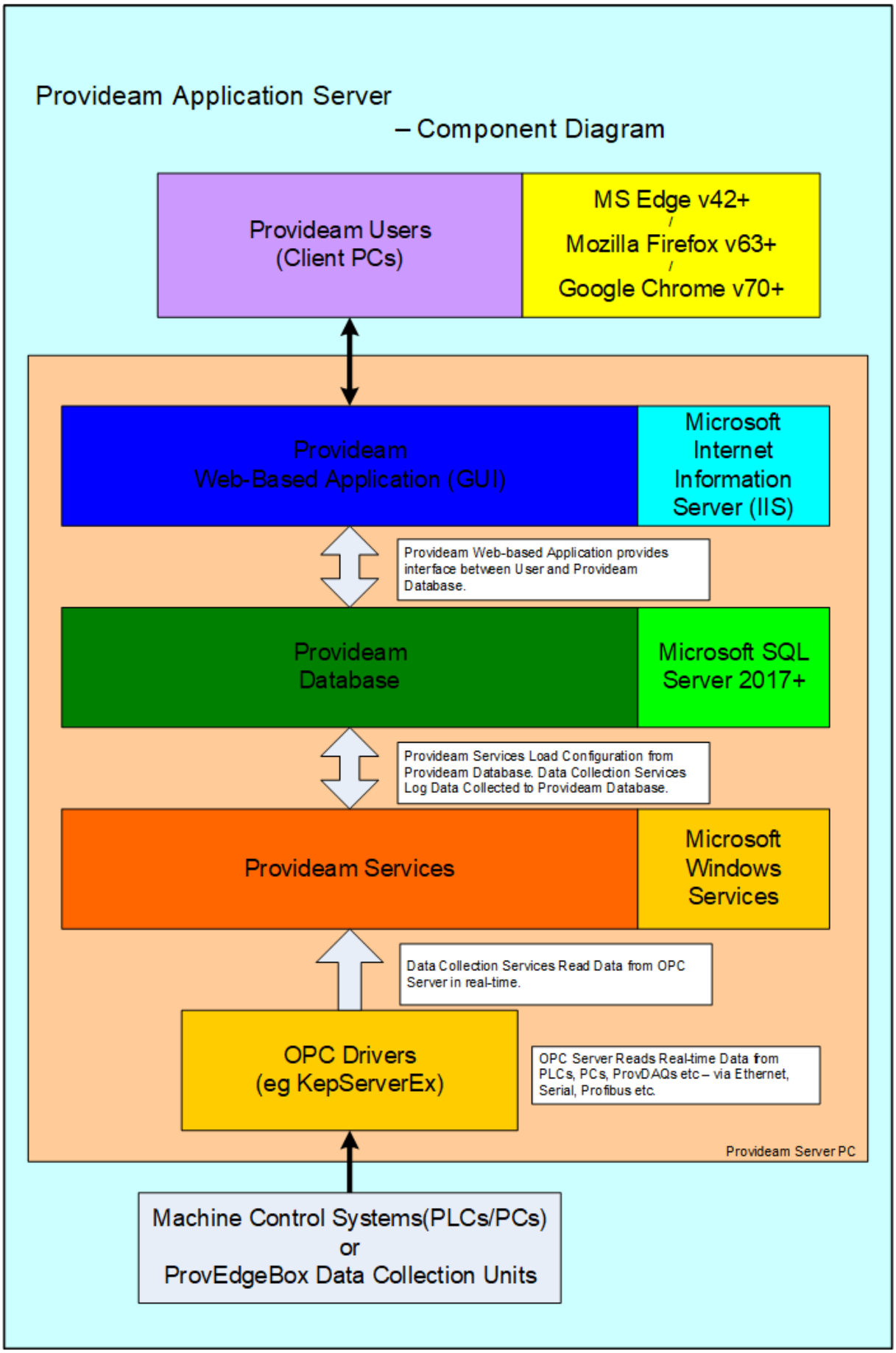


Fig. Provideam Application Server - Component Diagram

Provideam Database

At the heart of the Provideam Database resides the Provideam Database. The Provideam Database is an MS SQL 2012 Database and requires the MS SQL 2012 Database Engine (or higher) to be installed on the Provideam Database Server. The Provideam Database has two main functions, a) it holds all of the Provideam Application configuration settings and b) it logs all data collected by the Data Collection Services.

Provideam Web-Based Intranet Application

The Provideam Application is essentially an intranet web-site hosted on the Provideam Server. The Provideam Application is hosted by the MS Internet Information Server, IIS. IIS must be installed on the Provideam Server to host the Provideam Application.

Provideam User Interface - Client PCs

Client PCs access the Provideam Application using the MS Internet Explorer, IE, web-browser. At present, Provideam support MS IE v9+ and Mozilla Firefox v10+. No other browser is supported. To access the Provideam Application from a web-browser, type the name of the Provideam Server in the explorer address bar as follows; *//ProvideamServer/*, where *ProvideamServer* is either the name or IP address of the Provideam Server.

Provideam Services

Provideam Services are MS Windows Services which perform task such as: Collecting Data, Running Scheduled Tasks and Alarm Annunciation. These services can be managed, started/stopped, using the Windows Services Management Console. See the next section for a detailed description of Provideam Services.

OPC Server Technology - Communications Middleware

OPC, Open Process Control, is a communications technology which aims to provide a standardised interface to a host of Industrial Control Systems (mainly PLCs). OPC drivers offer Provideam a standard, robust and reliable interface to a wide range of Industrial Control Systems. Provideam recommend the OPC Servers supplied by PTC (Kepware) Inc. Most other third-party OPC Servers will work with Provideam. However we only test with the servers supplied by Kepware.

7.1.2 Provideam Services

The diagram below outlines the interactions between the various services in the Provideam Application.

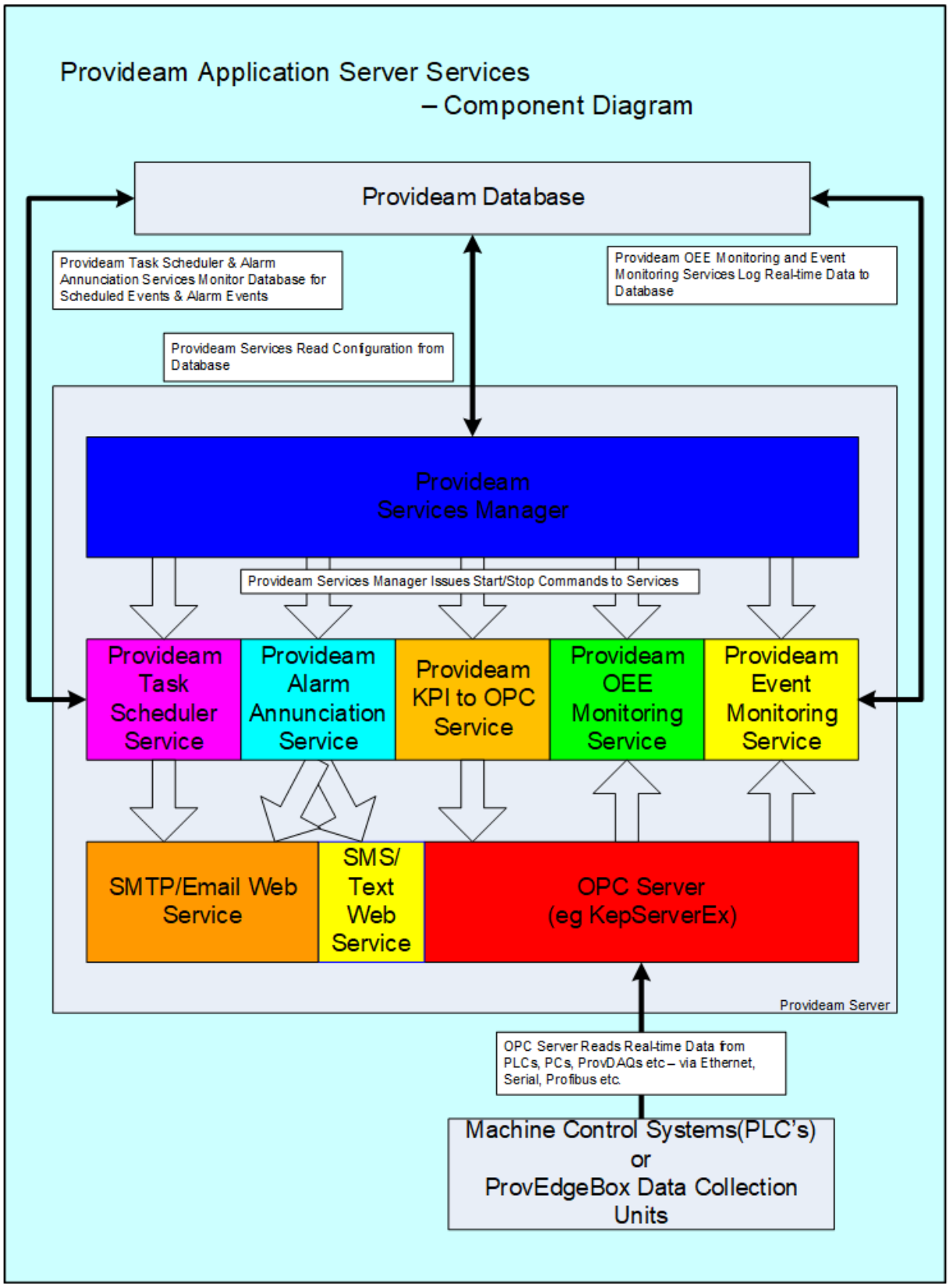


Fig. Provideam Application Server Services - Component Diagram

Currently, there are five Provideam Services;

Provideam Services Manager

The main function of the Provideam Services Manager is to facilitate the control of the other services via the Provideam Database and Provideam Application. Provideam is an enterprise-class application and it's component services may be distributed over several Servers. Commands can be sent via the Provideam Database to the Provideam Services Manager to Start or Stop any of the other Provideam Services. This feature is used in the Services Status Page of the Provideam Admin section of the Provideam GUI.

The second function of the Services Manager is to read the configuration of the local OPC Server. This function is used in conjunction with the OEE Monitoring Admin and Event Monitoring Admin sections of the Provideam Application to enumerate the tags configured in the OPC Server. Note: Many OPC Servers do not support OPC Enumeration.

Provideam Task Scheduler Service

The Provideam Task Scheduler Service monitors the Provideam Database for tasks to run. For the most part, the task are to run various reports that the users have configured and to deliver these reports, via email, to a list of email addresses. Scheduled Report Tasks can be created in both the OEE Monitoring and Event Monitoring Modules.

This feature requires that you configure the SMTP settings in the Provideam Admin section of the Provideam Application.

Provideam Alarm Annunciation Service

The Provideam Alarm Annunciation Service is used to transmit alarms generated in the Event Monitoring Module. Alarms can be transmitted via Email or Text Message. To send alarms by email you will need to configure the SMTP settings as is the case for the Provideam Task Scheduler Service.

Provideam OEE Monitoring Service

The Provideam OEE Monitoring Service monitors the current state of the machines for which it is configured. As it monitors the current state of each machine it also creates a historical log of the events that occur on each machine.

The current status of each machine is derived from two sources, a) from an OPC Server interface to the machine which indicates Modes, Yields etc, and b) from the machine record in the Provideam Database. The Provideam Database holds the current status of each machine. If no OPC tag has been defined for a particular item then the OEE Monitoring Service will take this value from the Provideam Database machine record. These non-OPC items are referred to as DB Items. Depending on how you chose to configure Provideam these DB Items can be controlled either via the Provideam Application GUI or via a database script from some other system such as another database.

Provideam Event Monitoring Service

The Provideam Event Monitoring Service monitors the current state of the Event Items for which it is configured. As it monitors the current state of each item it also creates a historical log, either on a poll or datachange, of that item.

The Provideam Event Monitoring Service is also used to monitor the alarm status of Event Items. If an Event Item is flagged as an Alarm Item, the Event Monitoring Service will check the current value to see if it is in alarm. If it is, then the Alarm Status flag will be set for that item. When the item is no longer in alarm the Alarm Status flag will be reset.

7.1.3 Provideam Data Collection

In a large Provideam installation the computing load may be distributed over a number of Servers. For example, it is recommended that no more than twenty machines are monitored by a single instance of the Provideam OEE Monitoring Service. In this situation several small Servers would be configured as Provideam Data Collection Servers. Provideam Data Collection Servers only require the Services Manager and the Data Collection Services to be installed. See the figure below for a component view of of a Data Collection Server.

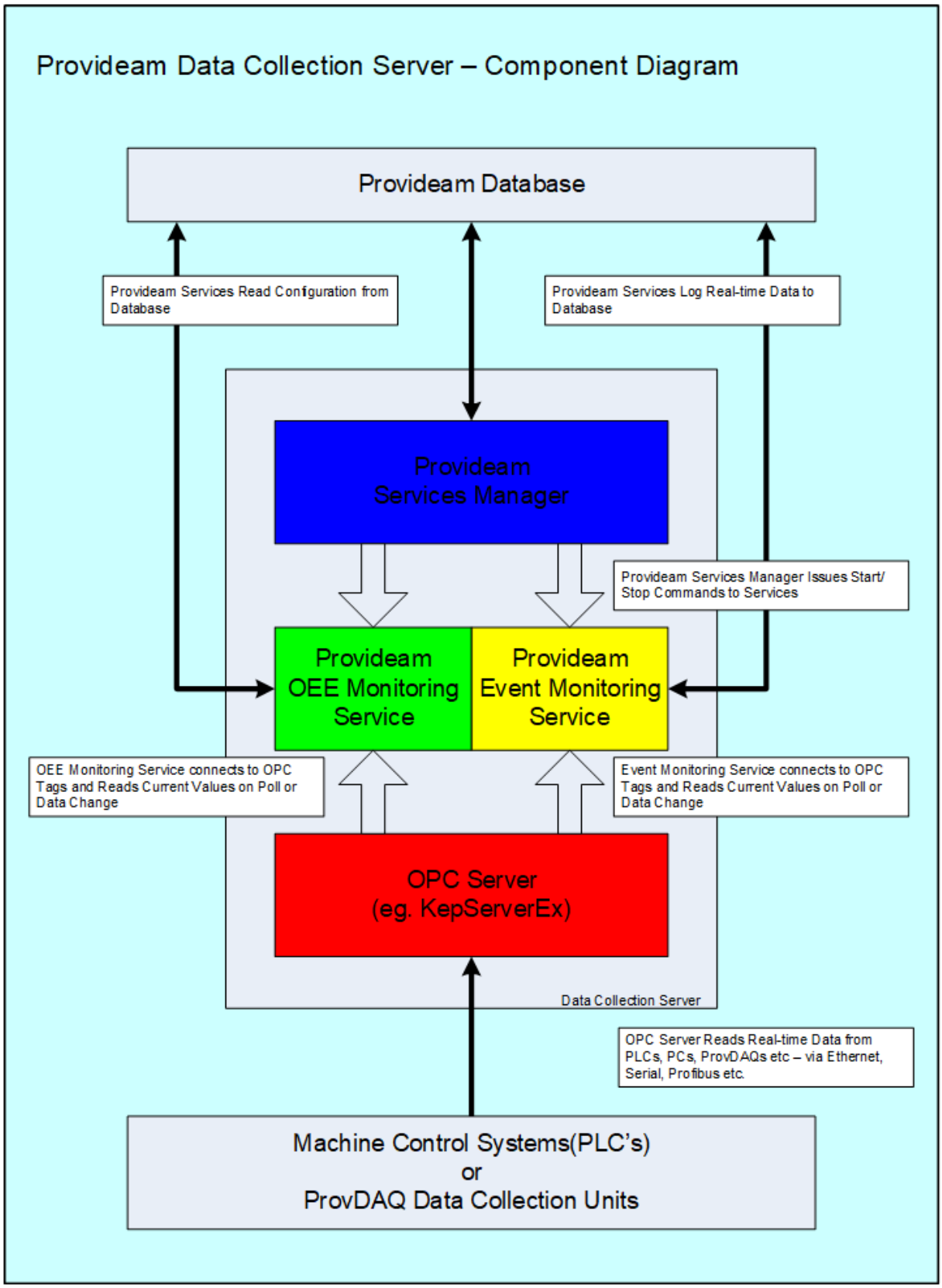


Fig. Provideam Data Collection Server- Component Diagram

In the figure above the Provideam Data Collection Server is a standalone Server separate from the Provideam Database Server. The Services connect to the Provideam Database using native Microsoft .NET Framework SQL drivers. See the next section to learn how to configure the SQL driver on the Data Collection PC.

7.2 Database Connection Tool

The Provideam Database Connection Configuration Tool allows you to configure a Provideam Database Connection. A Provideam Database Connection is required on each server which runs an application which needs to connect to the Provideam Database.

The Database Connection Configuration Tool is a standalone application which can be run, either from a shortcut located on the Desktop or directly by double-clicking on the *ProvDBConfig* application in the *"<Install Folder>\"* folder.

In a small installation all of the Provideam components typically reside on one server in which case you only need to configure a Provideam Database Connection on that server. However in a large installation, distributed over several servers, you will need to create a Provideam Database Connection on each of the servers running components that need to connect to the Provideam Database.

The three main functions of the Database Configuration Connection Tool are;

1. to allow you to set the parameter by which Provideam applications connect to the Provideam Database
2. to test these parameters
3. to save these parameters

7.2.1 Database Connection Parameter

The first function of the Database Connection Configuration tool is to allow you to set parameters for your Provideam Database Connection.

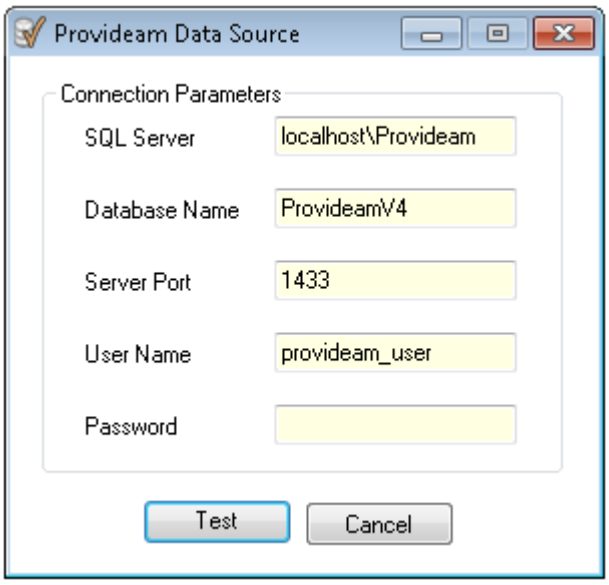


Fig. Provideam Database Connection Tool - Provideam Data Source

- The **SQL Server** field refers to the DNS or IP address of the SQL Server Instance. *Localhost\Provideam* is the default name for the SQL Server Instance on the local machine. If the SQL Server Instance is on a remote machine then you will need to enter the IP address or DNS of the SQL Server Instance on that machine. For example, *ProvideamServer\Provideam*
- The **Database Name** field refers to the name of the Provideam Database. *Provideam* is the default name for the Provideam Database.
- The **Server Port** field refers to the Port Number that the TCP/IP Network Library will use to connect to the Provideam Database. *1433* is the default Port Number for SQL Server databases.
- Provideam uses the SQL Server Security. The **User Name** field refers to the SQL Server user name with which you wish to log on to the Provideam Database. *provideam_user* is the user name used by the Provideam Application.
- The **Password** field refers to the password associated with the user name you have entered above.

7.2.2 Testing Connection Parameters

Once you have entered the parameters you require to connect to your Provideam Database you can then test these parameters. The Database Connection Configuration tool will attempt to connect to the Provideam Database using the parameters you have entered...

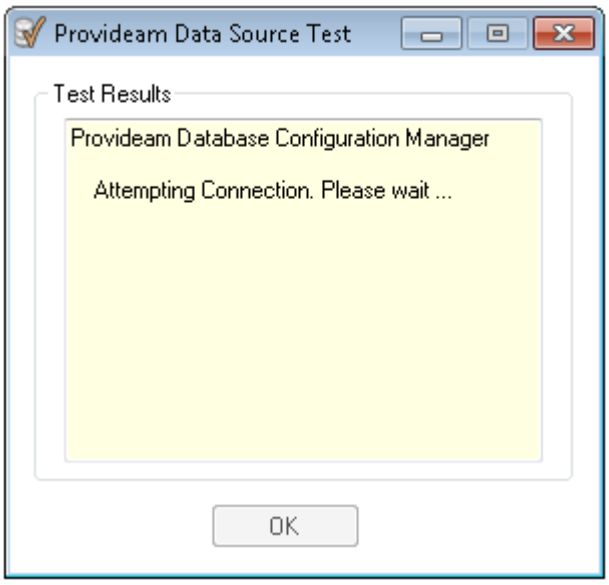


Fig. Provideam Database Connection Tool - Provideam Data Source, Attempting Connection..

- If the test is successful the TESTS SUCCESSFUL message will appear.

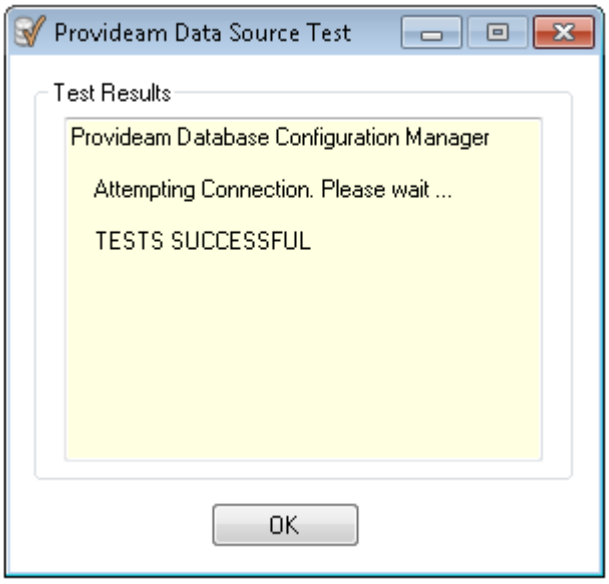


Fig. Provideam Database Connection Tool - Provideam Data Source, TESTS SUCCESSFUL!

Click OK and the you will be prompted to save these details.

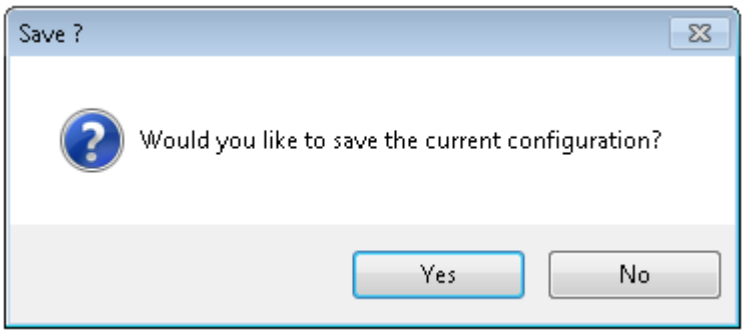


Fig. Provideam Database Connection Tool - Provideam Data Source, Save Configuration?

Click Yes to save these details and return to the Details screen. Click No to return to the Details screen without saving.

7.2.3 Saving Connection Parameters

If you have successfully tested your configuration then you will be given the opportunity to save these parameters on the local machine. The parameters you have entered, excluding the password, are stored in an XML file in *"<Install Folder>\Database\Provideam.xml"*

By default the Provideam Application connects to the Provideam Database with the User Name: *Provideam_user*. The password associated with this User Name is *Prov2004* and is hard coded into the application.

7.2.4 Configuration Tool Error Messages

If your parameters are incorrect your Database Connection Test will fail and a message will appear indicating the reason for failure.

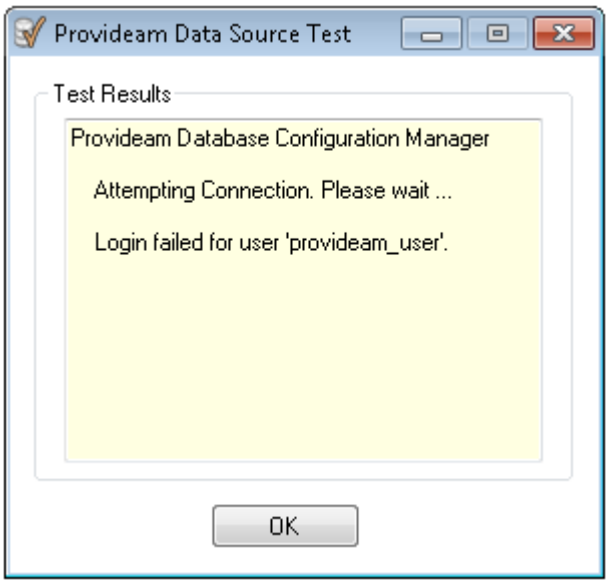


Fig. Provideam Database Connection Tool - Provideam Data Source, ERROR!

Error Messages:

Error: Login failed for user 'Provideam_user'

Solution: 1. Check that the Login Name and Password have been entered correctly, with correct capitalization.

2. Check that the Database Server Machine is running and is on the Network

3. Check that SQL Server is running on the Database Server

4. Check that no Firewall or Antivirus software is preventing communication with the Database Server

5. Check that the User Name and Login Name exist for the Provideam Database

7.3 Database Management Tool

The Provideam Database Management Tool allows you to perform some useful Database Management Task without needing to install the Microsoft SQL Server Management Studio Application.

The Database Management Tool is a standalone application which can be run by double-clicking on the *ProvDBMgt* application in the *"<Install Folder>\Tools"* folder.

The main tasks of the Database Management Tool are;

1. to allow you Backup the Provideam Database

2. to allow you to Restore a Provideam Database Backup (*.bak)
3. to allow you to Attach a Provideam Database Data File (*.mdf)
4. to allow you to Detach the Provideam Database
5. to allow you to Delete OEE Data which occurs before a specified date
6. to allow you to Delete Event Data which occurs before a specified date
7. to allow you to Backup, Shrink(remove data) and Upload a Provideam Database to our ftp site for analysis.

Note: The Provideam Database Management Tool only functions with a Provideam SQL Server Instance.

7.3.1 Database Backup

The first function of the Database Management Tool is to allow you to set parameters for your Provideam Database Backup operation.

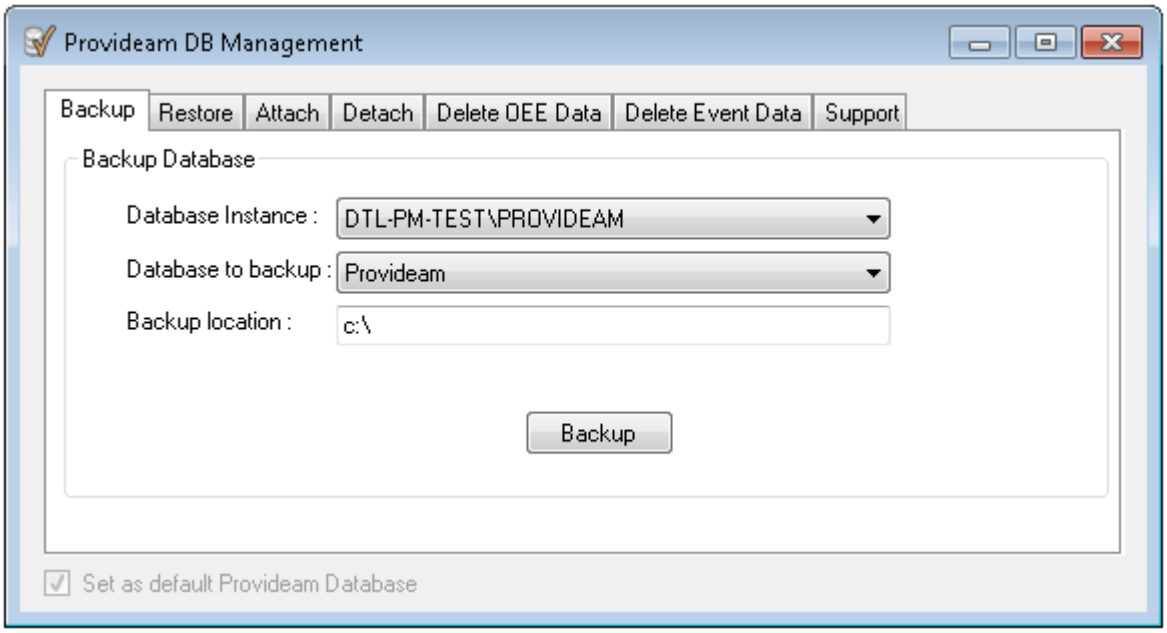


Fig. Provideam Database Management Tool - Provideam Database Backup

- The **Database Instance** selection box allows you to select the Database Instance you wish to connect with
- The **Database to backup** selection box allows you to select the Database you wish to back up
- The **Backup location** text box allows you to specify the location where the Database will be backed-up to

- The **Backup** button starts the Database Backup procedure

7.3.2 Database Restore

The next function of the Database Management Tool is to allow you to set parameters for your Provideam Database Restore operation.

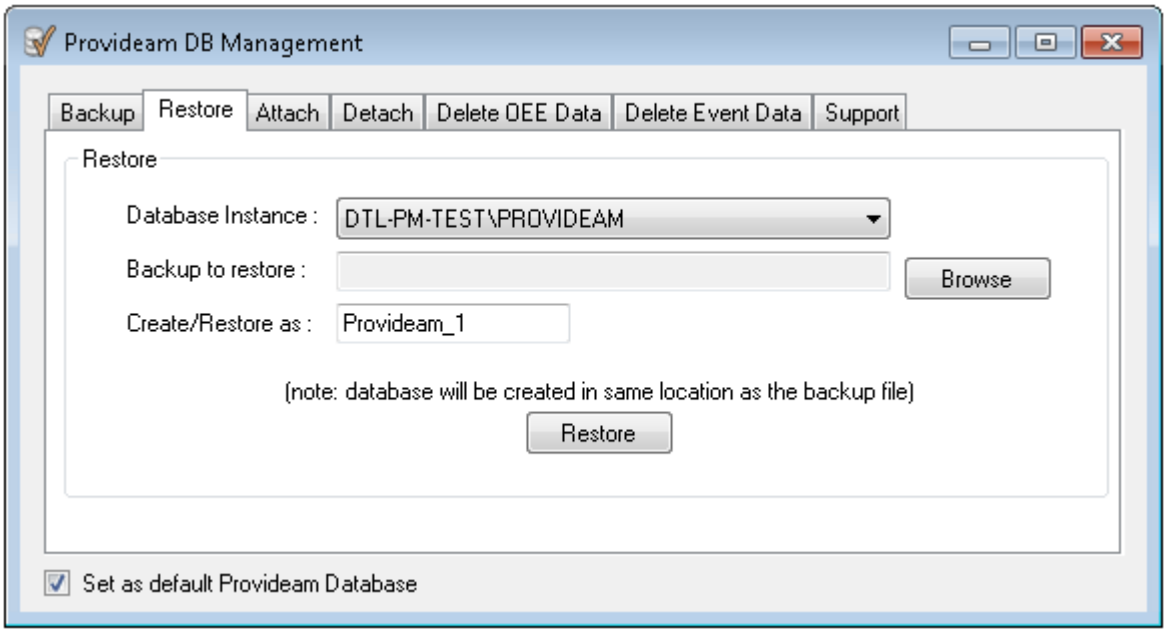


Fig. Provideam Database Management Tool - Provideam Database Restore

- The **Database Instance** selection box allows you to select the Database Instance you wish to connect with
- The **Backup to restore** selection box, along with the **Browse** button allows you to select the Database Backup you wish to Restore
- The **Create/Restore as** text box allows you to specify the name of the Database after it has been Restored. Note this name must be unique. An error will occur if you use the name of an existing Database.
- The **Restore** button starts the Database Restore procedure
- The **Set as default Provideam Database** checkbox allows you to cause the local Provideam links to be updated to point to the newly Restored Database. In other words the Provideam website will be pointed toward the new Database.

7.3.3 Database Attach

The next function of the Database Management Tool is to allow you to set parameters for your Provideam Database Attach operation.

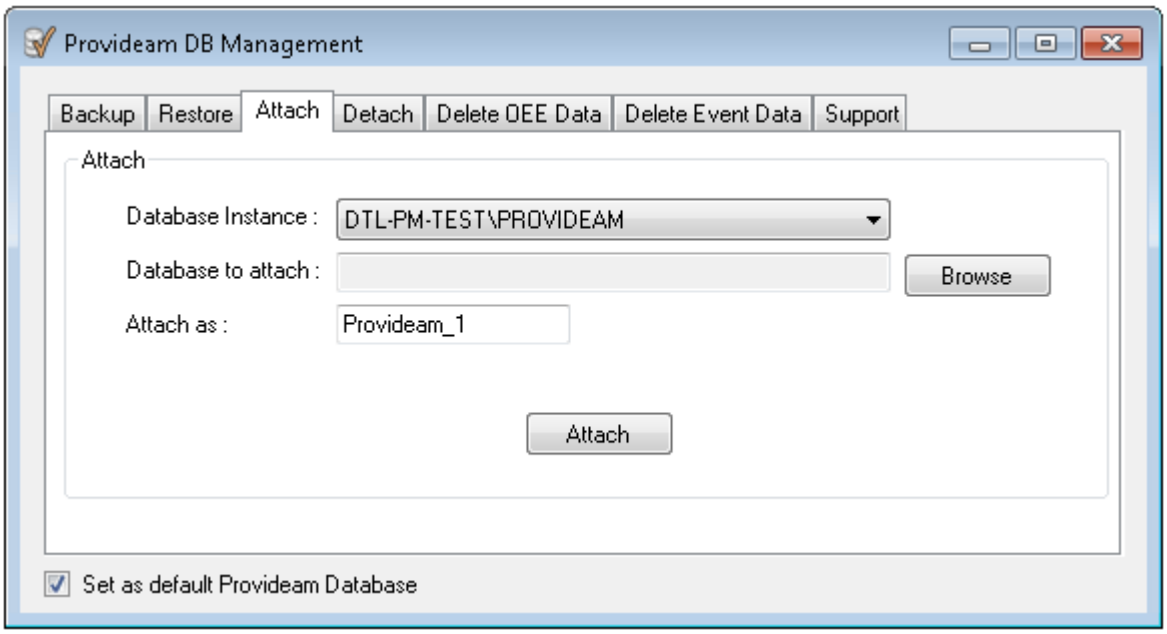


Fig. Provideam Database Management Tool - Provideam Database Attach

- The **Database Instance** selection box allows you to select the Database Instance you wish to connect with
- The **Backup to attach** selection box, along with the **Browse** button allows you to select the Database Data File you wish to Attach
- The **Attach as** text box allows you to specify the name of the Database after it has been Attached. Note this name must be unique. An error will occur if you use the name of an existing Database.
- The **Attach** button starts the Database Attach procedure
- The **Set as default Provideam Database** checkbox allows you to cause the local Provideam links to be updated to point to the newly Attached Database. In other words the Provideam website will be pointed toward the new Database.

7.3.4 Database Detach

The next function of the Database Management Tool is to allow you to set parameters for your Provideam Database Detach operation.

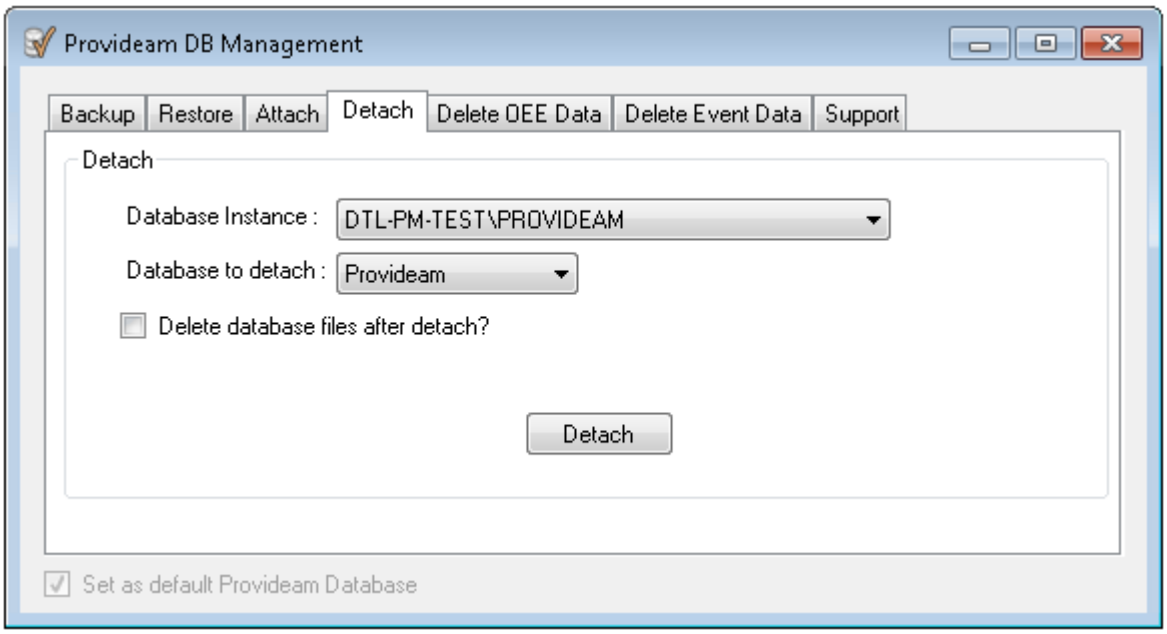


Fig. Provideam Database Management Tool - Provideam Database Detach

- The **Database Instance** selection box allows you to select the Database Instance you wish to connect with
- The **Database to detach** selection box allows you to select the Database you wish to Detach
- The **Delete database files after detach** text box allows you to specify that the Database files should be deleted following the Detach operation
- The **Detach** button starts the Database Detach procedure

7.3.5 Database Delete OEE Data

The next function of the Database Management Tool is to allow you to set parameters for your Provideam Database Delete OEE Data operation.

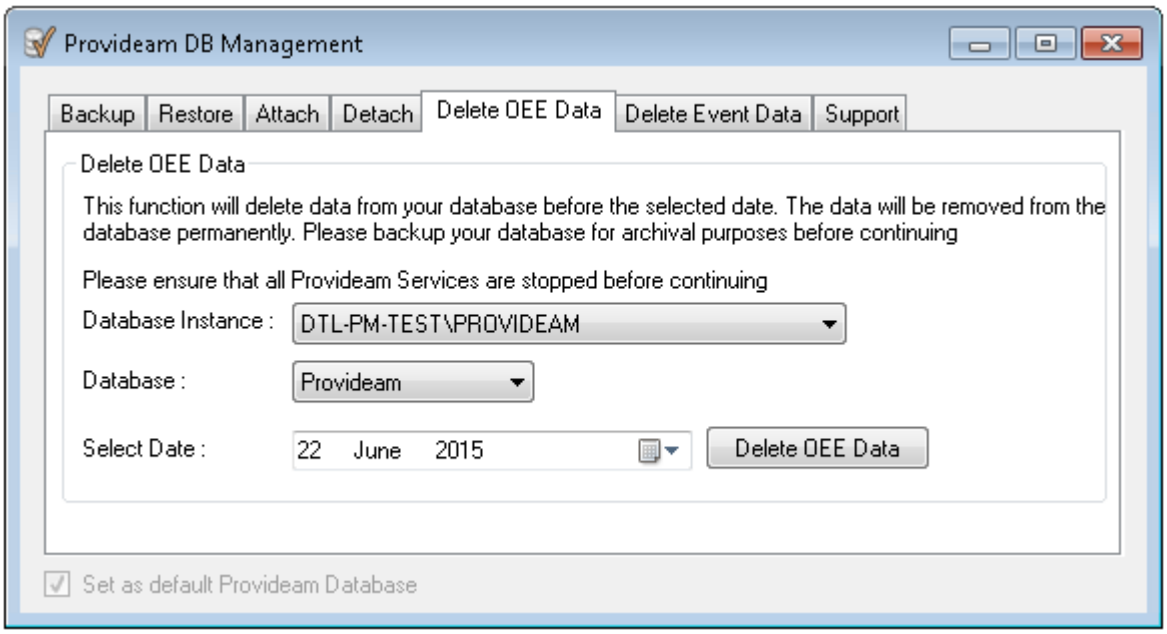


Fig. Provideam Database Management Tool - Provideam Database Delete OEE Data

- The **Database Instance** selection box allows you to select the Database Instance you wish to connect with
- The **Database** selection box allows you to choose which Database will be affected
- The **Select Date** date picker allows you to specify the date before which all OEE Data will be deleted..
- The **Delete OEE Data** button starts the Delete OEE Data procedure

7.3.6 Database Delete Event Data

The next function of the Database Management Tool is to allow you to set parameters for your Provideam Database Delete Event Data operation.

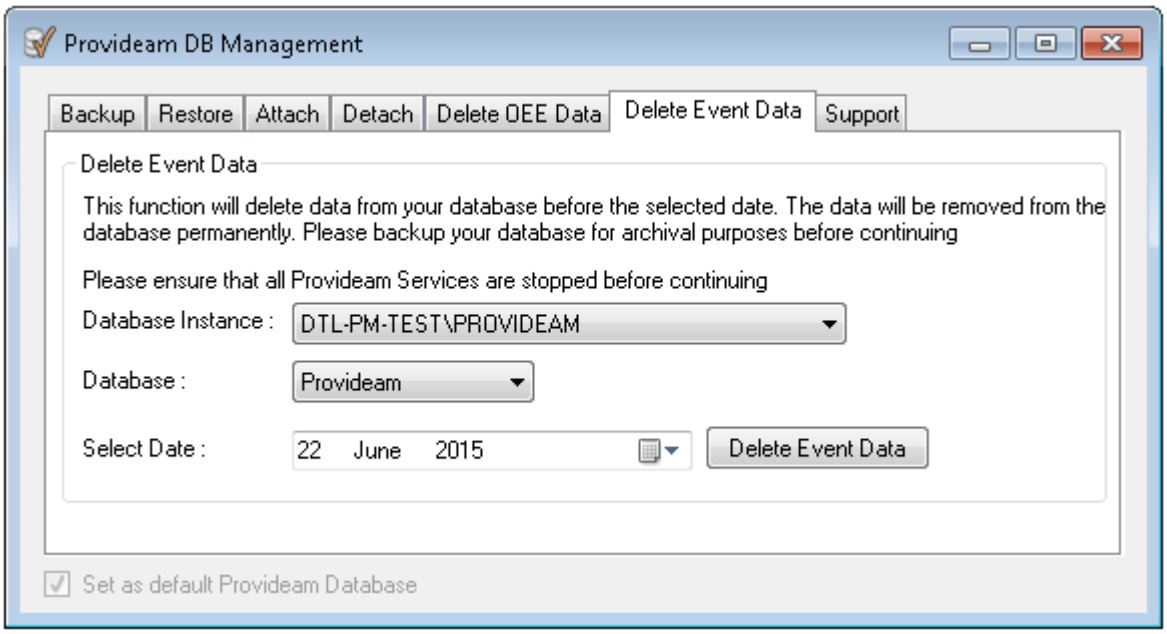


Fig. Provideam Database Management Tool - Provideam Database Delete Event Data

- The **Database Instance** selection box allows you to select the Database Instance you wish to connect with
- The **Database** selection box allows you to choose which Database will be affected
- The **Select Date** date picker allows you to specify the date before which all Event Data will be deleted..
- The **Delete Event Data** button starts the Delete Event Data procedure

7.3.7 Database Support

The next function of the Database Management Tool is to allow you to set parameters for your Provideam Database Support operation.

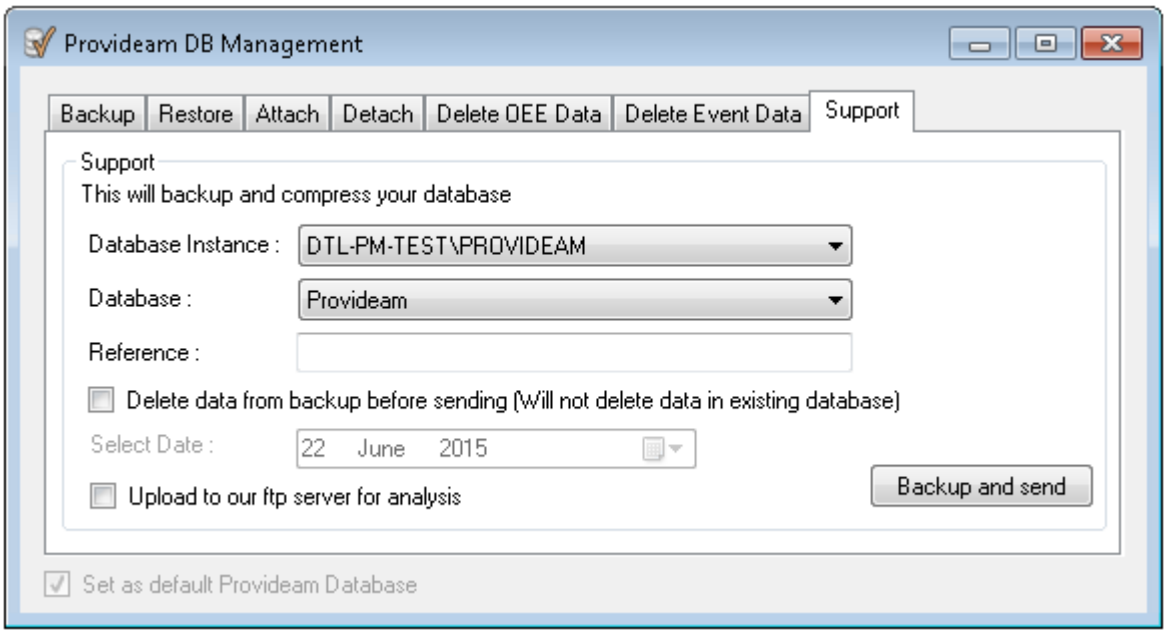


Fig. Provideam Database Management Tool - Provideam Database Support

- The **Database Instance** selection box allows you to select the Database Instance you wish to connect with
- The **Database** selection box allows you to choose which Database will be affected
- The **Reference** text box allows you to provide a reference for your backup
- The **Delete data from backup before sending** checkbox allows you to cause all data in the backed up database (ie not the Production Database) to be deleted before compressing/uploading
- The **Select Date** date picker allows you to specify the date before which all Data will be deleted..
- The **Upload to our ftp server for analysis** checkbox allows you to specify that the compressed Database should be uploaded to our ftp servers
- The **Backup and send** button starts the Support procedure

7.4 Provideam Admin

In the Provideam Admin Module general parameters, related to the application as a whole, are configured.

7.4.1 Setup

The Setup Section includes a number of pages for the general management of global settings, services and licences.

7.4.1.1 *Server Settings*

This page contains some general settings related to the Provideam Installation.

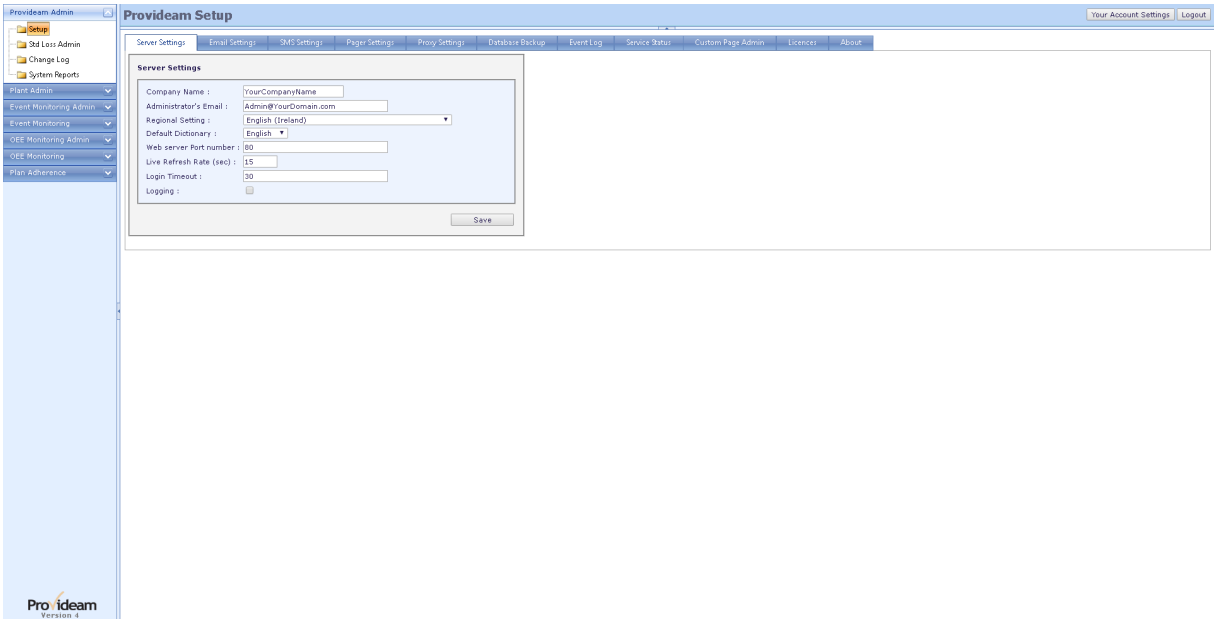


Fig. Provideam Settings - Server Settings

- The **Company Name** field refers to the name of your company, which may be displayed on reports and views.
- The **Administrators Email** field allows you to set the sender email address of emails sent from Provideam. It is useful to set this as Provideam@YourDomain.com as this indicates clearly that the email has been sent from Provideam and it facilitates management of the emails by the recipients.
- The **Regional Setting** selection box allows you to chose settings appropriate to your region. For example the format of how dates might be displayed.
- The **Default Dictionary** selection box allows you to select the Dictionary which will be used by default for the application. When a User logs on, this Dictionary will be replaced by the Dictionary selected for the User. See User Settings.
- The **Web Server Port Number** field allows you to indicate to Provideam the Port Number that the website is on. By default Provideam is installed on Port 80. This is the default Port for HTTP traffic. If you are hosting more than one website on the Server, only one of them can be on Port 80. In which case Provideam may be set to another Port. If Provideam is not on the default Port, 80, then you must enter the Port Number here so that Provideam can function correctly.

- The **Live Refresh Rate (sec)** field allows you to set the time in seconds at which the Provideam OEE Live Display will update it's display. The Provideam OEE Live Display is a feature which allows you to display a variety of views and reports which are continuously updating. This feature is often used with a large monitor overlooking a production area and provides feedback to the machine operators as to how production is running.
- The **Login Timeout (mins)** field allows you to set the inactivity timeout time in minutes. In some circumstances an additional MS IIS Setting must be made. If you have problems with this feature contact support@Provideam.com for a solution.
- The **Logging** checkbox allows you to set whether or not user logging is enabled. If this option is checked then user interaction with the Provideam application is logged in the Change Log. Events such as changing a Machine Configuration will be logged. Requires separate license.

7.4.1.2 *Email Settings*

This page contains the settings you will need to enable Provideam to send emails. Provideam requires an SMTP server to relay emails. Your IT Department should be able to tell you the settings required to connect to your companies SMTP server.

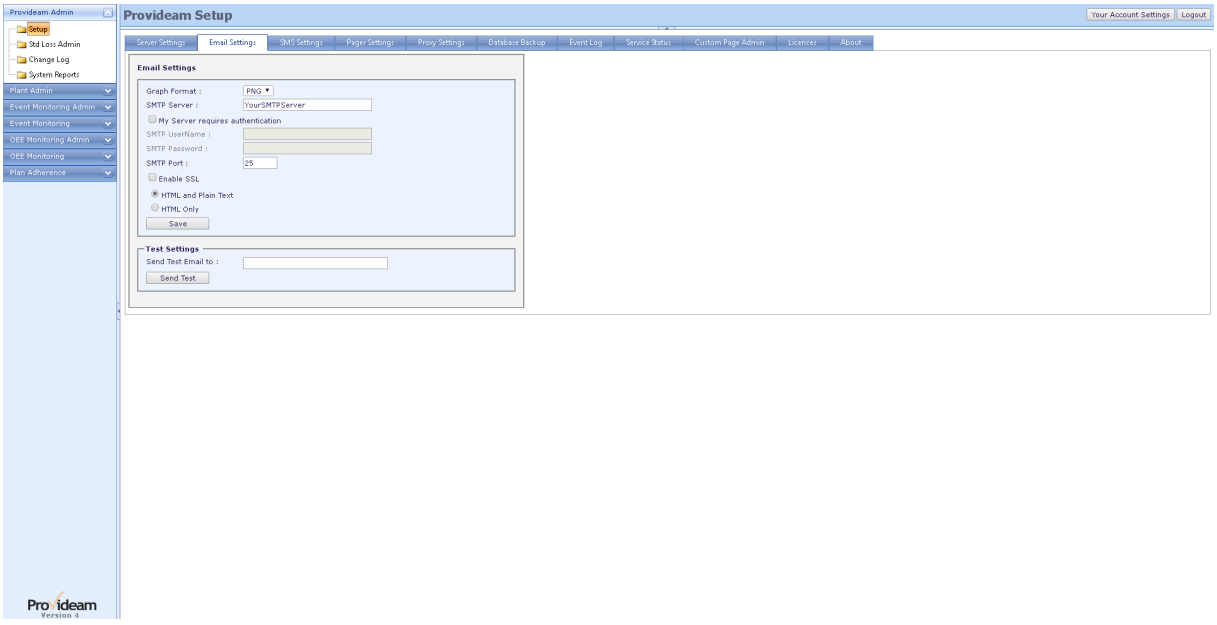


Fig. Provideam Settings - Email Settings

- The **Graph Format** selection box allows you to choose the format of charts embedded in emails. PNG generally produces higher quality images but it is

not supported by all Email Clients. For example some versions of Lotus Notes do not support PNG.

- The **SMTP Server** field allows you to set the address of the SMTP Server which will transmit the email messages generated in Provideam.
- The **My Server Requires Authentication** check box enables the SMTP authentication settings. Access to some SMTP servers is controlled by User Name and Password.
- The **SMTP UserName** field allows you to enter a User Name for SMTP authentication.
- The **SMTP Password** field allows you to enter a Password for SMTP authentication.
- The **SMTP Port** field allows you to enter a Port Number for communicating with the SMTP Server. 25 is the default Port Number used for SMTP Servers..
- The **Enables SSL** check box allows you to enable SSL encryption mode. Before using this setting make sure that your SMTP server supports SSL mode.
- The **HTML and Plain Text** option button allows you to send a plain text version of all HTML emails. The plain text version is not seen unless the email client cannot parse the HTML content. This is the default setting.
- The **HTML only** option button allows you to limit the body content of HTML emails to HTML only. The setting is provided because some email clients will not show the HTML content if a plain text copy of the email is included.
- The **Save** button box allows you to save your Email Settings.
- The **Send Test Email To** field box allows you to enter an email address to test the Email Settings.
- The **Test Email** button allows you to send a test email to the Test Email Address. The Test Email contains both a PNG and a JPEG image. If one does not appear correctly in the body of the email then you will need to set the other as your Graph Format.

7.4.1.3 SMS Settings

This page contains the settings you will need to enable Provideam to send SMS Text Messages. Provideam uses a 3rd party company to deliver SMS Messages. The SMS Text Messages service is made available on a Pay-As-You-Go basis. Contact your Provideam supplier to receive a quotation for SMS Message Bundles. Your SMS Settings will be sent to you at the time of your purchase.

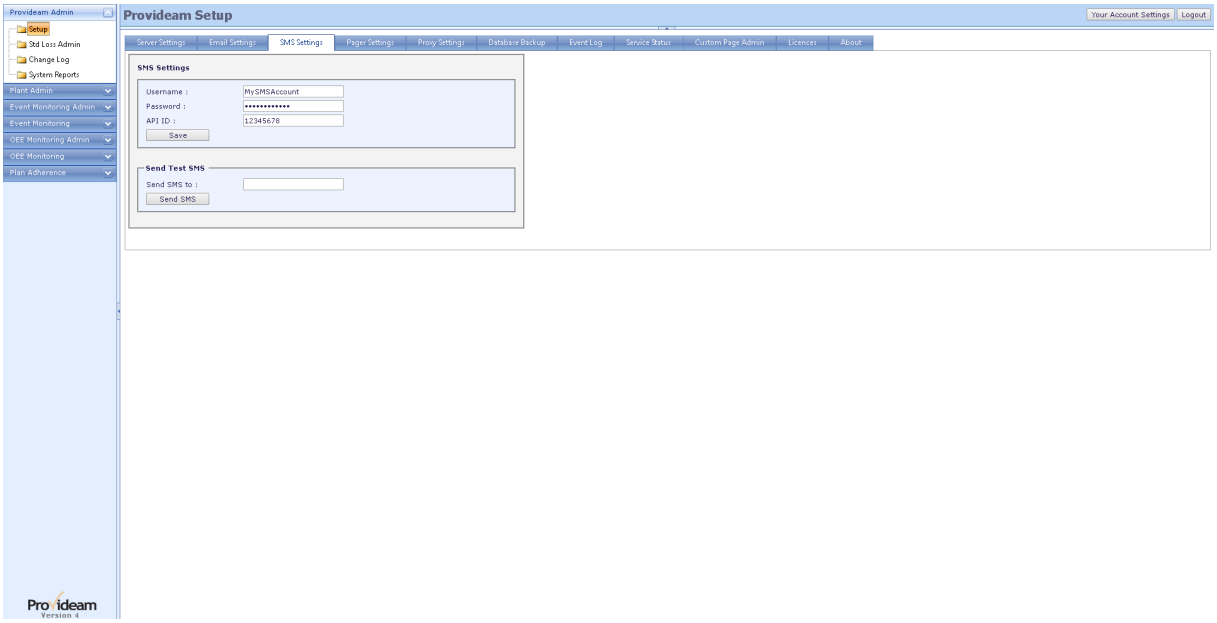


Fig. Provideam Settings - SMS Settings

- The **Username** field allows you to enter a User Name for SMS Service authentication.
- The **Password** field allows you to enter a Password for SMS Service authentication.
- The **API ID** field allows you to enter your unique API handle for the SMS Service.
- The **Save** button box allows you to save your SMS Service Settings.
- The **Send SMS To** field box allows you to enter a Phone Number to test the SMS Service Settings.
- The **Send SMS** button allows you to send a test SMS Message to the Phone Number.

7.4.1.4 Pager Settings

This page contains the settings you will need to enable Provideam to send pages via a TAP enabled paging system. Provideam requires a paging system connected to one of the servers serial ports to facilitate paging.

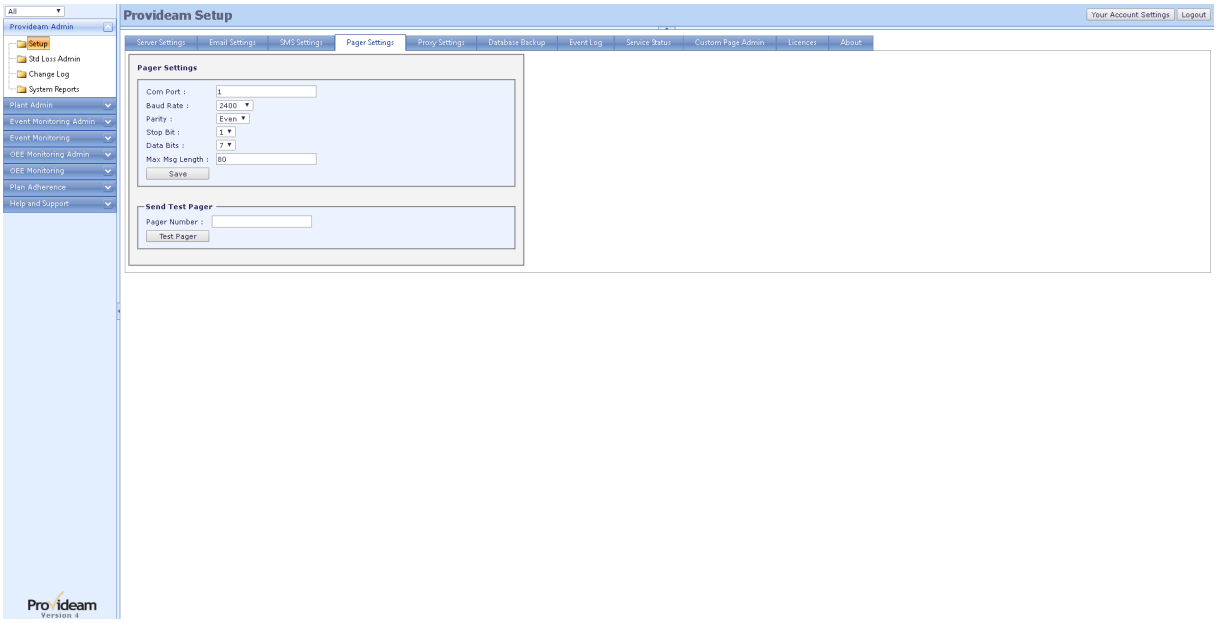


Fig. Provideam Settings - Pager Settings

- The **Com Port** field allows you to enter the serial com port used by the server for paging.
- The **Baud Rate** selection box allows you to enter the baud rate of the TAP protocol.
- The **Parity** selection box allows you to select the parity of the TAP protocol.
- The **Stop Bits** field allows you to enter the number of stop bits in the TAP protocol.
- The **Data Bits** field allows you to enter the number of data bits in the TAP protocol.
- The **Max Msg Length** field allows you to enter a maximum limit to the length of the message being sent.
- The **Save** button box allows you to save your Pager Settings.
- The **Pager Number** field box allows you to enter a Pager Number to test the Pager Settings.
- The **Test Pager** button allows you to send a test page to the Pager Number.

7.4.1.5 *Proxy Settings*

Some components of Provideam require access to the Internet to work. For example SMS Text Messages sent from the Alarm Annunciation Module are sent via the internet. If your site uses a Proxy Server to connect to the internet then you will need to configure the Proxy Settings for these components to work.This page allows you to configure Provideam to use a Proxy Server.

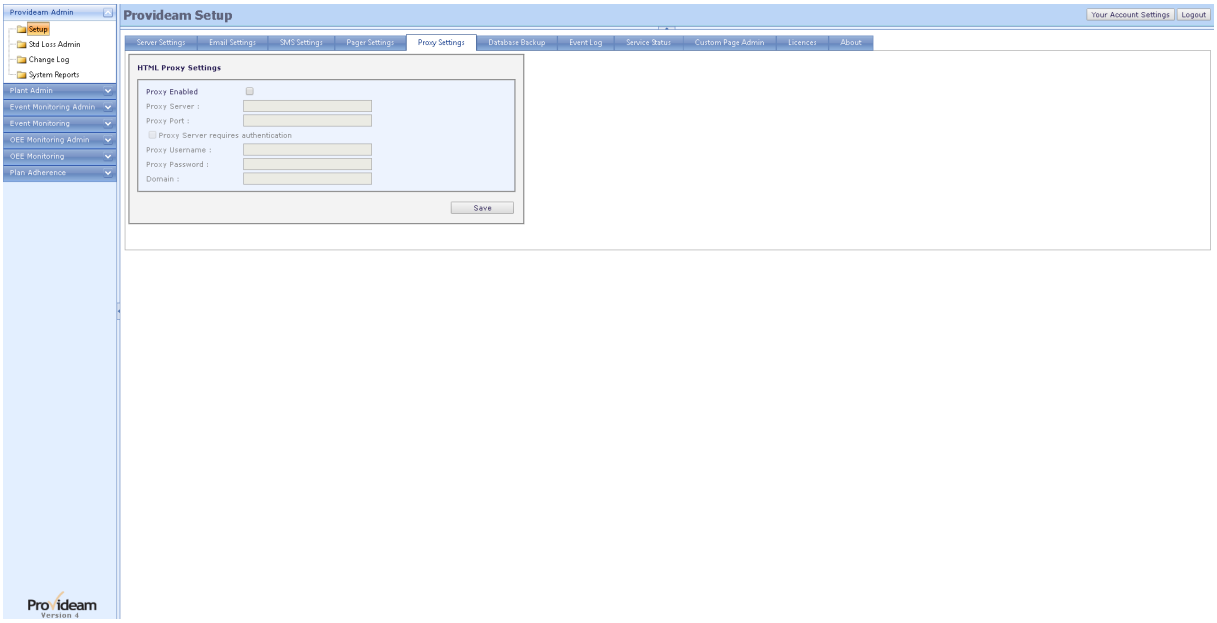


Fig. Provideam Settings - Proxy Settings

- The **Proxy Enabled** check box allows you to enable the Provideam Proxy Server Settings.
- The **Proxy Server** field allows you to set the address of the Proxy Server.
- The **Proxy Port** field allows you to set the Port Number of the Proxy Server.
- The **Proxy Server Requires Authentication** check box enables the Proxy Server authentication settings. Access to some Proxy servers is controlled by User Name and Password.
- The **Proxy UserName** field allows you to enter a User Name for Proxy authentication.
- The **Proxy Password** field allows you to enter a Password for Proxy authentication.
- The **Save** button box allows you to save your Proxy Settings.

7.4.1.6 Database Maintenance

The Database Maintenance feature enables you to create a backup of your Provideam Data. The backup can be created immediately or on a defined schedule. By default the backup is stored to 'C:\ProvideamBackup'

Backup Now

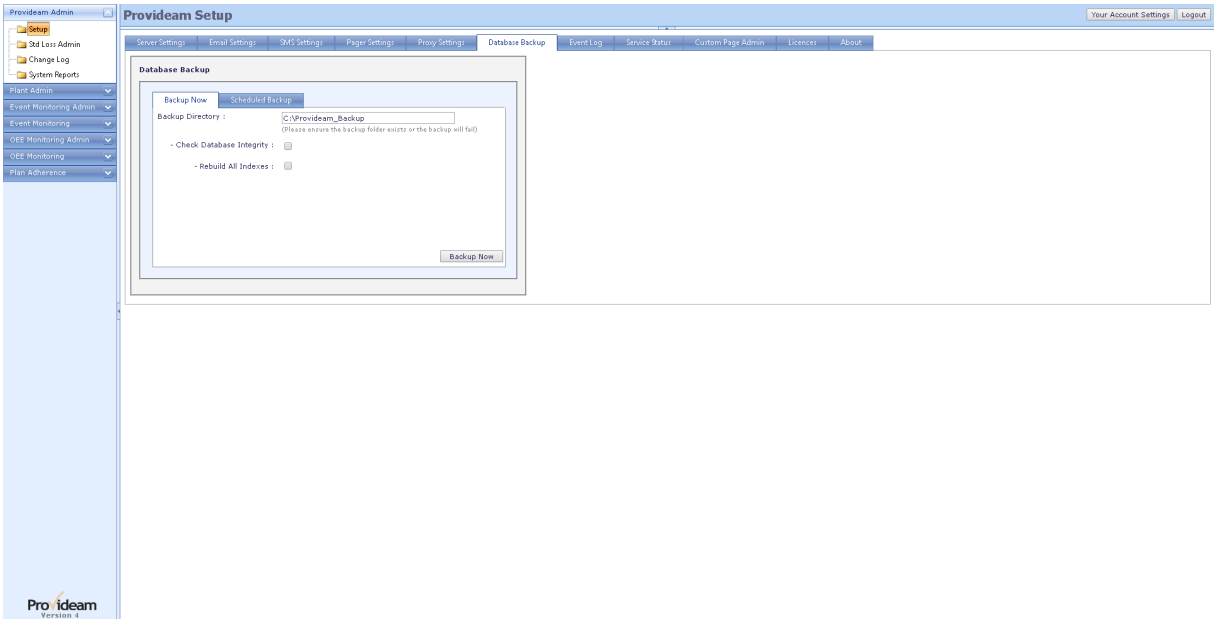


Fig. Provideam Settings - Database Maintenance - Backup Now

- The **Backup Directory** field allows you to specify the location where Provideam Database Backups will be saved.
- The **Check Database Integrity** check box allows you to set whether or not the Integrity of the Database will be tested at the time of generating the Backup.
- The **Rebuild All Indexes** check box allows you to set whether or not the Database Indices will be rebuilt at the time of generating the Backup.
- The **Backup Now** button box allows you to run your backup immediately.

Scheduled Backup

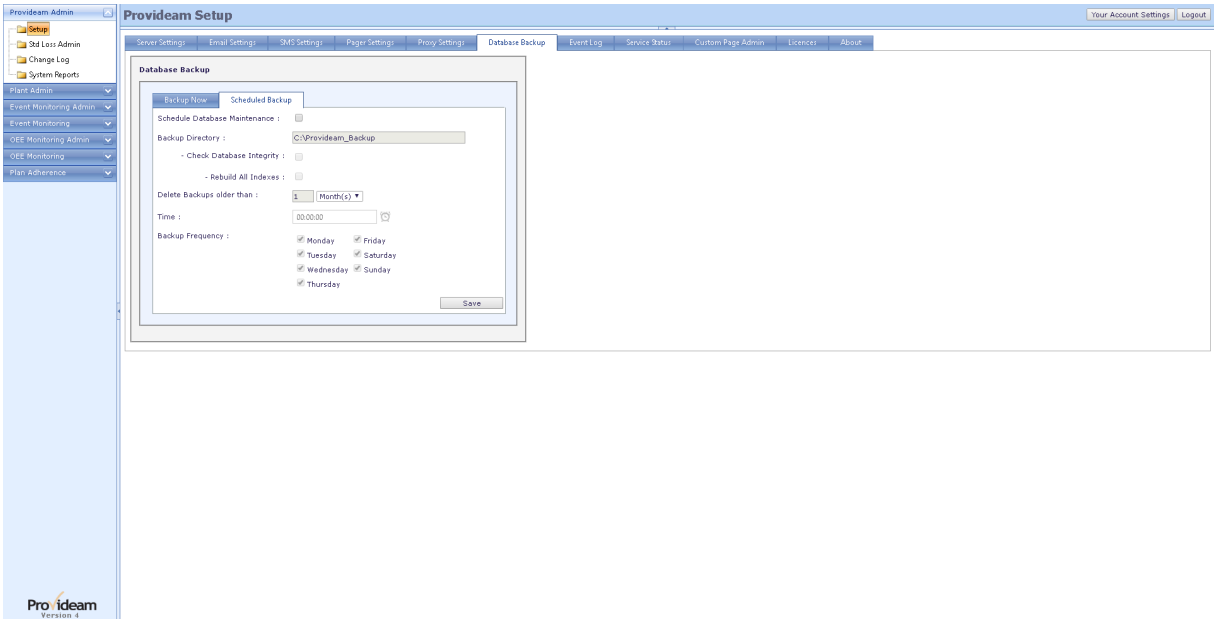


Fig. Provideam Settings - Database Maintenance - Scheduled Backup

- The **Schedule Database Maintenance** check box allows you to enable the scheduling of Database Backups.
- The **Backup Directory** field allows you to specify the location where Provideam Database Backups will be saved.
- The **Check Database Integrity** check box allows you to set whether or not the Integrity of the Database will be tested at the time of generating the Backup.
- The **Rebuild All Indexes** check box allows you to set whether or not the Database Indices will be rebuilt at the time of generating the Backup.
- The **Delete Backups older than** selections enable you to set a time limit for saving Backups on your PC. Backups older than the time specified will be deleted automatically.
- The **Time** field allows you to set the time of day at which the Provideam Backup will be created.
- The **Backup Frequency** checkboxes allow you to select the days on which the Backups will be created.
- The **Save** button box allows you to save your Backup Schedule Settings.

7.4.1.7 Event Log

The Event Log Page allows you to view a log of recent events which occurred in the Web Application or Services.

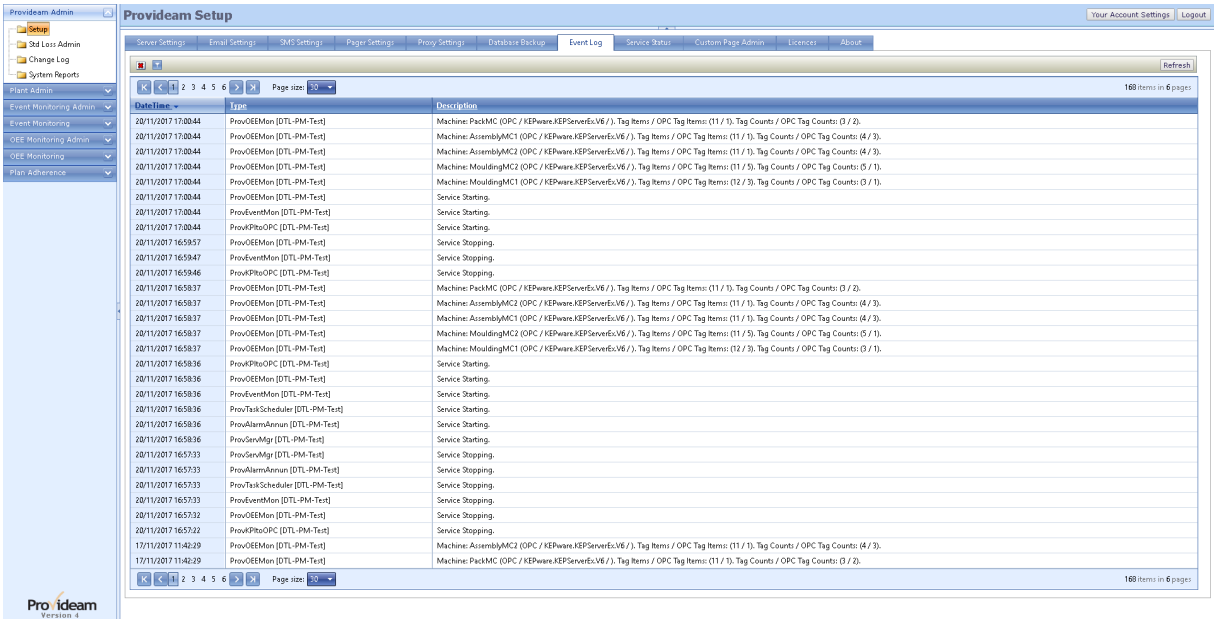


Fig. Provideam Settings - Event Log

- The **Delete** button box allows you to delete all current events.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).
- The **Refresh** button allows you to refresh the current display.
- The **DateTime** field shows the date and time when the event occurred.
- The **Type** field shows the module which generated the event following in square brackets by the server location of the module.
- The **Description** field shows a description of the event.

7.4.1.8 *Services Status*

The Service Status Page is used to show the operating mode of each service. Each of the services which have been registered appear on the left had side, preceded by the server on which they are installed. In the example below all the services are installed on the *DTL_PM_Test* Server.

The green and red lamps on the right hand side of the page indicated whether or not each service is running. Green represents running and red represents stopped. The Service Status Page updates every 3 seconds. If a service changes state from running to stopped the lamp will change color within 3 seconds.

For services installed on a PC other than the Provideam Application Server, the lamps will not work correctly unless the clock on the PC is synchronized with that on the *Application Server*.

Provideam Services are managed by the Provideam Services Manager Service. The sole purpose of this service is to allow you to start and stop services via the Service Status Page. The Start and Stop Buttons on the Service Status Page send a request to the Provideam Services Manager Service to start/stop the relevant service. The Provideam Services manager Service then issues a command to the relevant service. Through this method you may be able to start/stop services on a remote PC without having to physically go to the PC.

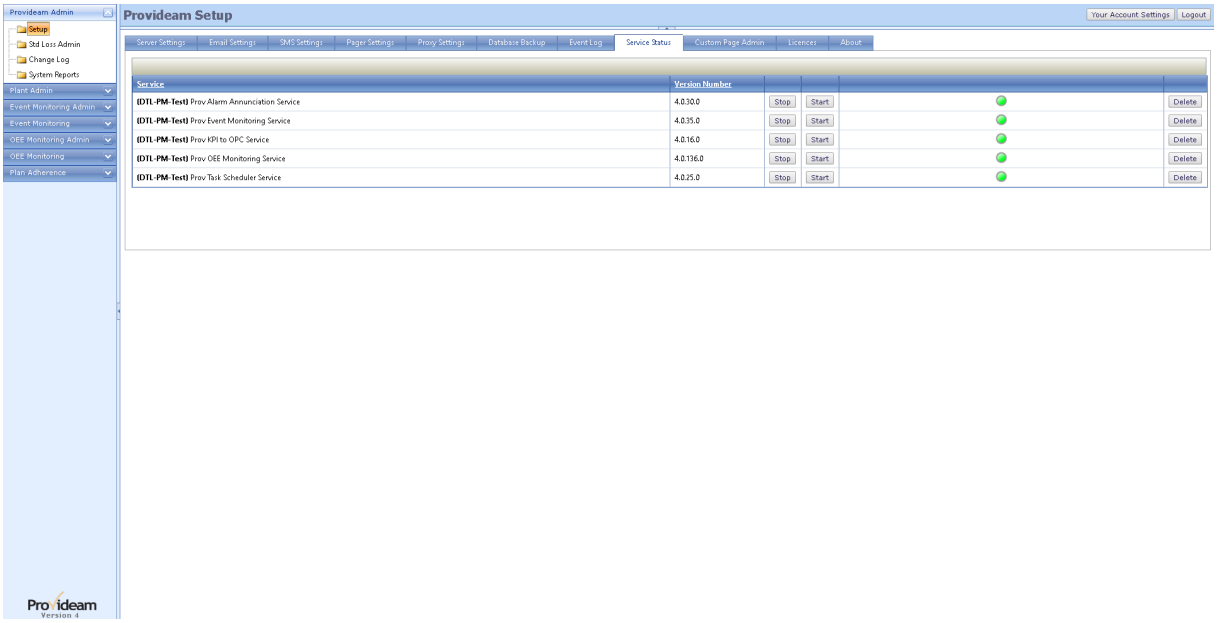


Fig. Provideam Settings - Service Status

- The **Stop** button allows you to stop a Provideam Service.
- The **Start** button allows you to start a Provideam Service.
- The **Lamp** indicates if the Provideam Service is running (●) or stopped (●).
- The **Delete** button allows you to delete a Provideam Service. This is used to delete services which were installed on servers which are no longer in service. This should only be done if there are no references to the service in the Provideam Configuration. For example there should be no Event Items related to the Event Monitoring Service. If you delete a service which has related items, these relationships may need to be re-created.

7.4.1.9 *Custom Page Admin*

The Custom Page Admin section allows you to create links in Provideam to external URLs. These URLs must be able to operate within an X-Frame. You can create links to external pages such as remote websites, or to local **aspx** pages you have created. These pages may be linked to Provideam datasets using the Provideam API plug-in feature, or to any other data source. We have provided some sample **aspx** pages programmed in C#. The source code is available on request.

Note:

Some websites will send an “X-Frame-Options: SAMEORIGIN” response to the browser. These pages (e.g. www.google.com) can only be displayed in a frame on the same origin as the page itself. Thus they cannot be linked to Provideam which would not be the same origin. See more here: https://developer.mozilla.org/en-US/docs/HTTP/X-Frame-Options

Custom Page Details.

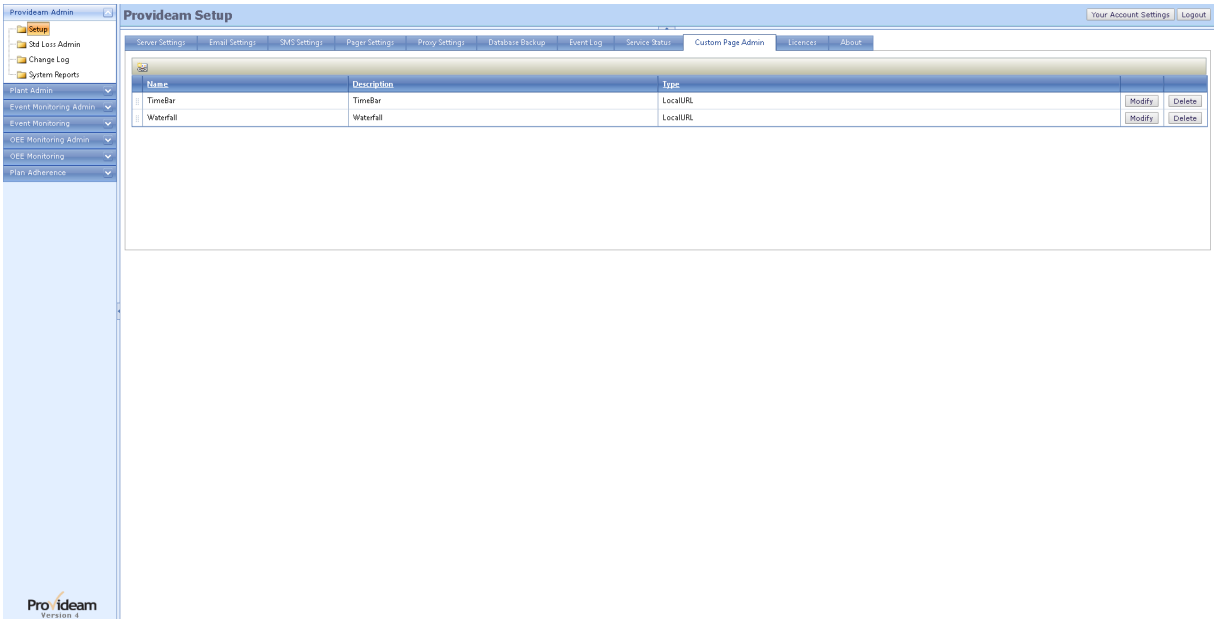


Fig. Custom Page Admin Details

- The AddNewURL button allows you to add a new Custom Page Menu at the URL address. Clicking this button will open the Add URL Pane below.
- The **Modify** button allows you to edit the configuration of Custom Page Menu Item.
- The **Delete** button allows you to delete the Custom Page Menu Item.

Notes:

1. The order in which the Custom Pages occur in the **Custom Pages** table determines the order in which the Views will appear in the Custom Pages menu. To change the order simply click and hold on the icon of the relevant record and drag it to the appropriate position in the list.

Custom Page Details

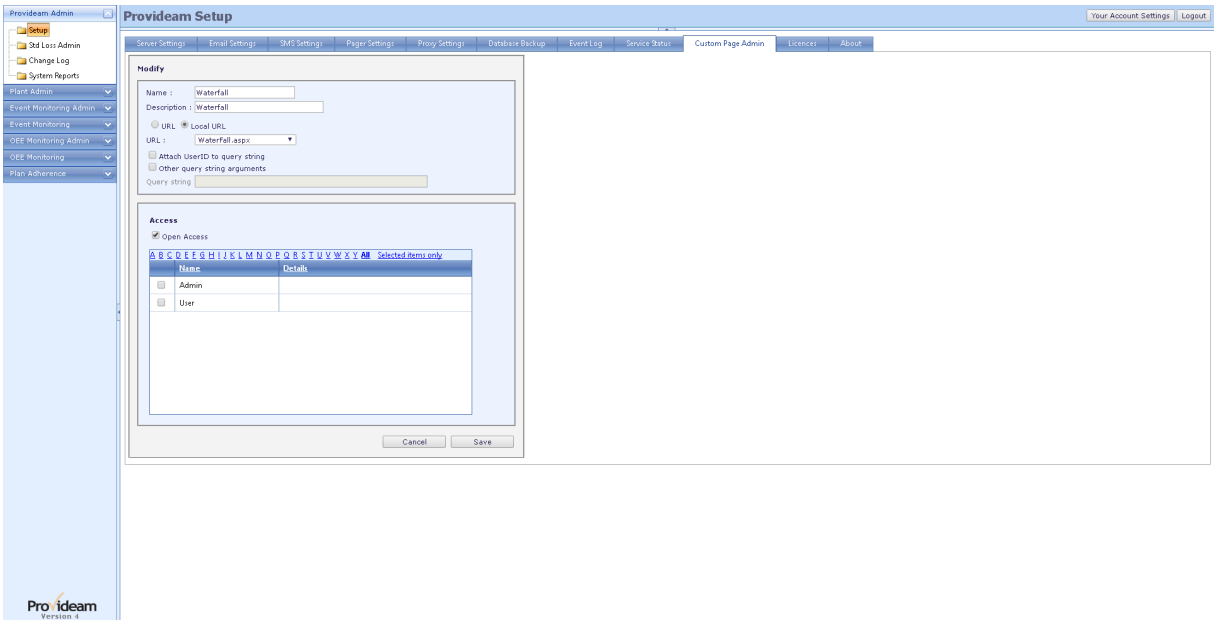


Fig. Custom Page Admin Edit Menu Item

- The **Name** text box allows you to set the name of the Custom Page Menu Item.
- The **Description** text box allows you to set the description of the Custom Page Menu Item.
- The **URL / Local URL** option buttons allow you to select whether the URL is an external URL, for example, *http://*www.provideam.com**,** or an internal URL integrated into the Provideam application web server. Several test pages are provided for testing the Local URL. See "*<Install Folder>\CustomPages*\". In the example above we have selected the **Waterfall.aspx** page.
- The **Attach UserID to query string?** check box allows you to set whether or not the currently logged-in User's UserID is appended to the URL. This allows you to pass the UserID parameter to the URL. The UserID could be used in the target page to return data specific to the specified URL.
- The **Other query string arguments?** check box allows you to set whether or not other parameters, specified in the **Query string** text box, will be appended to the URL.

- The **Query string** text box allows you to specify parameters to be appended to the URL. This text box will only be enabled if the **Other query string arguments?** check box is checked.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Save** button allows you to save changes to the Live view.

Access Control Section:

- The **Open Access** check box allows you to give all users access to this Custom Page Menu Item. If this check box is on then any user will have access to this Custom Page Menu Item. Note that this setting overrides the setting of individual **User Access List**.
- The **User Access List** area allows you to select which users will have access to this View. Check or uncheck any User which you want to include or exclude from the Access List. The alphabetic filter allows you to limit the display to Names which start with the selected letter. The **Selected items only** option shows the Users which you have selected.

Custom Page Menu - Waterfall Chart Example

This is an example of a standalone aspx page which has been integrated in to Provideam. This example uses Provideam API plug-in to interact with Provideam OEE Data. By combining the Custom Page Menus with API plug-ins you can create your own dashboards like the Waterfall example below.

Note: ChartDirector is a component which generates Charts. To use this component in your own code you would need to purchase a ChartDirector license from www.advsofteng.com.

Fig. Custom Page Example - Waterfall Chart

Custom Page Menu - Timebar Chart Example

Fig. Custom Page Example - Timebar Chart

7.4.1.10 *Licences*

The Licenses page provides details of your license to use Provideam. In the example below the installation is licensed to DTL Systems on the *DTL_PM_TEST* server.

Two modules have been licensed:

The OEE Monitoring Module;

- 400 OEE Machines in Total
- 360 Automatic Data Capture Licences. This means that 360 of OEE Machine Licenses can be used for Automatic Data Capture. The remaining 40 OEE Machine Licenses can only be used for Manual Data Entry.

And the Event Monitoring Module;

- 400 Event Items

In addition two general features have been licensed;

- Provideam Active Directory Integration
- Provideam API

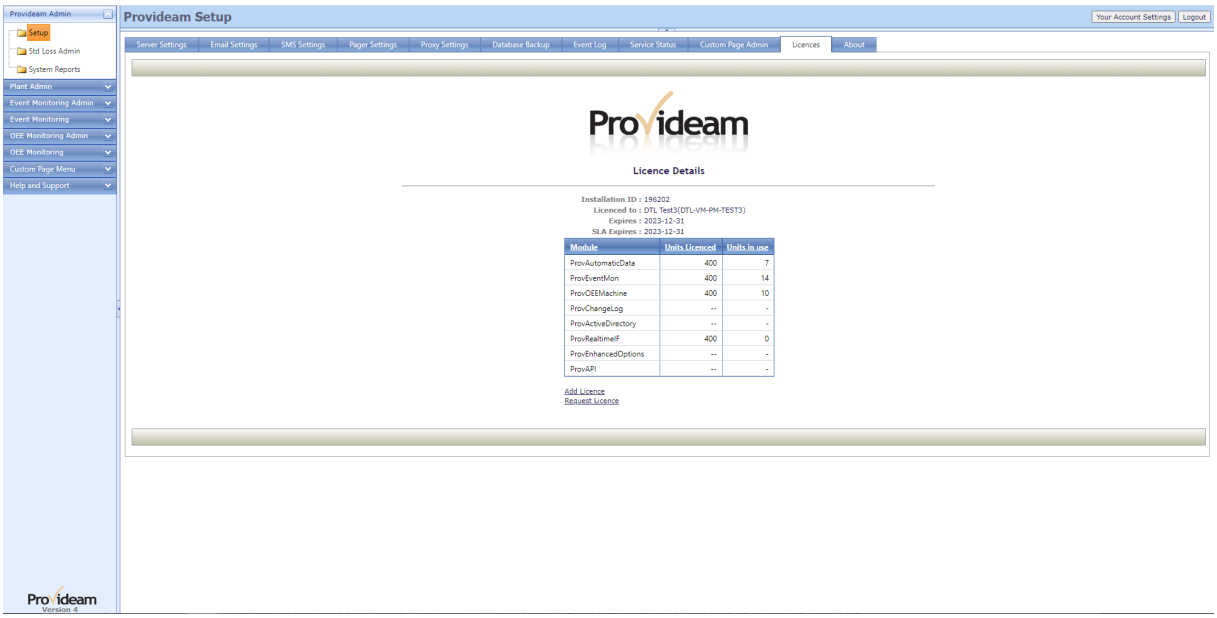


Fig. Provideam Settings - Licenses

- The **Add Licence** link allows you to enter a new Encrypted License Code received from DTL Systems Limited.
- The **Request Licence** button allows you to generate an Encrypted License Request Code to send to DTL Systems Limited.

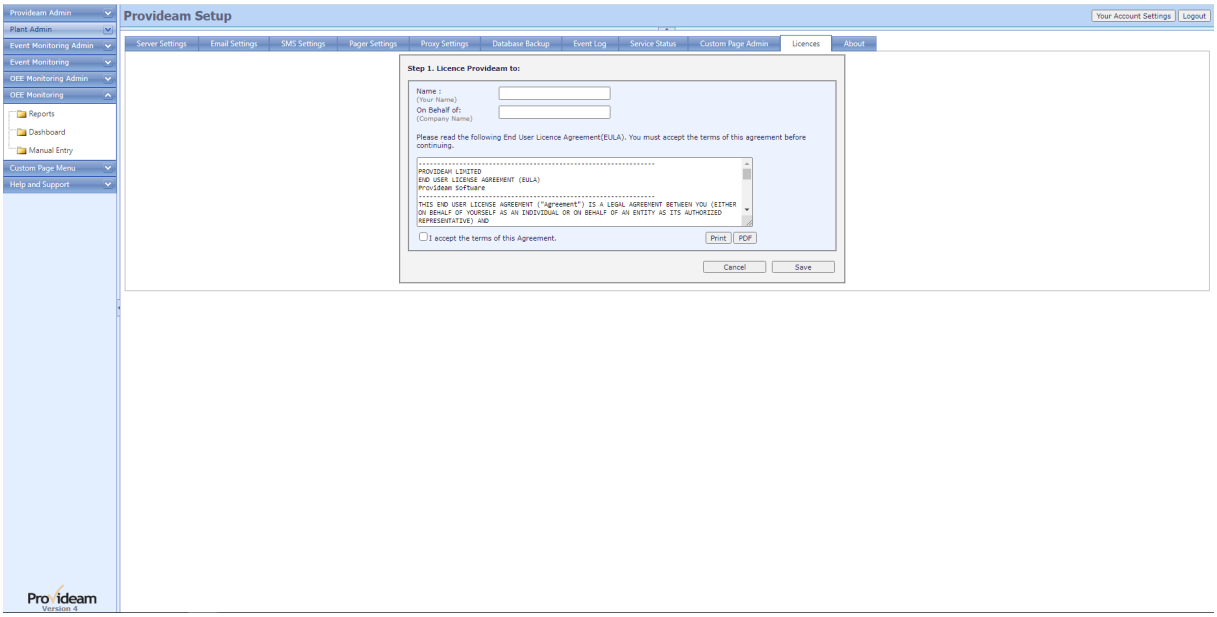


Fig. Provideam Settings - Request License

- The **Name** field allows you to enter your personal name.
- The **On Behalf of** button allows you to enter your company's name.
- The **I accept the terms of this agreement** checkbox allows you to confirm that you have read, understood and accept the terms of the End User License Agreement.
- The **Cancel** button allows to close this page and return to the previous page without changing your license.
- The **Save** button allows you to generate an Encrypted License Request Code.

Clicking on the License Request link opens the page shown above. Enter the appropriate details and click the Save button to generate a new License Request Code.

Send the License Request Code by email, to support@provideam.com to have DTL Systems Limited. generate a new License Code for your application.

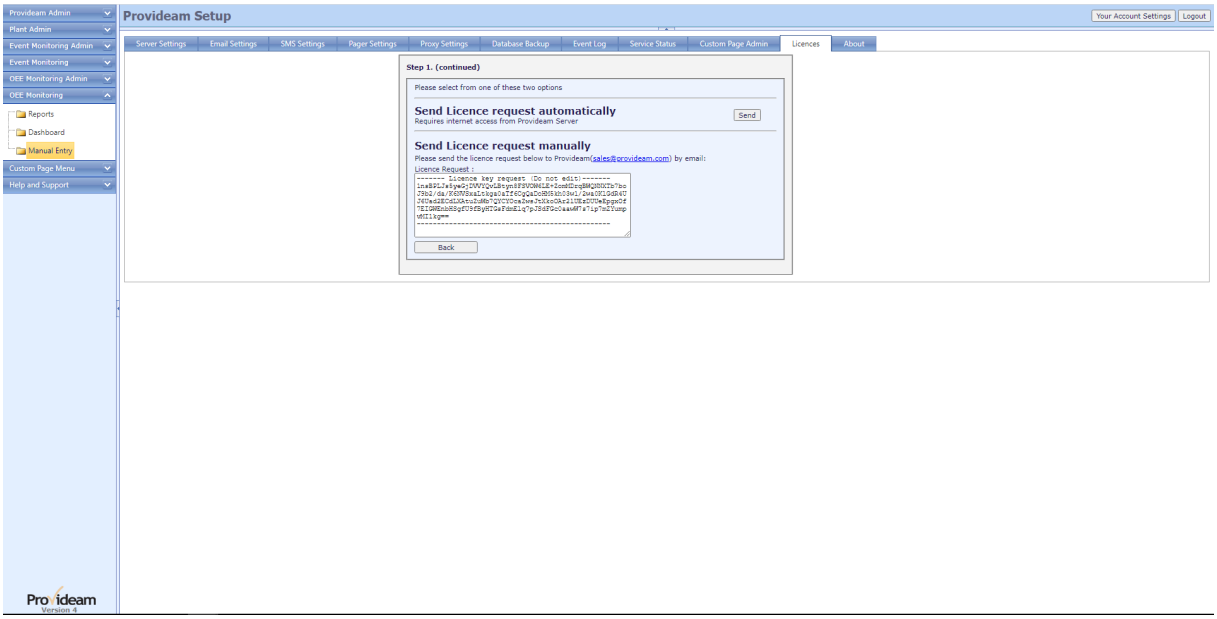


Fig. Provideam Settings - Encrypted License Request Code

- The **Send** button allows to send the license request directly to www.provideam.com. Once your request has been validated you will be able to download the response code automatically. The validation process can take a number of hours to complete.
- The **Back** button allows to close this page and return to the previous page without applying your license.

If you have sent your request by email then when we receive your Encrypted License Request Code we will generate a new Encrypted License Code appropriate to the Module Licenses you have purchased. The new Encrypted License Code will be sent to you by Email. Copy the Code into the License Field in the Add License page.

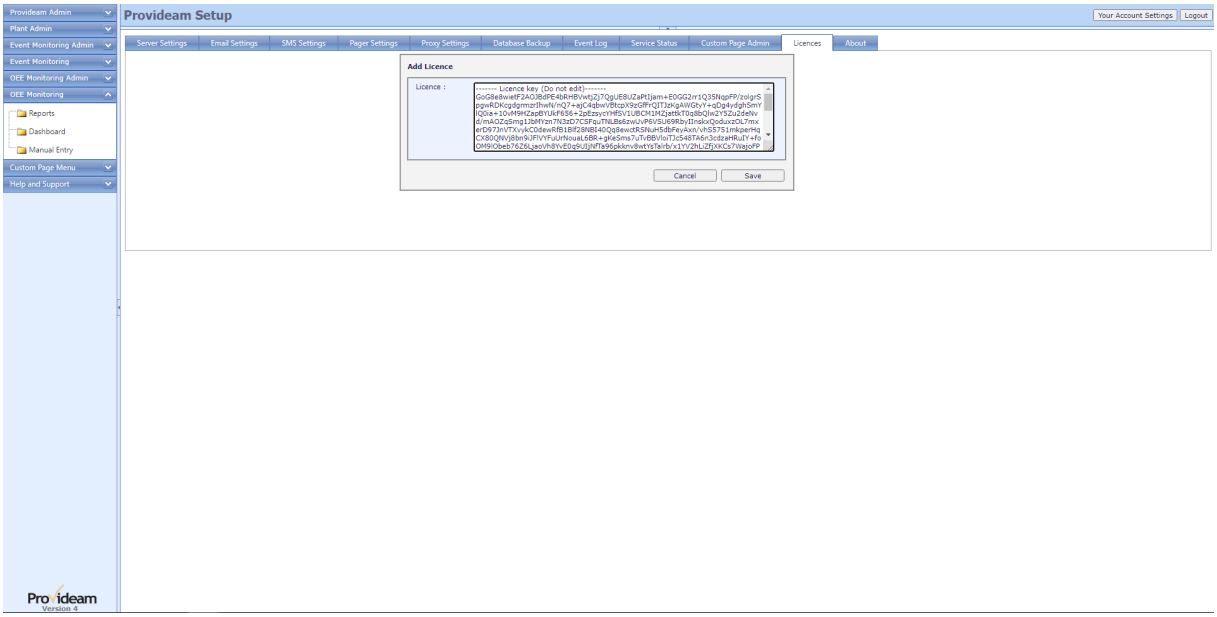


Fig. Provideam Settings - Encrypted License Code

- The **Licence** text box allows you to enter the new License Code.
- The **Cancel** button allows to close this page and return to the previous page without changing your license.
- The **Save** button allows you to save your new License Code. On clicking the **Save** button the License Code will be validated to ensure that it is correctly formed. If the License Code is accepted you will be required to restart the Provideam Application to load the new License

Note: In a multi-plant installation the licences assigned to each Plant may be displayed on the Plant Admin section. Refer to the Setup Page page in the Plant Admin Module.

7.4.1.11 About

The about page displays Provideam contact details.

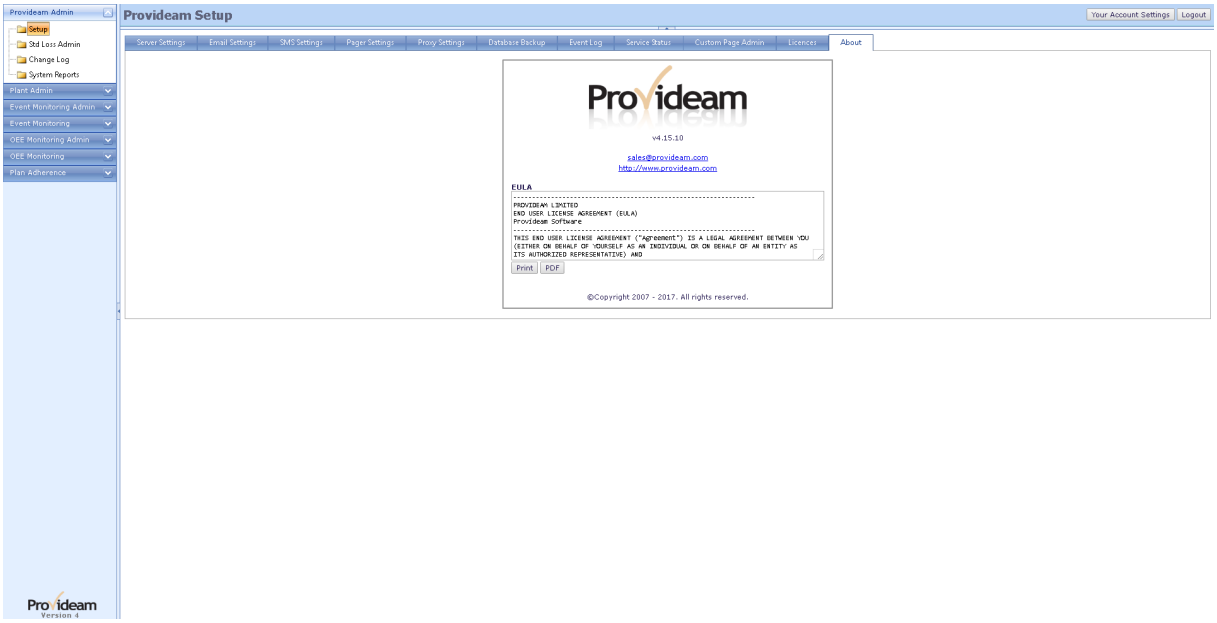


Fig. Provideam Settings - About

7.4.2 Standard Loss Details

The Standard Loss feature has been designed to allow you to apply a consistent framework of Loss Descriptions to all the Machines configured in your Provideam implementation. In this way you will be able to compare the losses occurring on Machines from different suppliers in different plants.

To use this feature you;

1. create a standardised list of losses as described below.
2. apply a Standard Loss Description to each Mode. See the Machine Admin, Mode section.
3. create a report which includes the Standard Loss Fields, *StdLossID*, *StdLossType* & *StdLossDesc.*

The Standard Loss Admin Pane.

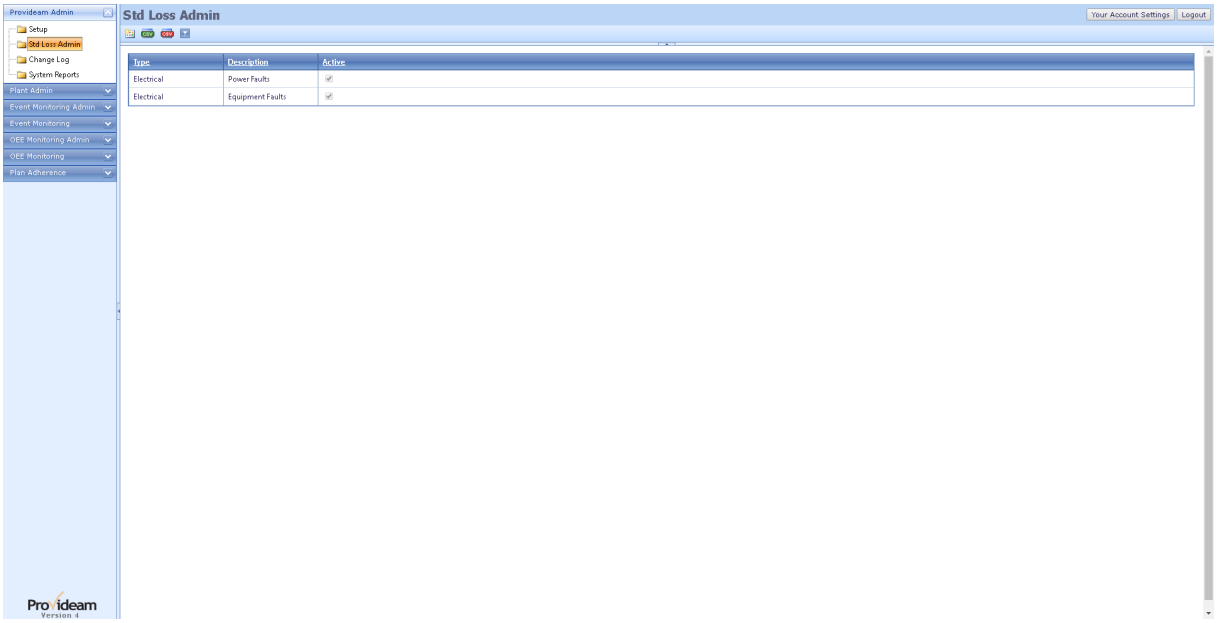


Fig. Provideam Settings - Standard Loss Admin

- The **AddNew** button allows you to create a new Standard Loss.
- The Import CSV button allows you to import Standard Loss data from a CSV file.
- The Export CSV button allows you to export the Standard Loss data to a CSV file.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).

The Plant Details Pane.

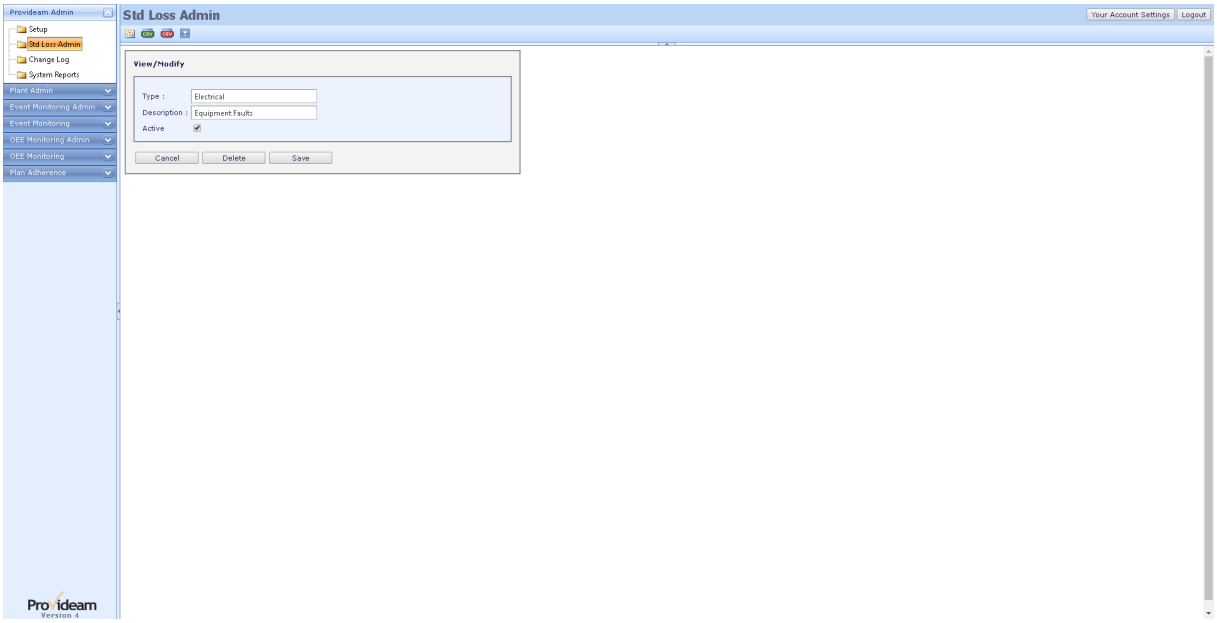


Fig. Provideam Settings - Standard Loss Details

- The **Standard Loss Name** text box allows you to set the name of the Standard Loss.
- The **Standard Loss Description** text box allows you to set the description of the Standard Loss.
- The **Active** check box allows you to enable the Standard Loss for selection by a User.
- The **Cancel** button allows you to close the pane without making any changes.
- The **Delete** button allows you to delete the Standard Loss.
- The **Save** button allows you to save changes to the Standard Loss.

7.4.3 Change Log

The Change Log Page allows you to view a log of actions performed by Users.

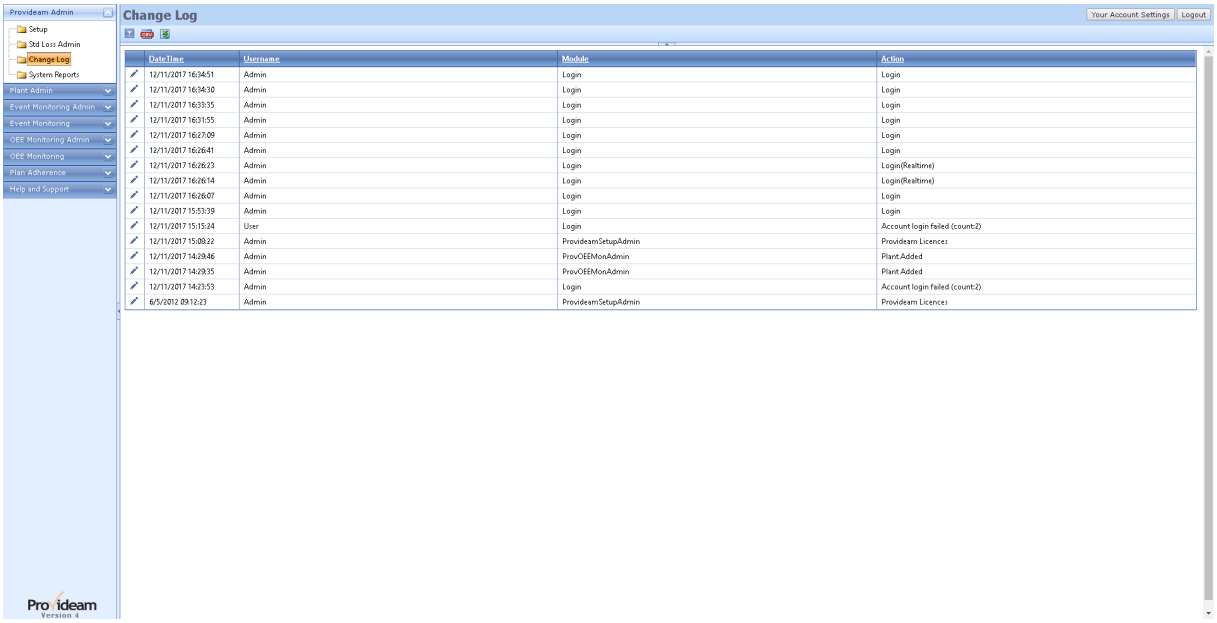


Fig. Provideam Change Log

- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied)
- The **Export To CSV** button box allows you export the data to a CSV file.
- The **Export To Excel** button box allows you export the data to MS Excel.
- The **Refresh** button allows you to refresh the current display.
- The **DateTime** field shows the date and time when the change occurred.
- The **UserName** field shows the User who made the change.
- The **Module** field shows the module which was effected by the change.
- The **Action** field shows the action performed.
- The **Edit** button box allows you to view a more detailed description of the change.
- The **Details** window shows the Command and the IP Address from where the Command was issued. The Command refers to starting the Provideam Service with the ServiceID 2.

Note: The Change Log is only available if you have purchased the Change Logging License.

7.4.4 System Reports

In the System Reports Section a number of useful system reports are provided to help the administrator.

The reports currently available are listed in the table below;

Report Type Name	Report Description
sp_GetReportsByUser	Report Access. List of all Reports and the associated Users with access to the Reports.
sp_GetSchTasksByUser	Scheduled Task. List of all Scheduled Reports and the Users scheduled to receive the Reports.
sp_GetAlarmsByUser	Event Alarms. List of all Annunciated Alarms and the Users configured to receive the Alarms.
sp_GetUsersByUserGroup	User Groups. List of all User Groups and the Users associated with the User Group.
sp_GetUserContactsByUser	User Contact Collections. List of all User Contact Collection and the Users associated with the User Contact Collection.
sp_GetUserActivityLogByUser	User Activity. List of User Log in events and time on site.

7.4.4.1 *System Reports Detail*

System Report Details.

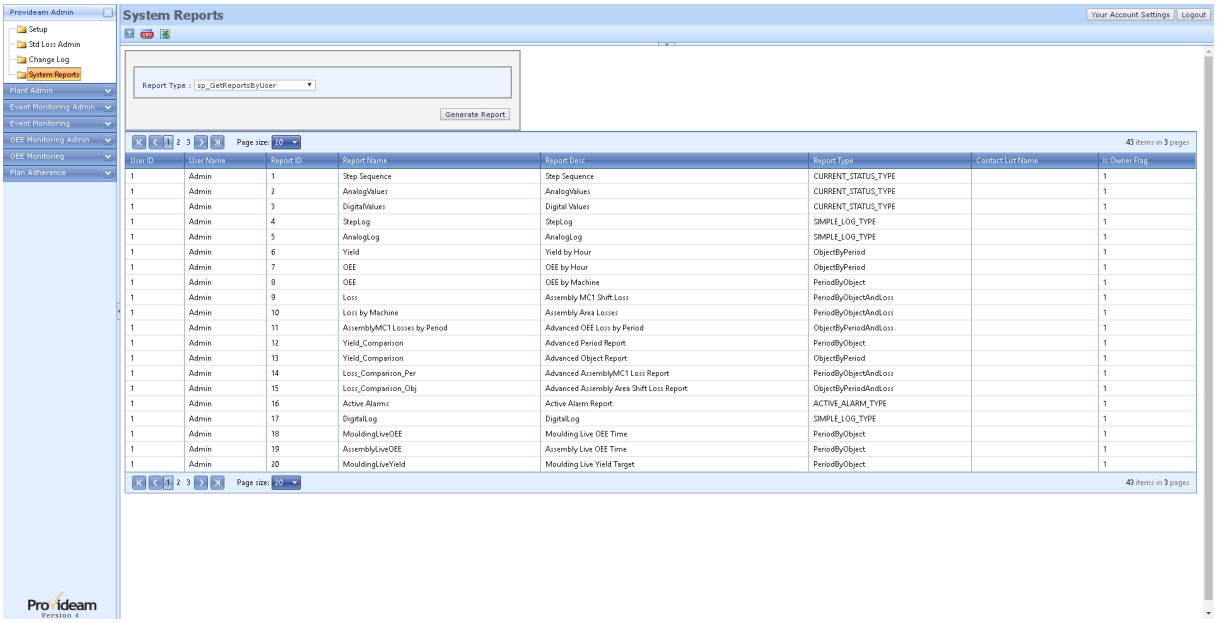


Fig. Provideam Report By User, System Report

To generate a System Report, first select the Report Type and then click the Generate Report button.

- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has
- The **Export CSV** button allows you to export the data to a CSV file.
- The **Export XLS** button allows you to export the data to an XLS file.
- The **Report Type** selection box allows you to select one of the available System Report Types.
- The **Generate** button generates the selected Report Type.

7.5 Plant Admin

In the Plant Admin Module general parameters, related to the Plants, are configured.

7.5.1 Setup

7.5.1.1 Plant Details

The Plant Admin Pane.

Provideam supports data collection and analysis from multiple Plants. If the application is being used to monitor one Plant only, then there is no requirement to enter any Plant Details. The Default details can be used. However if multiple Plants are to be monitored then the user will configure each Plant in the Plant Admin Pane. Dictionaries, User Groups, OEE Admin Areas, OEE Admin Shifts etc, are all assigned to a specific Plant.

When a User Logs in to Provideam, the User will be able to access data from one of more Plants depending on their security rights.

Tip: Good Practice is to create individual User Groups for each Plant. If a User needs to access data from multiple Plants the User can be assigned to the User Groups related to the individual Plants.

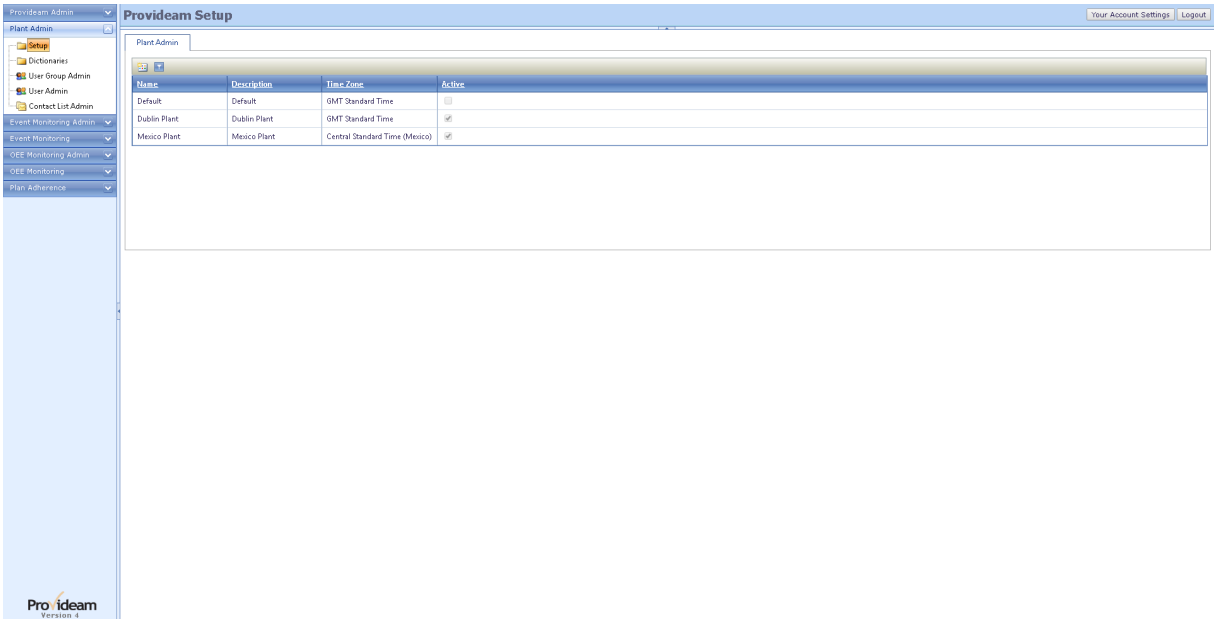


Fig. Plant Admin Settings - Plant Admin

- The **AddNew** button allows you to create a new Plant.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).

If a User is assigned to multiple Groups then a selection box will appear on the top left hand corner of the Menu Section. From the selection box the user will be able to select an individual Plant to which the User has access rights, or 'All'. If the User selects an individual Plant then the data Provideam displays will be limited to that Plant. If the User selects 'All' then all data to which the User has access will be displayed.

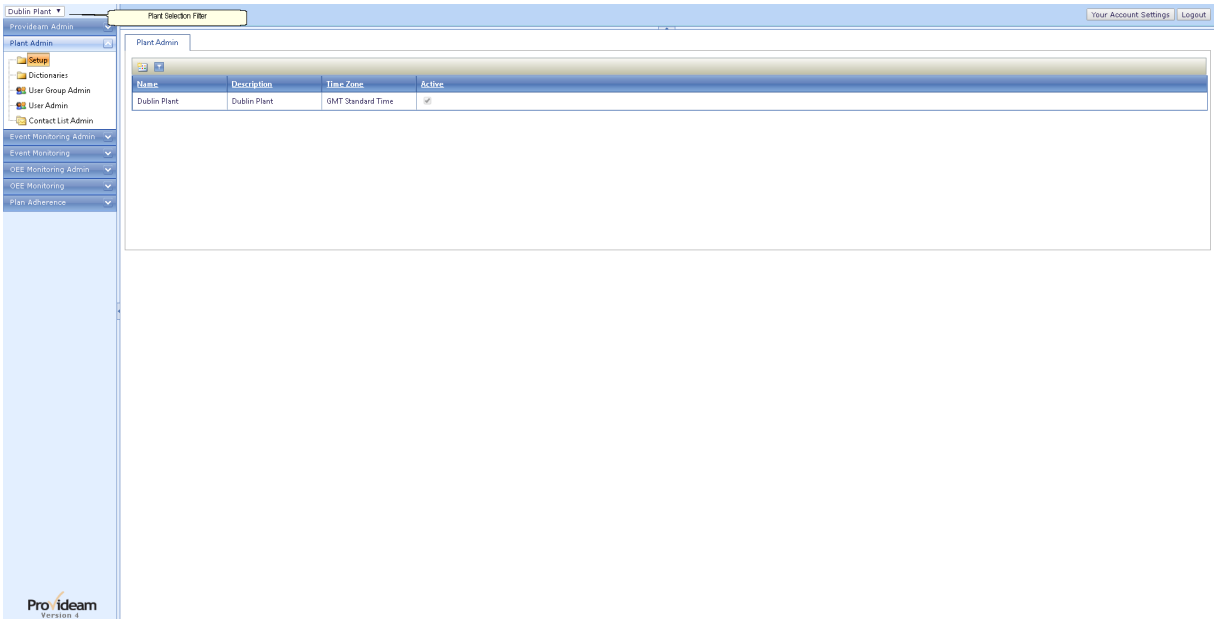


Fig. Plant Admin Settings - Plant Admin Selection

- The **Plant Filter** selection box allows you to limit the data displayed to a single Plant.

In a multi-plant environment the licences assigned to each plant may be displayed on the Plant Admin Page.

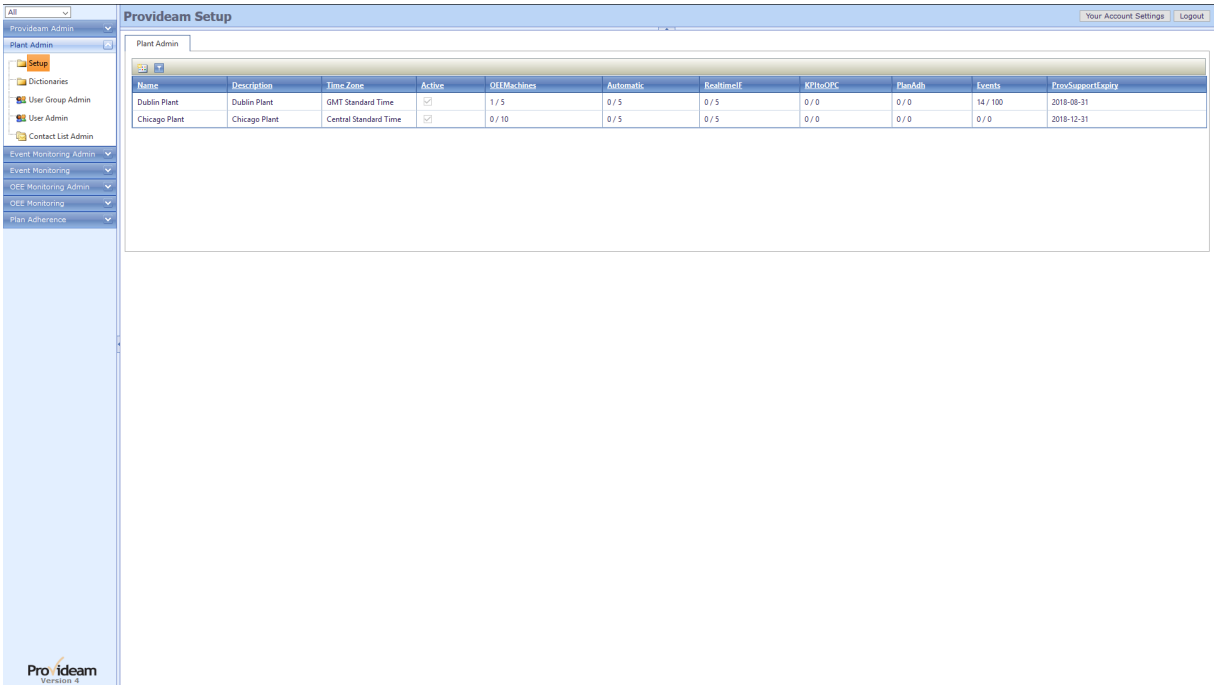


Fig. Plant Admin Settings - Plant Admin Selection with display of assigned licences

The figure above shows the number of licences used/assigned to each Plant, and the expiry date of the Support Agreement. Contact your supplier if you would like to use this feature.

Note: If this feature is configured, the Plant Administrator, would be prevented from configuring the application to exceed the assigned licences. For example the Plant Administrator would be prevented from creating more than 5 Machines in the OEE configuration for the Dublin Plant.

The Plant Details Pane.

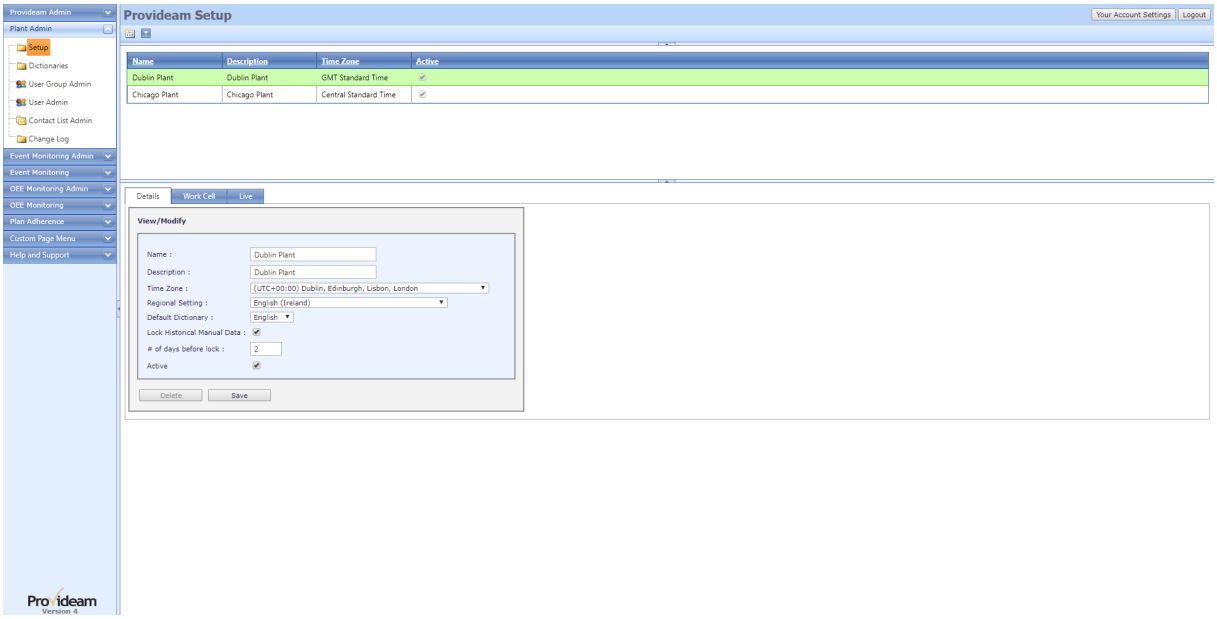


Fig. Plant Admin Settings - Plant Details

- The **Plant Name** text box allows you to set the name of the Plant.
- The **Plant Description** text box allows you to set the description of the Plant.
- The **Lock Historical Manual Data** check box allows you to enable the feature which locks (ie prevents editing) Manual Entry Data.
- The **# of days before lock** text box allows you to set the the number of days, from the current day that can be edited - without requiring special permission. In the example above, data older than 2 days cannot be edited. Special permission can be assigned to the User Group to allow a User linked to the User Group to modify data at any time.
- The **Active** check box allows you to enable the Plant for selection by a User.
- The **Cancel** button allows you to close the pane without making any changes.

- The **Delete** button allows you to delete the Plant.
- The **Save** button allows you to save changes to the Plant.

7.5.1.2 *Plant Work Cell Admin*

The Workcell Admin Pane.

This pane allows you to create and manage Work Cells. Work Cells are intended to be used to group Machines for Reporting purposes.

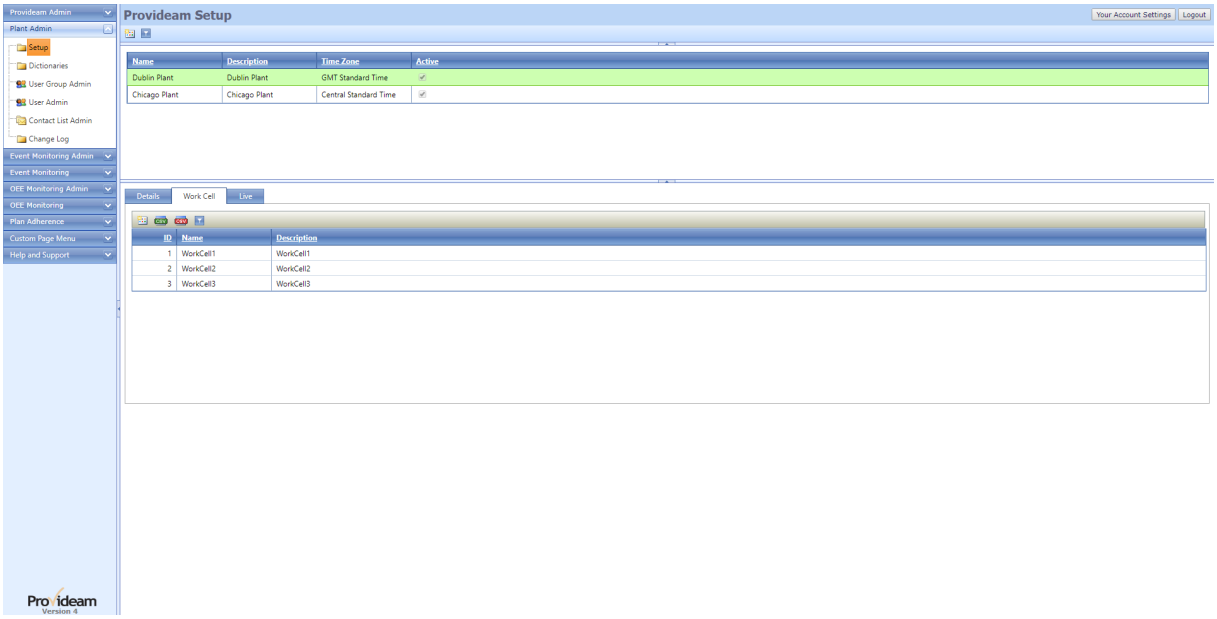


Fig. Plant Admin - Plant Work Cell Admin

- The AddNew button allows you to create a new Work Cell.
- The Import CSV button allows you to import Work Cell data from a CSV file.
- The Export CSV button allows you to export the Work Cell data to a CSV file.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).

Note: When using the CSV import facility it is best practice to base your import file on a previously exported file. Thus you will ensure that the data format is compatible.

The Plant Work Cell Details Pane.

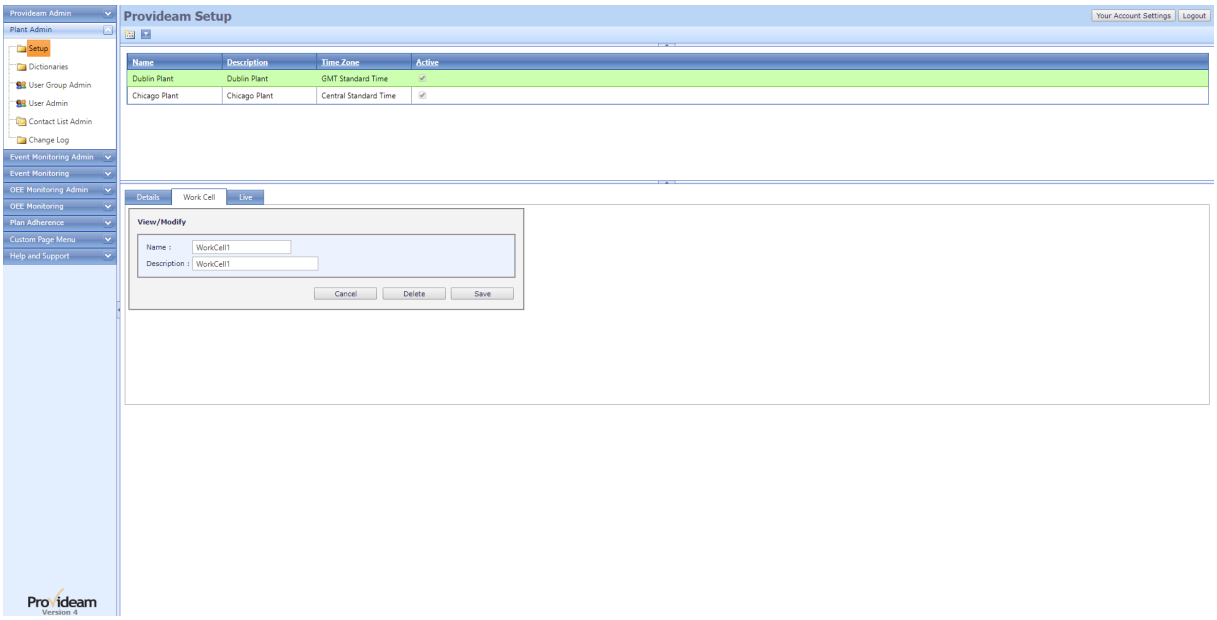


Fig. Plant Admin - Work Cell Details

- The **Name** text box allows you to set the name of the Work Cell.
- The **Description** text box allows you to set the description of the Work Cell.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Work Cell.
- The **Save** button allows you to save changes to the Work Cell.

Note: Work Cells which are created in the Plant Admin section are applied to each Machine, as required, on the Machine Admin Details Page. Work Cell related fields can then be used in OEE Reports.

In the Figure below we show that AssemblyMC1 is linked to WorkCell2.

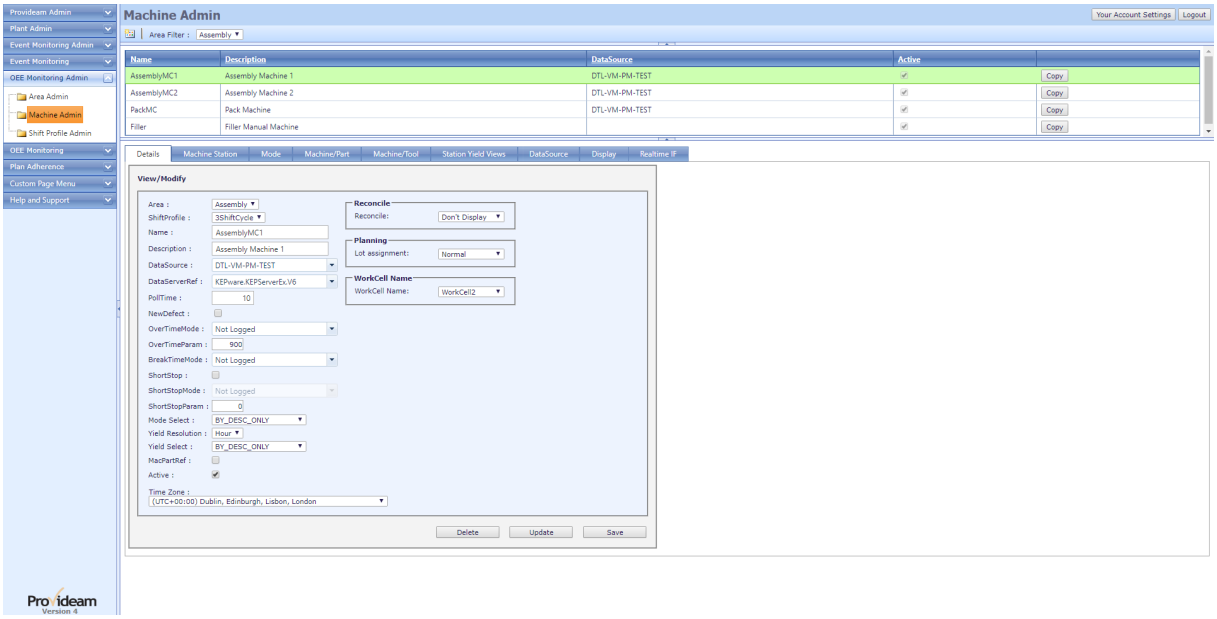


Fig. Machine Admin Details - Showing Work Cell applied to the AssemblyMC1

7.5.1.3 *Plant Live Views*

The Plant Live View Pane.

This pane allows you to configure 'Live' views for the selected Plant. Live Views is a method of presenting Provideam data on a large TV or monitor for the purposes of providing feedback to production operators in real-time.

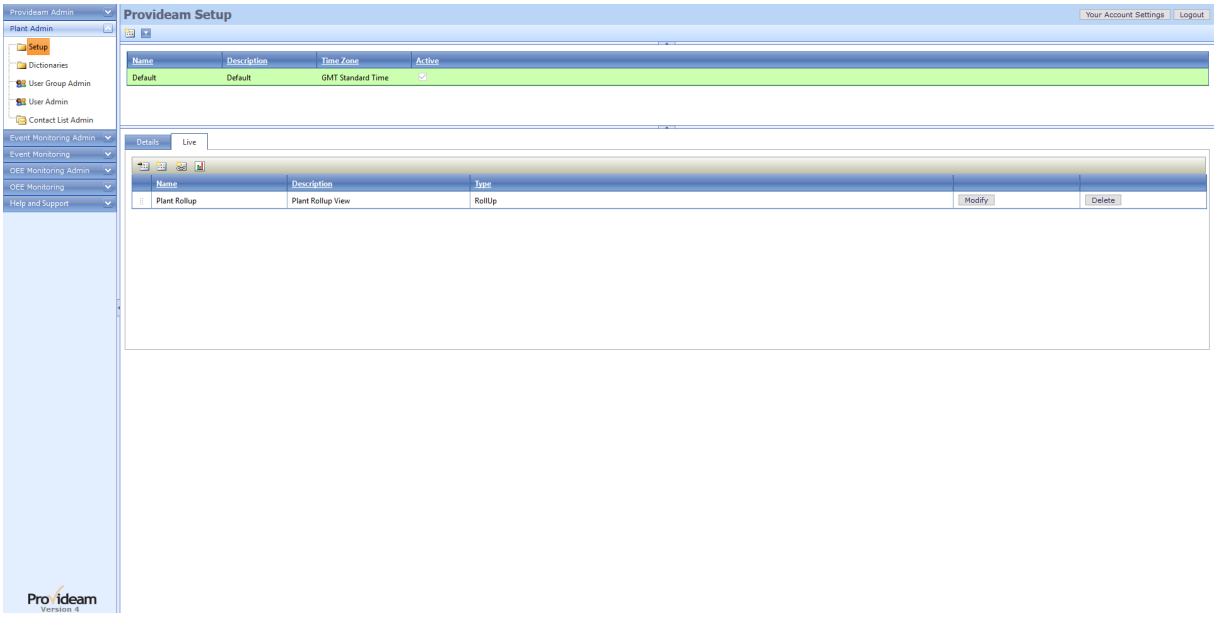


Fig. Plant Admin Settings - Plant Live View

- The Import button allows you to import a report from the OEE Report section to be displayed as a View. Clicking this button will open the Plant Report Import Pane below.
- The AddNew button allows you to add a 'Current Status' View. Clicking this button will open the Add Current Status Pane below.
- The AddNewURL button allows you to add a new view at the URL address. Clicking this button will open the Add URL Pane below.
- The Live button allows you open the Live View Display in a new Browser Tab.
- The **Modify** button allows you to edit the configuration of 'Current Status' or 'AndOn' Views. It is not possible to edit Views created in the OEE Report Module in the Live View Pane. To edit a report based View you must edit the original report and then re-import the view.
- The **Delete** button allows you to delete the View.

Notes:

1. The order in which the Views occur in the **Live Views** table determines the order in which the Views will appear in the Live Views presentation. To change the order simply click and hold on the icon of the relevant record and drag it to the appropriate position in the list.

The Plant Live Report Import Pane.

Reports which are created in the OEE Monitoring Report Module can be imported as Live views.

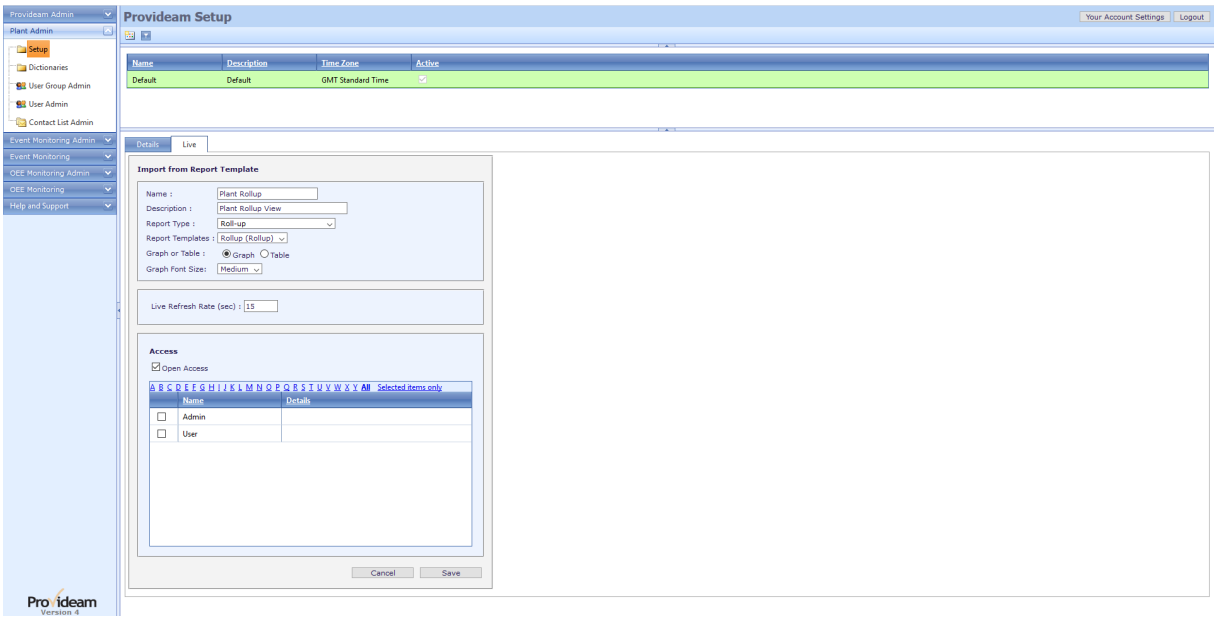


Fig. Plant Admin Settings - Plant Live Report Import Pane

- The **Name** text box allows you to set the name of the Live View.
- The **Description** text box allows you to set the description of the Live View.
- The **Report Type** selection box allows you to select a the type of Report to be displayed as a View.
- The **Report Template** selection box allows you to select a report to be displayed as a View. The report will have been created in the OEE Reports section.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Save** button allows you to save the report View configuration.

Live Refresh Time Section:

- The **Live Refresh Rate (sec)** text box allows you to set an individual refresh update time for each Live View. The default value is set in the Provideam Admin Section. This feature is designed to facilitate Live Views which require a longer time to display such as a video. Provideam can be configured to support the display of .mp4 videos in Live Views.

Access Control Section:

- The **Open Access** check box allows you to give all users access to this View. If this check box is on then any user, with access to the selected Plant, will have access to this View. Note that this setting overrides the setting of individual **User Access List**.
- The **User Access List** area allows you to select which users will have access to this View. Check or uncheck any User which you want to include or exclude from the Access List. The alphabetic filter allows you to limit the display to Names which start with the selected letter. The **Selected items only** option shows the Users which you have selected.

The Plant Live 'Current Status' Pane.

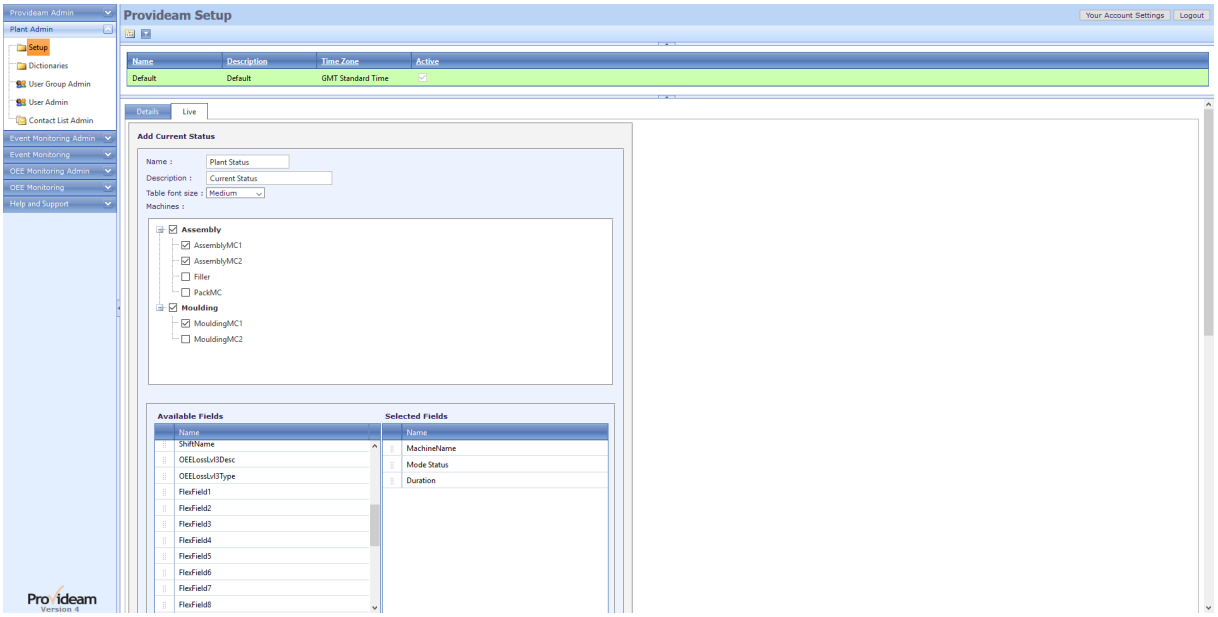


Fig. Plant Admin Settings - Plant Live 'Current Status' View Details

- The **Name** text box allows you to set the name of the Live View.
- The **Description** text box allows you to set the description of the Live View.
- The **Machines** check boxes allow you to select which machines will appear in the view.
- The **Fields** frame displays the list of fields which can be display in a Current Status Live view. To select a field check the relevant checkbox.
- The **Selected Fields** frame displays the fields which have been selected and will be displayed in the Live view.
- The **Functions** frame displays the list of functions which can be display in a Current Status Live view. To select a function check the relevant checkbox.
- The **Selected Functions** frame displays the functions which have been selected and will be displayed in the Live view.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Save** button allows you to save changes to the Live view.

Live Refresh Time Section:

- The **Live Refresh Rate (sec)** text box allows you to set an individual refresh update time for each Live View. The default value is set in the Provideam Admin Section. This feature is designed to facilitate Live Views which require a longer time to display such as a video. Provideam can be configured to support the display of .mp4 videos in Live Views.

Access Control Section:

- The **Open Access** check box allows you to give all users access to this View. If this check box is on then any user, with access to the selected Plant, will have access to this View. Note that this setting overrides the setting of individual **User Access List**.
- The **User Access List** area allows you to select which users will have access to this View. Check or uncheck any User which you want to include or exclude from the Access List. The alphabetic filter allows you to limit the display to Names which start with the selected letter. The **Selected items only** option shows the Users which you have selected.

The Plant Live 'Add URL' Pane.

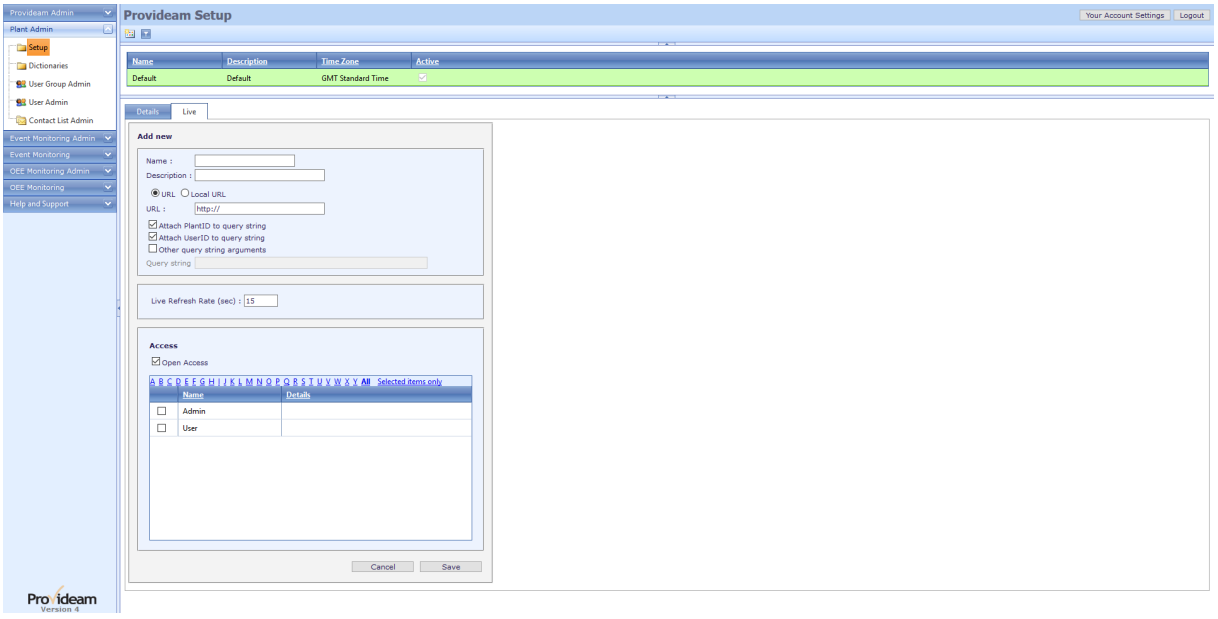


Fig. Plant Admin Settings - Plant Live 'Add New URL' View Details

- The **Name** text box allows you to set the name of the Live View.
- The **Description** text box allows you to set the description of the Live View.
- The **URL / Local URL** option buttons allow you to select whether the URL is an external URL, for example, *http://www.google.com*, or an internal URL integrated into the Provideam application web server.

  Two test pages are provided for testing the Local URL. See "*<Install Folder>\CustomPages\test.html*" and "*<Install Folder>\CustomPages\test.aspx*".

In addition a HTML template "*<Install Folder>\CustomPages\playvideotemplate.html*" has been provided to guide you to embedding MP4 video files on your Custom Pages. The MP4 file should be located in the Custom Pages folder. To create your own video page simply copy the HTML template and rename it to an appropriate file name. Then edit the file using a text editor and change the MP4 file reference to the name of your MP4 file. Finally you will need to update the IIS WebServer to include MP4 file types in the MIME Map section for the Provideam website. (see instructions below).

- The **Attach PlantID to query string?** check box allows you to set whether or not the PlantID is appended to the URL. This allows you to pass the PlantID parameter to the URL. The PlantID could be used in the target page to return data specific to the specified URL.
- The **Attach UserID to query string?** check box allows you to set whether or not the currently logged-in User's UserID is appended to the URL. This allows you to pass the UserID parameter to the URL. The UserID could be used in the target page to return data specific to the specified URL.
- The **Other query string arguments?** check box allows you to set whether or not other parameters, specified in the **Query string** text box, will be appended to the URL.
- The **Query string** text box allows you to specify parameters to be appended to the URL. This text box will only be enabled if the **Other query string arguments?** check box is checked.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Save** button allows you to save changes to the Live view.

Live Refresh Time Section:

- The **Live Refresh Rate (sec)** text box allows you to set an individual refresh update time for each Live View. The default value is set in the Provideam Admin Section. This feature is designed to facilitate Live Views which require a longer time to display such as a video. Provideam can be configured to support the display of .mp4 videos in Live Views.

Access Control Section:

- The **Open Access** check box allows you to give all users access to this View. If this check box is on then any user, with access to the selected Plant, will have access to this View. Note that this setting overrides the setting of individual **User Access List**.
- The **User Access List** area allows you to select which users will have access to this View. Check or uncheck any User which you want to include or exclude from the Access List. The alphabetic filter allows you to limit the display to

Names which start with the selected letter. The **Selected items only** option shows the Users which you have selected.

Steps to configure IIS to play MP4 video files;

1) Select the web site to configure in IIS. Right click on the site and select **Properties**.

2) Under the HTTP Headers Tab, under the MIME Map Section, select "**File Types**", and select either the "**New Type**" or "**Add**" options.

3) Type "*.mp4*" as the extension and "*video/mp4*" as the MIME Type.

4) Click OK.

5) Restart the IIS WebServer using the IISRESET command or the IIS Manager.

The Plant Live Change View Order.

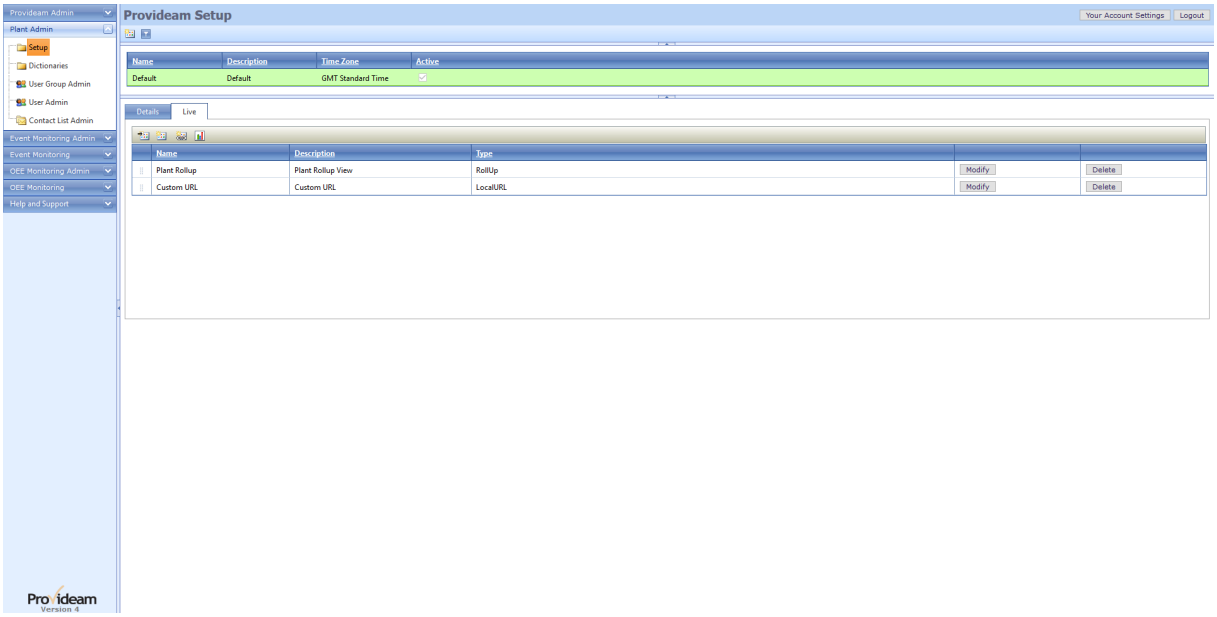


Fig. Plant Admin Settings - Plant Live View - Change Order

The order in which the Live Views appear can be modified. The order in which the records occur in the above table defines the order in which they appear on the Live View. The records are 'drag and drop'. To change the order simply click and hold on the icon in the first column of the record and drag it to the appropriate position in the table.

7.5.1.4 *ProvEdgeBoxes Admin*

The Plant ProvEdgeBoxes Admin Pane.

This pane allows you to configure ProvEdgeBoxes for the selected Plant.

Note: ProvEdgeBoxes are intelligent sensors which can be used to count production output from a Production Line. See the ProvEdgeBoxes section of this User Guide for a detail description.

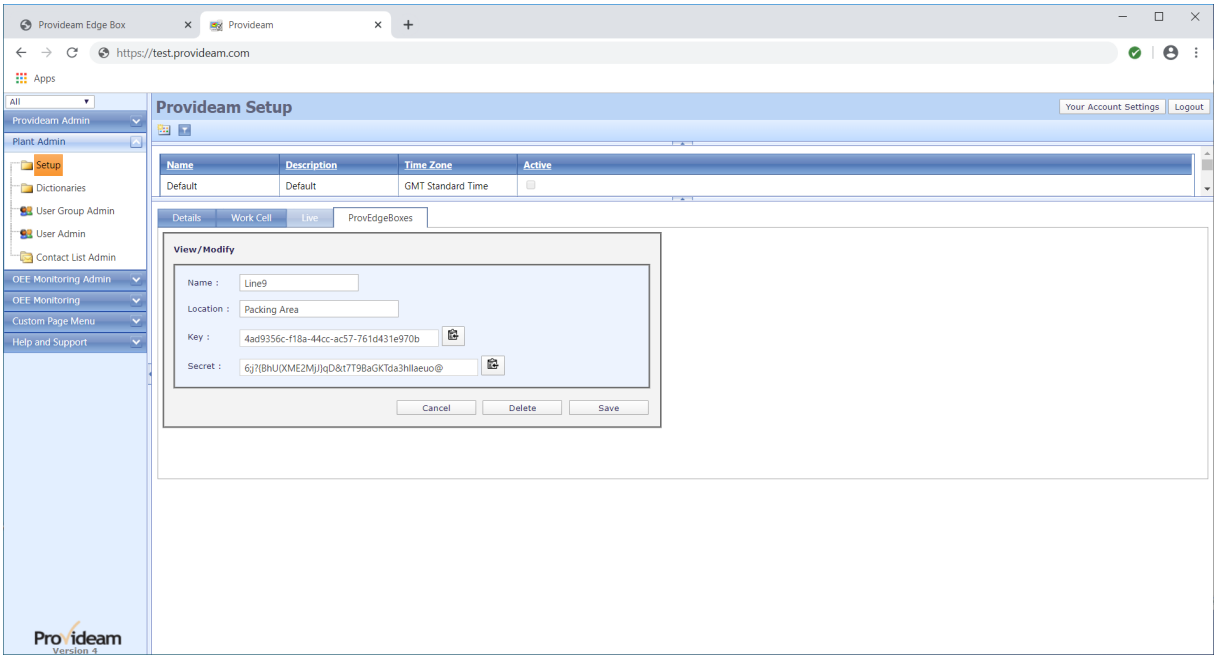


Fig. Plant Admin Settings - ProvEdgeBoxes Modify

- The **Name** text box allows you to set the unique name which will identify the ProvEdgeBox
- The **Location** text box allows you to set the name which will help to identify the ProvEdgeBox
- The **Key** text box displays the unique Key to be used by the ProvEdgeBox when connecting to the Provideam ProvEdgeBox Server
- The **Secret** text box displays the unique Secret to be used by the ProvEdgeBox when connecting to the Provideam ProvEdgeBox Server. Once the details are saved it will not be possible to view this Secret again. If the Secret is lost, then the user will need to create a new Secret. If a Secret is changed while a ProvEdgeBox is connected the ProvEdgeBox will stop communicating with the Provideam ProvEdgeBox Server.
- The **Cancel** button allows you to cancel any edits and return to the previous page.

- The **Delete** button allows you to delete the ProvEdgeBox.
- The **Save** button allows you to save changes to the ProvEdgeBox.

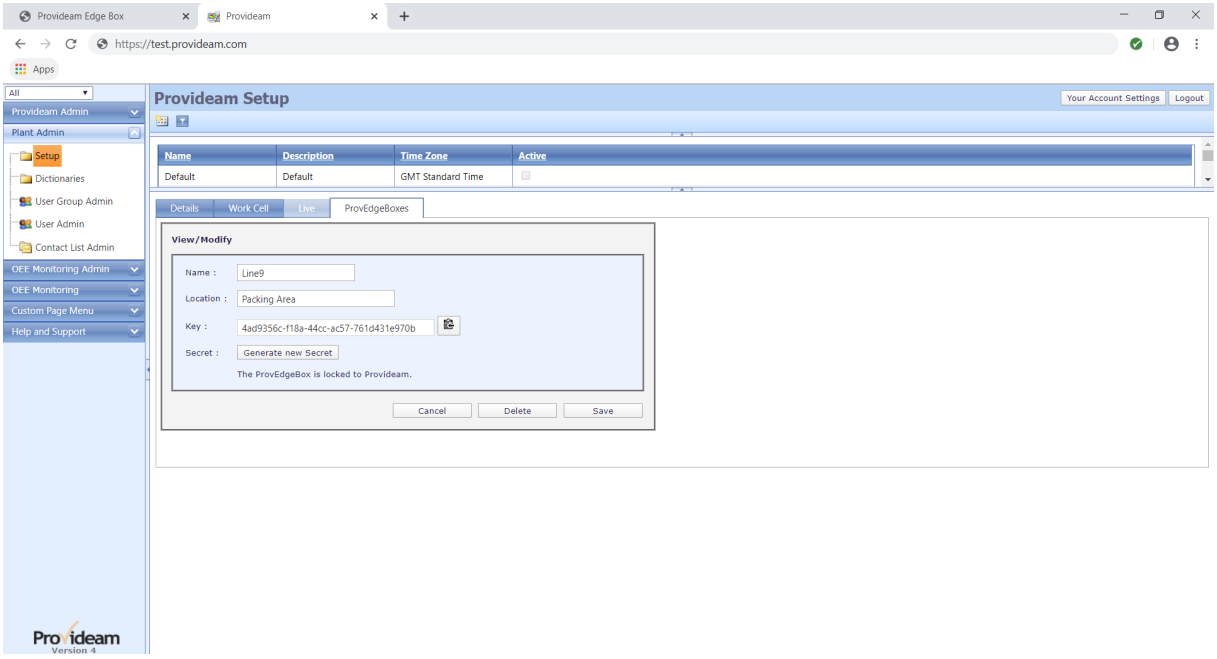


Fig. Plant Admin Settings - ProvEdgeBox Locked

- The **Name** text box allows you to set the unique name which will identify the ProvEdgeBox
- The **Location** text box allows you to set the name which will help to identify the ProvEdgeBox
- The **Key** text box displays the unique Key to be used by the ProvEdgeBox when connecting to the Provideam ProvEdgeBox Server
- The **Generate new Secret** button allows you to create a new unique Secret to be used by the ProvEdgeBox when connecting to the Provideam ProvEdgeBox Server. Once the details are saved it will not be possible to view this Secret again. If the Secret is lost, then the user will need to create a new Secret. If a Secret is changed while a ProvEdgeBox is connected the ProvEdgeBox will stop communicating with the Provideam ProvEdgeBox Server.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the ProvEdgeBox.
- The **Save** button allows you to save changes to the ProvEdgeBox.

7.5.2 Data Collection

Data Collection

The Data Collection function allows you to create MQTT and OPC-UA connections.

To access this function, open the Plant Admin section and click on the Data Collection menu item.

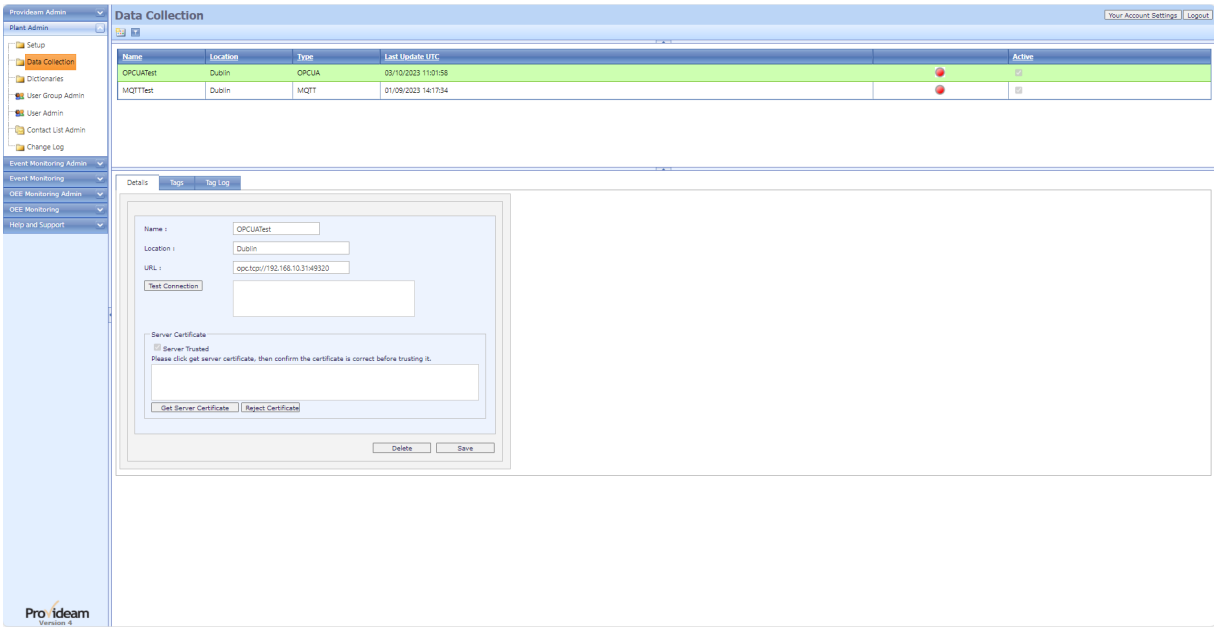


Fig. Data Collection, OPCUA Connection Details pane

In the screenshot above, two sample connections are shown. A sample OPCUA connection "OPCUATest", and a sample MQTT connection "MQTTTest".

The OPCUATest connection has been selected. The connection details are displayed in the lower section. In the case of OPCUA connections, this page allows you to enter the OPCUA Server Endpoint address, and accept the Server Certificate.

The **Filter** button box both on the top-left-hand corner of the Data Collection page allows you to filter the connections (the icon changes to when a filter has been applied).

The Tags pane allows you to manage Tags.

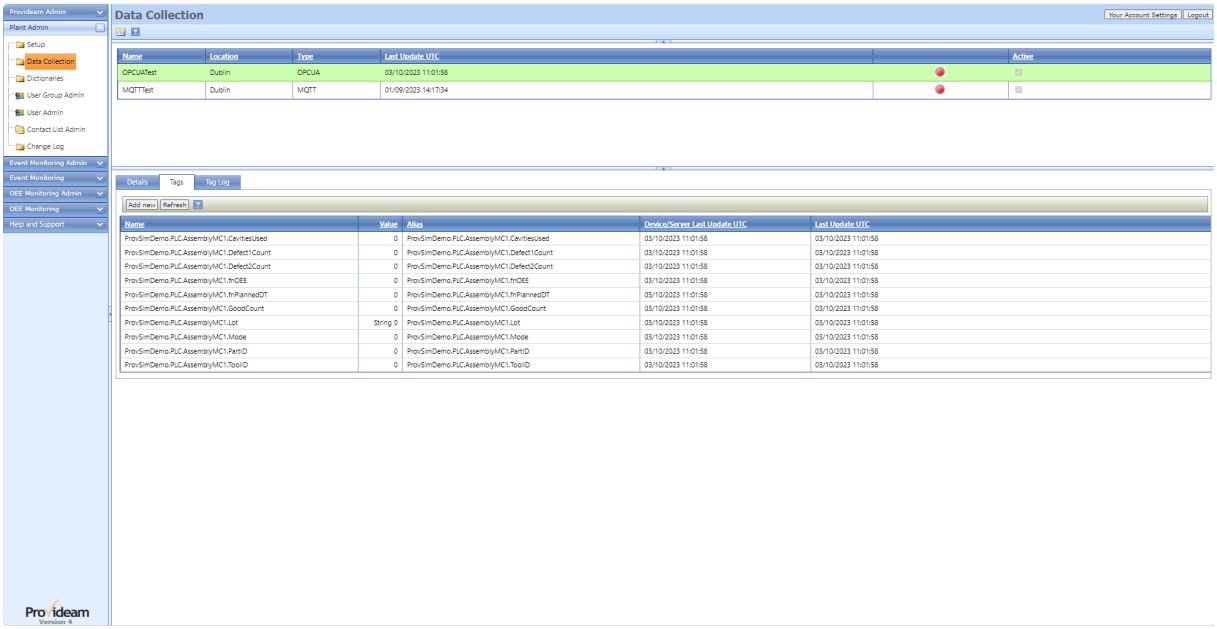


Fig. Data Collection, OPCUA Connection Tags pane

The Tags panel shows the Tags that are to be monitored.

On this pane Tags can be added or removed from the data collection configuration.

The Tag Log panel shows a recent history of the data collected from the selected Tags.

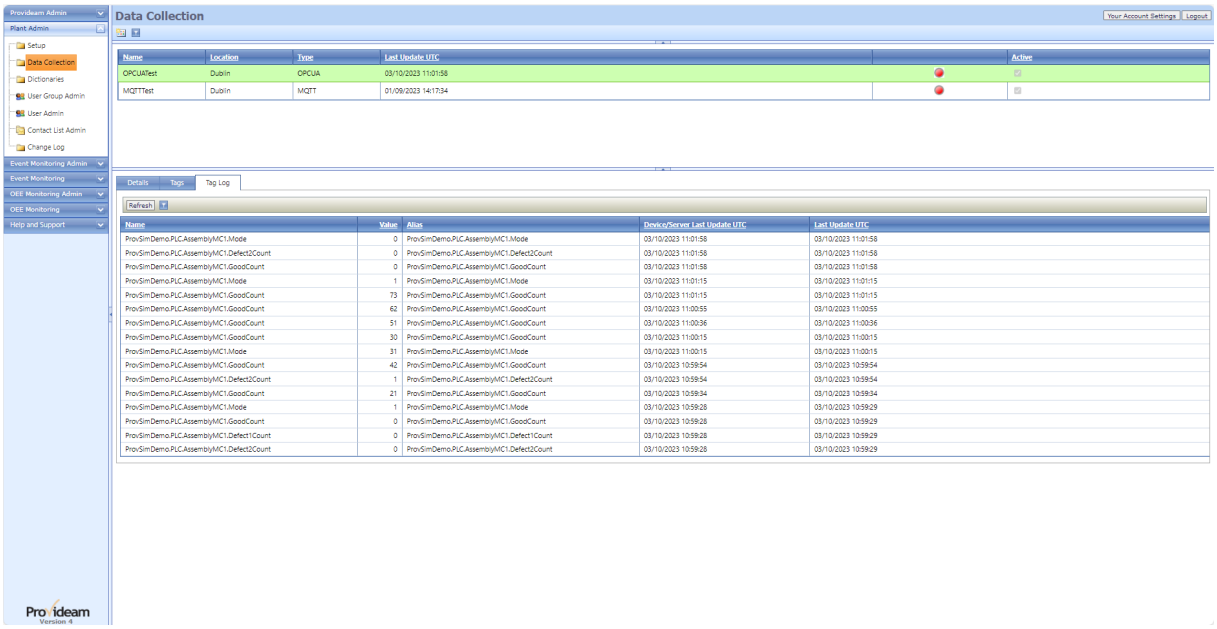


Fig. Data Collection, OPCUA Connection Tag Log pane

The **Filter** button box both on the top-left-hand corner of both the Tags and Tag Log panels allow you to filter the displayed data.

Adding a new OPCUA connection

To add a new connection:

Step 1: click on the **AddNew** icon.

Step 2: choose which kind of connection you want to create by clicking on the MQTT or OPC-UA button.

Step 3: if you click the OPC-UA connection, a window will open where you will be prompted to add the Name, Location, and URL of the new OPC-UA connection.

Step 4: click on the **Add New** button.

Step 5: click on the **Test Connection** button. The result will not be successful.

Step 6: swap the CERTS.

Step 7: click the **Get Server Certificate** button. If the certificate is acceptable, click the **Test Connection** button. The result should now be "Successful".

Step 8: check the **Server trusted** box.

Step 9: click the **Save** button.

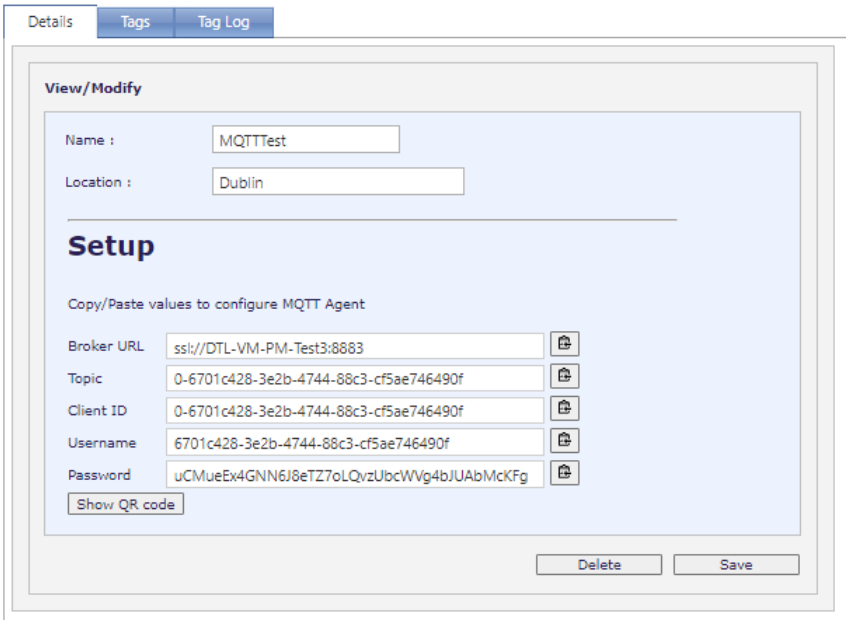
Adding a new MQTT connection

To add a new connection:

Step 1: click on the **AddNew** icon.

Step 2: choose which kind of connection you want to create by clicking on the MQTT or OPC-UA button.

Step 3: if you click the MQTT button, a window will open where you will be prompted to add the Name and Location of the new MQTT connection. It will also provide the information needed for your MQTT subscriber to connect to the Provideam MQTT broker.



Data Collection MQTT Connection Details Setup

Step 4: click the **Save** button.

Step 5: copy the MQTT URL, Topic etc. to your MQTT client.

7.5.3 Dictionaries

Provideam has a fully integrated Dictionary Function. The Dictionary Function allows you to customise the text anywhere in the application to text that best suits your requirements. For example if you prefer to use 'Productive Time' instead of 'OEE Time' you can easily change this text.

There are 2 Reserved Dictionaries created on installation. These will be used as Standard Dictionaries for the most popular languages requested by Provideam Clients. Reserved Dictionaries cannot be edited or deleted by a User. We will add more Reserved Dictionaries for other widely used languages in future.

To create a customised Dictionary simply copy one of the Reserved Dictionaries and make any changes you require to the copied Dictionary.

In the figure below the Reserved English Dictionary is selected. The keys associated with this Reserved Dictionary are shown in the lower section of the page.

Note: The Reserved Dictionaries cannot be deleted or edited.

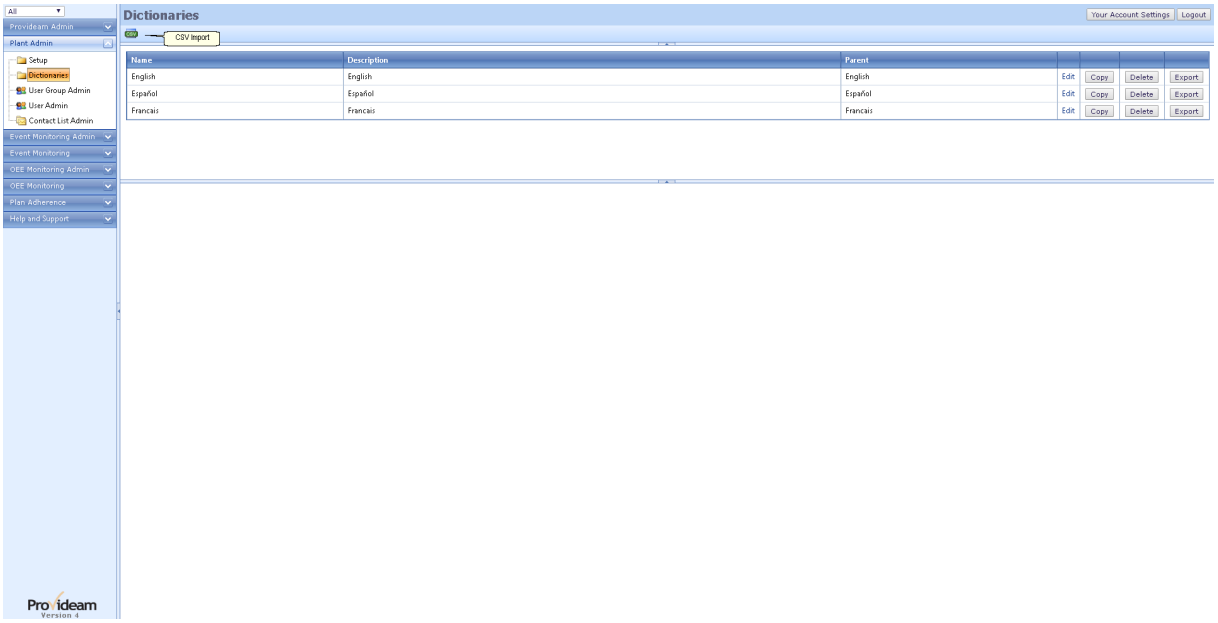


Fig. Dictionaries - Reserved Dictionary

Upper Table

- The **Name** field allows you to set the unique name for the Dictionary
- The **Description** field allows you to add a more detailed depiction of the Dictionary
- The **Parent** field shows the Name of the Reserved Dictionary from which the Dictionary has been derived
- The **Edit** button allows you to edit the Name and Description of a Customisable Dictionary. This field is disabled for Reserved Dictionaries
- The **Copy** button allows you to create a copy of the selected Dictionary
- The **Delete** button allows you to delete the selected Dictionary. This field is disabled for Reserved Dictionaries
- The **Export** button allows you to export the selected Dictionary to a CSV file. This facilitates editing the Dictionary in an application such as MS Excel.
- The **Import CSV** button allows you to import a CSV file. While importing you may chose to overwrite an existing Customisable Dictionary or create a new Dictionary.

Lower Panes

- The **EventAdmin** pane refers to text in Event Monitoring Module User Interface

- The **EventLogic** pane refers to text in Event Monitoring Module Reports - Field Names, Functions etc.
- The **Generic** pane refers to generic text used throughout the application
- The **OEEAdmin** pane refers to text in OEE Monitoring Module User Interface
- The **OEELogic** pane refers to text in OEE Monitoring Module Reports - Field Names, Functions etc.
- The **ProvDemo** pane refers to text in Provideam Demo Application
- The **Services** pane refers to text used in the Provideam Services
- The **SetupAdmin** pane refers to text used in the Provideam Admin Section of the User Interface

In the next figure a copy has been made of the Reserved English Dictionary. This Dictionary is customisable. In the figure below we show how to edit single entry. For large scale customisation it may be more efficient to export the entire Dictionary to CSV where it can be edited in MS Excel.

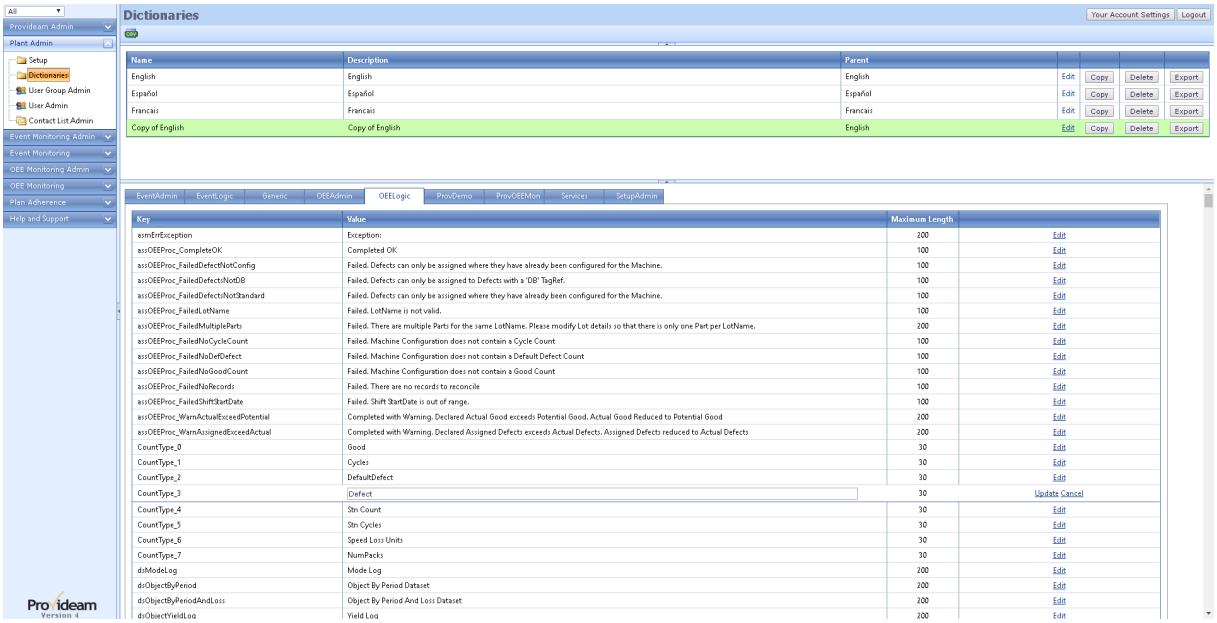


Fig. Dictionaries - Customisable Dictionary

Lower Table

- The **Key** field refers to the unique name given to the text item
- The **Value** field refers to the text which will be displayed in the User Interface for the selected Key

- The **Maximum Length** field refers to the maximum number of text characters which can be used for the selected Key
- The **Edit** button allows you to edit the text value for the selected Key
- The **Update** button allows you to update(save) the text you have entered for the selected Key
- The **Cancel** button allows you cancel the edit mode.

The Import Screen is shown below;

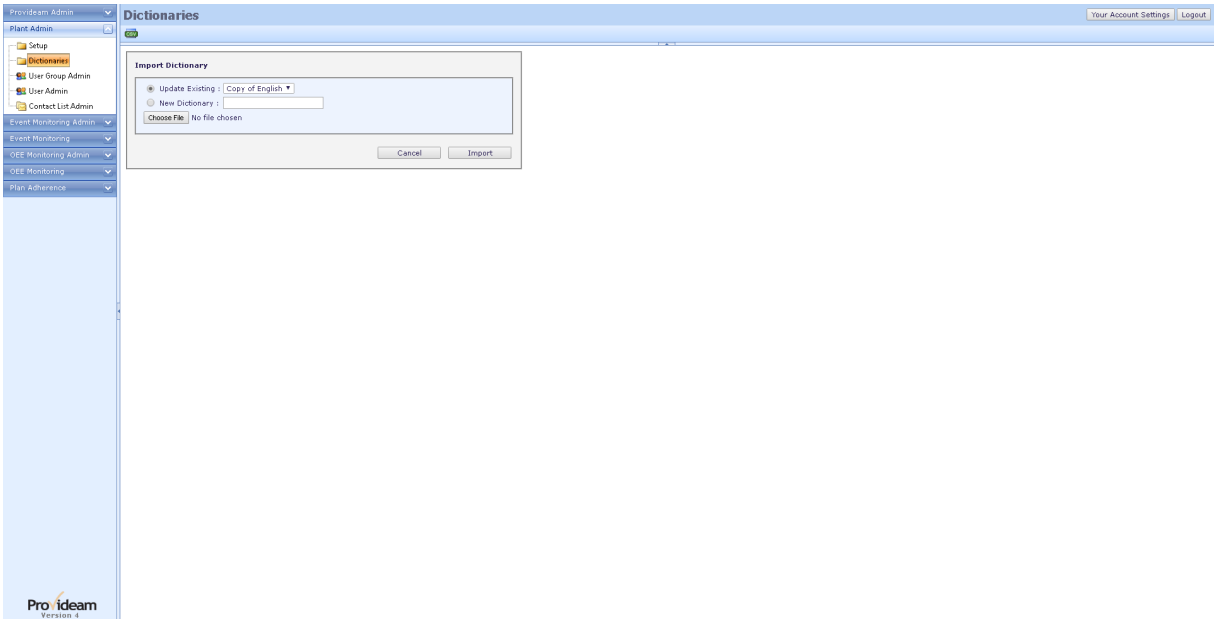


Fig. Dictionaries - Import Dictionary

- The **Update Existing** selection box allows you to chose an existing Customisable Dictionary to overwrite
- The **New Dictionary** field allows you to enter a new Dictionary Name. Once the import function has completed the new Dictionary will appear under this new Name.
- The **Choose File** button allows you to select the location of the CSV file Dictionary you wish to import.
- The **Cancel** button closes the Import Dictionary pane
- The **Import** button starts the importation function.

Note: Importing a Database can take several minutes.

7.5.4 User Group Admin

In the User Group Section, User Groups and User Group Security are configured. Access to the Provideam application is controlled. Each User must be associated with a User Group to access the application. The Users' application rights are derived from the User Group to which the User has been assigned.

7.5.4.1 User Group Details

User Group Details.

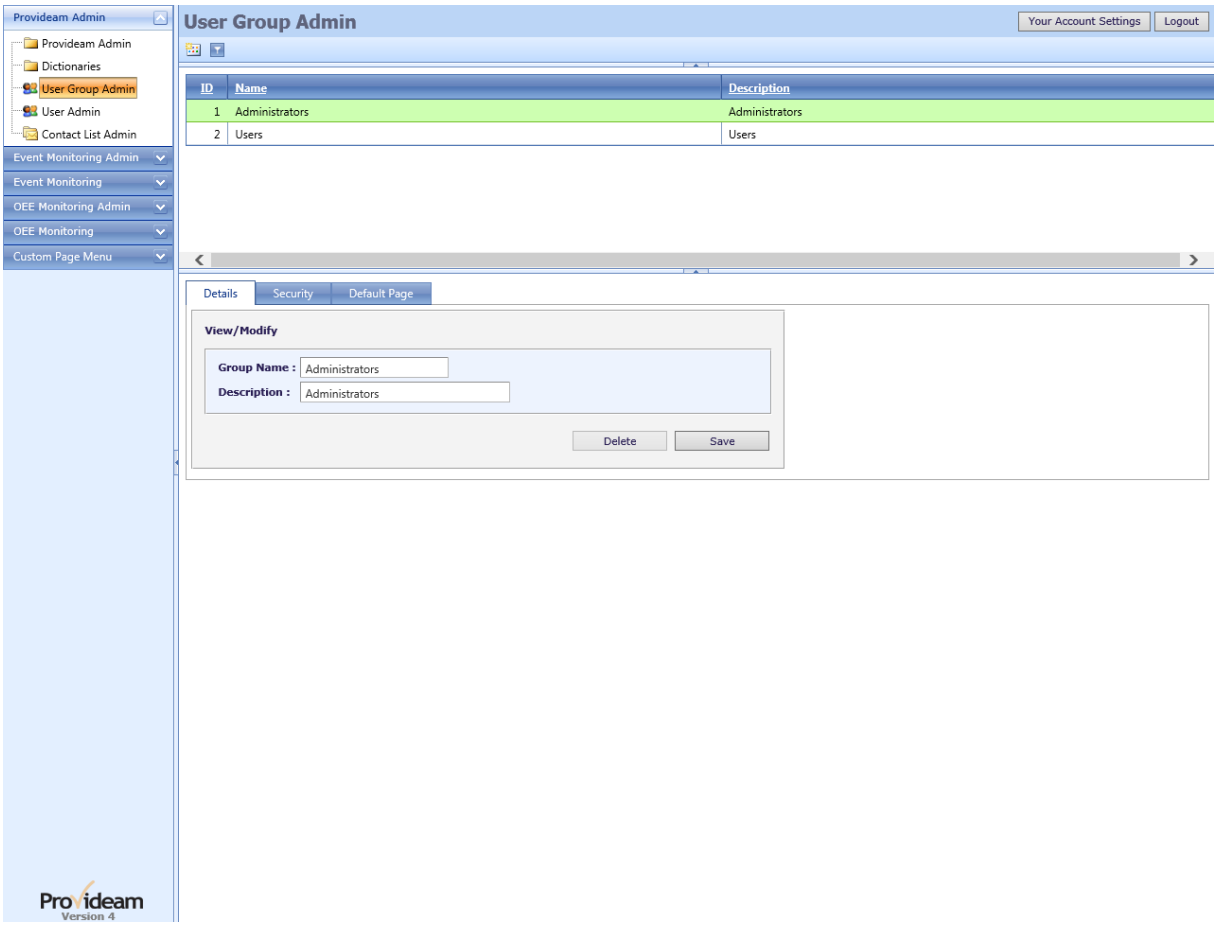


Fig. Provideam User Groups

To select a User Group click on appropriate record in the upper table. The selected User Group will be highlighted and it's details will be displayed in the Details pane. In figure 9 above the *Users* User Group has been selected.

- The **AddNew** button allows you to add a new User Group
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).

- The **Group Name** field allows you to set the unique name for the User Group
- The **Description** field allows you to add a more detailed depiction of the User Group
- The **Delete** button allows you to delete the selected User Group
- The **Save** button allows you to save changes to the Group Name or Description

Note: The default User Groups are *Administrators* and *Users*. It is not permitted to delete the *Administrator* User Group.

User Group Details - Add New User

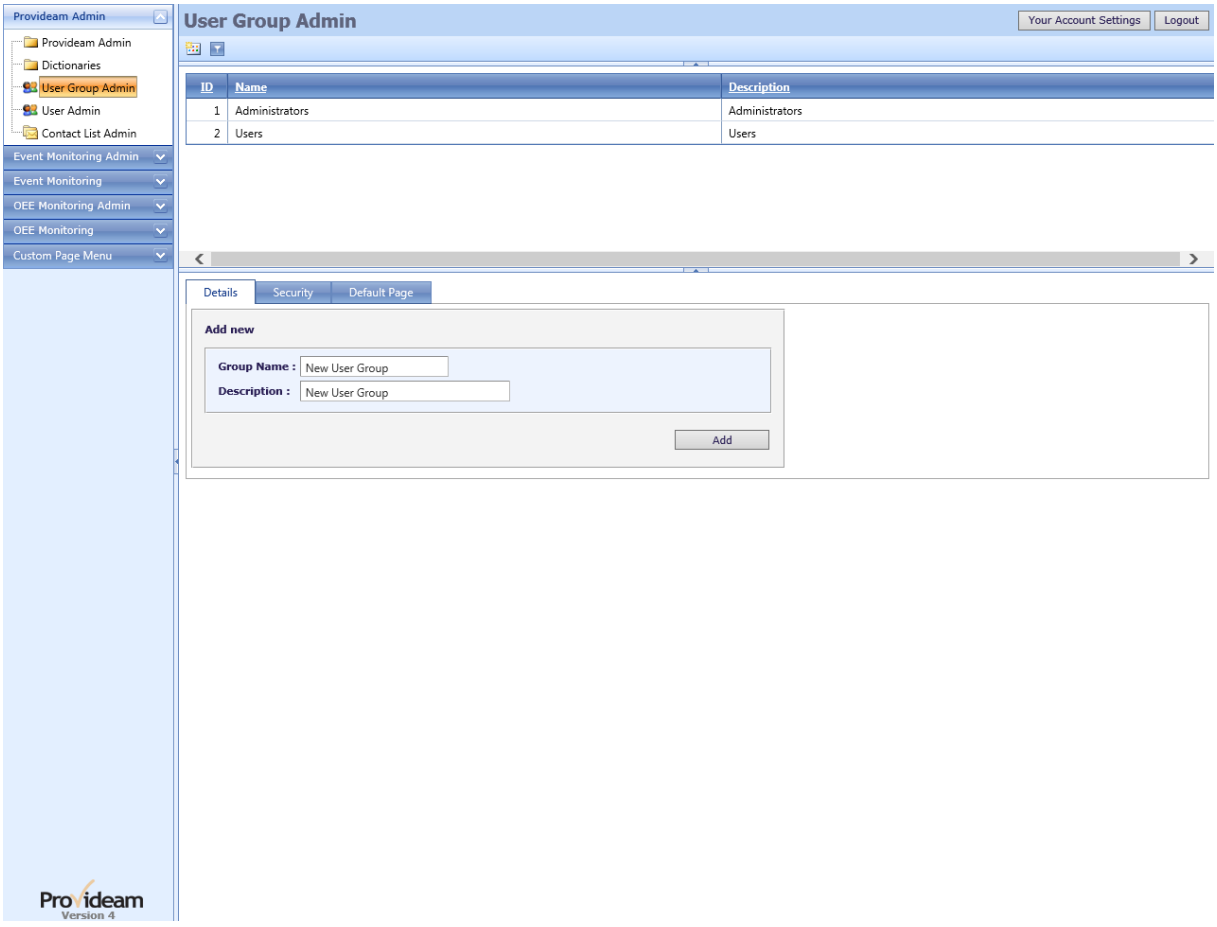


Fig User Group Details - Add New User Group

- To confirm the new User Group details click the **Add** button. Otherwise select another User Group or navigate away from the User Administration page

7.5.4.2 *Security*

Access to the features of Provideam is controlled by Login Name and Password.

Depending on the User Group to which your User name has been assigned you may be entitled to;

- Access Data related to certain Plants, Areas or Machines
- View certain Modules or Pages
- Edit, Modify or Delete Data.

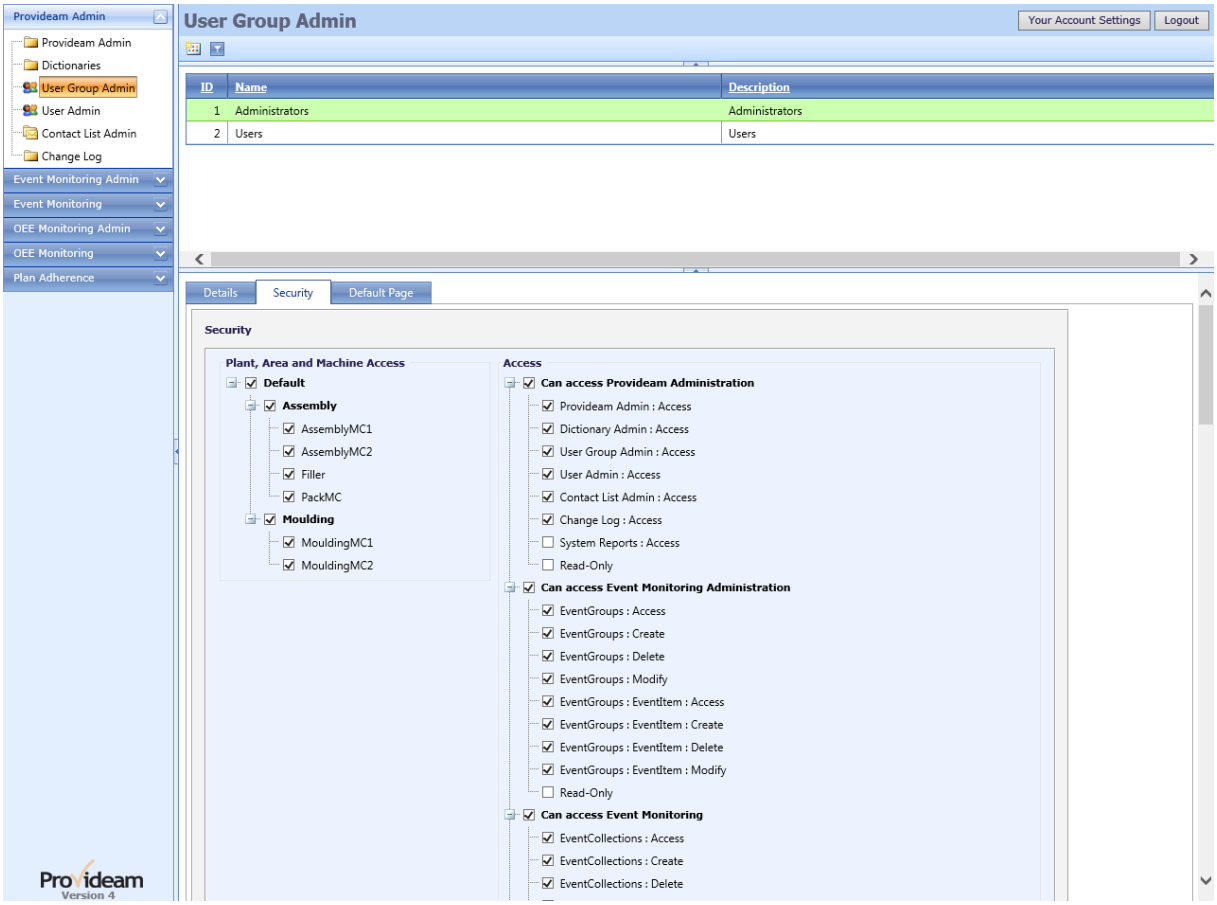


Fig. User Group Security Assignment

The left hand section of the pane allows you to select which Plants, Areas and Machines the User Group, *User* will be able to view.

The right hand section of the pane allows you to select which Modules, Pages and Features, *User* will be able to access.

Check or Uncheck any box to enable or disable that feature. Scroll to the bottom of the page and click the **Save** button if you wish to save your changes. Otherwise navigate away from this pane.

Note: These setting only become available once the User has logged out and then back in to Provideam.

7.5.4.3 *Default Page*

Provideam allows you to select a Default Home Page for each User Group.

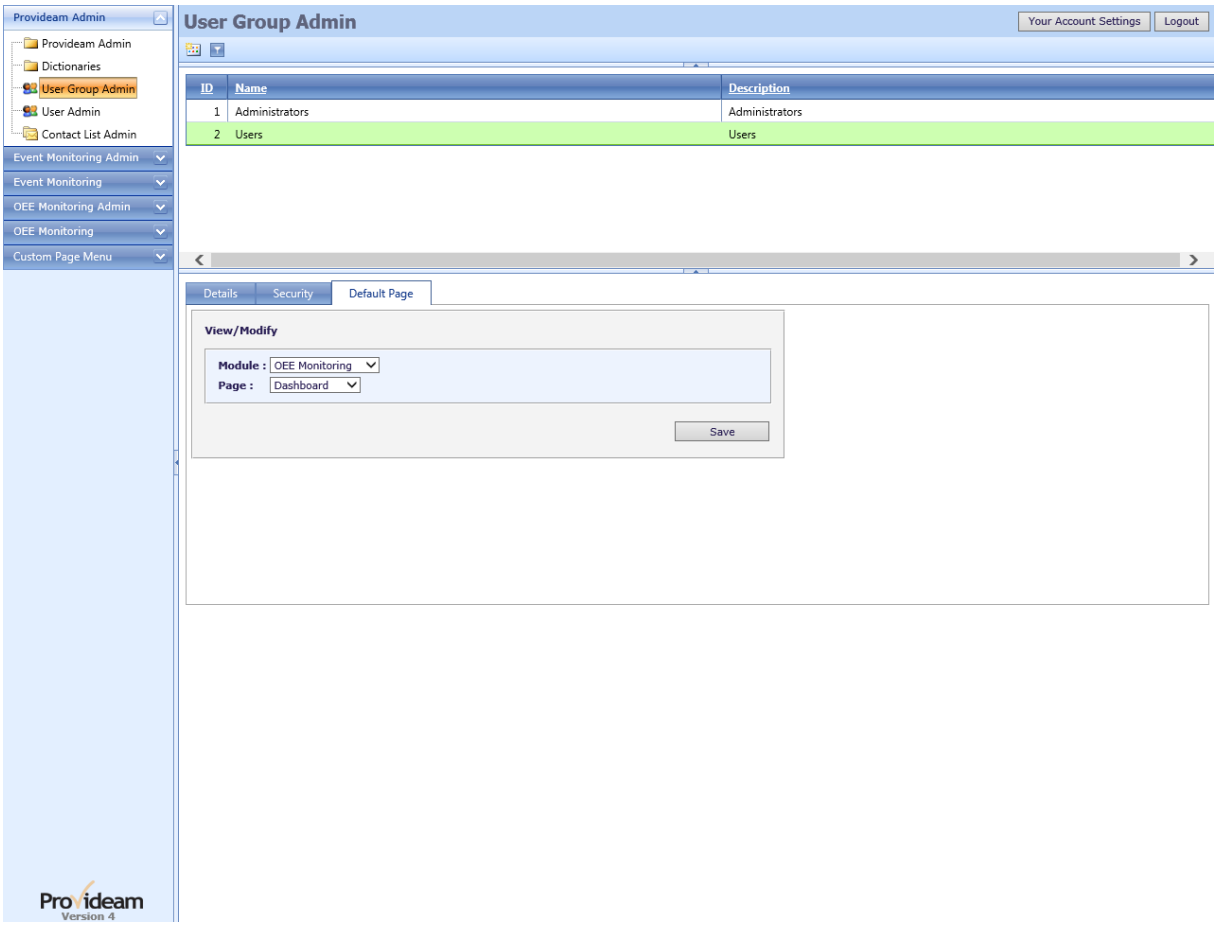


Fig. User Group Default Page

In the Default Page section you can select which page opens when a member of the selected User Group logs in.

- The **Module** selection box allows you to filter the options in the **Page** selection box to the selected Module.

- The **Page** selection box allows you to select which Page will open by default for the selected User Group.
- The **Save** button allows you to save the Default Page setting.

7.5.5 User Admin

In the Users Section, Users and User Group Assignments are configured. Access to the Provideam application is controlled. Each User must have a Login Name and Password to access the application. The Users' application rights are derived from the User Group to which the User has been assigned.

7.5.5.1 Users

Users are assigned to User Groups from which they derive their security settings.

Users Contact Details (Email, Mobile & Page) are entered in the Contact Details table. It is possible to have multiple addresses of the same type. For example it would be possible to save a work and home email address.

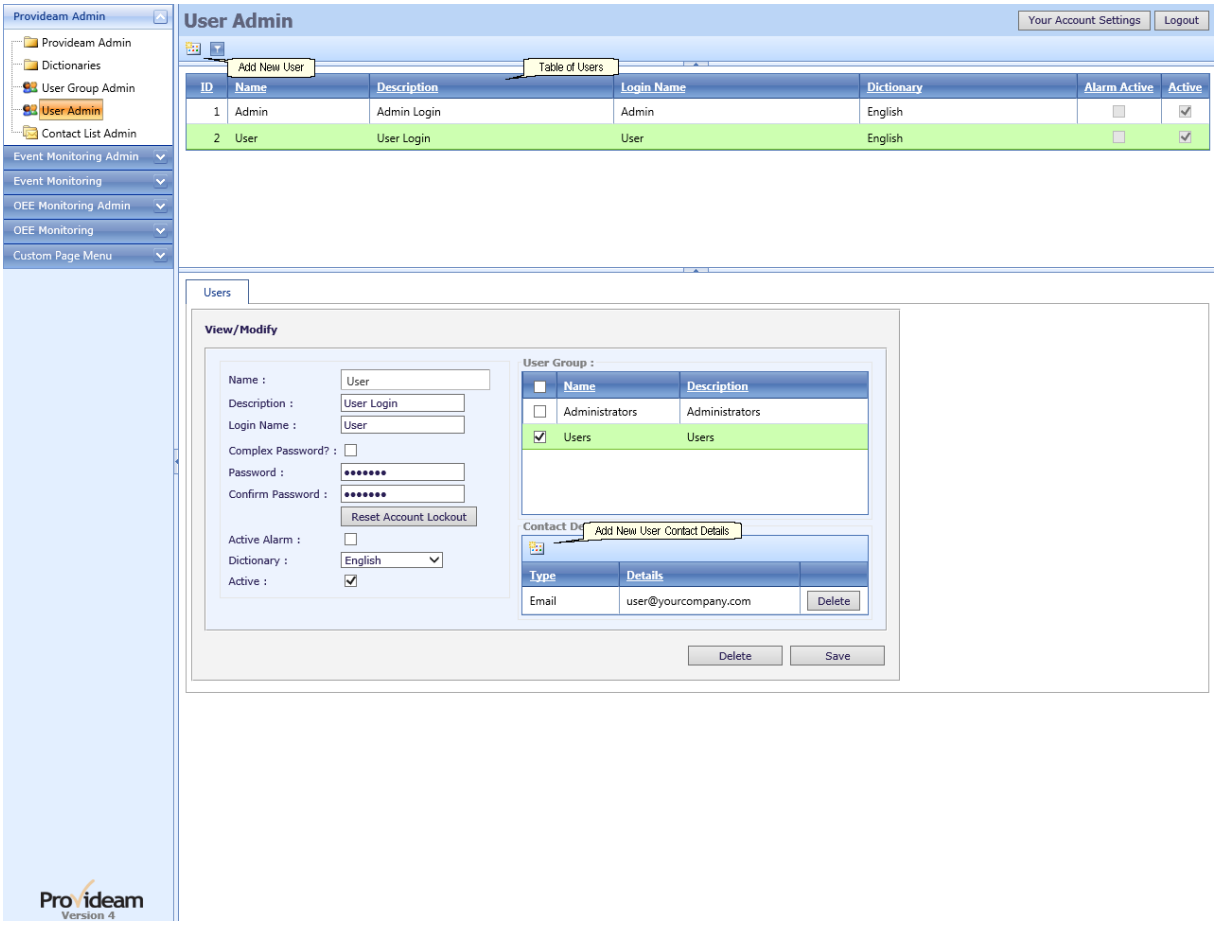


Fig. User Details

To select an existing User click on the appropriate record. The display changes to show the Users details.

User Details

- The **AddNew** button allows you to create a new User.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).
- The **Name** field allows you to set the unique name for the User
- The **Description** field allows you to add a more detailed description of the User
- The **LoginName** field allows you to set the unique name with which this User will login to Provideam
- The **Domain User Name** field allows you to set the unique Domain Name for the User. This is used for integration with Windows Active Directory Authentication, or Single Sign-on (SAML 2.0) Authentication.
- The **Complex Password?** checkbox allows you to set whether or not the password is complex. If the password is complex then it requires the following:
    - o A minimum of 8 characters
    - o A minimum of 1 uppercase characters
    - o A minimum of 1 lowercase characters
    - o A minimum of 1 number
    - o A minimum of 1 special character (~#$%^&*()_=`:;<>,?)
    - o To be changed every 90days
- The **Password** field allows you to enter the password associated with the login name
- In the **Confirm Password** field you are required to re-enter the password thus enabling Provideam to cross check that the password has been entered correctly
- The **Active Alarm** check box allows you to set whether or not the User will receive Event Alarms
- The **Dictionary** selection box allows you to select the default dictionary for the User.
- The **Delete** button allow the you to delete the selected User Group
- The **Save** button allows the you to save changes to the User

User Group Table

- The **User Group** selection table allows you to assign the User to existing User Groups. The User can be associated with several User Groups and will take the combined rights of all assigned User Groups.

Contact Details Table

The Contacts Detail table allows you to enter Contact Details for the User.

- The **Email** type allows you to assign an email address for this User. This is very useful when you wish to send reports and views by email. Alarm Events are also sent be email. If no email address is defined then the email alarm function will be disabled for the User.
- The **Mobile** type allows you to assign a mobile/cell phone number for this User. This is very useful when you wish to send alarm notification by SMS Text Message. If no mobile number is defined then the text alarms function will be disabled for the User.
- The **Pager** type allows you to assign a Pager number for this User. This is used for sending page messages via a TAP enabled paging system.

7.5.6 Contact Lists

In the Contact Lists Section, Contact Lists are configured. Contact Lists offer an efficient method of managing the contact details of a number of Users for the purposes of report delivery or alarm annunciation. Contact Lists can be groups of Email Addresses, Mobile/Cell Numbers or Pager Numbers.

7.5.6.1 Contact List Details

Contact List Details.

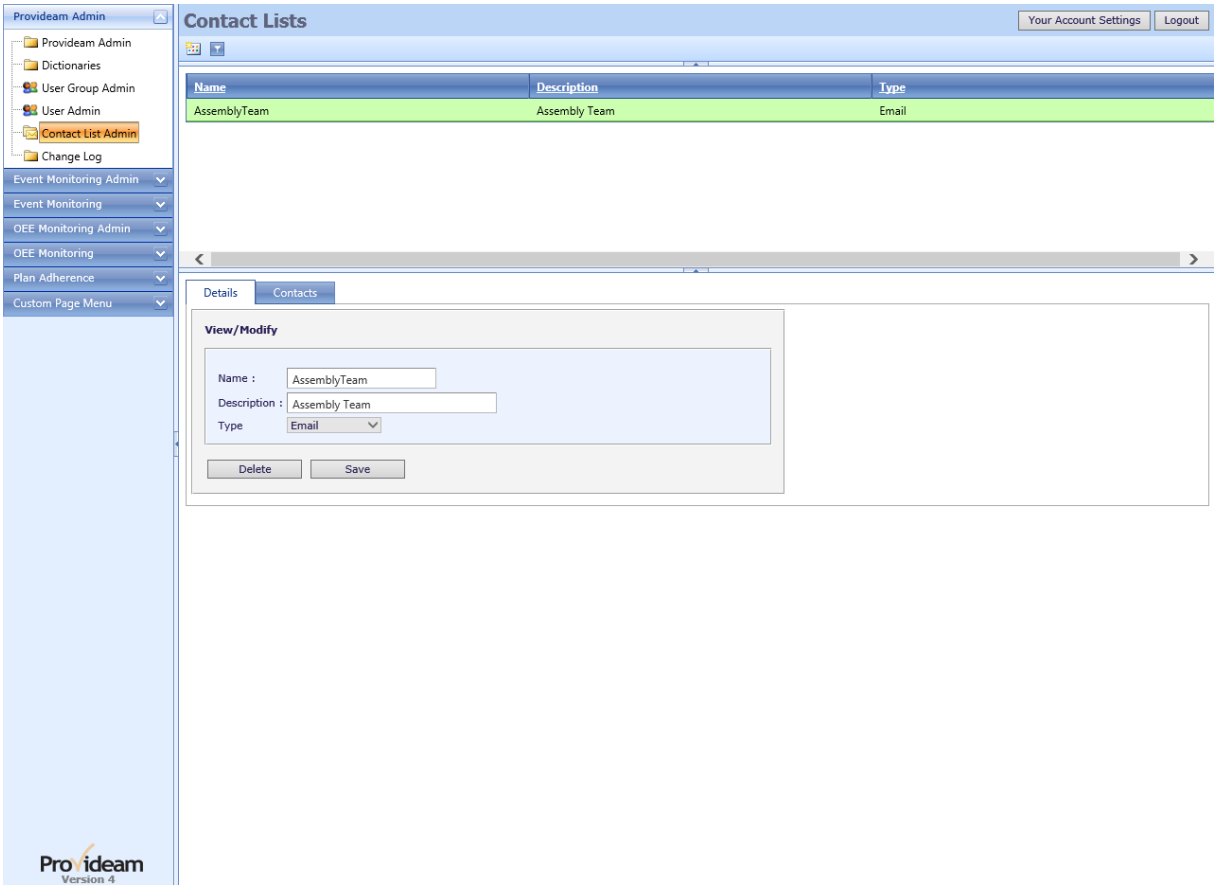


Fig. Provideam Contact List

To select a Contact List click on the appropriate record in the upper table. The selected Contact List will be highlighted and it's details will be displayed in the Details pane. In figure above the *AssemblyTeam* User Group has been selected.

- The **AddNew** button allows you to add a new Contact List
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).
- The **Name** field allows you to set the unique name for the Contact List
- The **Description** field allows you to add a more detailed depiction of the Contact List
- The **Type** field allows you to set the type of Contact List. The Type can be Email, Mobile/Cell, Pager or ReportAccess. The Type cannot be modified.
- The **Delete** button allows you to delete the selected Contact List
- The **Save** button allows you to save changes to the Name or Description

The Email Type is for creating lists of Email addresses. This type of Contact List can be used in Scheduled Emails and Alarm Annunciation.

The Mobile/Cell Type is for creating lists of phone numbers. This type of Contact List can be used in Alarm Annunciation.

The Pager Type is for creating lists of Pager numbers. This type of Contact List can be used in Alarm Annunciation.

The ReportAccess Type is for creating lists of Users. This type of Contact List can be used for configuring security access to Reports, Views and Menus.

7.5.6.2 *Contact List Contacts*

Contact List Contacts

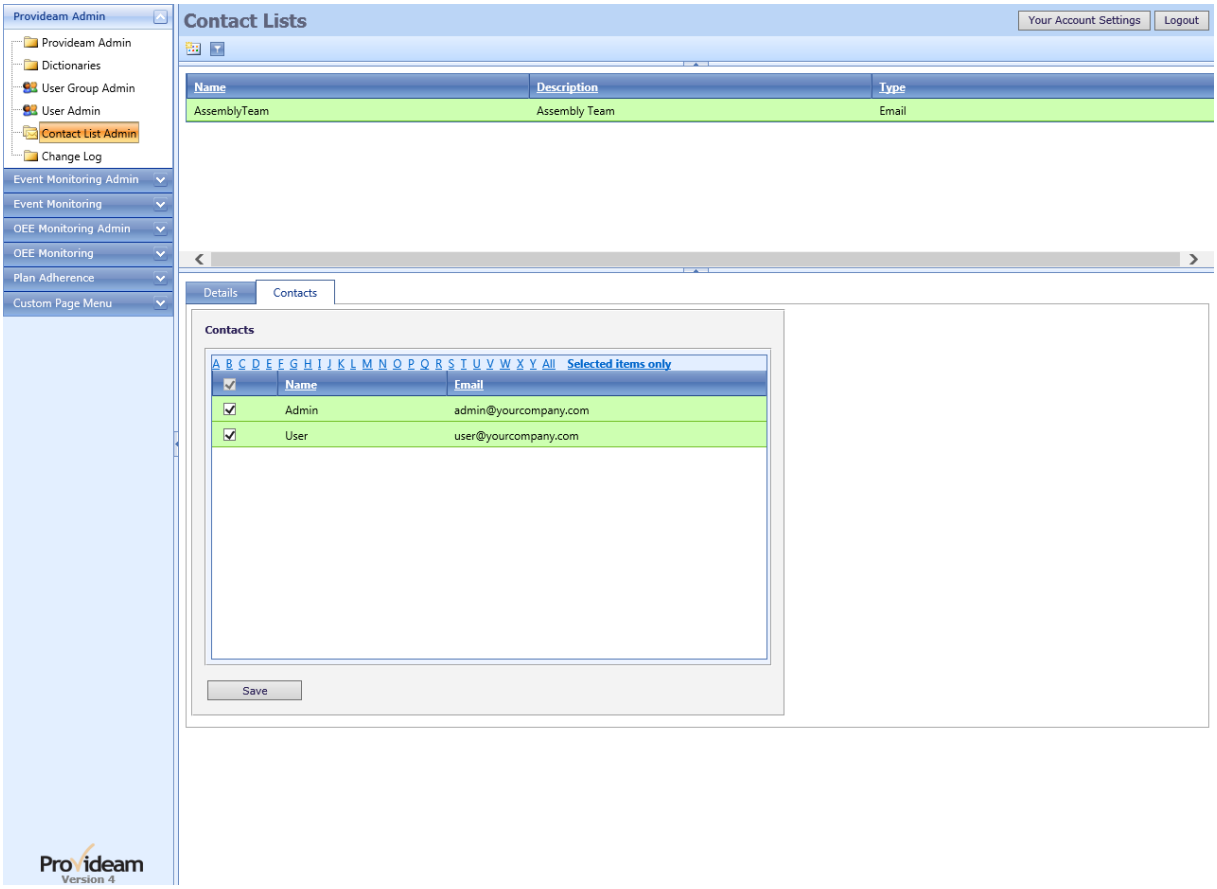


Fig. Contact List Assignment

Check or Uncheck any Contact which you want to include or exclude from the Contact List. The alphabetic filter allows you to limit the display to Names which start with the selected letter. The **Selected items only** option shows the Contacts which you have selected.

7.6 OEE Monitoring Module

The OEE Monitoring Module has four main functions;

- Monitor the current status of each Machine Item (Mode, Yield Count, Lot, Part etc.)
- Log the value of these Items on a Poll or DataChange
- Provide a User Interface to analyse the data collected
- Send OEE Reports by Email, on defined schedule, to relevant users.

The OEE Monitoring Admin section allows you to set up Areas, Machines, Shifts etc..

In Provideam, manufacturing operations are modelled in a hierarchical structure of Areas and Machines, see figure below.

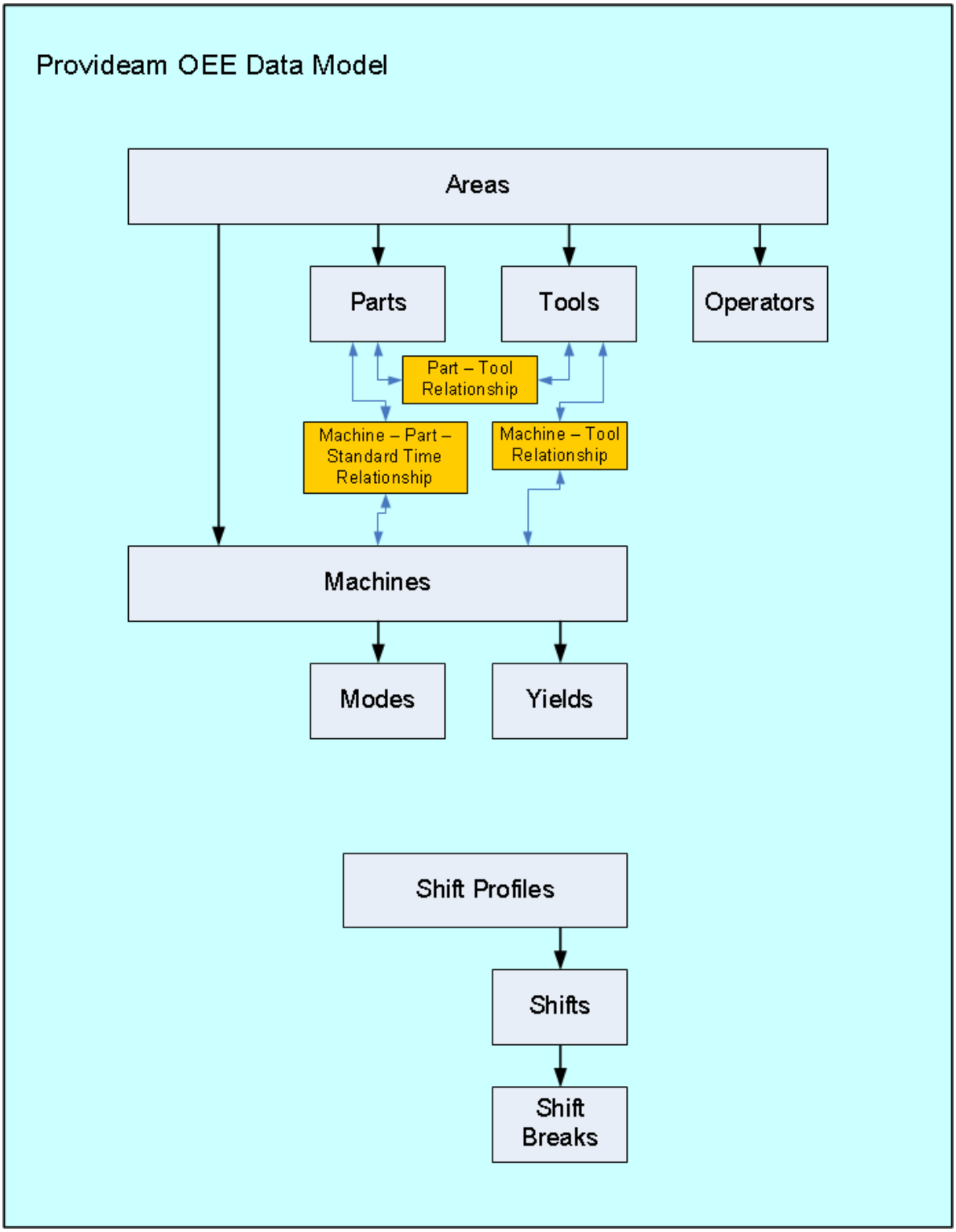


Fig. Provideam OEE Mon - Data Model

Provideam OEE Mon Data Model Definitions

Areas

Machines which share the same Parts, Tools and Operators are grouped by Area. Each Area has sub-properties Part, Tool, Operator and Machine.

A Part represents a product type which can be run on a Machine. Provideam is an OEE based productivity tool. If a particular Machine produces two different Parts which both have the same Cycle Time, then it is not necessary to configure both Parts, unless you want to track the Parts, as it will have no bearing on the OEE calculations.

A Tool represents a tool, such as a Mould, used to make a Part. A Tool may have a number of Cavities. Thus one Machine Cycle could produce several Parts in a multi-cavity Tool.

An Operator represents an individual or team of individuals associated with the productivity on a Machine.

The Part-Tool Relationship defines which Parts can be produced from which Tools.

The Machine-Tool Relationship defines which Tools can be fitted on which Machines.

The Part-Tool-StandardTime Relationship defines which Parts can be produced on which Machines and also the Standard Time to produce the Part on the Machine.

Only Tools, Parts which have a relationship with a Machine should be selected for the Machine. Otherwise the Provideam OEE Analysis will not function correctly.

A Default Part, Default Tool and Default Operator (including appropriate relationships) are created when a new Machine is created. If your Machine does not need to track Parts, Tools or Operators then you do not have to configure or display these parameters.

Machines

The Machine is the basic unit around which Provideam builds it's OEE analysis. A Machine has sub-properties Mode and Yield.

Modes represent the operational states in which a Machine can be. For example, Run, ChangeOver, Planned Downtime, Electrical Fault etc.

Yields represent various counts taken from a Machine. For example, Cycles, Good Count, Defect Count at Station 1, Defect Count at Station 2 etc.

Shifts

Provideam allows you to configure several Shift Profiles (Shift Patterns). A Shift Profile is a collection of individual Shifts which define the shift pattern of a Machine or group of Machines over the course of one week.

A Shift defines the day, start time and duration of a unit of production.

A Shift Break is a sub-property of a Shift and defines the start time and duration of a break period during a Shift.

7.6.1 OEE Admin

The OEE Monitoring Admin section allows you to configure the OEE Monitoring Module.

7.6.1.1 Area Admin

7.6.1.1.1 Area Details

The Area Details Pane.

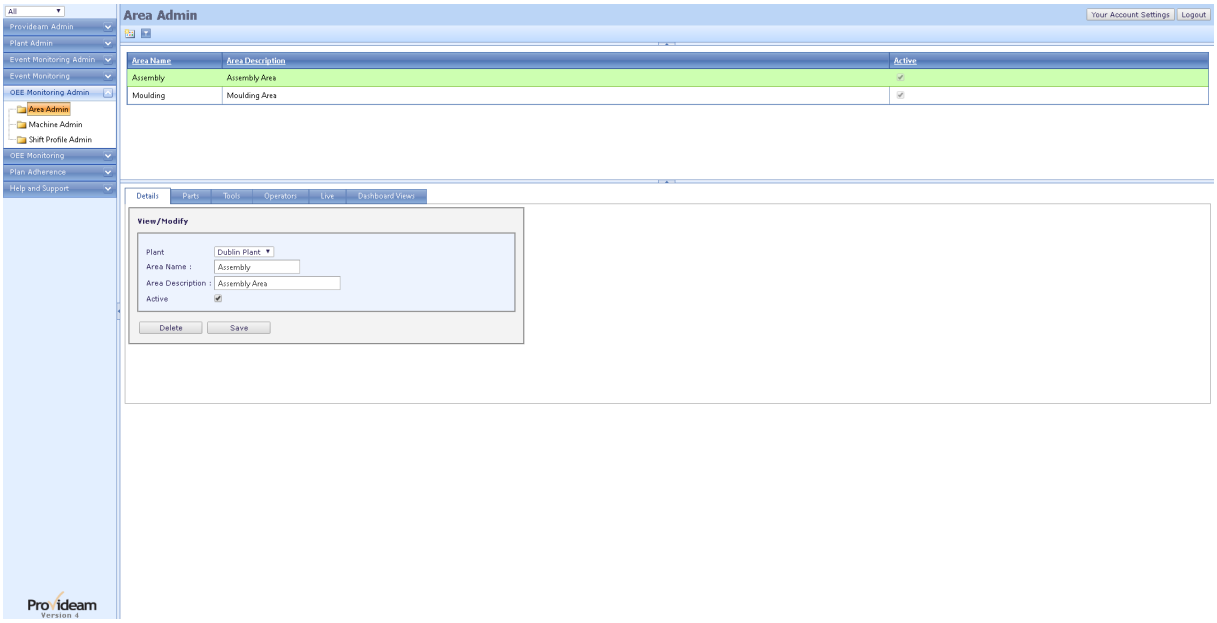


Fig. OEE Mon Admin Settings - Area Details

- The **AddNew** button allows you to create a new Area.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).
- The **Area Name** text box allows you to set the name of the Area.
- The **Area Description** text box allows you to set the description of the Area.
- The **Analysis Type** selection box allows you to set the default analysis type for the Area. The options are *OEE* or *Downtime*. If you choose *Downtime* then the *OEE* Dashboard will display Downtime Analysis functions. If you choose OEE then the Dashboard will display OEE Analysis functions.
- The **Active** check box allows you to enable the Area for data collection.
- The **Delete** button allows you to delete the Area. This button is only enabled if there are no Machines related to the Area.
- The **Save** button allows you to save changes to the Area.

7.6.1.1.2 Part Details

The Part Details Pane.

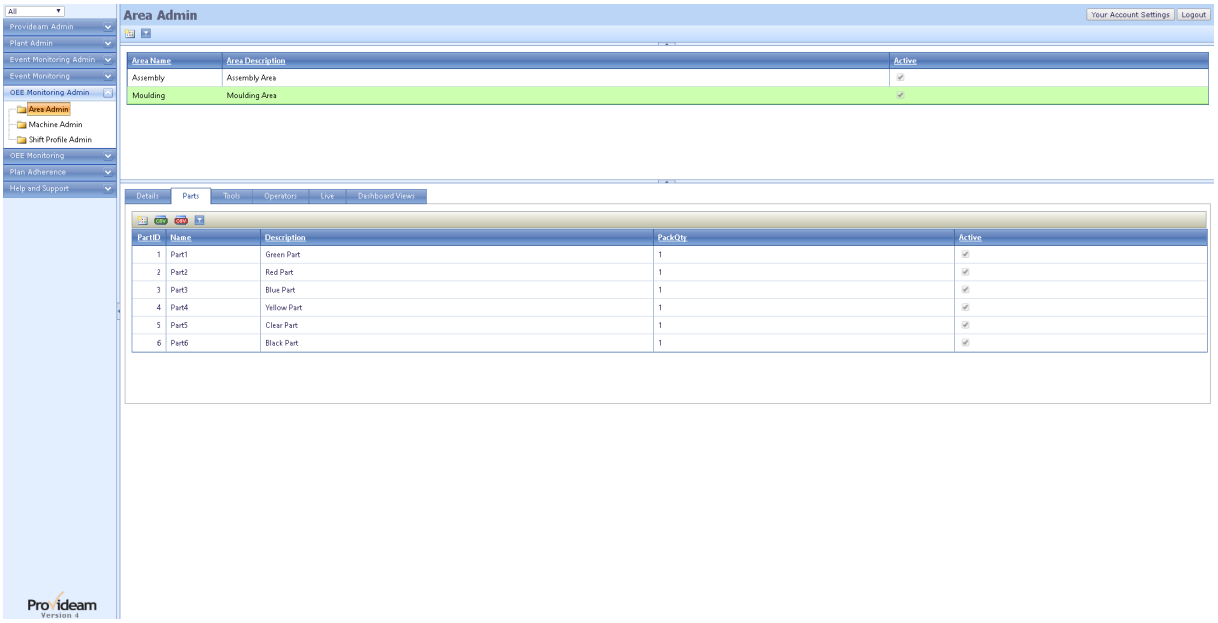


Fig. OEE Mon Admin Settings - Area Parts

- The AddNew button allows you to create a new Part.
- The Import CSV button allows you to import Part data from a CSV file.
- The Export CSV button allows you to export the Part data to a CSV file.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).

Note: When using the CSV import facility it is best practice to base your import file on a previously exported file. Thus you will ensure that the data format is compatible.

The Area Part Details Pane.

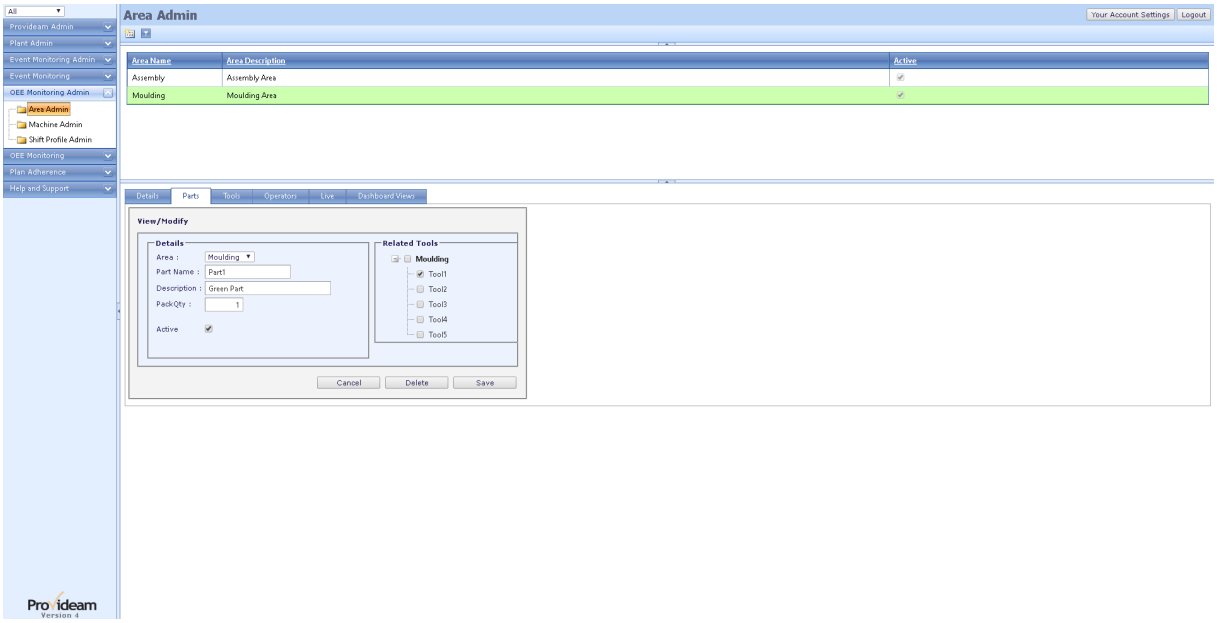


Fig. OEE Mon Admin Settings - Area Part Details

- The **Area** selection box shows the Area to which the Part belongs.
- The **Part Name** text box allows you to set the name of the Part.
- The **Description** text box allows you to set the description of the Part.
- The **PackQty** text box allows you to set the number of units in which the Part is packed. For example a particular Part might be packed in boxes of 3000. The **PackQty** would therefore be 3000.
- The **Active** check box allows you to enable the Part for selection through the Provideam User Interface.
- The **Related Tools** selection tree allows you to set which Tools can be used to produce the Part.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Part. Parts can only be deleted if there is no Production Data logged which references the Part.
- The **Save** button allows you to save changes to the Part.

7.6.1.1.3 Tool Details

The Area Tools Pane.

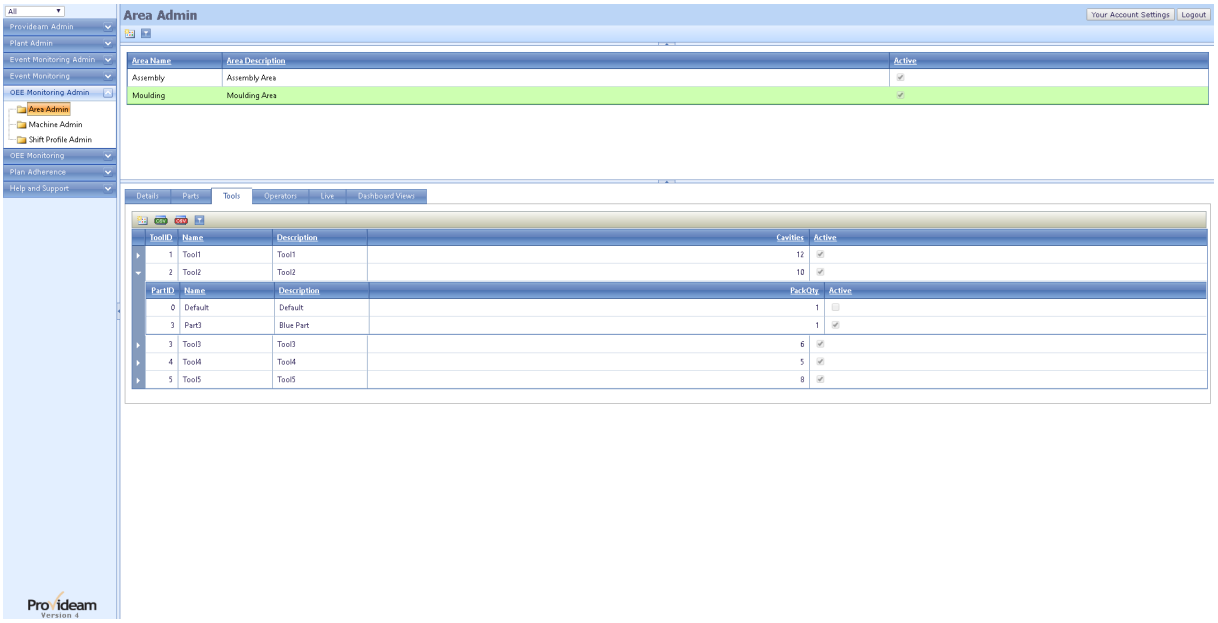


Fig. OEE Mon Admin Settings - Area Tools

- The AddNew button allows you to create a new Tool.
- The Import CSV button allows you to import Tool data from a CSV file.
- The Export CSV button allows you to export the Tool data to a CSV file.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).

Note: The related table structure allows you to see the Parts related to each Tool.

The Area Tool Details Pane.

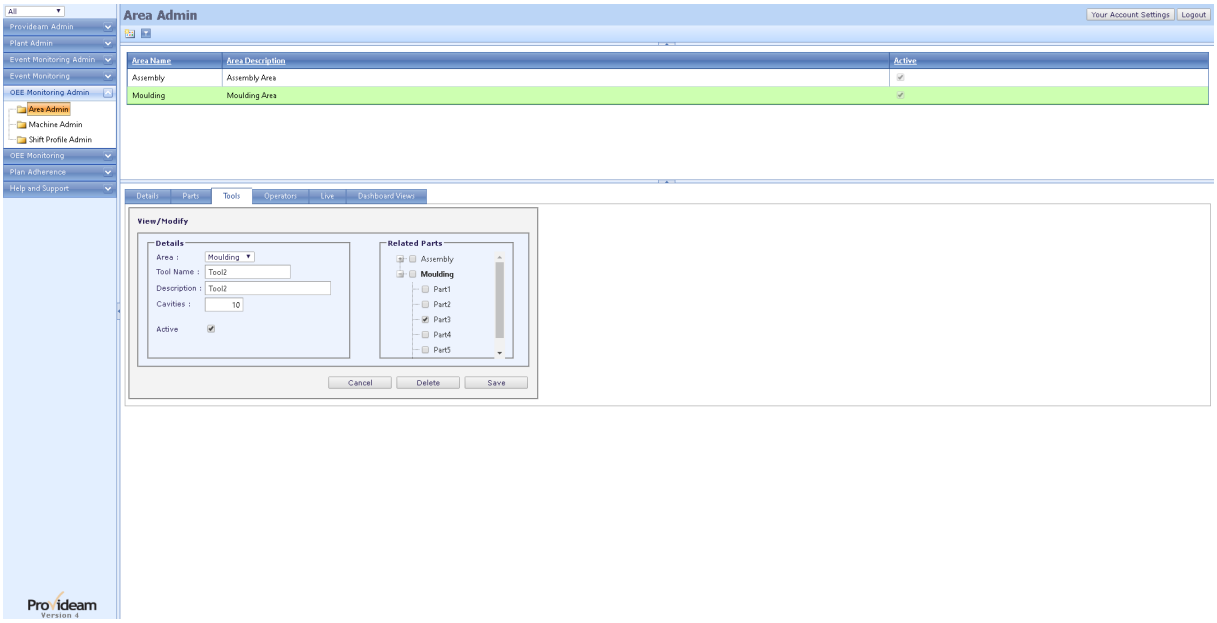


Fig. OEE Mon Admin Settings - Area Tool Details

- The **Area** selection box shows the Area to which the Tool belongs.
- The **Tool Name** text box allows you to set the name of the Tool.
- The **Description** text box allows you to set the description of the Tool.
- The **Cavities** text box allows you to set the number of Cavities in the Tool. For example a particular Tool which can produce 12 Parts would have 12 Cavities.
- The **Active** check box allows you to enable the Tool for selection through the Provideam User Interface.
- The **Related Parts** selection tree allows you to set which Parts can be used to produced by the Tool.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Tool. Tools can only be deleted if there is no Production Data logged which references the Tool.
- The **Save** button allows you to save changes to the Tool.

7.6.1.1.4 Operator Details

The Area Operators Pane.

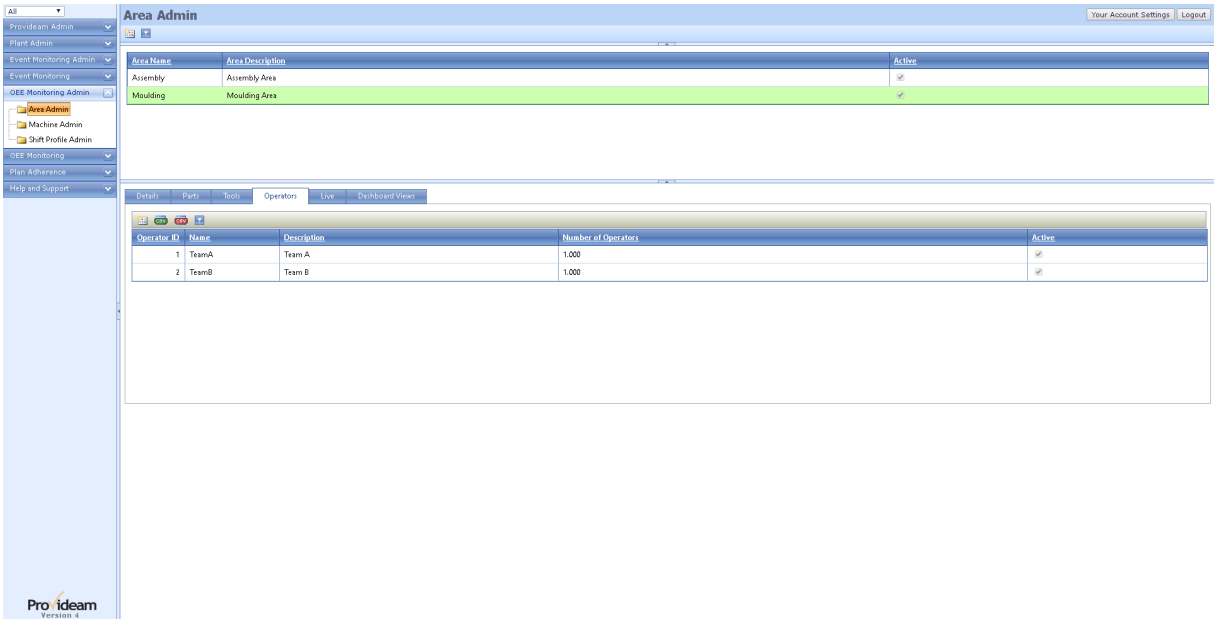


Fig. OEE Mon Admin Settings - Area Operators

- The AddNew button allows you to create a new Operator.
- The Import CSV button allows you to import Operator data from a CSV file.
- The Export CSV button allows you to export the Operator data to a CSV file.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).

The Area Operator Details Pane.

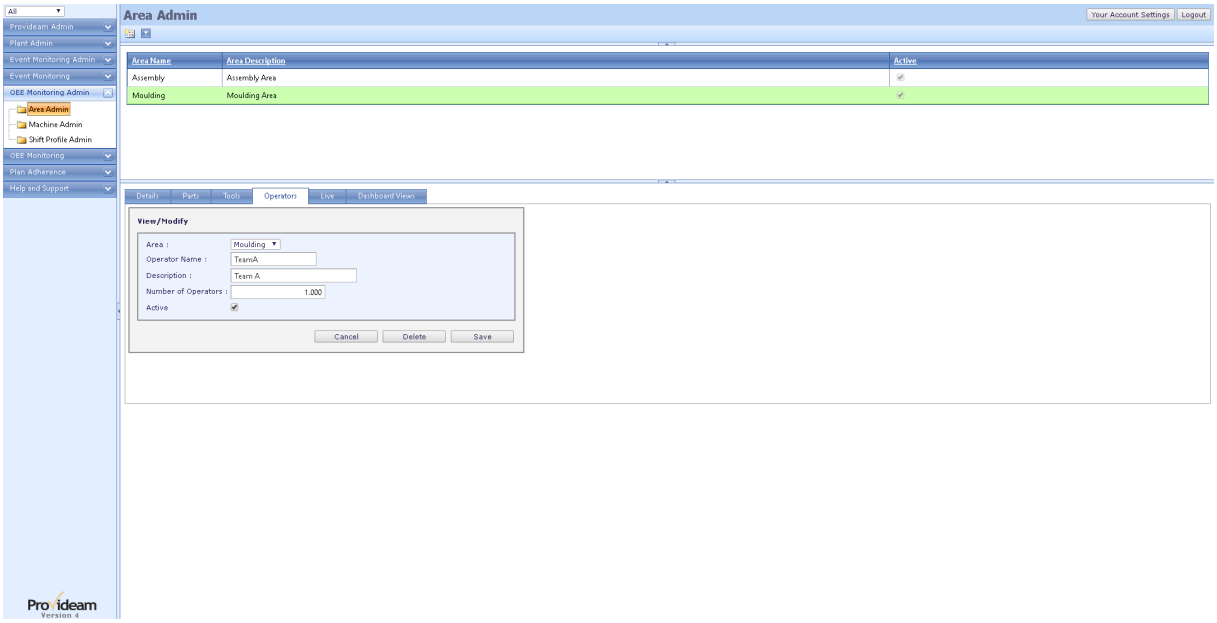


Fig. OEE Mon Admin Settings - Area Operator Details

- The **Area** selection box shows the Area to which the Operator belongs.
- The **Operator Name** text box allows you to set the name of the Operator.
- The **Description** text box allows you to set the description of the Operator.
- The **Number of Operators** text box allows you to set the number of Operators in a Production Team. This setting is for use with the Operator Productivity functions.
- The **Active** check box allows you to enable the Operator for selection through the Provideam User Interface.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Operator. Operators can only be deleted if there is no Production Data logged which references the Operator.
- The **Save** button allows you to save changes to the Operator.

7.6.1.1.5 Area Live Views

The Area Live View Pane.

This pane allows you to configure 'Live' views for the selected Area. Live Views is a method of presenting Provideam data on a plasma or LED monitor for the purposes of providing feedback to production operators in real-time. Live views can be accessed from the OEE Monitoring Dashboard.

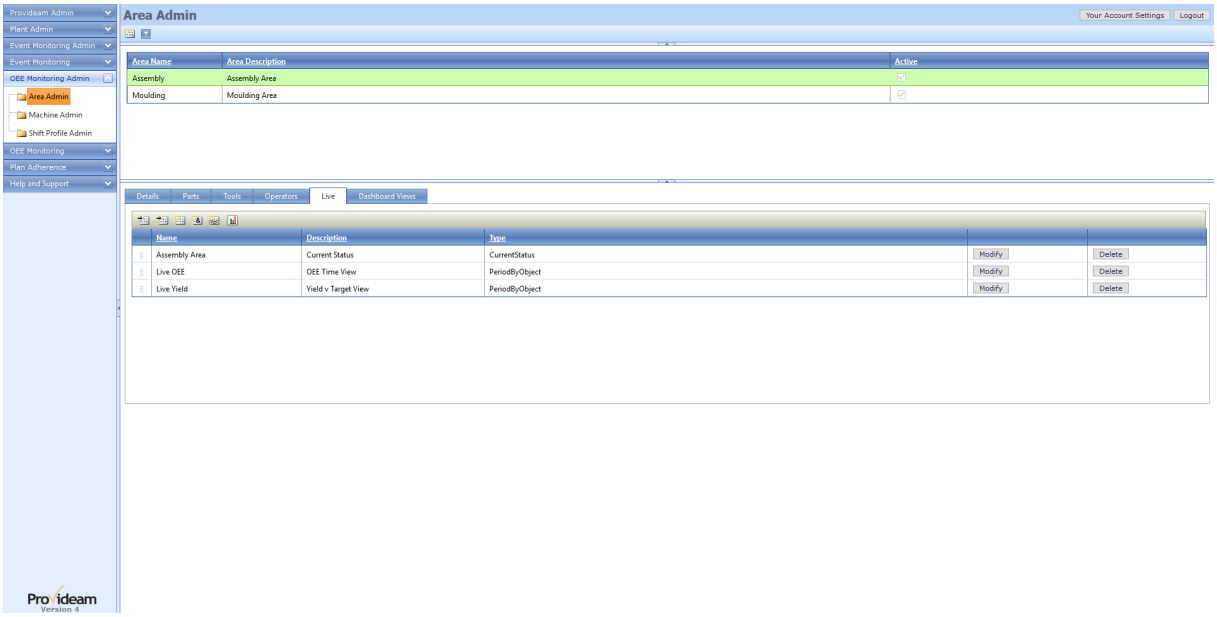


Fig. OEE Mon Admin Settings - Area Live View

- The Import button allows you to import a report from the OEE Report section to be displayed as a View. Clicking this button will open the Area Report Import Pane below.
- The second Import button allows you to import a report from the Plan Adherence Report section to be displayed as a View. Clicking this button will open the Area Report Import Pane below.
- The AddNew button allows you to add a 'Current Status' View. Clicking this button will open the Add Current Status Pane below.
- The AddNewAndOn button allows you to add an 'AndOn' View. Clicking this button will open the Add New AndOn Pane. This operates in the same way as the Current Status Pane.
- The AddNewURL button allows you to add a new view at the URL address. Clicking this button will open the Add URL Pane below.
- The Live button allows you open the Live View Display in a new Browser Tab.
- The **Modify** button allows you to edit the configuration of 'Current Status' or 'AndOn' Views. It is not possible to edit Views created in the OEE Report Module in the Live View Pane. To edit a report based View you must edit the original report and then re-import the view.
- The **Delete** button allows you to delete the View.

Notes:

1. The order in which the Views occur in the **Live Views** table determines the order in which the Views will appear in the Live Views presentation. To change the order simply click and hold on the icon of the relevant record and drag it to the appropriate position in the list.

The Area Live Report Import Pane.

Reports which are created in the OEE Monitoring Report Module can be imported as Live views.

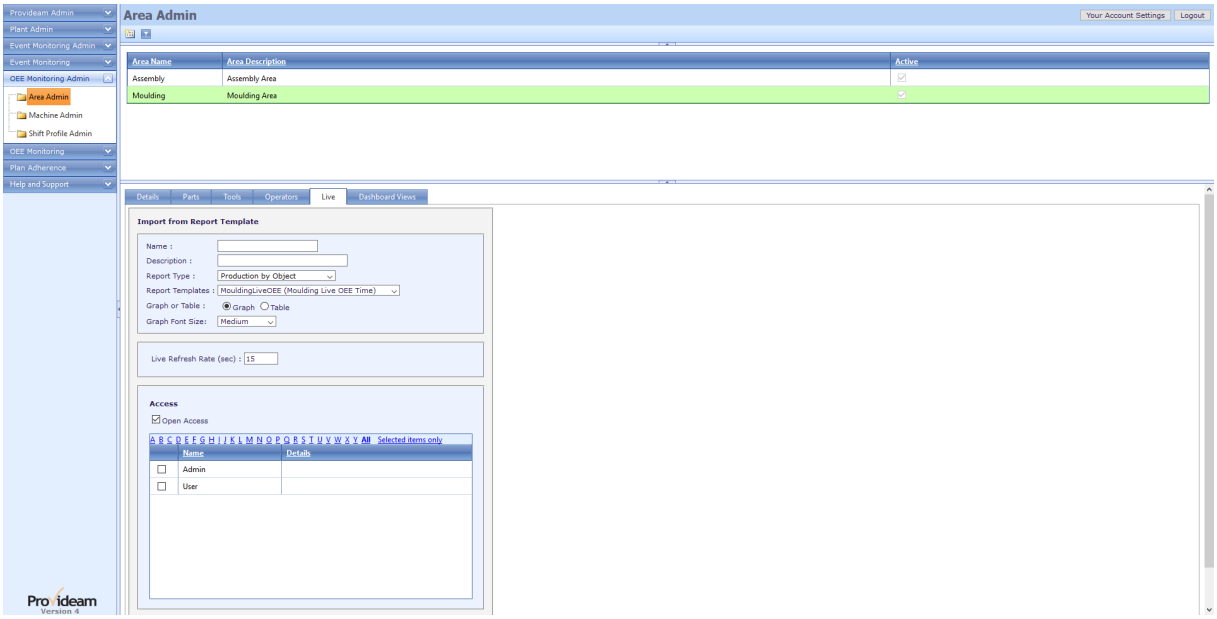


Fig. OEE Mon Admin Settings - Area Live Report Import Pane

- The **Name** text box allows you to set the name of the Live View.
- The **Description** text box allows you to set the description of the Live View.
- The **Report Type** selection box allows you to select the type of Report to be displayed as a View.
- The **Report Template** selection box allows you to select a report, of the selected Report Type, to be displayed as a view. The report will have been created in the OEE Reports section, or in the Plan Adherence section of the application.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Import** button allows you to import the report configuration.

Live Refresh Time Section:

- The **Live Refresh Rate (sec)** text box allows you to set an individual refresh update time for each Live View. The default value is set in the Provideam Admin Section. This feature is designed to facilitate Live Views which require a longer time to display such as a video. Provideam can be configured to support the display of .mp4 videos in Live Views.

Access Control Section:

- The **Open Access** check box allows you to give all users access to this View. If this check box is on then any user, with access to the selected Area, will have access to this View. Note that this setting overrides the setting of individual **User Access List**.
- The **User Access List** area allows you to select which users will have access to this View. Check or uncheck any User which you want to include or exclude from the Access List. The alphabetic filter allows you to limit the display to Names which start with the selected letter. The **Selected items only** option shows the Users which you have selected.

The Area Live 'Current Status' Pane.

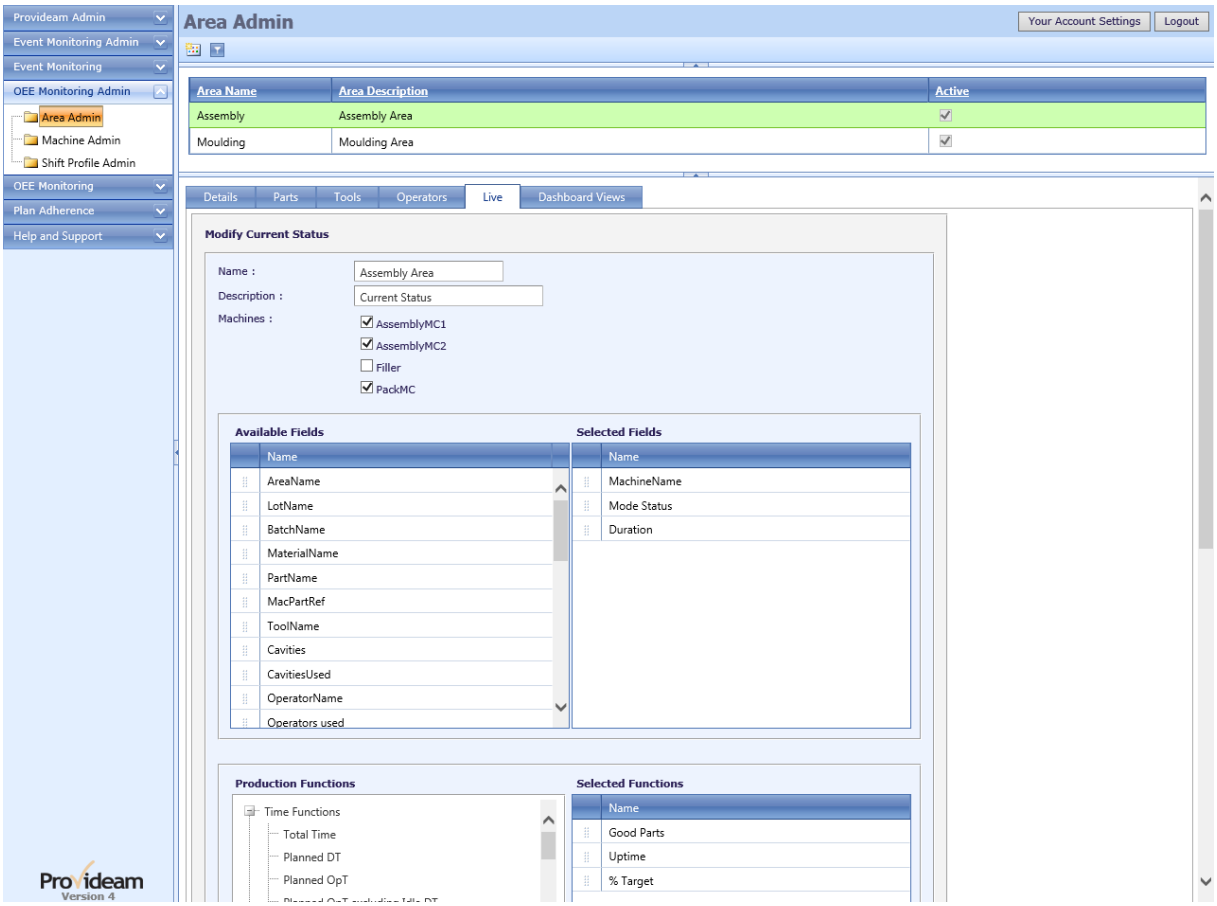


Fig. OEE Mon Admin Settings - Area Live 'Current Status' View Details

- The **Name** text box allows you to set the name of the Live View.
- The **Description** text box allows you to set the description of the Live View.
- The **Machines** check boxes allow you to select which machines will appear in the view.
- The **Fields** frame displays the list of fields which can be display in a Current Status Live view. To select a field check the relevant checkbox.
- The **Selected Fields** frame displays the fields which have been selected and will be displayed in the Live view.
- The **Functions** frame displays the list of functions which can be display in a Current Status Live view. To select a function check the relevant checkbox.
- The **Selected Functions** frame displays the functions which have been selected and will be displayed in the Live view.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Save** button allows you to save changes to the Live view.

Live Refresh Time Section:

- The **Live Refresh Rate (sec)** text box allows you to set an individual refresh update time for each Live View. The default value is set in the Provideam Admin Section. This feature is designed to facilitate Live Views which require a longer time to display such as a video. Provideam can be configured to support the display of .mp4 videos in Live Views.

Access Control Section:

- The **Open Access** check box allows you to give all users access to this View. If this check box is on then any user, with access to the selected Area, will have access to this View. Note that this setting overrides the setting of individual **User Access List**.
- The **User Access List** area allows you to select which users will have access to this View. Check or uncheck any User which you want to include or exclude from the Access List. The alphabetic filter allows you to limit the display to Names which start with the selected letter. The **Selected items only** option shows the Users which you have selected.

The Area Live 'Add URL' Pane.

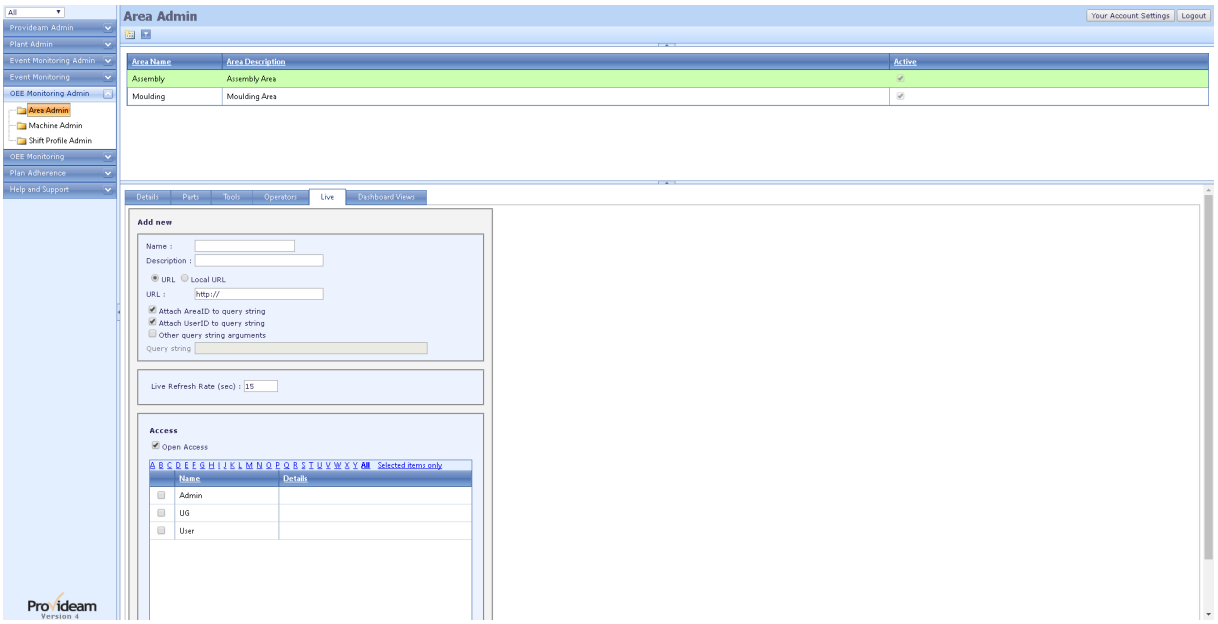


Fig. OEE Mon Admin Settings - Area Live 'Add New URL' View Details

- The **Name** text box allows you to set the name of the Live View.
- The **Description** text box allows you to set the description of the Live View.
- The **URL / Local URL** option buttons allow you to select whether the URL is an external URL, for example, *http://www.google.com*, or an internal URL integrated into the Provideam application web server.

  Two test pages are provided for testing the Local URL. See "*<Install Folder>\CustomPages\test.html*" and "*<Install Folder>\CustomPages\test.aspx*".

  In addition a HTML template "*<Install Folder>\CustomPages\playvideotemplate.html*" has been provided to guide you to embedding MP4 video files on your Custom Pages. The MP4 file should be located in the Custom Pages folder. To create your own video page simply copy the HTML template and rename it to an appropriate file name. Then edit the file using a text editor and change the MP4 file reference to the name of your MP4 file. Finally you will need to update the IIS WebServer to include MP4 file types in the MIME Map section for the Provideam website. (see instructions below).
- The **Attach AreaID to query string?** check box allows you to set whether or not the AreaID is appended to the URL. This allows you to pass the AreaID parameter to the URL. The AreaID could be used in the target page to return data specific to the specified URL.

- The **Attach UserID to query string?** check box allows you to set whether or not the currently logged-in User's UserID is appended to the URL. This allows you to pass the UserID parameter to the URL. The UserID could be used in the target page to return data specific to the specified URL.
- The **Other query string arguments?** check box allows you to set whether or not other parameters, specified in the **Query string** text box, will be appended to the URL.
- The **Query string** text box allows you to specify parameters to be appended to the URL. This text box will only be enabled if the **Other query string arguments?** check box is checked.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Save** button allows you to save changes to the Live view.

Live Refresh Time Section:

- The **Live Refresh Rate (sec)** text box allows you to set an individual refresh update time for each Live View. The default value is set in the Provideam Admin Section. This feature is designed to facilitate Live Views which require a longer time to display such as a video. Provideam can be configured to support the display of .mp4 videos in Live Views.

Access Control Section:

- The **Open Access** check box allows you to give all users access to this View. If this check box is on then any user, with access to the selected Area, will have access to this View. Note that this setting overrides the setting of individual **User Access List**.
- The **User Access List** area allows you to select which users will have access to this View. Check or uncheck any User which you want to include or exclude from the Access List. The alphabetic filter allows you to limit the display to Names which start with the selected letter. The **Selected items only** option shows the Users which you have selected.

Steps to configure IIS to play MP4 video files;

1) Select the web site to configure in IIS. Right click on the site and select **Properties**.

2) Under the HTTP Headers Tab, under the MIME Map Section, select "**File Types**", and select either the "**New Type**" or "**Add**" options.

3) Type "*.mp4*" as the extension and "*video/mp4*" as the MIME Type.

4) Click OK.

5) Restart the IIS WebServer using the IISRESET command or the IIS Manager.

The Area Live 'Change Order' Pane.

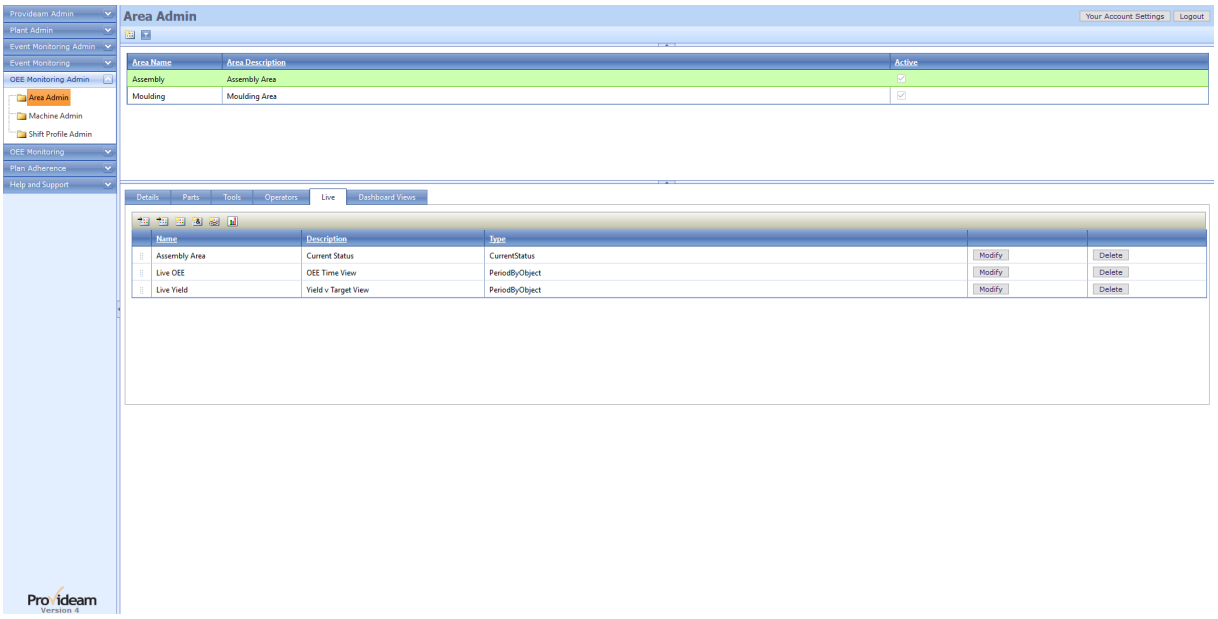


Fig. OEE Mon Admin Settings - Area Live View - Change Order

The order in which the Live Views appear can be modified. The order in which the records occur in the above table defines the order in which they appear on the Live View. The records are 'drag and drop'. To change the order simply click and hold on the icon in the first column of the record and drag it to the appropriate position in the table.

7.6.1.1.6 Dashboard Views

The Area Dashboard Views Pane.

This pane allows you to configure Overall Data views for the OEE Monitoring Dashboard module for the selected area. If no views are defined here then the standard Overall Data view will be display on the OEE Dashboard.

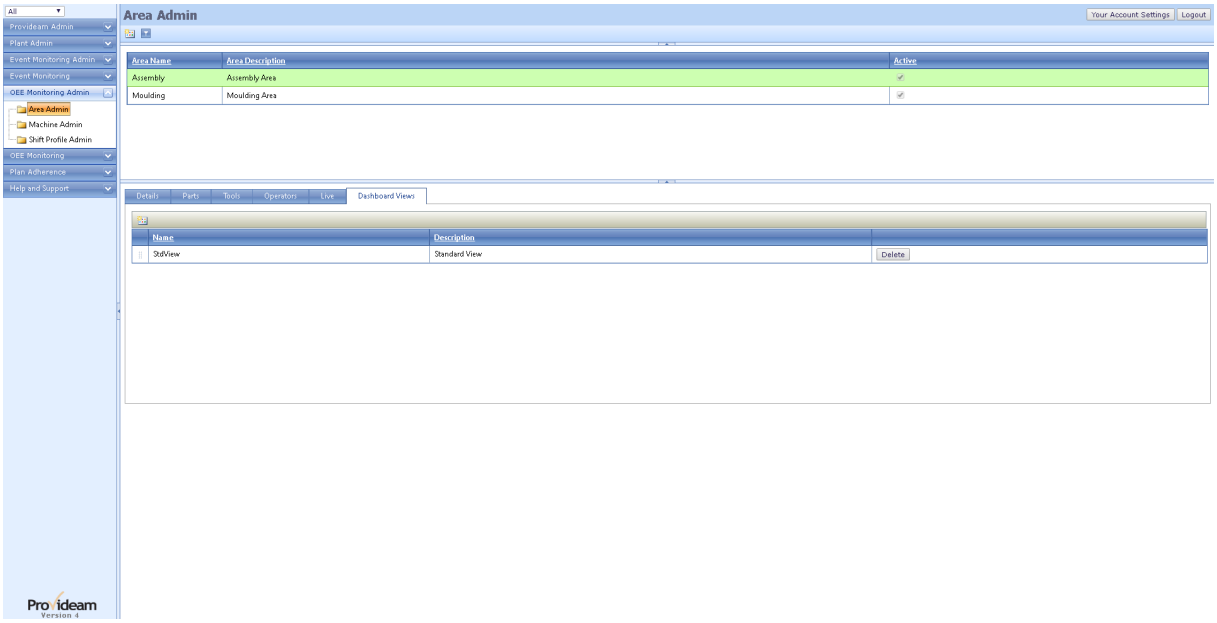


Fig. OEE Mon Admin Settings - Area Dashboard Views

- The **AddNew** button allows you to add an 'Overall Dashboard' View. Clicking this button will open the Overall Dashboard Field Details Pane below.
- The **Delete** button allows you to delete the View.

Notes:

1. The order in which the Views occur in the **Overall Dashboard Views** table determines the order in which the Views will appear on the OEE Dashboard. To change the order simply click and hold on the icon of the relevant record and drag it to the appropriate position in the list.

The Area Dashboard View Field Details Pane.

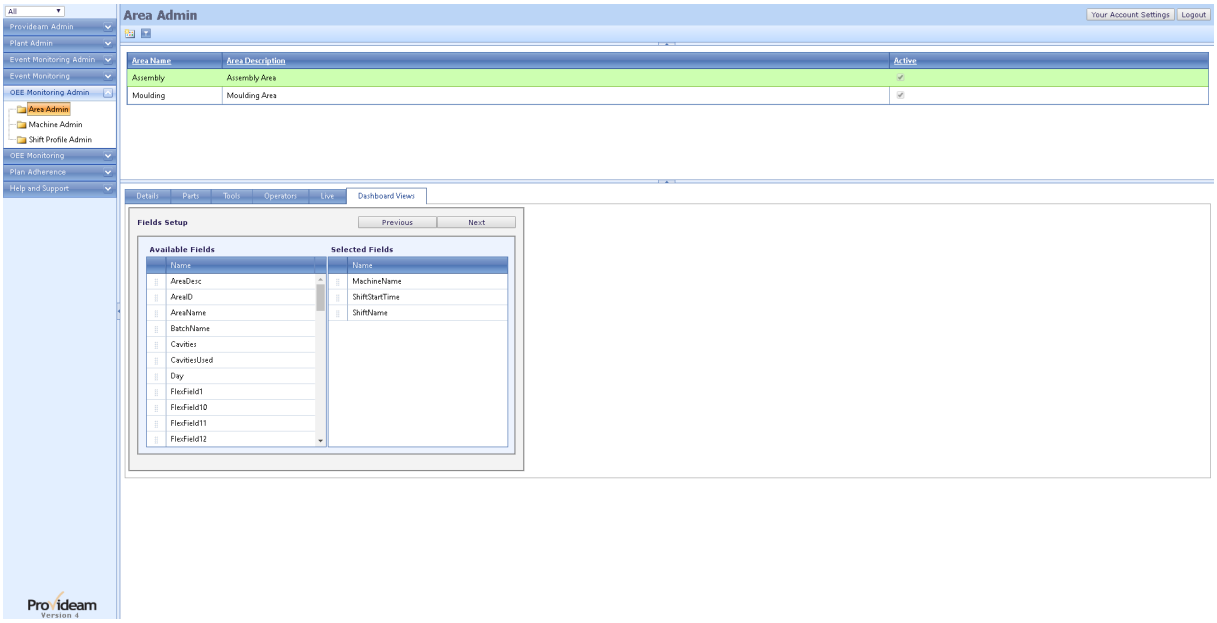


Fig. OEE Mon Admin Settings - Area Dashboard View Field Details

- The **Available Fields** frame displays the list of fields which can be display in a Dashboard view.
- The **Selected Fields** frame displays the fields which have been selected and will be displayed in the Dashboard view.
- To select a field simply click and hold the mouse on the required field in the **Available Fields** frame and drag it over to the **Selected Fields** frame.
- The **Previous/Cancel** button allows you to cancel any edits and return to the previous page.
- The **Next** button opens a pane which allows you to select functions for the view.

Notes:

1. The order in which the field columns occur in the **Selected Fields** lists determines the order in which the fields will appear in your view. To change the order simply click and hold on the ⠿ icon of the relevant record and drag it to the appropriate position in the list.
2. To remove a field from the **Selected Fields** list, simply drag it back to the **Available Fields** list.

The Area Dashboard View Function Details Pane.

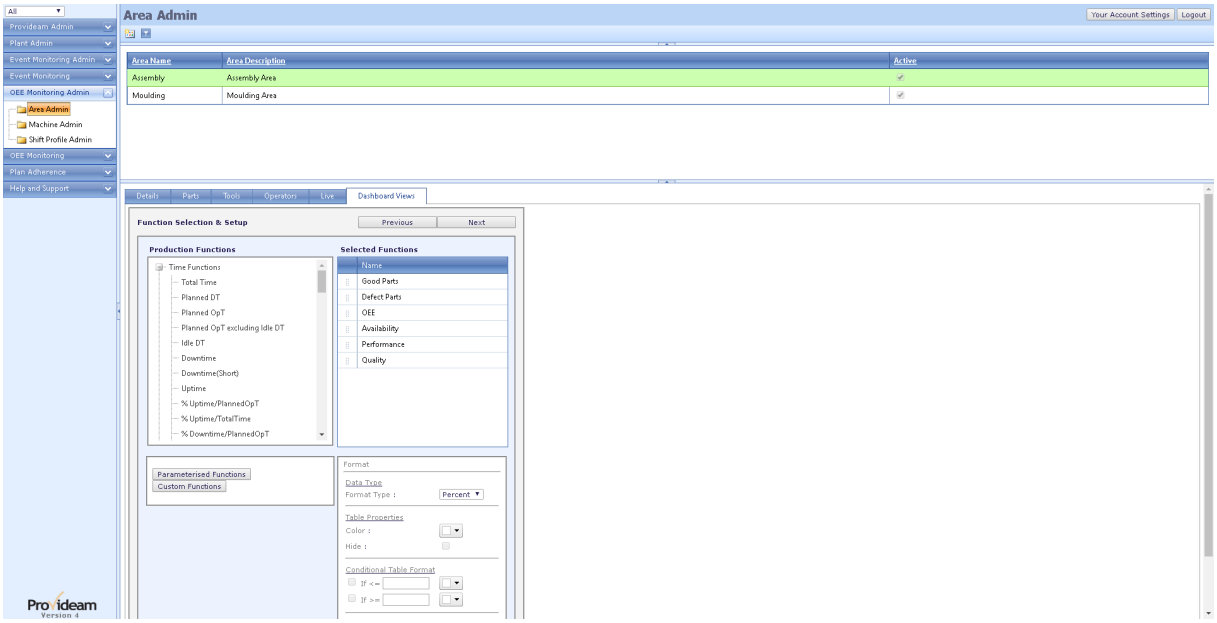


Fig. OEE Mon Admin Settings - Area Dashboard View Function Details

- The **Production Functions** frame displays the list of functions which can be display in a Dashboard view.
- The **Selected Functions** frame displays the functions which have been selected and will be displayed in the Dashboard view.
- To select a function simply click and hold the mouse on the required field in the **Production Functions** frame and drag it over to the **Selected Functions** frame.
- The **Previous/Cancel** button allows you to cancel any edits and return to the previous page.
- The **Next** button opens a pane which allows you to save the view.
- The **Add Parameterized Function** button opens a pane which allows you to define parameterized functions. Parameterized functions are functions which are limited to specified parameters. In the example below a function is created which quantifies the number of defects of a specific type. Once created, parameterized functions can be displayed in the same way as normal functions.

Notes:

1. The order in which the function columns occur in the **Selected Functions** lists determines the order in which the Functions will appear in your view. To change the order simply click and hold on the icon of the relevant record and drag it to the appropriate position in the list.
2. To remove a function from the **Selected Functions** list, simply drag it back to the **Production Functions** list.

The Area Dashboard View Edit Name Pane.

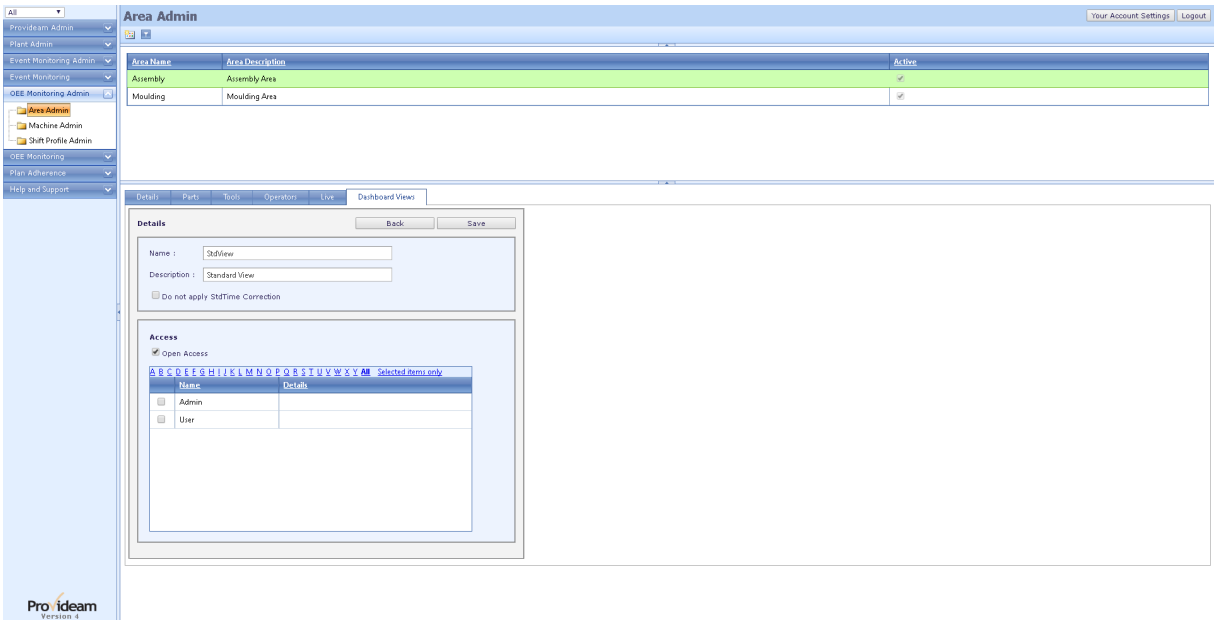


Fig. OEE Mon Admin Settings - Area Dashboard View Edit Name

- The **Name** text box allows you to set the name of the Dashboard View.
- The **Description** text box allows you to set the description of the Dashboard View.
- The **Back\Cancel** button allows you to cancel any edits and return to the previous page.
- The **Save** button allows you to save changes to the Dashboard View.

- The **Do not apply StdTime Correction** checkbox indicates to the OEE Logic that you do not wish to limit the OEE value to 100%. In normal circumstances Provideam will, if necessary, reduce the StdTime so that the percentage OEE does not exceed 100%. If this checkbox is checked then you may get OEE values greater than 100% if your StdTime is greater than the minimum time required to make one Good Part.

Access Control Section:

- The **Open Access** check box allows you to give all users access to this View. If this check box is on then any user, with access to the selected Area, will have access to this View. Note that this setting overrides the setting of individual **User Access List**.

- The **User Access List** area allows you to select which users will have access to this View. Check or uncheck any User which you want to include or exclude from the Access List. The alphabetic filter allows you to limit the display to Names which start with the selected letter. The **Selected items only** option shows the Users which you have selected.

The Area Dashboard View Parameterized Function Select Pane.

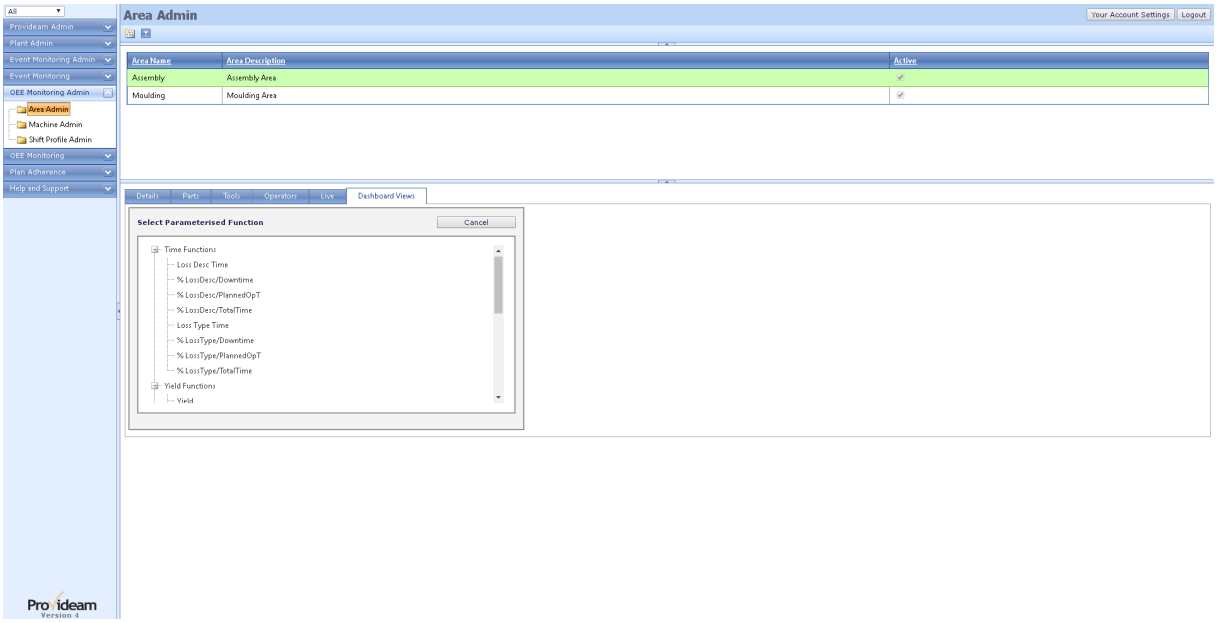


Fig. OEE Mon Admin Settings - Area Dashboard View Parameterized Function Select

- The **Select Parameterized Function** frame shows the parameterized functions which are available. Tool tips provide more detail on the definition of each function. Click on the function to select that function and to open the parameterization pane.
- The **Cancel** button allows you to cancel any edits and return to the previous page.

The Area Dashboard View Parameterized Function Details Pane.

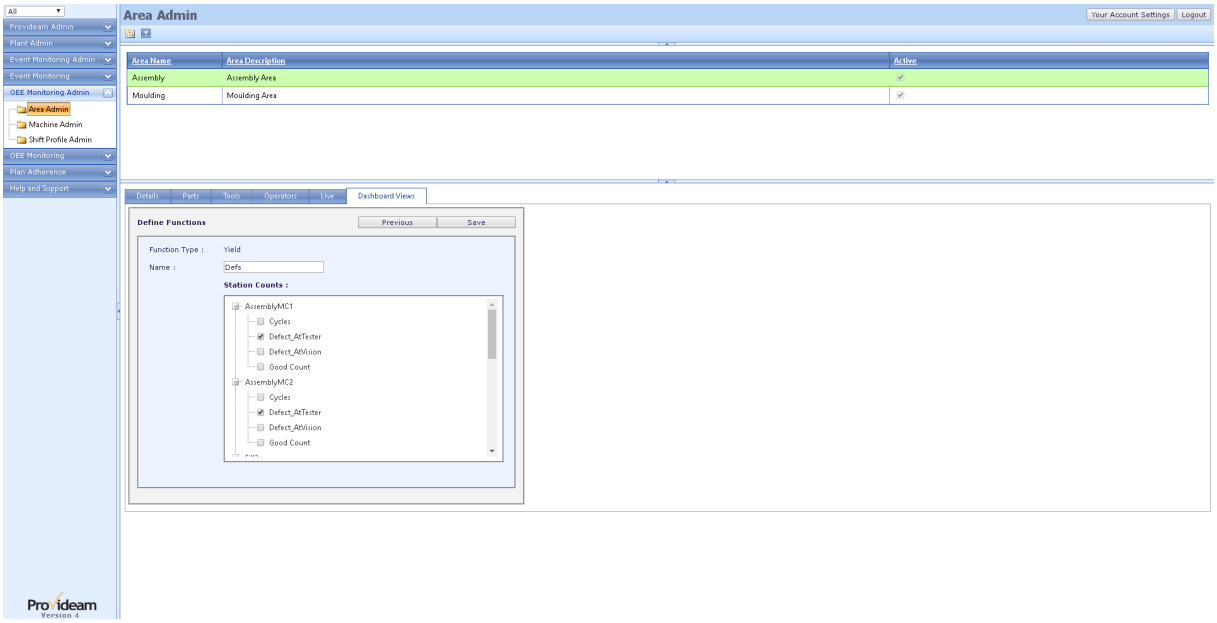


Fig. OEE Mon Admin Settings - Area Dashboard View Parameterized Function Details

- The **Name** text box allows you to set the name of the Parameterized Function.
- The **Parameters (Station Counts)** frame shows the parameters which can be selected for this function. In this example a 'Yield' function has been selected and therefore Station Count parameters are displayed. For 'Loss' functions, Modes would be displayed. The parameters are grouped by the Machine. Check the parameters which should be included in the function.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Save** button allows you to save the parameters.

The Area Dashboard View Details Pane - with Parameterized Function.

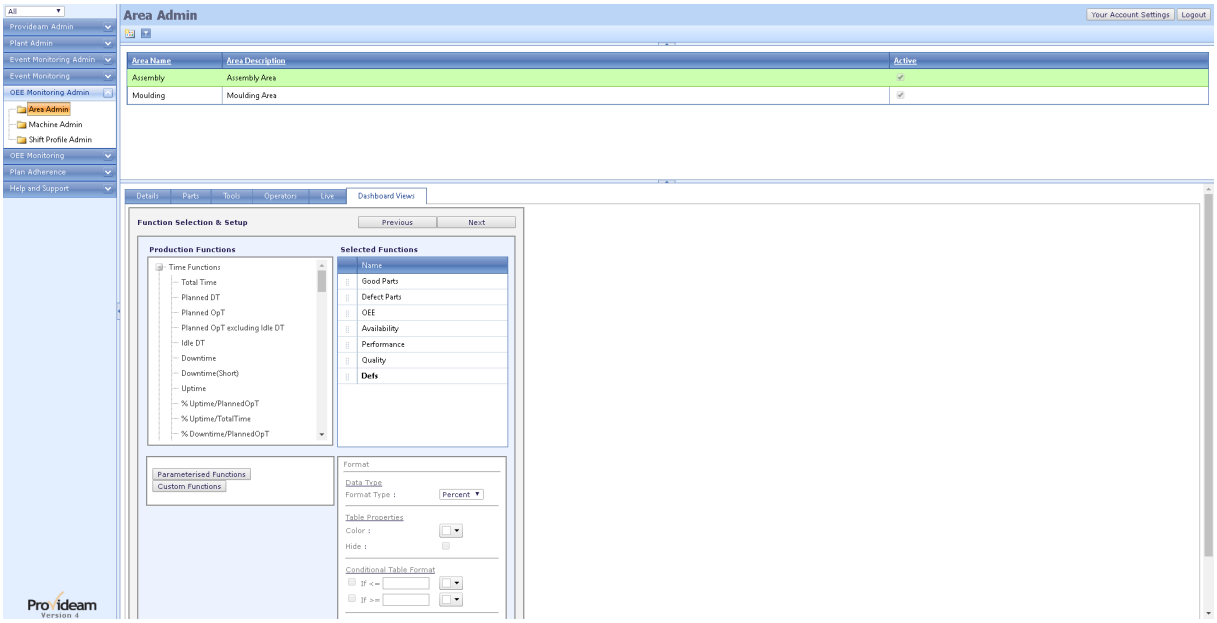


Fig. OEE Mon Admin Settings - Area Dashboard View Details with Parameterized Function

The example above shows a parameterized function in the Select Functions frame.

7.6.1.2 Machine Admin

7.6.1.2.1 Machine Details

The Machine Details Pane.

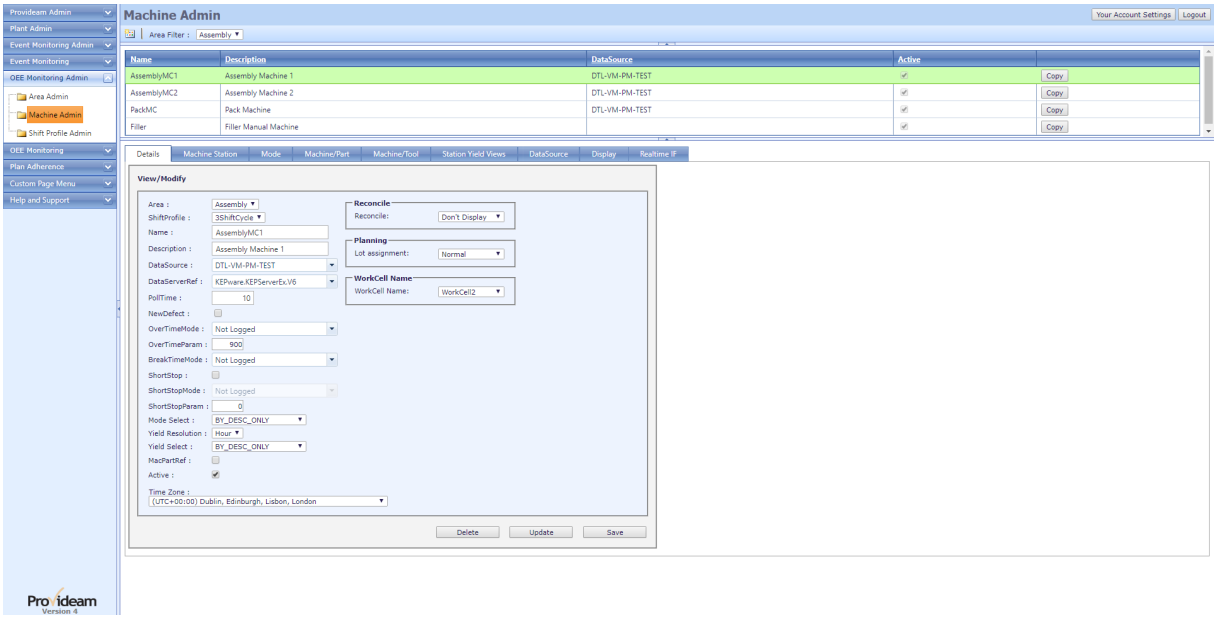


Fig. OEE Mon Admin Settings - Machine Details

Details

- The  **AddNew** button allows you to add a new Machine.
- The **Area Filter** selection box allows you to set the Area to which the Machines in the Overall Data Table belong.
- The **Copy** button allows you to create a copy of the selected Machine.
- The **Area** selection box allows you to set the Area to which the Machine belongs.
- The **Shift Profile** selection box allows you to set the Shift Profile for the Machine.
- The **Name** text box allows you to set the name of the Machine.
- The **Description** text box allows you to set the description of the Machine.
- The **DataServerRef** selection box allows you to set the OPC Server used to interface with the Machine. At present Provideam supports tag reading (OPC Enum) from the Kepware. For other makes of OPC Server tags can be added to the OPC Server manually in real-time (OPC Manual). Manual Tag assignment is done in the normal OPC manner, 'channel.device.tag'.
- The **PollTime** text box allows you to set the time between database updates for the Machine. The default value is 10s. In this case the Data Collection Service will update the Database for this Machine every 10s. In any case the Database will update immediately if the Mode changes.
- The **NewDefect** check box is for future use.
- The **OverTimeMode** selection box allows you to set the default Mode for the Machine during an Overtime Shift. An Overtime Shift is one which has it's **Overtime** flag checked. During an Overtime Shift, the current Machine Mode may be overwritten by the **OverTimeMode** setting if the Machine is 'stopped', continuously, for a period greater the period specified in the **OverTimeParam** text box. This function allows you to default the Machine Mode, in Shifts which are not always operated, to the **OverTimeMode** setting. The **OverTimeMode** setting would usually be a 'Planned Downtime' Mode.
- The **OverTimeParam** text box allows you to set the period after which the **OverTimeMode** setting would overwrite the current Machine Mode during an Overtime Shift. If the Machine runs normally and does not stop for this period then data will be collected as normal. However if the Machine stops for a period greater then this period, then all the time from when the Machine stopped may be recorded as the Mode set in **OverTimeMode** above.
- The **BreakTimeMode** selection box allows you to set the default Mode for the Machine during Shift Breaks. Shift Breaks are set in the Shift Profile Admin. The Mode will default to the **BreakTimeMode** setting only if the Machine is stopped. The **BreakTimeMode** setting would usually be a 'Planned Downtime' Mode.

- The **ShortStop** check box allows you to enable the OEE Monitoring Service to overwrite the current Machine Mode, if 'stopped' and the time period of the stop is less then the period set in the **ShortStopParm**, with the Mode in the **ShortStopMode** setting.
- The **ShortStopMode** selection box allows you to set the default Mode for the Machine during a Short Stop. The **ShortStopMode** setting can be any 'stop' Mode.
- The **ShortStopParam** text box allows you to set the period up to which the **ShortStopMode** setting will overwrite the current Machine Mode. This parameter also has the effect of modifying the OEE Loss Level 2 Type for the current 'stop' mode, be that the actual Mode or the **ShortStopMode** setting. If the stop is less then the period set in the **ShortStopParam** then the OEE Loss Level 2 Type will be set to 'Performance', otherwise the default OEE Loss Level 2 Type of the Mode will apply. Set the **ShortStopParam** setting to 0 to disable this function.
- The **Mode Resolution** selection box allows you to set the Log Resolution for Modes in the Manual Entry Page. If the value is set to *Hour* then the Modes will be entered in Hour buckets. If the value is set to *Shift* then the Modes will be entered in Shift buckets.
- The **Mode Select** selection box allows you to set whether the Modes will be selected from one Mode Description selection box, or selected first by Mode Group and then by Mode Description . The options are; **BY_DESC_ONLY**, **BY_GROUP_AND_DESC**.
- The **Yield Resolution** selection box allows you to set the Log Resolution for Yields in the Manual Entry Page. If the value is set to *Hour* then the Modes will be entered in Hour buckets. If the value is set to *Shift* then the Modes will be entered in Shift buckets.
- The **Yield Select** selection box allows you to set whether the Station Yields will be selected from one Yield Description selection box, or selected first by Yield Name and then by Yield Description . The options are; **BY_DESC_ONLY**, **BY_GROUP_AND_DESC**.
- The **MacPartRef** check box allows you to enable the feature which provides a means of associating the same Part to the same Machine multiple times. This is used for example where the Machine-Part relationship may have different Standard Times depending on the number of Operators working at the Machine. This feature can also be used for keeping a historical record of Standard Times. When the Standard Time for a Machine-Part relationship is updated, the old Machine-Part relationship is made inactive and the new Machine-Part relationship is made active.
- The **Active** check box allows you to enable the Machine for Data Collection.
- The **TimeZone** selection box allows you to set the Time Zone in which the Machine is operating. This allows you to monitor Machines in different TimeZone using one instance of Provideam.

- The **Delete** button allows you to delete the Machine.
- The **Save** button allows you to save changes to the Machine.

Reconcile

The Reconcile Section enables you to configure the Provideam OEE Monitoring Dashboard to allow a Manual Reconciliation of the Good/Defect Counts taken from the Machine.

For some Machines, such as Moulding Machines, it is not possible to assess automatically if each Part produced is Good or Defect until the Parts are manually tested by a Quality Inspector. In this situation Provideam can only assume that the Parts are Good. Following Quality Inspection, however, the Provideam User can correct the record, by entering the NumPacks, using the Reconciliation feature in the Production Log section of the OEE Monitoring Dashboard. NumPacks is the number of standard PackQty's actually packed following Quality Inspection. See Part Admin for details on the PackQty. The NumPacks value can be entered as the discrete number of Packs recorded during a production run or it can be the sequence number of the Packs. The sequence number can be used when Parts are packed in an incrementing sequence of Packs. For example the Lot would start with Pack 1, at the end of the first Shift if 5 Packs had been packed, the next Shift would start with Pack 5 and so on.

The Reconcile options are; *Don't Display*, *By Lot*, *By Lot(Seq)*, *By Shift* and *By Shift(Seq).*

- If you select Don't Display then the Reconcile feature will be disabled.
- If you select By Lot then the reconciled Good/Defect Counts are averaged over the Lot.
- If you select By Lot(Seq) then the reconciled Good/Defect Counts are averaged over the Lot. In this case the Pack Quantities are entered in an incrementing sequence.
- If you select By Shift then the reconciled Good/Defect Counts are averaged over the Shift/Lot combination.
- If you select By Shift(Seq) then the reconciled Good/Defect Counts are averaged over the Shift/Lot combination. In this case the Pack Quantities are entered in an incrementing sequence.

If you select a Reconcile method then you will also need to choose a **PackMethod**. The **PackMethod** selection box allows you to choose whether you are going to deal in discrete Pack Quantities or you will allow partially filled Packs. The **PackMethod** options are; *Num Pack Only* and **Num Pack & Remainder**.

Planning

The Planning Section is for future use.

WorkCell Name

This selection box is used to define the Work Cell to which the Machine belongs. This is an optional setting. The Work Cells are configured in the Plant Admin Section.

7.6.1.2.2 Station Counts

The Machine Station Counts Pane.

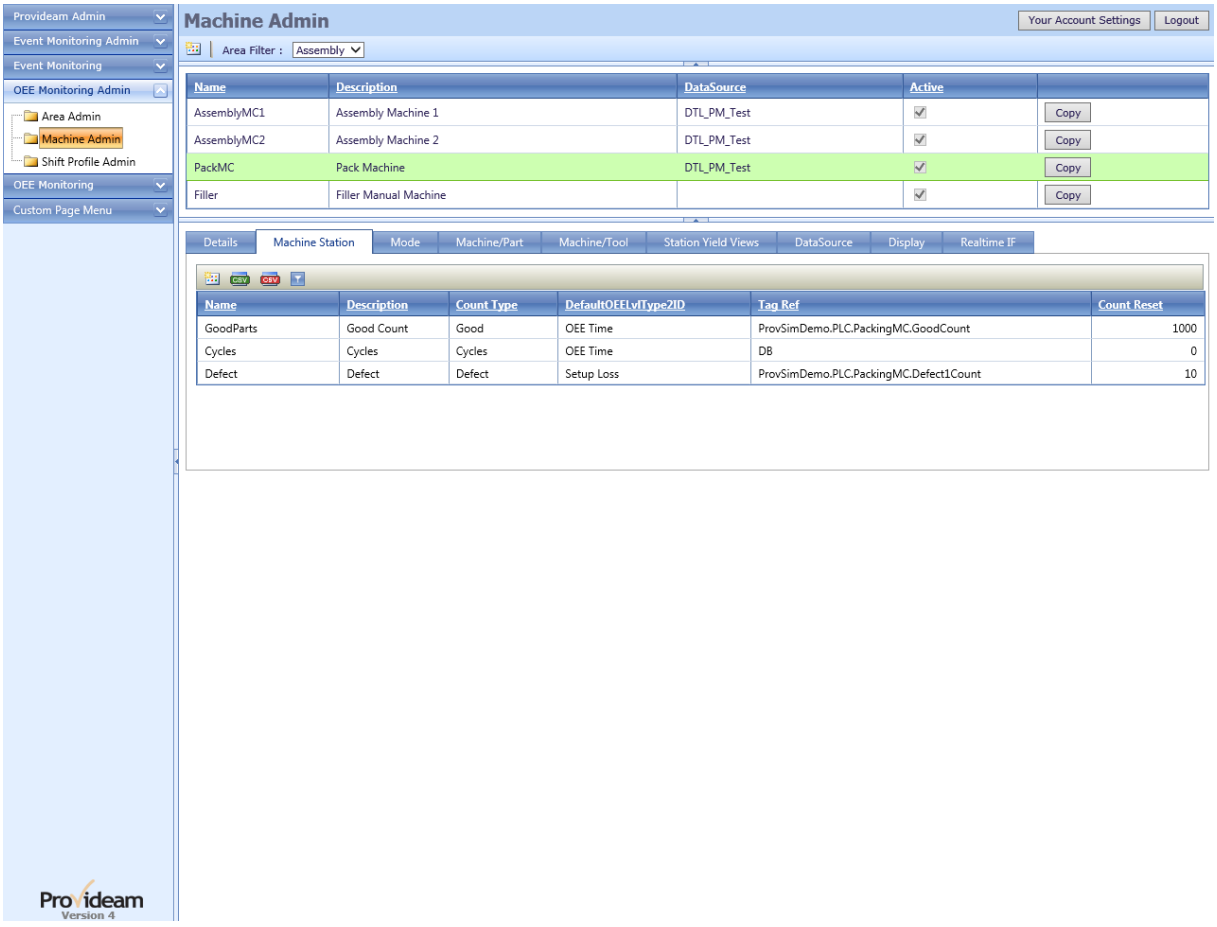


Fig. OEE Mon Admin Settings - Machine Station Counts

- The **AddNew** button allows you to create a new Machine Station Count.
- The **Export CSV** button allows you to export the Machine Station Count data to a CSV file.

- The **Import CSV** button allows you to import Machine Station Count data from a CSV file.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).

The Machine Station Count Details Pane.

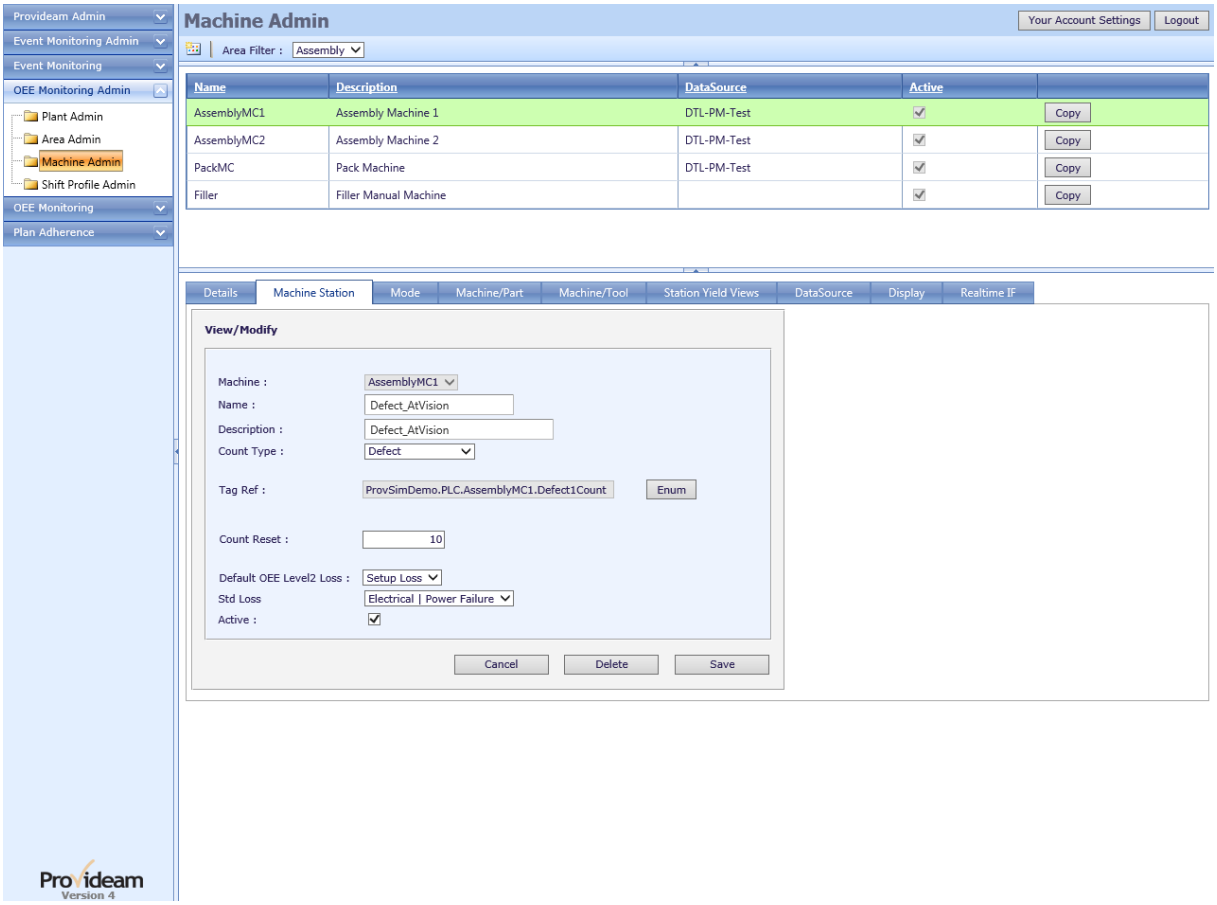


Fig. OEE Mon Admin Settings - Machine Station Count Details

- The **Machine** selection box shows the Machine to which the Station Count belongs.
- The **Name** text box allows you to set the name of the Station Count.
- The **Description** text box allows you to set the description of the Station Count.
- The **Count Type** selection box allows you to set the Station Count type. The options are; *Good*, *Cycles*, *Default Defect*, *Defect*, *Stn Count, Speed Loss* and *NumPacks*.

- The **Tag Ref** text box allows you to set the data source of the Station Count, either *OPC Enum*, *OPC Manual*, *DB*, *DB Manual* or *DB Automatic*. *OPC Enum* or *OPC Manual* indicate that the Count value will be read directly from an OPC Tag. *DB* indicates that the Count will be read from a Database entry to dbCount in table tP_MacStation. *DB Manual* is used for automatic Machines to indicate that the count will be entered on the Manual Yield Dashboard. *DB Automatic* is used for automatic Machines to indicated that the count will be interpreted from other data. So, for example, if Cycles is set to OPC and Defects is set to OPC, GoodCounts could be set to *DB Automatic*, in which case the GoodCounts would be [Cycles] * [NumCavities] - [Defects]. Once an actual GoodCounts value is entered, the interpretation will stop and the actual value will be used instead.
- The **Enum** button allows you to query the OPC server to determine the available OPC Tags of the relevant type(Integer). You can use the OPC Enum function to read Tags from a Kepware OPC Server, or enter the Tag reference manually using the OPC Manual function.
- The **Count Reset** text box allows you to set the maximum value of the Station Count. The Station Counts operate like a clock. Just as a clock continually cycles through 12, the Station Count must continually cycle through the **Count Reset** setting. Provideam measures the total count from the start of each period to the end of the period.
- The **Std Loss** selection box allows you to set the Standard Loss identifier for the selected Station Count. The available items will have been configured in the Plant Admin, StdLoss Admin Section.
- The **Active** checkbox box allows you to set whether or not this Station Count will be selectable on the Dashboard or the Manual Entry Pages.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Station Count. Station Counts can only be deleted if there is no Production Data logged which references the Station Count.
- The **Save** button allows you to save changes to the Station Count.

The **Count Types** selection determines how the Count will feature in OEE calculations. The OEE analysis is based on Good and Defect Counts. However it is not always possible to determine these values directly from the Machine.

Good - Good Count (Only 1 allowed).

Cycles - Machine Cycle Count (Only 1 allowed). In a Moulding Machine the Potential Good Count would be this value multiplied by the number of Cavities in the Tool

Default Defect - Defect Count (Only 1 allowed). When the reconciliation feature is used, the difference between the number of Parts Packed and the Potential Good

Count is assigned to the Default Defect Count. If other Defect Counts are configured you may distribute the Defects amongst them during the reconciliation process.

Defect - Defect Count (No limit. However only 15 can be used in the reconciliation process).

Stn Count - Station Count (No limit). This is a count taken from the Machine which is of interest to the Users but does not directly affect the OEE analysis.

Speed Loss Units - Speed Loss Units Count (No limit). This is a count taken from the Machine which is used to represent a unit loss to Production due to a reduced speed of the Machine. So, if for example, the Machine is set to run at 90% of it's normal running speed, Provideam can be configured to count units equivalent to 10% of normal production output. This method allows you to assign production counts to various speed loss reasons. These lost units will be included in the Performance Loss.

NumPacks - NumPack Count (Only 1 allowed). When the automatic reconciliation feature is used this value overwrites the NumPacks value of the Shift Record. The Shift Record value is updated immediately before the automatic reconciliation takes place. In this manner it is possible to use a standard Provideam count to update the NumPacks value.

7.6.1.2.3 Modes

The Machine Modes Pane.

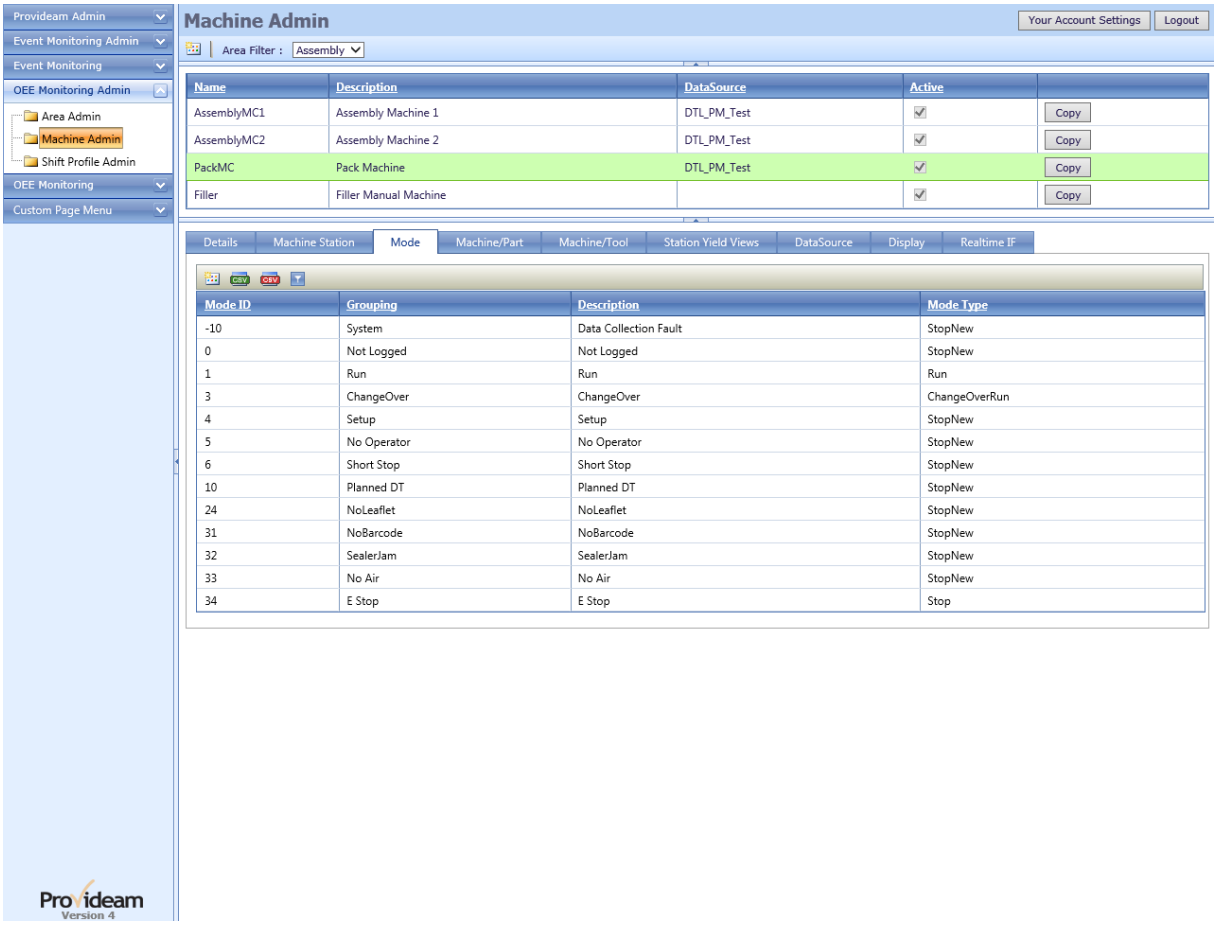


Fig. OEE Mon Admin Settings - Machine Modes

- The **AddNew** button allows you to create a new Machine Mode.
- The **Export CSV** button allows you to export the Machine Mode data to a CSV file.
- The **Import CSV** button allows you to import Machine Mode data from a CSV file.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).

The Machine Mode Details Pane.

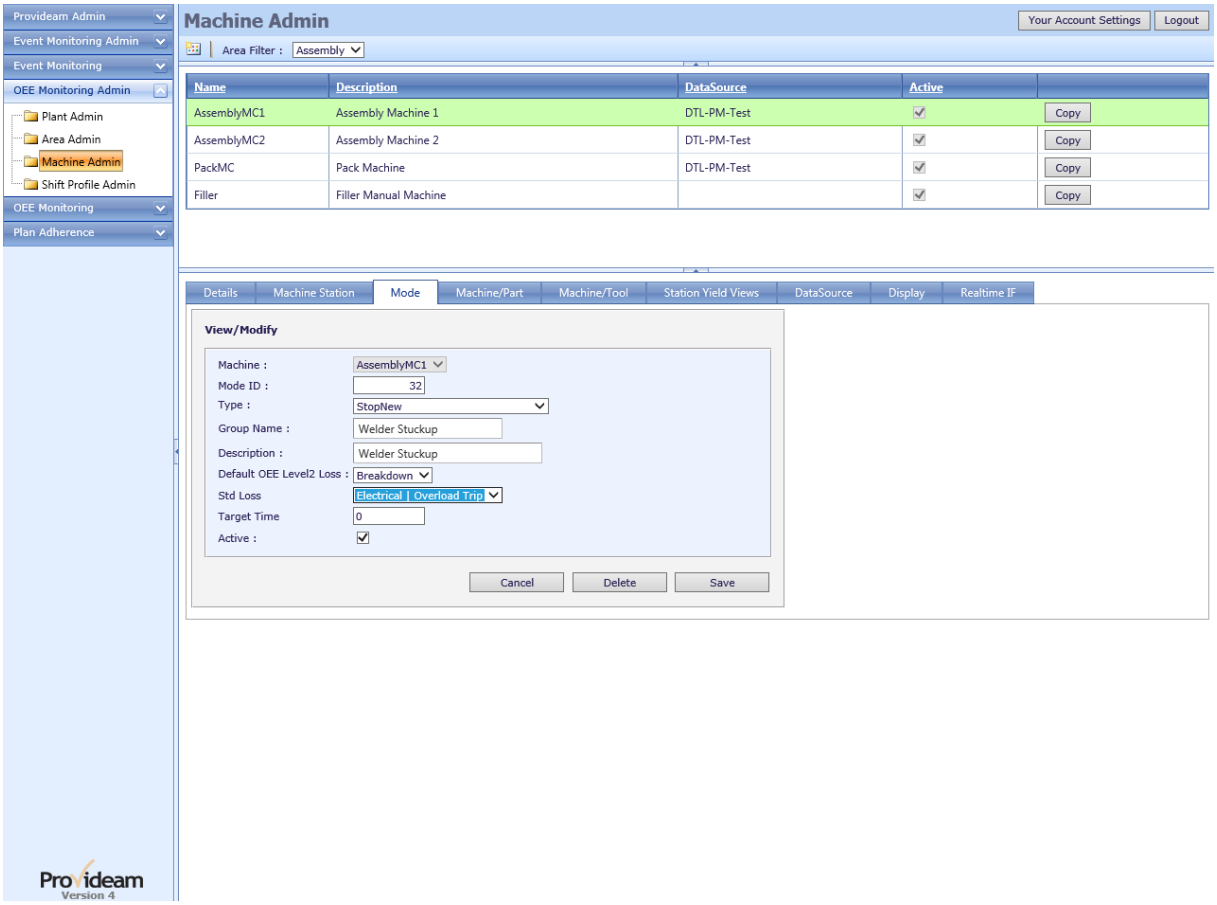


Fig. OEE Mon Admin Settings - Machine Mode Details

- The **Machine** selection box shows the Machine to which the Mode belongs.
- The **ModeID** text box allows you to set the ID of the Mode. The ModeID setting should an integer between 1 and 9999 which uniquely defines the Mode.
- The **Type** selection box allows you to set the Mode type. The options are as follows;
    - *Stop:* The *Stop* Mode indicates that the Machine is stopped for a Downtime reason. It has the property that if the previous Mode is also a stop, the previous Mode will be updated with the new Mode ID.
    - *StopNew:* The *StopNew* Mode indicates that the Machine is stopped for a Downtime reason. It has the property that it will always create a new Mode, unless the previous Mode is an unknown Mode (ie ModeID = 0).
    - *ChangeOverRun:* The *ChangeOverRun* Mode indicates that the Machine is running during a ChangeOver. It has the effect of causing a new set of Lot records to be created.
    - *ChangeOverStop:* The *ChangeOverStop* Mode indicates that the Machine is stopped for ChangeOver. It has the effect of causing a new set of Lot records to be created.

- *ChangeOverStop_NoLotChange:* The *ChangeOverStop_NoLotChange* Mode indicates that the Machine is stopped for ChangeOver.
- *ChangeOverStop_NoLotChange_Manual:* The *ChangeOverStop_NoLotChange_Manual* Mode indicates that the Machine is stopped for ChangeOver. If a Mode of this type is selected, then no other Mode will be recorded, until the Operator sets a different Mode using the RealtimeIF App. This Mode Type is designed to allow the Operator to block new Modes being created by the automatic data capture system, while the Machine is being "setup".
- *Run:* The *Run* Mode indicates that the Machine is running normally.

- The **Group Name** text box allows you to set the name of the Mode.
- The **Description** text box allows you to set the description of the Mode.
- The **Default OEE Level2 Loss** selection box allows you to select the default OEE Level 2 Loss type of the Mode. The available options are limited by the Mode Type selected. For example if you choose a Mode Type of *Stop* or *StopNew* your options will be limited to *Breakdown* (Availability), *Short Stop* (Performance), *Planned* (Planned Downtime) or Idle (similar to Planned Downtime). If you choose *ChangeOverRun* or *Run* then your options are limited to *Run* (OEE Time). And if you choose *ChangeOverStop* or *ChangeOverStop - No Lot Change* your options will be limited to *Change Over* (Availability) or *Change Over* (Performance).
- The **Std Loss** selection box allows you to set the Standard Loss identifier for the selected Mode. The available items will have been configured in the Plant Admin, StdLoss Admin Section.
- The **Target Time** text box allows you to set the target time in seconds for each instance of the selected Mode. This value is used in Loss Analysis Functions to determine the target time for the selected Mode. It is commonly used for ChangeOver Analysis Reports.
- The **Active** checkbox box allows you to set whether or not this Mode will be selectable on the Dashboard or the Manual Entry Pages.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Mode. Modes can only be deleted if there is no Production Data logged which references the Mode.
- The **Save** button allows you to save changes to the Mode.

The Machine Mode Details (Export CSV) Pane.

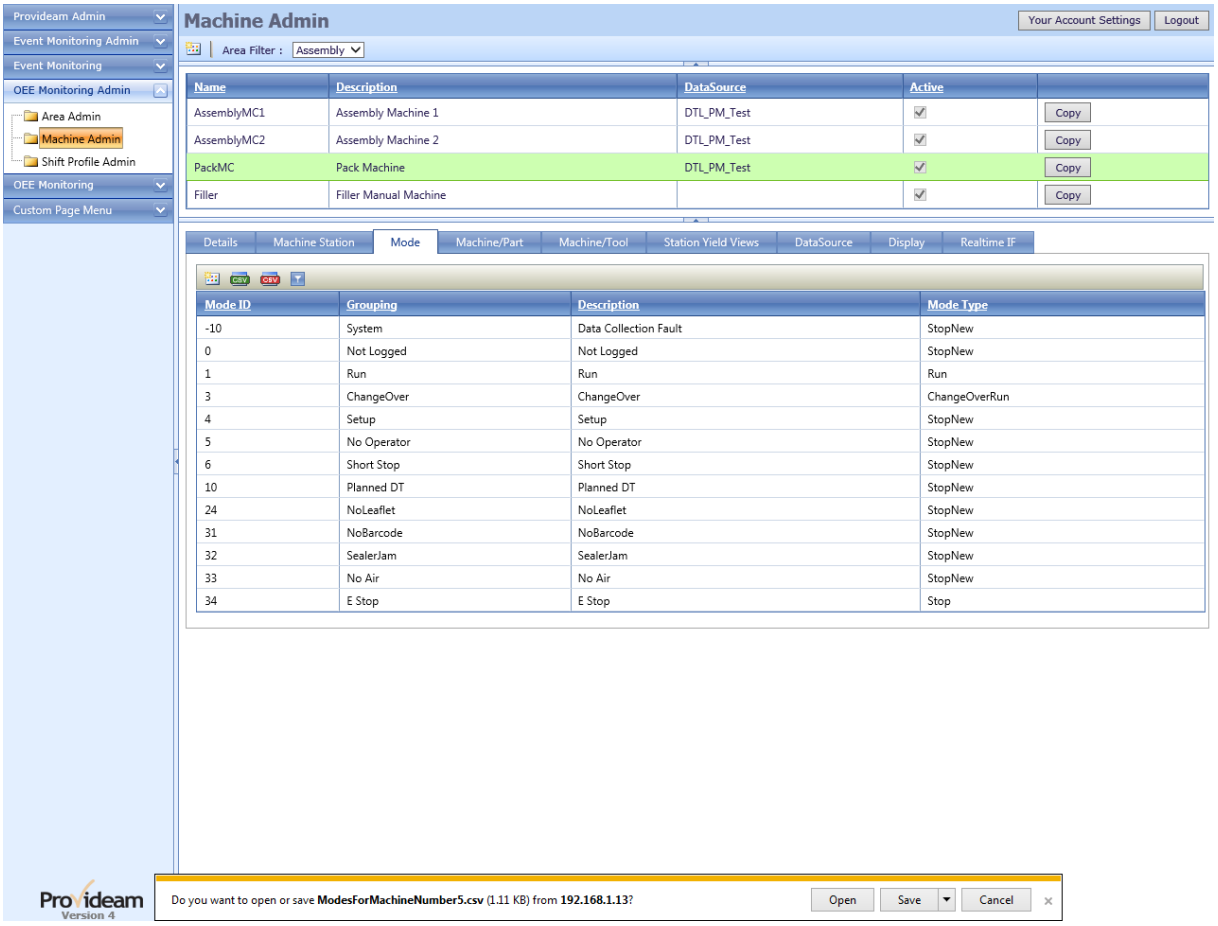


Fig. OEE Mon Admin Settings - Machine Modes Export

It is possible to export the Mode table to a CSV file for manipulation through a 3rd Party application such as a spreadsheet.

Note: The data in Provideam CSV files are TAB separated rather than COMMA separated.

The Machine Mode Details (Import CSV) Pane.

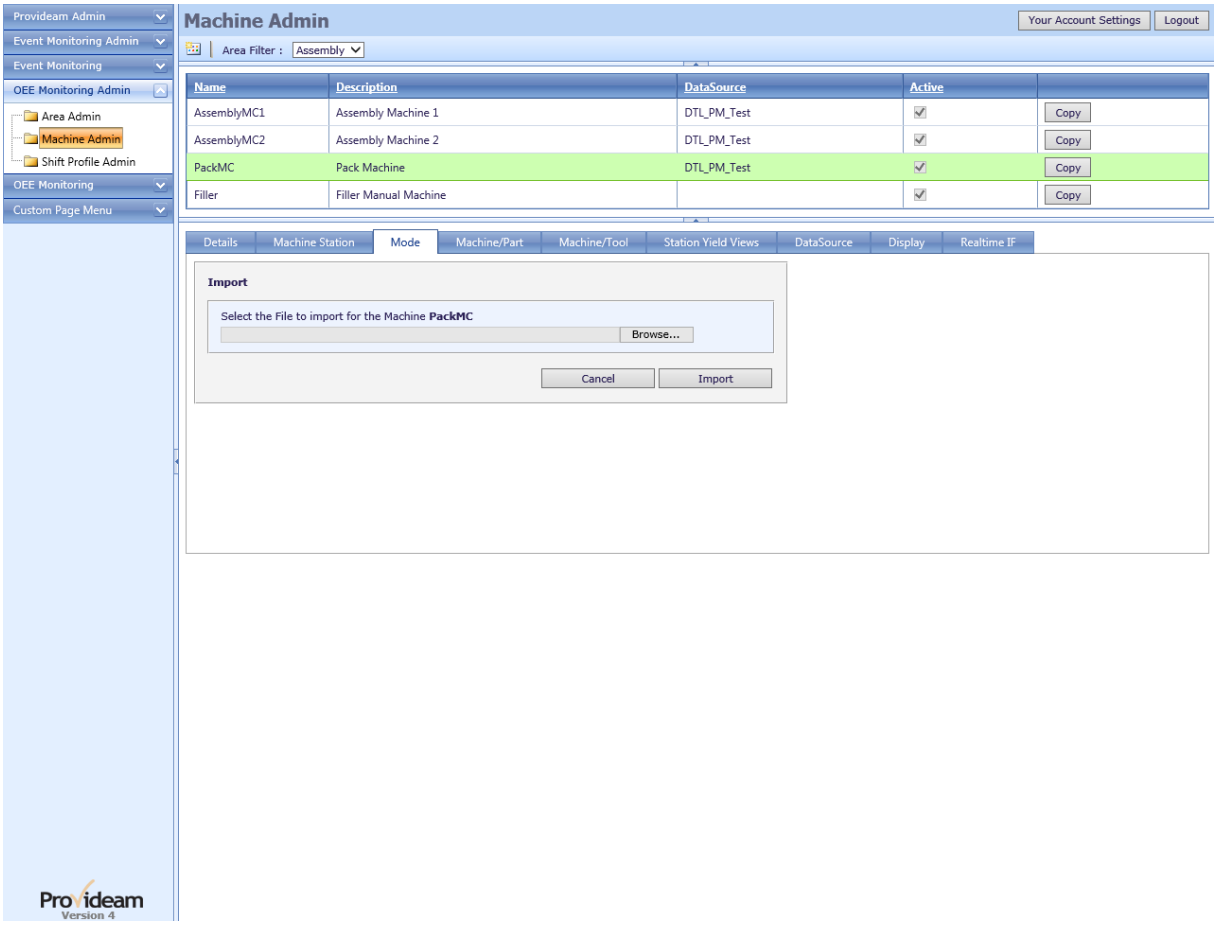


Fig. OEE Mon Admin Settings - Machine Modes Import

It is possible to import the Mode data from a CSV file.

7.6.1.2.4 Machine-Part Relationships

The Machine-Part Relationships Pane (Simple Method).

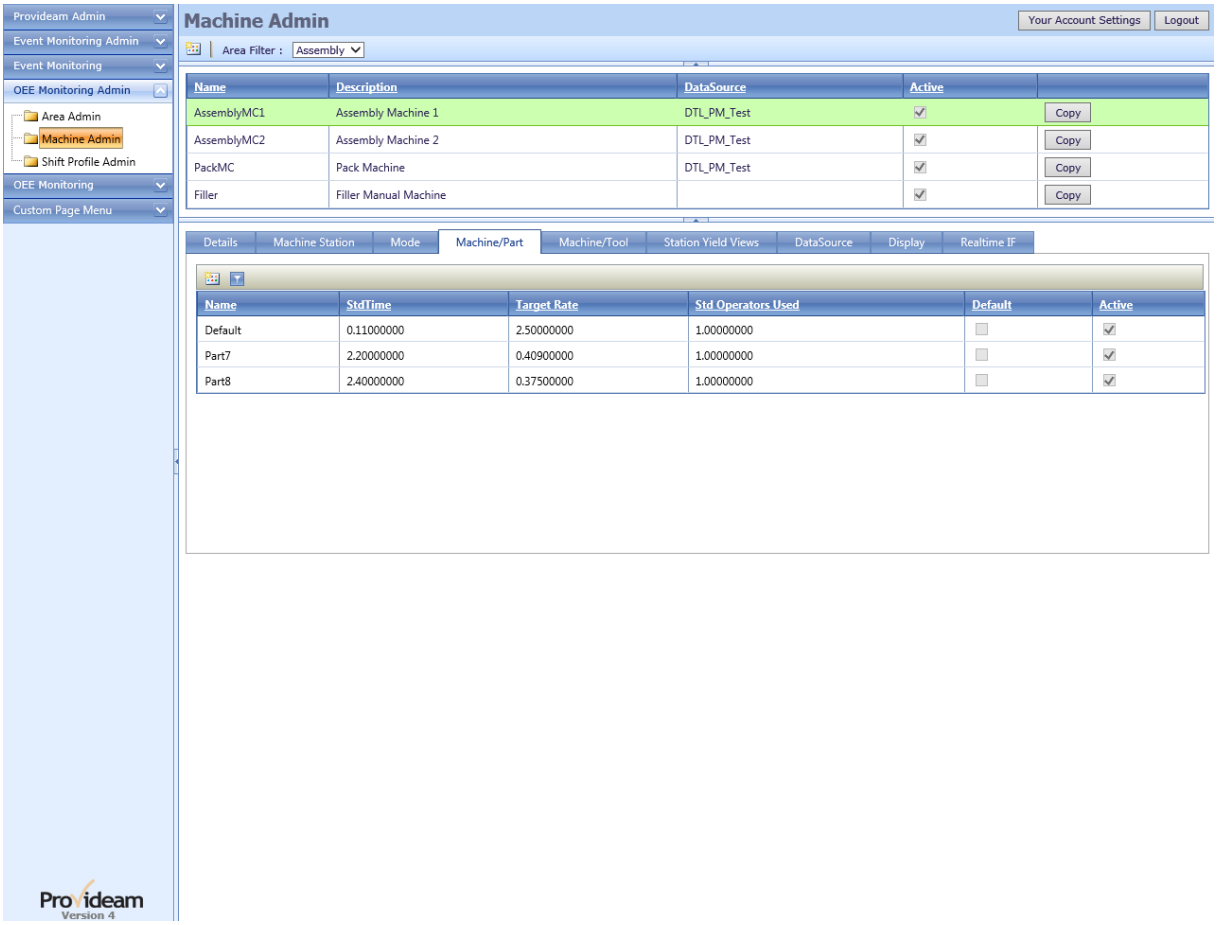


Fig. OEE Mon Admin Settings - Machine-Part-StandardTime Relationships

- The AddNew button allows you to create a new Machine-Part-StandardTime relationship.
- The Filter button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).

The Machine-Part Relationship Details Pane.

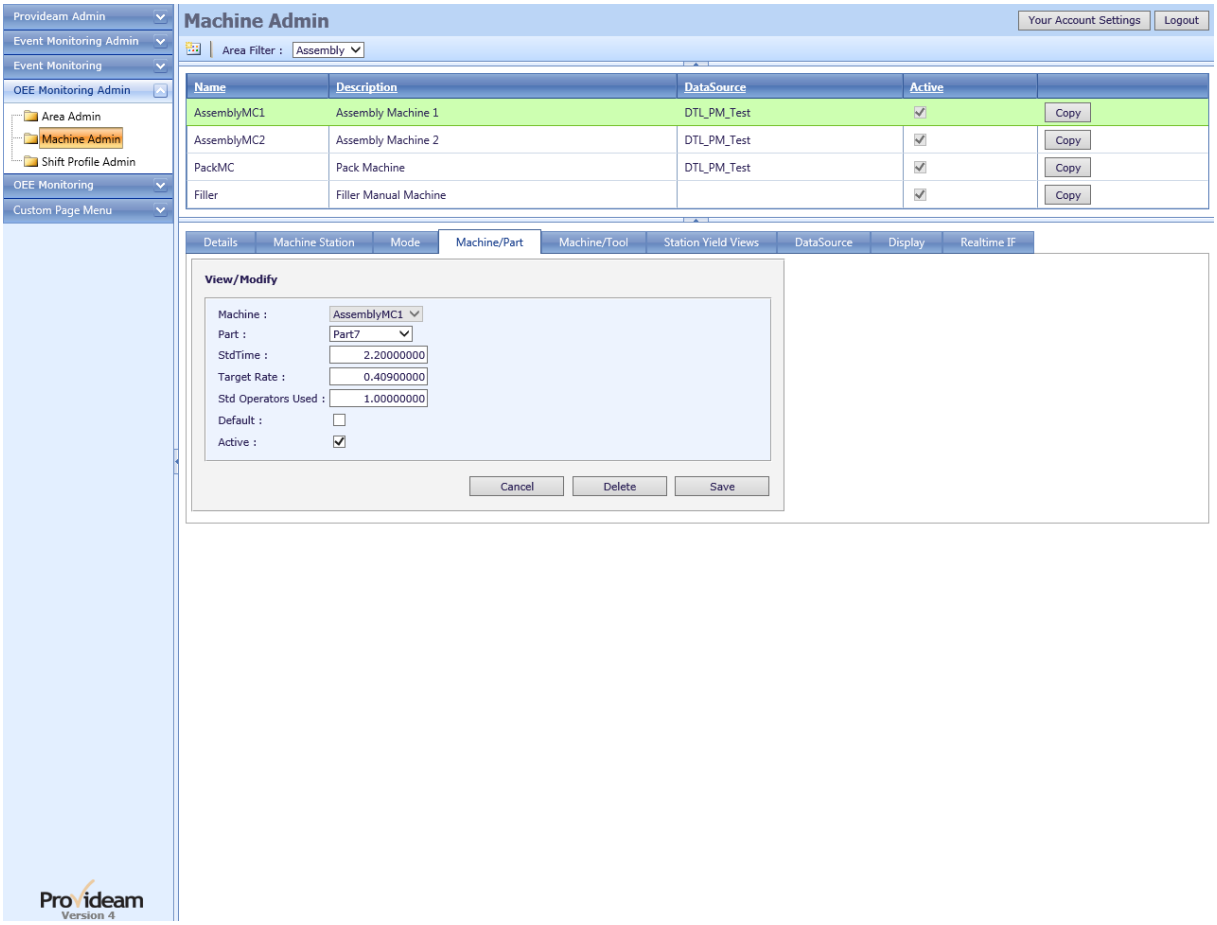


Fig. OEE Mon Admin Settings - Machine-Part-StandardTime Relationship Details

- The **Machine** selection box shows the Machine to which the Machine-Part-StandardTime relationship belongs.
- The **Part** selection box allows you to select a Part which can be produced on the selected Machine.
- The **StdTime** text box allows you to set the Standard Time, in seconds, to produce one of the selected Parts on the selected Machine.
- The **Target Rate** text box allows you to set the rate, in Parts/seconds. That is to say the number of Parts expected to be produced per second on the selected Machine.
- The **Std Operators Used** text box allows you to set the number of Operators that are typically used to manufacture the Part on the selected Machine. The value entered here is used in the Standard Operator Productivity Functions.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Machine-Part-StandardTime relationship. Machine-Part-StandardTime relationships can only be deleted if

there is no Production Data logged which references the Machine-Part-StandardTime relationship.

- The **Save** button allows you to save changes to the Machine-Part-StandardTime relationship.

The Machine-Part Relationships Pane (Advanced Method).

In the Advance Method the *MacPartRef* checkbox is set in the Machine Admin > Details page. This method is more complex and should only be used if required. When the *MacPartRef* checkbox is set, a new term, MacPartRef, appears in the Machine-Part-StandardTime relationship table. The new term allows us to create unique relationships for several instances of the same Part. In the example below we have enabled the three instances of the Part, *JAM0750* to be unique because the combination of Part and MacPartRef is unique. To identify the correct relationship, either in Manual Entry or Automatic Entry, it is necessary to provide both the Part (ID) Name and the MacPartRef. The MacPartRef can be any text, of at least one character, as long as it is not duplicated for the same Machine-Part combination. The user interface hides any pre-existing Machine-Part relationships where the MacPartRef value was blank. These cannot be used once the *MacPartRef* checkbox is set. If you wish to return to the standard method of Machine-Part Relationships management, you must first delete all relationships where the MacPartRef value is not blank.

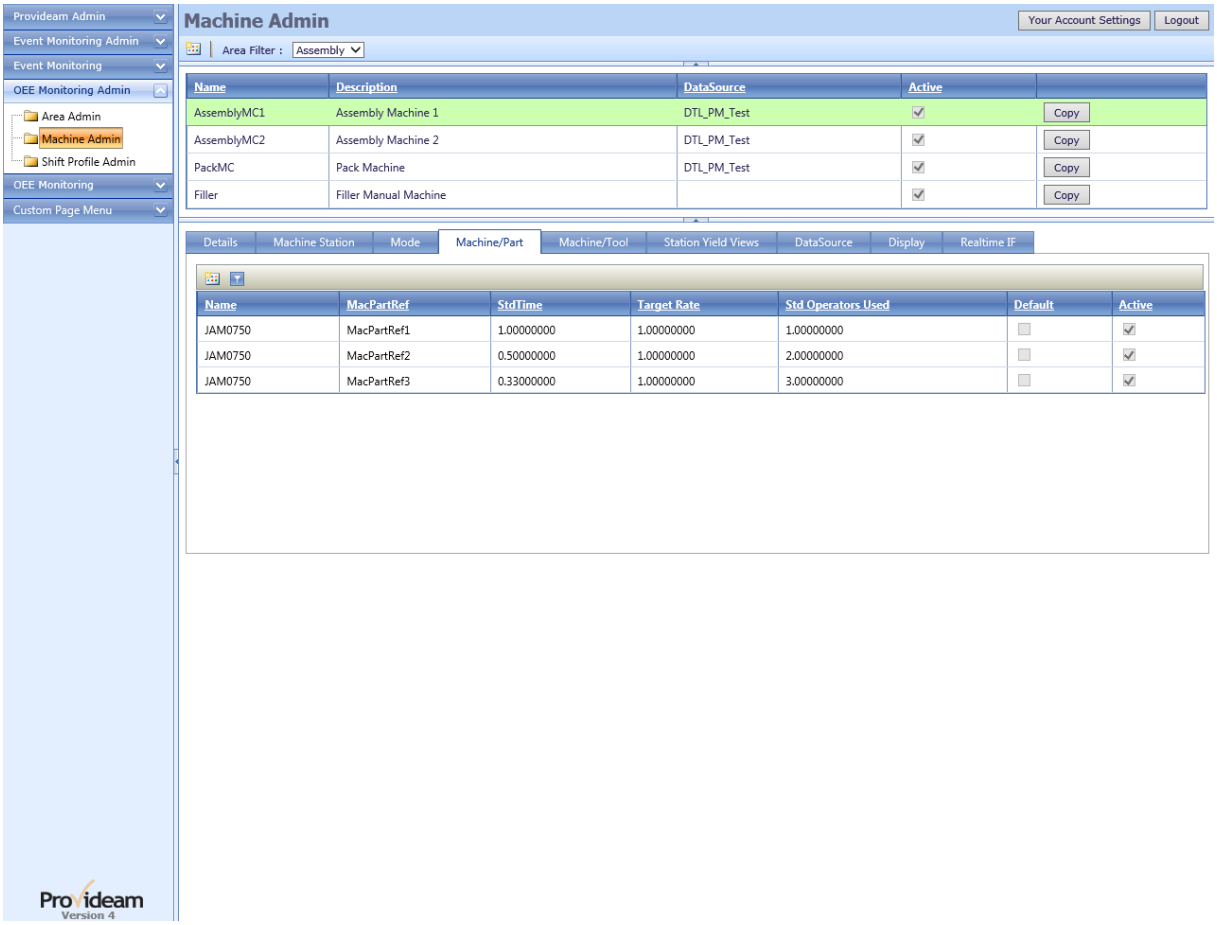


Fig. OEE Mon Admin Settings - Machine-Part-StandardTime Relationships - Advance Method

- The **AddNew** button allows you to create a new Machine-Part-StandardTime relationship.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).

The Machine-Part Relationship Details Pane (Advanced Method).

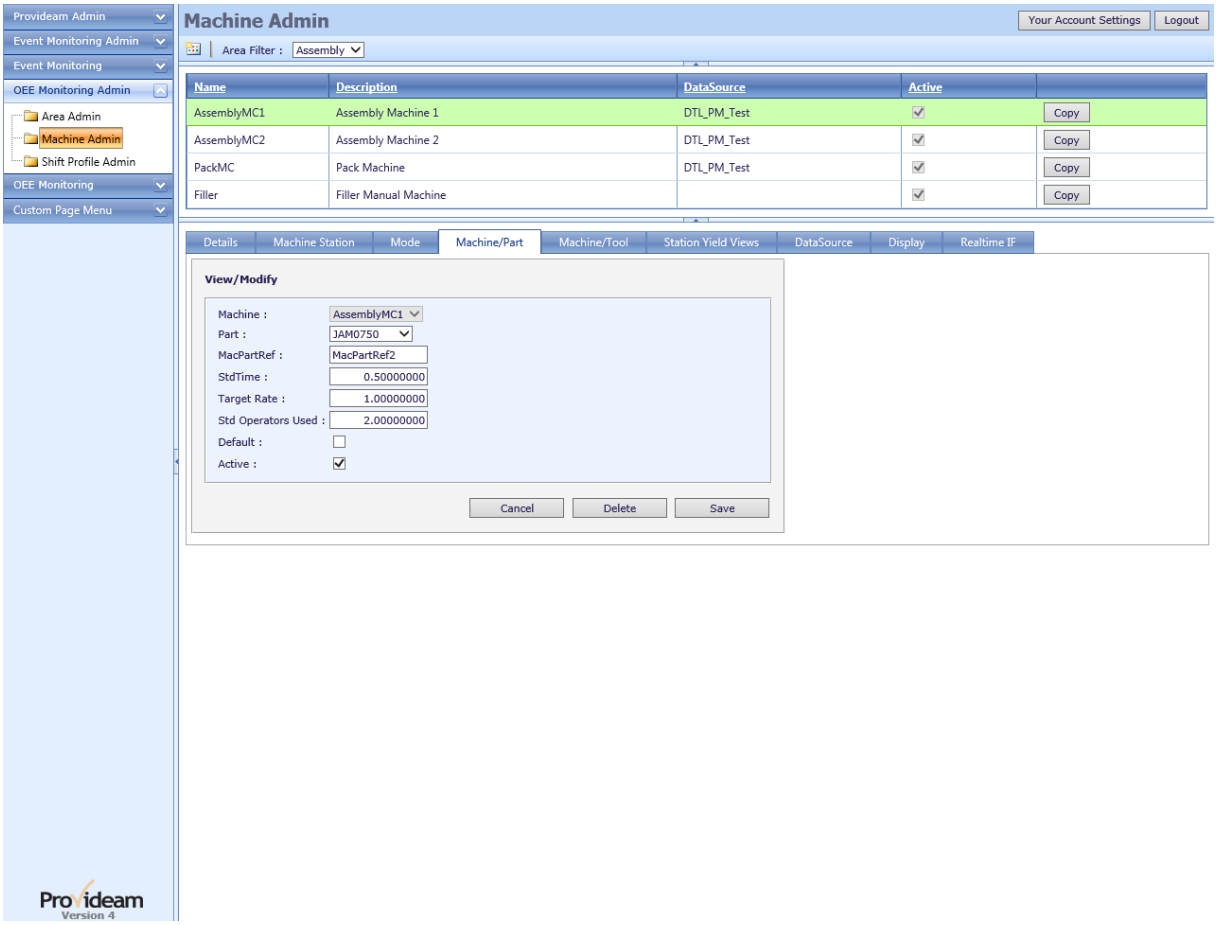


Fig. OEE Mon Admin Settings - Machine-Part-StandardTime Relationship Details - Advanced Method

- The **Machine** selection box shows the Machine to which the Machine-Part-StandardTime relationship belongs.
- The **Part** selection box allows you to select a Part which can be produced on the selected Machine.
- The **MacPartRef** text box allows you to set a unique MacPartRef value. The text must have at least one character.
- The **StdTime** text box allows you to set the Standard Time, in seconds, to produce one of the selected Parts on the selected Machine.
- The **Target Rate** text box allows you to set the rate, in Parts/seconds. That is to say the number of Parts expected to be produced per second on the selected Machine.
- The **Std Operators Used** text box allows you to set the number of Operators that are typically used to manufacture the Part on the selected Machine. The value entered here is used in the Standard Operator Productivity Functions.
- The **Default** checkbox allows you to set which Machine-Part-Relationship will appear first in any Provideam User Interface selection box.

- The **Active** checkbox allows you to set whether or not the Machine-Part-Relationship will appear in any Provideam User Interface selection box.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Machine-Part-StandardTime relationship.
- The **Save** button allows you to save changes to the Machine-Part-StandardTime relationship.

7.6.1.2.5 Machine-Tool Relationships

The Machine-Tool Relationships Pane.

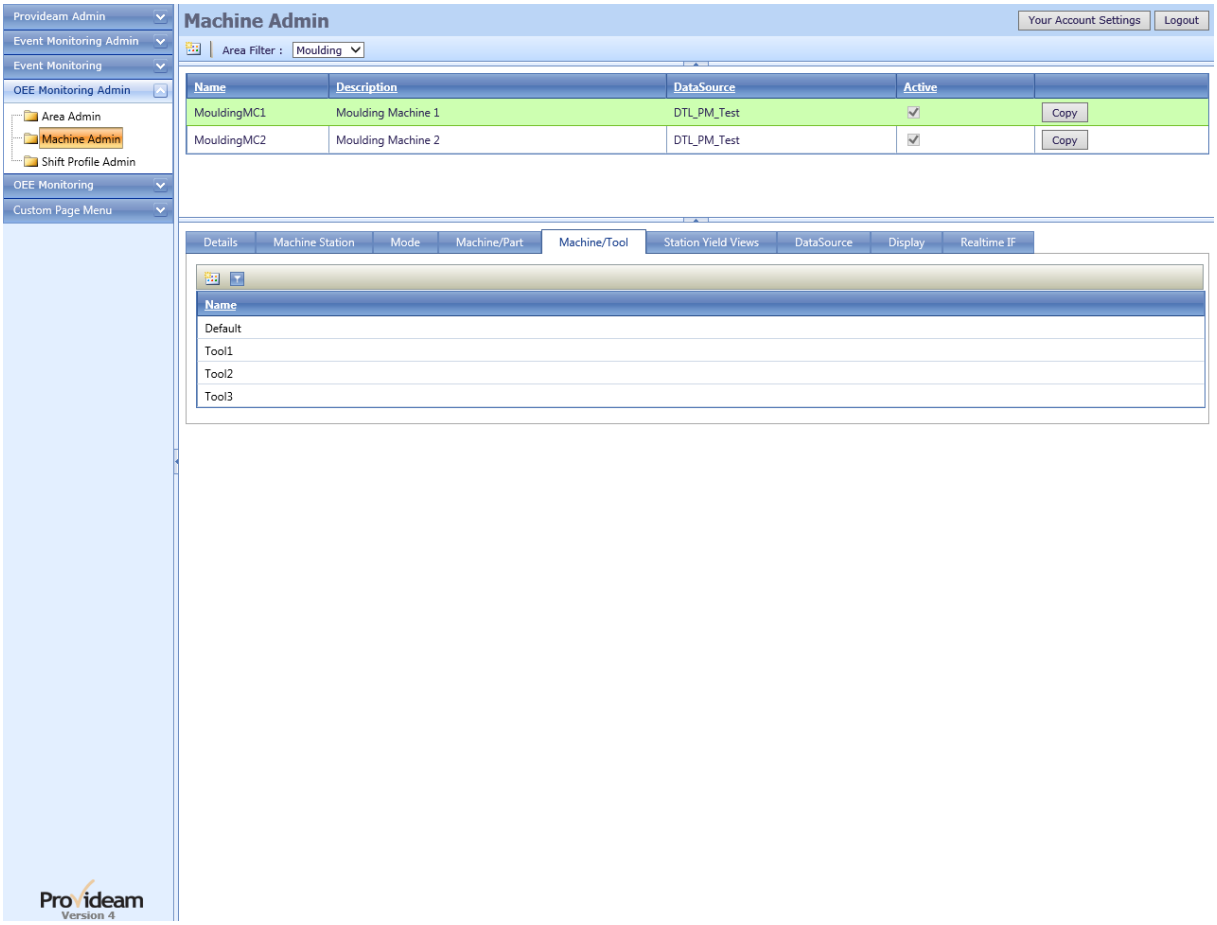


Fig. OEE Mon Admin Settings - Machine-Tool Relationships

- The AddNew button allows you to create a new Machine-Tool relationship.

- The Filter button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).

The Machine-Tool Relationship Details Pane.

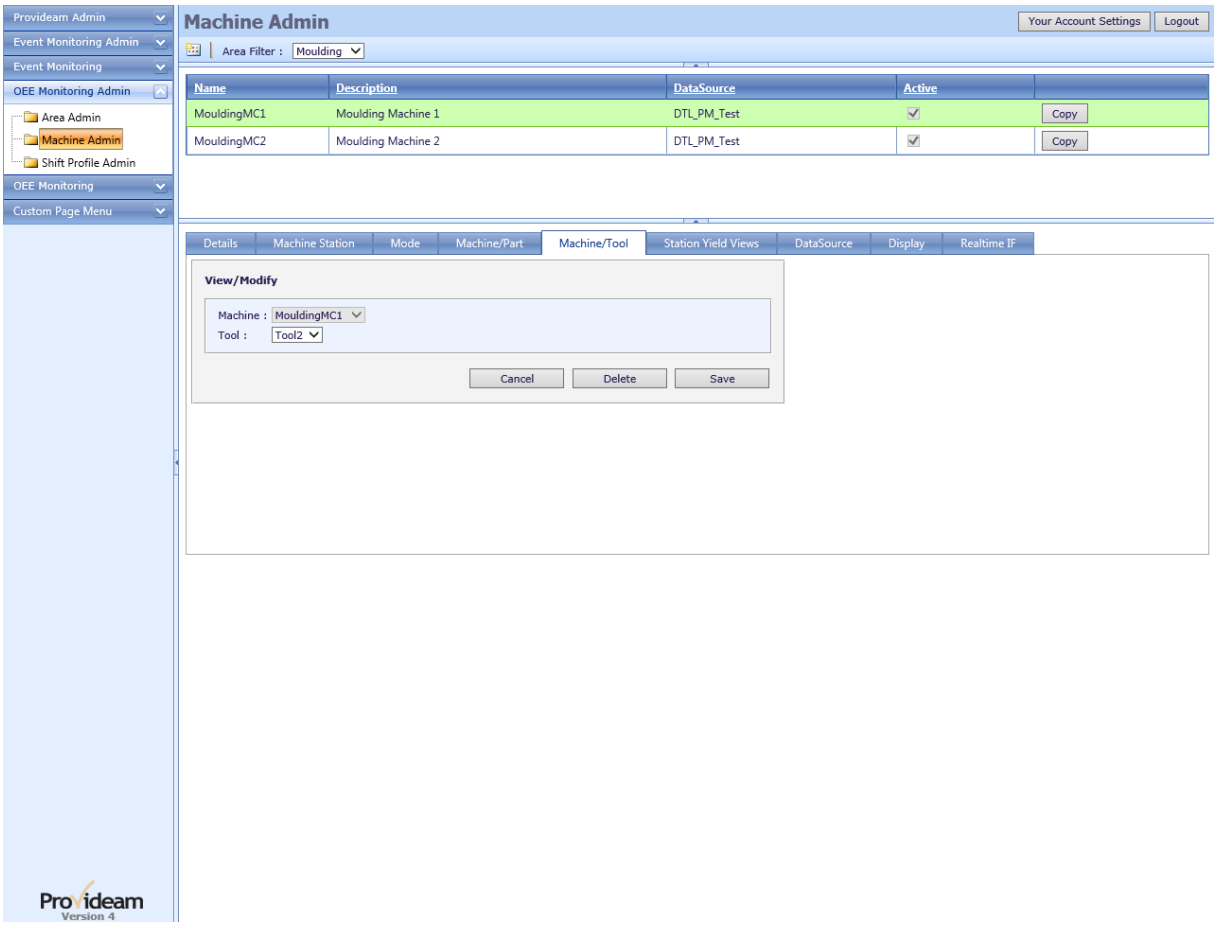


Fig. OEE Mon Admin Settings - Machine-Tool Relationship Details

- The **Machine** selection box shows the Machine to which the Machine-Tool relationship belongs.
- The **Tool**selection box allows you to select a Tool which can run on the selected Machine.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Machine-Tool relationship.
- The **Save** button allows you to save changes to the Machine-Tool relationship.

7.6.1.2.6 Station Yield Views

The Machine Station Yield Views Pane.

Station Yield Views are configurable views which occur in the Station Yield pane on the OEE Monitoring Dashboard.

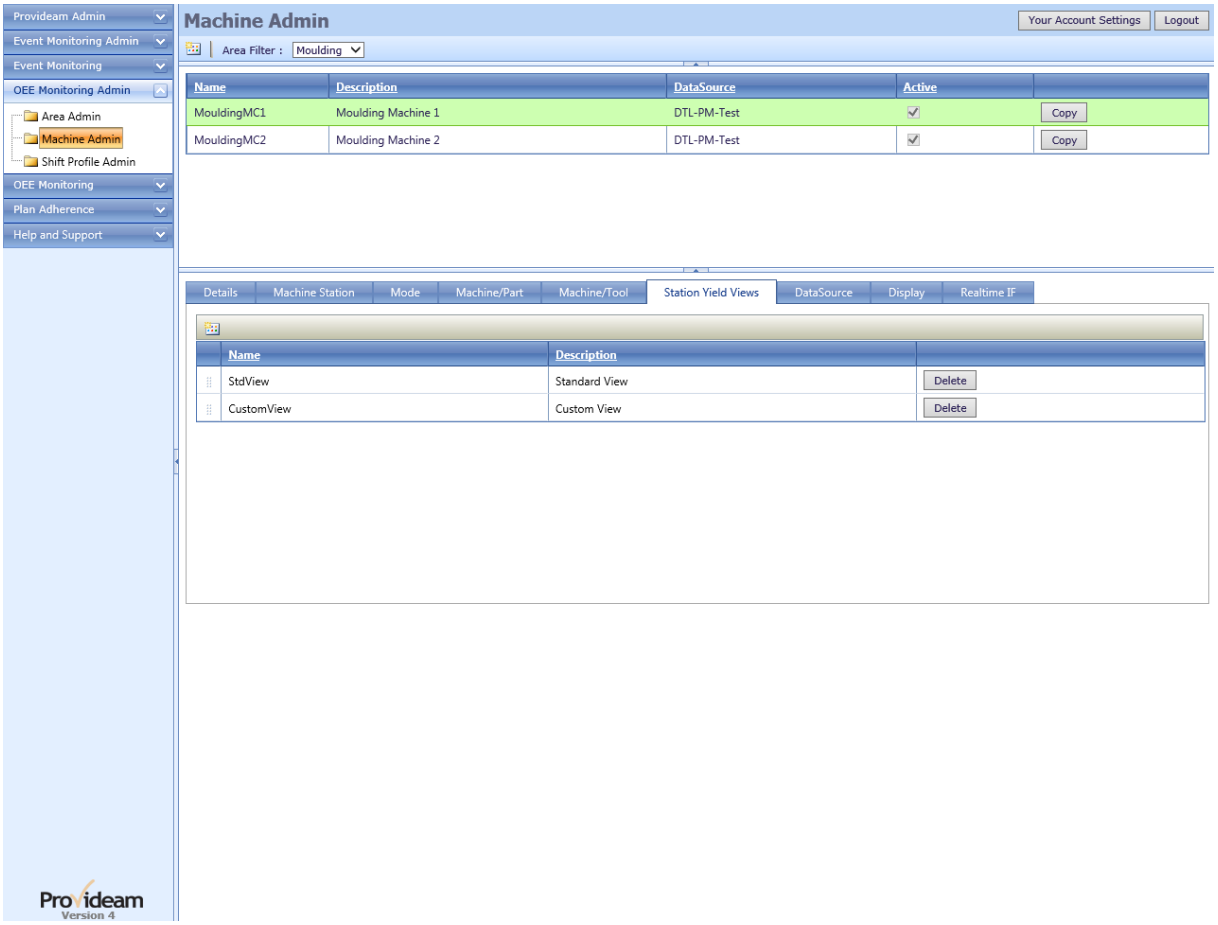


Fig. OEE Mon Admin Settings - Station Yield Views

- The **AddNew** button allows you to add a 'StationYield' View. Clicking this button will open the StationYield Details Pane shown below.
- The **Delete** button allows you to delete the View.

Notes:

1. The order in which the Views occur in the **Station Yield Views** table determines the order in which the Views will appear on the OEE Dashboard, Station Yield Page. To

change the order simply click and hold on the icon of the relevant record and drag it to the appropriate position in the list.

The Machine Station Yield View Details Pane.

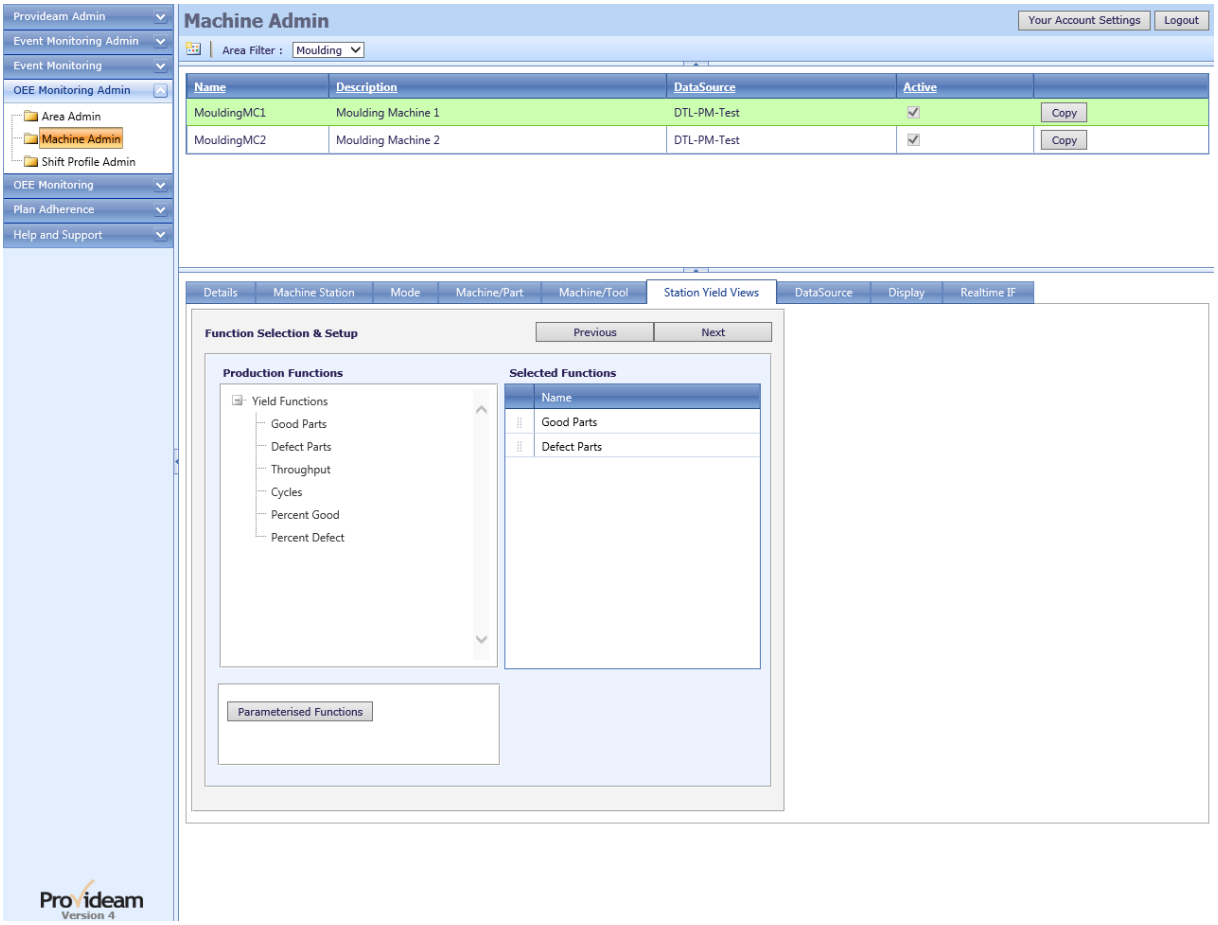


Fig. OEE Mon Admin Settings - Machine Station Yield View Details

- The **Production Functions** frame displays the list of functions which can be display in a Station Yield view.
- The **Selected Functions** frame displays the functions which have been selected and will be displayed in the Station Yield view.
- To select a function simply click and hold the mouse on the required function in the **Production Functions** frame and drag it over to the **Selected Functions** frame.
- The **Previous** button returns to the Station Yield Views page.
- The **Next** button opens a pane which allows you to name the Station Yield view.

- The **Add Parameterised Function** button opens a pane which allows you to define parameterised functions. Parameterised functions are functions which are limited to specified parameters. In the example below a function is created which quantifies the number of defects of a specific type. Once created, parameterised functions can be displayed in the same way as normal functions.

Notes:

1. The order in which the function columns occur in the **Selected Functions** lists determines the order in which the Functions will appear in your view. To change the order simply click and hold on the icon of the relevant record and drag it to the appropriate position in the list.
2. To remove a function from the **Selected Functions** list, simply drag it back to the **Production Functions** list.

The Machine Station Yield View Edit Name Pane.

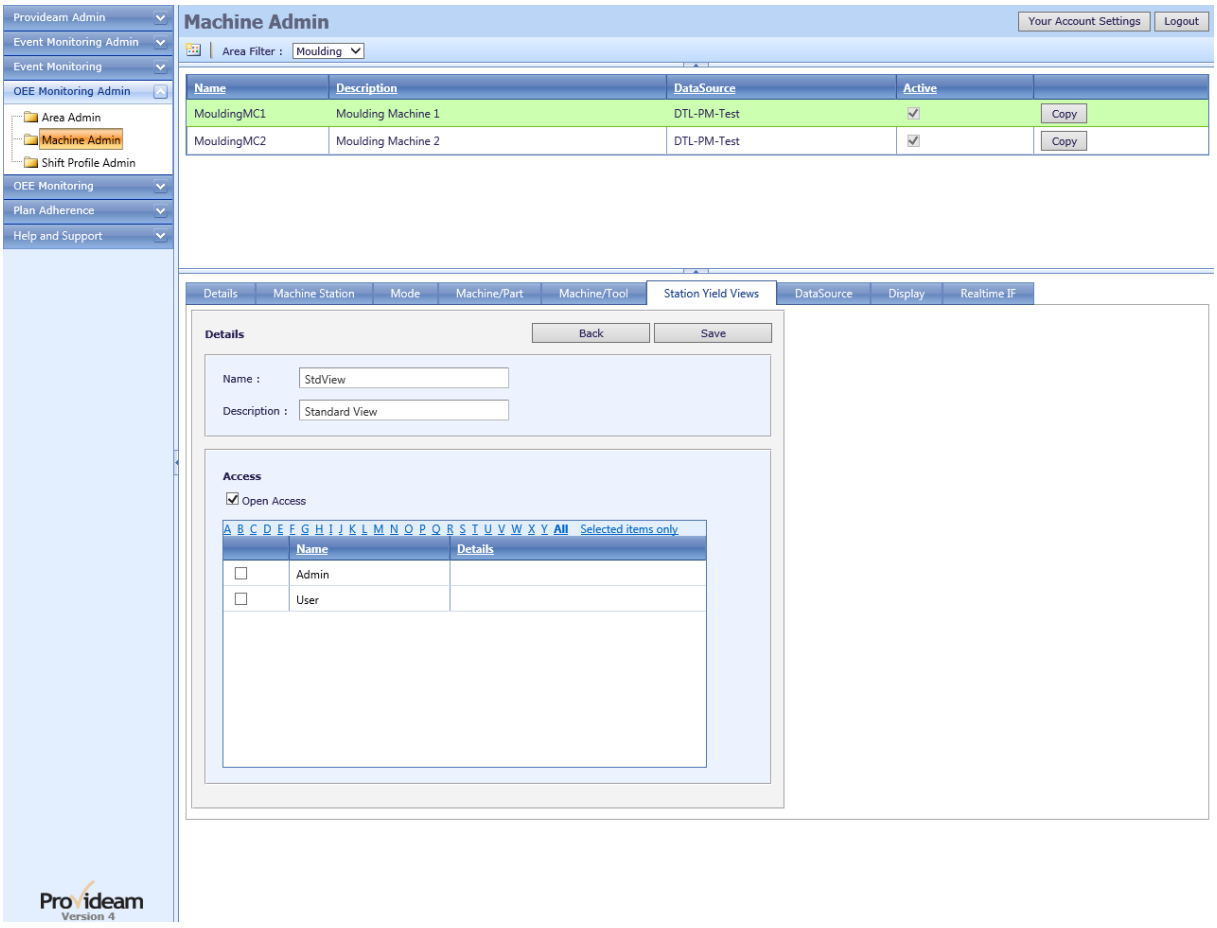


Fig. OEE Mon Admin Settings - Machine Station Yield View Edit Name

- The **Name** text box allows you to set the name of the Station Yield View.
- The **Description** text box allows you to set the description of the Station Yield View.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Previous** button opens the Station Yield view details pane.
- The **Save** button saves the Station Yield view details, and opens the Station Yield Views pane.

Access Control Section:

- The **Open Access** check box allows you to give all users access to this View. If this check box is on then any user, with access to the selected Area, will have access to this View. Note that this setting overrides the setting of individual **User Access List**.
- The **User Access List** area allows you to select which users will have access to this View. Check or uncheck any User which you want to include or exclude from the Access List. The alphabetic filter allows you to limit the display to Names which start with the selected letter. The **Selected items only** option shows the Users which you have selected.

The Machine Station Yield View Parameterised Function Select Pane.

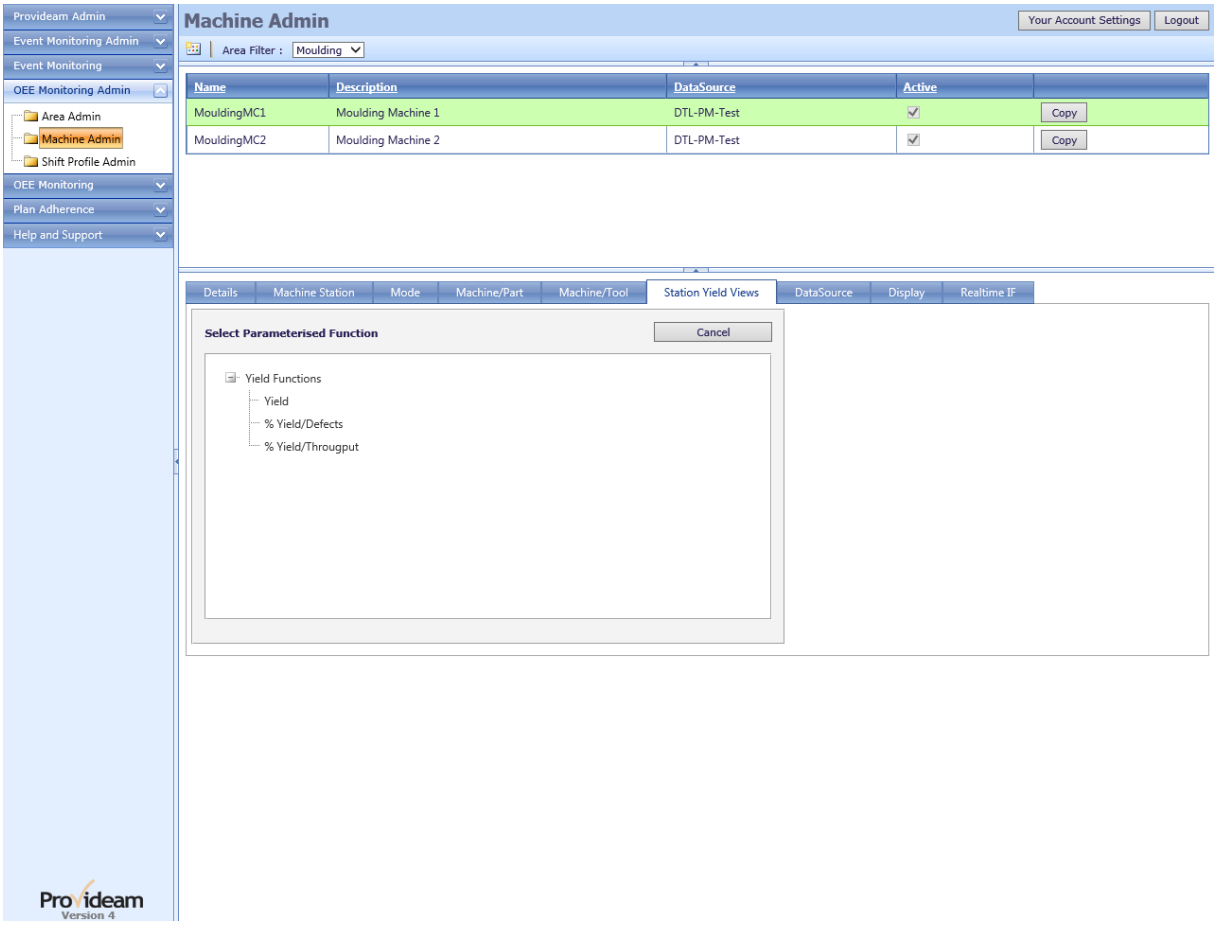


Fig. OEE Mon Admin Settings - Machine Station Yield View Parameterised Function Select

- The **Select Parameterised Function** frame shows the parameterised functions which are available. Tool tips provide more detail on the definition of each function. Click on the function to select that function and to open the parameterisation pane.
- The **Cancel** button allows you to cancel any edits and return to the previous page.

The Machine Station Yield View Parameterised Function Details Pane.

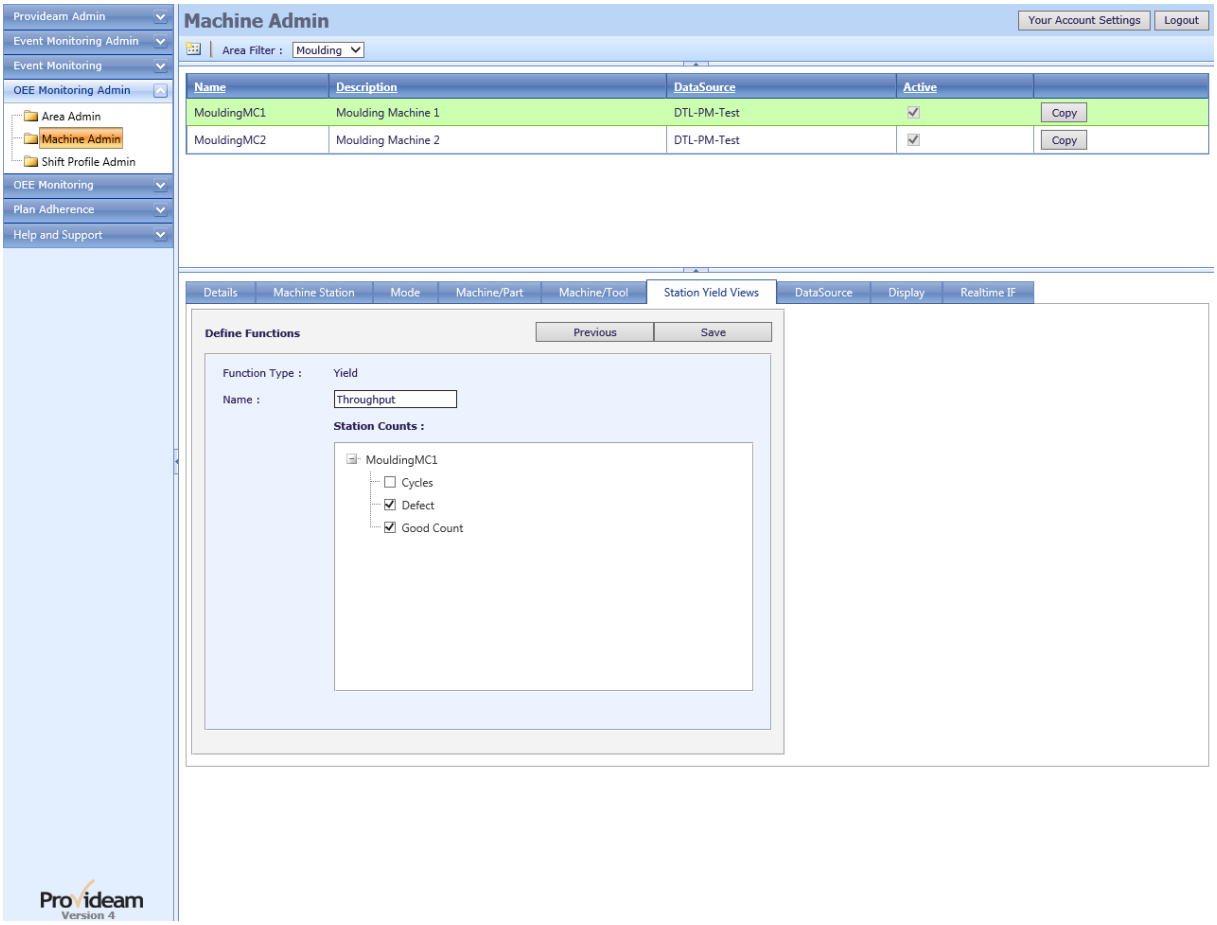


Fig. OEE Mon Admin Settings - Machine Station Yield View Parameterised Function Details

- The **Name** text box allows you to set the name of the Parameterised Function.
- The **Station Counts (Parameters)** frame shows the parameters which can be selected for this function. In this example a 'Yield' function has been selected and therefore Station Count parameters are displayed. For 'Loss' functions, Modes would be displayed. The parameters are grouped by the Machine. Check the parameters which should be included in the function. At present only 'Yield' functions are supported by the Station Yield View.
- The **Previous\Cancel** button allows you to cancel any edits and return to the previous page.
- The **Save** button allows you to save the parameters.

The Machine Station Yield View Details Pane - with Parameterised Function.

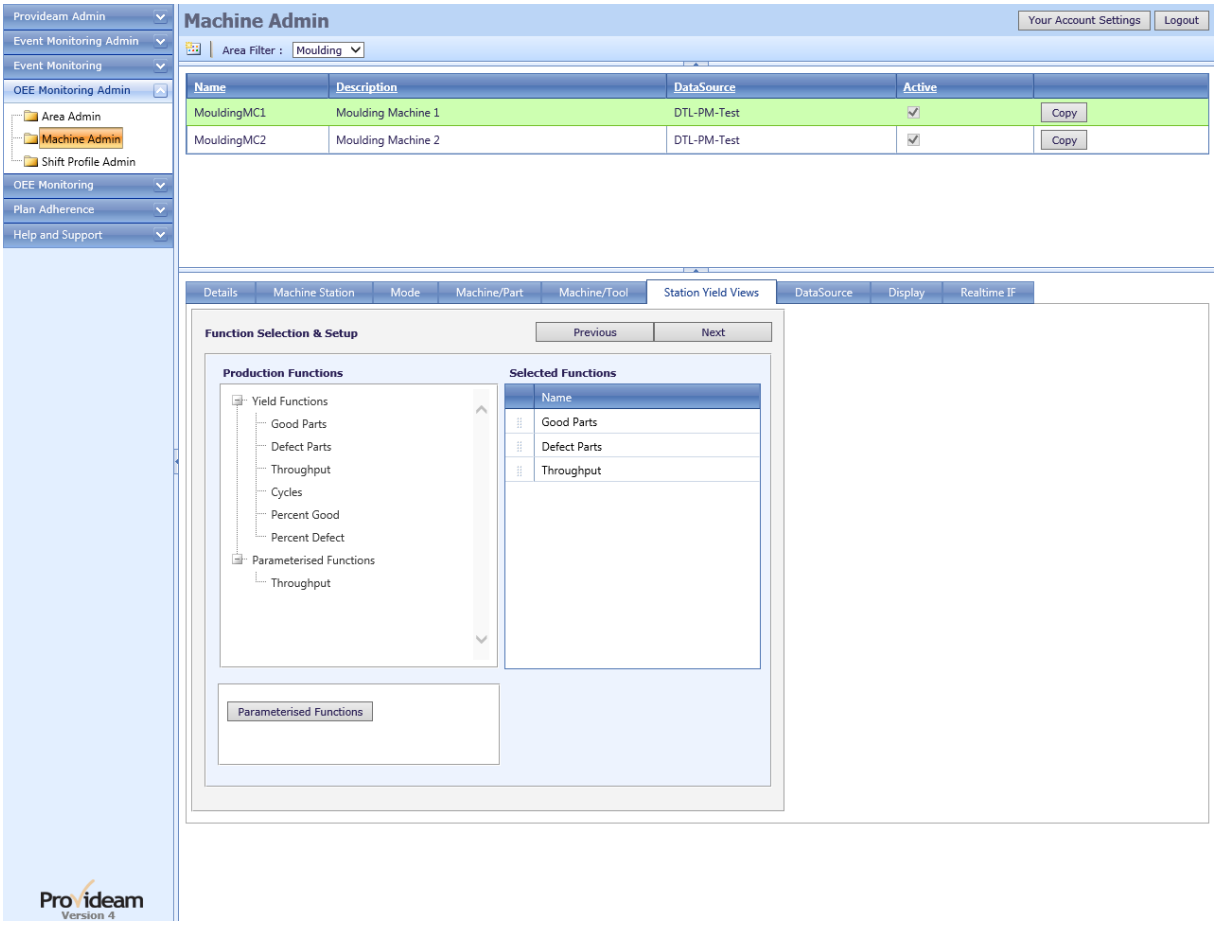


Fig. OEE Mon Admin Settings - Machine Station Yield View Details with Parameterised Function

The example above shows a parameterised function in the Select Functions frame.

7.6.1.2.7 Machine Data Sources

The Machine DataSource Pane

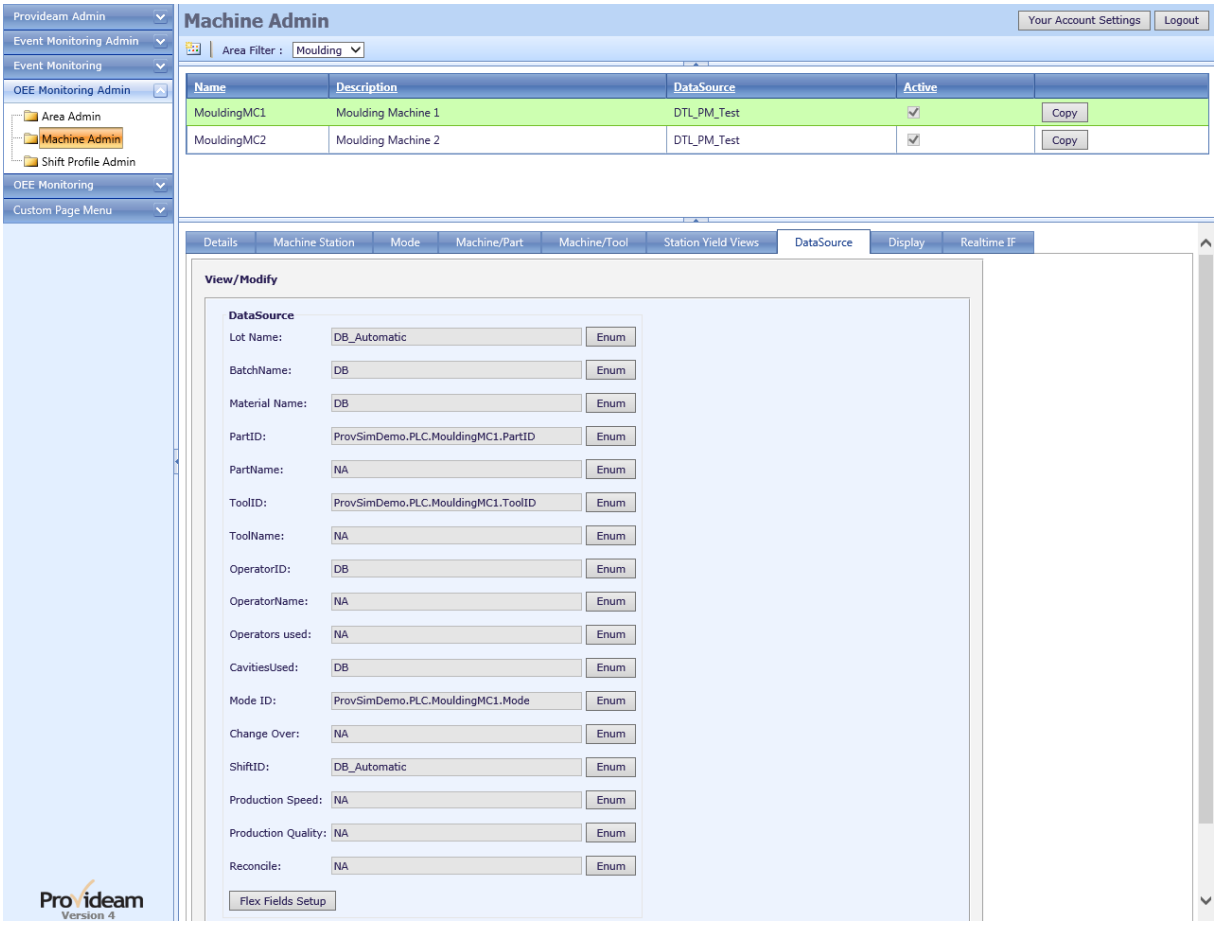


Fig. OEE Mon Admin Settings - Machine DataSource

DataSource

The DataSource section of the Machine Details allows you to define the source of various pieces of data related to the operation of the machine. The source can either be an OPC Tag(*OPC Enum / OPC Manual*) or a Database(*DB*) reference. *DB* refers to a field in the Machine properties table tP_Machine. For example dbLotName refers to the Lot Name setting. By modifying the field dbLotName you can set the current Lot Name for the Machine. Dashboard functions are provided to update the these fields, however it is also possible to update the fields programmatically. Thus you may update these fields using a script to link the field to a value in another database such as an ERP (Enterprise Resource Planning) system.

- The ENUM button allows you to chose between NA, DB, OPC Enum or OPC Manual. OPC Enum is only compatible with the Kepware OPC Servers. If you choose OPC Enum the Provideam Services Manager Service on the DataSource Server will query the DataServerRef OPC Server and return a tree structure of the available tags (of the relevant type string/integer). If no data is return then it is likely that there are no available tags of the correct type. If a time out error occurs then it is likely that the Provideam Services Manager Service is not running or needs to be restarted. If you choose OPC

Manual you must write the tag address directly into the text box provided. DB is used where the source of data is from a Database Script or from the Provideam User Interface. If the DataSource is set to NA then the item will be ignored by Provideam Data Collection Services.

- Lot Name - String Parameter which defines the current Lot Name. If the setting is DB_Automatic then the LotName is generated automatically by the OEE Monitoring Service and takes the form <MachineName> + TimeStamp. If the setting is an OPC Tag or DB then the LotName is read directly from the OPC Server or the database field dbLotName.
- Batch Name - String Parameter which defines the current Batch Name.
- Material Name - String Parameter which defines the current Material Name.
- PartID - Integer Parameter which defines the current Part. The integer value must be an ID of a Part to which the Machine has a relationship.
- PartName - String Parameter which defines the current Part. The string value must be a Name of a Part to which the Machine has a relationship. Note: PartID and PartName are mutually exclusive - only one can be defined. It is not possible to define a DataSource for both.
- MacPartRef - String Parameter which defines the current MacPartRef. The string value must be a Name of a MacPartRef to which the Machine has a relationship for the selected PartID. If the setting is DB_Automatic then the default MacPartRef will be selected each time the recorded PartID changes. You may overwrite the default value through the Provideam Dashboard once the PartID has been changed. The default MacPartRef is defined in the Machine/Part Pane. Note: The MacPartRef item will only appear on the DataSource Pane when the MacPartRef checkbox is set on the Machine Details Pane.
- ToolID - Integer Parameter which defines the current Tool. The integer value must be an ID of a Tool to which the Machine has a relationship.
- ToolName - String Parameter which defines the current Tool. The string value must be a Name of a Tool to which the Machine has a relationship. Note: ToolID and ToolName are mutually exclusive - only one can be defined. It is not possible to define a DataSource for both.
- CavitiesUsed - Integer Parameter which defines the current number of Cavities being used. The integer value must be between 1 and the number of Cavities in the current Tool.
- OperatorID - Integer Parameter which defines the current Operator. The integer value must be an ID of an Operator from the same Area as the Machine.
- OperatorName - String Parameter which defines the current Operator. The string value must be a Name of a Operatorfrom the same Area as the Machine. Note: OperatorID and OperatorName are mutually exclusive - only one can be defined. It is not possible to define a DataSource for both.

- Operators Used - Real Parameter which defines the current number of Operators Used in the Production Run.
- ModeID - Integer Parameter which defines the current Mode. The integer value must be an ID of Mode defined for the Machine.
- Change Over - Boolean Parameter which, when triggered, causes a new Lot/Batch to be created. This Parameter is automatically reset by the OEE Monitoring Service.
- ShiftID - Integer Parameter which defines the current Shift. The integer value must be an ID of a Shift from the Shift Profile selected for the Machine. Note the Shift setting can be DB_Manual, DB_Automatic or OPC Tag. DB_Automatic is the default setting. When DB_Automatic is selected the ShiftID is set by the OEE Monitoring Service determining the current ShiftID from the selected Shift Profile. DB_Manual is equivalent to DB for the other parameters and implies that the ShiftID will be set programmatically.
- Production Speed - Decimal Parameter which defines the Production Speed. The value must be between 0 and 150% (ie between 0.0 and 1.5). Only one Speed value is recorded per Production Run. This Parameter should only used in circumstances where it is not possible to measure a Good Counts and Defect Counts value. If the Production Speed value is 60% then the (OEE Time + Quality Loss Time) value is 60% of the Net Operating Time, and the Speed Loss is 40% of the Net Operating Time. See Section "Expressing OEE As a Time Value" for a definition of Net Operating Time.
- Production Quality - Decimal Parameter which defines the Production Quality. The value must be between 0 and 150% (ie between 0.0 and 1.5). Only one Quality value is recorded per Production Run. This Parameter should only used in circumstances where it is not possible to measure a Good Counts and Defect Counts value. If the Production Quality value is 30% then the OEE Time value is 30% of the (OEE Time + Quality Loss Time) value, and the Quality Loss is 60% of the (OEE Time + Quality Loss Time) value.
- Reconcile - Boolean Parameter which, when triggered, causes a reconciliation to occur. This Parameter is automatically reset by the OEE Monitoring Service. Note the Reconcile setting can be DB, DB_Automatic or OPC Tag. If DB or OPC Tag then the reconciliation will occur only when triggered by the input. If DB_Automatic then the reconciliation will occur at each Shift or Lot change, as well as when the input is triggered. The reconciliation can also be triggered manually via the Production Log page of the user interface.
- The Flex Fields button allows you to configure an additional 20 data points which can be used in a similar way to Material Name. These points can be updated from OPC, from DB scripts or from the OEE Dashboard as you require. The text to describe the points can be edited in a customisable Dictionary. The data is capture by Batch-Shift.

The Machine DataSource (OPC Enum) Pane.

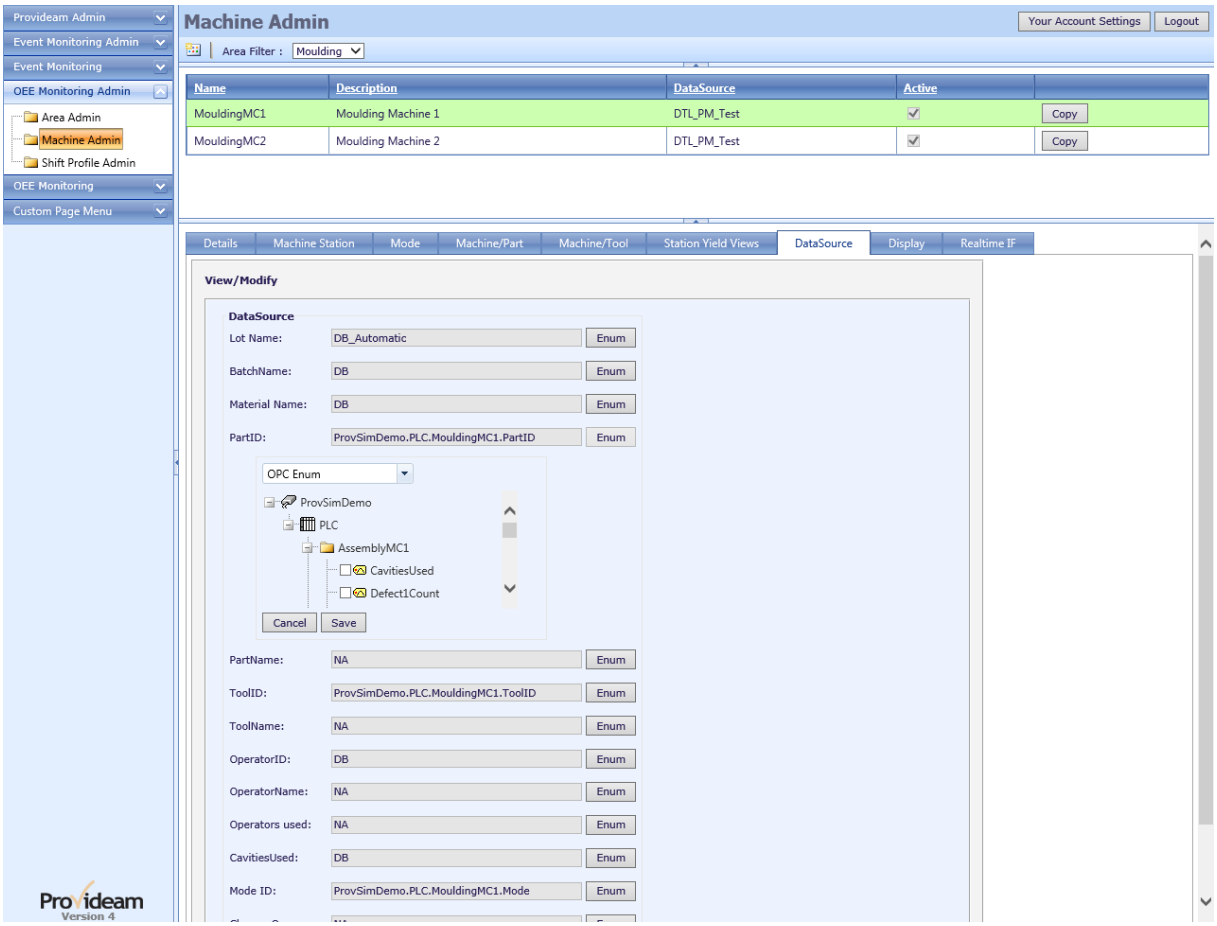


Fig. OEE Mon Admin Settings - Machine DataSource - OPC Enumeration

7.6.1.2.8 Machine Display Options

The Machine Display Pane

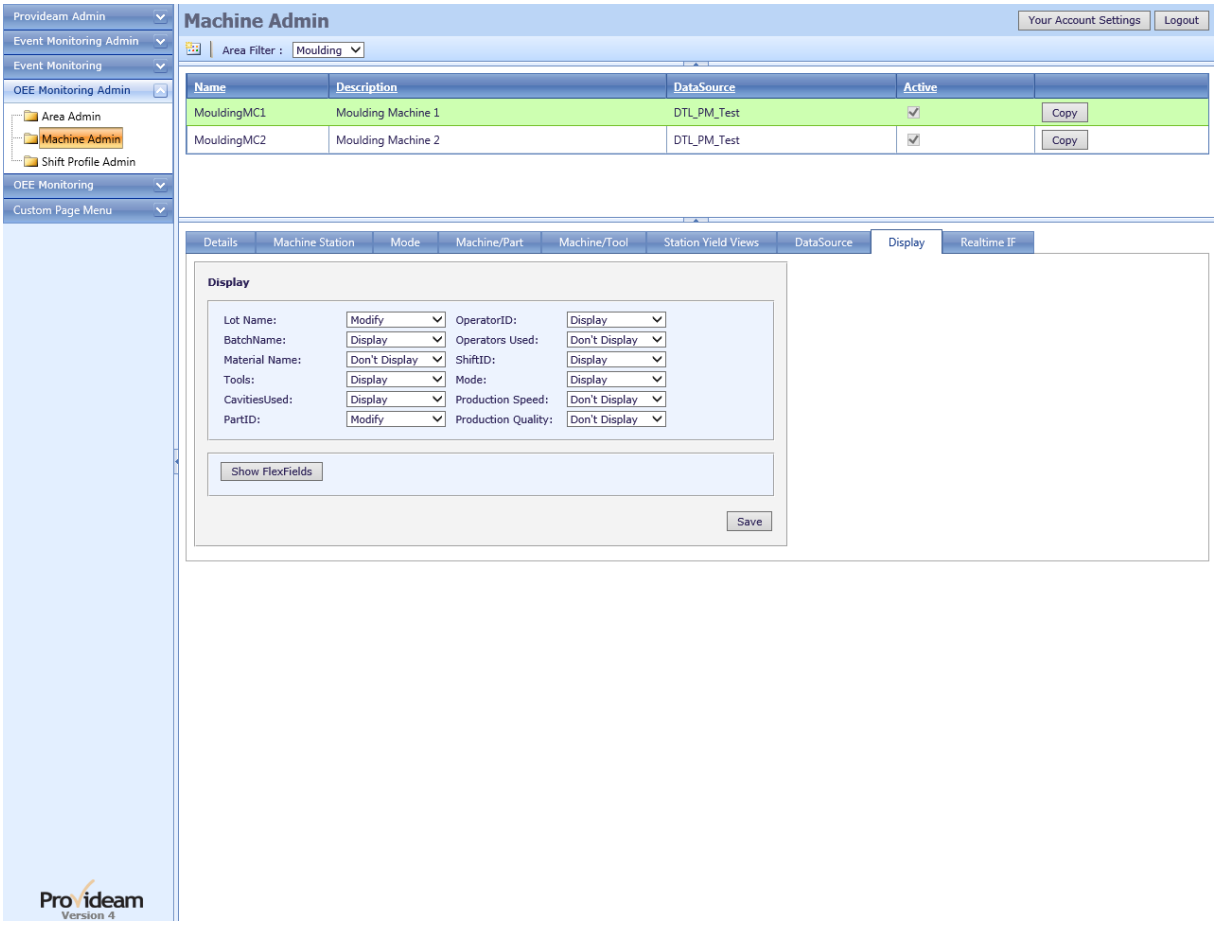


Fig. OEE Mon Admin Settings - Machine Display

- The **Show FlexFields** button allows you to expand the screen to show the Display settings for Flex Fields.
- The **Save** button allows you to save changes to the Machine Display Details.

Display

The Display Section of the Machine Details allows you to define how data will appear on the Provideam OEE Monitoring Dashboard for the Machine. The choices will be *Don't Display*, *Display*, and *Modify*.

If you select *Don't Display* then that item will not be displayed on the Dashboard for that Machine. This is the recommend setting for items which are not relevant to the Machine. For example if Provideam is not required to track Lots for a Machine it simplifies the display to select *Don't Display* for **Lot Name**. Thus the User sees a more focused, less cluttered Dashboard.

If you select *Display* then that item will be display but it will not be modifiable through the Dashboard. This is the correct setting if the item source is an OPC Tag or a script from another Database.

If you select *Modify* then that item will be displayed and be modifiable through the Dashboard. This allows you to supplement the automatically collected Machine data with manually entered data. Thus if you collect Mode data directly from the Machine control system you could manually enter Lot, Batch, Part data, etc., via the Dashboard.

7.6.1.2.9 Scheduled Dow ntime

The Scheduled Downtime feature allows the user to add periods when the Machine is scheduled to be down. For example holidays or shutdowns.

The OEEMon data collection services monitors the records in the Schedule Downtime table, and will overwrite the current Mode with the Mode the user has selected for the Scheduled Downtime.

Entries in the Scheduled Downtime table will only affect live/future data collection. It will not affect previously recorded data.

Warning: The OEEMon data collection service will not record the actual Mode reason during the declared Scheduled Downtime period. Care must be taken to ensure the Scheduled Downtime periods are declared correctly.

The Machine Scheduled Downtime Pane.

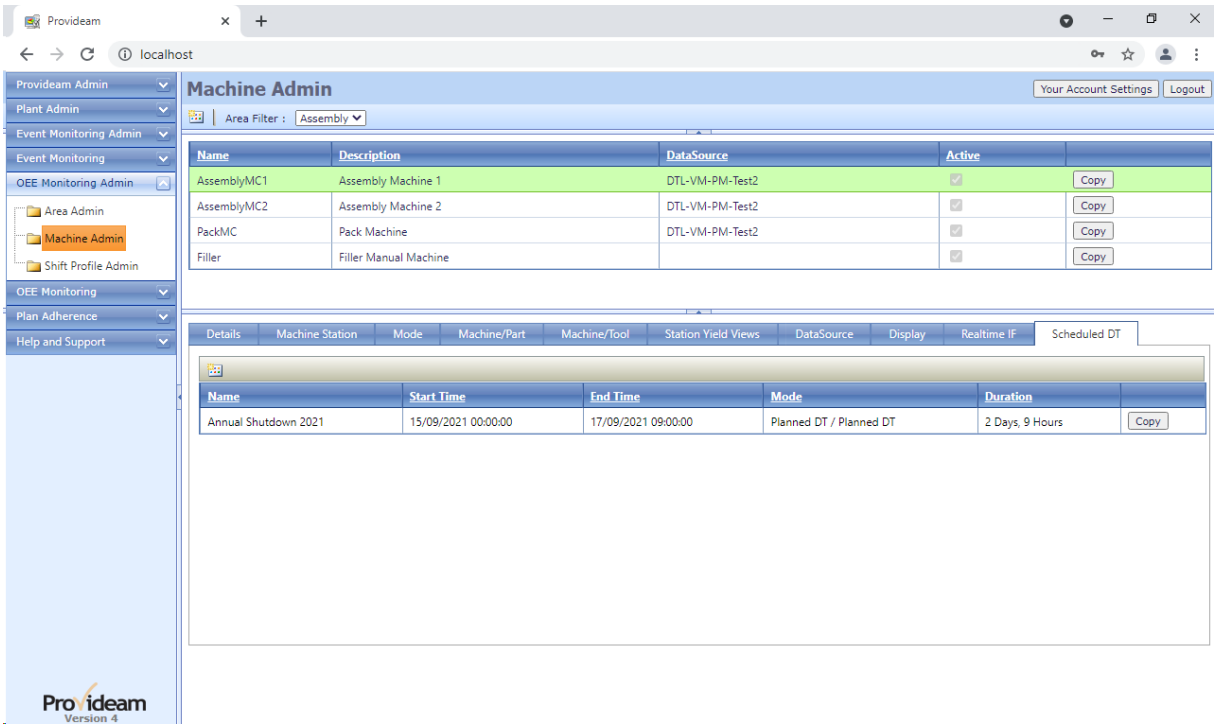


Fig. OEE Mon Admin Settings - Scheduled Downtime

- The AddNew button allows you to create a new Scheduled Downtime record.
- The Copy button allows you to copy the Scheduled DT details to other Machines in the same Area.

The Machine Scheduled Downtime Details Pane.

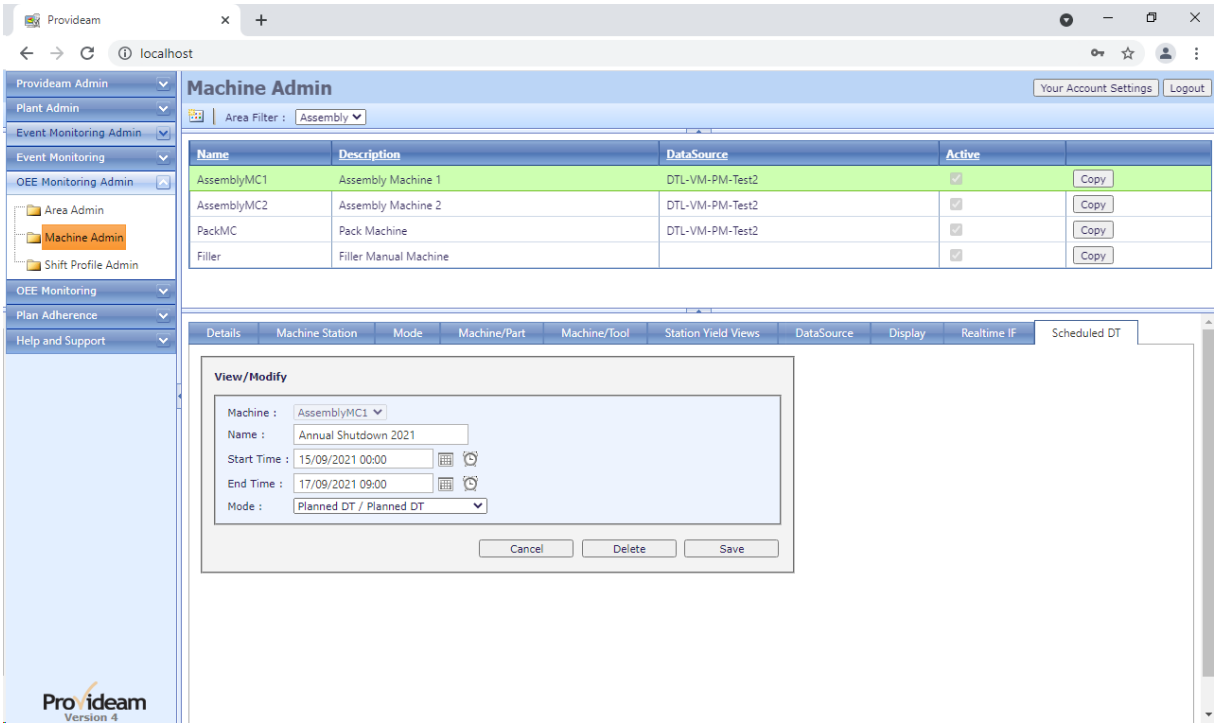


Fig. OEE Mon Admin Settings - Machine Scheduled Downtime Details

- The **Machine** selection box shows the Machine to which the Scheduled Downtime belongs.
- The **Name** text box allows you to enter a name to identify the Scheduled Downtime.
- The **StarTime** datetime picker allows you to set when the Scheduled Downtime should begin.
- The **EndTime** datetime picker allows you to set when the Scheduled Downtime should end.
- The **Mode** selection box allows you to set the Mode which should be logged during the period of the Scheduled Downtime
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Scheduled Downtime.
- The **Save** button allows you to save changes to the Scheduled Downtime.

Warnings:

1. Editing or Deleting a Scheduled Downtime will not affect any logged data. If Scheduled Downtime has been recorded it will remain in the Provideam Mode Logs - even if the Scheduled Downtime record is deleted here.

2. Schedule Downtime records which have passed will be deleted. The delete action will be triggered if a new Scheduled Downtime record is created, or a Scheduled Downtime record is edited.

Note: The Scheduled Downtime records interact with the OEEMon Data Collection Service. The OEEMon service will continuously check the records in the Scheduled Downtime Table. If the OEEMon services finds that there is a current Scheduled Downtime declared, then it will attempt to log the Mode selected, as the reason for Downtime.

The Machine Scheduled Downtime Copy Pane.

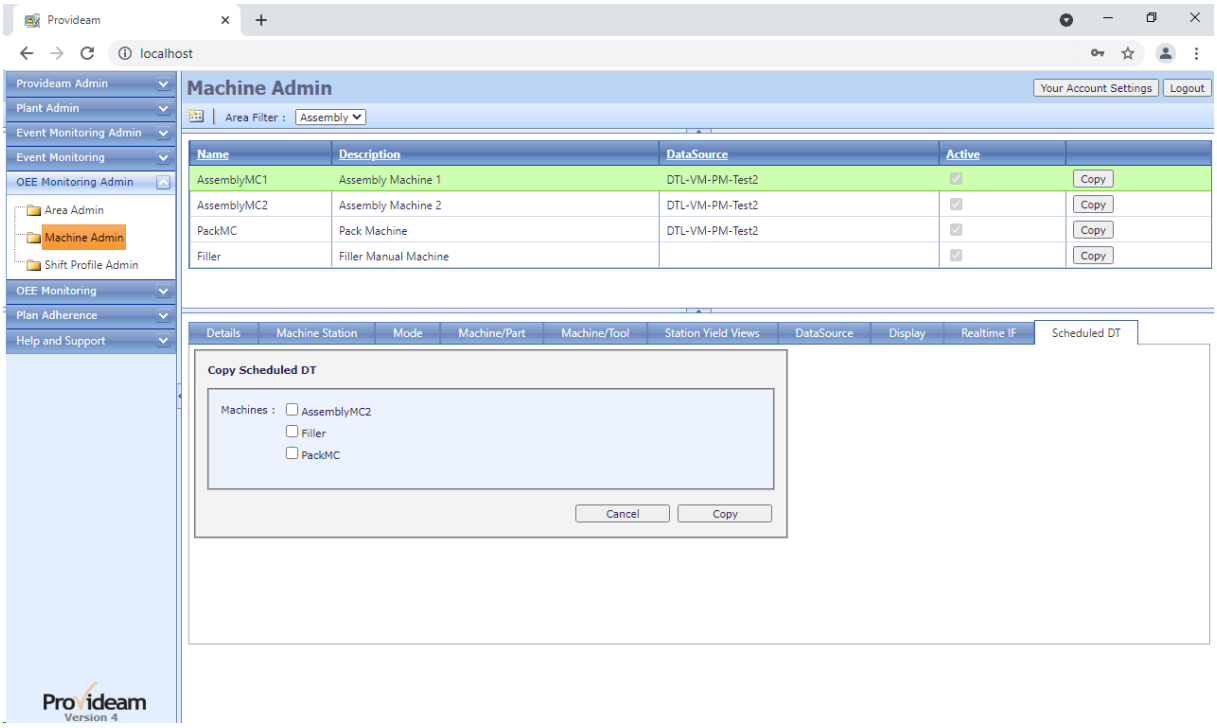


Fig. OEE Mon Admin Settings - Machine Scheduled Downtime Copy

- The **Machine** checkbox allows you to set which Machines are to get a copy of the Scheduled Downtime.
- The **Copy** button allows you to copy the selected Scheduled Downtime to the selected Machines.
- The **Cancel** button allows you to cancel any edits and return to the previous page.

7.6.1.3 Shift Profile Admin

7.6.1.3.1 Shift Profile Details

The Shift Profile Details Pane.

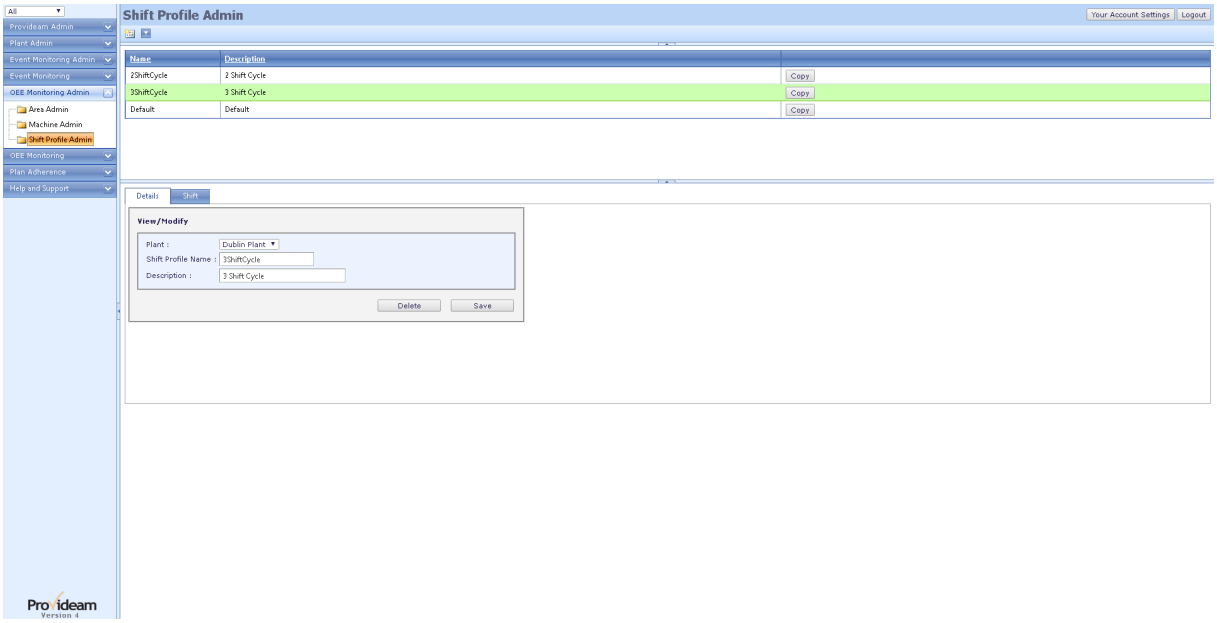


Fig. OEE Mon Admin Settings - Shift Profile Details

- The **AddNew** button allows you to create a new Shift Profile.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).
- The **Copy** button allows you to create a new copy of the selected Shift Profile.
- The **Shift Profile Name** text box allows you to set the name of the Shift Profile.
- The **Description** text box allows you to set the description of the Shift Profile.
- The **Delete** button allows you to delete the Shift Profile. Shift Profiles can only be deleted if there is no Production Data logged which references the Shift Profile.
- The **Save** button allows you to save changes to the Shift Profile.

7.6.1.3.2 Shifts

The Shift Profile, Shifts Pane.

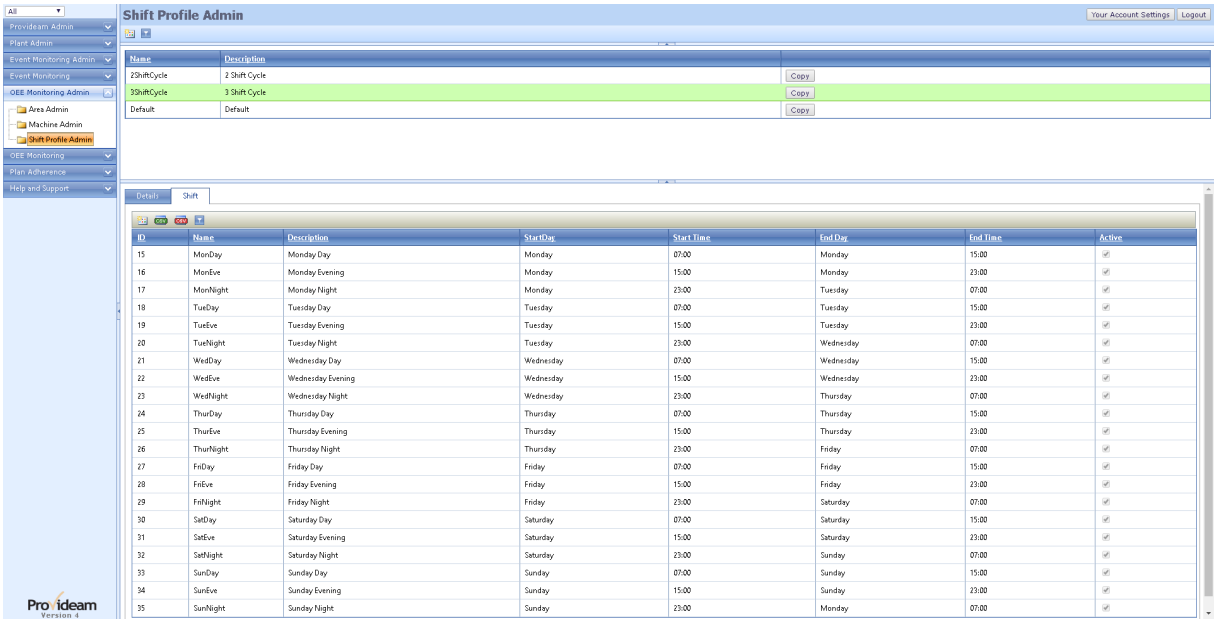


Fig. OEE Mon Admin Settings - Shift Profile Shifts

- The **AddNew** button allows you to create a new Shift.
- The **Import CSV** button allows you to import Shift data from a CSV file.
- The **Export CSV** button allows you to export the Shift data to a CSV file.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).

The Shift Profile, Shift Details Pane.

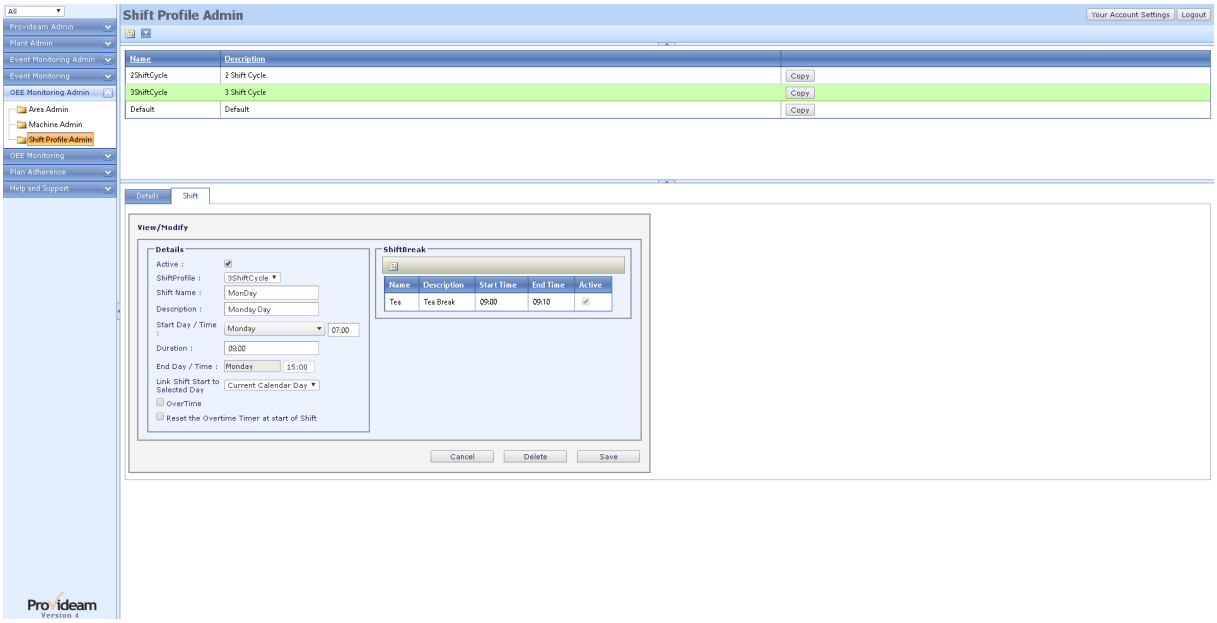


Fig. OEE Mon Admin Settings - Shift Profile Shift Details

- The **Active** check box allows you to set whether or not the selected Shift is Active. If the Shift is not Active then data will not be captured for the Shift.
- The **ShiftProfile** selection box shows the Shift Profile to which the Shift belongs.
- The **Shift Name** text box allows you to set the name of the Shift.
- The **Description** text box allows you to set the description of the Shift.
- The **Start Day** / **Time** selection box / text box allows you to set the day of the week and the start time(hh:mm) of the Shift.
- The **Duration** text box allows you to set the duration in hours:minutes (hh:mm) of the Shift.
- The **End Day** / **Time** selection box / text box shows the day of the week and the end time(hh:mm) of the Shift.
- The **Link Shift Start to Selected Day** selection box allows you to decide which Day the selected Shift belongs to. The default selection is *Current Calendar Day*. This will be the appropriate setting for the majority of Shifts. This means that this shift will be associated with Shifts occurring on the specified calendar Day. If you have a Shift starting after midnight which you consider to belong to the previous calendar Day (eg the Night Shift for a particular Day starts after midnight (ie in the next calendar Day)), then you would chose the setting *Previous Calendar Day* to link this to the previous Day. Likewise if you have a Shift starting before midnight which you wish to link to the following calendar Day then you would chose the setting *Next Calendar Day*.
- The **Overtime** check box allows you to set whether or not the automatic Overtime Mode selection functionality will operate. If the Overtime flag is

checked then, depending on the Overtime Mode settings in the Machine Admin, the Machine Mode will be set to the defined Overtime Mode if the Machine has been 'stopped' for a defined Overtime period. See Machine Admin.

- The **Reset the Overtime Timer at start of Shift** check box allows you to set whether or not the Overtime Mode Timer will be reset at the start of a Shift. This situation is relevant where there are consecutive Overtime Modes. The Overtime Mode timer may have started to count down in the first Shift. You now have the option to decide if the timer is to be reset at the start of each Shift.
- The **Related ShiftBreak** table shows the Breaks which have been defined for the Shift. Click on a Break record to see the Break details. During a Break period the Machine Mode will switch to the pre-defined 'Break Mode' if the machine is 'stopped'. See Machine Admin.
- The **AddNew Shift Break** button allows you to create a new Shift Break.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Shift. Shifts can only be deleted if there is no Production Data logged which references the Shift.
- The **Save** button allows you to save changes to the Shift.

The Shift Profile, Shift Breaks Pane.

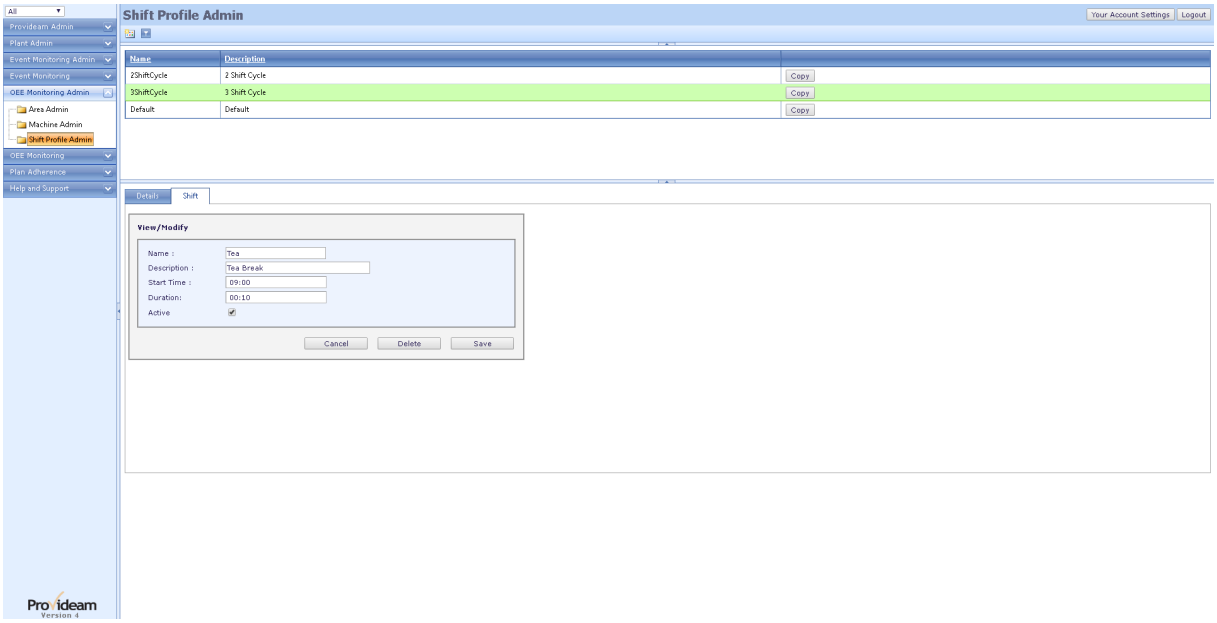


Fig. OEE Mon Admin Settings - Shift Profile Shift Breaks

- The **Name** text box allows you to set the name of the Shift Break.
- The **Description** text box allows you to set the description of the Shift Break.
- The **Start Time** text box allows you to set the start time(hh:mm) of the Shift Break.
- The **Duration** text box allows you to set the duration in hours:minutes (hh:mm) of the Shift Break.
- The **Active** check box allows you to enable the Shift Break.. If the Active flag is not checked then the Shift Break will be ignored.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Shift Break.
- The **Save** button allows you to save changes to the Shift Break.

7.6.2 OEE Monitoring

The OEE Monitoring section allows you to analyse data collected by the OEE Monitoring Service.

7.6.2.1 OEE Reports

Provideam OEE Reports are configured using the OEE Report Wizard. The OEE Report Wizard is a simplified method of defining the structure, content and format of Provideam OEE Reports.

There are five basic report templates;

1) Production Trend Reports (dsObjectByPeriod DataSets)

2) Production By Object Reports (dsPeriodByObject DataSets)

3) OEE Loss Grouped By Object Reports (dsPeriodByObjectAndLoss DataSets)

4) OEE Loss Grouped By Period Reports (dsObjectByPeriodAndLoss DataSets)

5) Mode Log Reports (dsObjectModeLog DataSets)

6) Yield Log Reports (dsObjectYieldLog DataSets)

An additional Report Template has been added since Provideam 4.6 called the Roll-up Report. This report is generated by combining a number of the DataSets listed above.

Below we describe the basic report templates. Before continuing it is important that we clarify what we mean by some of the terms that we use;

DataSets:

These are the Report Template Names. They define the basic structure of the data which will be returned. They include; dsObjectByPeriod, dsPeriodByObject, dsPeriodByObjectAndLoss, dsObjectByPeriodAndLoss, dsObjectModeLog and dsObjectYieldLog.

Period:

This refers to a date range over which the report data is derived. For example the Report Period could be a Shift or a Day or a Month etc.

Object:

This refers to any property of the data which is not a date. For example a Machine, a Lot, an Operator etc. Defining a report Object determines the which data will be returned in the report. For example if you define an Object to be MachineName = 'AssemblyMC1', then only data for AssemblyMC1 will be returned. Objects can have one or more elements. A simple Object would contain one element such as the MachineName example above. A complex Object would combine multiple elements such as PartName, OperatorName, AreaName etc.

Fields:

These define how the data will appear on your report. The order of the Fields is important as this will determine the order of Sorting and Grouping of your data. If a Field is included in your report definition the Field values will be displayed in one of the left hand columns of your report and the data will be grouped on that Field Name. For example if you had a report with the Fields AreaName, MachineName and ShiftName, your data would be broken down by Area, then Machine and then Shift. However if you removed the MachineName Field your data would be broken down only by Area then Shift. In other words all the Machine data for an Area would be combined (grouped) in to one row.

Functions:

These are calculations you apply to your data. For example; Percentage OEE, or Sum Downtime etc.

Production Trend Report

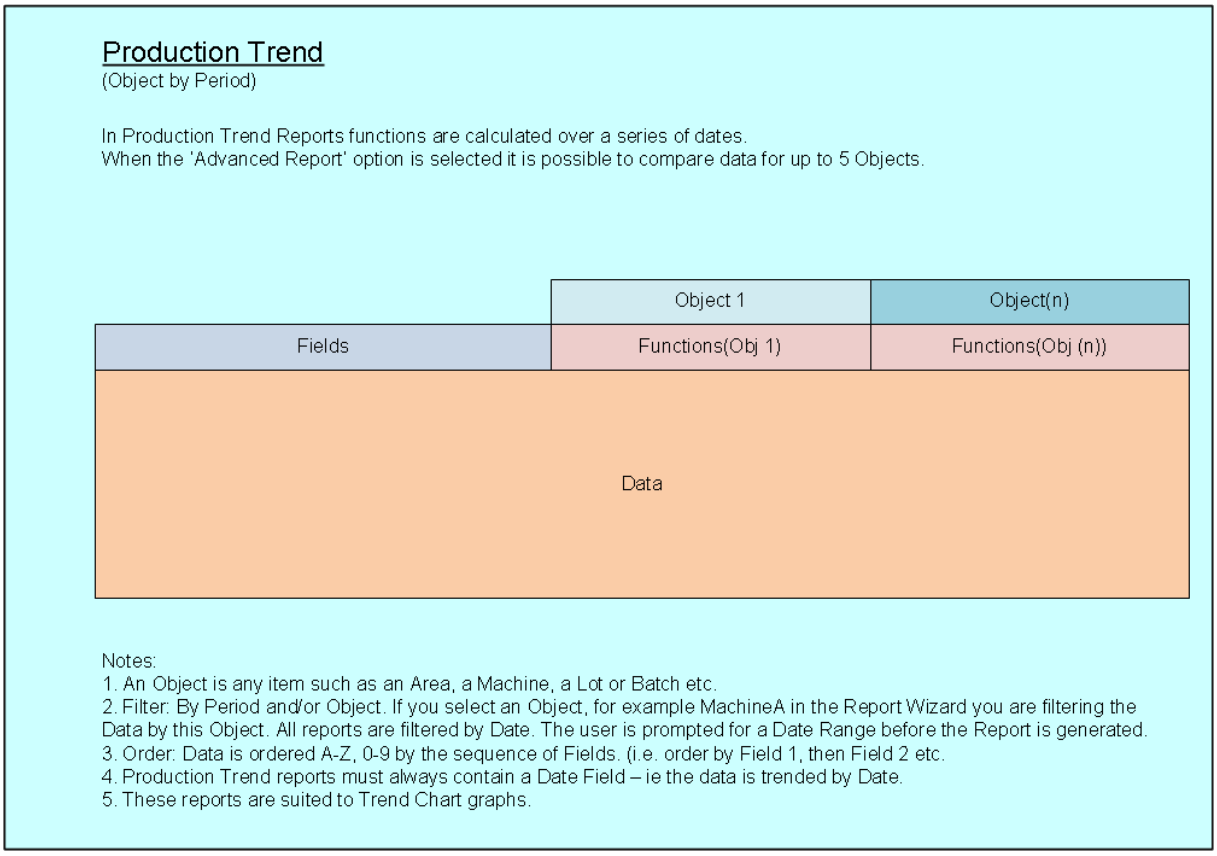


Fig. OEE Report Template - Production Trend

In the Production Trend Report Example below the configuration is as follows;

DataSet: Production Trend (dsObjectByPeriod)

Objects: Object1("AssemblyMC1"), Object2("AssemblyMC2")

Period: Shift*

Fields: ShiftName, Hour

Functions: GoodParts, Defect Parts

*Period Setting is not shown due to lack of space.

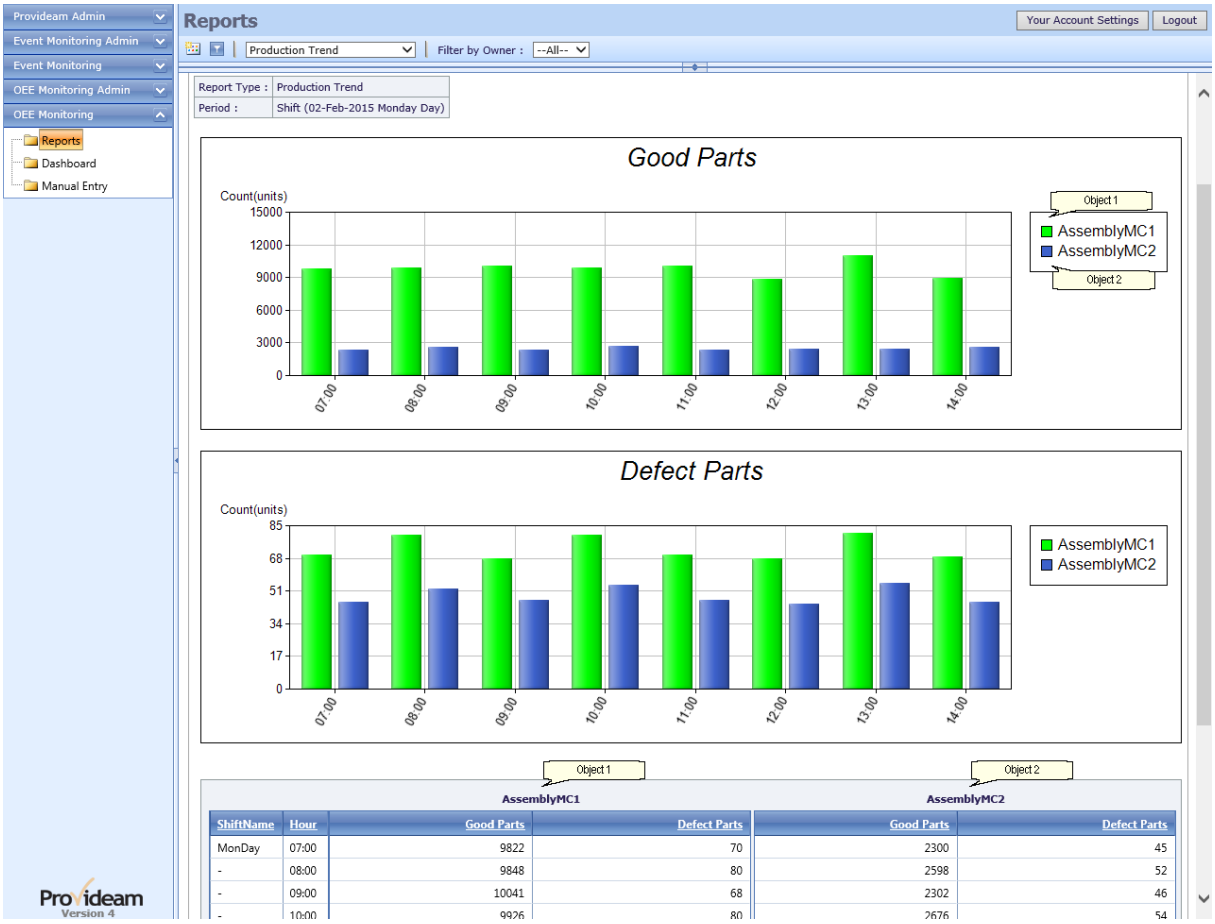


Fig. Production Trend Report Example

Production Object Report

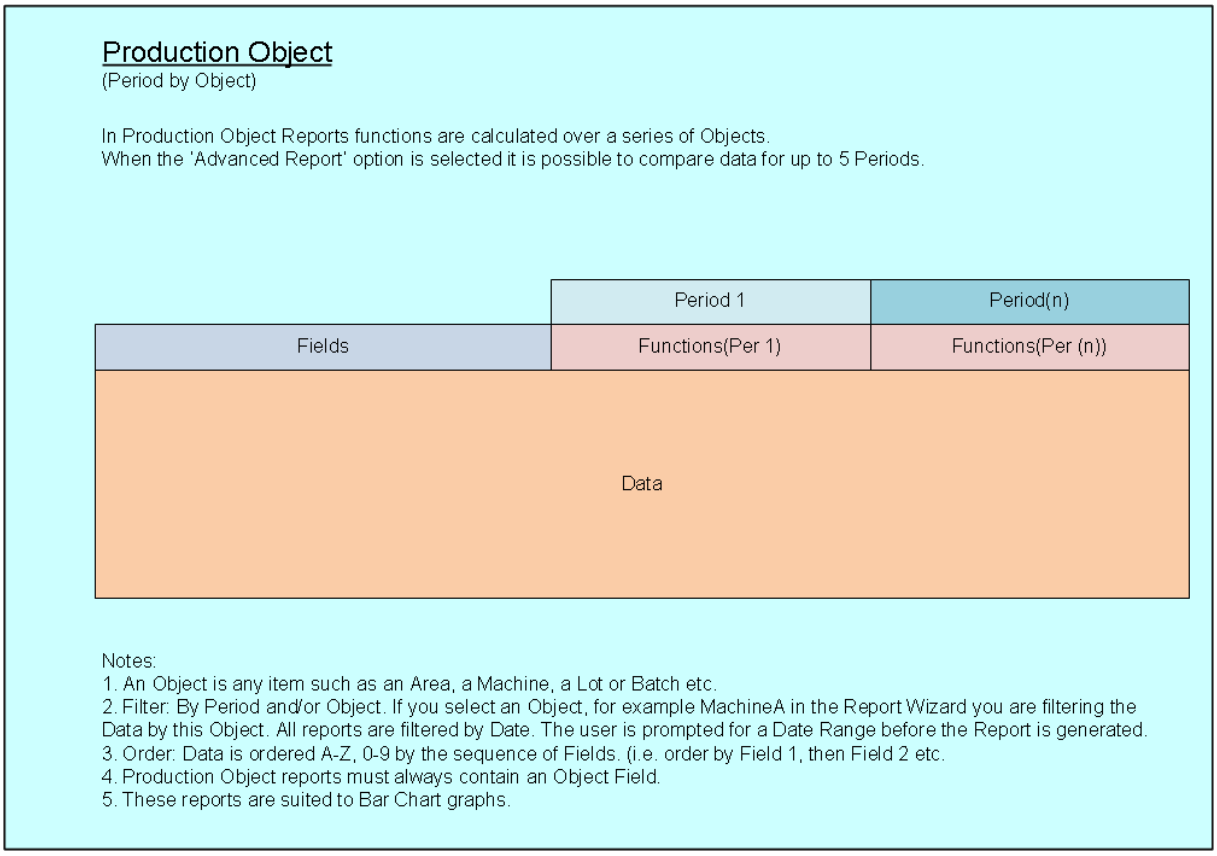


Fig. OEE Report Template - Production Object

See the Routine Operation / OEE Reports section of this User Guide to see an example of the Production By Object Report.

OEE Loss By Object Report

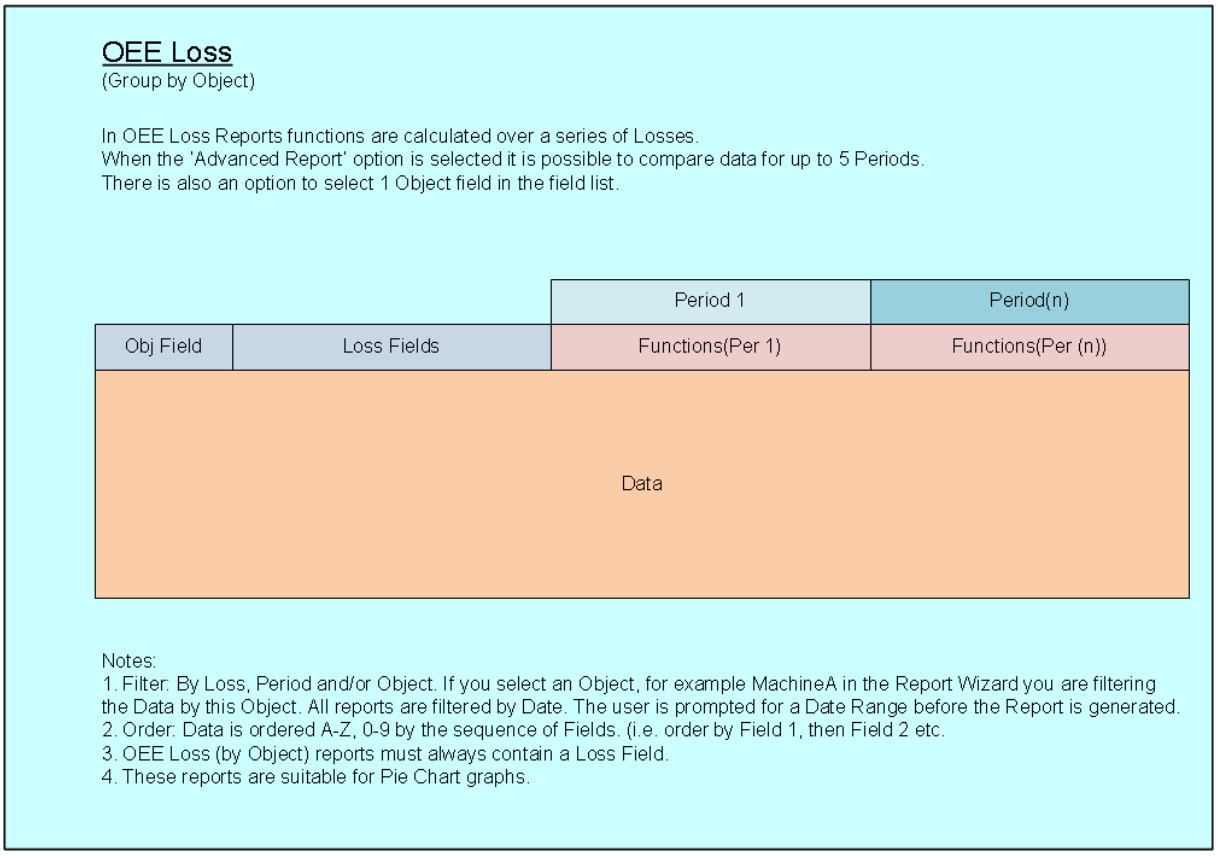


Fig. OEE Report Template - OEE Loss Report By Object

See the Routine Operation / OEE Reports section of this User Guide to see an example of the OEE Loss By Object Report.

OEE Loss By Period Report

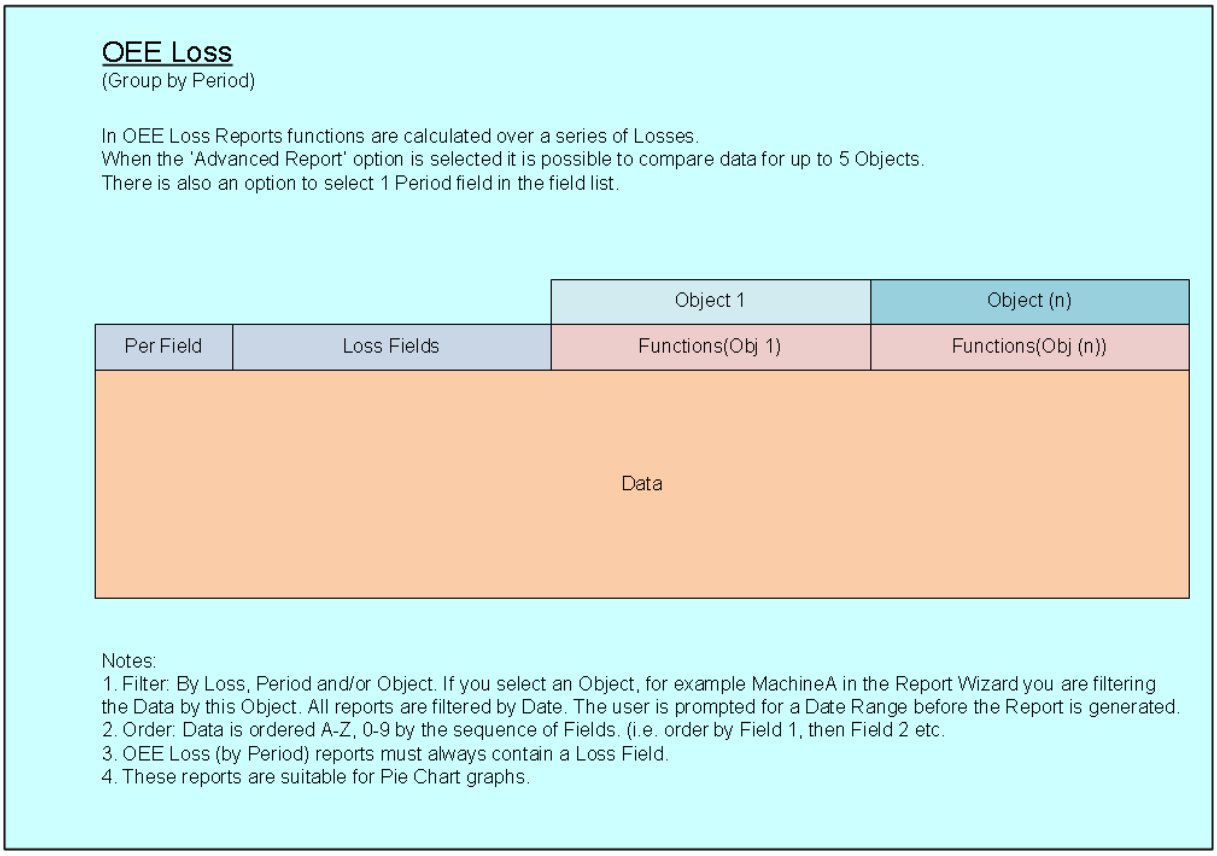


Fig. OEE Report Template - OEE Loss Report By Period

See the Routine Operation / OEE Reports section of this User Guide to see an example of the OEE Loss By Period Report.

Mode Log Report

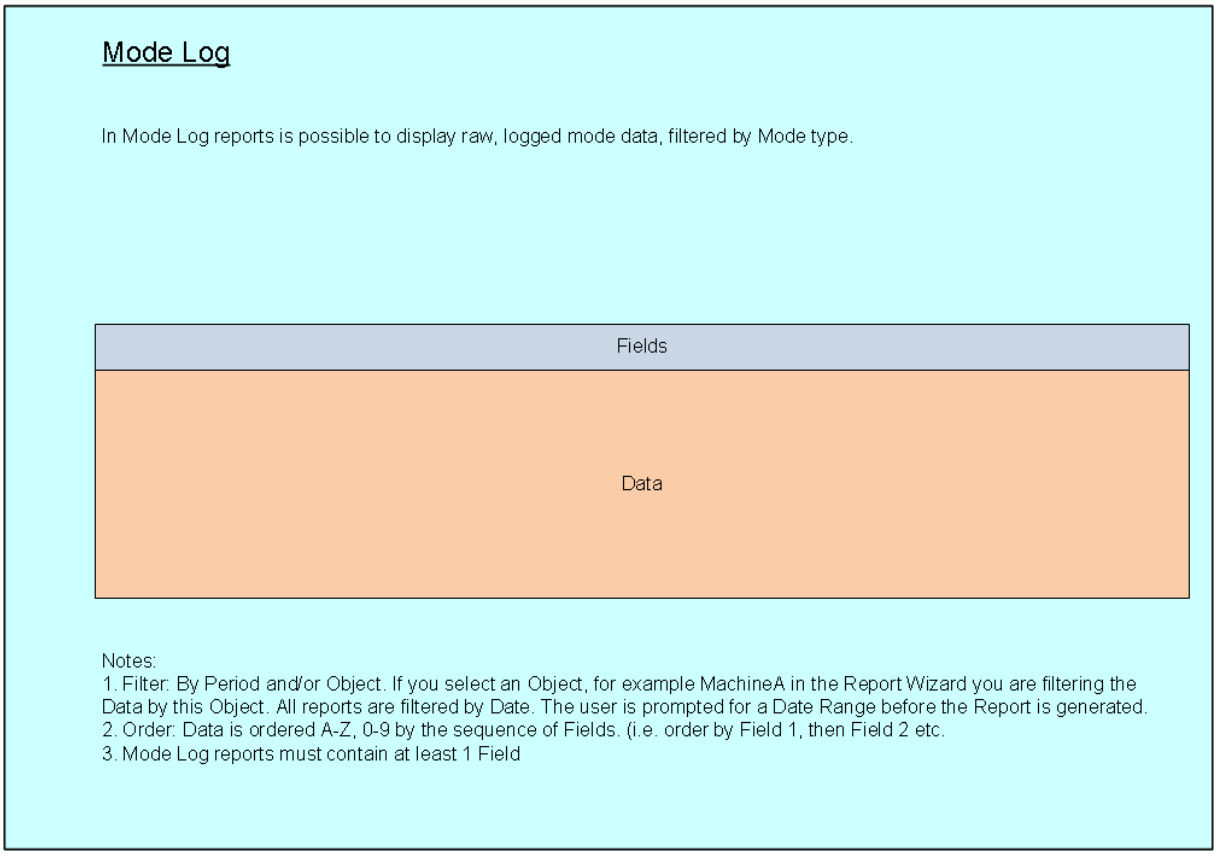


Fig. OEE Report Template - Mode Log Report

See the Routine Operation / OEE Reports section of this User Guide to see an example of the Mode Log Report.

Yield Log Report

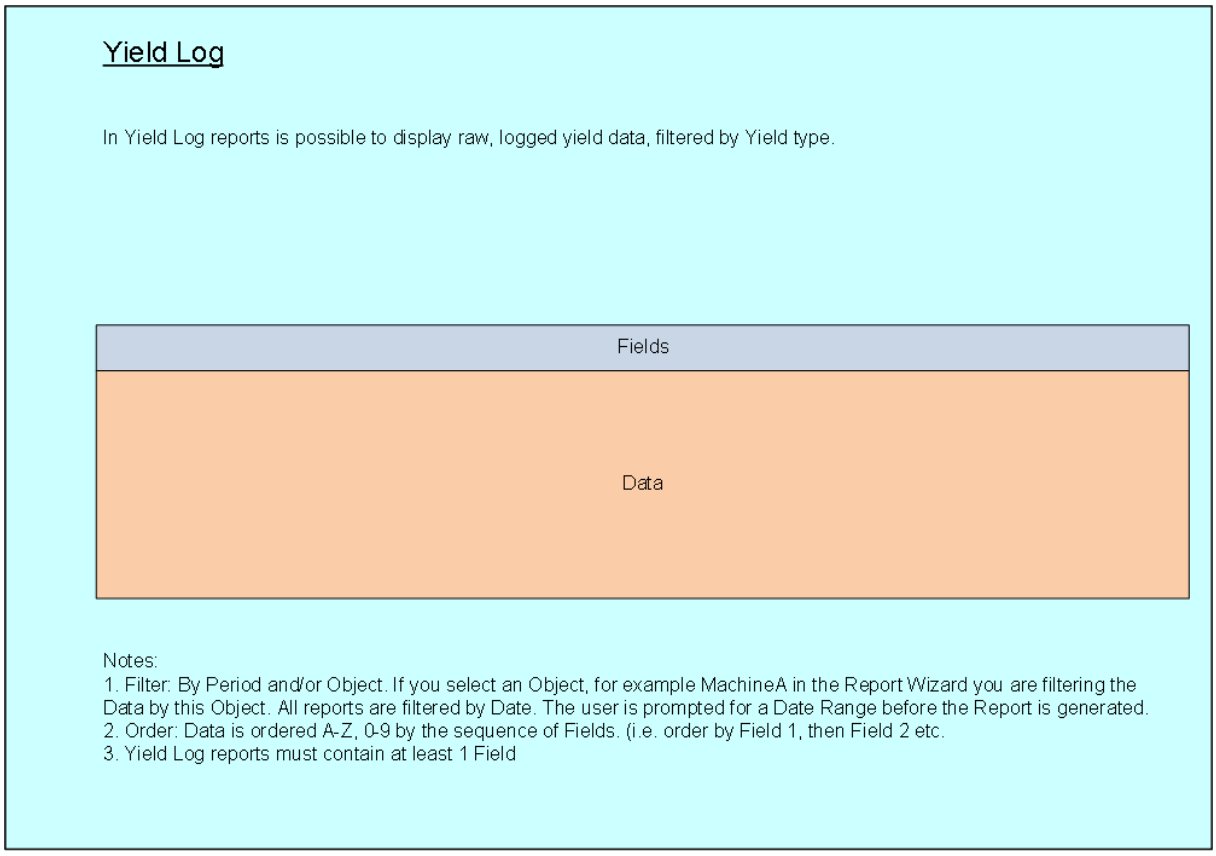


Fig. OEE Report Template - Yield Log Report

See the Routine Operation / OEE Reports section of this User Guide to see an example of the Yield Log Report.

7.6.2.1.1 DataSets

Provideam offers the following DataSet Templates:

DataSet Name	DataSet Description	
dsObjectByPeriod	Production Trend Report DataSets	
dsPeriodByObject	Production Object Report DataSets	
dsObjectByPeriodAndLoss	OEE Loss By Period Report DataSets	
dsPeriodByObjectAndLoss	OEE Loss By Object Report DataSets	
dsObjectModeLog	Mode Log Report DataSets	
dsObjectYieldLog	Yield Log Report DataSets	

7.6.2.1.2 Fields

Production Trend & Production Object Report Fields:

Field Name	Field Description	
fdLotName	Lot Name	
fdLotStartTime	Lot Start Time	
fdPlantName	Plant Name	
fdPlantDesc	Plant Description	
fdAreaName	Area Name	
fdAreaDesc	Area Description	
fdMachineName	Machine Name	
fdMachineDesc	Machine Description	
fdPartName	Part Name	
fdPartDesc	Part Description	
fdMacPartRef	Machine Part Reference. By using a unique MacPartRef identifier we can link the same Part to a Machine several times, each time with a different Standard Time.	
fdToolName	Tool Name	
fdToolDesc	Tool Description	
fdBatchName	Batch Name	
fdCavities	Number of Cavities in Tool	
fdCavitiesUsed	Number of Cavities in Tool Used in Batch	
fdMaterialName	Material Name	
fdFlexField1	FlexField1 Value	
fdFlexField2	FlexField2 Value	
fdFlexField3	FlexField3 Value	
fdFlexField4	FlexField4 Value	
fdFlexField5	FlexField5 Value	
fdFlexField6	FlexField6 Value	
fdFlexField7	FlexField7 Value	
fdFlexField8	FlexField8 Value	
fdFlexField9	FlexField9 Value	
fdFlexField10	FlexField10 Value	

fdFlexField11	FlexField11 Value	
fdFlexField12	FlexField12 Value	
fdFlexField13	FlexField13 Value	
fdFlexField14	FlexField14 Value	
fdFlexField15	FlexField15 Value	
fdFlexField16	FlexField16 Value	
fdFlexField17	FlexField17 Value	
fdFlexField18	FlexField18 Value	
fdFlexField19	FlexField19 Value	
fdFlexField20	FlexField20 Value	
fdProdSpeed	A value between 0 and 150% use to indicate the Machine Speed in situations where it is not possible to calculate OEE from Good Count. 100% indicates no speed loss.	
fdProdQuality	A value between 0 and 150% use to indicate the Machine Quality in situations where it is not possible to calculate OEE from Good Count. 100% indicates no quality loss.	
fdIsReconciled	Flag indicating whether the Lot Reconciled Flag has been Set	
fdPackQty	Number of Parts in a Pack	
fdStdTime	OEE Standard Time	
fdTargetRate	Target Rate	
fdShiftStartDate	Shift Start Date	
fdShiftStartTime	Shift Start Time	
fdShiftName	Shift Name	
fdShiftDesc	Shift Description	
fdShiftComment	Shift Comment	
fdOperatorName	Operator Name	
fdOperatorsUsed	Number of Operators Used in Production Run	
fdStdOperatorsUsed	Standard Number of Operators Used for Part on Machine	
fdYear	Mode Start Date Year	
fdMonth	Mode Start Date Month	
fdWeek	Mode Start Date Week	
fdDay	Mode Start Date Day	
fdHour	Mode Start Time Hour	

fdYYYYMM	Mode TimeStamp formatted as YYYY-MM	
fdYYYYMMDD	Mode TimeStamp formatted as YYYY-MM-DD	
fdYYYYMMDDHH	Mode TimeStamp formatted as YYYY-MM-DD HH	
fdYYYYWW	Mode TimeStamp formatted as YYYY-WW (Where WW is the ISO Week Number)	
fdLotID	Unique Lot ID of Production Record	
fdPlantID	Unique Plant ID from Plant Configuration Table	
fdAreaID	Unique Area ID from Area Configuration Table	
fdMachineID	Unique Machine ID from Machine Configuration Table	
fdPartID	Unique Part ID from Part Configuration Table	
fdToolID	Unique Tool ID from Tool Configuration Table	
fdOperatorID	Unique Operator ID from Operator Configuration Table	
fdProdShiftID	Unique ID of Production Shift Record	
fdShiftID	Unique Shift ID from Shift Configuration Table	
fdWorkCellID	Unique WorkCell ID	
fdWorkCellName	Work Cell Name	
fdWorkCellDesc	Work Cell Description	

OEE Loss Report Fields:

Field Name	**Field Description**	
fdAreaName	Area Name	
fdAreaDesc	Area Description	
fdBatchName	Batch Name	
fdCavities	Number of Cavities in Tool	
fdCavitiesUsed	Number of Cavities in Tool Used in Batch	
fdDay	Mode Start Date Day	
fdHour	Hour of Mode StartTime	
fdLotName	Lot Name	
fdMaterialName	Material Name	
fdMachineName	Machine Name	
fdMachineDesc	Machine Description	

fdMaterialName	Material Name	
fdMonth	Mode Start Date Month	
fdOEELossLvl1ID	Unique OEELossLvl1ID (0 - OEETime, 1 - Availability, 2 - Performance, 3 - Quality, 4 - Planned Downtime). These IDs are returned as the text equivalents from the Dictionary of the current User.	
fdOEELossLvl2ID	Unique OEELossLvl2ID (0 - OEETime, 1 - Setup Loss, 2 - Yield Loss, 3 - Breakdown, 4 - ChangeOver, 5 - ShortStop, 6 - SpeedLoss, 7 - Cavitation Loss, 8 - Planned Downtime, 9 - Idle Downtime, 10 - ChangeOver as Performance Loss). These IDs are returned as the text equivalents from the Dictionary of the current User.	
fdOEELossLvl3Type	The Type value from the Mode Configuration Table	
fdOEELossLvl3Desc	The Description value from the Mode Configuration Table	
fdOperatorName	Operator Name	
fdOperatorDesc	Operator Description	
fdPackQty	Pack Quantity	
fdPartName	Part Name	
fdPartDesc	Part Description	
fdPlantName	Plant Name	
fdPlantDesc	Plant Description	
fdShiftName	Shift Name	
fdShiftDesc	Shift Description	
fdShiftStartTime	Shift Start Time	
fdStdLossID	Unique ID for the StdLoss	
fdStdLossType	The Type value from the StdLoss Table	
fdStdLossDesc	The Description value from the StdLoss Table	
fdStdOperatorsUsed	Standard Number of Operators Used for Part on Machine	
fdStdTime	OEE Standard Time	
fdTargetRate	Target Rate	
fdToolName	Tool Name	
fdToolDesc	Tool Description	
fdWeek	Mode Start Date Week	
fdWorkCellName	Work Cell Name	
fdWorkCellDesc	Work Cell Description	
fdYear	Mode Start Date Year	

fdYYYYMM	Mode TimeStamp formatted as YYYY-MM	
fdYYYYMMDD	Mode TimeStamp formatted as YYYY-MM-DD	
fdYYYYMMDDHH	Mode TimeStamp formatted as YYYY-MM-DD HH	
fdYYYYWW	Mode TimeStamp formatted as YYYY-WW (Where WW is the ISO Week Number)	

Mode Log Report Fields:

Field Name	**Field Description**	
fdLotName	Lot Name	
fdLotStartTime	Lot Start Time	
fdPlantName	Plant Name	
fdPlantDesc	Plant Description	
fdAreaName	Area Name	
fdAreaDesc	Area Description	
fdMachineName	Machine Name	
fdMachineDesc	Machine Description	
fdPartName	Part Name	
fdPartDesc	Part Description	
fdMacPartRef	Machine Part Reference. By using a unique MacPartRef identifier we can link the same Part to a Machine several times, each time with a different Standard Time.	
fdToolName	Tool Name	
fdToolDesc	Tool Description	
fdBatchName	Batch Name	
fdCavities	Number of Cavities in Tool	
fdCavitiesUsed	Number of Cavities in Tool Used in Batch	
fdMaterialName	Material Name	
fdFlexField1	FlexField1 Value	
fdFlexField2	FlexField2 Value	
fdFlexField3	FlexField3 Value	
fdFlexField4	FlexField4 Value	
fdFlexField5	FlexField5 Value	

fdFlexField6	FlexField6 Value	
fdFlexField7	FlexField7 Value	
fdFlexField8	FlexField8 Value	
fdFlexField9	FlexField9 Value	
fdFlexField10	FlexField10 Value	
fdFlexField11	FlexField11 Value	
fdFlexField12	FlexField12 Value	
fdFlexField13	FlexField13 Value	
fdFlexField14	FlexField14 Value	
fdFlexField15	FlexField15 Value	
fdFlexField16	FlexField16 Value	
fdFlexField17	FlexField17 Value	
fdFlexField18	FlexField18 Value	
fdFlexField19	FlexField19 Value	
fdFlexField20	FlexField20 Value	
fdProdSpeed	A value between 0 and 150% use to indicate the Machine Speed in situations where it is not possible to calculate OEE from Good Count. 100% indicates no speed loss.	
fdProdQuality	A value between 0 and 150% use to indicate the Machine Quality in situations where it is not possible to calculate OEE from Good Count. 100% indicates no quality loss.	
fdIsReconciled	Flag indicating whether the Lot Reconciled Flag has been Set	
fdPackQty	Number of Parts in a Pack	
fdStdTime	OEE Standard Time	
fdTargetRate	Target Rate	
fdShiftStartDate	Shift Start Date	
fdShiftStartTime	Shift Start Time	
fdShiftName	Shift Name	
fdShiftDesc	Shift Description	
fdShiftComment	Shift Comment	
fdOperatorName	Operator Name	
fdOperatorsUsed	Number of Operators Used in Production Run	
fdStdOperatorsUsed	Standard Number of Operators Used for Part on Machine	

fdStartTime	Start Time of the Mode Record	
fdModeType	Mode Type (1 - RunMode, 2 - StopMode, 3 - StopModeNew, 4 - ChangeOverRunMode, 5 - ChangeOverStopMode, 6, DefectMode, 7 - ChangeOverStopMode_NoLotChange). These values are returned as the text equivalents from the Dictionary of the current User.	
fdOEELossLvl1ID	Unique OEELossLvl1ID (0 - OEETime, 1 - Availability, 2 - Performance, 3 - Quality, 4 - Planned Downtime, 5 - Idle Downtime). These IDs are returned as the text equivalents from the Dictionary of the current User.	
fdOEELossLvl2ID	Unique OEELossLvl2ID (0 - OEETime, 1 - Setup Loss, 2 - Yield Loss, 3 - Breakdown, 4 - ChangeOver, 5 - ShortStop, 6 - SpeedLoss, 7 - Cavitation Loss, 8 - Planned Downtime, 9 - Idle Downtime, 10 - ChangeOver as Performance Loss). These IDs are returned as the text equivalents from the Dictionary of the current User.	
fdOEELossLvl3Type	The Type value from the Mode Configuration Table	
fdOEELossLvl3Desc	The Description value from the Mode Configuration Table	
fdTime	The Duration of the Mode Records	
fdNumEvents	The Number of Occurrences of the Mode Records	
fdContinuation	The Continuation Status Flag of the Mode Records. The Continuation Flag indicates that the Mode not a new occurrence but rather a continuation of the previous Mode Record.	
fdModeComment	The Comment associated with the Mode	
fdStdLossID	Unique ID for the StdLoss	
fdStdLossType	The Type value from the StdLoss Table	
fdStdLossDesc	The Description value from the StdLoss Table	
fdYear	Mode Start Date Year	
fdMonth	Mode Start Date Month	
fdWeek	Mode Start Date Week	
fdDay	Mode Start Date Day	
fdHour	Mode Start Time Hour	
fdYYYYMM	Mode TimeStamp formatted as YYYY-MM	
fdYYYYMMDD	Mode TimeStamp formatted as YYYY-MM-DD	
fdYYYYMMDDHH	Mode TimeStamp formatted as YYYY-MM-DD HH	
fdYYYYWW	Mode TimeStamp formatted as YYYY-WW (Where WW is the ISO Week Number)	
fdLotID	Unique Lot ID of Production Record	
fdPlantID	Unique Plant ID from Plant Configuration Table	

fdAreaID	Unique Area ID from Area Configuration Table	
fdMachineID	Unique Machine ID from Machine Configuration Table	
fdPartID	Unique Part ID from Part Configuration Table	
fdToolID	Unique Tool ID from Tool Configuration Table	
fdOperatorID	Unique Operator ID from Operator Configuration Table	
fdProdShiftID	Unique ID of Production Shift Record	
fdShiftID	Unique Shift ID from Shift Configuration Table	
fdProdModeID	Unique ID of Production Mode Record	
fdModeID	Mode ID from Mode Configuration Table. This value in unique when combined with the Machine ID	
fdToolStdTime	Tool Standard Time (Standard Time by number of Cavities in Tool)	

7.6.2.1.3 Functions

Production Report Functions:

Function Name	Function Description	Function Params
fnTotalTime	Total Time Logged	
fnPlannedDT	Planned Downtime (Sum of all Downtimes flagged as 'Planned')	
fnPlannedOpT	Planned Operating Time: [Total Time] – [Planned DT]	
fnPlannedOpTExIdleDT	Planned Operating Time excl. Idle DT: [Total Time] – [Planned DT] - [IdleDT]	
fnDownTime	Downtime (Sum of all Downtimes not including Downtimes flagged as 'Planned')	
fnDownTimeShort	Downtime (Short): (Sum of all Downtimes not including Downtimes flagged as 'Planned' which are shorter than the ShortStopParam)	
fnPCDowntimeByPlannedOpT	Downtime over PlannedOpT PC: [Downtime] / [PlannedOpT], (0 if [PlannedOpT] <= 0)	
fnPCDowntimeByTotalTime	Downtime over TotalTime PC: [Downtime] / [TotalTime], (0 if [TotalTime] <= 0)	
fnUpTime	Uptime: [TotalTime] - [PlannedDT] - [IdleDT] - [DownTime]	
fnPCUptimeByPlannedOpT	Uptime over PlannedOpT PC: [Uptime] / [PlannedOpT], (0 if [PlannedOpT] <= 0)	
fnPCUptimeByTotalTime	Uptime over TotalTime PC: [Uptime] / [TotalTime], (0 if [TotalTime] <= 0)	

fnChangeOverTargetTime	ChangeOver Target Time	
fnChangeOverVarianceTime	ChangeOver Variance Time	
fnPCChangeOverVarianceTime	% ChangeOver Variance Time	
fnLossDescTargetTime	Loss Desc Target Time (Sum of all Target Times for each instance of selected Modes)	List of Mode Description text values to be included in Function Result
fnLossDescVarianceTime	Loss Desc Variance Time: ([Loss Desc Time] - [Loss Desc Target Time])	List of Mode Description text values to be included in Function Result
fnPCLossDescVarianceTime	% Loss Desc Variance Time: ([Loss Desc Time] - [Loss Desc Target Time]) / [Loss Desc Target Time] (0 if [Loss Desc Target Time] <= 0)	List of Mode Description text values to be included in Function Result
fnLossTypeTargetTime	Loss Type Target Time (Sum of all Target Times for each instance of selected Modes)	List of Mode Grouping text values to be included in Function Result
fnLossTypeVarianceTime	Loss Type Variance Time ([Loss Type Time] - [Loss Type Target Time])	List of Mode Grouping text values to be included in Function Result
fnPCLossTypeVarianceTime	% Loss Type Variance Time: ([Loss Type Time] - [Loss Type Target Time]) / [Loss Type Target Time] (0 if [Loss Type Target Time] <= 0)	List of Mode Grouping text values to be included in Function Result
fnLossDescTime	Loss Desc Time (Sum of all time associated with a specific Loss Desc Parameter)	List of Mode Description

		text values to be included in Function Result
fnLossTypeTime	Loss Type Events (Number of all events associated with a specific Loss Type Parameter)	List of Mode Grouping text values to be included in Function Result
fnPCLossDescByDowntime	LossDescTime over PlannedOpT PC: [LossDescTime] / [DownTime], (0 if [DownTime] <= 0), where LossDescTime is the sum of all time associated with a specific Loss Desc Parameter.	List of Mode Description text values to be included in Function Result
fnPCLossDescByPlannedOpT	LossDescTime over PlannedOpT PC: [LossDescTime] / [PlannedOpT], (0 if [PlannedOpT] <= 0), where LossDescTime is the sum of all time associated with a specific Loss Desc Parameter.	List of Mode Description text values to be included in Function Result
fnPCLossDescByTotalTime	LossDescTime over PlannedOpT PC: [LossDescTime] / [TotalTime], (0 if [TotalTime] <= 0), where LossDescTime is the sum of all time associated with a specific Loss Desc Parameter.	List of Mode Description text values to be included in Function Result
fnPCLossTypeByDowntime	LossTypeTime over PlannedOpT PC: [LossTypeTime] / [DownTime], (0 if [DownTime] <= 0), where LossTypeTime is the sum of all time associated with a specific Loss Type Parameter.	List of Mode Grouping text values to be included in Function Result
fnPCLossTypeByPlannedOpT	LossTypeTime over PlannedOpT PC: [LossTypeTime] / [PlannedOpT], (0 if [PlannedOpT] <= 0), where LossTypeTime is the sum of all time associated with a specific Loss Type Parameter.	List of Mode Grouping text values to be included in Function Result
fnPCLossTypeByTotalTime	LossTypeTime over PlannedOpT PC: [LossTypeTime] / [TotalTime], (0 if [TotalTime] <= 0), where LossTypeTime is the sum of all time associated with a specific Loss Type Parameter.	List of Mode Grouping text values to be

		included in Function Result
fnGoodParts	Good Parts (Sum of all Good Parts produced)	
fnDefectParts	Defect Parts (Sum of all Defect Parts produced)	
fnSetupDefects	Setup Defect Parts (Sum of all Setup Defect Parts produced)	
fnYieldDefect	Yield Defect Parts (Sum of all Yield Defect Parts produced)	
fnThroughPut	Throughput: [Good Parts] + [Defect Parts]	
fnCycles	Cycles (Number of Machine Cycles)	
fnStationYield	Yield Count (Sum of all product count for a specified list of MacStation Parameters)	List of MacStation Description text values to be included in Function Result
fnPCStationYieldByDefects	Yield Count over Defects PC: [Yield Count] / [Defects], (0 if [Defects] <= 0), where Yield Count is the sum of all product count at a specific MacStation Parameter.	List of MacStation Description text values to be included in Function Result
fnPCStationYieldByThroughput	Yield Count over Throughput PC: [Yield Count] / [Throughput], (0 if [Throughput] <= 0), where Yield Count is the sum of all product count at a specific MacStation Parameter.	List of MacStation Description text values to be included in Function Result
fnStationYieldTime	Yield Count Time ((Sum of all product count for specified MacStation Description Parameters) x [StdTime])	List of MacStation Description text values to be included in Function Result
fnGoodPC	Good PC: [Good Parts] / ([Good Parts] + [Defect Parts]), (0 if ([Good Parts] + [Defect Parts]) <= 0)	
fnDefectPC	Defect PC: [Defect Parts] / ([Good Parts] + [Defect Parts]), (0 if ([Good Parts] + [Defect Parts]) <= 0)	

fnGoodRate	Good Rate: [Good Parts] / ([TotalTime] - [PlannedDT] - [IdleDT]), (0 if / ([TotalTime] - [PlannedDT] - [IdleDT]) <= 0)	
fnGoodRateMins	Good Rate Mins: ([Good Parts] * 60) / ([TotalTime] - [PlannedDT] - [IdleDT]), (0 if ([TotalTime] - [PlannedDT] - [IdleDT]) <= 0)	
fnGoodRateMinsExLongDTs	Good Rate Mins ex Long DTs: ([Good Parts] * 60) / ([TotalTime] - [PlannedDT] - [IdleDT] - [Downtime(Long)]), (0 if ([TotalTime] - [PlannedDT] - [IdleDT] - [Downtime(Long)]) <= 0)	
fnDefectRate	Defect Rate: [Defect Parts] / ([TotalTime] - [PlannedDT] - [IdleDT]), (0 if ([TotalTime] - [PlannedDT] - [IdleDT]) <= 0)	
fnDefectRateMins	Defect Rate Mins: ([Defect Parts] * 60) / ([TotalTime] - [PlannedDT] - [IdleDT]), (0 if ([TotalTime] - [PlannedDT] - [IdleDT]) <= 0)	
fnDefectRateMinsExLongDTs	Defect Rate Mins ex Long DTs: ([Defect Parts] * 60) / ([TotalTime] - [PlannedDT] - [IdleDT] - [Downtime(Long)]), (0 if ([TotalTime] - [PlannedDT] - [IdleDT] - [Downtime(Long)]) <= 0)	
fnCycleRate	Cycle Rate: [Cycle Rate] / ([TotalTime] - [PlannedDT] - [IdleDT]), (0 if / ([TotalTime] - [PlannedDT] - [IdleDT]) <= 0)	
fnCycleRateMins	Cycle Rate: ([Cycles] * 60) / ([TotalTime] - [PlannedDT] - [IdleDT]), (0 if ([TotalTime] - [PlannedDT] - [IdleDT]) <= 0)	
fnCycleRateMinsExLongDTs	Cycle Rate ex Long DTs: ([Cycles] * 60) / ([TotalTime] - [PlannedDT] - [IdleDT] - [Downtime(Long)]), (0 if ([TotalTime] - [PlannedDT] - [IdleDT] - [Downtime(Long)]) <= 0)	
fnGoodTime	Good Time: ([TotalTime] - [PlannedDT] - [IdleDT]) / [Good Parts], (0 if [Good Parts] <= 0)	
fnDefectTime	Defect Time: ([TotalTime] - [PlannedDT] - [IdleDT]) / [Defect Parts], (0 if [Defect Parts] <= 0)	
fnCycleTime	Cycle Time: ([TotalTime] - [PlannedDT] - [IdleDT]) / [Cycles], (0 if [Cycles] <= 0)	
fnWorkCycleTime	Work Cycle Time: ([TotalTime] - [PlannedDT] - [IdleDT] - [Downtime]) / [Cycles], (0 if [Cycles] <= 0)	
fnMTTS	Mean Time To Stop: ([TotalTime] - [PlannedDT] - [IdleDT]) / [Num Stops], (0 if [Num Stops] <= 0)	
fnMTTSS	Mean Time To Short Stop(Performance): ([TotalTime] - [PlannedDT] - [IdleDT]) / [Num SStops], (0 if [Num SStops] <= 0)	
fnMTTLS	Mean Time To Long Stop: ([TotalTime] - [PlannedDT] - [IdleDT]) / [Num LStops], (0 if [Num LStops] <= 0)	
fnNumStops	Number of Stops (Sum of all Downtime Events)	
fnNumSStops	Number of Short Stops(Performance) (Sum of all Short Downtime events)	
fnNumLStops	Number of Long Stops: [NumStops] – [NumSStops]	
fnNumPlannedDTs	Number of Planned DTs (Sum of all Planned Downtime Events)	
fnNumIdleDTs	Number of Idle DTs (Sum of all Idle Downtime Events)	

fnNumBreakdowns	Number of Breakdown DTs (Sum of all Breakdown Downtime Events)	
fnNumChangeOvers	Number of ChangeOvers (Sum of all ChangeOver Events)	
fnNumChangeOversPerf	Number of Performance ChangeOvers (Sum of all Performance ChangeOver Events)	
fnLossDescEvents	Loss Desc Time (Sum of all time associated with a specific Loss Desc)	List of Mode Description text values to be included in Function Result
fnLossTypeEvents	Loss Type Events (Number of all events associated with a specific Loss Type)	List of Mode Grouping text values to be included in Function Result
fnAvailLoss	Availability Loss: [DownTime] – [SStopLoss]	
fnSStopLoss	Short Stop Loss (Sum of all Short(Performance) Downtimes)	
fnSpeedLoss	Speed Loss (Loss due to running at rate less than Standard Rate): [TotalTime] – [PlannedDT] – [IdleDT] – [DownTime] – [CavitLoss] – [QualLoss] – [OEETime]	
fnCavitLoss	Cavitation Loss (Loss due to cycling a Machine while using less Cavities then are available on the Tool): ([NumCavities] – [CavitiesUsed]) * ([Cycles] * [StdTime])	
fnSpeedLossUnitTime	SpeedLoss Units Time: ([StdTime] * [SpeedLoss Units]), where SpeedLoss Units are then units lost to production when the Machine is running slower then the StdTime. SpeedLoss Units could be thought of as an opportunity loss due to SlowRunning.	
fnPerfLoss	Performance Loss: [TotalTime] – [PlannedDT] – [IdleDT] – [DownTime] + [SStopLoss] – [QualLoss] – [OEETime]	
fnQualLoss	Quality Loss: ([Corrected Std Time] * [Defect Parts])	
fnBreakdownLoss	Breakdown Loss: (Sum of all Breakdown Downtimes)	
fnChangeOverLoss	ChangeOver Loss: (Sum of all ChangeOvers)	
fnChangeOverLossPerf	Performance ChangeOver Loss: (Sum of all Performance ChangeOvers)	
fnSetupDefLoss	Setup Defect Loss: ([Corrected Std Time] * [Setup Defect Parts])	
fnYieldDefLoss	Yield Defect Loss: ([Corrected Std Time] * [Yield Defect Parts])	
fnCyclesStdTime	Cycles StdTime: ([StdTime] * [Cycles])	
fnActOpTime	Actual Operating Time: [TotalTime] – [PlannedDT] – [IdleDT] – [DownTime] + [SStopLoss]	

fnNetOpTime	Net Operating Time: [OEETime] + [QualLoss]	
fnOEETime	OEE Time: ([Corrected StdTime] * [Good Parts])	
fnAvailability	Availability: ([TotalTime] - [PlannedDT] – [IdleDT] – [DownTime] + [SStopLoss]) / ([TotalTime] - [PlannedDT] - [IdleDT]), (0 if ([TotalTime] - [PlannedDT] - [IdleDT]) <= 0)	
fnPerformance	Peformance: ([OEETime] + [QualLoss]) / ([TotalTime] – [PlannedDT] – [IdleDT] – [DownTime] + [SStopLoss]), (0 if ([TotalTime] – [PlannedDT] – [IdleDT] – [DownTime] + [SStopLoss]) <= 0)	
fnQuality	Quality: ([OEETime]) / ([OEETime] + [QualLoss]), (0 if ([OEETime] + [QualLoss]) <= 0)	
fnOEE	OEE: ([OEETime]) / ([TotalTime] - [PlannedDT] - [IdleDT), (0 if ([TotalTime] - [PlannedDT] - [IdleDT]) <= 0)	
fnTEEP	TEEP: ([OEE] x [Loading]) Where Loading = [PlannedOpT]/ [TotalTime], (0 of [TotalTime] =0)	
fnTarget	Target: ((PlannedOpT) * [TargetRate]). Set by Standard Machine-Part Target Rate	
fnPCTarget	% Target: [GoodParts]/[Target], (0 if [Target] = 0)	
fnTargetOEETime	Target OEETime: ((PlannedOpT) * [TargetRate] * [StdTime]). Set by Standard Machine-Part Target Rate	
fnTargetOEE	% Target OEE: [Target OEETime]/[PlannedOpT], (0 if [PlannedOpT] = 0)	
fnTargetRate	Target Rate: Average Standard Machine Target Rate	
fnTargetRateMins	Target Rate Mins: Average Standard Machine Target Rate Per Minute	
fnTargetRateMinsExLongDTs	Target Rate Mins ex Long DTs: Average Standard Machine Target Rate Per Minute	
fnOperatorTime	Operator Time: ([Total Time] * [Operators Used])	
fnOperatorProductivity	Operator Productivity (Parts/Hour/Operator): ([Good Parts] / [Operator Time])	
fnStdOperatorTime	Std Operator Time: ([Total Time] * [Std Operators Used])	
fnStdOperatorProductivity	Operator Productivity (Parts/Hour/Std Operator): ([Good Parts] / [Std Operator Time])	
fnRelOperatorProductivity	Relative Operator Productivity: ([Operator Productivity] / [Std Operator Productivity])	
fnPCRelCycleTime	% Relative Cycle Time:[CyclesStdTime] / ([TotalTime] – [PlannedDT] – [IdleDT]), (0 if ([TotalTime] – [PlannedDT] – [IdleDT]) <=0])	
fmPCRelWorkCycleTime	% Relative Work Cycle Time: [CyclesStdTime] / ([TotalTime] – [PlannedDT] – [IdleDT] – [DownTime]), (0 if ([TotalTime] – [PlannedDT] – [IdleDT] – [DownTime]) <=0])	
fnIdelDT	Idle DT: (sum of all Idle Downtimes)	
fnTaktTime	TAKT Time: ([PlannedOpT] - [IdleDT]) / ([Cycles]), (0 if [Cycles] = 0)	

fnStdTimeCor	StdTime Correction Factor: ([TotalTime] – [PlannedDT] – [IdleDT] – [DownTime]) / ([OEETime] + [QualLoss]), (1 if ([OEETime] + [QualLoss]) <= 0 OR StdTimeCor < 1)	
fnUtilisation	Utilisation: ([Uptime])/ ([PlannedOpT] - [IdleDT]) , (0 if ([PlannedOpT] - [IdleDT]) = 0)	
fnStdEfficiency	Std Efficiency: ([GoodParts] *[StdTime])/ ([PlannedOpT] - [IdleDT]) , (0 if ([PlannedOpT] - [IdleDT]) = 0)	
fnStdEfficiencyExChangeOvers	Std Efficiency ex ChangeOvers: ([GoodParts] *[StdTime])/ ([PlannedOpT] - [IdleDT] - [ChangeOverLoss]) , (0 if ([PlannedOpT] - [IdleDT]) = 0)	
fnActEfficiency	Actual Efficiency: ([GoodParts] *[Uptime])/ ([Throughput] *([PlannedOpT] - [IdleDT])) , (0 if ([Throughput]*([PlannedOpT] - [IdleDT])) = 0)	
fnToolEfficiency	Tool Efficiency: ([CavitiesUsed] *[Uptime])/ ([NumCavites] *([PlannedOpT] - [IdleDT])) , (0 if ([NumCavities]*([PlannedOpT] - [IdleDT])) = 0)	
fnCavityTime	Cavity Time: ([CycleTime]/[NumCavitiesUsed]): ([TotalTime] - [PlannedDT] - [IdleDT]) / ([Cycles] * [NumCavitiesUsed]), (0 if ([Cycles] * [NumCavitiesUsed]) <= 0)	
fnWorkCavityTime	Work Cavity Time: ([WorkCycleTime]/[NumCavitiesUsed]): ([TotalTime] - [PlannedDT] - [IdleDT] – [DownTime]) / ([Cycles] * [NumCavitiesUsed]), (0 if ([Cycles] * [NumCavitiesUsed]) <= 0)	
fnTargetOEETime	Target OEE Time: ([PlannedOpT] * [TargetRate] * [StdTime])	
fnTargetOEE	Target OEE: ([TargetOEETime] / [PlannedOpT])	

Loss Report Loss Functions

Function Name	Function Description	Function Param
fnTime	Time (Sum of Time for Loss)	
fnNumEvents	Num Events (Sum of all Events for this Object-Loss)	
fnMTTEvent	MTT Event: [Num Events] / [Planned OpT], (0 if [Planned OpT] =0) Where [Planned OpT] refers to the Object.	
fnEventRate	Event Rate: [Planned OpT] / [Num Events], (0 if [Num Events] = 0)	
fnPCTotalTime	% Total Time: [Time] / ([Total Time]) , (0 if ([Total Time]) = 0)	
fnPCPlannedOpT	% Planned OpT: [Time] / ([Planned OpT]), (0 if ([Planned OpT]) = 0)	
fnPCLossTime	% Loss Time: [Time] / ([Planned OpT] – [OEE Time])], (0 if ([Planned OpT] – [OEE Time]) = 0)	

fnPCDownTime	% Downtime: [Time] / [Downtime]], (0 if [Downtime] = 0) Where Loss Type is a Downtime	
fnPCSelLossTime	% Selected Loss Time: [Time] / (Sum of Time for all selected Losses)	
fnTargetTime	Target Time (Sum of Target Time associated with each instance of the Mode)	
fnVarianceTime	Variance Time: ([Time] - [Target Time])	
fnPCVarianceTime	% Variance Time: ([Time] - [Target Time]) / [Time])(0 if ([Target Time]) = 0)	

Note the Production Report Functions can be used in Loss Reports. A second DataSet Table is returned with the Production Data.

Mode Functions:

There are no Functions available for Mode Log Reports

7.6.2.1.4 Periods

Provideam Report Periods:

Period Name	**Period Description**	
pdCustom	Custom Period. Defined by Start Date and End Date	
pdMonth	Month Period. Defined by Month Number and Date	
pdWeek	Week Period. Defined by Week Number and Date	
pd7Days	7 Days Period. Defined by End Date	
pd30Days	30 Days Period. Defined by End Date	
pdDay	Day Period. Defined by Date	
pdShift	Shift Period. Defined by ShiftID and Date	
pdHour	Hour Period. Defined by Hour Number and Date	
pdWTD	Week To Date Period. Defined by End Date	
pdMTD	Month To Date Period. Defined by End Date	
pdYTD	Year To Date Period. Defined by End Date.	

7.6.2.1.5 Objects

Provideam Report Objects:

Object Name	Object Description	
obLotName	The obLotName can take any text values. The Producton Data is filtered on the Lot Name.	
obBatchName	The obBatchName can take any text values. The Producton Data is filtered on the Batch Name.	
obMaterialName	The obMaterialName can take any text values. The Producton Data is filtered on the Material Name.	
obFlexField1	The obFlexField1 can take any text values. The Producton Data is filtered on the FlexField1.	
obFlexField2	The obFlexField2 can take any text values. The Producton Data is filtered on the FlexField2.	
obFlexField3	The obFlexField3 can take any text values. The Producton Data is filtered on the FlexField3.	
obFlexField4	The obFlexField4 can take any text values. The Producton Data is filtered on the FlexField4.	
obFlexField5	The obFlexField5 can take any text values. The Producton Data is filtered on the FlexField5.	
obFlexField6	The obFlexField6 can take any text values. The Producton Data is filtered on the FlexField6.	
obFlexField7	The obFlexField7 can take any text values. The Producton Data is filtered on the FlexField7.	
obFlexField8	The obFlexField8 can take any text values. The Producton Data is filtered on the FlexField8.	
obFlexField9	The obFlexField9 can take any text values. The Producton Data is filtered on the FlexField9.	
obFlexField10	The obFlexField10 can take any text values. The Producton Data is filtered on the FlexField10.	
obFlexField11	The obFlexField11 can take any text values. The Producton Data is filtered on the FlexField11.	
obFlexField12	The obFlexField12 can take any text values. The Producton Data is filtered on the FlexField12.	
obFlexField13	The obFlexField13 can take any text values. The Producton Data is filtered on the FlexField13.	
obFlexField14	The obFlexField14 can take any text values. The Producton Data is filtered on the FlexField14.	
obFlexField15	The obFlexField15 can take any text values. The Producton Data is filtered on the FlexField15.	
obFlexField16	The obFlexField16 can take any text values. The Producton Data is filtered on the FlexField16.	
obFlexField17	The obFlexField17 can take any text values. The Producton Data is filtered on the FlexField17.	

obFlexField18	The obFlexField18 can take any text values. The Producton Data is filtered on the FlexField18.	
obFlexField19	The obFlexField19 can take any text values. The Producton Data is filtered on the FlexField19.	
obFlexField20	The obFlexField20 can take any text values. The Producton Data is filtered on the FlexField20.	
obPartID	The obPartID can take any integer values. The Producton Data is filtered on the PartID.	
obToolID	The obToolID can take any integer values. The Producton Data is filtered on the ToolID.	
obAreaID	The obAreaID can take any integer values. The Producton Data is filtered on the AreaID.	
obMachineID	The obMachineID can take any integer values. The Producton Data is filtered on the MachineID.	
obOperatorID	The obOperatorID can take any integer values. The Producton Data is filtered on the OperatorID.	
obProdShiftID	The obProdShiftID can take any integer values. The Producton Data is filtered on the Production ShiftID.	
obProdModeID	The obProdModeID can take any integer values. The Producton Data is filtered on the Production ModeID.	

7.6.2.1.6 Loss Objects

Provideam Report Loss Objects:

Loss Objects only apply to OEE Loss DataSets.

Loss Object Name	**Loss Object Description**	
lsOEELossLvl1ID	The lsOEELossLvl1ID can take the following values (0 - OEETime, 1 - Availability, 2 - Performance, 3 - Quality, 4 - Planned Downtime, 5 - Idle Time)	
lsOEELossLvl2ID	The lsOEELossLvl2ID can take the following values(0 - OEETime, 1 - Setup Loss, 2 - Yield Loss, 3 - Breakdown, 4 - ChangeOver, 5 - ShortStop, 6 - SpeedLoss, 7 - Cavitation Loss, 8 - Planned Downtime, 9 - Idle Downtime, 10 - ChangeOver as Performance Loss)	
lsOEELossLvl3Type	The lsOEELossLvl3Type can take any text values. The Loss Data is filtered on the Mode Grouping Type.	
lsOEELossLvl3Desc	The lsOEELossLvl3Desc can take any text values. The Loss Data is filtered on the Mode Description.	
lsStdLossID	The lsStdLossID can take any text integer. The Loss Data is filtered on the Std Loss ID.	

IsStdLossType	The IsStdLossType can take any text values. The Loss Data is filtered on the Std Loss Grouping Type.	
IsStdLossDesc	The IsStdLossDesc can take any text values. The Loss Data is filtered on the Std Loss Description.	

7.6.2.2 *OEE Dashboard*

The OEE Dashboard is your gateway to real-time and historical shift data. It provides easy and fast access to production data from any area of the plant, presented in an array of powerful charts and tables.

The Overall Data Table

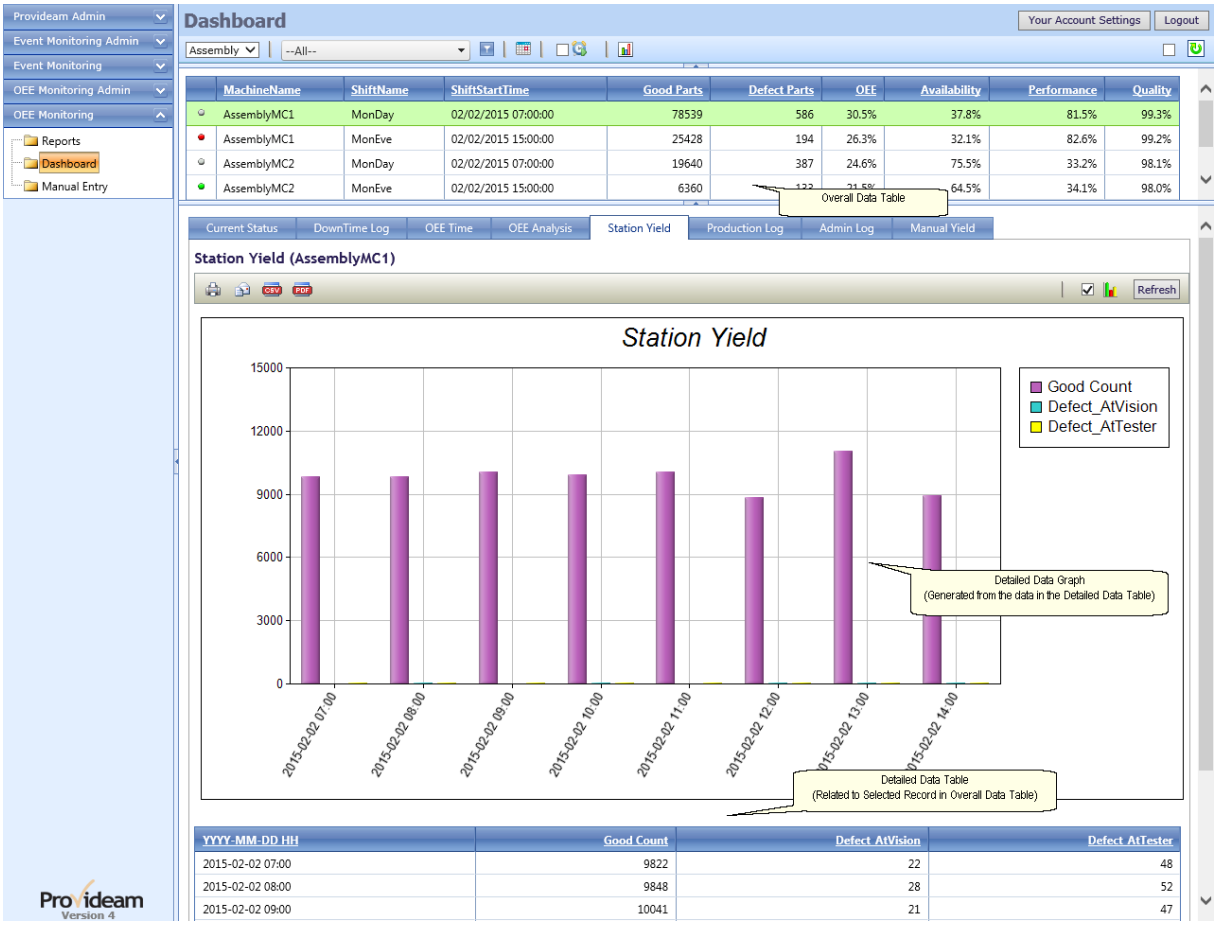


Fig. OEE Dashboard - Overall(Upper) Data Table

- The **Area** selection box allows you to select an Area.
- The **Machine** selection box allows you to select one or more Machines.
- The icon button applies the Machine selection filter..
- The icon button opens a date picker calendar window.

- The **Current** check box causes the Overall Data Table to display only the current Lot-Shift record for each Machine. This is useful if the Machine has had multiple changeovers in a Shift - you need only display the current Lot.
- The icon button allows opens the Provideam Live Interface.
- The **View** selection box allows you to select a view to configure the Overall Dashboard Display.
- The **Auto-Update** check box causes the Overall Data Table to be updated every 15s. This setting turns off after 15minutes to avoid overloading the database with unnecessary queries.
- The icon button refreshes the Overall Data Table.
- Clicking on a record in the Overall Data Table updates the Dashboard Panes with data related to the selected record.

Historical Data & Multiple Records

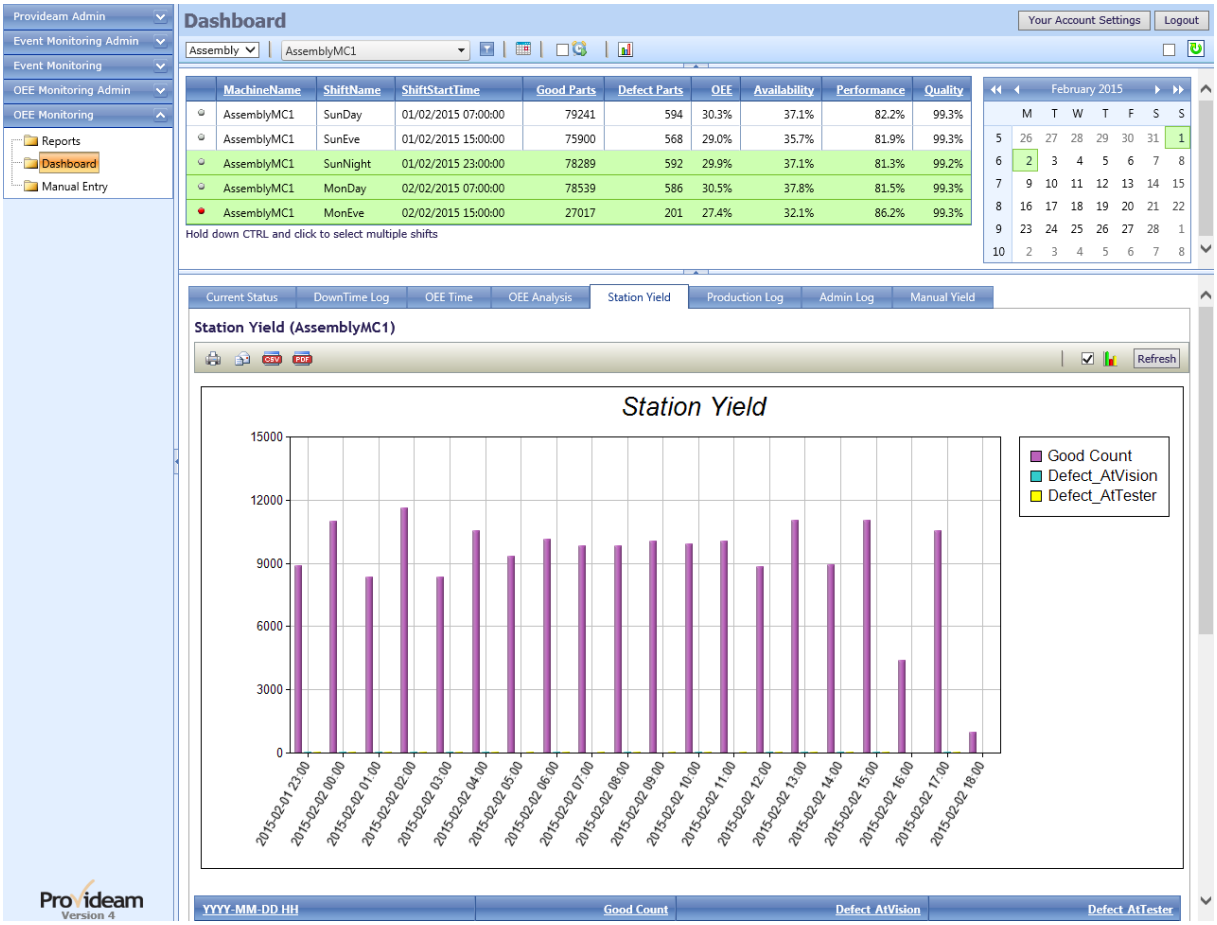


Fig. OEE Dashboard - Overall(Upper) Data Table - Historical Data

- The **Data Picker** allows you to select data from previous Shifts.

Note: In the above figure the **Machine** selection has been limited to one Machine. This enables a feature whereby multiple Shift records can be selected by holding down the CTRL key. The data for the selected (multiple) Shifts is then displayed in the Dashboard Panes, as in the example above where we see data in the Station Yield Pane for the two selected Shifts.

The Current Status Pane

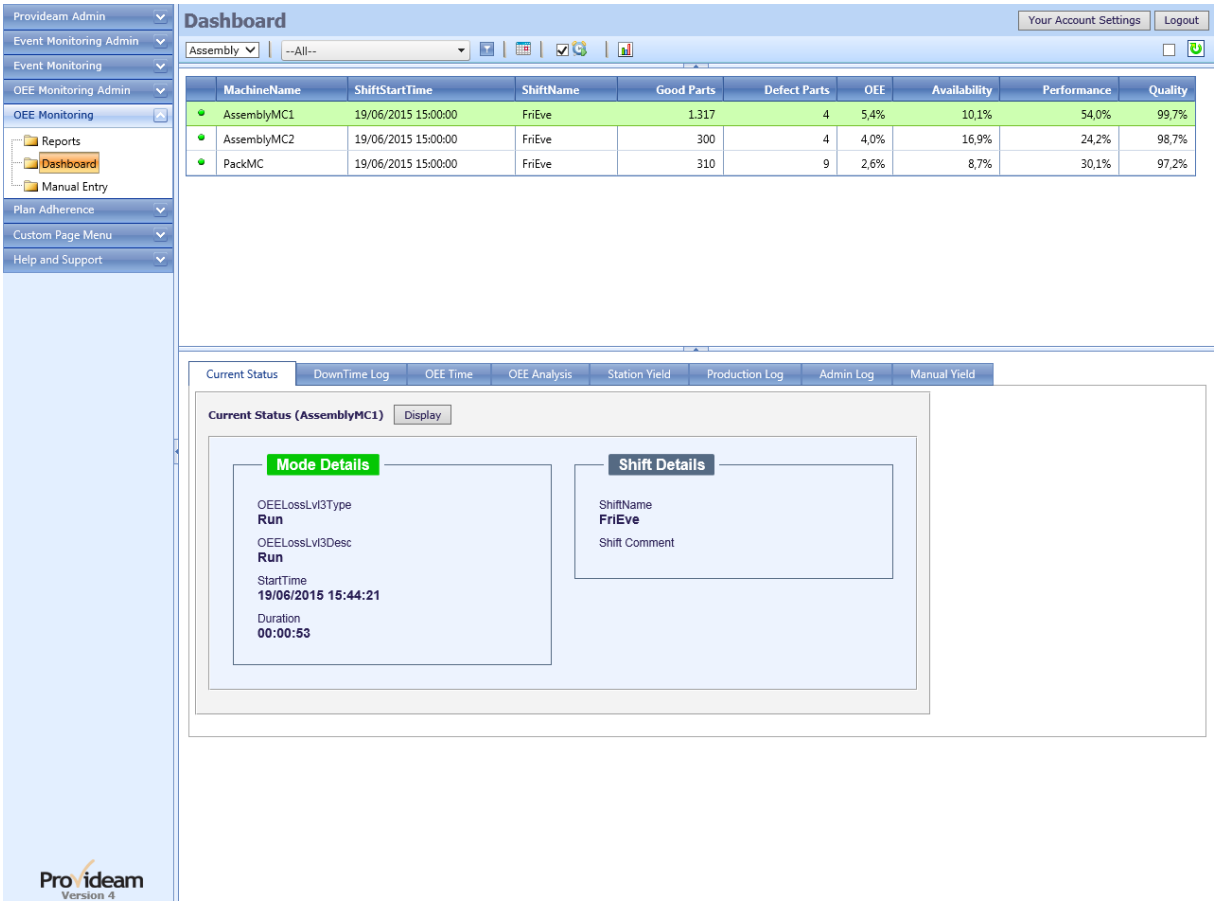


Fig. OEE Dashboard - Current Status - Simple Example

In the above figure you will see a simple example of the Current Status Pane. In this example you only see current Mode and Shift data. Lot, Part, Tool data, etc. has been hidden from view by the due to the Machine Admin settings.

The Current Status Pane updates every 10 seconds. If the Machine Mode changes then the display will update. The icon is used for Run Mode, for Stop Modes and for ChangeOver Modes.

Current Status Pane - Complex Example

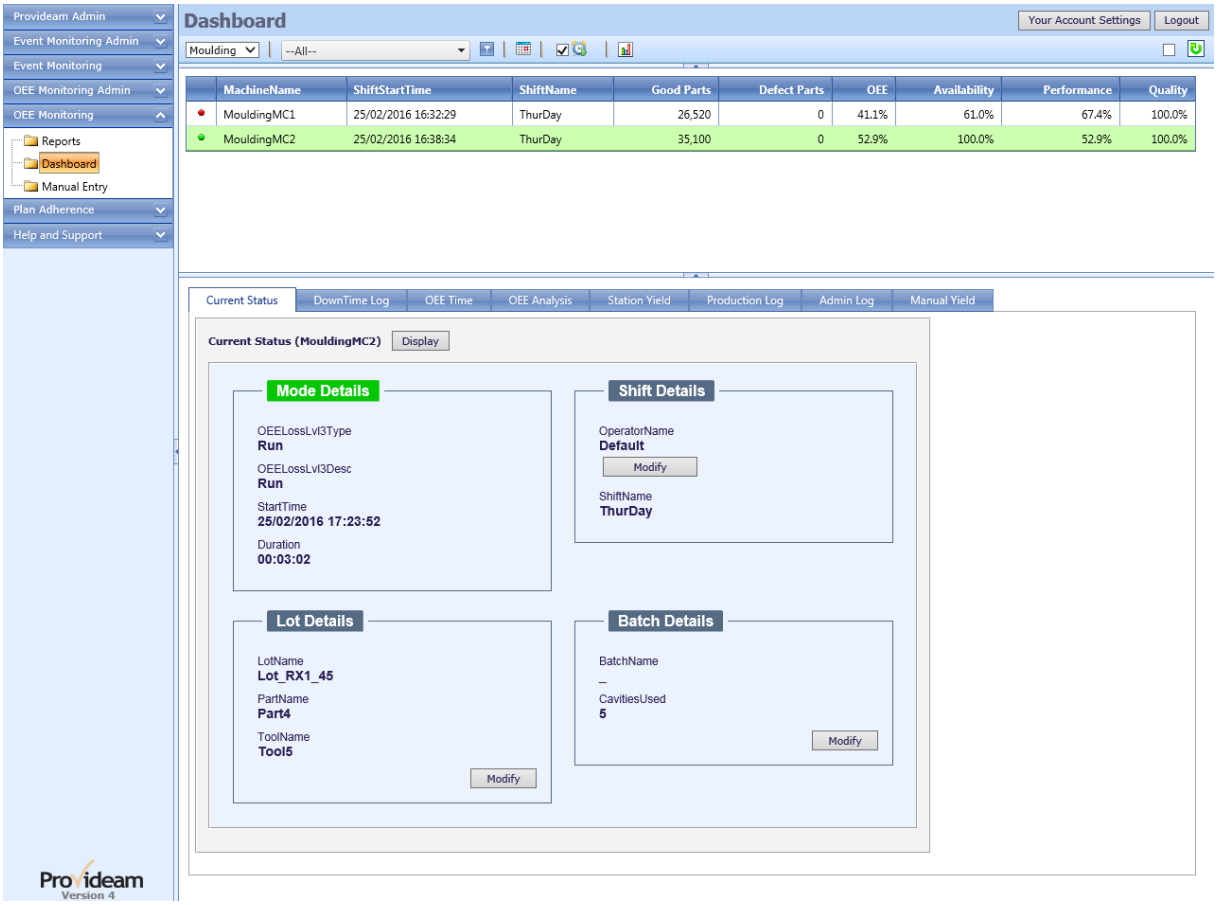


Fig. OEE Dashboard - Current Status - Complex Example

- The **Change** Operator button allows you to assign an Operator, to the selected Machine, for the Shift.
- The **New** Lot button opens the New Lot page. This feature enables you to create a new Lot record at the time of saving the new Lot Details.
- The **Modify** Lot button opens the Modify Lot page. This feature enables you to update the details of the current Lot.

- The **New** Batch button opens the New Batch page. This feature enables you to create a new Batch record at the time of saving the new Batch Details.
- The **Modify** Batch button opens the Modify Batch page. This feature enables you to update the details of the current Batch.

NOTE: Items such as Lot Name or Batch Name may not be visible/enabled in this section. Please refer to the Display Settings in the Machine Admin Section.

Current Status Pane - Complex Example - Change Operator

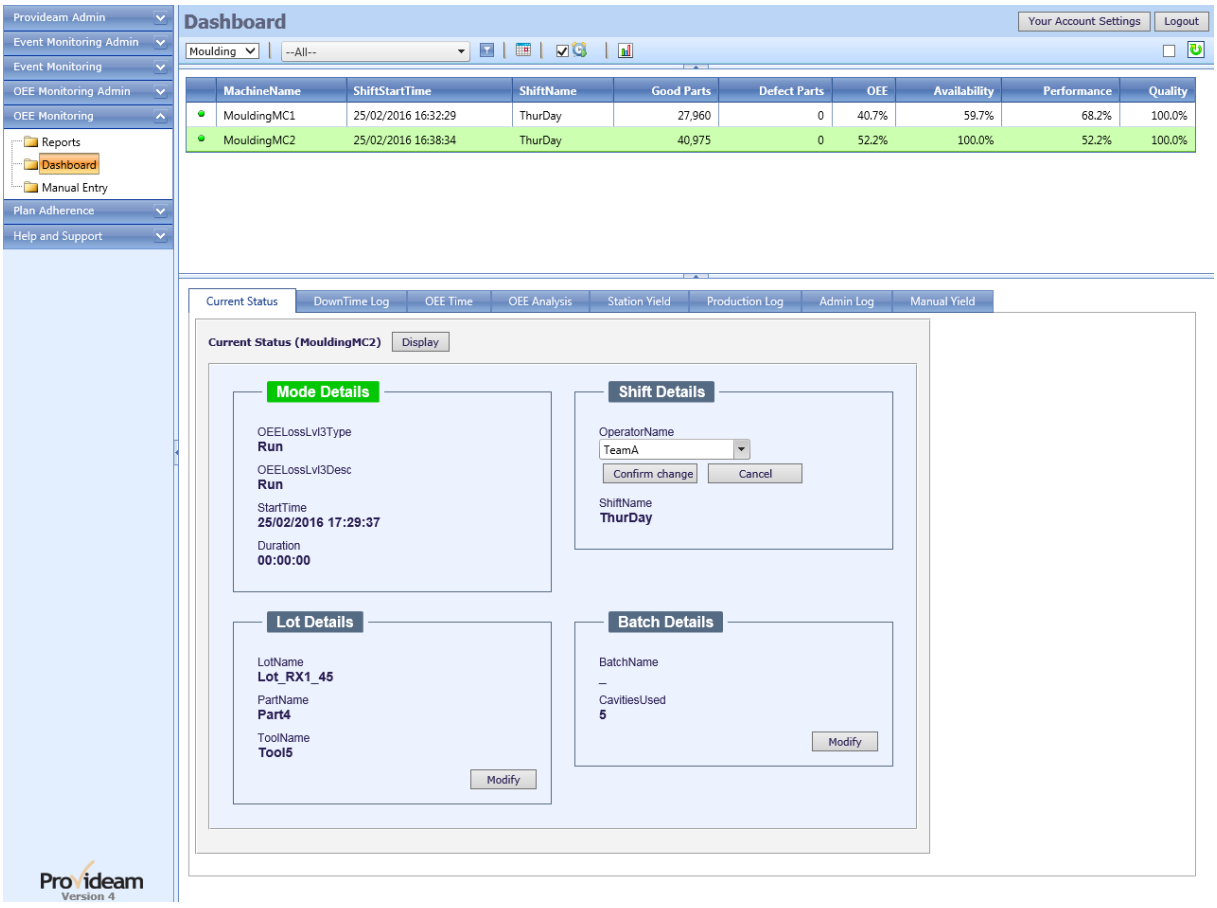


Fig. OEE Dashboard - Current Status - Complex Example - Change Operator

- The **OperatorName** selection box allows you to select an Operator for the Machine.
- The **All Machines** check box allows you to set whether or not the change of Operator should be applied to all Machines in the Area.
- The **Confirm Change** button saves the change to the database.
- The **Cancel** button cancels the edits are returns to the previous screen.

Current Status Pane - Complex Example - Modify Lot

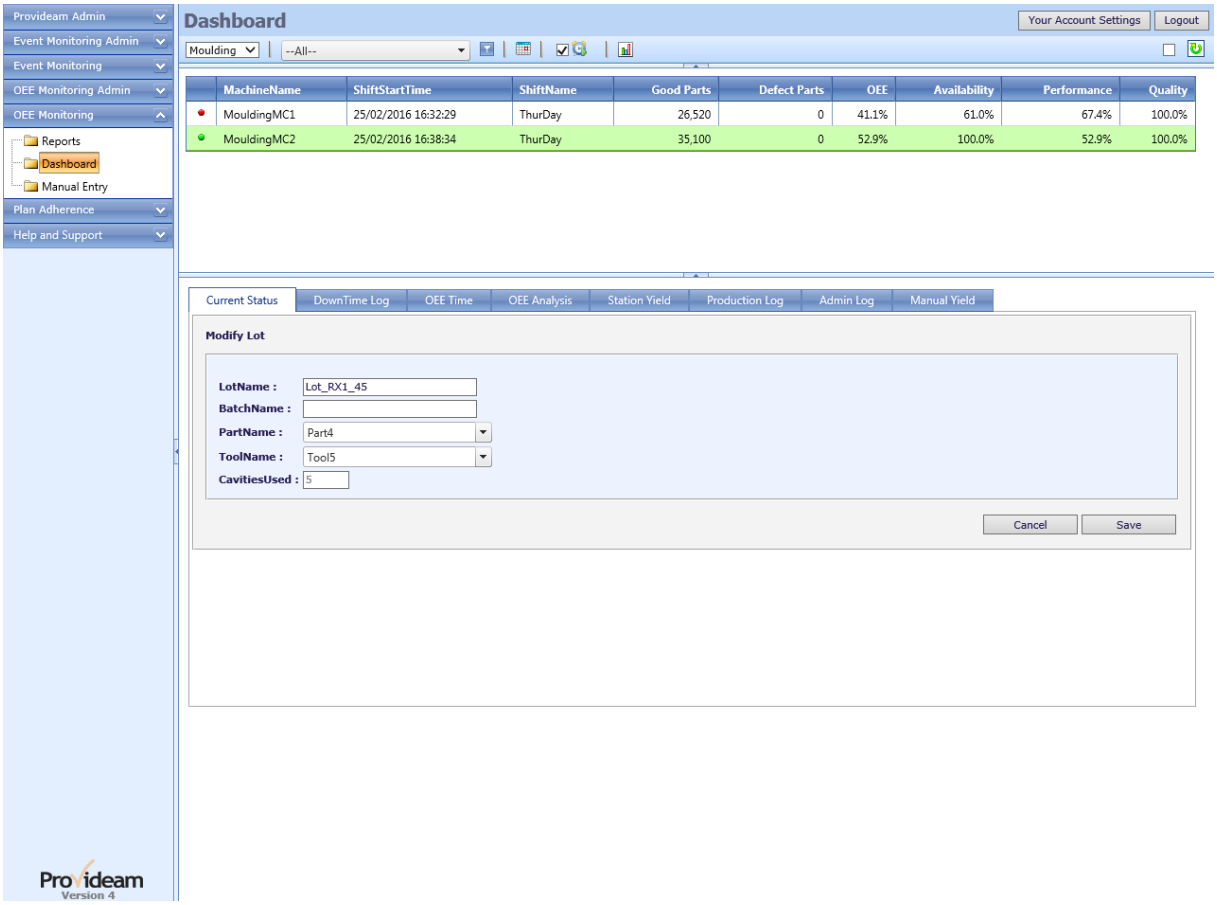


Fig. OEE Dashboard - Current Status - Complex Example - Modify Lot

- The **LotName** text box allows you to set the Lot Name for Machine.
- The **BatchName** text box shows you the Batch Name for Machine.
- The **PartName** selection box allows you to select a Part for the Lot.
- The **ToolName** selection box allows you to select a Tool for the Lot. The list of available Tools will be limited by the Part-Tool and Machine-Tool relationships you configured in the Machine Admin Section.
- The **CavitiesUsed** text box shows you the #Cavities in the selected Tool. This value will be applied as the #Cavities used for all Batches in the Lot.
- The **Save** button saves the change to the database.
- The **Cancel** button cancels the edits are returns to the previous screen.

Current Status Pane - Complex Example - Modify Batch

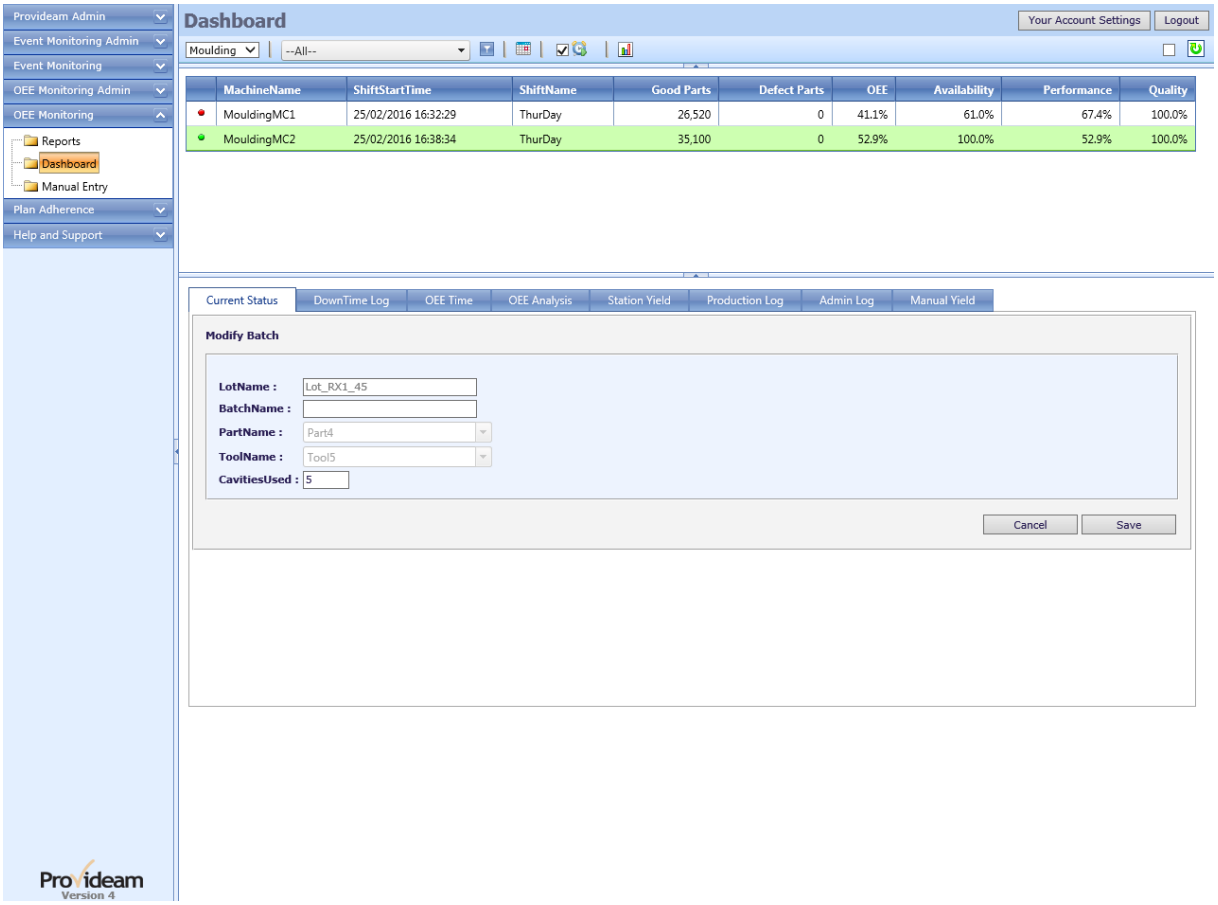


Fig. OEE Dashboard - Current Status - Complex Example - Modify Batch

- The **LotName** text box shows you the Lot Name for Machine.
- The **BatchName** text box allows you to set the Batch Name for Machine .
- The **PartName** selection box shows you the Part for the Lot.
- The **ToolName** selection box shows you the the Tool for the Lot.
- The **CavitiesUsed** text box allows you to set the #Cavities Used for this Batch
- The **Save** button saves the change to the database.
- The **Cancel** button cancels the edits are returns to the previous screen.

The Downtime Log Pane

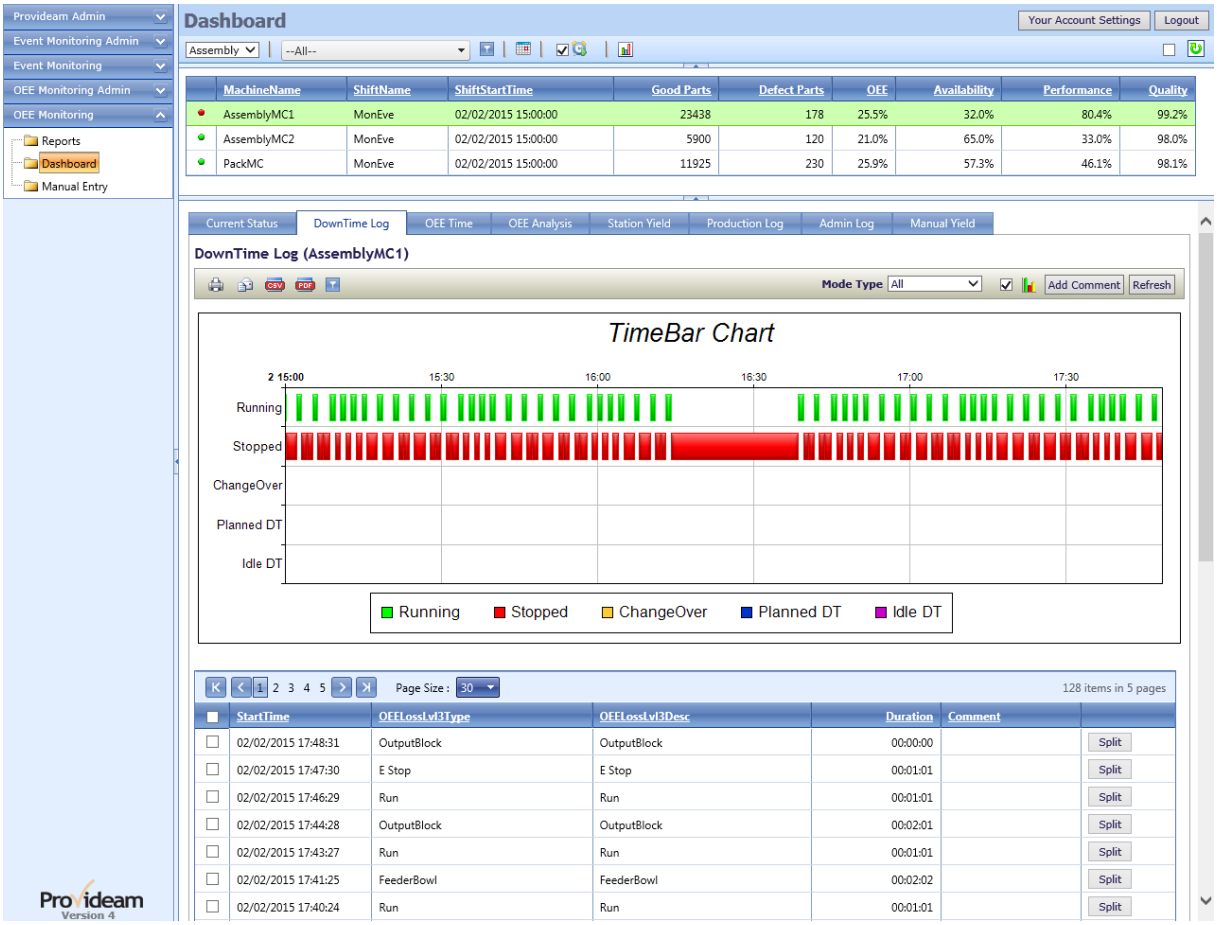


Fig. OEE Dashboard - Downtime Log

- The **Print** button allows you to print the data.
- The **Email** button allows you to email the data.
- The **Export CSV** button allows you to export the data to a CSV file.
- The **Export PDF** button allows you to export the data to a PDF file.
- The check box allows you to enable a graphical display of Mode Data.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).
- The **Mode Type** selection box allows you to limit the log to specific Mode Types. The options are; *All*, *Run Only*, *All Stops*, *Short Stops* (Performance Losses), *Long Stops* (Availability Losses)
- The **Page Size** selection box allows you to limit the Downtime Log. The options are; 20, 30, 50 or 1000.
- The **Add Comment** button opens the Add Comment Page which allows you to add Comments to selected Modes.

- The **Split** button opens the Split Mode Page which allows you to add Split a Mode in to two Modes.
- The **Refresh** button refreshes the Downtime Log Pane.

The Downtime Log Pane - Select Modes

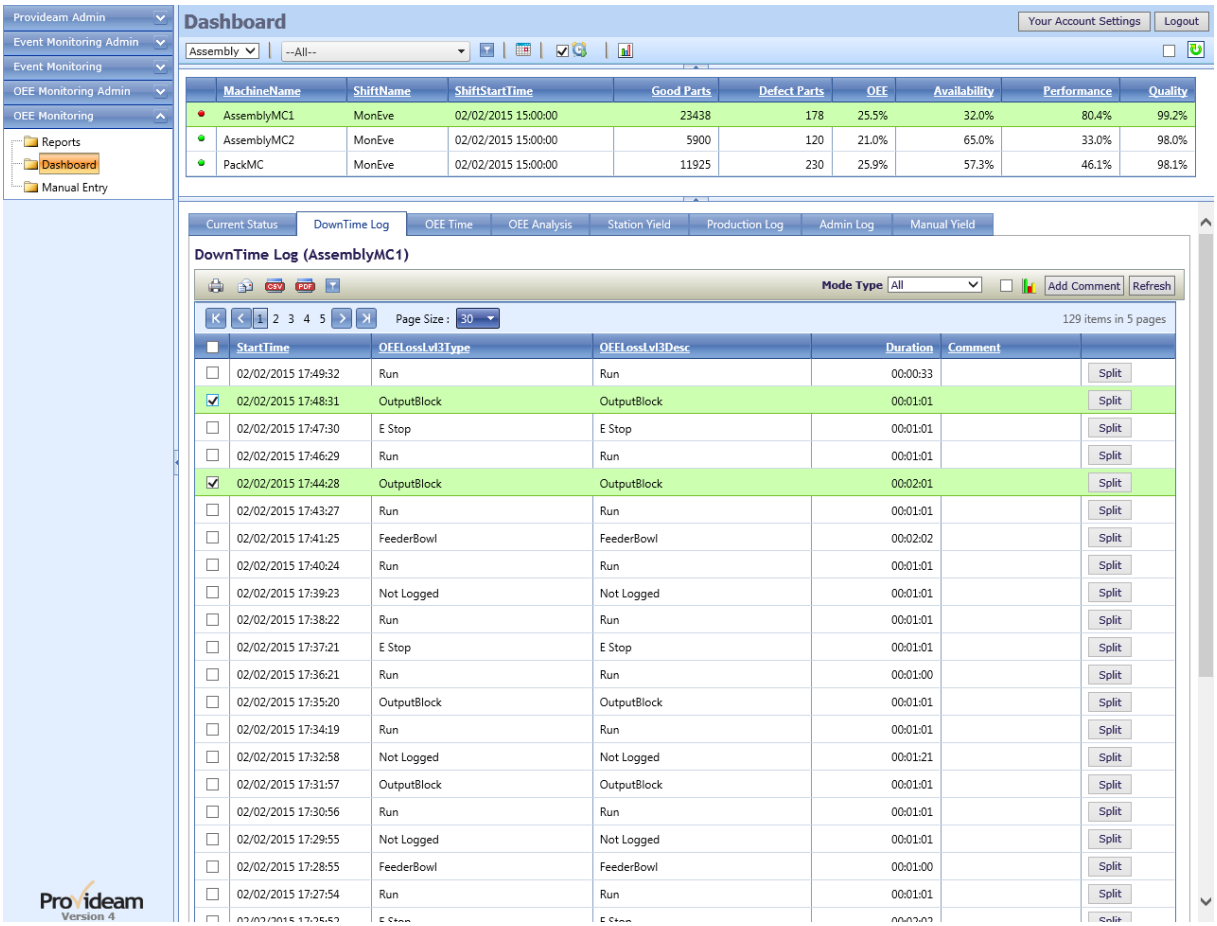


Fig. OEE Dashboard - Downtime Log - Select Modes

- The checkbox to the left hand side of the Mode record enables you to select the Mode record.
- The **Add Comment** button opens the Add Comment Page.

The Downtime Log Pane - Modify Modes / Add Comments

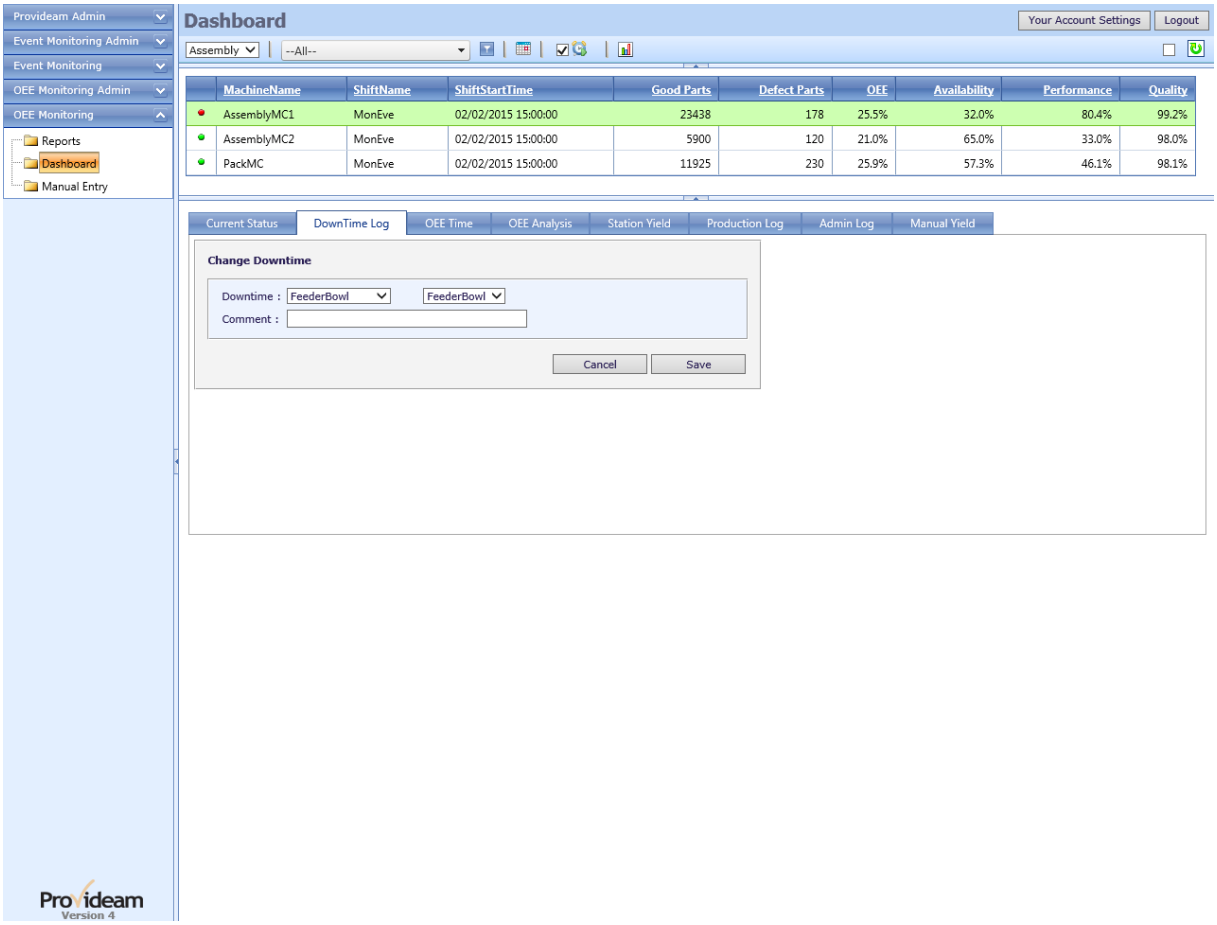


Fig. OEE Dashboard - Downtime Log - Modify Modes / Add Comments

- The **Downtime** selection box allows you to select a Mode to replace the existing Mode.
- The **Comment** text box allows you to enter a Comment to replace the existing Comment.
- The **Save** button saves the change to the database.
- The **Cancel** button cancels the edits are returns to the previous screen.

The Downtime Log Pane - Split Mode

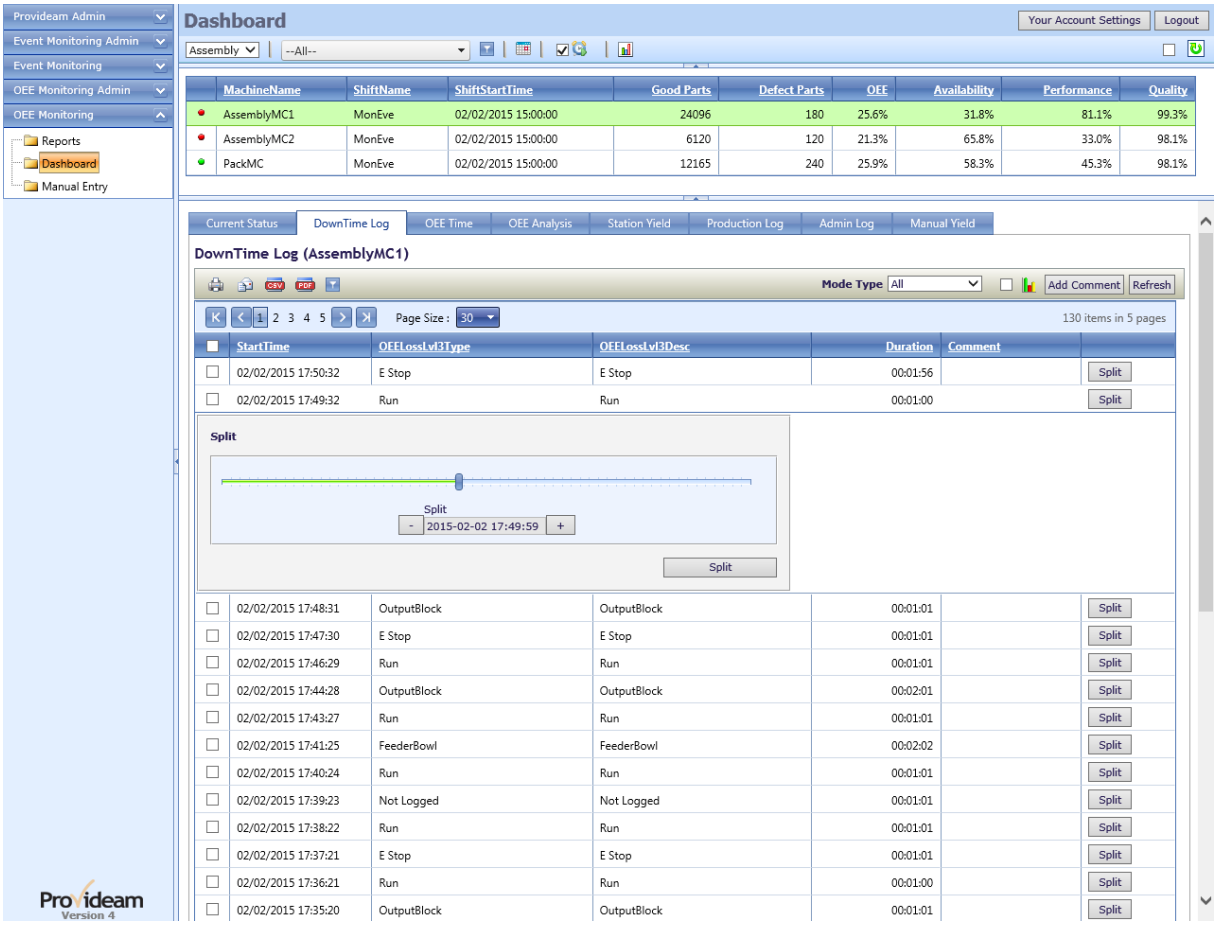


Fig. OEE Dashboard - Downtime Log - Split Mode

- The **Split** slider control allows you to select the time at which the Mode will be divided.
- The  button allows you to decrement the Split Mode time by 1 minute (or 1second for short duration Modes).
- The  button allows you to increment the Split Mode time by 1 minute (or 1second for short duration Modes).
- The **Save** button causes the selected Mode to be divided into two Modes at the selected time.
- The **Cancel** button cancels the edits are returns to the previous screen.

The OEE Time Pane

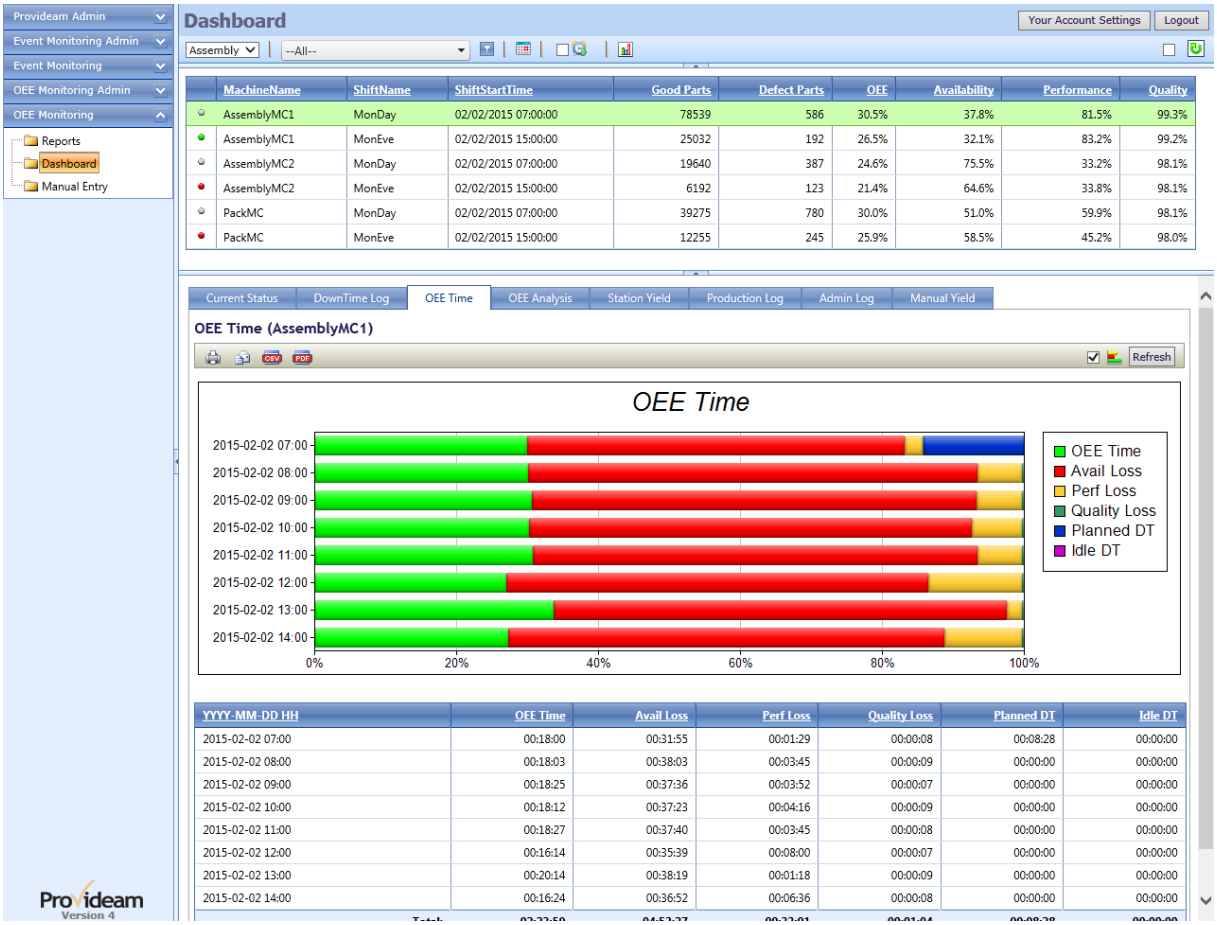


Fig. OEE Dashboard - OEE Time Pane

- The **Print** button allows you to print the data.
- The **Email** button allows you to email the data.
- The **Export CSV** button allows you to export the data to a CSV file.
- The **Export PDF** button allows you to export the data to a PDF file.
- The check box allows you to enable a graphical display of OEE Time Data.
- The **Refresh** button refreshes the OEE Time Pane.

The OEE Analysis Pane

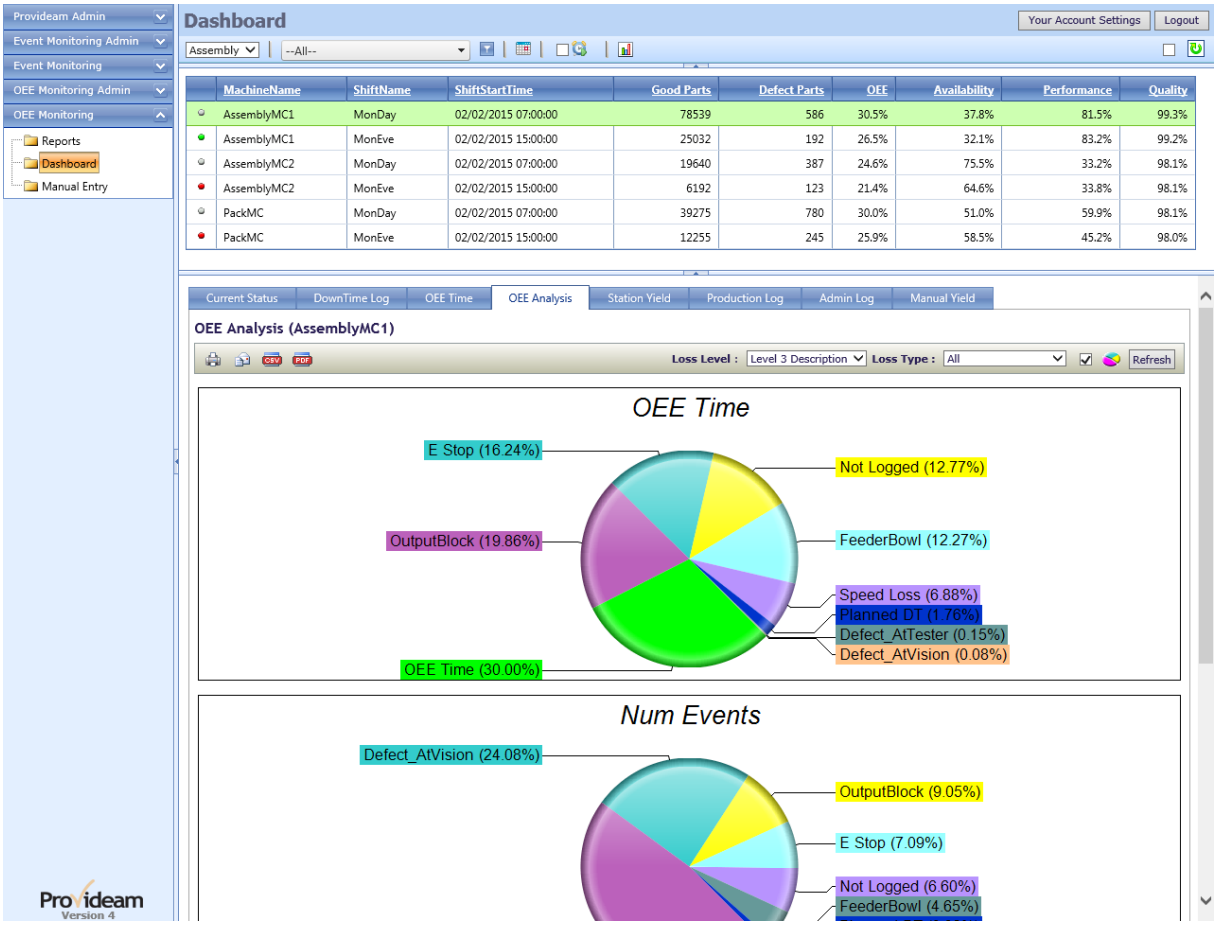


Fig. OEE Dashboard - OEE Analysis Pane

- The **Print** button allows you to print the data.
- The **Email** button allows you to email the data.
- The **Export CSV** button allows you to export the data to a CSV file.
- The **Export PDF** button allows you to export the data to a PDF file.
- The **Loss Level** selection box allows you to limit the log to specific Mode Types. The options are; *Level 1*, *Level 2*, *Level 3 Type* (Modes grouped by Group Name) and *Level 3 Description* (Modes grouped by Description).
- The **Loss Type** selection box allows you to limit the OEE Analysis Data to specific Loss Types. The options are; *All* (include OEE Time and Planned Downtimes), *All Losses* (exclude OEE Time and Planned Downtimes), *Availability Only*, *Performance Only*, *Quality Only* and *All Stops* (only Downtimes).
- The check box allows you to enable a graphical display of OEE Analysis Data.
- The **Refresh** button refreshes the OEE Analysis Pane.

Note: By clicking on a segment of the Pie Chart, or by clicking on the loss type in the table, it is possible to drill down to see when the selected loss actually occurred. In the screenshot below the 'FeederBowl' issue was selected.

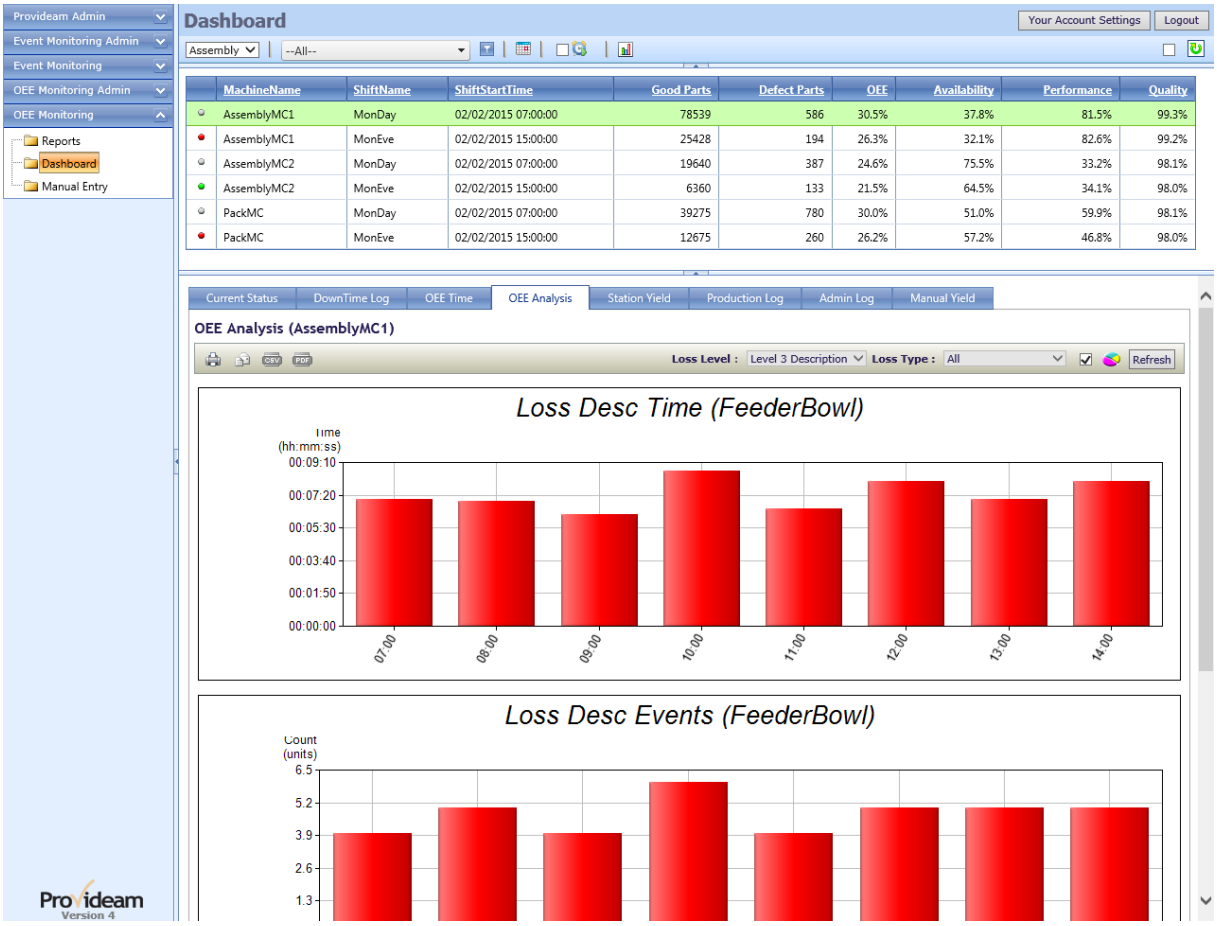


Fig. OEE Dashboard - OEE Analysis Drilldown Pane

The Station Yield Pane

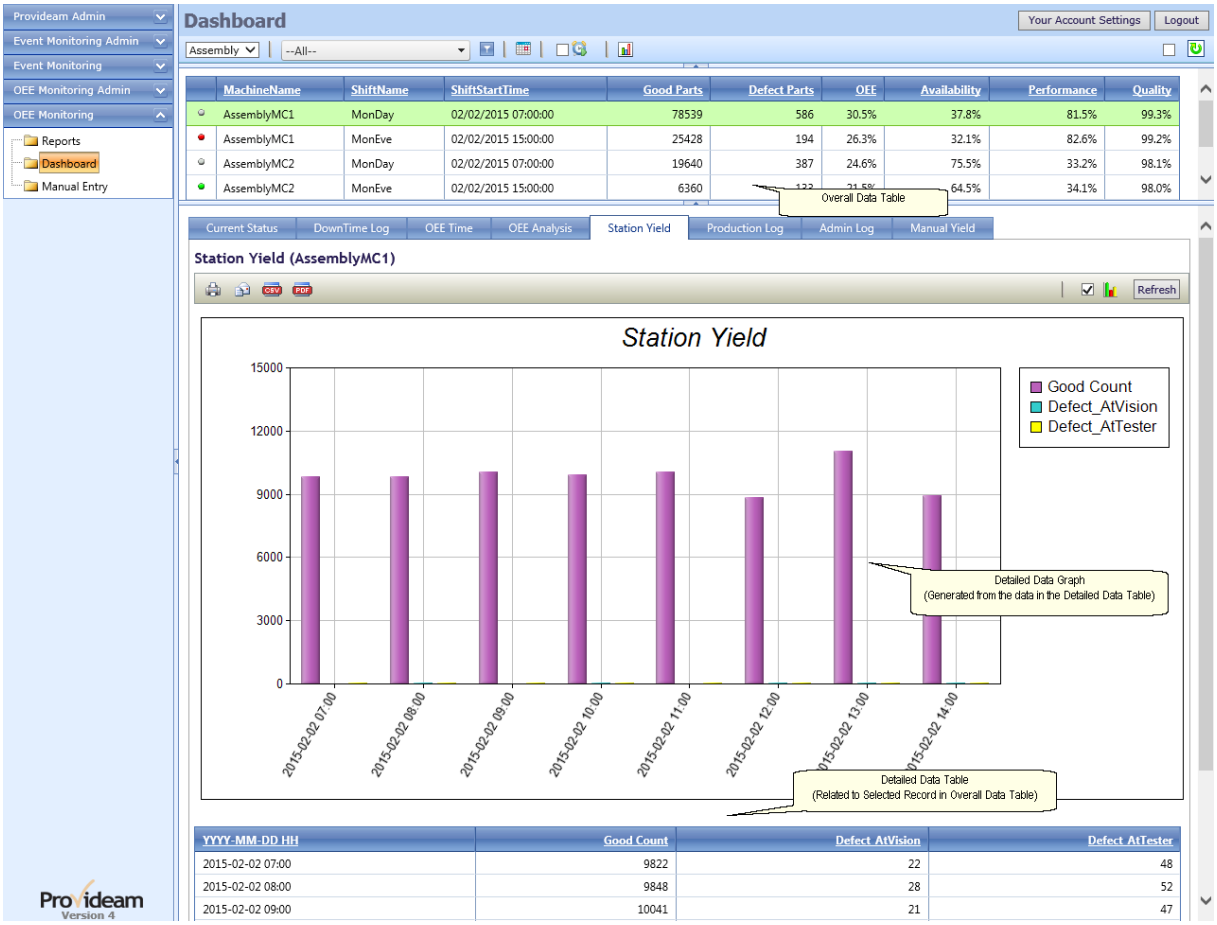


Fig. OEE Dashboard - Station Yield Pane

- The **Print** button allows you to print the data.
- The **Email** button allows you to email the data.
- The **Export CSV** button allows you to export the data to a CSV file.
- The **Export PDF** button allows you to export the data to a PDF file.
- The check box allows you to enable a graphical display of Station Yield Data.
- The **Refresh** button refreshes the Station Yield Pane.

The Production Log Pane

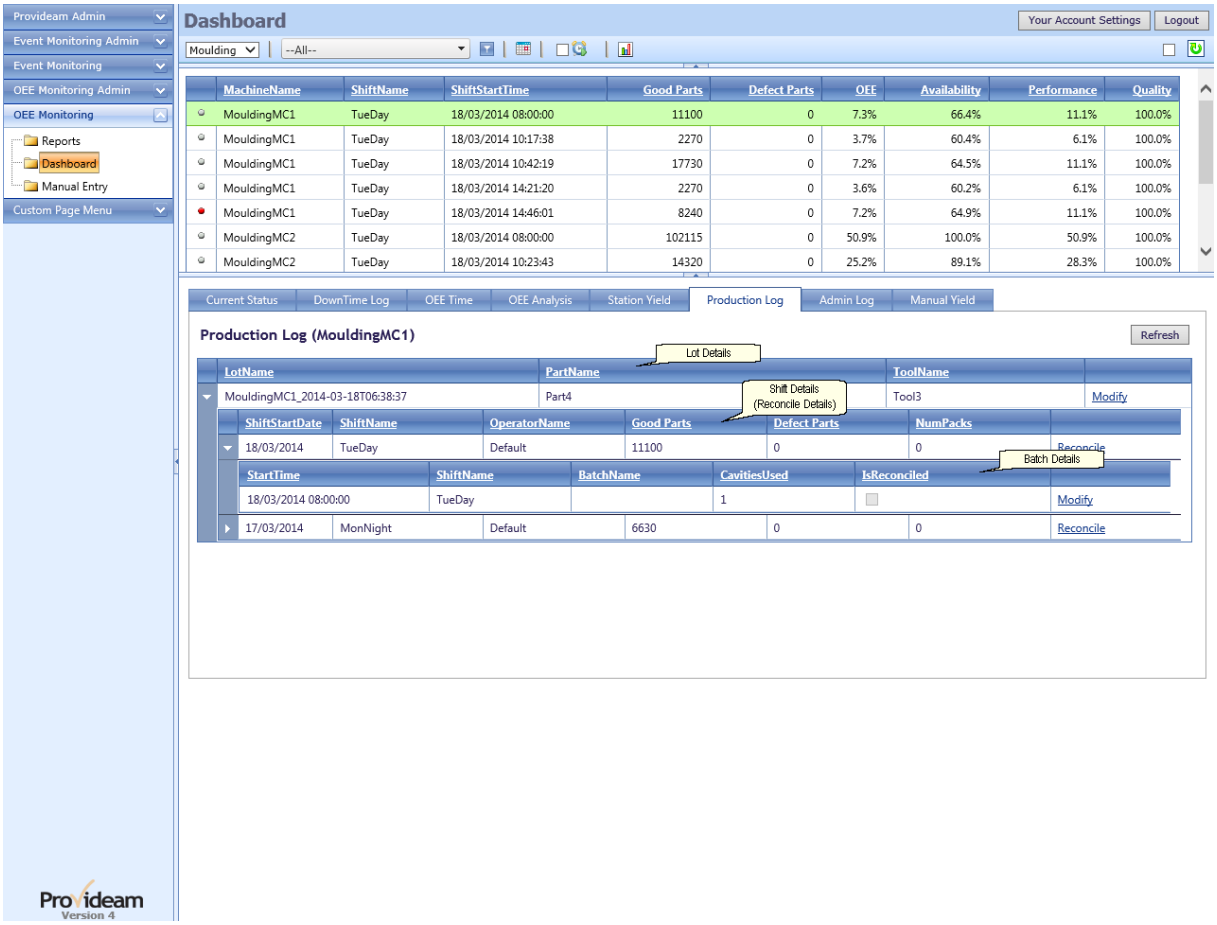


Fig. OEE Dashboard - Production Log Pane - Expanded

The Production Log Pane allows you to Reconcile actual, quality assured, good production against the potentially good production. By Potential Good we mean Throughput (every Part produced - Good or Defect). This feature is essential for Machines where it is impossible to determine whether a Part is Good or Defect until it is inspected after it has been produced. A typical example of this type of Machine is a Moulding Machine, where it is usually difficult to inspect products, automatically, in real-time.

Depending on how the Machine is configured, see Machine Admin, you can Reconcile production By Lot or By Shift.

- By Lot - Actual (Reconciled) Good and Defects are averaged over the entire Lot. This may occur over several Shifts.
- By Shift - Actual (Reconciled) Good and Defects are averaged over the Shift for the period of the selected Lot.

The Actual Good Quantity is entered in NumPacks (Number of Packs). NumPacks is the number of packed (Quality Assured) Parts in standard pack units. For example if Parts

are packed in cases of 1000 Parts, the PackQty (Pack Quantity) would be 1000. When entering the Actual Good Quantity you enter the NumPacks, ie the number of Packs of 1000 Parts. So if the NumPacks is 3 the Actual Good is 3000.

When entering the NumPacks value there are two options; 1) the actual number of NumPacks for the period, 2) the sequence number of NumPacks reached at the end of the period. Some companies operate a system where each packed unit, for a Lot, is given a sequence number 1,2,3... Provideam automatically calculates the actual number of NumPacks from the sequence number. The sequence number starts at 1 for each new Lot.

The figure above shows the Lot/Batch data for the MouldingMC2 Machine for a particular Lot. The Lot Details record shows the data related to the Lot - Lot Name, Part, Tool etc. The Modify hyperlink opens a page which allows you to modify these details. Modifying the Lot data here will update all related Batch records.

In the figure above you will see one related Reconcile Details record. A unique Reconcile Details record is shown for each Shift that the Lot is run over. In this case the Lot only ran on one Shift, therefore you only see one Reconcile Details record. This allows you to Reconcile on a Shift by Shift basis. You will be able to distinguish between Shifts by the ShiftName and ShiftStartDate Fields. The Reconcile hyperlink opens a page which allows you to Reconcile production data for the selected Shift.

The final record is the Batch Details record. Each Lot is comprised of one or more Batch records. The Batch records allow you to modify certain production parameters. For example you may start production using 12 Cavities in a Mould but have to close 2 Cavities half way through the Lot for quality reasons. In this instance the first Batch would have 12 Cavities and the second, created at the time you closed the 2 defective Cavities, would have 10 Cavities.

NOTE: Items such as Lot Name or Batch Name may not be visible/enabled in this section. Please refer to the Display Settings in the Machine Admin Section.

The Production Log Pane - Modify Lot Details

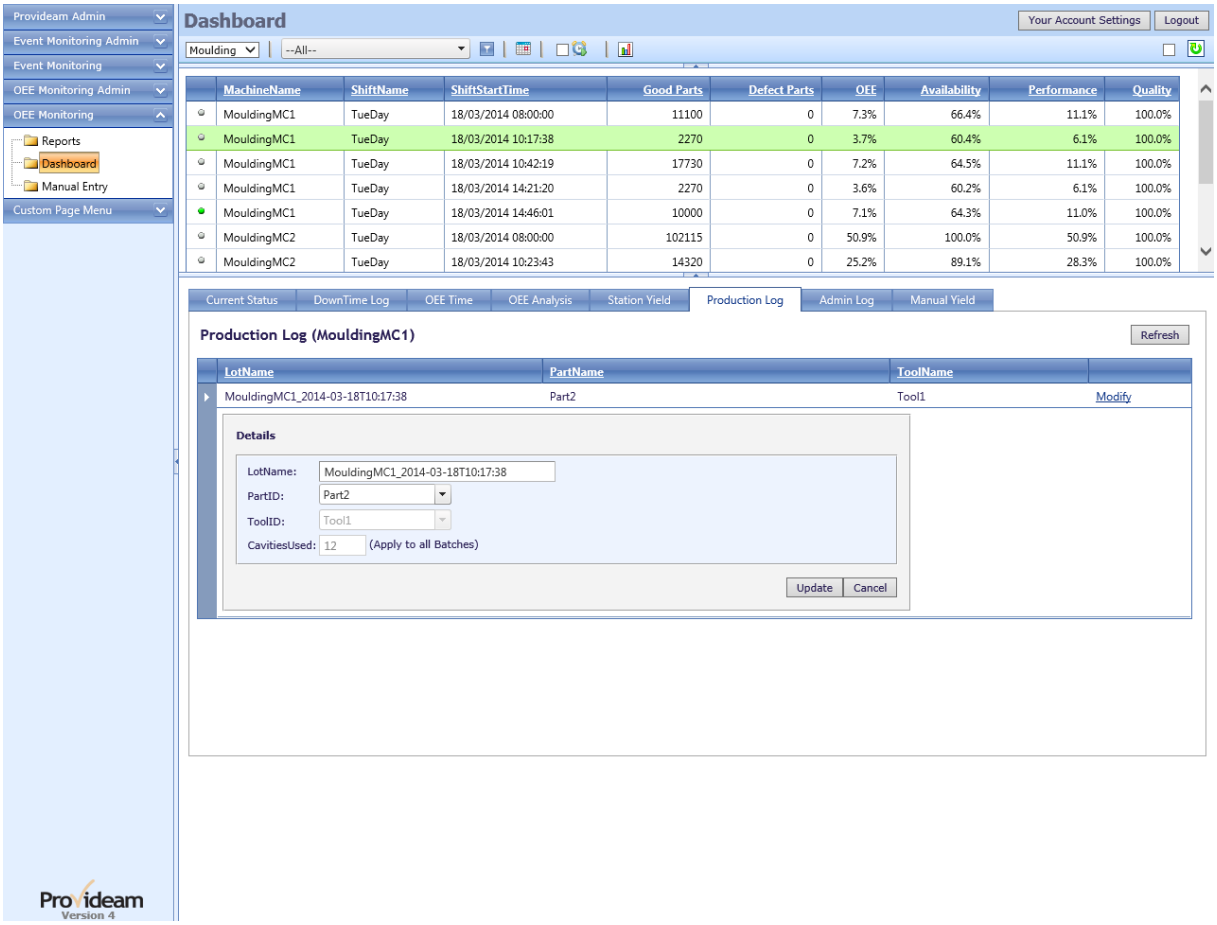


Fig. OEE Dashboard - Production Log Pane - Modify Lot Details

- The **Lot Name** text box allows you to set the name of the Lot Name for the Lot.
- The **PartID** selection box allows you to select a Part for the Lot. Only Parts which are related to the Machine and related to a Tool which can run on the Machine are available for selection.
- The **ToolID** selection box allows you to select a Tool for the Part. Only Tools which are related to the Part and to the Machine are available for selection.
- The **Update** button allows you to save changes to the database.
- The **Cancel** button allows you to cancel any edits and return to the previous page.

The Production Log Pane - Modify Batch Details

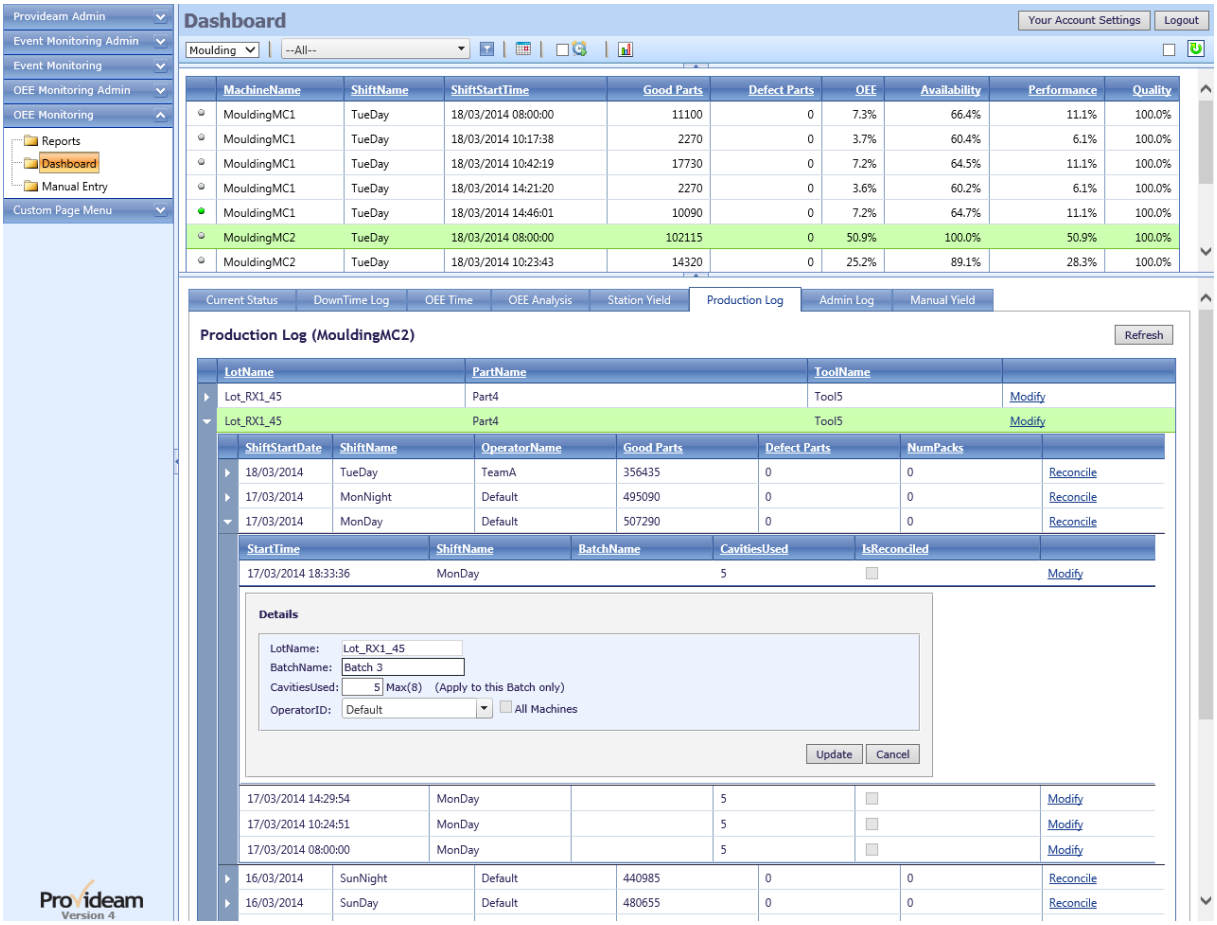


Fig. OEE Dashboard - Production Log Pane - Modify Batch Details

- The **Batch Name** text box allows you to set the name of the Batch Name for the Batch.
- The **CavitiesUsed** text box allows you to set the actual number of cavities used for the Batch.
- The **OperatorID** selection box allows you to select a Operator for the Batch.
- The **All Machines** check box allows you to set the selected Operator for all Machines in the Area for the selected Shift.
- The **Update** button allows you to save changes to the database.
- The **Cancel** button allows you to cancel any edits and return to the previous page.

The Production Log Pane - Reconcile Data

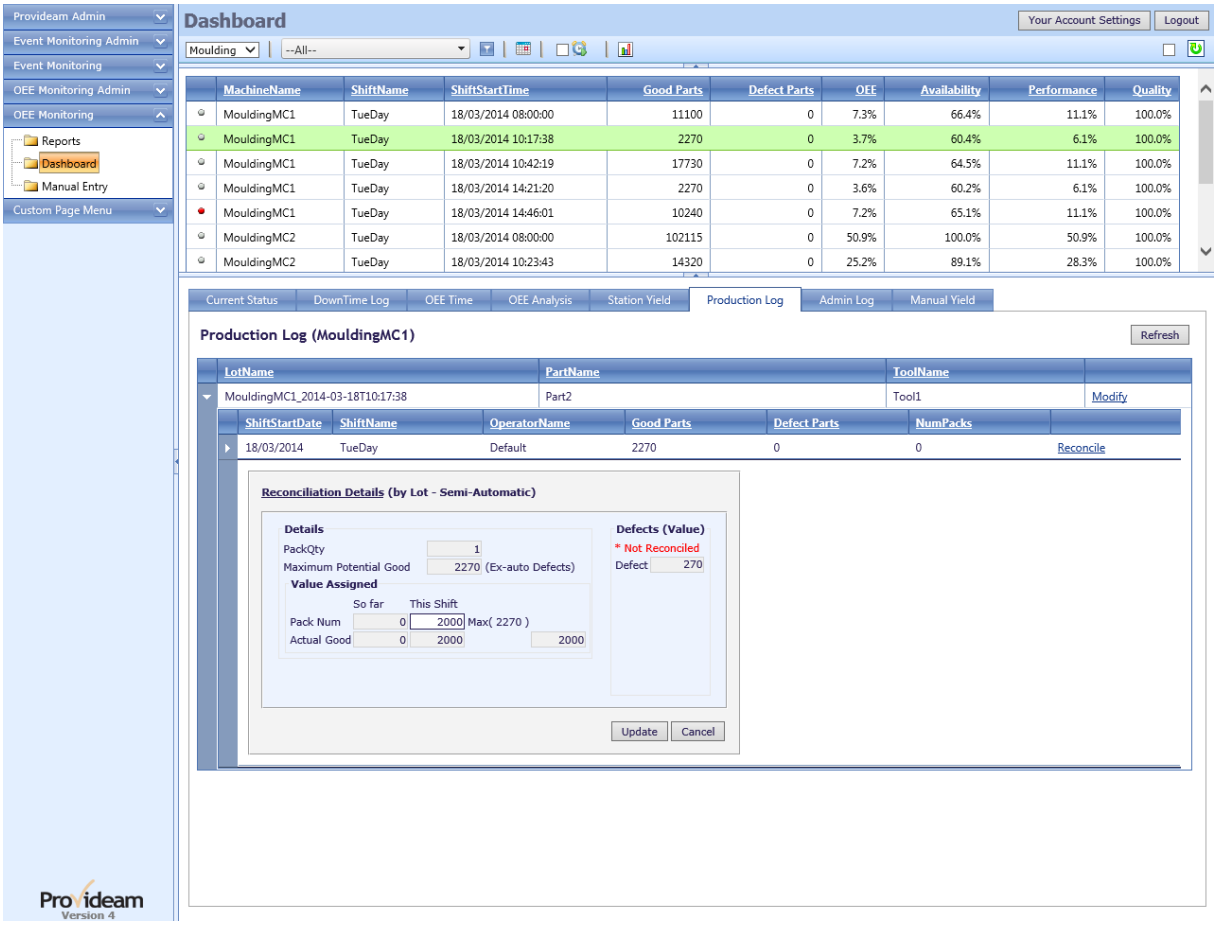


Fig. OEE Dashboard - Production Log Pane - Reconcile Data

Details

- The **PackQty** text box shows the number of Parts in a standard Pack unit. See Area Admin.
- The **Potential Good** text box shows the total number of Parts produced, excluding any Defects which were counted automatically..
- The **Pack Num** text box allows you to set the number of Parts produced during the production run.
- The **Actual Good** text box shows the actual number of Good Parts the Pack Num represents..

Defects (value)

- The Defect text boxes allows you to enter the actual number of Defects record for each Defect Type. When you enter the Pack Num value the difference between the Actual Good and the Potential Good is automatically entered as the Default Defect value. Similarly as you enter a value in each other Defect text box the Default Defect value is reduced by that amount. (Note: To use the Reconciliation feature you must set a Default Defect - See Machine Admin).

- The **Reconcile** button allows you to distributes the Good and Defect values over the Yield records for the Lot in the database.
- The **Cancel** button allows you to cancel any edits and return to the previous page.

The Admin Log Pane - Mode Data

The Admin Log Pane is a maintenance tool which helps an Administrator to analyse the raw production data collected from a Machine. The Admin Log Data is presented in a manner similar to the structure in which it is logged to the database. The Database Keys are shown and can be used, with reference to the database, to investigate data issues.

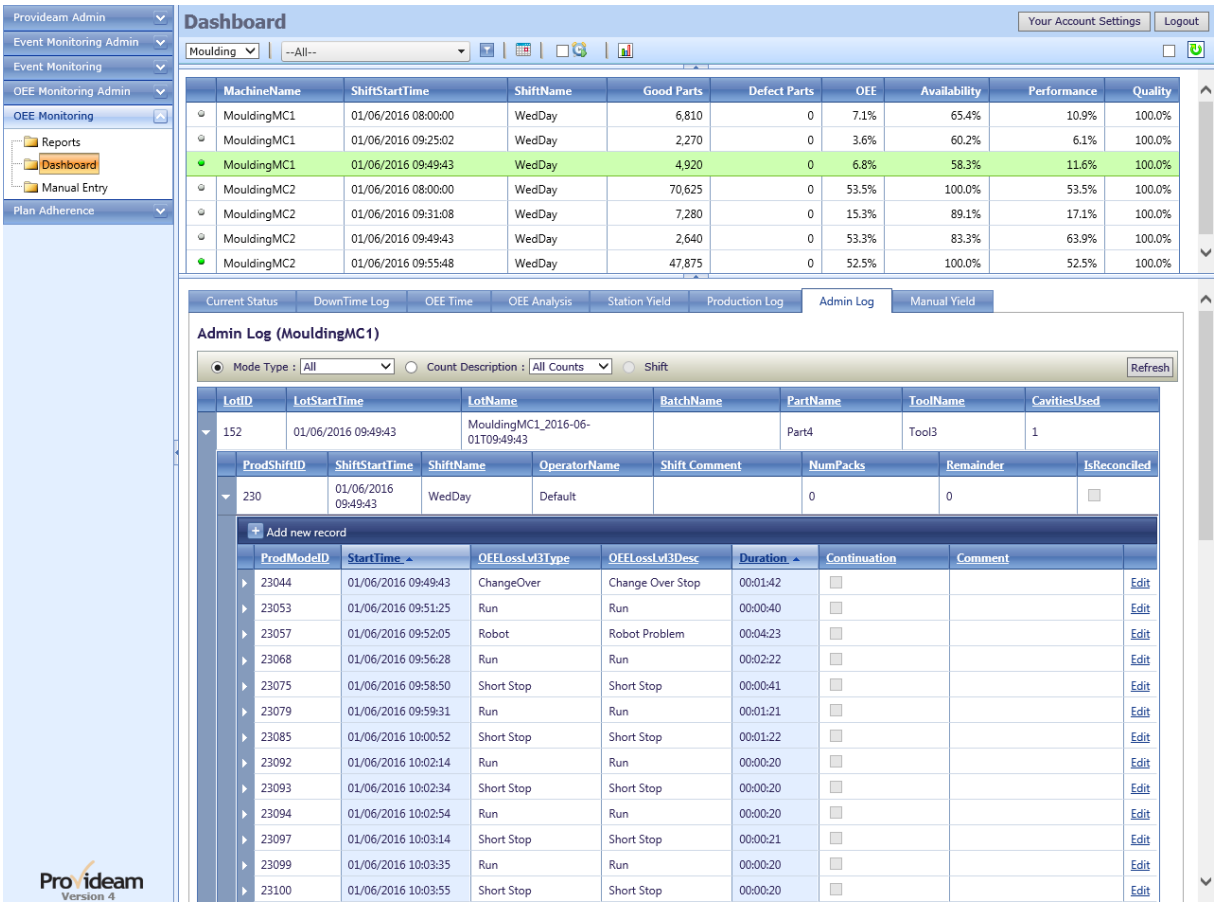


Fig. OEE Dashboard - Admin Log Pane - Mode Data

- The **Log Type** option buttons allow you to choose which type of data will be returned. The options are; *Mode Type* and *Count Description* and *Shift*.
- The **Mode Type** selection box allows you to limit the Mode data returned. The options are; *All*, *Run Only*, *.All Stops Only*, *Short Stops* and *Long Stop*.

- The **AddNew record** button enables you to add a new Mode records. This is a useful feature which allows you to correct data errors.
- The **Edit** hyperlink enables you to edit a Mode records. This is a useful feature which allows you to correct data errors.

The Admin Log Pane - Mode Data - Modify

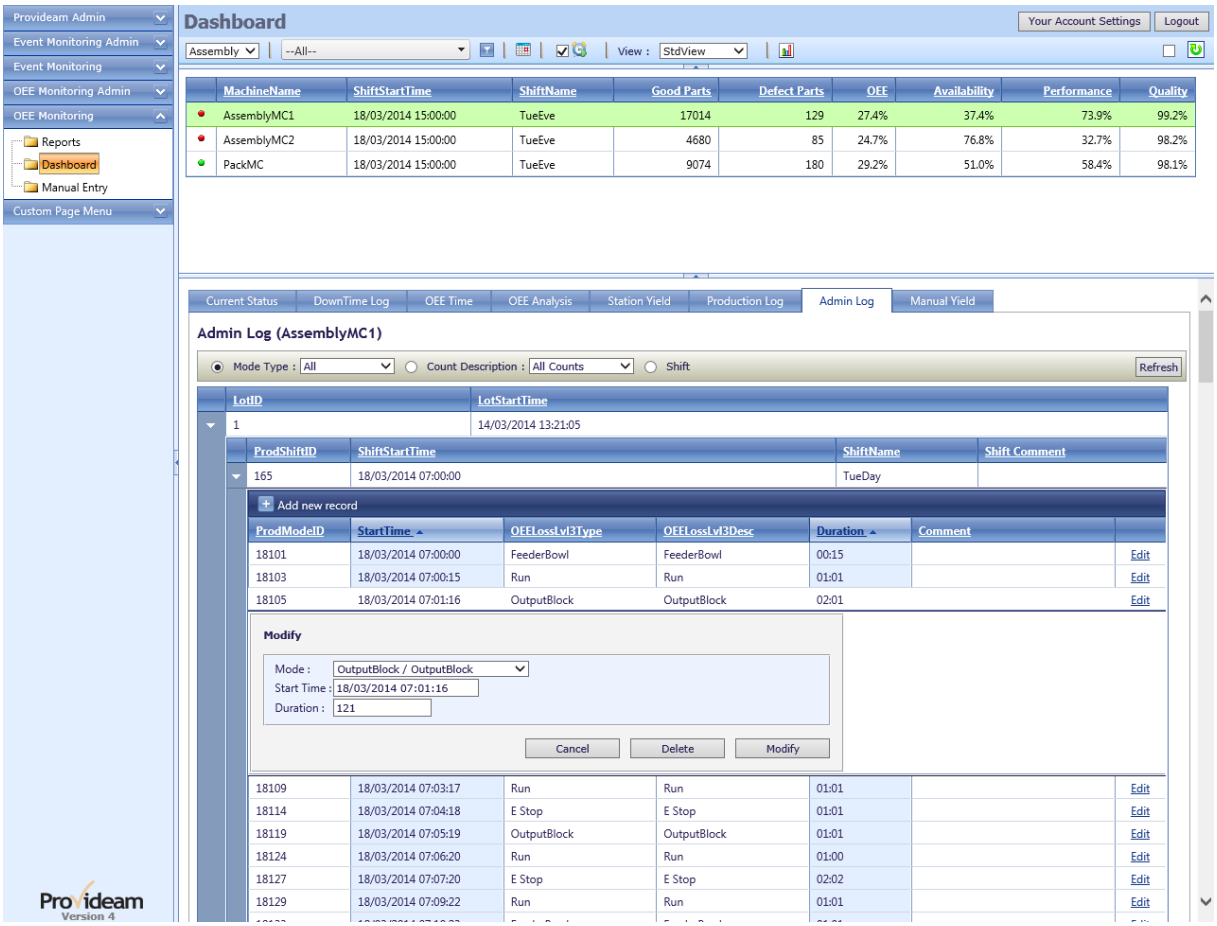


Fig. OEE Dashboard - Admin Log Pane - Mode Data - Modify

- The **Mode** selection box allows you to set the required Mode type.
- The **Start Time** text box allows you to set the Mode Start Time.
- The **Duration** text box allows you to set the Mode Duration in seconds.
- The **Cancel** button cancels the edits and returns to the previous screen.
- The **Delete** button allows you to delete the selected Mode record.
- The **Modify** button allows you to save your changes to the selected Mode record.

WARNING: These modifications cannot be undone. Ensure that access to these screens is only available to trained users.

The Admin Log Pane - Yield Data

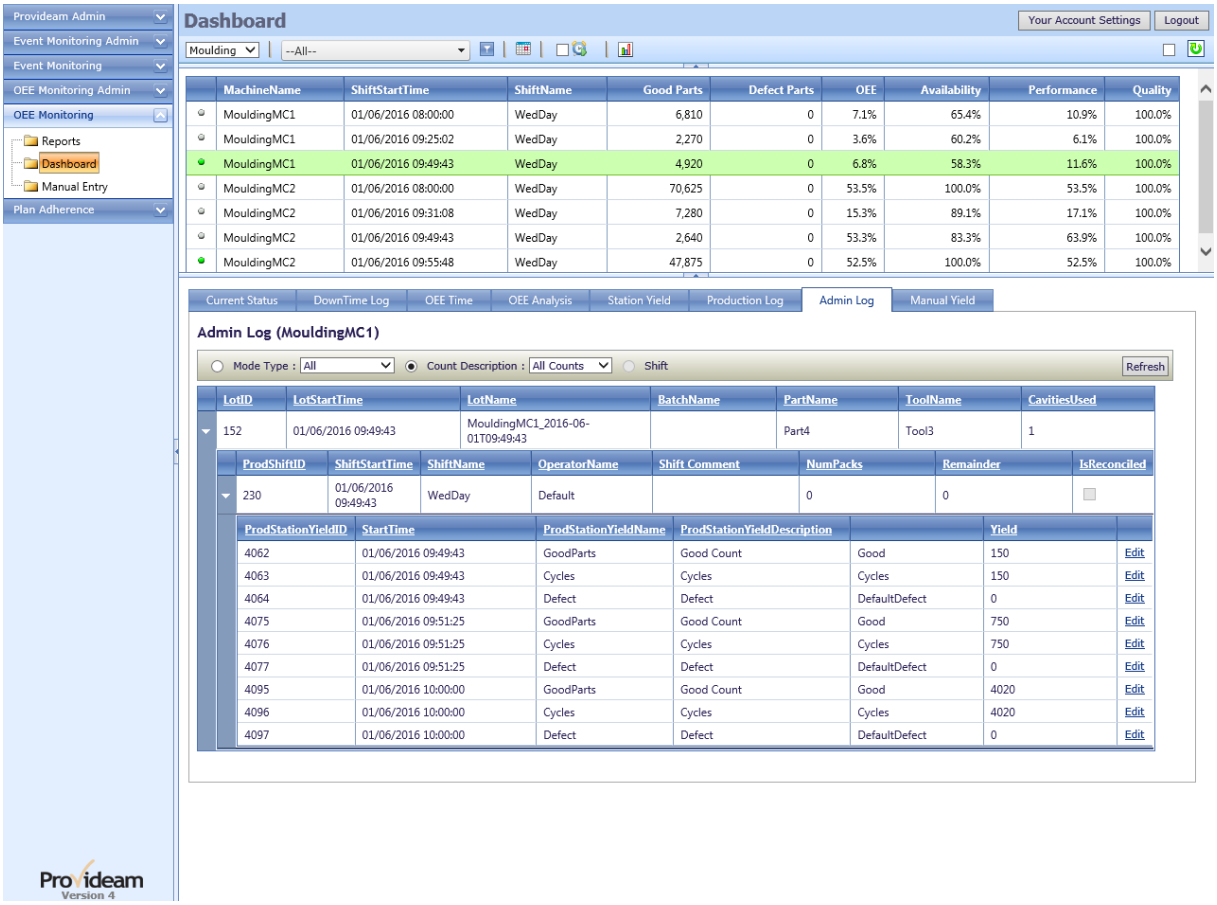


Fig. OEE Dashboard - Admin Log Pane - Yield Data

- The **Count Description** selection box allows you to limit the Yield data returned. You can limit the data to each Station Yield Count you defined in the Machine Admin.
- The **Edit** hyperlink enables you to edit a Yield value. This is a useful feature which allows you to correct data errors.

The Admin Log Pane - Yield Data - Modify

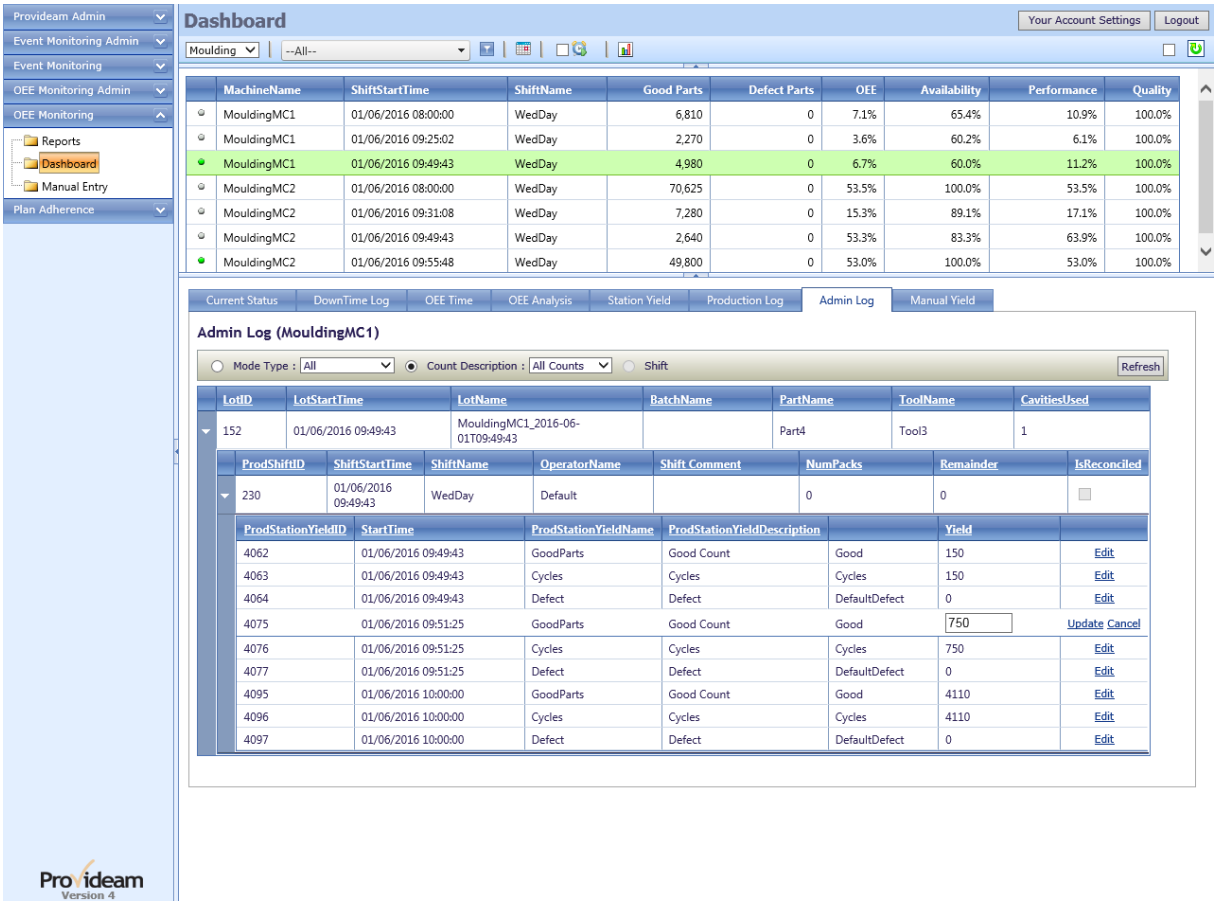


Fig. OEE Dashboard - Admin Log Pane - Yield Data - Modify

- The **Yield** text box allows you to set the required Yield value for the record.
- The **Update** button saves the change to the database. Note, the OEE Monitoring Service will over write any changes you make to the current record. Wait until the data is not current before updating.
- The **Cancel** button cancels the edits and returns to the previous screen.

The Admin Log Pane - Lot by Shift Data

The Lot associated with the selected record in the upper table is displayed. The Lot is broken down by Shift.

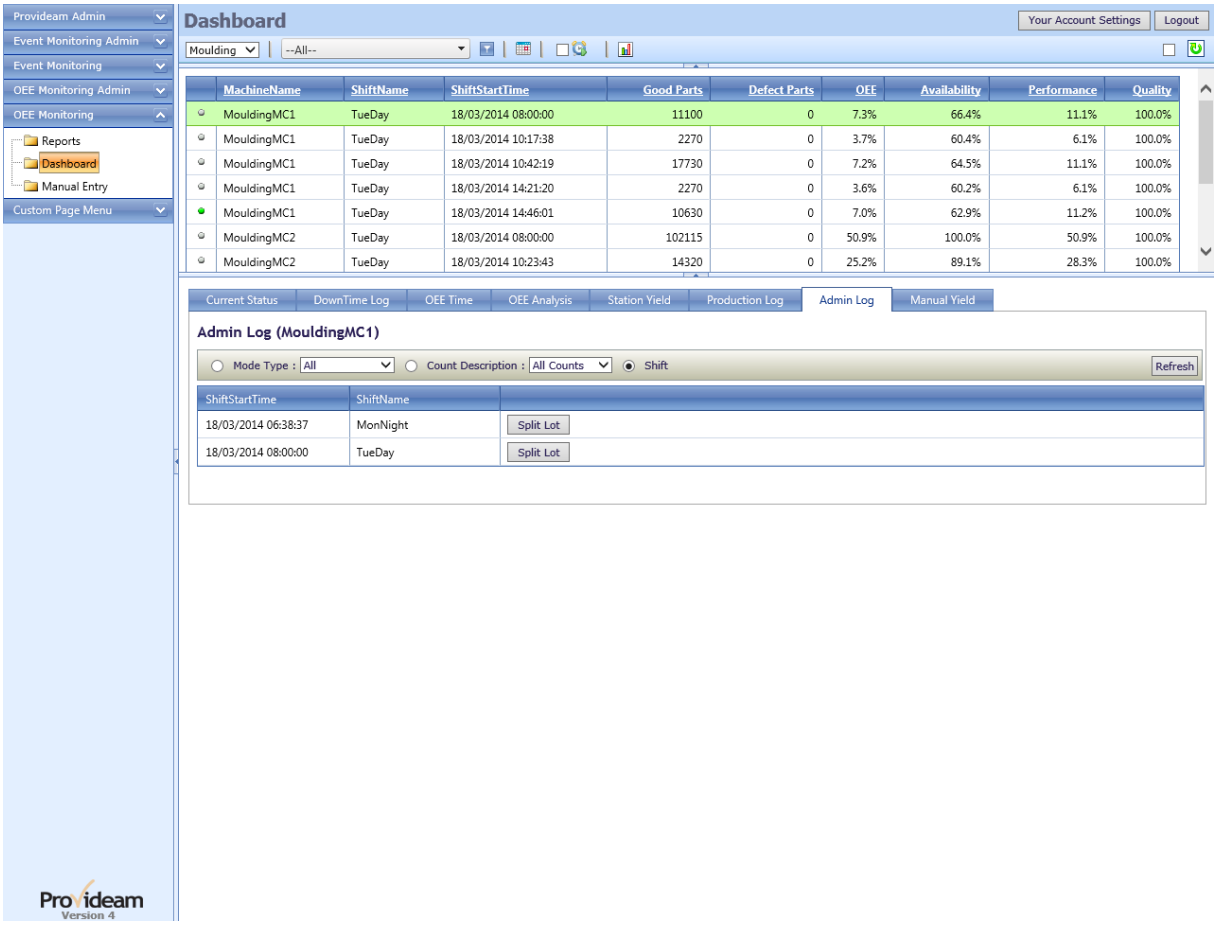


Fig. OEE Dashboard - Admin Log Pane - Lot Shifts Data

- The **Split Lot** button opens the pane which allows you to Split the Lot at your selected time during the Shift you selected.

The Admin Log Pane - Lot/Shift Split

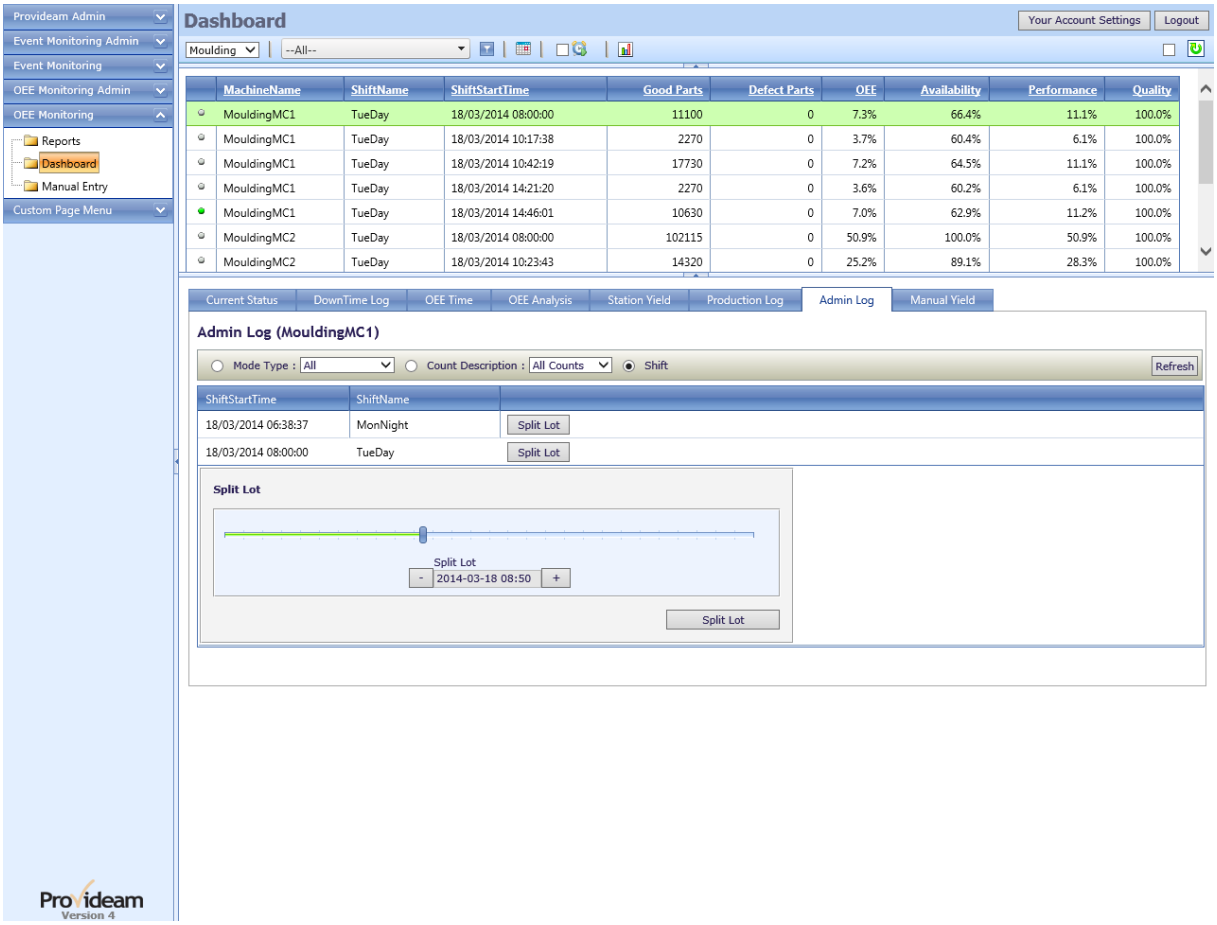


Fig. OEE Dashboard - Admin Log Pane - Lot/Shifts Split

- The **Split Lot** slider control allows you to select the time at which the Lot will be divided.
- The - button allows you to decrement the Split Lot time by 1 minute.
- The + button allows you to increment the Split Lot time by 1 minute.
- The **Split Lot** button causes the selected Lot to be divided into two Lots at the selected time.

The Manual Yield Pane

The Manual Yield Pane allows you to include manually counted Good Parts / Defects to the data collected automatically for a Machine. This is useful in the case of a Machine which can be monitored for Downtime automatically but for which there is no practical way of capturing yield data.

Before using this pane you must set the **Tag Ref** value of a number of Station Yield types to *DB_Manual* in the OEE Monitoring Administration section.

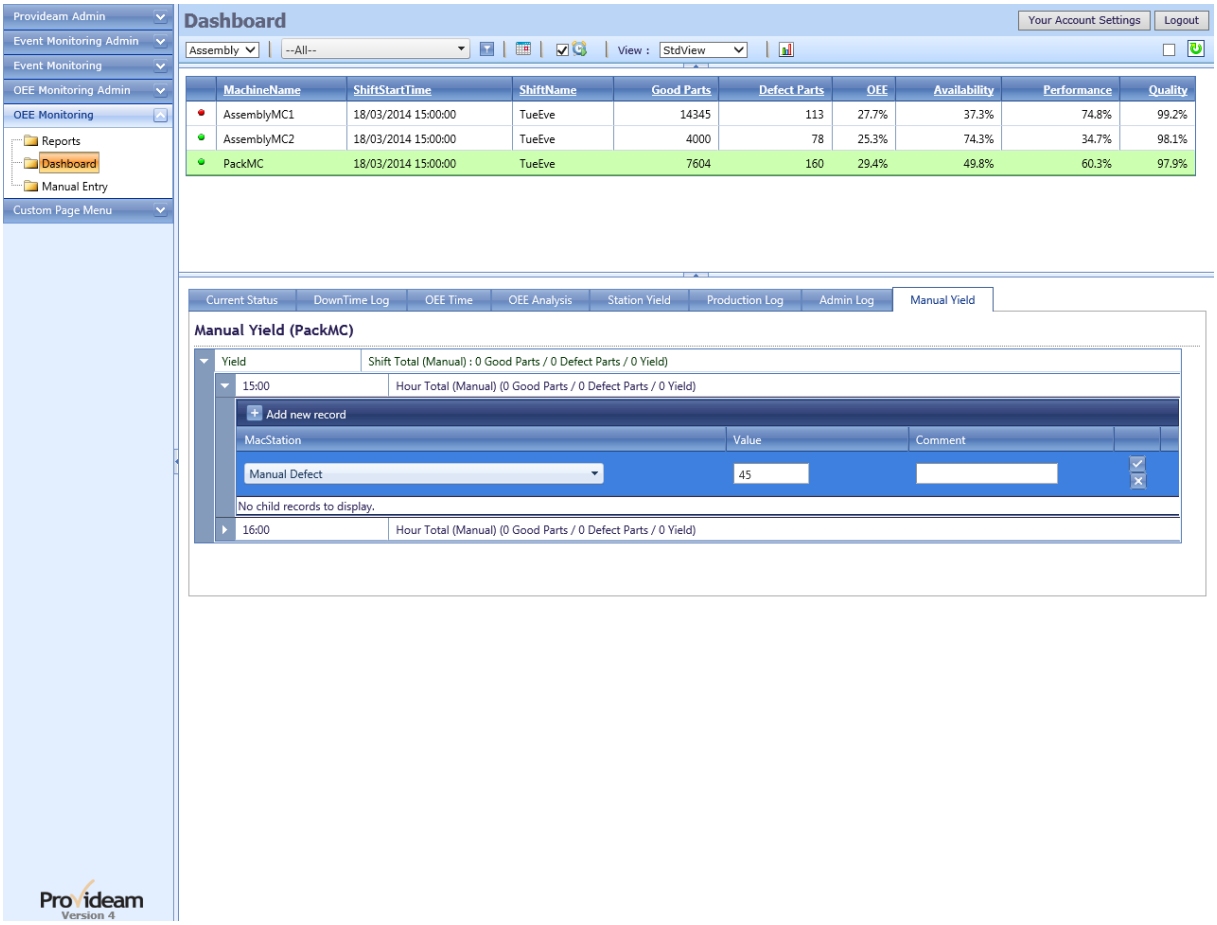


Fig. OEE Dashboard - Manual Yield Pane

- The **Add new record** link allows you to create a new Yield record.
- The **MacStation** selection box allows you to select the yield type from the list created by the Provideam Administrator in the Machine Station Admin section of Provideam.
- The **Value** text box allows you to enter the value of the yield.
- The **Accept** icon button allows you to save the new yield record.
- The **Cancel** icon button allows you to cancel the yield record entry.

7.6.2.3 *OEE Manual Entry*

It is not always possible to collect data automatically from a machine. To facilitate the analysis and reporting of productivity data related to 'manual' machines we have developed the OEE Manual Entry Page.

The user can enter manual data during or after the shift. The two most common scenarios are;

1) Operators collect production data on paper shift logs. These logs are collected after the shift and a data entry operator enters the data into Provideam

2) Operators enter production data directly in to the Provideam Manual Entry Page as the shift develops.

The data is stored in exactly the same way as automatically collected data and the consequently all the reporting features of Provideam will work with 'manual' machines.

The Overall Data Table shows the headline details for all shift records created on the selected days. The Table can be filtered by Area, Machine and Date.

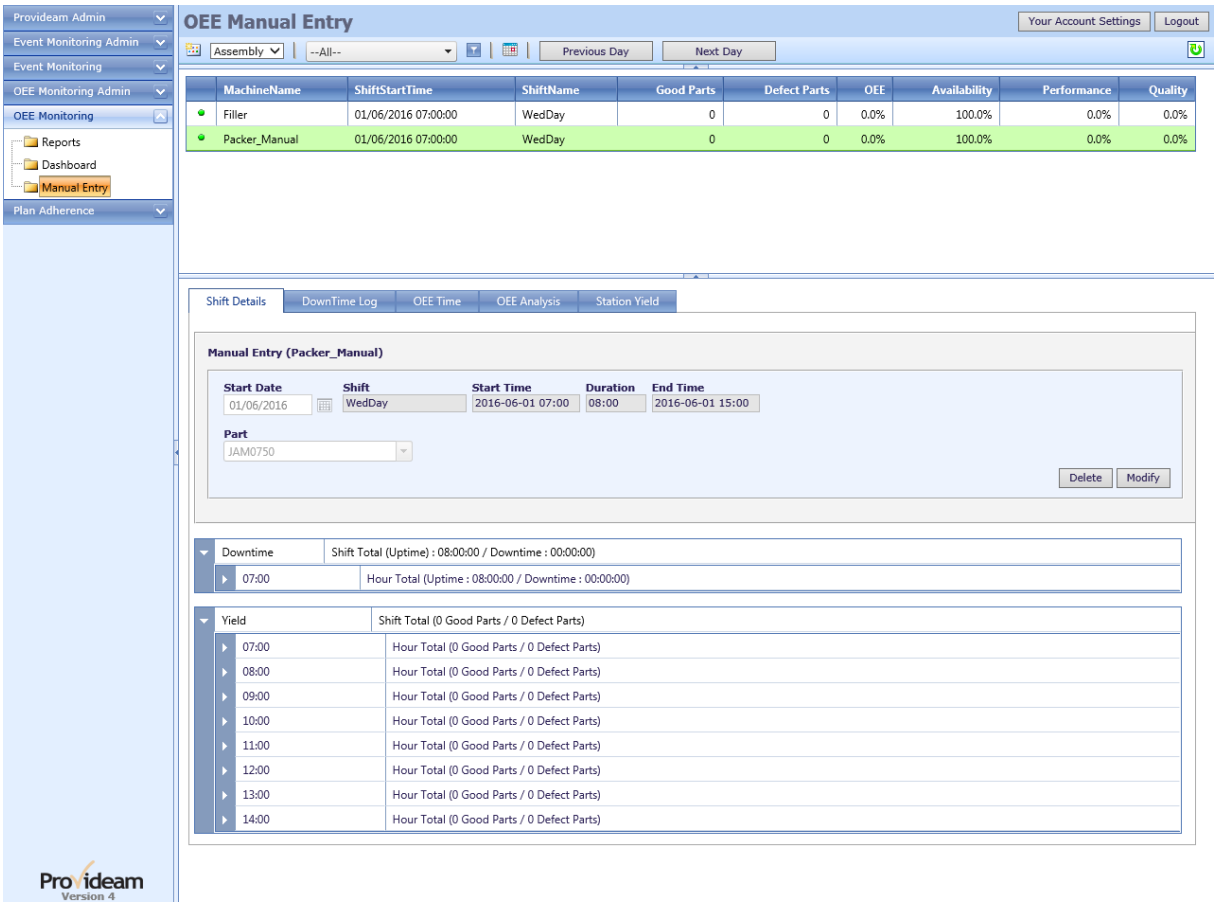


Fig. OEE ManualEntry - Overall(Upper) Data Table

The Overall Data Table Controls;

- The **AddNew** button allows you to create a new Shift.
- The **Area** selection box allows you to filter the Table by Area.
- The **Machine** selection box allows you to filter the Table by Machine.
- The **Show Date Selection** button opens a date picker calendar window.
- The **Previous Day** button allows you to move to the previous day.
- The **Next Day** button allows you to move to the next day.
- The icon button refreshes the Overall Data Table.
- Clicking on a record in the Overall Data Table updates the detail panes with data related to the selected record.

Note: By default the Shift Details Pane will only show the time and date of the shift. The Provideam Administrator may configure the Machine Details in the Machine Admin section of Provideam to also display LotName, PartName, ToolName, CavitiesUsed, BatchName, Material and OperatorName. Thus in more complex situation it is possible for the User to track details of Lot, Part etc. In the figure above the Machine has been configured to allow PartName to be controlled by the User.

The Add New Shift Pane

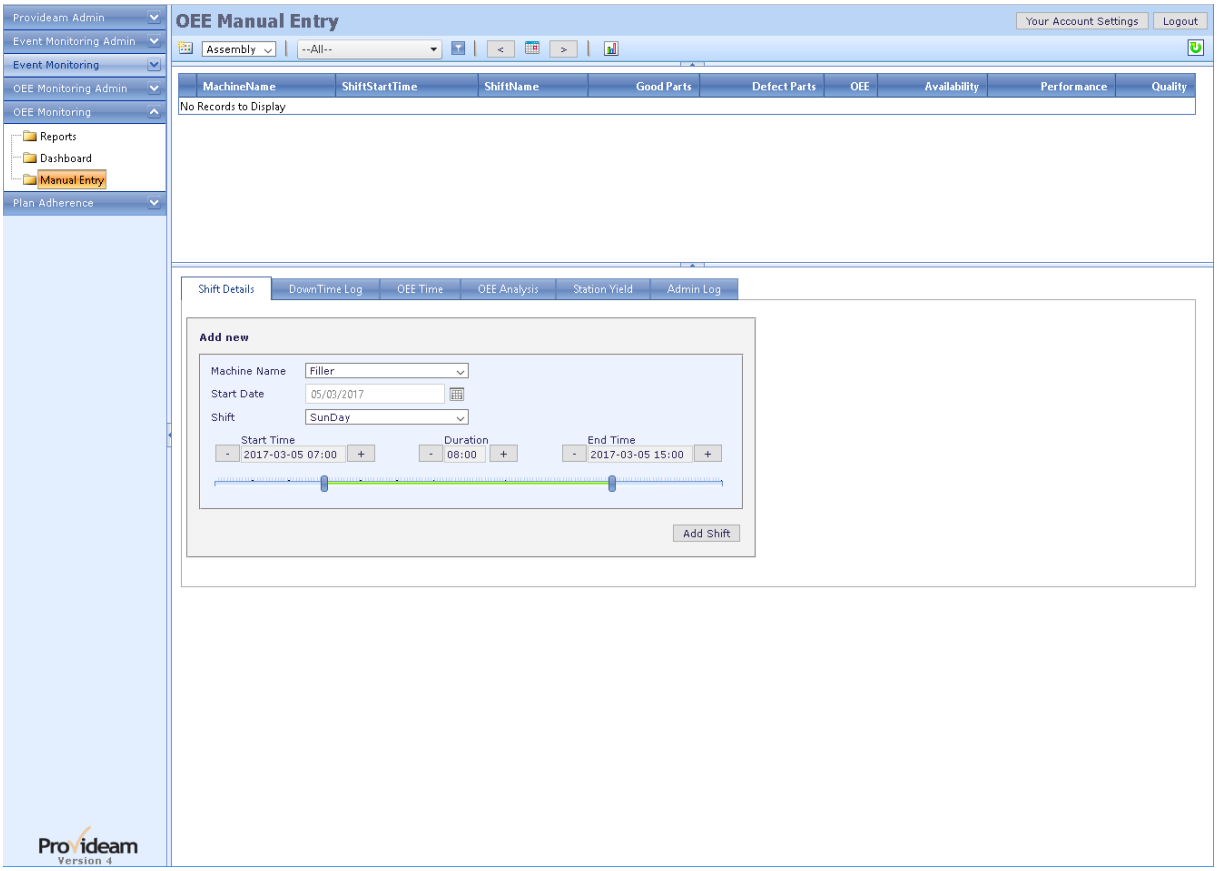


Fig. AddNew Shift Pane

The AddNew Shift Pane Controls;

- The **Machine Name** selection box allows you to select a 'manual' Machine from the selected Area.
- The **Start Date** box allows you to select, using the calendar, the Shift Start Date.
- The **Shift** selection box allows you to select one of the available Shifts for the selected Shift Start Date.
- The **Start Time** box allows you to set, using the -/+ buttons, the Shift Start Time. The Start Time is adjusted in increments of 1min. The default Start Time is the time set in the Shift Admin for this Shift.
- The **Duration** box allows you to set, using the -/+ buttons, the Shift End Time. The End Time is adjusted in increments of 1min. The default Duration is the time set in the Shift Admin for this Shift
- The **End Time** box allows you to set, using the -/+ buttons, the Shift End Time. The End Time is adjusted in increments of 1min. The default End Time is the default Shift Start Time plus the default Shift Duration

- The **Shift** slider control allows you to select the Start Time and End Time of the Shift. The Start and End Time are adjusted in increments of 5 minutes
- The **Add Shift** button creates a new Shift with the selected details.

The Shift Details Pane.

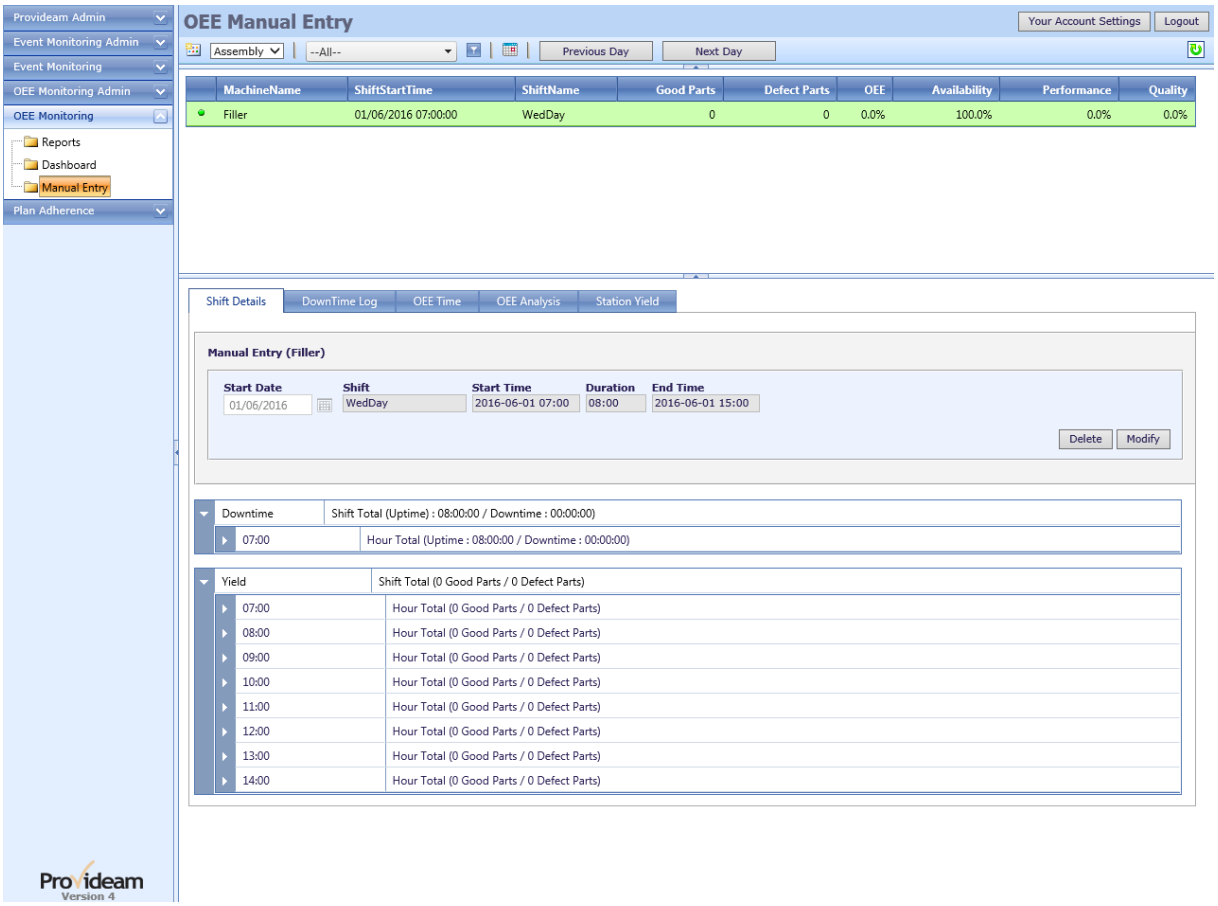


Fig. Shift Details Pane

The Shift Details Pane allows the user to edit the details of the selected shift.

The Shift Details Pane Controls;

- The **Delete** button allows you to delete the selected Shift.
- The **Modify** button allows you to edit some details of the selected Shift. Primarily the duration, the LotName, PartName etc.

Note:

1) By default the Shift Details Pane will only show the time and date of the shift. The Provideam Administrator may configure the Machine Details in the Machine Admin section of Provideam to also display LotName, PartName, ToolName, CavitiesUsed, BatchName, Material and OperatorName. Thus in more complex situations it is possible for the User to track details of Lot, Part etc. In the figure, OEE ManualEntry - Overall(Upper) Data Table, above the Machine has been configured to allow PartName to be modifiable by the User.

2) The Shift Delete Button can be enabled/disabled in User Group Security

The Shift Details Pane - Adding Downtime Records.

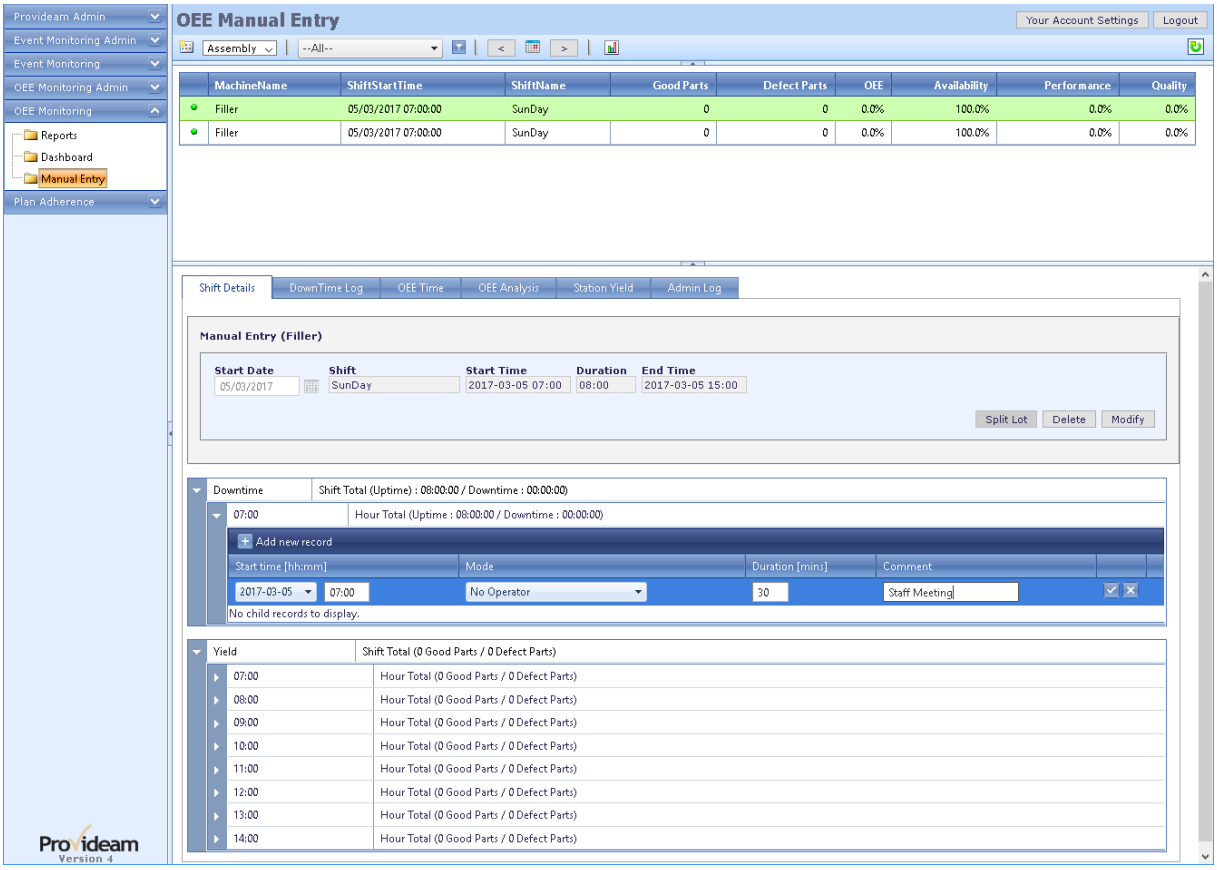


Fig. Shift Details Pane - Add Downtime

The Shift Details Pane - Add Downtime Controls;

- The **Add new record** link allows you to create a new Mode record.

The Downtime Table in the Shift Details Pane is divided into hour long segments or 'buckets'. That is to say there is a record for each hour. To add downtime details to the

Shift you expand the appropriate Hour period and click the **Add new record** link. A pane opens to allow you to enter the details of the downtime.

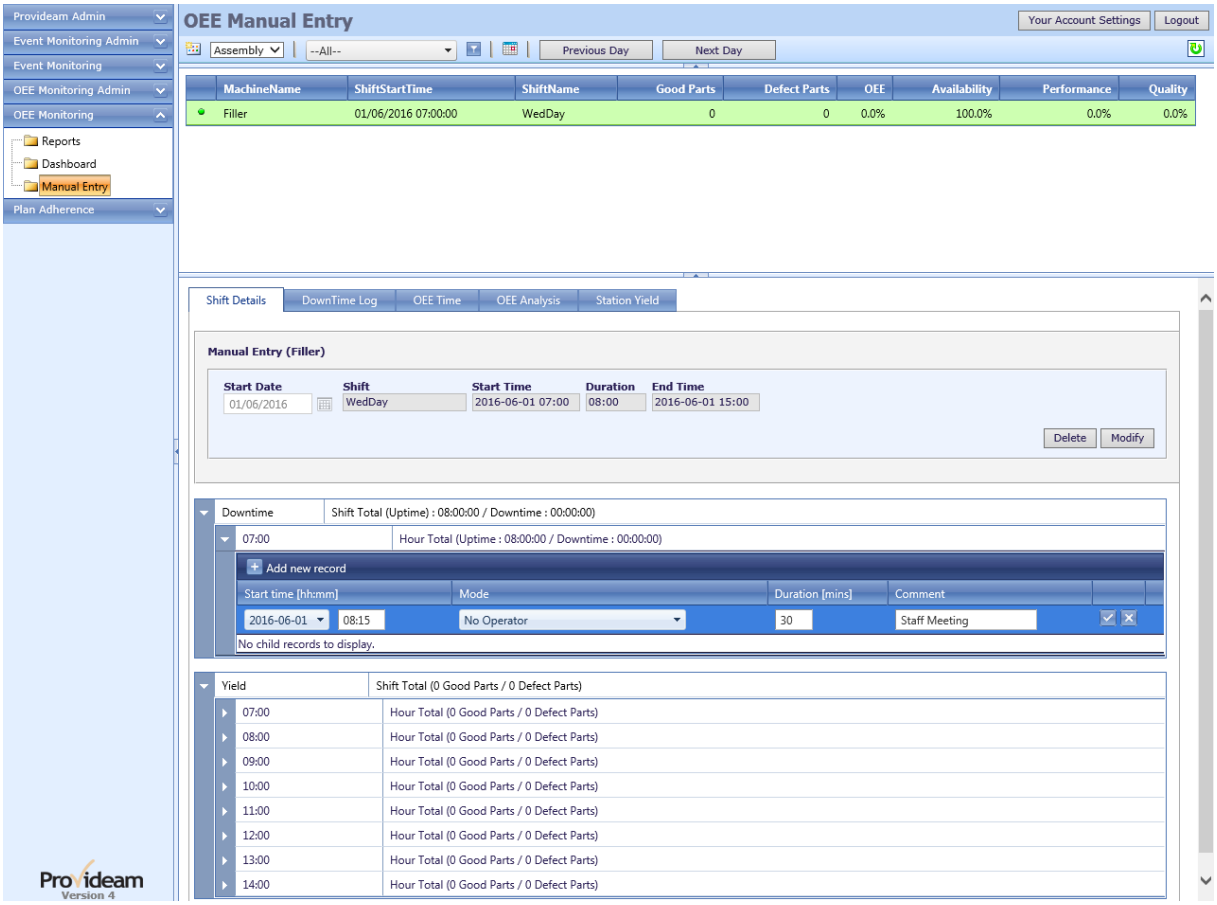


Fig. Shift Details Pane - Insert Downtime

The Shift Details Pane - Insert Downtime Controls;

- The **Start Time** text box allows you to enter the time at which the downtime occurred.
- The **Mode** selection box allows you to select the reason for the downtime from the list created by the Provideam Administrator in the Machine Mode Admin section of Provideam.
- The **Duration** text box allows you to enter the duration of the downtime. If the duration extends beyond the end of the current period, the time will roll-over into the following periods. If the duration extends beyond the end of the Shift, that portion of downtime beyond the end of the Shift will be ignored.
- The **Comment** text box allows you to add a short comment to the downtime record.
- The **Accept** icon button allows you to save the new downtime record.

- The **Cancel** icon button allows you to cancel the downtime record entry.

Note: Provideam will allow you to enter overlapping downtime records as long as the sum of the individual downtimes does not exceed the total time available for the current period. If overlapping downtimes are detected the downtime text will be displayed in red. Overlapping downtimes will not cause a problem for your reports but the sequence will appear incorrect in a downtime log. By modifying the individual downtime records to ensure that they do not overlap you can correct the log.

The Shift Details Pane - Adding Yield Records.

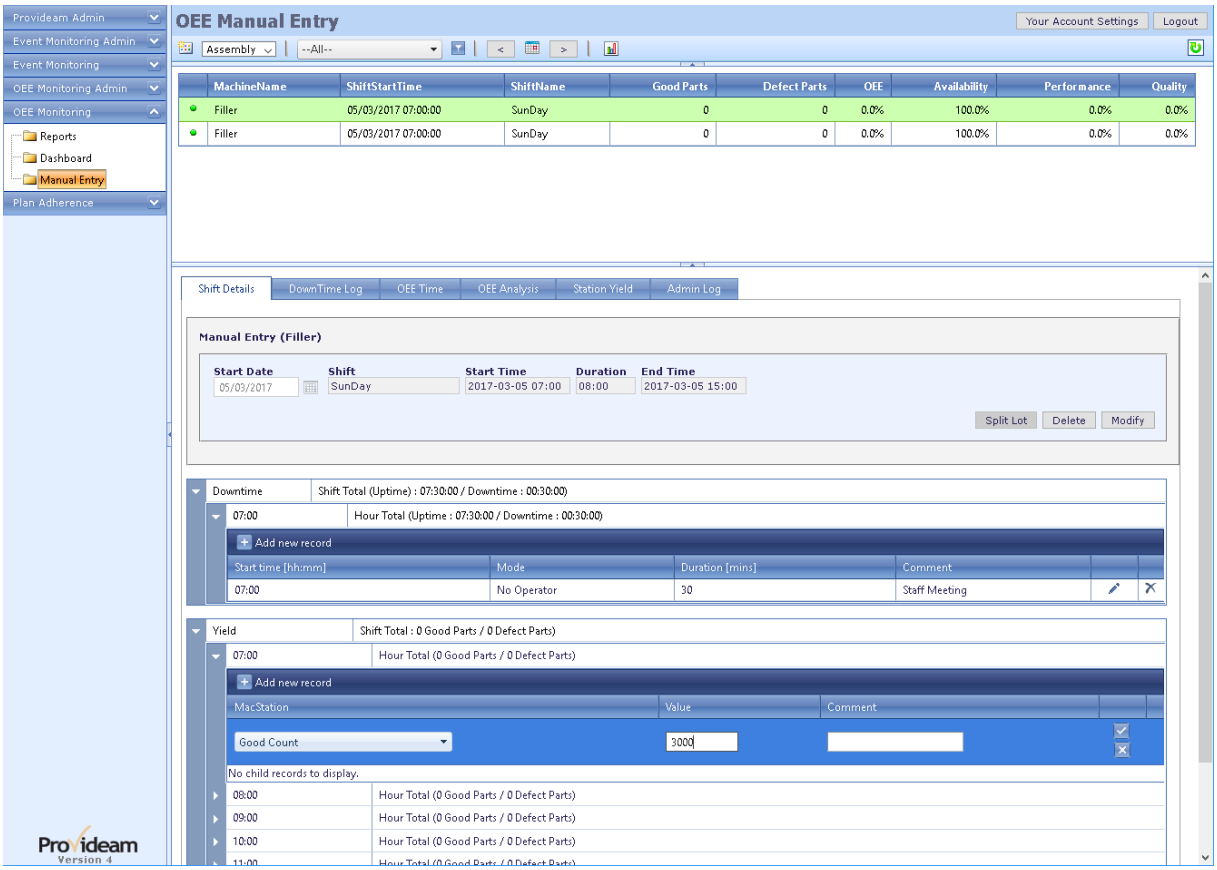


Fig. Shift Details Pane - Add Yield Values

The Shift Details Pane - Add Yield Controls;

- The **Add new record** link allows you to create a new Yield record.
- The **Refresh** link allows you to refresh the yield data display.

- The **MacStation** selection box allows you to select the yield type from the list created by the Provideam Administrator in the Machine Station Admin section of Provideam.
- The **Value** text box allows you to enter the value of the yield.
- The **Accept** icon button allows you to save the new yield record.
- The **Cancel** icon button allows you to cancel the yield record entry.

The Yield Table in the Shift Details Pane is divided into hour long segments or 'buckets'. That is to say there is a record for each hour. To add yield values to the Shift you expand the appropriate Hour period and click the **Add new record** link. A pane opens to allow you to enter the details of the yield. If the user wishes to monitor production hour by hour then he must enter good/defect yield values hour by hour. However if the user is only interested in looking at the shift as a whole then it is possible just to enter one value for good/defect. If only one good/defect value is entered then it will not be useful to report by hour as all the data will be contained in one hour period and not averaged across the shift.

The Downtime Log Pane

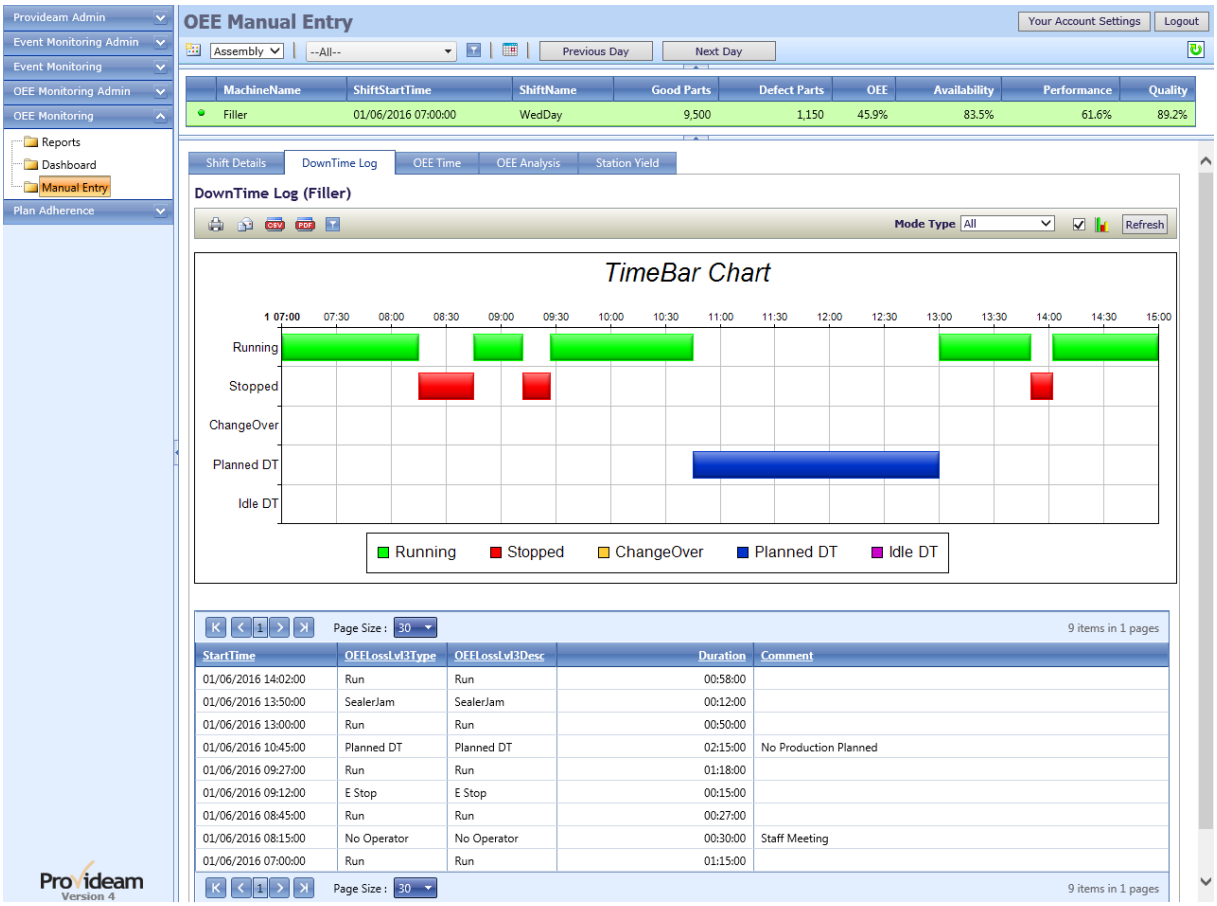


Fig. OEE ManualEntry - Downtime Log Pane

- The **Print** button allows you to print the data.
- The **Email** button allows you to email the data.
- The **Export CSV** button allows you to export the data to a CSV file.
- The **Export PDF** button allows you to export the data to a PDF file.
- The **Mode Type** selection box allows you to limit the log to specific Mode Types. The options are; *All*, *Run Only*,*All Stops*, *Short Stops & Long Stops*
- The check box allows you to enable a graphical display of Downtime Log Data.
- The **Refresh** button refreshes the Downtime Log Pane.

The OEE Time Pane

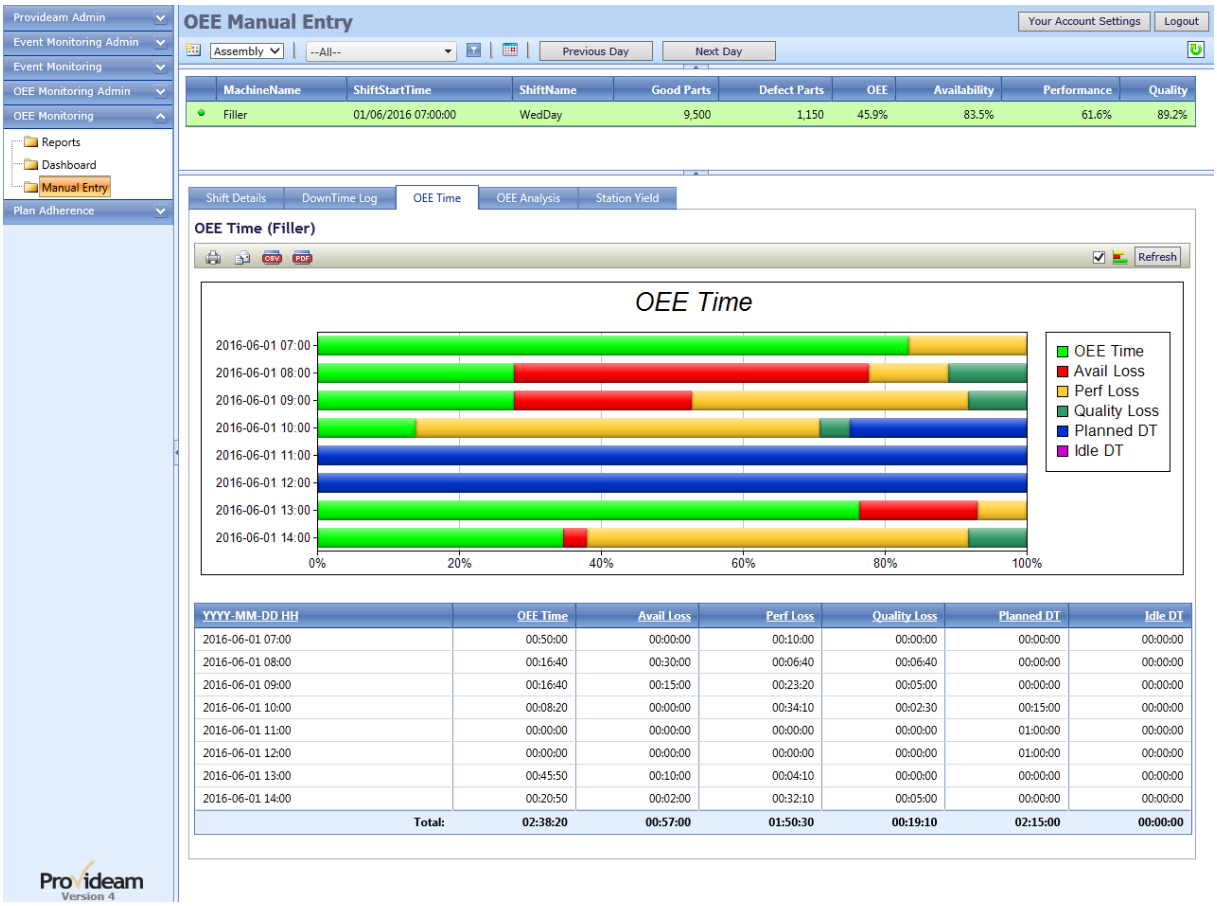


Fig. OEE ManualEntry - OEE Time Pane

- The **Print** button allows you to print the data.

- The **Email** button allows you to email the data.
- The **Export CSV** button allows you to export the data to a CSV file.
- The **Export PDF** button allows you to export the data to a PDF file.
- The check box allows you to enable a graphical display of OEE Time Data.
- The **Refresh** button refreshes the OEE Time Pane.

The OEE Analysis Pane

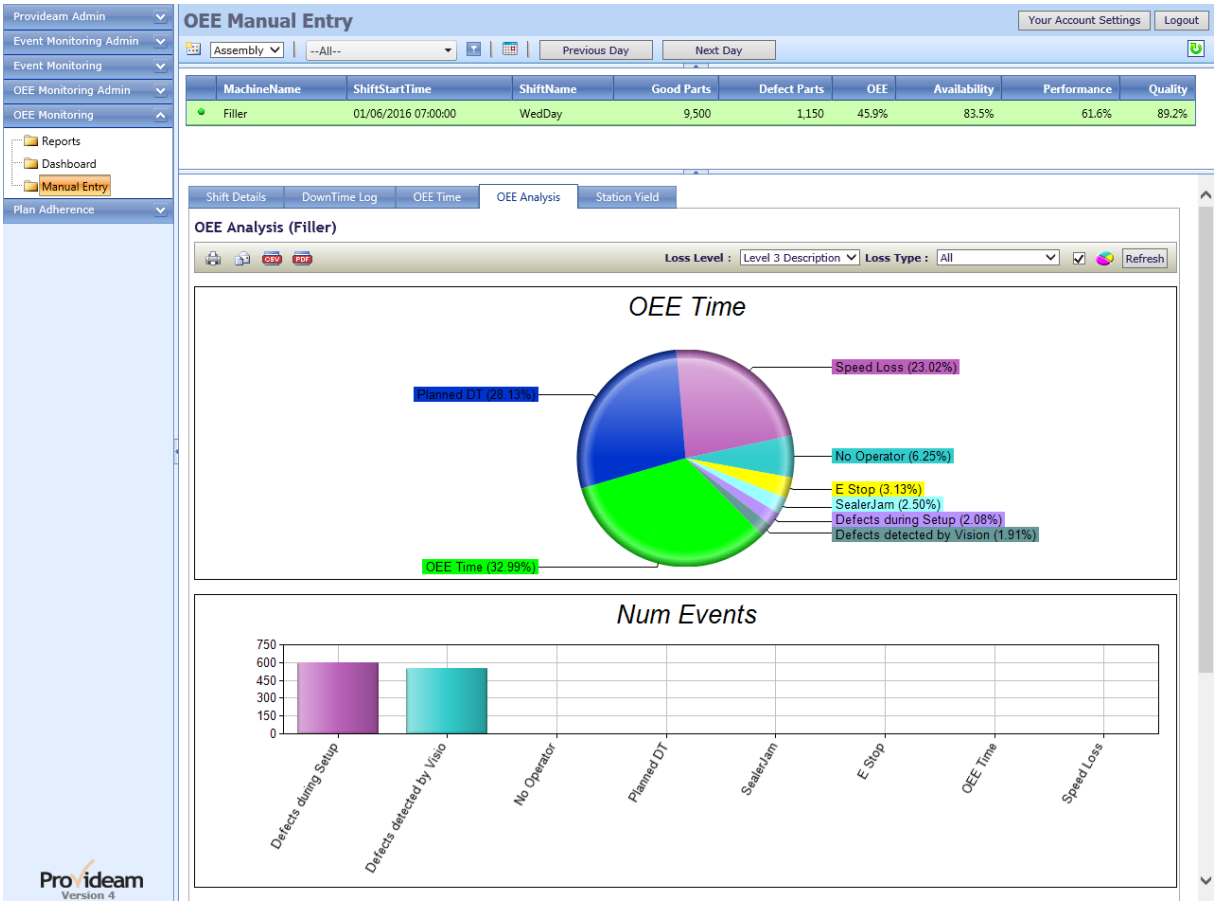


Fig. OEE ManualEntry - OEE Analysis Pane

- The **Print** button allows you to print the data.
- The **Email** button allows you to email the data.
- The **Export CSV** button allows you to export the data to a CSV file.
- The **Export PDF** button allows you to export the data to a PDF file.

- The **Loss Level** selection box allows you to display the data in specific Loss Categories. The options are; *Level 1*, *Level 2*, *Level 3 Type* (Modes grouped by Group Name) and *Level 3 Description* (Modes grouped by Description).
- The **Loss Type** selection box allows you to limit the OEE Analysis Data to specific Loss Types. The options are; *All* (include OEE Time and Planned Downtimes), *All Losses* (exclude OEE Time and Planned Downtimes), *Availability Only*, *Performance Only*, *Quality Only* and *All Stops* (only Downtimes).
- The  check box allows you to enable a graphical display of OEE Analysis Data.
- The **Refresh** button refreshes the OEE Analysis Pane.

The Station Yield Pane

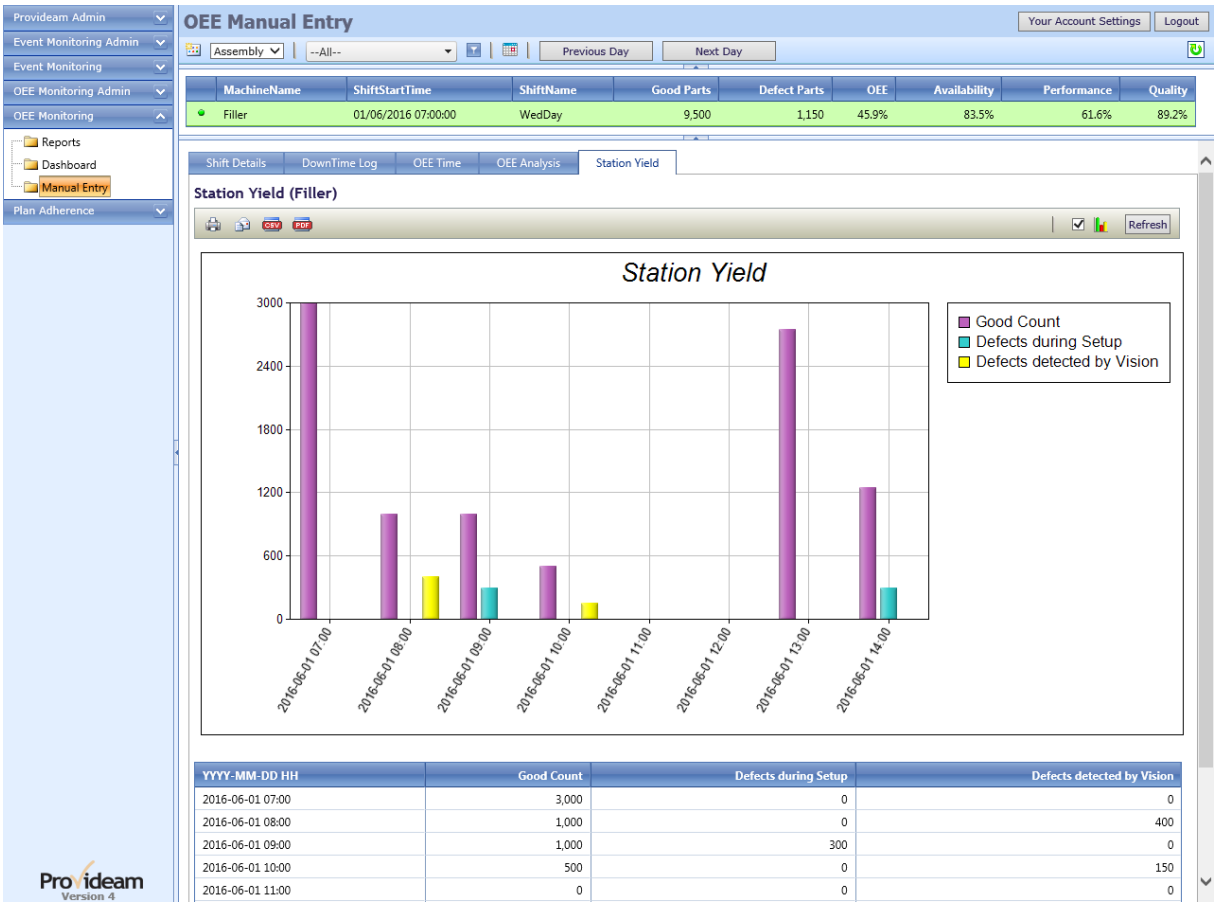


Fig. OEE ManualEntry - Station Yield Pane

- The  **Print** button allows you to print the data.
- The  **Email** button allows you to email the data.

- The **Export CSV** button allows you to export the data to a CSV file.
- The **Export PDF** button allows you to export the data to a PDF file.
- The check box allows you to enable a graphical display of Station Yield Data.
- The **Refresh** button refreshes the Station Yield Pane.

Manual Entry Data Lock

At the Plant Admin level a parameter can be configured with the effect that Manual Entry Data older then a specified number of days will be locked. See Plant Admin > Setup.

If the data is locked a icon will appear on the Shift Details section.

Under the Manual Entry Section of the User Group Security Settings a setting is provided to enable an Administrator to edit Manual Entry Data despite the lock.

7.6.2.4 *Provideam Live*

Provideam Live is a feature which allows you to display real-time data in the form of motivational charts and views. Provideam Live is typically used in conjunction with large monitors, for example Plasma or LED screens, to display production data to operators in the manufacturing area. Provideam Live is configured in the Area Admin section of Provideam. The time interval between each chart is set in the Provideam Admin section. The default time interval is 15s.

Below, some typical Live displays are shown.

Live Provideam

Assembly Area
Current Status

Machine Name	Part Name	Mode Status	Duration	Good Parts	Target	% Target
AssemblyMC1	Default	Running	00:00:44	63403	60580.00	104.7%
AssemblyMC2	Default	Running	00:00:00	16030	16463.40	97.4%
PackMC	Part7	Stopped	00:00:22	31506	14218.20	221.6%

Press F11 to switch between fullscreen and normal.

Fig. Provideam Live - Current Status Table

The colors are coded as follows;

Green:	Running at or above Target
Yellow:	Running below Target
Red:	Stopped
Amber:	Change Over
Blue:	Planned Downtime
Purple:	Idle Downtime

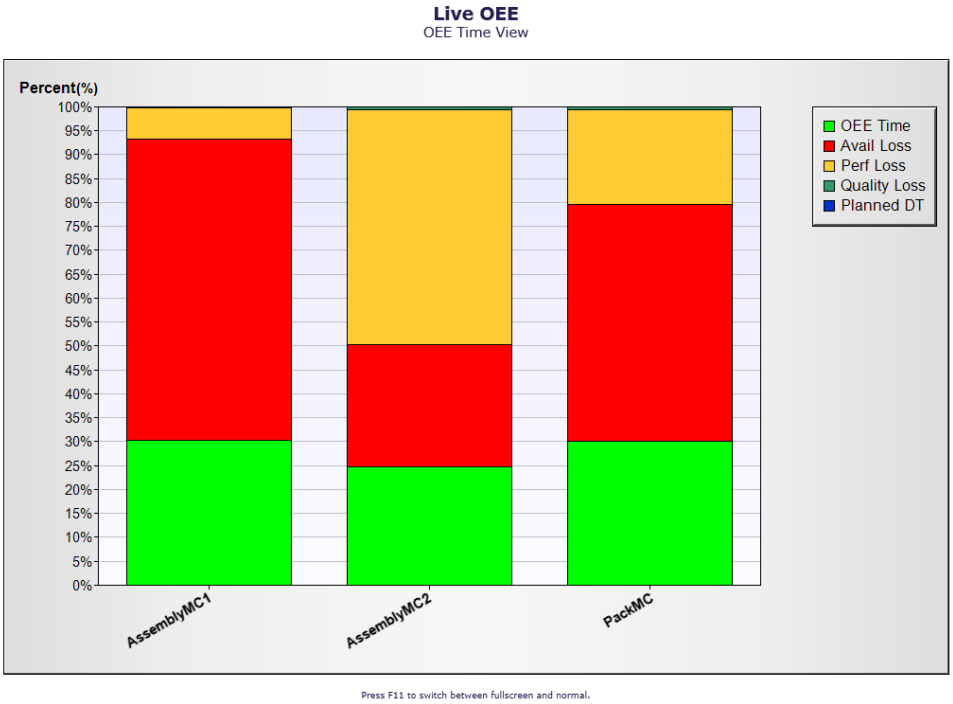


Fig. Provideam Live - OEE Time Analysis Chart

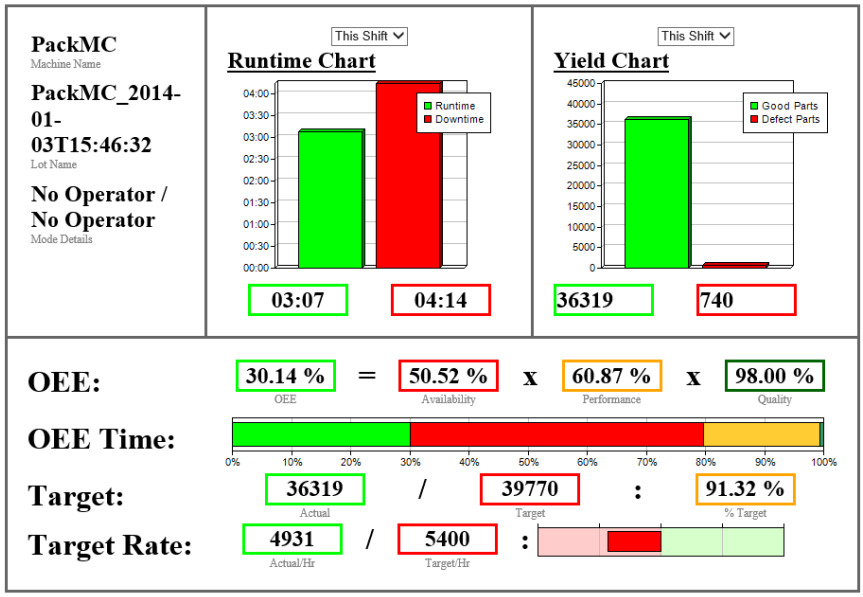


Fig. Provideam Live - AndOn Board Display

7.7 Event Monitoring Module

The Event Monitoring Module has four main functions;

- Monitor the current status of Digital/Analog Tag Items
- Log the value of these Items on a Poll or DataChange
- Provide a User Interface to analyze the data collected
- Annunciate Alarms by Text and/or Email

The Event Monitoring Admin section allows you to set up Event Groups, Event Items and Event Collections.

Event Items are individual Digital/Analog Tag Items. Event Groups are groupings of Event Items with similar data collection properties. Event Collections are collections of similar Items for reporting purposes.

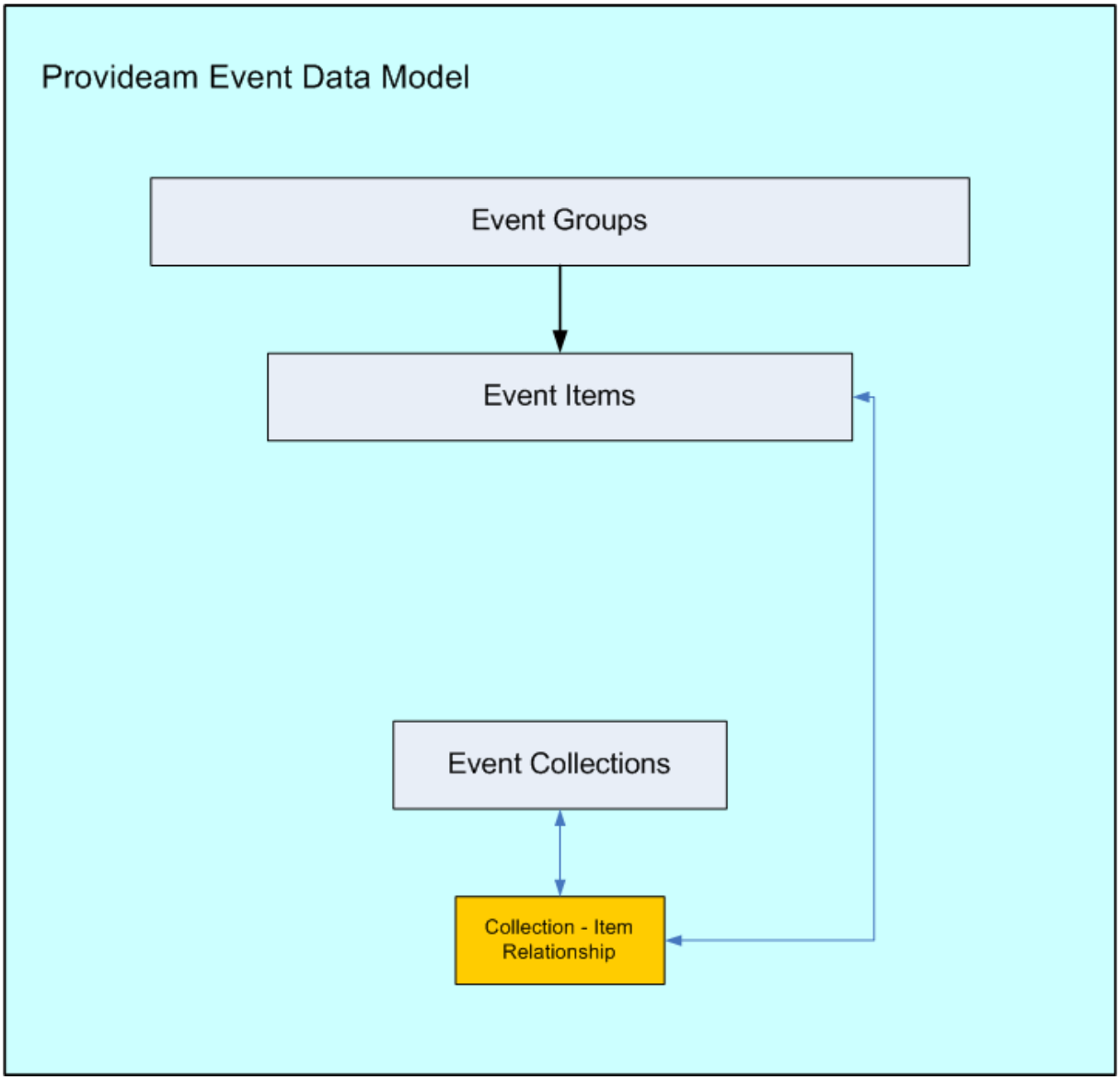


Fig. Provideam Event Mon - Data Model

7.7.1 Event Admin

The Event Mon Admin section allows you to configure the Event Monitoring Module.

7.7.1.1 Event Groups

The Event Group Details Pane.

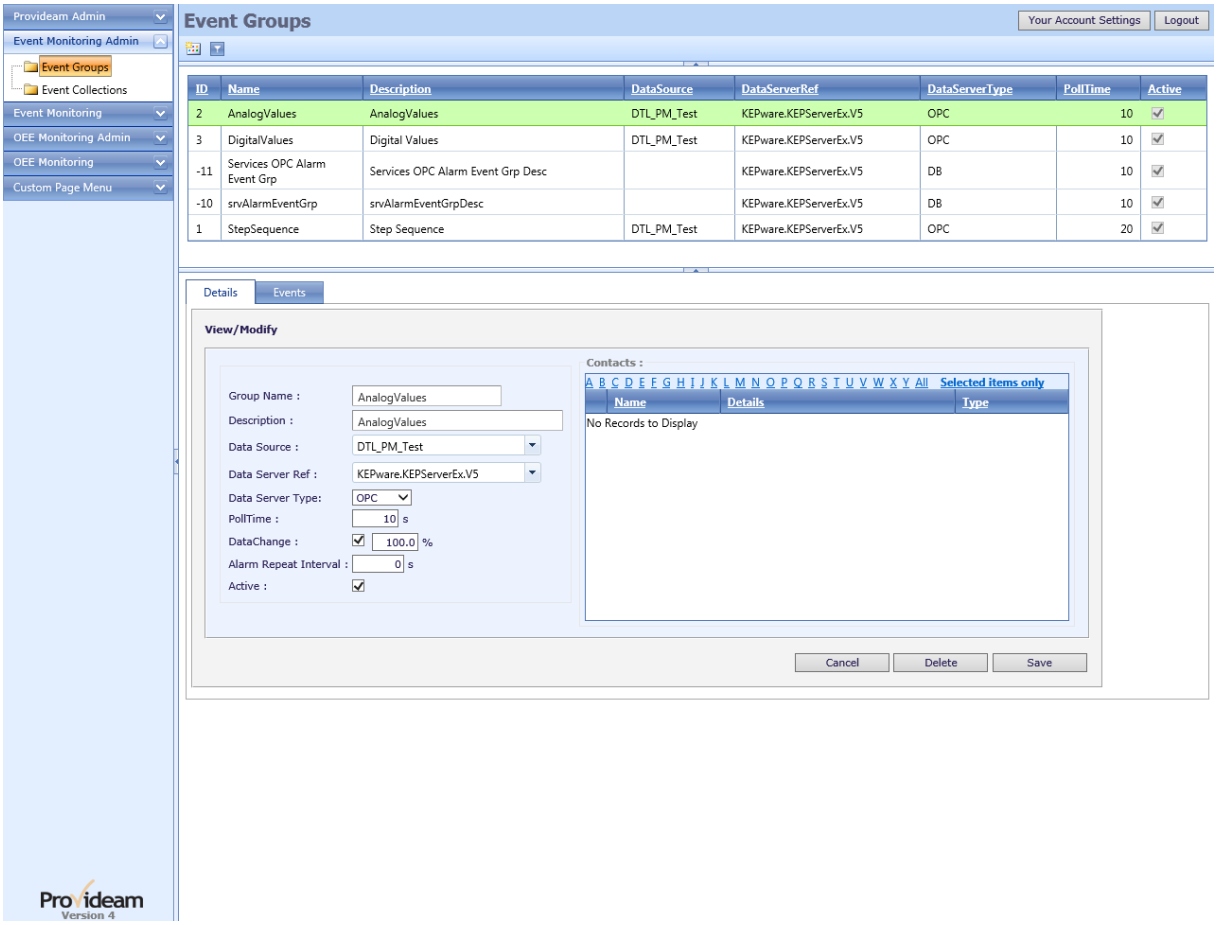


Fig. Event Mon Admin Settings - Event Group Details

- The **AddNew** button allows you to create a new Event Group.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).
- The **Group Name** text box allows you to set the name of the Event Group.
- The **Description** text box allows you to set the description of the Event Group.
- The **Data Source** selection box allows you to select the Data Collection PC which will be used to monitor the Event Items in this Event Group.
- The **Data Server Ref** selection box allows you to select the name of Data Server for the Event Monitoring Service.
- The **Data Server Type** selection box allows you to select either *OPC* or *DB*(Database) as the source of data for the Event Items.
- The **Polltime** text box allows you to set the frequency at which the Event Item values are read for the purposes of the Event Item Current Status property. This is not the frequency at which the Event Item values are logged.
- The **DataChange** check box allows you to enable DataChange Events for the Event Items in the Event Group. In OPC, DataChange is a Group property.

The **DataChange** text box, if enabled, allows you to set the percentage of full scale at which a DataChange event will occur. For further details read the OPC specifications.

- The **Alarm Repeat Interval** text box allows you to set the frequency at which alarms, if still active will be re-annunciated by Text/Email. This is only applicable if one or more of the Event Items is configured as an Alarm. If set to 0, the Alarm will only be annunciated when it first occurs and will not be re-annunciated unless it is first reset.
- The **Active** check box allows you to enable the Event Group for data collection.
- The **Related Users** selection tree allows you to direct alarms from this Event Group to specific Users.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Event Group.
- The **Save** button allows you to save changes to the Event Group.

The Event Group Event Items Pane.

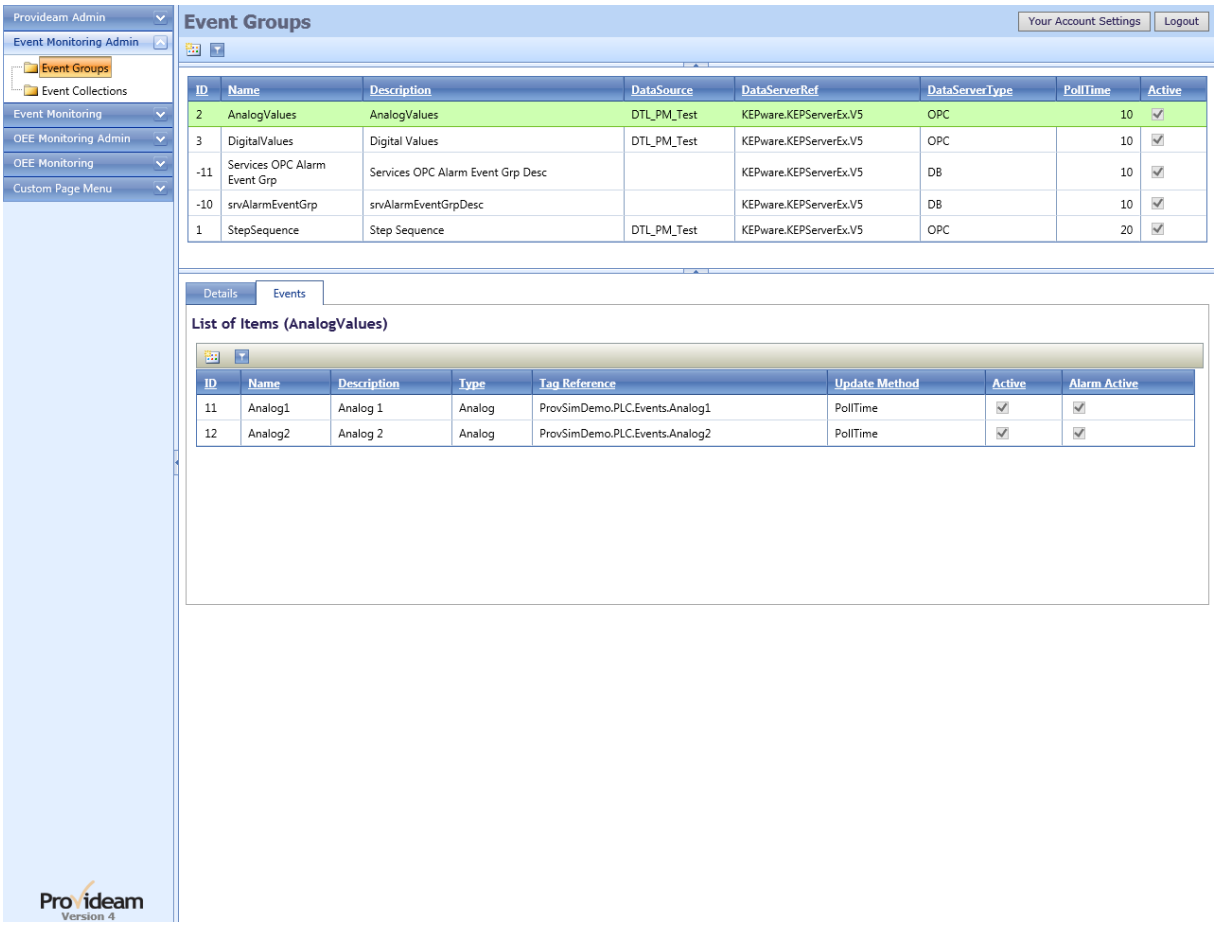


Fig. Event Mon Admin Settings - Event Items

The Event Items figure above shows a list of items related to the Event Group selected in the Upper Table. In the above example we see the Event Items related to the AnalogValues Event Group.

- The **AddNew** button allows you to add a new Event Item.
- The **Enum** button allows you to enumerate new Event Items from the Data Source.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).

The Event Group Event Item Details (Analog) Pane.

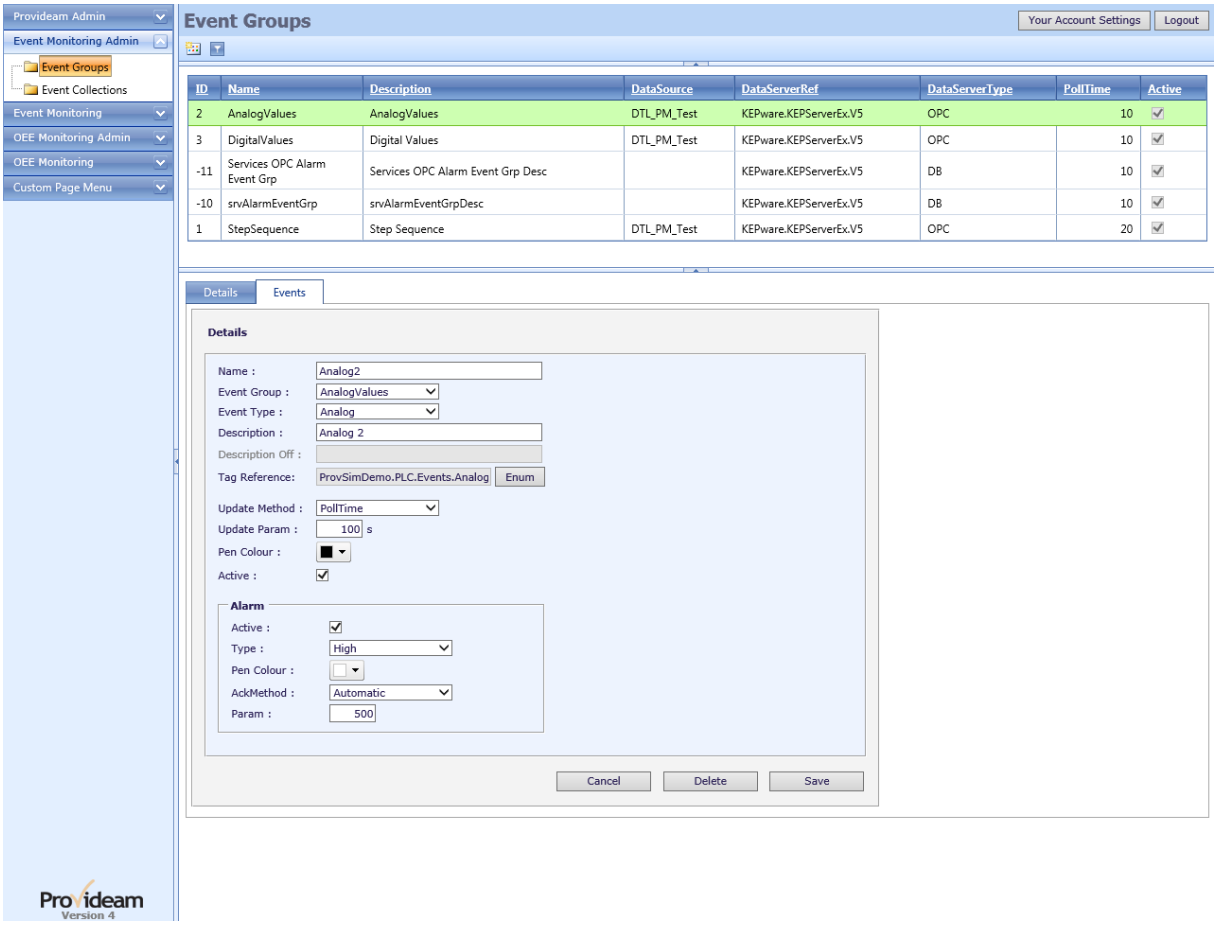


Fig. Event Mon Admin Settings - Event Item Details(Analog)

- The **Name** text box allows you to set the name of the Event Item.

- The **Event Group** selection box allows you to select the Event Group to which the Event Item belongs.
- The **Event Type** selection box allows you to select the Event Type, *Analog* or *Digital*.
- The **Description** text box allows you to set the description of the Event Item. For Digital Event Items this value can be empty if the **Description Off** text box is not empty. If the box is left empty then no value will be logged when the item turns on.
- The **Description Off** text box allows you to set the 'off' description of the Event Item. For Digital Event Items this value will be recorded when the Event Item turns off. If the box is left empty then no value will be logged when the item turns off.
- The **Tag Reference** text box allows you to set the OPC address of the Event Item.
- The **Update Method** selection box allows you to select the update method, *PollTime*, *DataChange* or *EventChange*. This is the method which determines when the Event Item Value will be logged to the database. *PollTime* is logged on the frequency defined in the **Update Param** text box. *DataChange* is logged when the Event Item value changes by a percentage of the fullscale value defined in the **Update Param** text box. This value must be lower or equal to the Event Group **DataChange** parameter. *EventChange* is logged when the Digital Event Item defined in the **Update Param** text box turns on.
- The **Update Param** text box allows you to set parameters for the **Update Method** as described above.
- The **PenColour** color picker is for future use.
- The **Active** check box allows you to enable the Event Item for data collection.
- The **Alarm Active** check box allows you to enable this Event Item as an Alarm Event Item.
- The **Alarm Type** selection box allows you to select the Alarm Type, *Change*, *OnHigh* or *OnLow*. The *Change* Alarm Type is activated when the Event Item Value changes by the percentage of fullscale defined in **Alarm Param** text box. The *OnHigh* or *OnLow* Alarm Type is activated when the Event Item Value moves above or below, respectively, the percentage of fullscale defined in the **Alarm Param** text box.
- The **Alarm PenColour** color picker is for future use.
- The **Alarm AckMethod** selection box allows you to choose whether the alarm resets automatically or manually. If you choose *Automatic* then the Alarm will reset when the Alarm conditions turn off. If you choose *Manual* then the Alarm will only turn off when the Alarm conditions are off and you manually acknowledge the Alarm..

- The **Alarm Param** allows you to set the parameters required for the Alarm Type.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Event Item.
- The **Save** button allows you to save changes to the Event Item.

The Event Group Event Item Details (Digital) Pane.

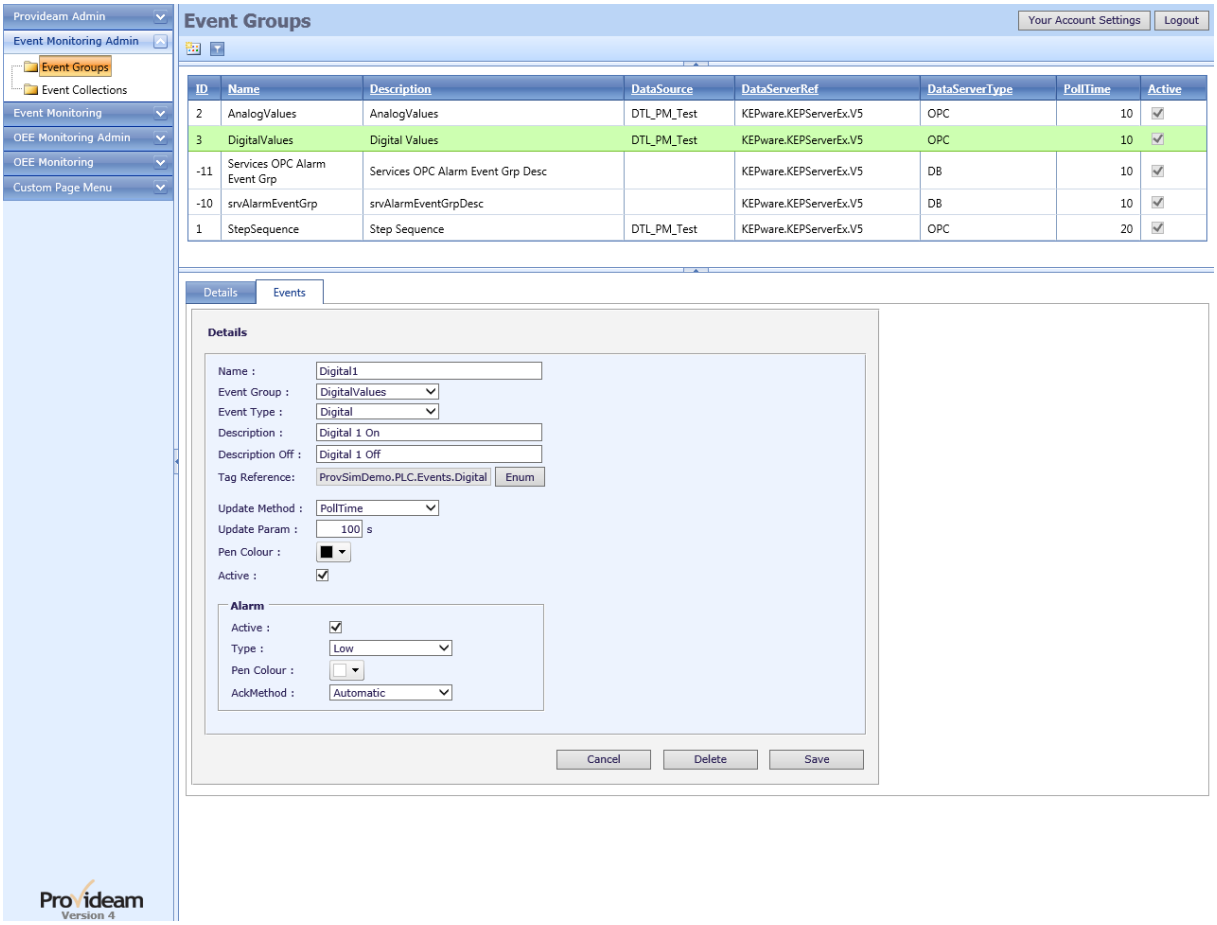


Fig. Event Mon Admin Settings - Event Item Details(Digital)

- The **Description** text box allows you to set the description of the Event Item. For Digital Event Items this value can be empty if the **Description Off** text box is not empty. If the box is left empty then no value will be logged when the item turns on.
- The **Description Off** text box allows you to set the 'off' description of the Event Item. For Digital Event Items this value will be recorded when the Event Item

turns off. If the box is left empty then no value will be logged when the item turns off.

7.7.1.2 *System Events*

We have a number of System Events in the Event Monitoring Module which you can use to monitor the OPC Quality for Data Collection Services, and the Running Status of Provideam Services.

The System Event Group Details Pane.

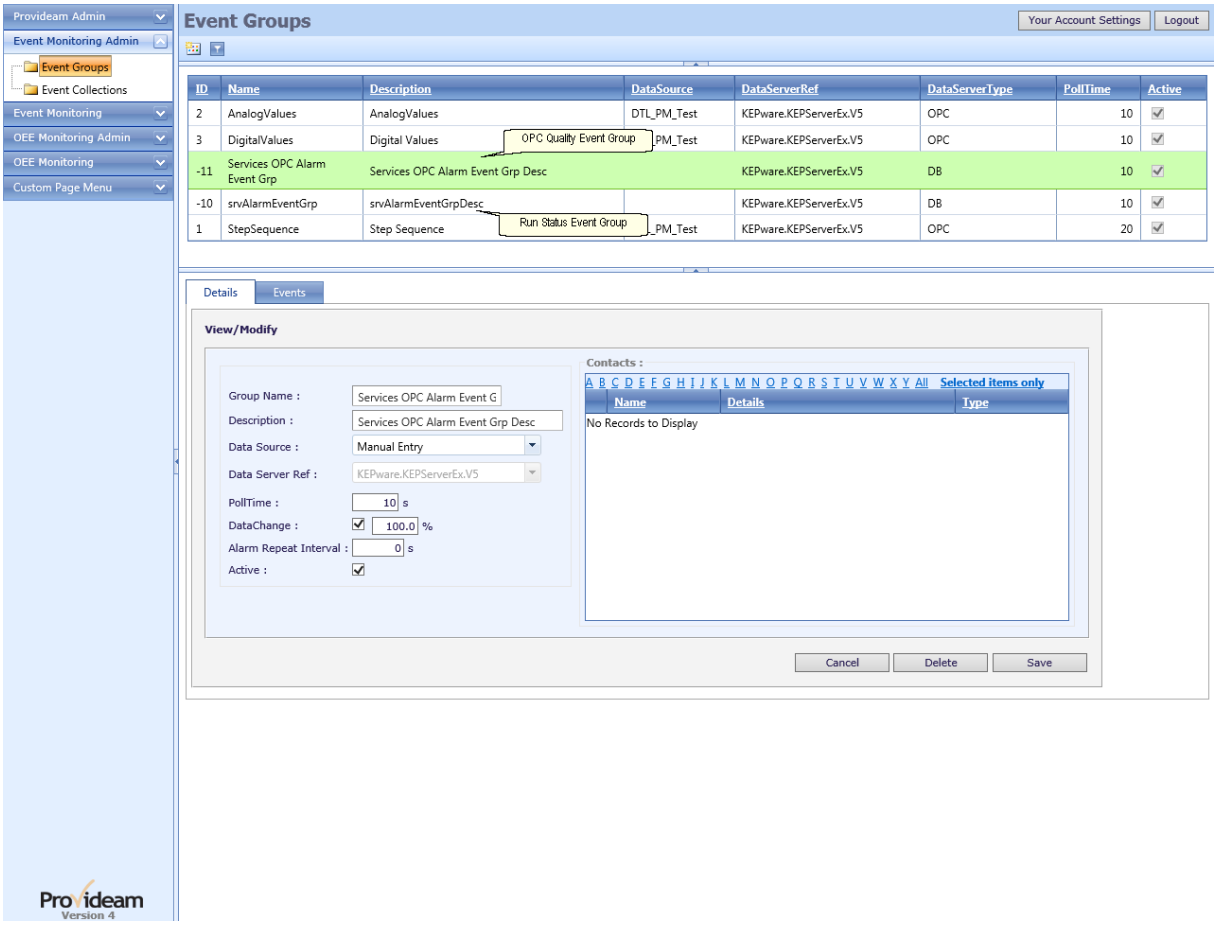


Fig. Event Mon Admin Settings - System Event Group Details

The System OPC Quality Event Items Pane.

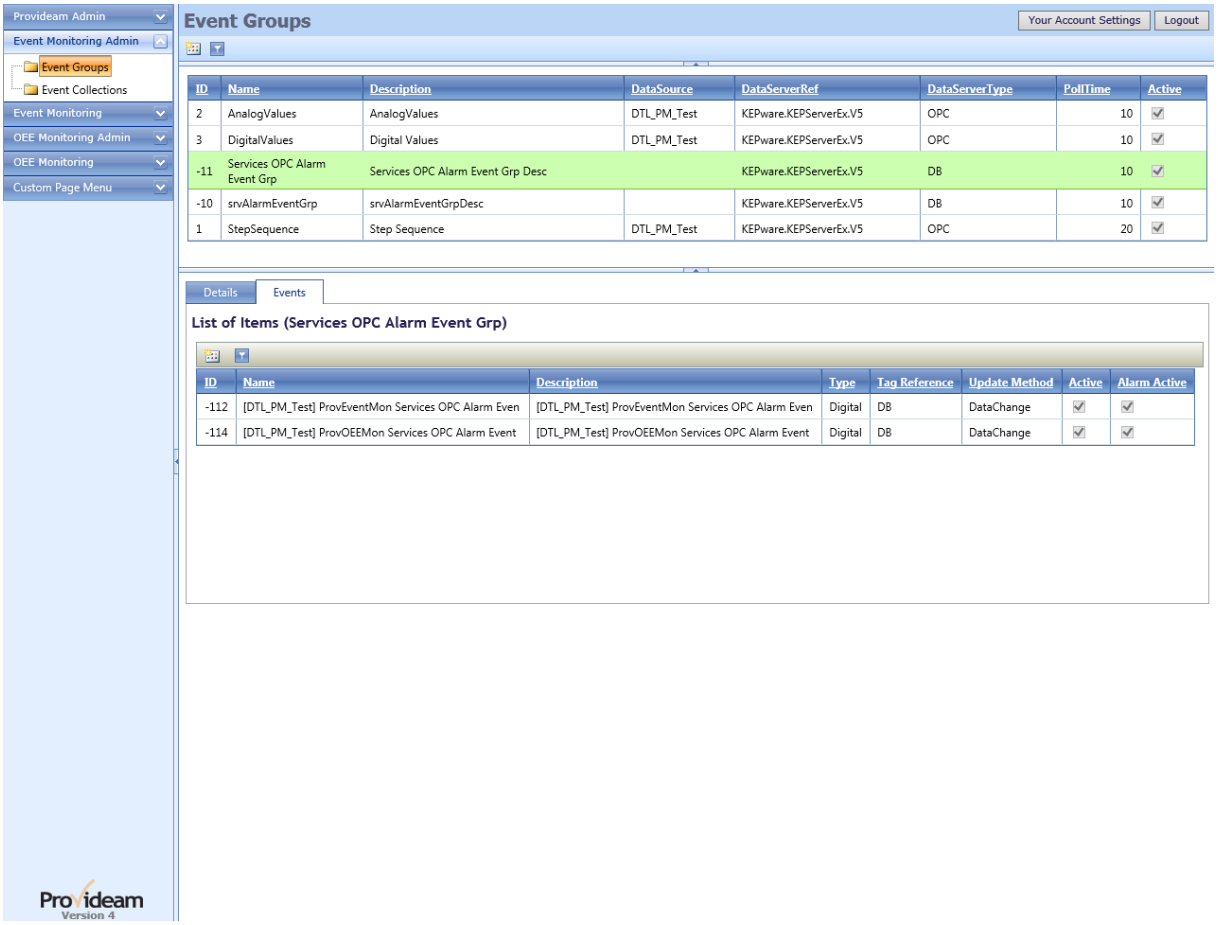


Fig. Event Mon Admin Settings - System OPC Quality Event Items

In the System OPC Quality Event Group you will find a System Event Item for each Data Collection Service configured in your application. The Item ID will be -100 - the ServiceID of the Data Collection Service. If your Data Collection ServiceID is 23 then your System OPC Quality Event Item ID will be "-123".

While the Data Collection Service is running it monitors the OPC Quality of the associated OPC Servers. If any of the OPC Servers returns a "Bad Quality" status then the associated Event Item will be set. If the none of the OPC Servers return a "Bad Quality" status then the associated Event Item will be reset.

Using the Provideam Alarm Annunciation Service these Event Items can be used to send alarm messages to selected Users.

The System Run Status Event Items Pane.

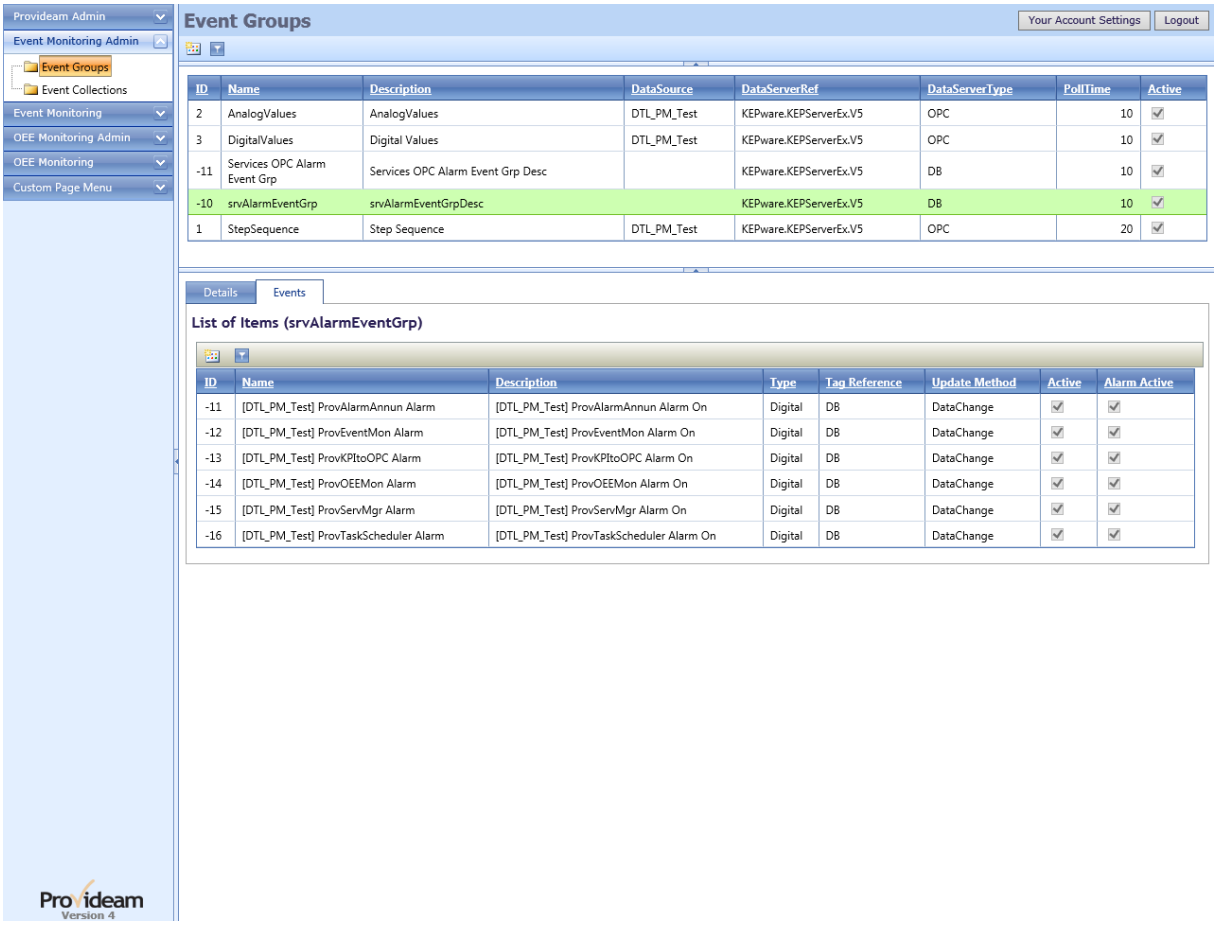


Fig. Event Mon Admin Settings - System Run Status Event Items

In the System Run Status Event Group you will find a System Event Item for each Provideam Service configured in your application. The Item ID will be -10 - the ServiceID of the Provideam Service. If your ServiceID is 6 then your System Run Status Event Item ID will be "-16".

The Provideam Services Manager Monitors the LastUpdate Time of each service. If the time has not been updated in 10minutes then the Provideam Services Manager will set the associated System Run Status Event Item. The Provideam Services Manager will reset the System Run Status Event Item once the LastUpdate Time is less then 10minutes.

Using the Provideam Alarm Annunciation Service these Event Items can be used to send alarm messages to selected Users.

Note: The Provideam Alarm Annunciation Service will not be able to send an alarm if it is itself stopped.

7.7.1.3 *Event Collections*

The Event Collections allows you to define collection of Event Items for the purposes of reporting.

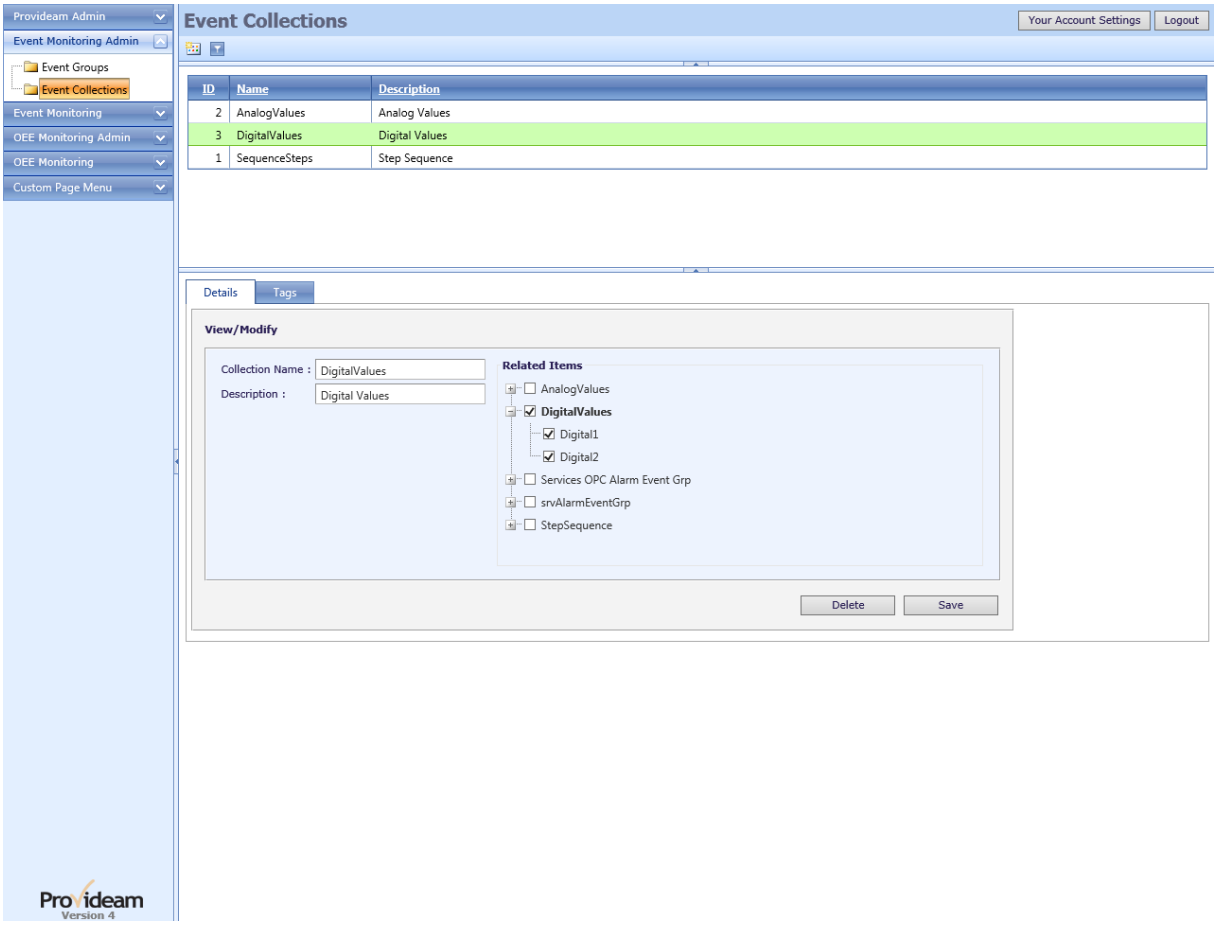


Fig. Event Mon Admin Settings - Event Collection Details

- The **AddNew** button allows you to create a new Event Collection.
- The **Filter** button box allows you to create a filter for the data. (Icon changes to when a filter has been applied).
- The **Collection Name** text box allows you to set the name of the Event Collection.
- The **Description** text box allows you to set the description of the Event Collection
- The **Related Items** selection tree allows you to select which Items are in the Event Collection.

The Event Collection Event Tags Pane.

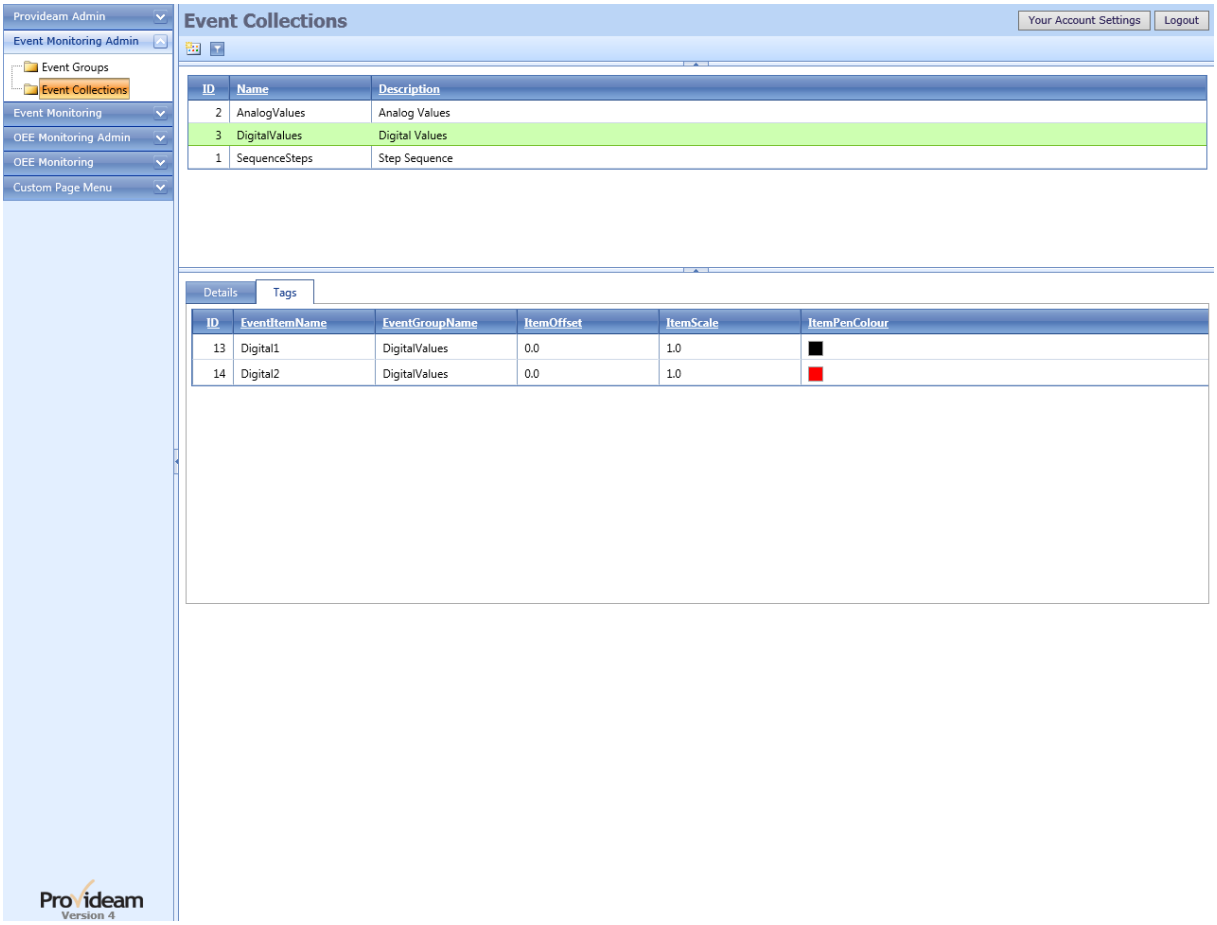


Fig. Event Mon Admin Settings - Event Collection Tags

The above tables shows the Event Items in the Digital Values Event Collection.

The Event Collection Event Tag Details Pane.

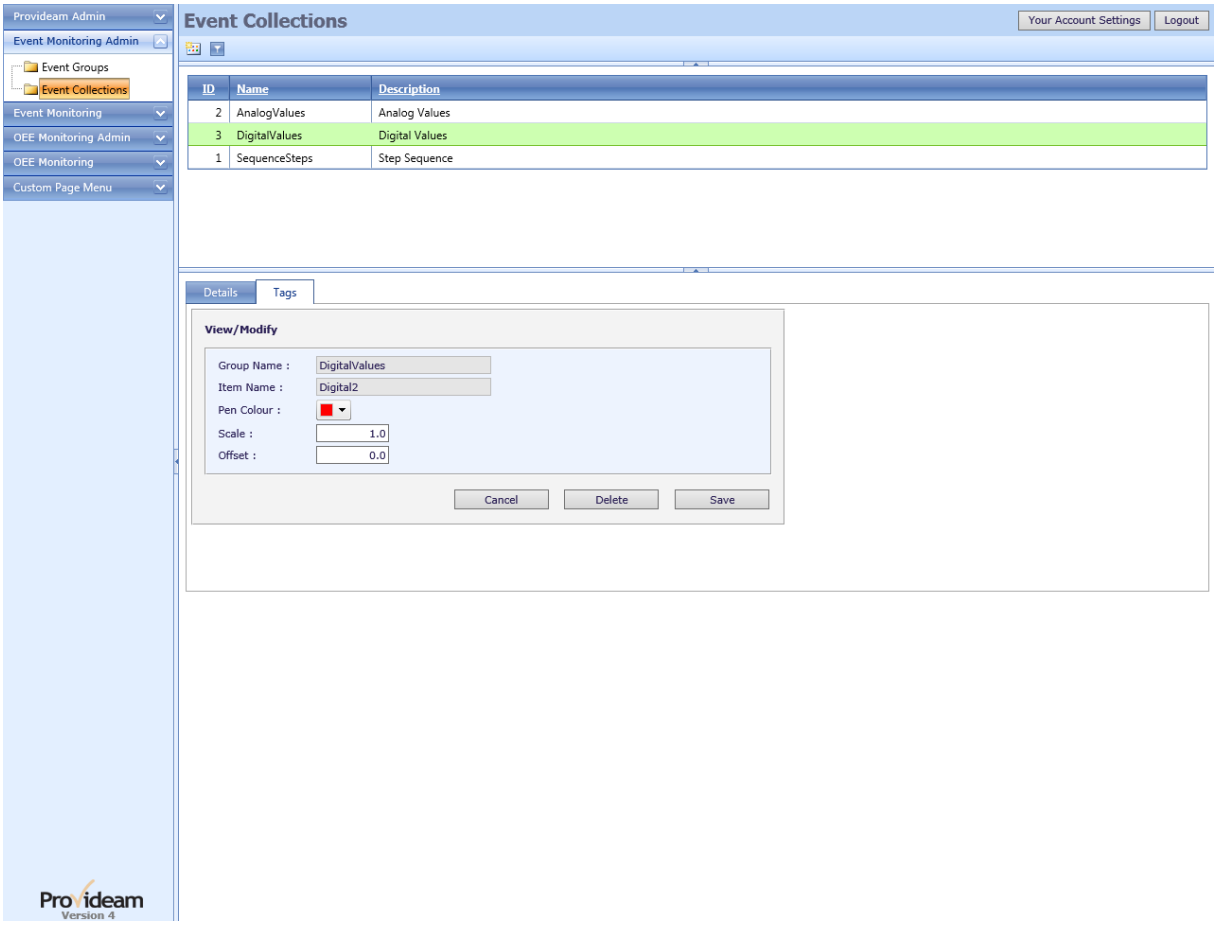


Fig. Event Mon Admin Settings - Event Collection Tag Details

- The **Group Name** text box displays the name of the Event Group.
- The **Item Name** text box displays the name of the Event Item.
- The **Pen Color** color picker allows you to set a color to be used when displaying the Event Item in a trend report based on this Event Collection.
- The **Scale** text box allows you to set a scale value to be used when displaying the Event Item in a report based on this Event Collection.
- The **Offset** text box allows you to set an offset value to be used when displaying the Event Item in a report based on this Event Collection.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Delete** button allows you to delete the Event Collection.
- The **Save** button allows you to save changes to the Event Collection.

7.7.2 Event Mon

The Event Monitoring section allows you to analyze data collected by the Event Monitoring Service.

7.7.2.1 Event Reports

There are three styles of Event Report;

1. Current Status (dsCurrentStatus DataSets)
2. Active Alarms (dsActiveAlarms DataSets)
3. Simple Log (dsSimpleLog DataSets)
4. Simple Group (dsSimpleGroup DataSets)

Below we describe the basic report templates. Before continuing it is important that we clarify what we mean by some of the terms that we use;

DataSets:

These are the Report Template Names. They define the basic structure of the data which will be returned. They include; dsCurrentStatus, dsActiveAlarms, dsSimpleLog, and dsSimpleGroup.

Period:

This refers to a date range over which the report data is derived. For example the Report Period could be a Day or a Week or a Month etc.

Object:

This refers to any property of the data which is not a date. Typically for Event Logic Reports the Object will be an EventCollectionID.

Fields:

These define how the data will appear on your report. The order of the Fields is important as this will determine the order of Sorting and Grouping of your data. If a Field is included in your report definition the Field values will be displayed in one of the left hand columns of your report and the data will be grouped on that Field Name.

Functions:

Functions are available for Simple Group reports. The functions are aggregate values for the selected items over the period of the report. Typical functions are Max Value, Min Value, Sum etc.

Each of these report styles is based on an Event Collection.

In the figure below you will see the Event Report interface. The upper section of the page displays a table of the pre-defined Event Reports of the selected style.

- The **Report Style** selection box allows you to select the report style. The options are; *Current Status*, *Active Alarms* and *Simple Log*.
- The  **AddNew** button allows you to create a new Event Report of the selected style.
- The **Preview** button allows you to run the report.
- The **Modify** button allows you to edit the selected report.
- The **Access** button allows you to assign User access to the report.
- The **Delete** button allows you to delete the selected report.
- The **Schedule** button allows you to create a task to send the report by email on a defined schedule. The **Schedule** button is not available for Current Status reports.
- Click on the report record to run the report.

Current Status

The Current Status report shows a table of the current value of each Item in the Event Collection. The current value is updated on the polltime defined in the Event Group for each Item in the Collection.

The Current Status Pane.

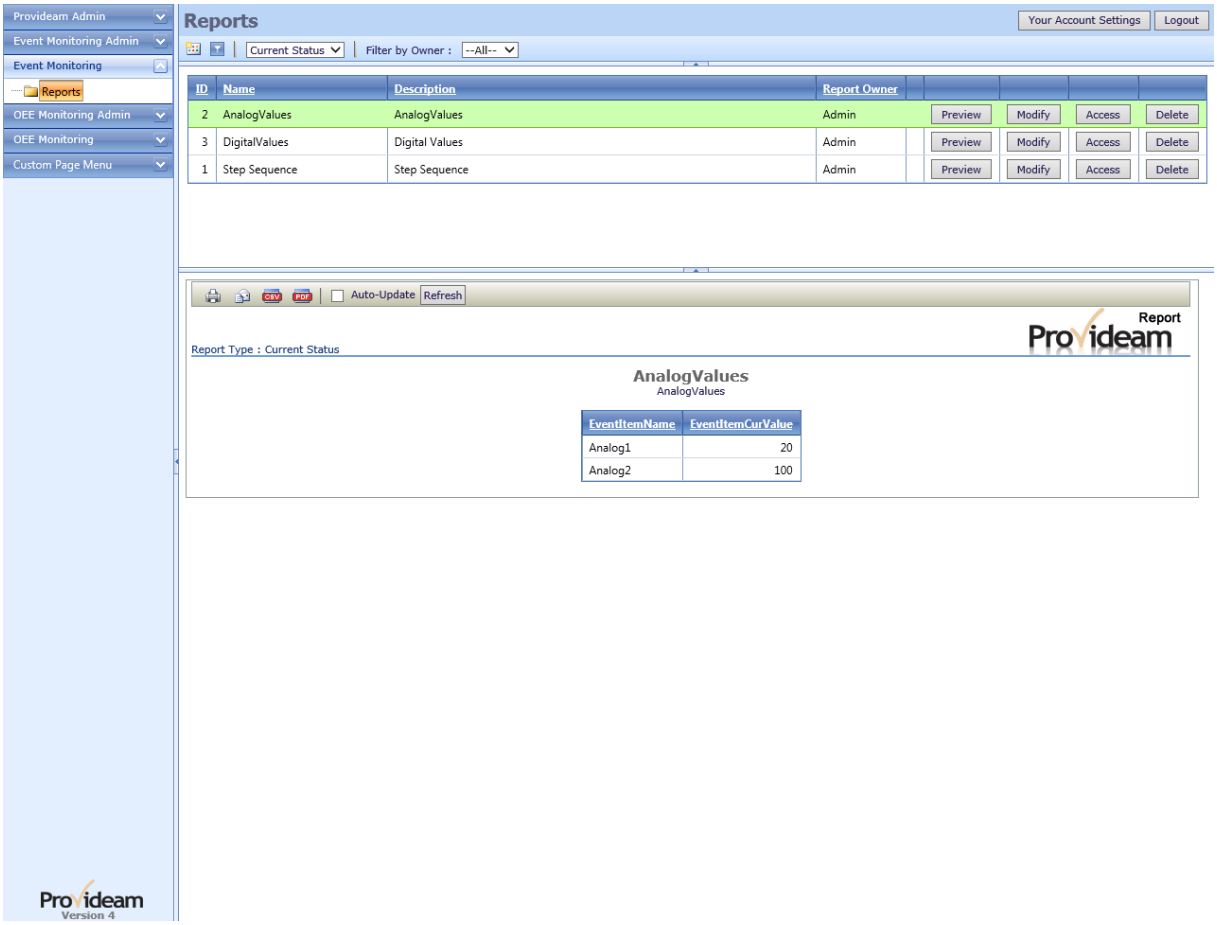


Fig. Event Mon Reports - Current Status

- Click on the Item details to generate a Simple Log Report of the Item for the current date.
- The **Print** button allows you to print the report.
- The **Email** button allows you to email the report.
- The **Export CSV** button allows you to export the report to a CSV file.
- The **Export PDF** button allows you to export the report to a PDF file.
- The **Pen Colour** colour picker allows you to set a colour to be used when displaying the Event Item in a trend report based on this Event Collection.
- The **Auto-Update** checkbox allows you to enable Provideam to update the report automatically every 15s.
- The **Refresh** button allows you to update the report manually.

The Current Status Pane, Simple Log.

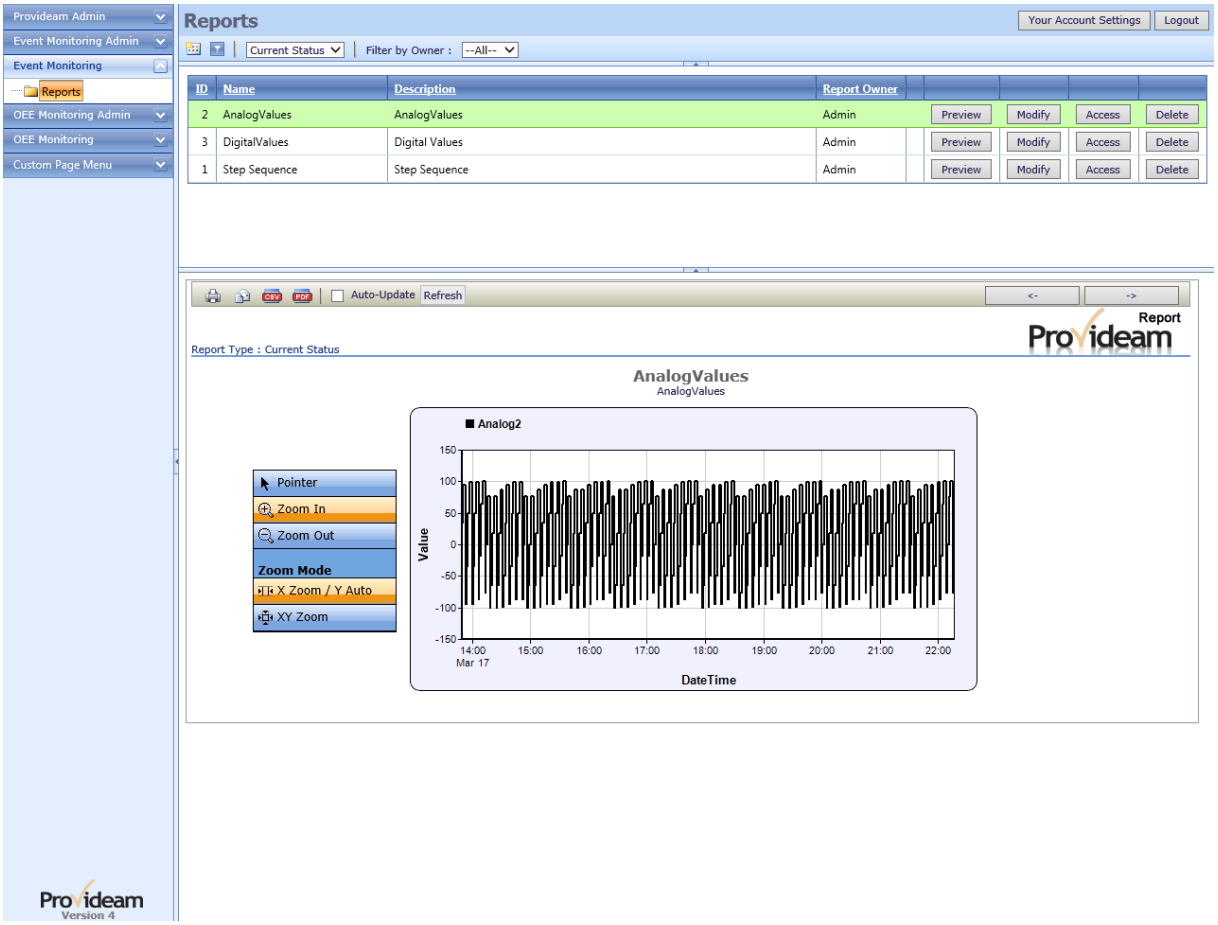


Fig. Event Mon Reports - Current Status, Simple Log

- Click on the Item details to generate a Simple Log Report of the Item for the current date .
- The **Print** button allows you to print the report.
- The **Email** button allows you to email the report.
- The **Export CSV** button allows you to export the report to a CSV file.
- The **Export PDF** button allows you to export the report to a PDF file.
- The Close button allows you to close the report and return to the previous page.
- The <-**Previous** button allows you to run the report for the previous day
- The **Forward**-> button allows you to run the report for the following day. The **Forward**-> button will only be available if the report date is not the current date.
- The **Auto-Update** checkbox allows you to enable Provideam to update the report automatically every 15s.
- The **Refresh** button allows you to update the report manually.

Graph Functions:

There are two zoom modes. The Zoom / Y Auto mode allows you to zoom in/out on the X axis only. If you select this mode, the Y axis will not change. The XY Zoom mode allows you to zoom in/out on both the X and the Y axes.

To zoom in, select the appropriate zoom mode and then select the Zoom In option. The mouse pointer will change to a . Select the zoom area by left-clicking on the graph to the left handside of the area on which you want to zoom and holding the click button down while moving the mouse to the right handside of the area. Once your release the click button the graph will be resized to the new area.

While zoomed in, you can pan left or right by firstly selecting the Pointer option, then clicking on the chart and 'dragging' the mouse to the left or right. Once you release the click button the graph will be redrawn.

To zoom out, select the Zoom Out option. The mouse pointer will change to a . Click on the graph and the chart will resize to the previous size.

When the chart has returned to it's original size the Zoom Out option will be disabled and the mouse pointer will change to a .

The Current Status Pane, Modify Report.

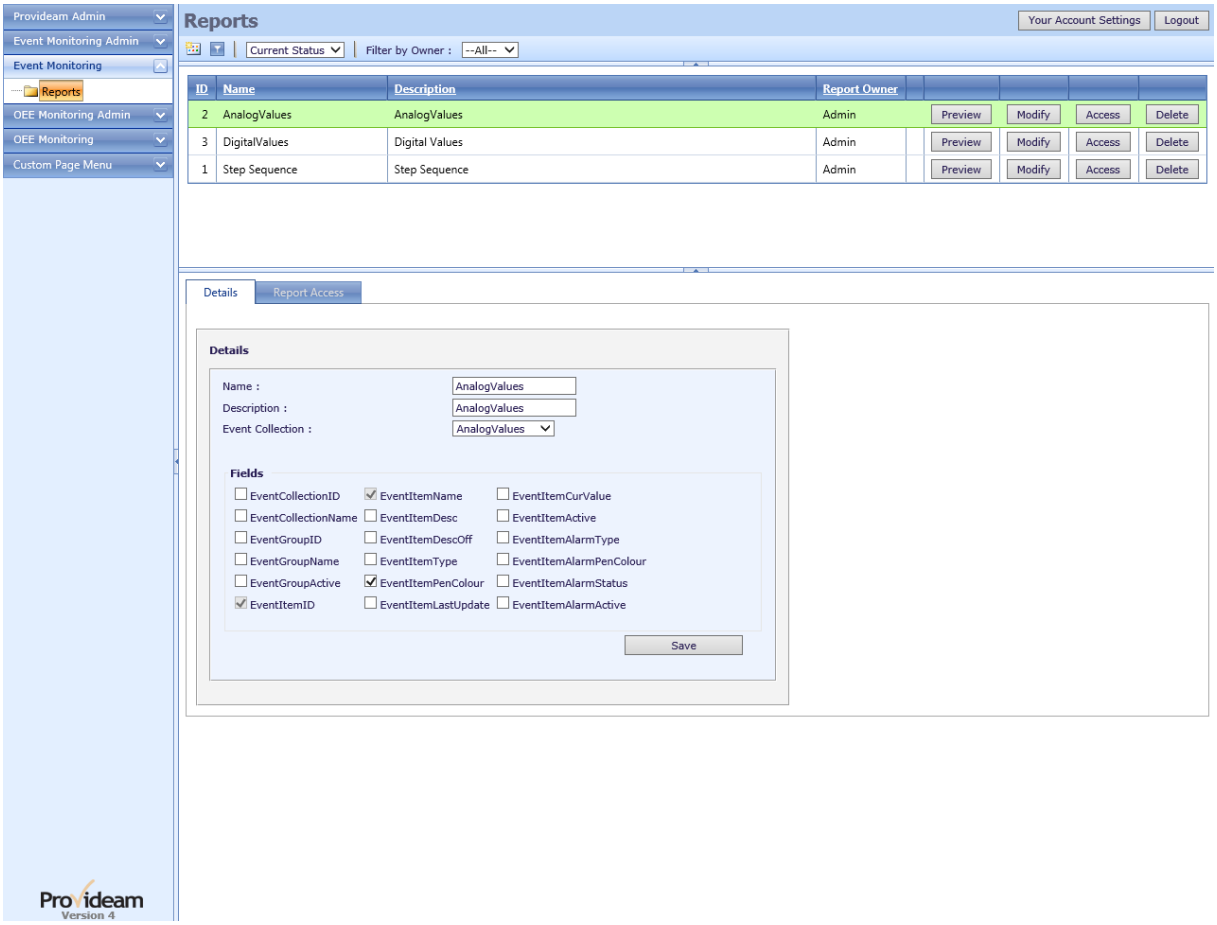


Fig. Event Mon Reports - Current Status, Modify Report

- The **Name** text box allows you to set the name of the Current Status report.
- The **Description** text box allows you to set the description of the Current Status report.
- The **Event Collection** selection box allows you to select the Event Collection for the Current Status report.
- The **Fields** frame allows you to check the items which you wish to appear on the report. In the example above only the Event Item Name and Current Value are selected.
- The **Save** button allows you to save changes to the Current Status report.

Active Alarms

The Active Alarms report shows a table of each Item in the Collection which is currently in an Alarm state.

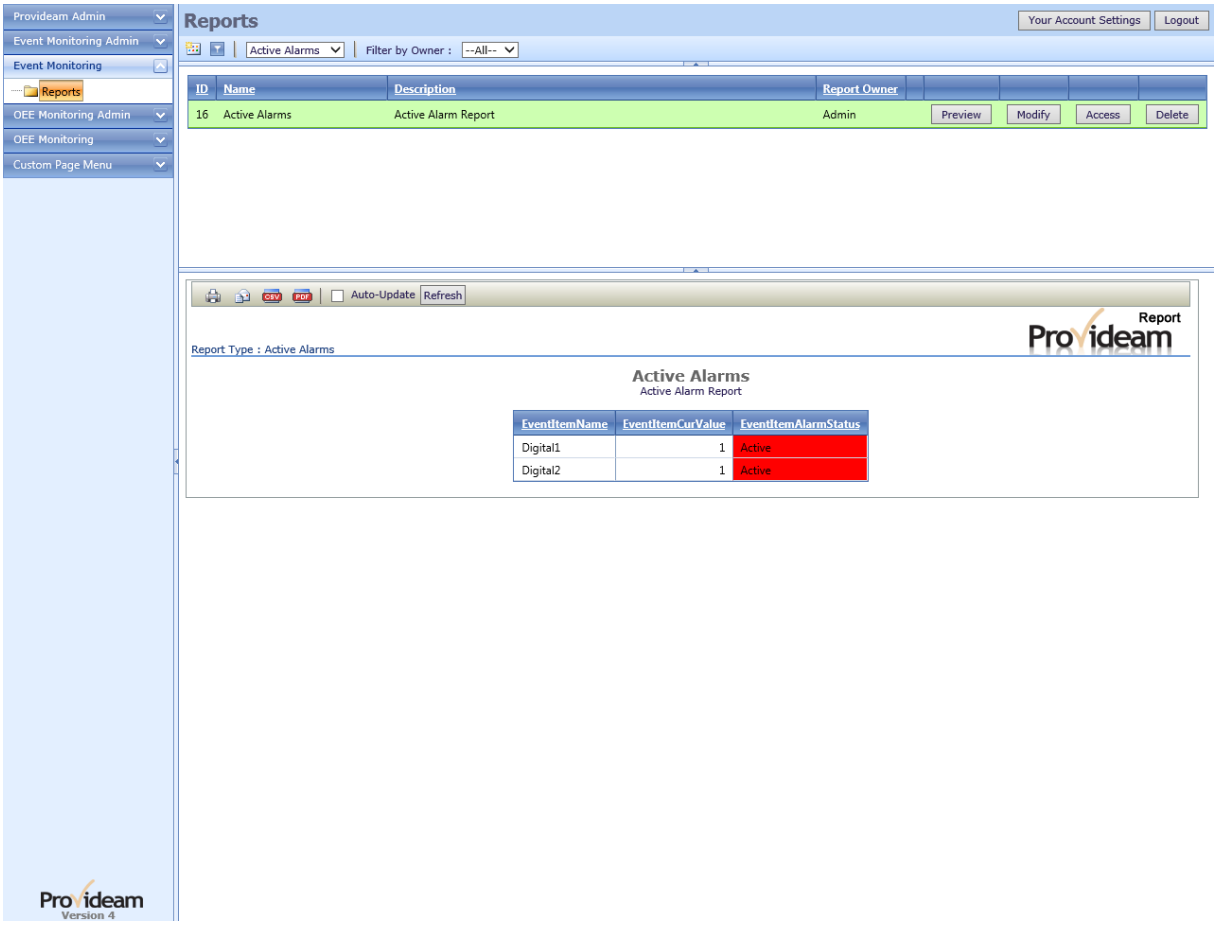


Fig. Event Mon Reports - Active Alarms

- Click on the report record to run the report.
- The **Print** button allows you to print the report.
- The **Email** button allows you to email the report.
- The **Export CSV** button allows you to export the report to a CSV file.
- The **Export PDF** button allows you to export the report to a PDF file.
- The **Auto-Update** checkbox allows you to enable Provideam to update the report automatically every 15s.
- The **Refresh** button allows you to update the report manually.

The Active Alarms Pane, Modify Report.

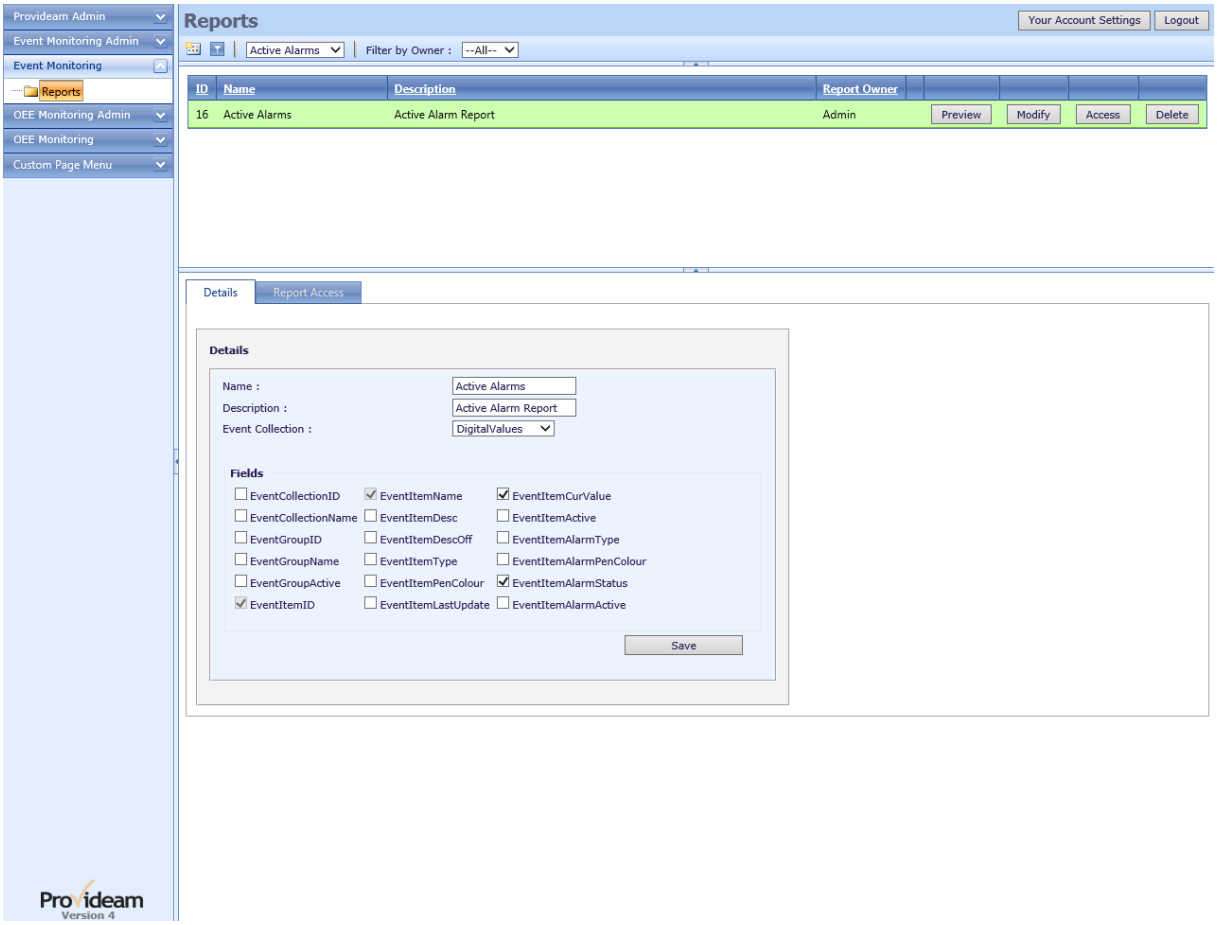


Fig. Event Mon Reports - Active Alarms, Modify

- The **Name** text box allows you to set the name of the Active Alarms report.
- The **Description** text box allows you to set the description of the Active Alarms report.
- The **Event Collection** selection box allows you to select the Event Collection for the Active Alarms report.
- The **Fields** frame allows you to check the items which you wish to appear on the report. In the example above only the Event Item Name and Current Value are selected.
- The **Save** button allows you to save changes to the Active Alarms report.

Simple Log

The Simple Log shows a Table and/or Graph of the data logged for each Item in the Collection over a defined period.

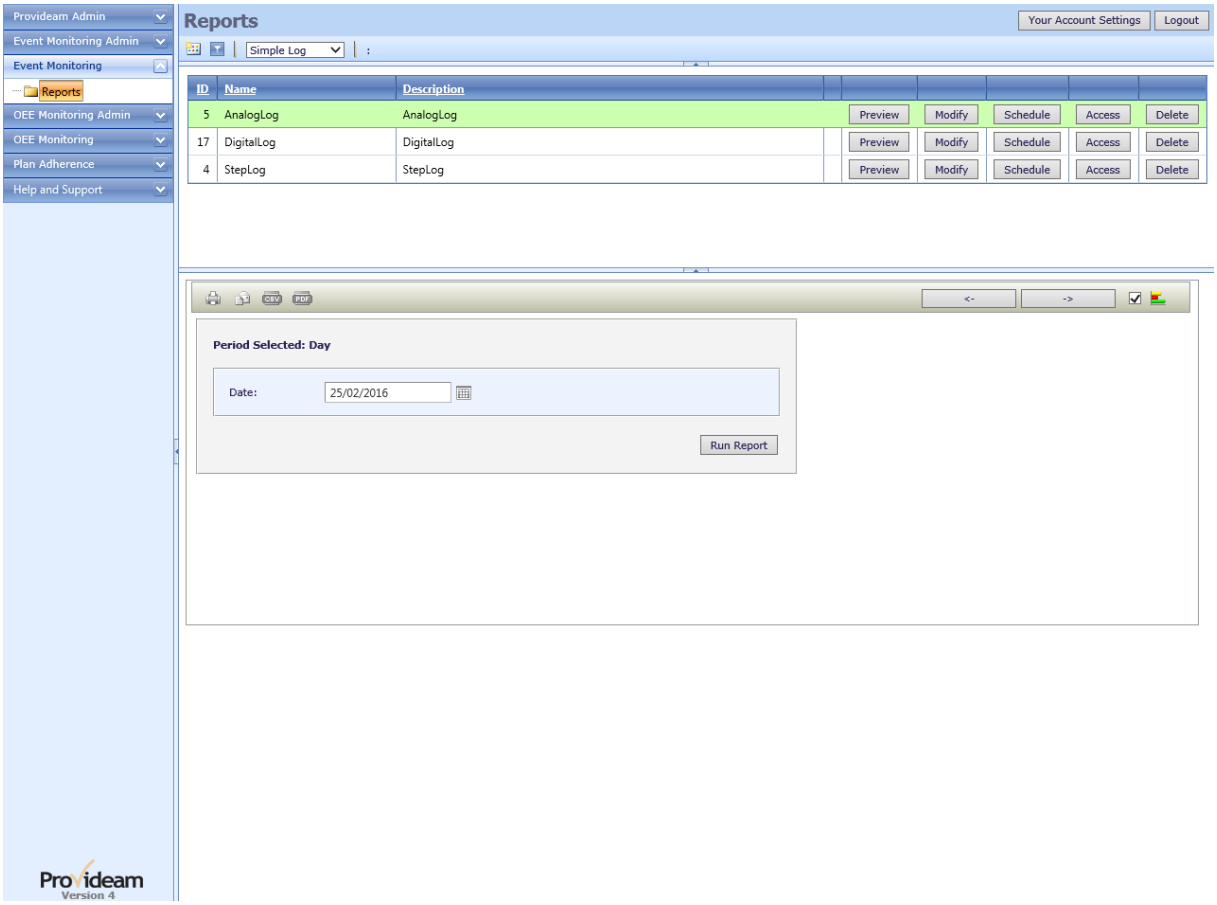


Fig. Event Mon Reports - Simple Log

- The **Date** selection box allows you to choose the date for which the report will be created. In the above example the report period is a day. Hence the period selection is for a date. The  date picker helps you to choose a date. If the period was for a week then the period selection would be for a week, etc, etc.
- The **Run Report** button will run the report for the selected period

The Simple Log Pane, Graphical Report.

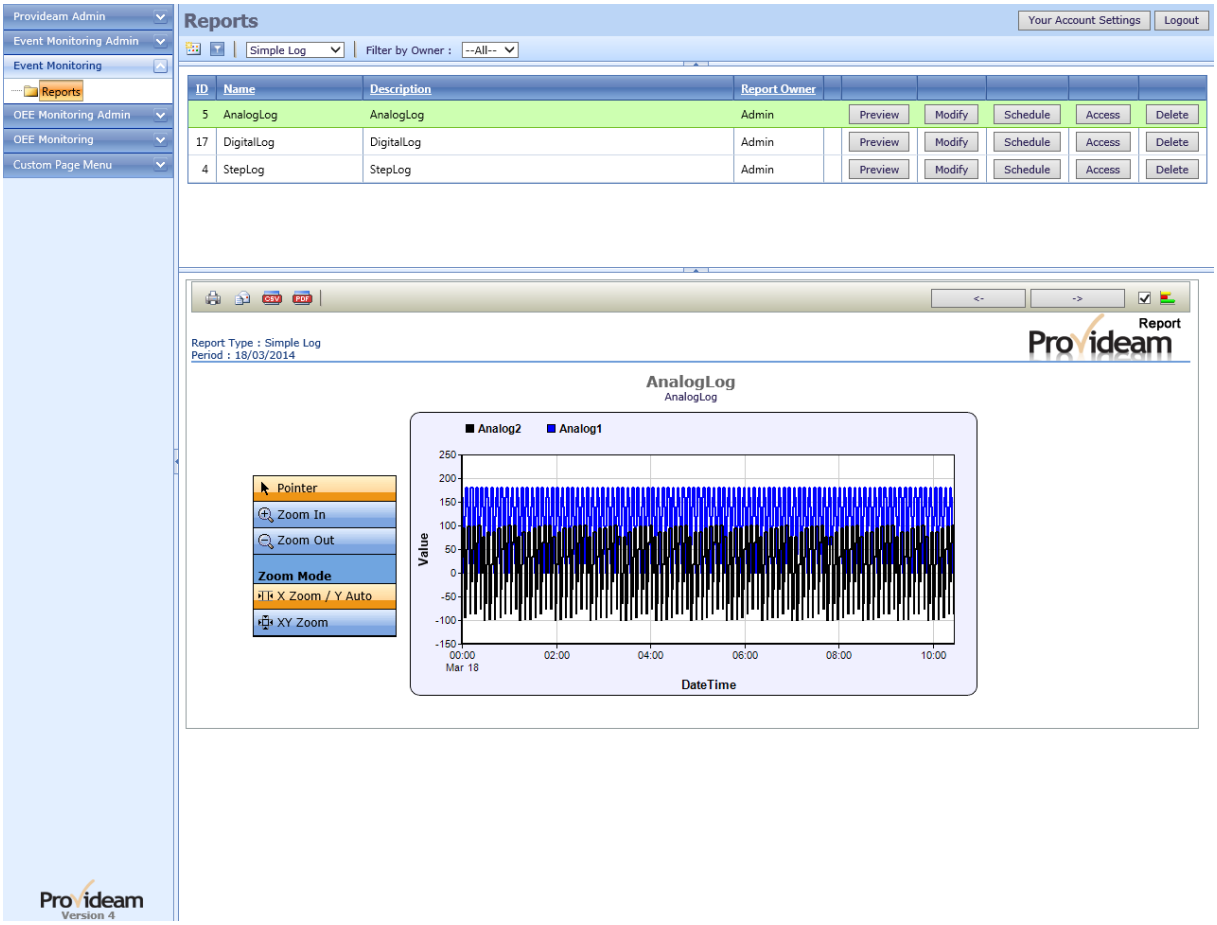


Fig. Event Mon Reports - Simple Log, Graphical Report

- The **Print** button allows you to print the report.
- The **Email** button allows you to email the report.
- The **Export CSV** button allows you to export the report to a CSV file.
- The **Export PDF** button allows you to export the report to a PDF file.
- The Close button allows you to close the report and return to the previous page.
- The **Data** selection box allows you to choose the amount of data to be returned. The options are *Recent* and *All*. The *Recent* option returns only the most recent 100 data values. The default option is *Recent*.
- The **Report Type** check box allows you to choose between a graphical and tabular report.
- The <-**Previous** button allows you to run the report for the previous day
- The **Forward**-> button allows you to run the report for the following day. The **Forward**-> button will only be available if the report date is not the current date.

The Simple Log Pane, Tabular Report.

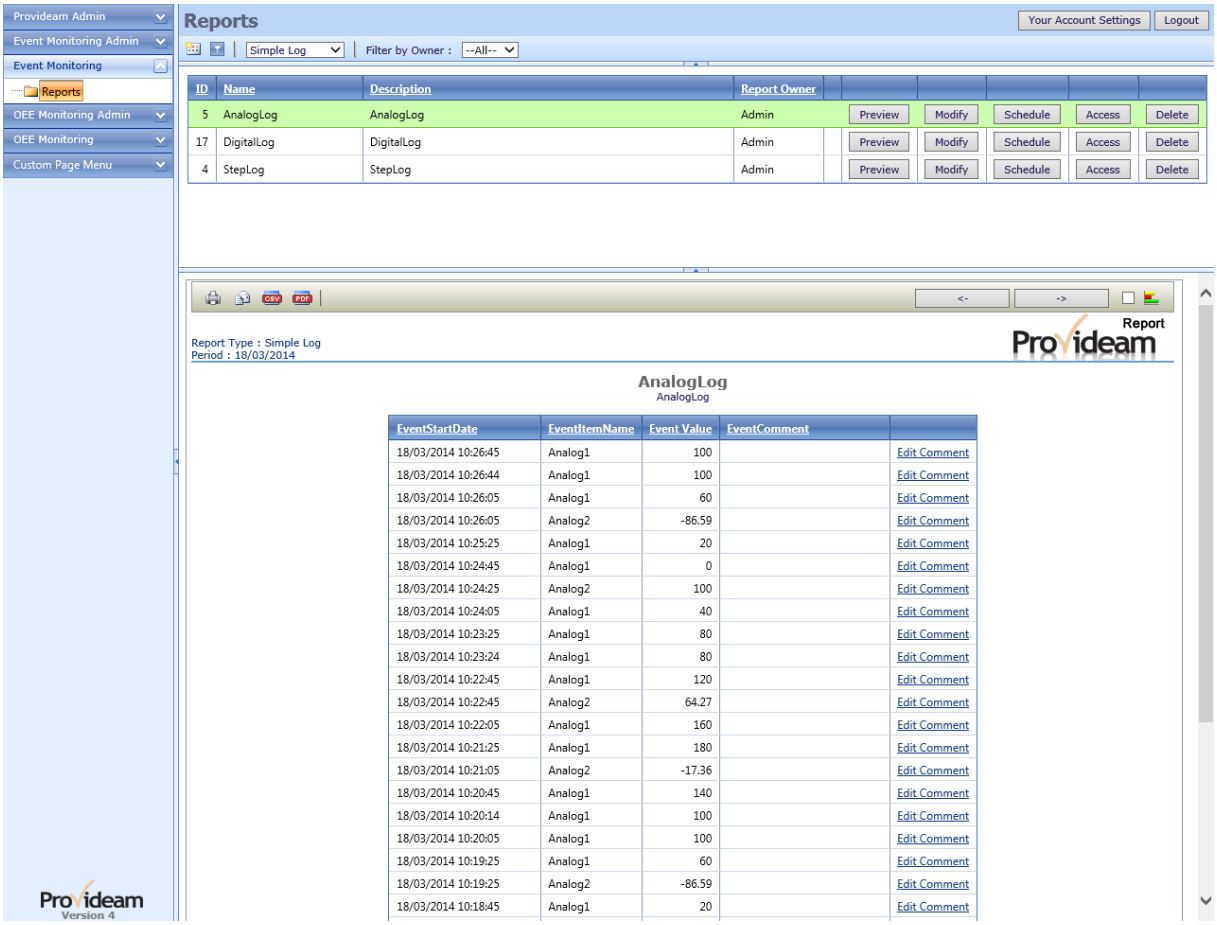


Fig. Event Mon Reports - Simple Log, Tabular Report

The Tabular report controls are the same as for the Graphical report with one addition. It is possible for Tabular reports to add a comment to each data point.

- The **Edit** hyperlink allows you to add/edit a data point comment.

The Simple Log Pane, Modify Report Details.

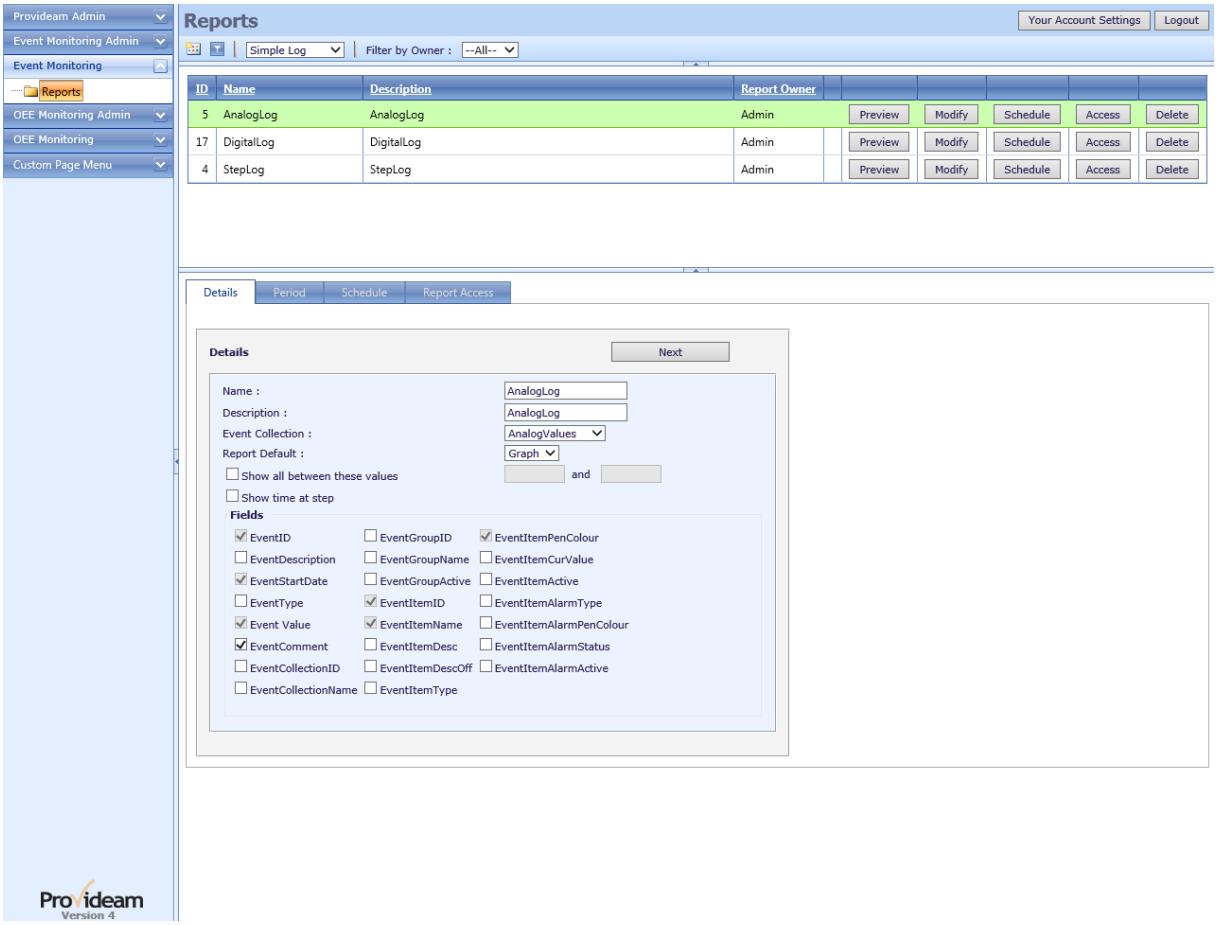


Fig. Event Mon Reports - Simple Log, Modify Report Details

- The **Name** text box allows you to set the name of the Active Alarms report.
- The **Description** text box allows you to set the description of the Active Alarms report.
- The **Event Collection** selection box allows you to select the Event Collection for the Active Alarms report.
- The **Report Default** selection box allows you to save the default type for the report. The options are; *Table* and *Graph*.
- The **Show all between these values** text boxes allow you to select a minimum and maximum data value. Only data which is between these values will be displayed. Enable this function by clicking the check box to the left hand side of the frame.
- The **Show Time at step** check box causes Provideam to display a column on the report which shows the time between each event. This is useful if you are monitoring a sequence of events.
- The **Next** button allows you to move to the next step, the period definition.

- The **Fields** frame allows you to check the items which you wish to appear on the report. In the example above only the Event Item Name and Current Value are selected.

The Simple Log Pane, Modify Report Period.

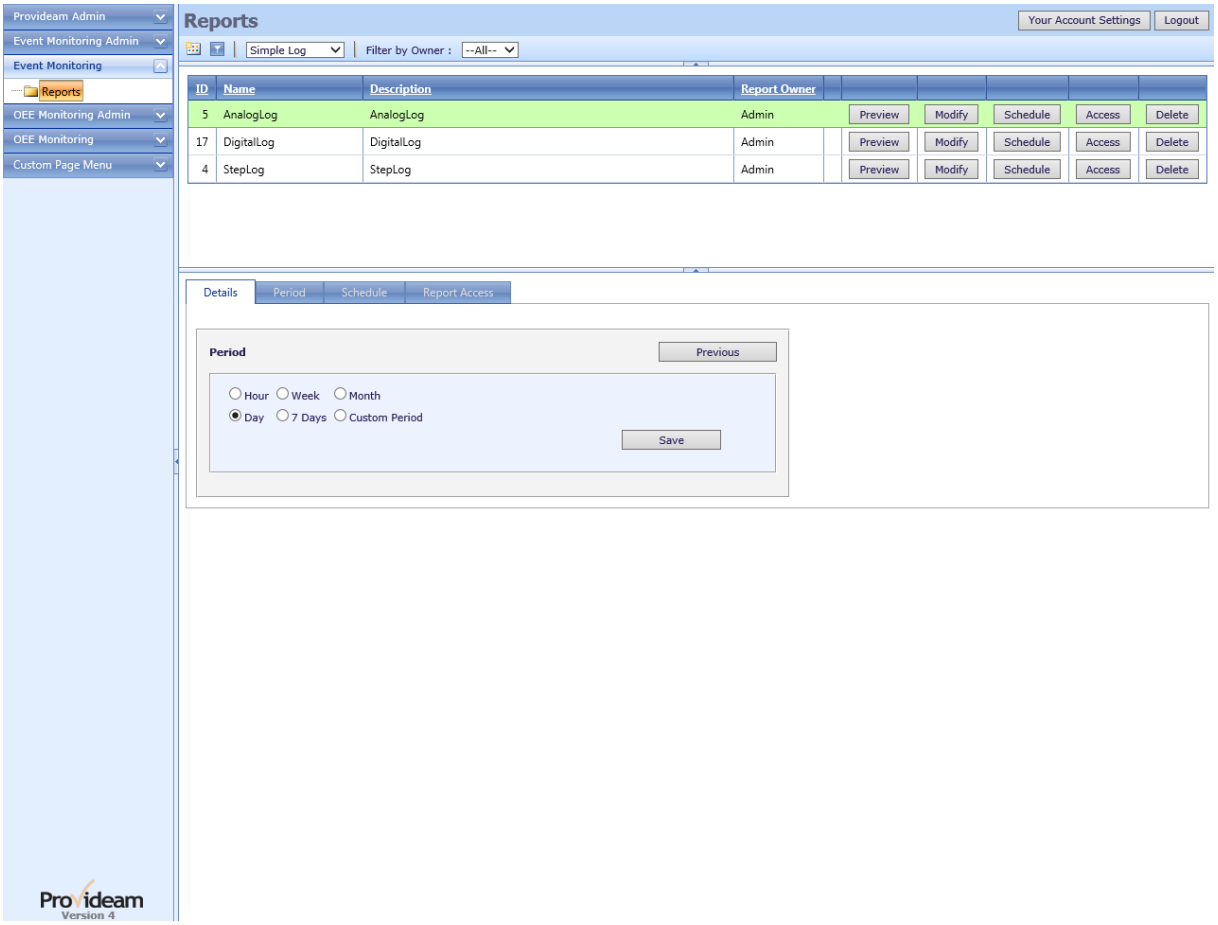


Fig. Event Mon Reports - Simple Log, Modify Report Period

- The **Period** option buttons allow you to select the period for the Simple Log report. The options are; *Hour*, *Week* (calendar week, Monday - Sunday), *Month* (calendar month), *Day*, *7 Days* (7 day period to selected date) and *Custom Period* (period between two selected dates).
- The **Next** button allows you to move to the next step, the period definition.
- The **Save** button allows you to save changes to the Active Alarms report.

The Simple Log Pane, Scheduled Tasks.

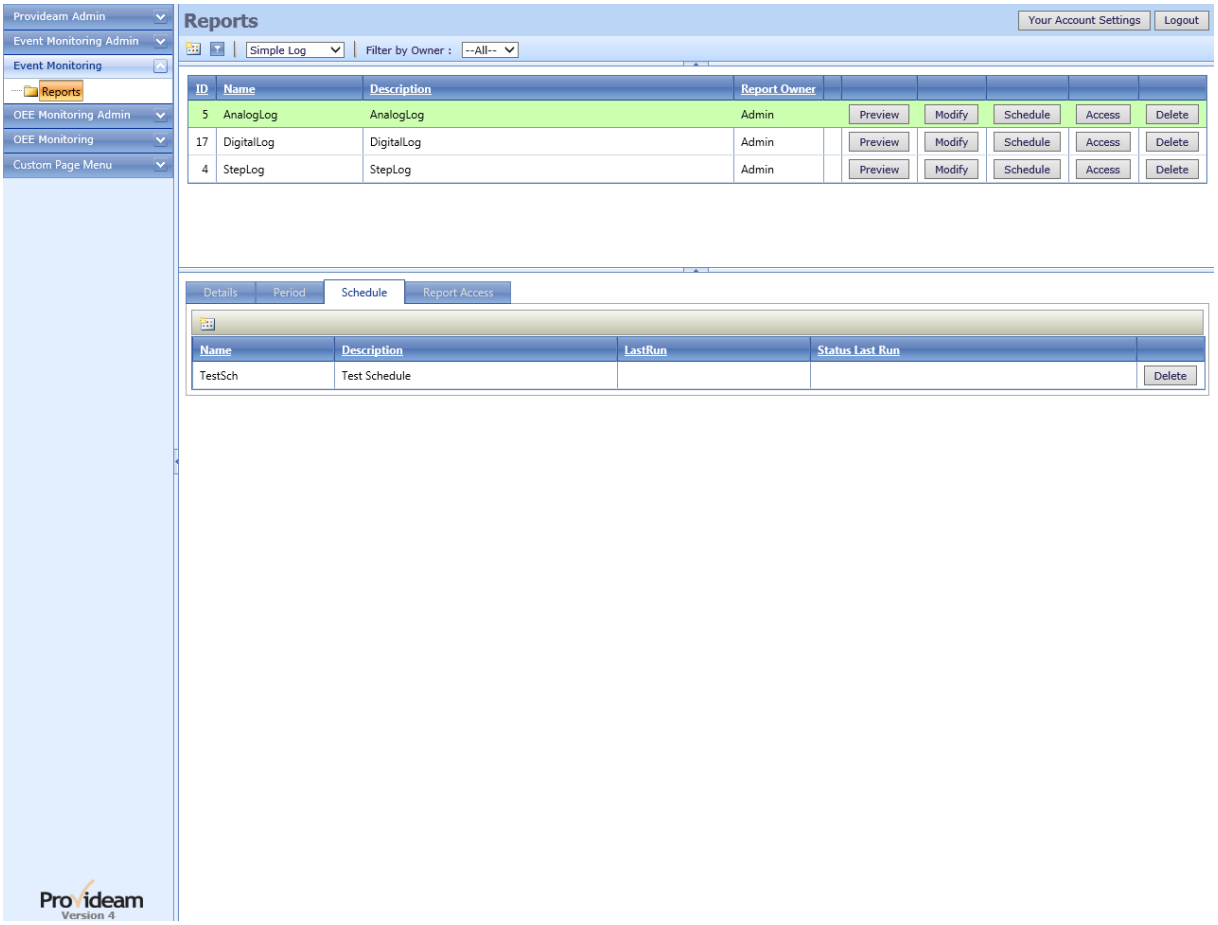


Fig. Event Mon Reports - Simple Log, Scheduled Tasks

- The **AddNew** button allows you to create a new scheduled task.
- The **Delete** button allows you to delete the selected scheduled task.
- Click on the scheduled task to Modify the task.

The Simple Log Pane, Scheduled Task Details.

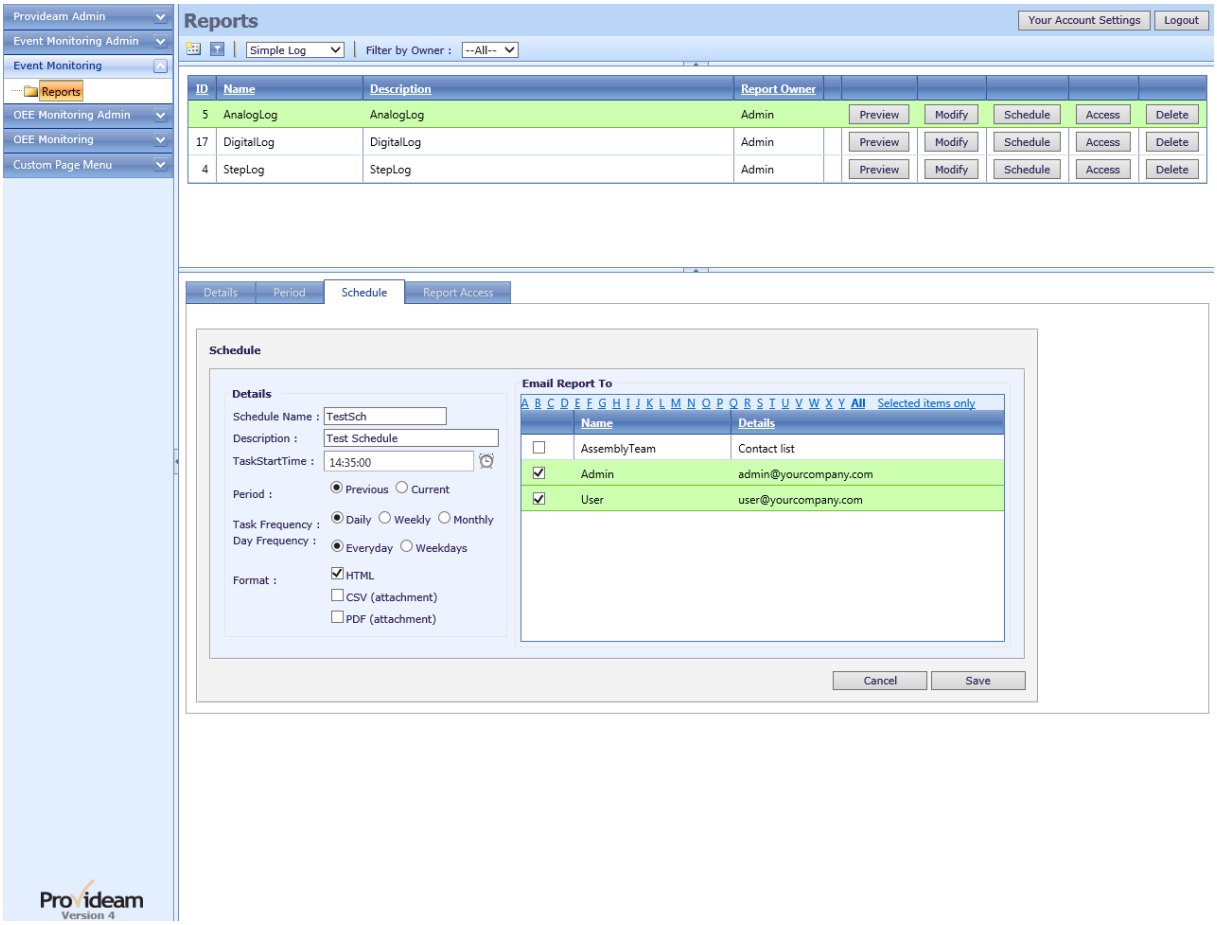


Fig. Event Mon Reports - Simple Log, Scheduled Task Details

- The **Schedule Name** text box allows you to set the name of the Scheduled Task.
- The **Description** text box allows you to set the description of the Scheduled Task.
- The **TaskStartTime** text box allows you to set the start time of the Scheduled Task. The **Time Picker** helps you to choose suitable times. The time format is hh:mm:ss.
- The **Period** option buttons allow you to set whether the report period is to be the current period or the previous period. This allows you, for example, to create a Scheduled Task to run at 00:05:00 which, if *Previous*, is selected generates a report for the whole of the previous day. Whereas if *Current* is selected will generate a report with a period of 5minutes.
- The **Task Frequency** option buttons allow you to the frequency of the Scheduled Task. The options are; *Daily* (every day), *Weekly* (selected days during week) and *Monthly* (selected days during month).
- The **Day(/Week/Month) Frequency** option buttons allow you to refine the **Task Frequency** settings. If the above example it allows to to choose between

Everyday and *Weekdays*. For the *Weekly* **Task Frequency** option you would choose specific days of the week, etc.

- The **Format** check boxes allow you to set the format of the report in the email. The options are *HTML* (embedded in email), *CSV* (a CSV attachment to the email) and **PDF** (a PDF attachment to the email).
- The **Email Report To** selection table allows you to set which Provideam User's email addresses will receive the scheduled report. You can check individual email addresses or Contact Lists.
- The **Cancel** button allows you to cancel any edits and return to the previous page.
- The **Save** button allows you to save changes to the Scheduled Task.

The Simple Log Pane, Report Access.

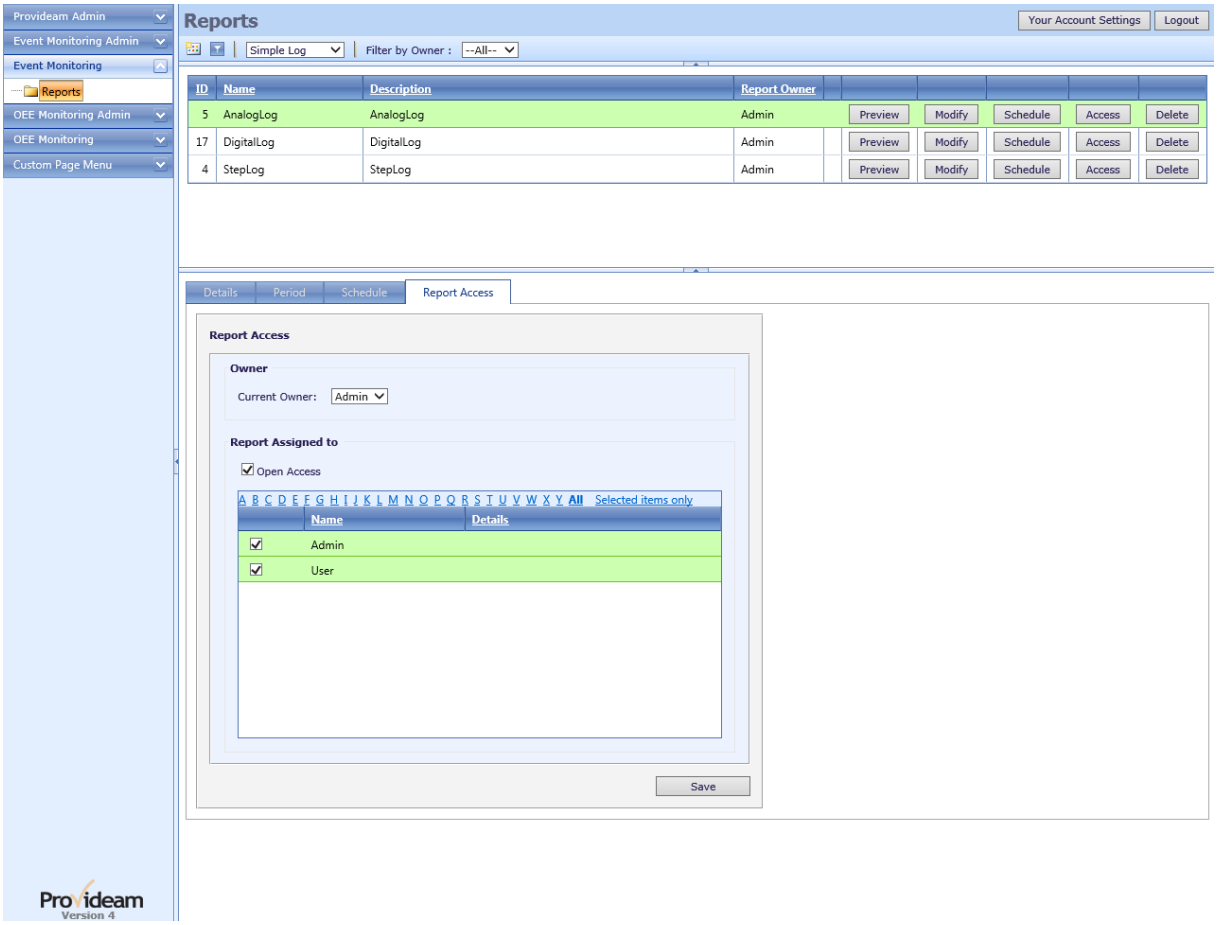


Fig. Event Mon Reports - Simple Log, Report Access

Access Control Section:

- The **Open Access** check box allows you to give all users access to this View. If this check box is on then any user, with access to the selected Area, will have access to this View. Note that this setting overrides the setting of individual **User Access List**.
- The **User Access List** area allows you to select which users will have access to this View. Check or uncheck any User which you want to include or exclude from the Access List. The alphabetic filter allows you to limit the display to Names which start with the selected letter. The **Selected items only** option shows the Users which you have selected.

Simple Group

The Simple Group shows an aggregated Table of the data logged for each Item in the Collection over a defined period.

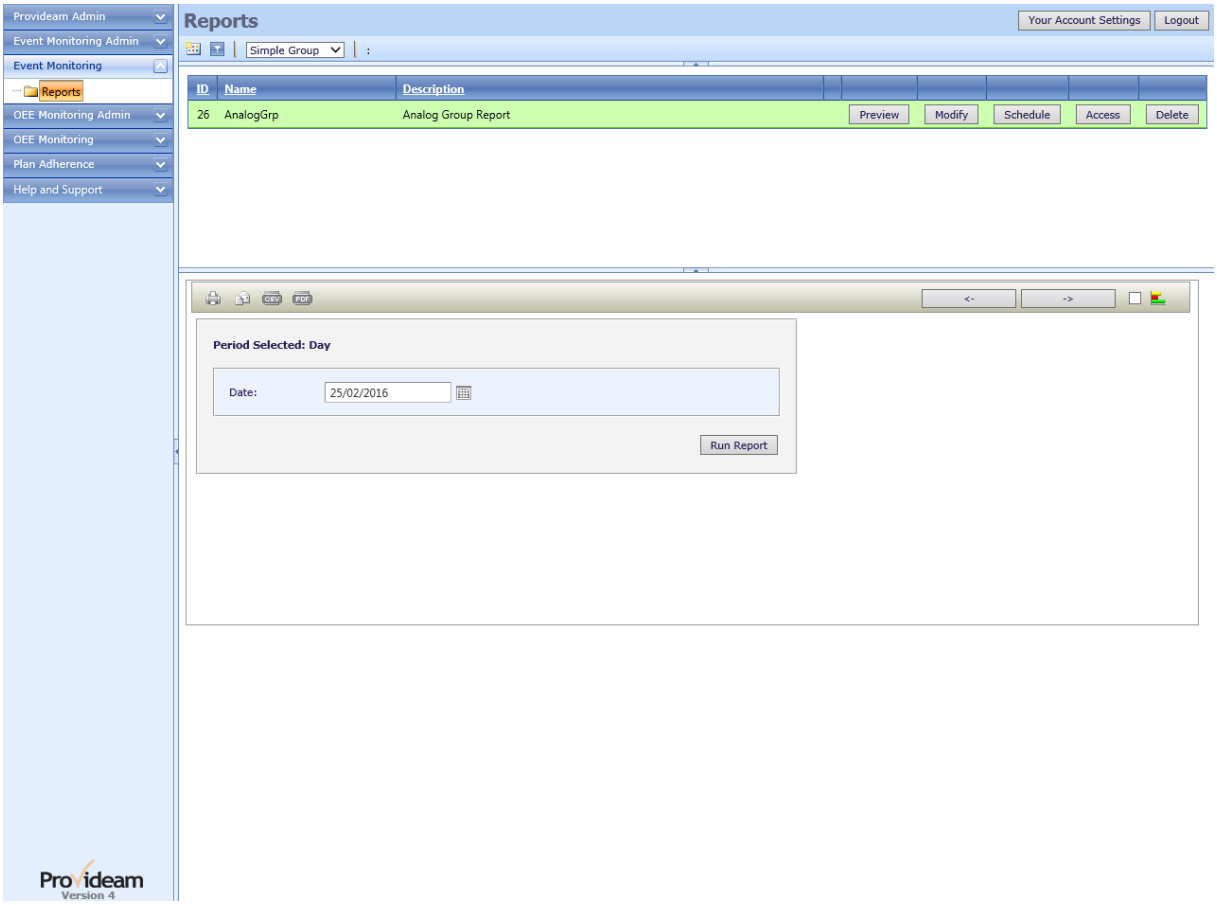


Fig. Event Mon Reports - Simple Group

- The **Date** selection box allows you to choose the date for which the report will be created. In the above example the report period is a day. Hence the period selection is for a date. The  date picker helps you to choose a date. If the period was for a week then the period selection would be for a week, etc, etc.
- The **Run Report** button will run the report for the selected period

The Simple Group Pane, Tabular Report.

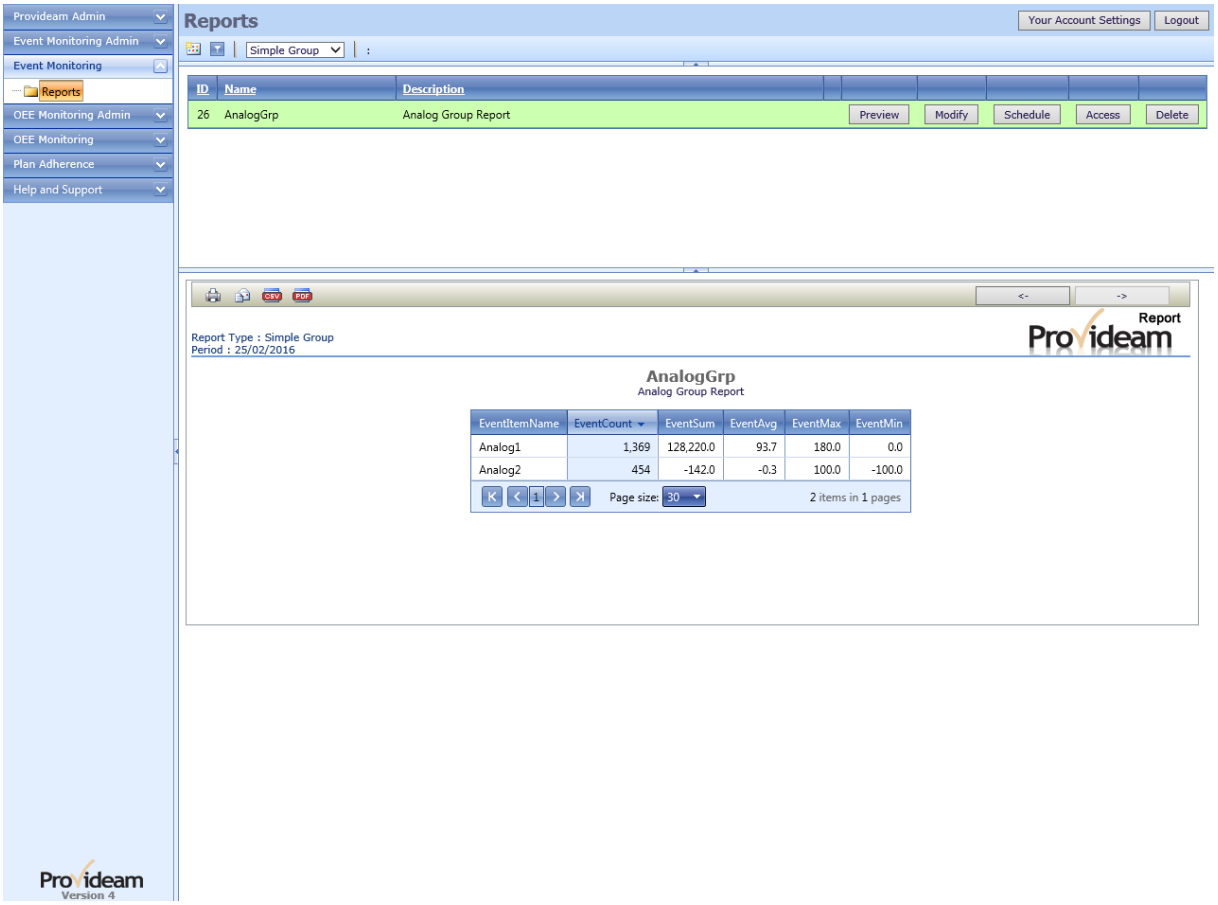


Fig. Event Mon Reports - Simple Group, Tabular Report

The Tabular report shows the aggregate functions calculated for each item.

The Simple Group Pane, Modify Report Details.

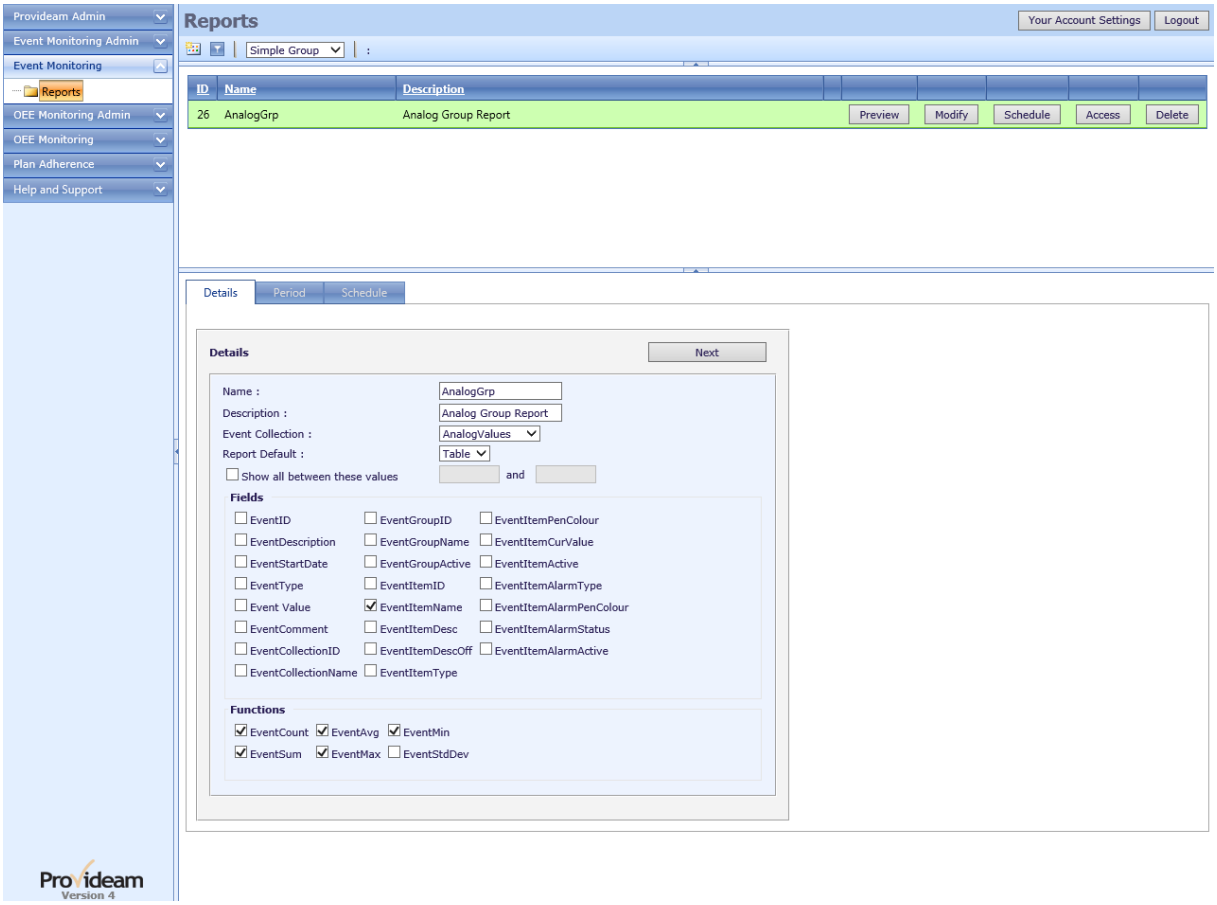


Fig. Event Mon Reports - Simple Group, Modify Report Details

- The **Name** text box allows you to set the name of the Active Alarms report.
- The **Description** text box allows you to set the description of the Active Alarms report.
- The **Event Collection** selection box allows you to select the Event Collection for the Active Alarms report.
- The **Report Default** selection box allows you to save the default type for the report. The options are; *Table* and *Graph*.
- The **Show all between these values** text boxes allow you to select a minimum and maximum data value. Only data which is between these values will be included in the aggregate function. Enable this function by clicking the check box to the left hand side of the frame.
- The **Fields** frame allows you to select an item on which you want to aggregate the data in the report. In the example above the report will be aggregated on the EventItemName.
- The **Functions** frame allows you to check the aggregate Functions which you wish to appear on the report.
- The **Next** button allows you to move to the next step, the period definition.

The Simple Group Pane, Modify Report Period.

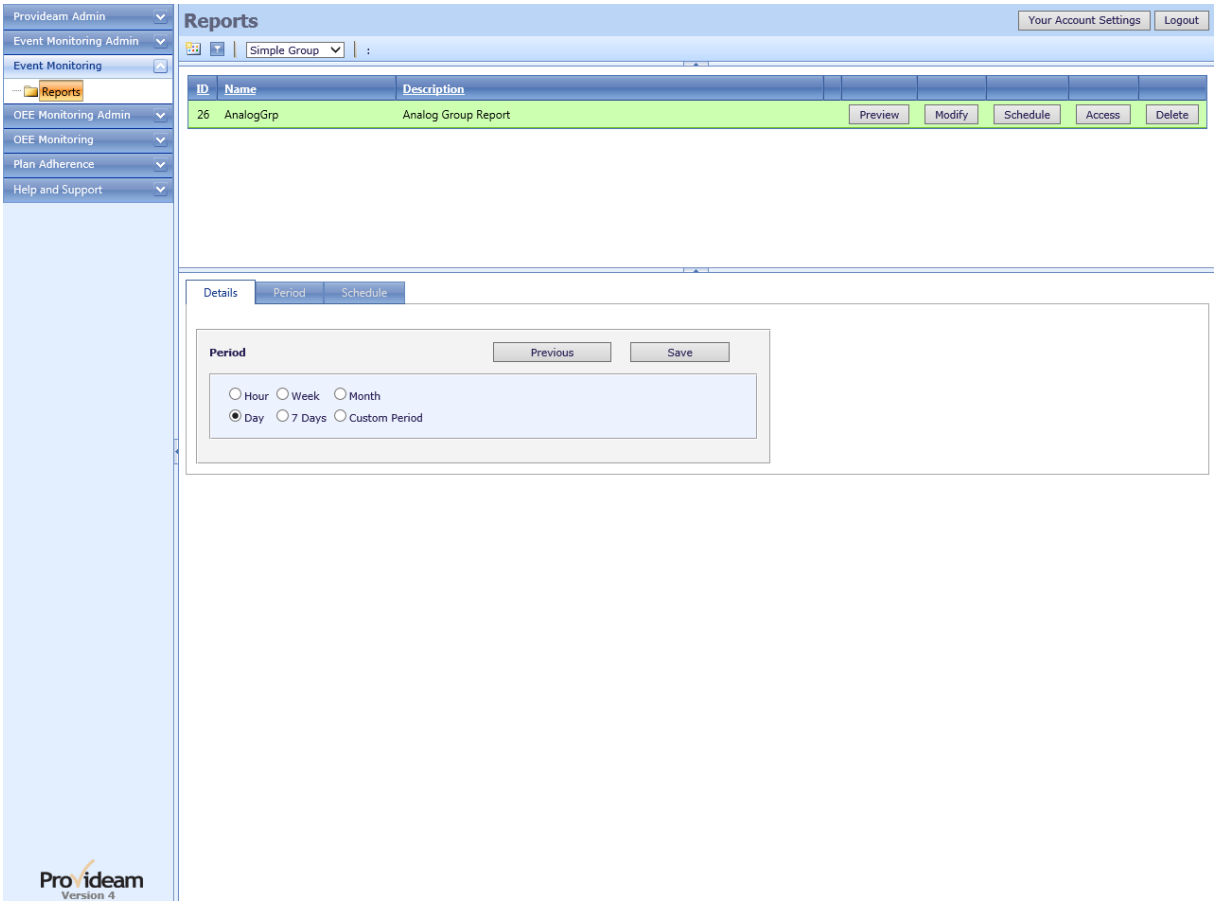


Fig. Event Mon Reports - Simple Group, Modify Report Period

- The **Period** option buttons allow you to select the period for the Simple Log report. The options are; *Hour*, *Week* (calendar week, Monday - Sunday), *Month* (calendar month), *Day*, *7 Days* (7 day period to selected date) and *Custom Period* (period between two selected dates).
- The **Next** button allows you to move to the next step, the period definition.
- The **Save** button allows you to save changes to the Active Alarms report.

7.7.2.1.1 Event Report DataSets

Provideam offers the following DataSet Templates:

DataSet Name	DataSet Description	
dsCurrentStatus	Current Status Report DataSets	

dsActiveAlarms	Active Alarms Report DataSets	
dsSimpleLog	Simple Log Report DataSets	
dsSimpleGroup	Simple Group Report DataSets	

7.7.2.1.2 Event Fields

Current Status Report Fields:

Field Name	Field Description	
fdEventCollectionID	Event Collection ID	
fdEventCollectionName	Event Collection Name	
fdEventGroupID	Event Group ID	
fdEventGroupName	Event Group Name	
fdEventGroupActive	Event Group Active	
fdEventItemID	Event Item ID	
fdEventItemName	Event Item Name	
fdEventItemDesc	Event Item Description	
fdEventItemDescOff	Event Item Description Off	
fdEventItemType	Event Item Type	
fdEventItmePenColor	Event Item Pen Colour	
fdEventItemLstUpdate	Event Item Last Update	
fdEventItemCurValue	Event Item Current Value	
fdEventItemActive	Event Item Active	
fdEventItemAlarmType	Event Item Alarm Type	
fdEventItemAlarmPenColour	Event Item Alarm Pen Colour	
fdEventItemAlarmStatus	Event Item Alarm Status	
fdEventItemAlarmActive	Event Item Alarm Active	

Active Alarms Report Fields:

Field Name	Field Description	
fdEventCollectionID	Event Collection ID	
fdEventCollectionName	Event Collection Name	
fdEventGroupID	Event Group ID	
fdEventGroupName	Event Group Name	
fdEventGroupActive	Event Group Active	
fdEventItemID	Event Item ID	
fdEventItemName	Event Item Name	
fdEventItemDesc	Event Item Description	
fdEventItemDescOff	Event Item Description Off	
fdEventItemType	Event Item Type	
fdEventItmePenColor	Event Item Pen Colour	
fdEventItemLstUpdate	Event Item Last Update	
fdEventItemCurValue	Event Item Current Value	
fdEventItemActive	Event Item Active	
fdEventItemAlarmType	Event Item Alarm Type	
fdEventItemAlarmPenColour	Event Item Alarm Pen Colour	
fdEventItemAlarmStatus	Event Item Alarm Status	
fdEventItemAlarmActive	Event Item Alarm Active	

Simple Log Report Fields:

Field Name	Field Description	
fdEventID	Event ID	
fdEventDescription	Event Description	
fdEventStartDate	Event Start Date	
fdEventType	Event Type	
fdEventValue	Event Value	

fdEventComment	Event Comment	
fdEventCollectionID	Event Collection ID	
fdEventCollectionName	Event Collection Name	
fdEventGroupID	Event Group ID	
fdEventGroupName	Event Group Name	
fdEventGroupActive	Event Group Active	
fdEventItemID	Event Item ID	
fdEventItemName	Event Item Name	
fdEventItemDesc	Event Item Description	
fdEventItemDescOff	Event Item Description Off	
fdEventItemType	Event Item Type	
fdEventItmePenColor	Event Item Pen Colour	
fdEventItemLstUpdate	Event Item Last Update	
fdEventItemCurValue	Event Item Current Value	
fdEventItemActive	Event Item Active	
fdEventItemAlarmType	Event Item Alarm Type	
fdEventItemAlarmPenColour	Event Item Alarm Pen Colour	
fdEventItemAlarmStatus	Event Item Alarm Status	
fdEventItemAlarmActive	Event Item Alarm Active	

7.7.2.1.3 Event Functions

Functions are only available for Simple Group Event Logic Reports.

Function Name	**Function Description**	
fnEventCount	Count of the Event Records	
fnEventSum	Sum of the Event Records	

fnEventAvg	Average Value of the Event Records	
fnEventMax	Maximum Value of the Event Records	
fnEventMin	Minimum Value of the Event Records	
fnEventStdDev	Standard Deviation Value of the Event Records	

7.7.2.1.4 Event Periods

Provideam Report Periods:

Period Name	**Period Description**	
pdCustom	Custom Period. Defined by Start Date and End Date	
pdMonth	Month Period. Defined by Month Number and Date	
pdWeek	Week Period. Defined by Week Number and Date	
pd7Days	7 Days Period. Defined by End Date	
pdDay	Day Period. Defined by Date	
pdHour	Hour Period. Defined by Hour Number and Date	

7.7.2.1.5 Event Objects

Provideam Report Objects:

Object Name	**Object Description**	
obEventGroupID	The obEventGroupID can take any integer values. The Event Data is filtered on the Event Group IDs.	
obEventItemID	The obEventItemID can take any integer values. The Event Data is filtered on the Event Item IDs.	
obEventCollectionID	The obEventCollectionID can take any integer values. The Event Data is filtered on the Event Collection IDs.	

Note: The Database has been optimized for queries filtering on the obEventCollectionID.

7.8 Integrated Help Module

The Integrated Help Module contains key resources to help you configure and maintain your Provideam Solution.

The image below shows the Provideam User Guide integrated with the Provideam application.

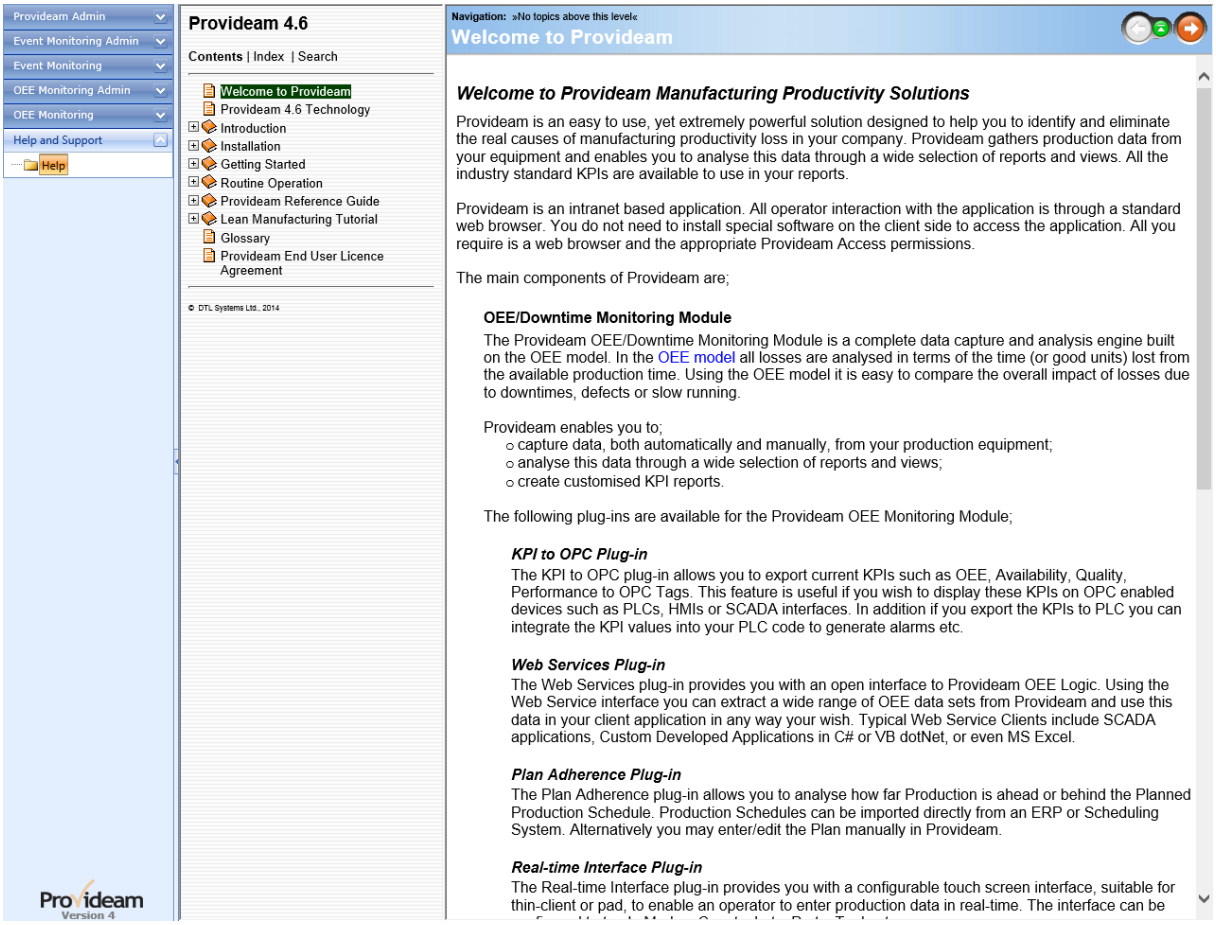


Fig. Provideam Integrated Help - The User Guide

The Help and Support Menu can be disabled via the User Group Security Settings.

7.9 Data Collection

This section looks at the automatic collection of data from OPC Servers, from ProvEdgeBoxes or from external database sources.

7.9.1 OPC Data Collection

In the majority of cases OEE data is collected directly from the machine control PLC or via a data collection PLC which acts as an interface to several machine control systems (some of which may not have a PLC). In either case the data is extracted from a PLC and this requires a communications link between Provideam and the data collection PLC.

There are two aspects to the communications link, a) the physical connection and b) the protocol. It is normally the job of a Controls or Automation Engineer to make this link.

Physical Connection

Increasingly the physical connection is an ethernet network. In other words the PLC is connected directly to the Local Area Network. In cases where the PLC does not support ethernet, or ethernet is too expensive, Serial to Ethernet Converters provide a satisfactory alternative. Alternatively, for small applications, the Provideam Server may communicate to the PLCs directly via a serial link such as RS232.

Protocol

All PLCs have a native protocol, or language, which they use to communicate with other devices. The modern approach to talking to a wide range of different PLCs, all with their own 'language' is to use OPC technology. OPC technology provides a standard interface between Windows applications, such as Provideam, and various communication protocols, such as Allen Bradley PLC's DF1 protocol. OPC specialist companies such as PTC (Kepware) Inc provide a wide range of drivers for various PLC protocols. Thus, by employing OPC technology from Kepware, Provideam can communicate with practically every PLC on the market.

It is generally necessary to carryout a small amount of PLC programming to optimise the collection of OEE data for each machine. Provideam can capture many pieces of data such as the current Part or Tool etc. from the PLC but the most important pieces of information are a) the current Mode and b) the number of Good Parts produced.

Mode

For each machine you need to define the Mode in the data collection PLC. The Mode is an integer value which defines the current state of the machine. 1 is normally used for Running, 21 might be a stop due to a lack of raw materials, 22 might be a stop due to a backup on the outfeed etc. 0 is reserved for use as stopped for unknown reason. Apart from the reserved values you may choose any integer values you wish to define each of the modes appropriate to each machine.

Yield

Yield values are the counts related to Good Parts, Defect Parts and Machine Cycles. Cycles is generally only used where the machine uses a Tool with multiple cavities such as a moulding machine. You must define an integer value for each count. The count will keep increasing until it reaches some maximum value where it should be reset to 0. The maximum value of each count is entered into the Provideam configuration so that it can keep track of each count as that count cycles through its maximum value.

7.9.2 OMRON OPC PLC Example

It is a relatively straight forward task to modify the Demonstration Configuration to work with a 'live' PLC. Simply follow the steps below;

Step 1: Create physical connection to PLC.

In the example below we have connected our server to an OMRON PLC using OMRON's Host Link Serial Interface. You may choose to use any network which suits your PLC. Kepware supports a wide range of PLC Network drivers and yours is almost certainly included.

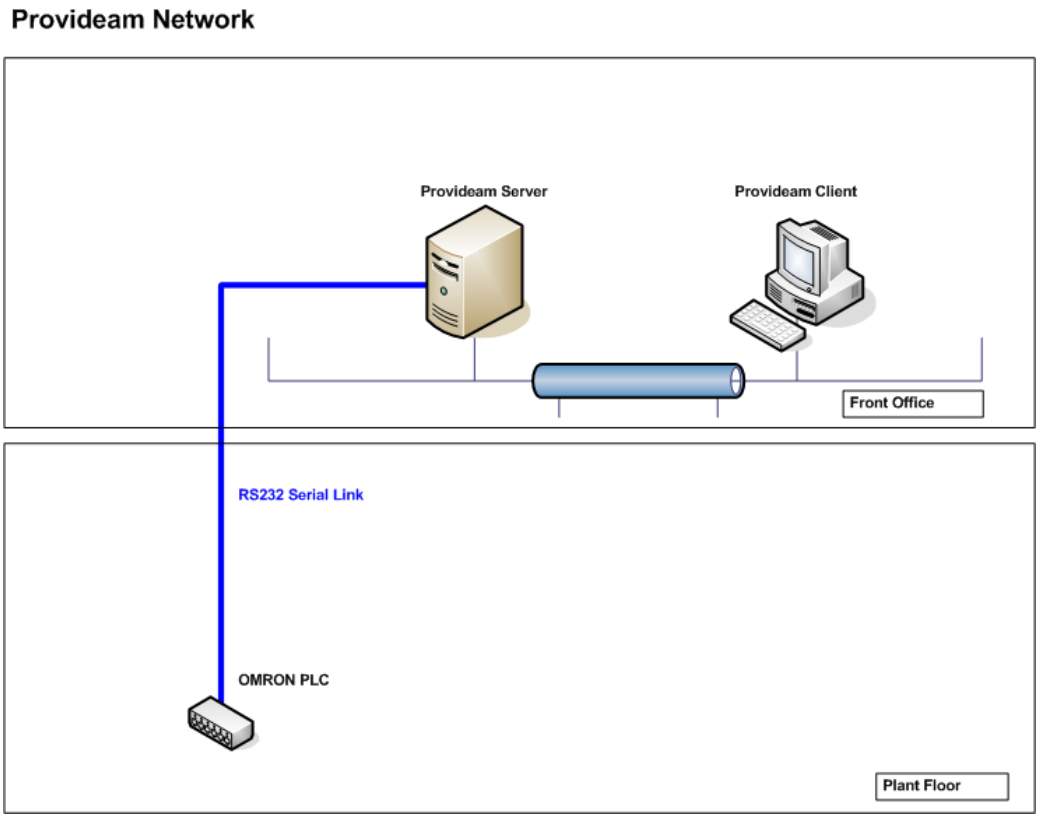


Fig. Data Collection Network Schematic

Step 2: Create Kepware Profile

A Kepware Profile is a file which defines how your server will connect to the PLC. The Profile holds information on the type of protocol, the address of the PLC and the addresses of the memory locations you wish to monitor. Please refer to the Kepware Manual if you are unfamiliar with setting up a Kepware Application.

In your Profile you must assign Tags to PLC memory locations. The Tags represent the different variables you wish Provideam to monitor. In our example you will see that the Mode for AssemblyMC1 is assigned to DM0000, the GoodCount to DM0010 etc.

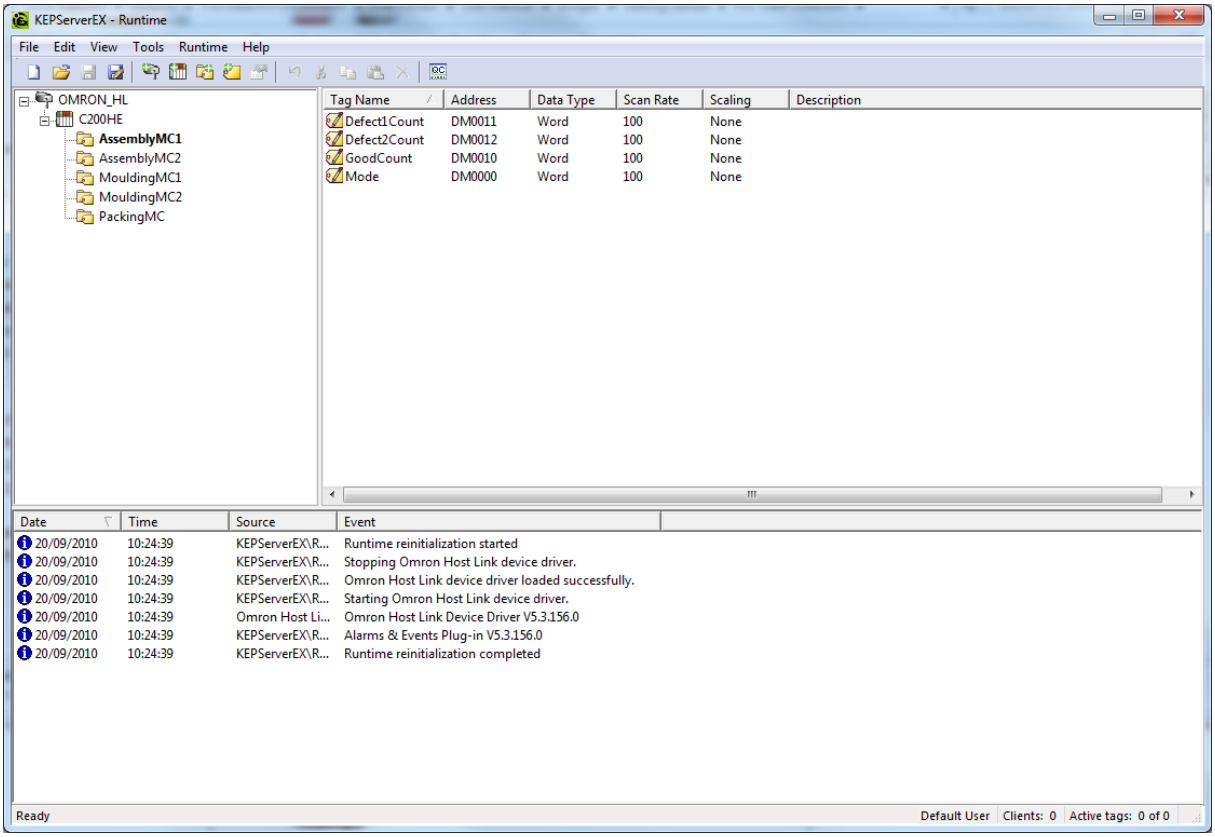


Fig. Kepware OMRON Host Link Profile

Once you have created your Kepware Profile you should test that it connects to the PLC by using Kepware's OPC Quick Client Tool.

Step 3: Program PLC to facilitate data collection.

To facilitate data collection you need to do a small amount of PLC programming. The purpose of this is to optimise the data collection so that only relevant data is being monitored and you are not, therefore, overloading your communications network.

In the figure below a typical OMRON PLC project is shown. The PLC is operating as a data collection centre for a number of Machine Control PLCs. You will notice that a separate block of code has been created for each machine which is being monitored.

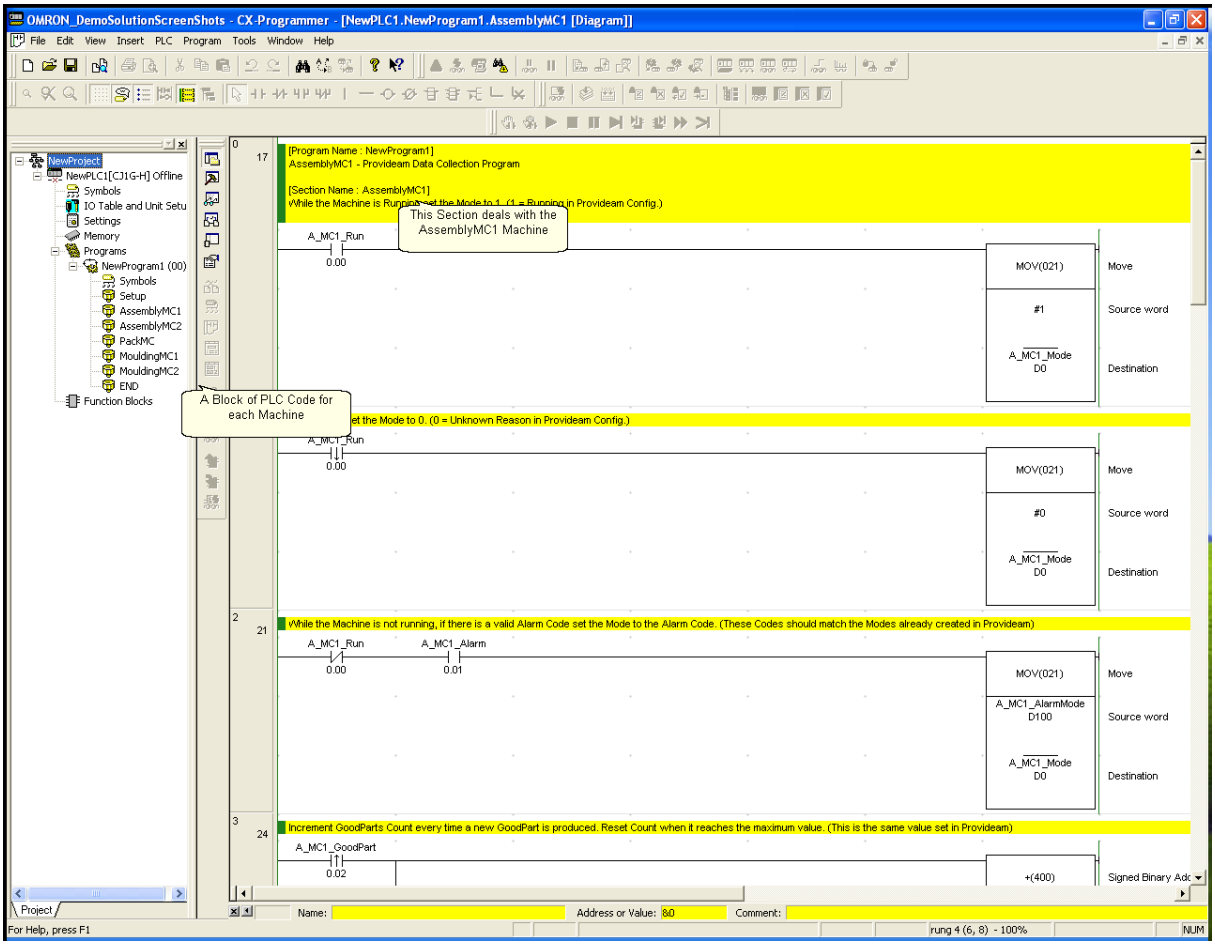


Fig. OMRON CX-Programmer Programming Software

The Mode is defined as follows (see Ladder Logic in the figure below);

1. While the AssemblyMC1 Machine Run Flag (A_MC1_Run) is On, Move 1 in to the Mode Memory Location (A_MC1_Mode) (i.e. Running)
2. When the Run Flag Changes State to Off, Move 0 into A_MC1_Mode (i.e. Unknown Reason or Not Logged)
3. While the Run Flag is Off and the Machine has an Active Alarm (A_MC1_Alarm), Move the Alarm reason into A_MC1_Mode (these reasons should match the reasons you have created in the Machine Admin Mode configuration).

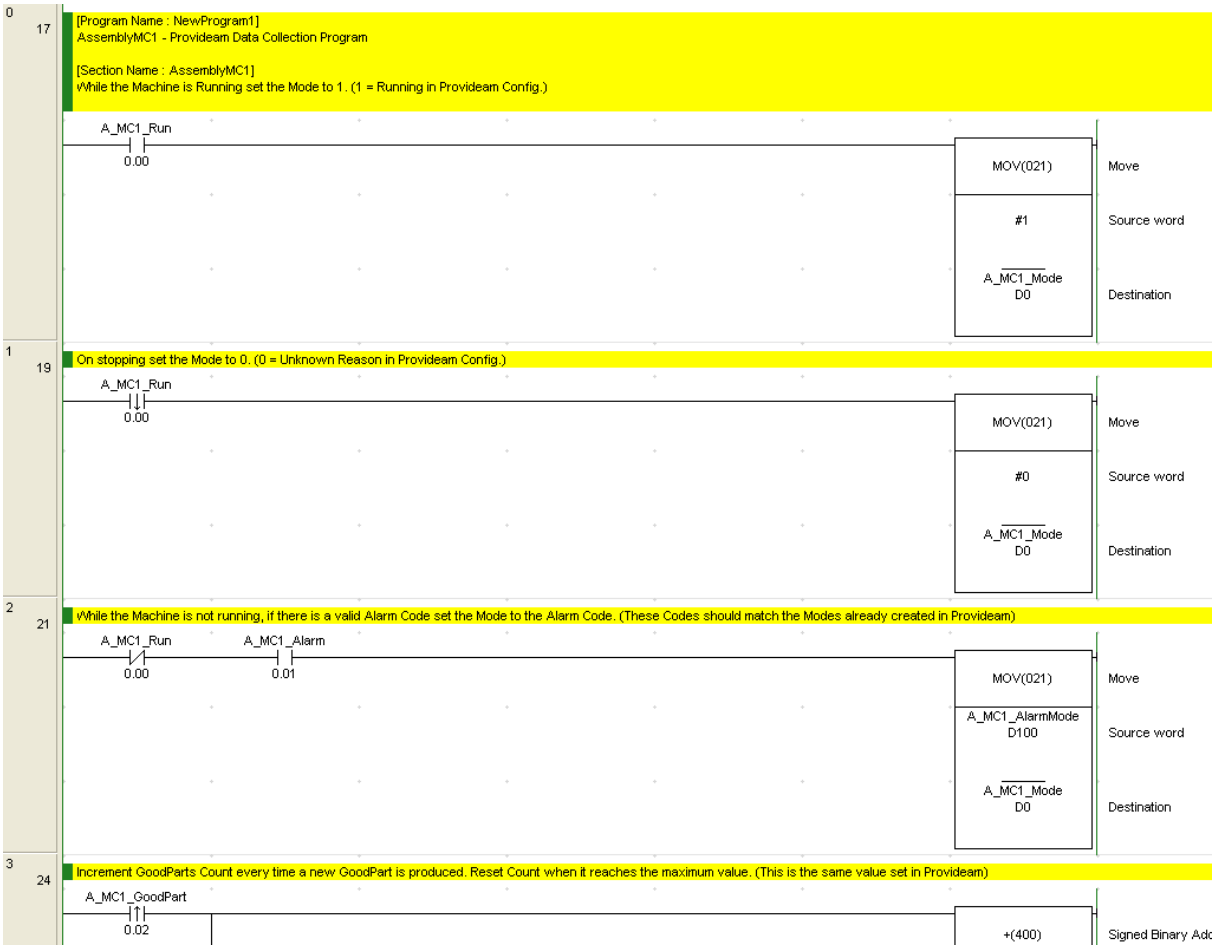


Fig. OMRON Ladder Logic defining Machine Mode

Next you will need to define each of the counts.

In the logic below the Good Parts Count Memory Location, A_MC1_Good, is incremented every time there is a pulse on the Good Part Sensor (A_MC1_Good). If the value exceeds 1000 then the count is reset to 0.

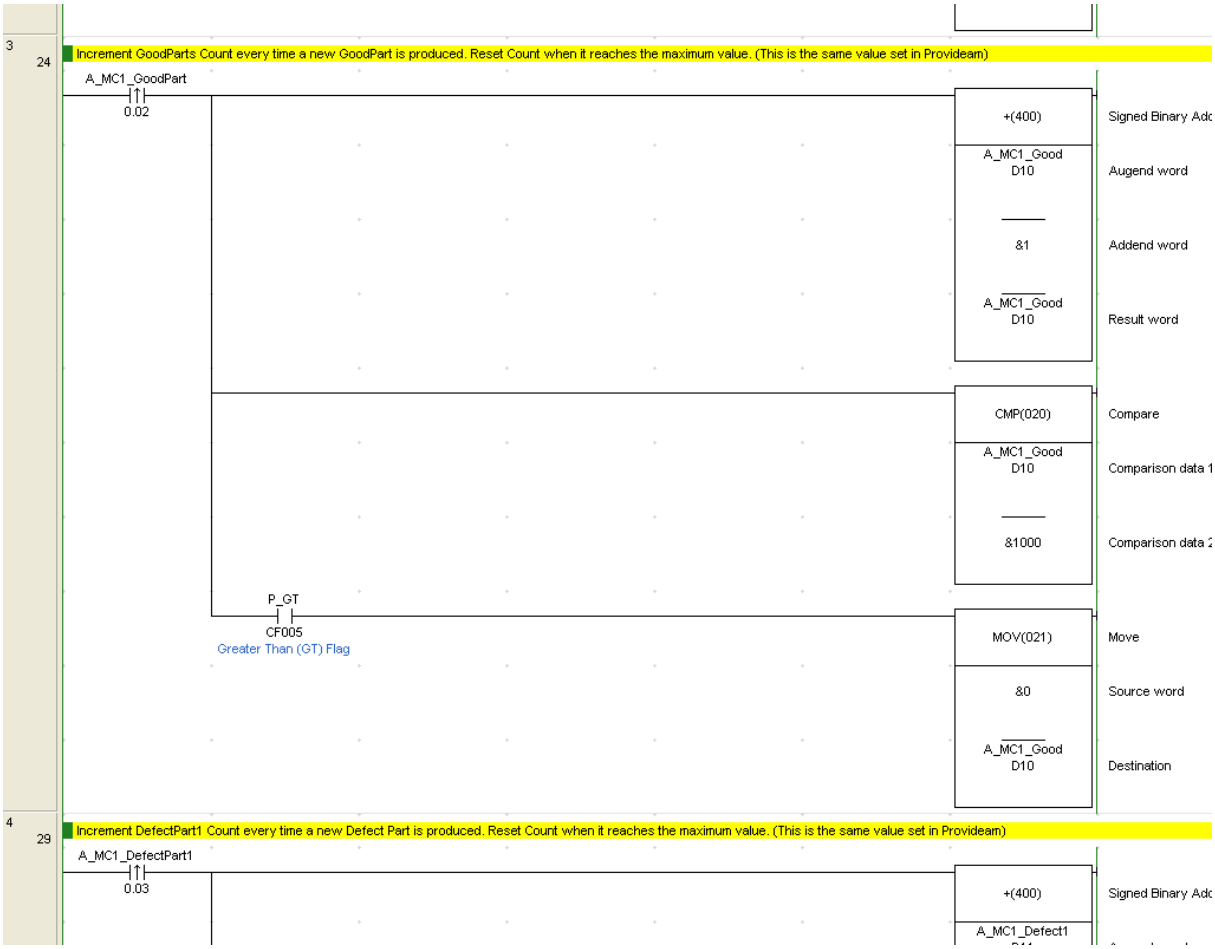


Fig. OMRON Ladder Logic defining Machine Good Parts Count

The Logic for Defect Parts count is almost identical except this time we are resetting the count on 10.

Note: In OMRON PLCs these counts will be automatically reset by the PLC when they reach the their maximum value, 65536. Consequently we don't need to include a reset instruction. In this case we would need to set the Count Reset value in the Machine Station Count Admin to 65536. In other PLC types, for example the Allen-Bradley SLC5, a fault would be generated if the PLC count was not reset before it reached the maximum value. In which case you should program the PLC to reset the value at some lower value such as 65500. In all cases the count value must be held in retentive memory - ie it must hold its value when the power to the PLC is cycled. In addition the value must not be reset at any time other than when the maximum value is reached.

In the example below the reset value is set to 10 which is therefore the value we must use in the Machine Station Count configuration.

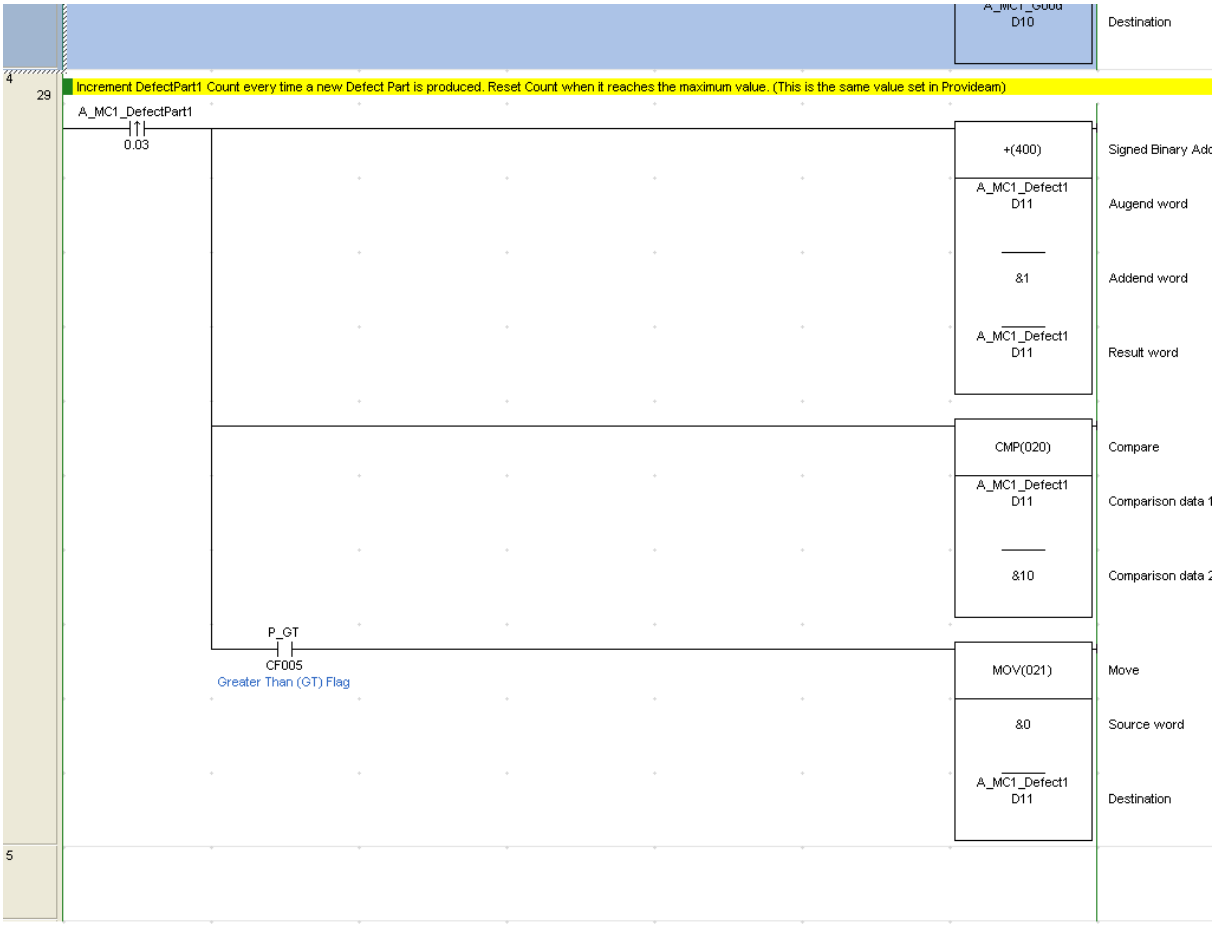


Fig. OMRON Ladder Logic defining Machine Defect Parts Count

Step 4: Modify the Provideam Machine Admin Configuration to the new Kepware Settings

Once you have saved your new Kepware Profile you should be able to browse the new tags as show in figure below. For each Machine select the appropriate Mode and Machine Station Count Tags.

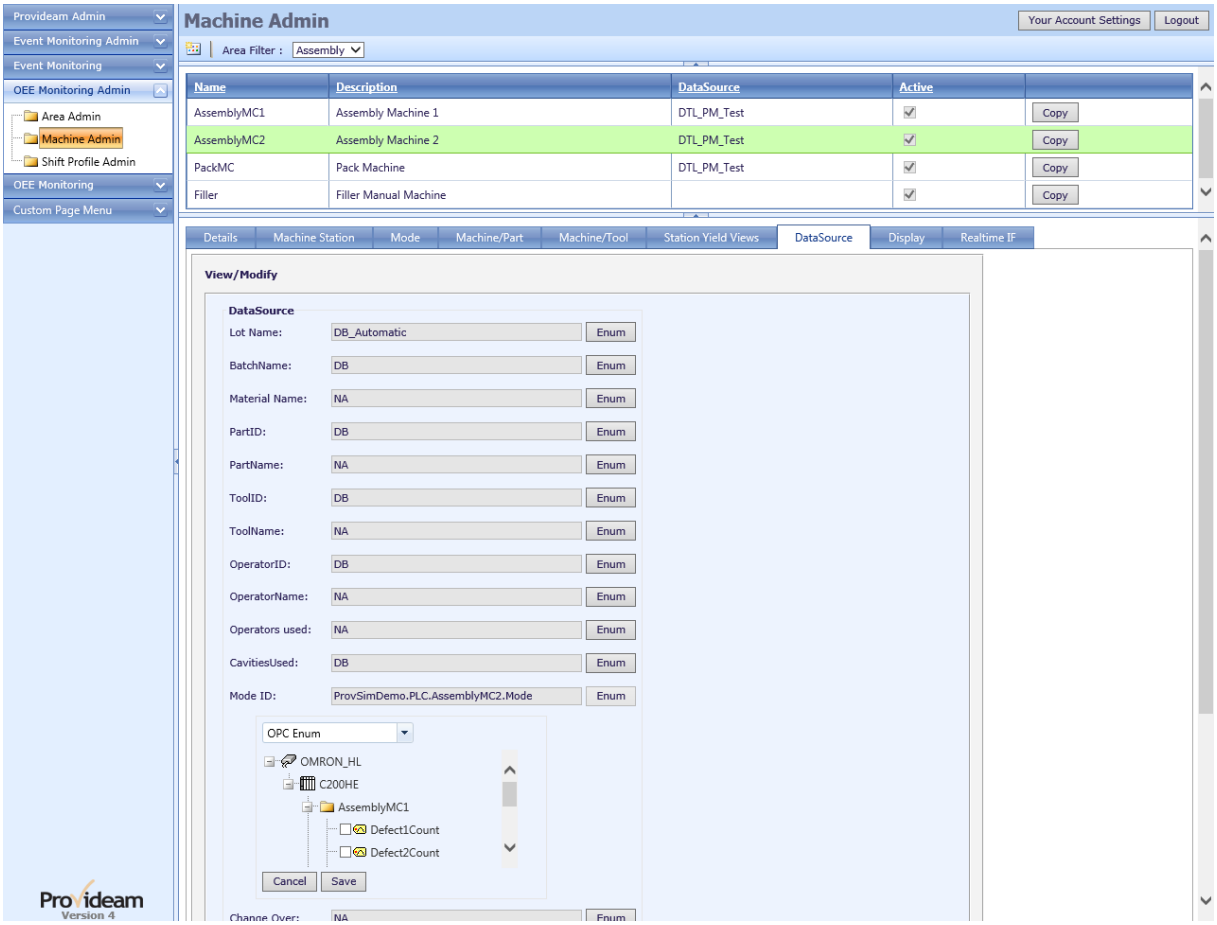


Fig. Enumerating the OMRON OPC Tags

You will also need to ensure that all the Modes defined in your PLC are accounted for in the list of ModeID's as in the figure below.

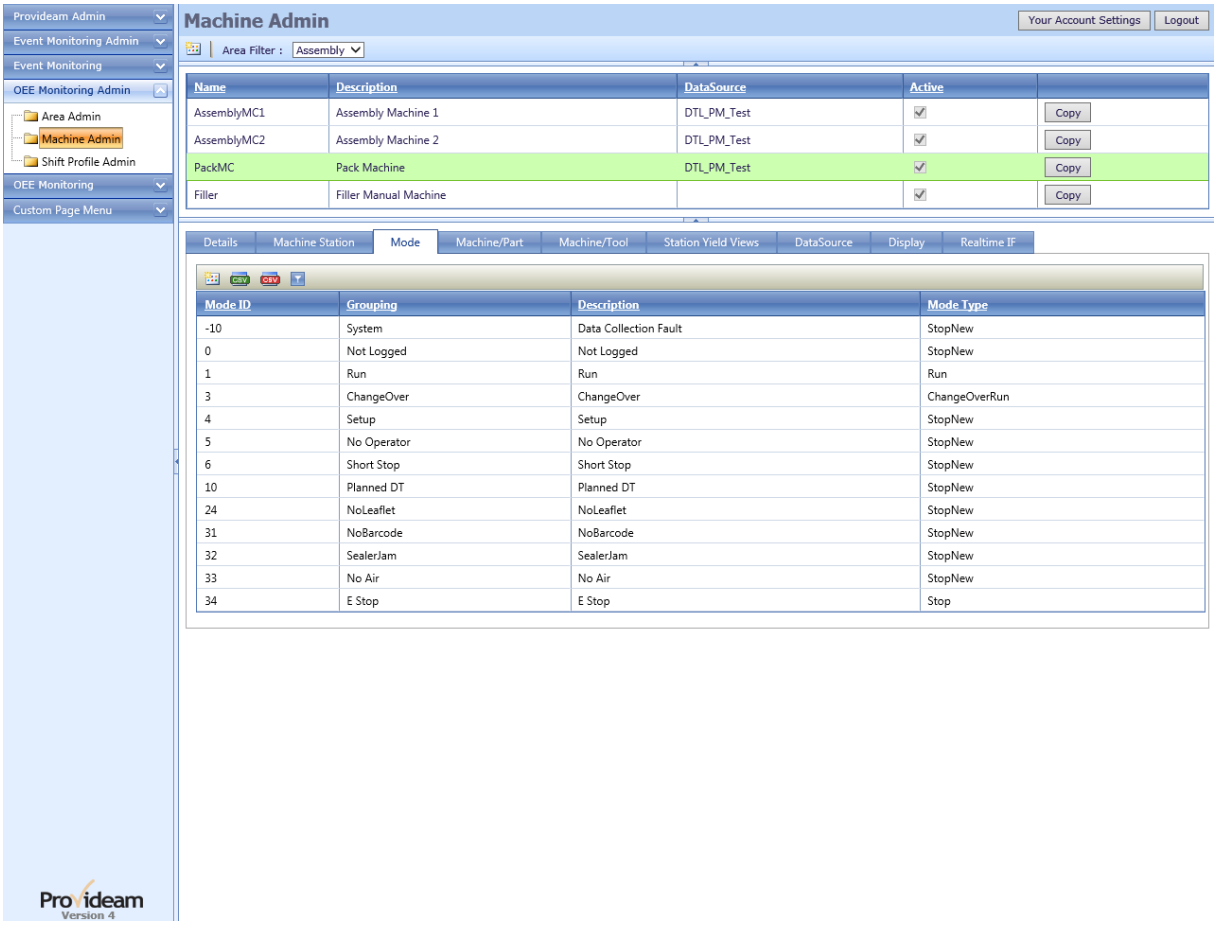


Fig. Edit the Machine Admin Mode Configuration

Step 5: Restart the OEE Monitoring Service

To pick up the change in Machine Configuration you will need to restart the Provideam OEE Monitoring Service.

Note: It can take a minute or two for the service to stop.

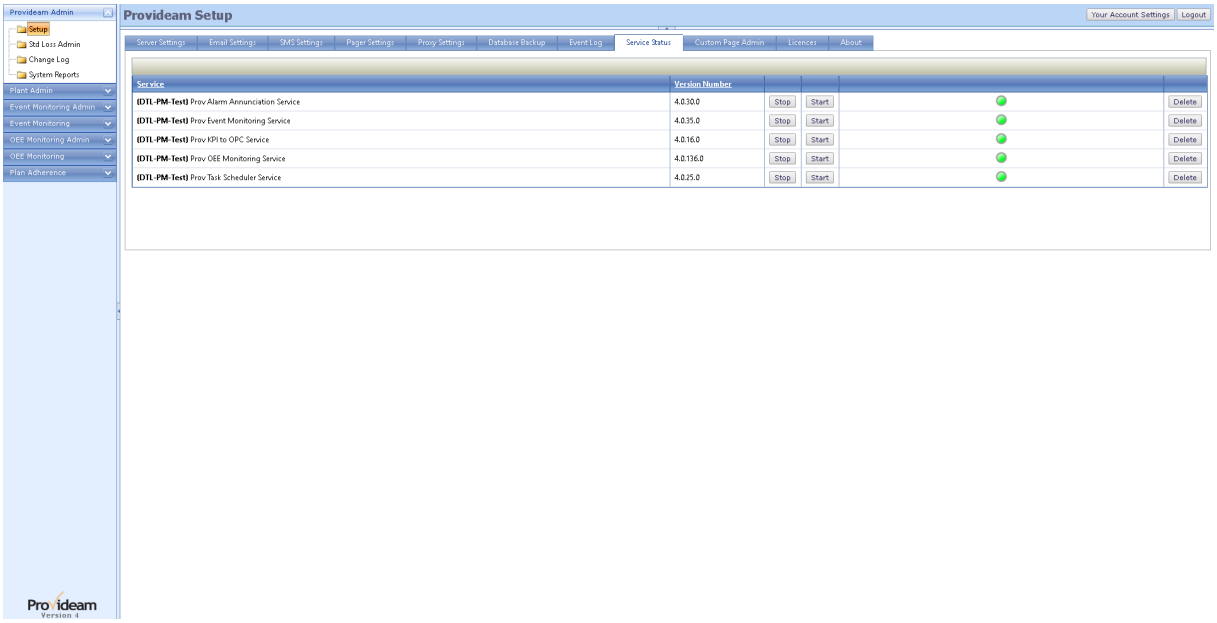


Fig. Provideam Admin - Service Status

If you experience difficulties enumerating the OPC Tags you should restart the Provideam Services Manager at the Provideam Server and try again. See figure below.

Note: All the Provideam Service are shutdown if you stop the Provideam Services Manager. After restarting you will need to restart each of the other Provideam Services you require in turn.

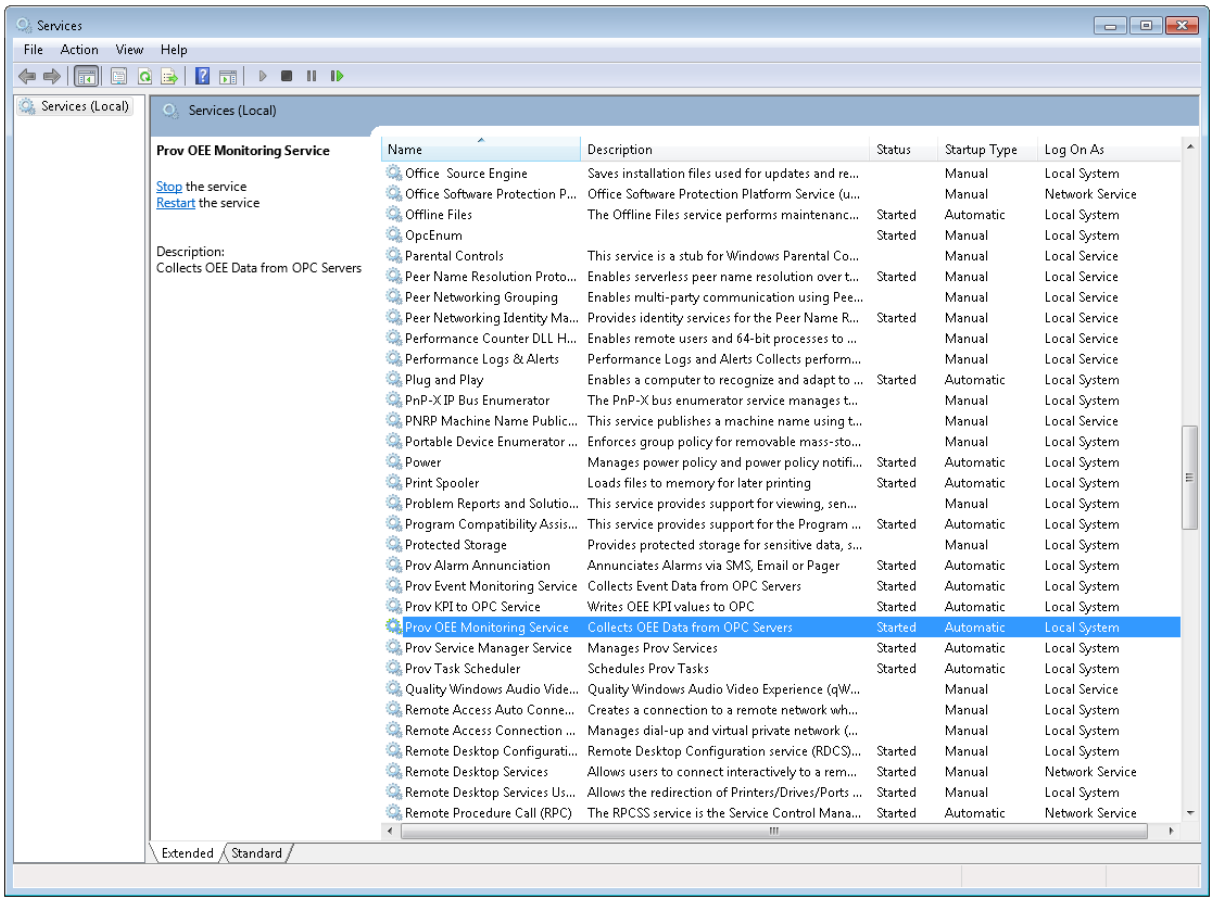


Fig. Windows Services Manager

7.9.3 DB Data Collection

It is also possible to update current production data by manipulating the values in fields in an interface table, tP_MachinePV. The Provideam OEE Monitoring Service monitors this table at regular intervals and if a datachange is detected it causes the production data to be updated.

A full list of the available fields in the tP_MachinePV database table is provided below;

Item Name	Item Description	Data Type
dbModeID	Integer value representing the Mode for the current Mode Record	Int
dbRunning	For future use	bit
dbChangeOver	Boolean flag to initiate ChangeOver. The flag is reset by the OEE Monitoring Service.	bit
dbReload	For future use	bit
dbProdSpeed	Decimal value between 0 and 1.5 indicating Production Speed for the current Lot Record. 1 is equivalent to 100% (ie running at Optimum	decimal(18, 8)

	Rate). 0 disables the function.	
dbProdQuality	Decimal value between 0 and 1.5 indicating Production Quality for the current Lot Record. 1 is equivalent to100% (ie no Defect Losses). 0 is equivalent to 0% (ie no Good Parts)	decimal(18, 8)
dbLotName	String value representing Lot Name for the current Lot Record. (max 50 characters).	nvarchar(50)
dbPartID	Small Integer value representing Part for the current Lot Record.	smallint
dbPartName	String value representing Part Name for the current Lot Record. (max 50 characters). Only use this field if you are not using the dbPartID field.	nvarchar(50)
dbMacPartRef	String value representing MacPartRef value for the current Lot Record. (max 50 characters). This value must be valid for the Part and Machine otherwise the OEE Monitoring Service will ignore your value and use an empty string.	nvarchar(50)
dbBatchName	String value representing Batch Name for the current Lot Record. (max 50 characters).	nvarchar(50)
dbToolID	Small Integer value representing Tool for the current Lot Record.	smallint
dbToolName	String value representing Tool Name for the current Lot Record. (max 50 characters). Only use this field if you are not using the dbToolID field.	nvarchar(50)
dbCavitiesUsed	Small integer representing the CavitiesUsed for the current Lot Record.	smallint
dbMaterial	String value representing Material Name for the current Lot Record. (max 50 characters).	nvarchar(50)
dbNumPacks	Small Integer value representing NumPacks for the current Shift Record.	smallint
dbRemainder	Small Integer value representing NumPacks Remainder for the current Shift Record.	smallint
dbReconcile	Boolean flag to initiate Reconciliation. The flag is reset by the OEE Monitoring Service.	bit
dbShiftID	Small Integer value representing Shift for the current Shift Record.	smallint
dbOperatorID	Small Integer value representing Operator for the current Shift Record.	smallint
dbOperatorName	String value representing Operator Name (max 50 characters) for the current Shift Record. Only use this field if you are not using the dbOperatorID field.	nvarchar(50)
dbOperatorsUsed	Decimal value representing OperatorUsed for the current Shift Record.	decimal(18, 8)
dbFlexField1	String value representing FlexField1 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField2	String value representing FlexField2 for the current Lot Record. (max 50 characters).	nvarchar(50)

dbFlexField3	String value representing FlexField3 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField4	String value representing FlexField4 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField5	String value representing FlexField5 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField6	String value representing FlexField6 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField7	String value representing FlexField7 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField8	String value representing FlexField8 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField9	String value representing FlexField9 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField10	String value representing FlexField10 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField11	String value representing FlexField11 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField12	String value representing FlexField12 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField13	String value representing FlexField13 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField14	String value representing FlexField14 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField15	String value representing FlexField15 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField16	String value representing FlexField16 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField17	String value representing FlexField17 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField18	String value representing FlexField18 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField19	String value representing FlexField19 for the current Lot Record. (max 50 characters).	nvarchar(50)
dbFlexField20	String value representing FlexField20 for the current Lot Record. (max 50 characters).	nvarchar(50)

To use this method of data collection you must first configure the Data Source setting for the relevant item to 'DB', or perhaps 'DB_Automatic'. Please refer to the OEE Monitoring > Machine Admin > Data Sources section of this manual to see how to configure Data Sources for a Machine.

Note: This data collection method is build in to the OEE Monitoring Service and you must re-start this service if you make any changes to the OEE Admin Configuration.

To use this method you would simply need to manipulate the value in the relevant field. For example if you wished to set the Machine Mode to Running you might run a SQL script "`UPDATE tP_MachinePV SET dbModeID = 1 WHERE ID = @MachineID`", where @MachineID represents the unique ID of the Machine you wish to update.

7.10 ProvAPI Plug-in

The ProvAPI plug-in allows a 3rd Party Application retrieve configuration and report data programatically from Provideam.

This plug-in could be used to import data into 3rd Party Applications such as Microsoft's Power BI, or it could be used by a developer to create customised Dashboards, Reports and Views.

Currently the ProvAPI does not allow the Client to update Provideam configuration data, but this ability may be added in the future.

7.10.1 ProvAPI Security

Only authorised Clients can access the Provideam API. To access the API the Client must include an API Key in the Header of the REST Method.

Provideam User's with Admin security permissions can create API keys in the Provideam Application.

Click on the **Your Account Settings** button on the header section of the Provideam Application to see the API Keys associated with your account.

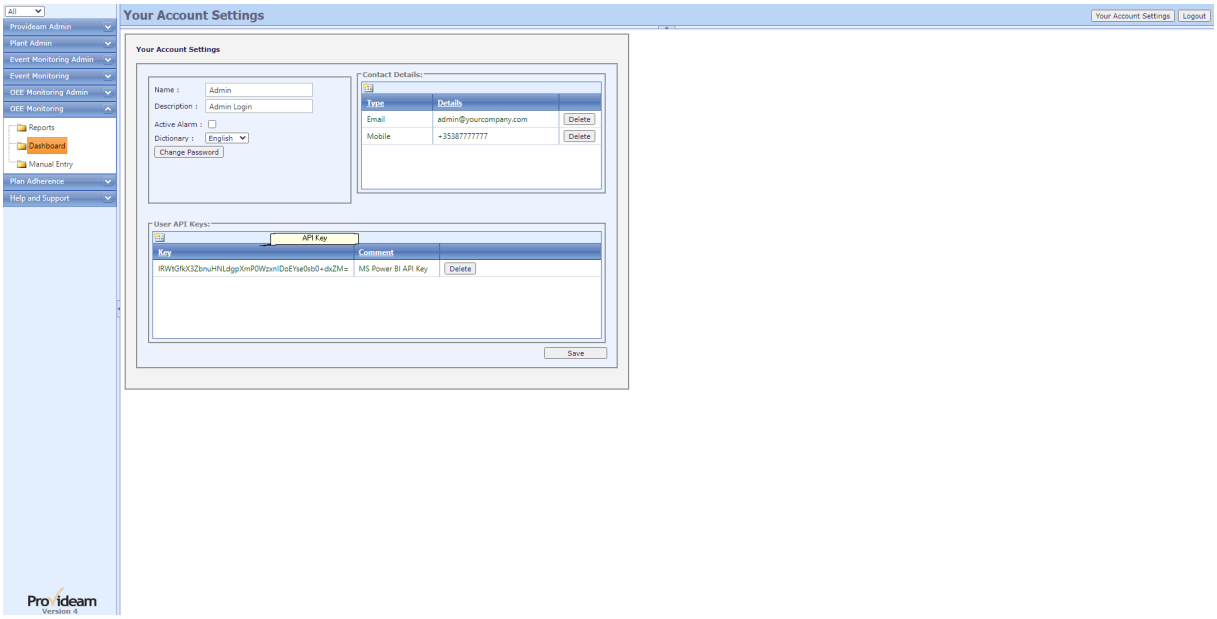


Fig. Provideam User Account Settings - API Key

The API key has the same security permissions as the associated User. An API key created by an Admin user will have Admin security permissions.

A new API Key can be generated by clicking on the **AddNew** button.

Note that all existing Clients which use a specific API key will be locked out if that API key is deleted.

Before using Swagger to access Provideam data you must first 'authorise' Swagger by logging in with your API key.

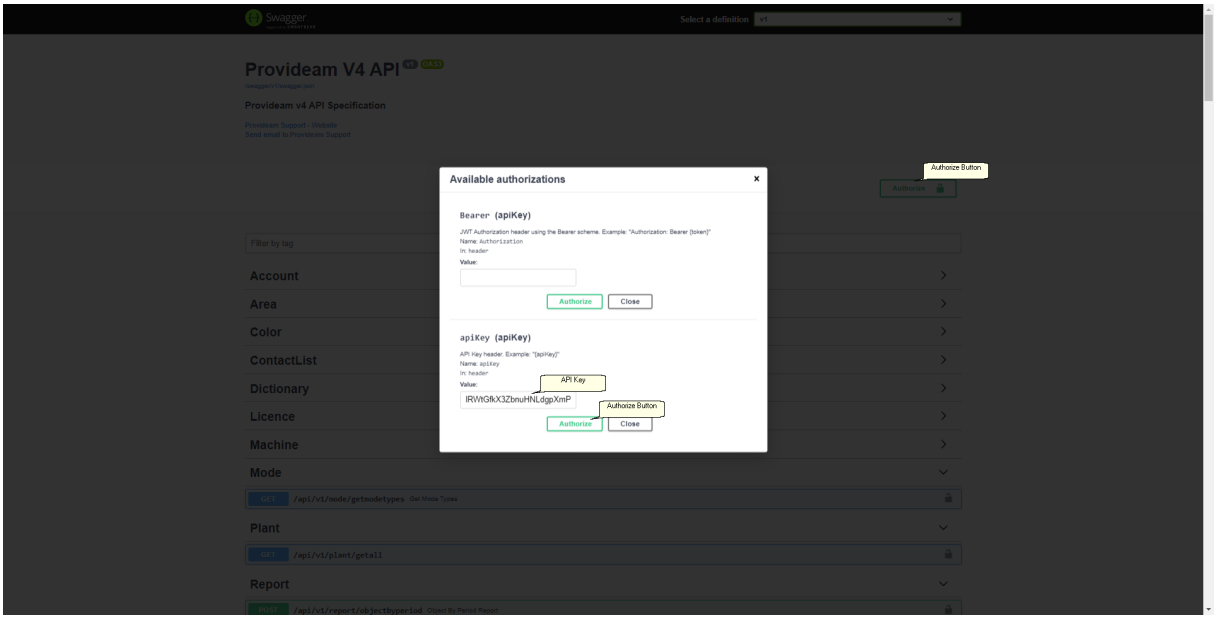


Fig. Swagger Showing the User's API Key

Once a valid API key has been entered, the page will show that the User has logged in.

Once the User has logged in with the valid API key, the GET and POST API methods will be available to the User - in-line with that User's security permissions.

7.10.2 ProvAPI EndPoints

The Provideam API plug-in supports a selection of GET and POST RESTful Methods to retrieve Provideam Data.

If the API has been installed and licensed on your Server, then use the link *http://ProvideamServer:YY/Swagger* (where YY represents the Port Number of the API website) to access the Swagger documentation.

The data returned by the API will be in JSON (JavaScript Object Notation) form. JSON is a lightweight easy to read/write notation - for both humans and machines.

The Swagger documentation lists the available Endpoints (or methods). In addition Swagger provides a means of testing the Endpoints.

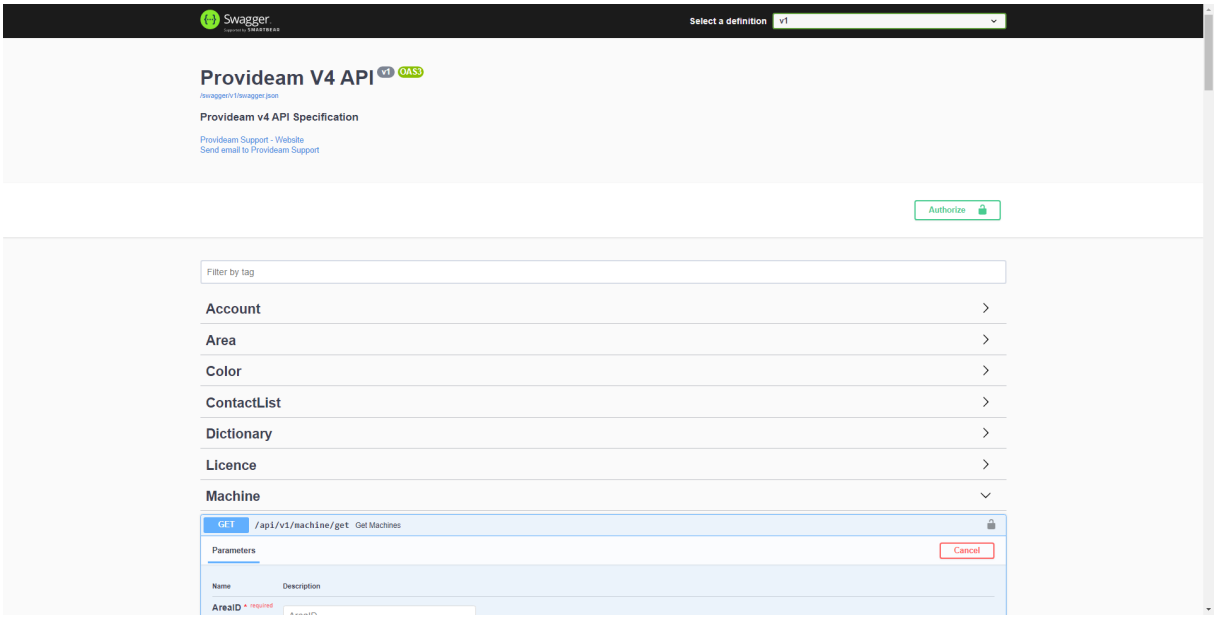


Fig. Provideam API - Swagger

In the example below, the GET Machine Endpoint is display. Swagger displays a sample of data that the Endpoint will return in the Model.

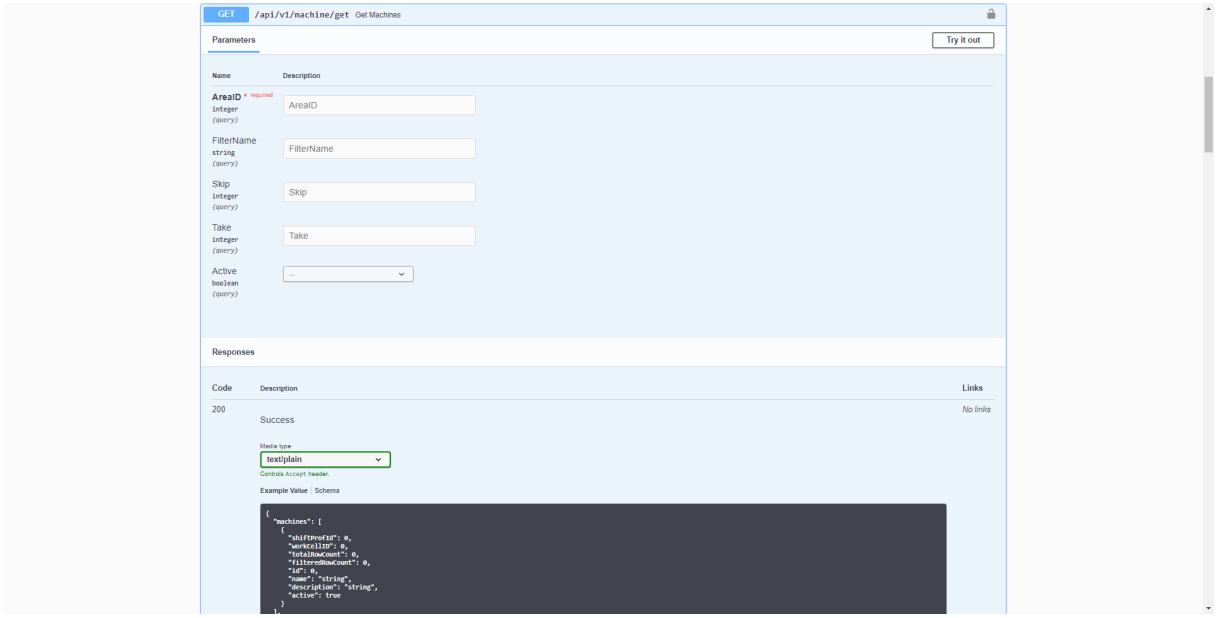


Fig. Provideam API - Swagger - Get Machines

Swagger allows the endpoint to be tested using the the "Try it out!" feature. First the required parameters must be entered. Note there may also be optional parameters which can be used if required.

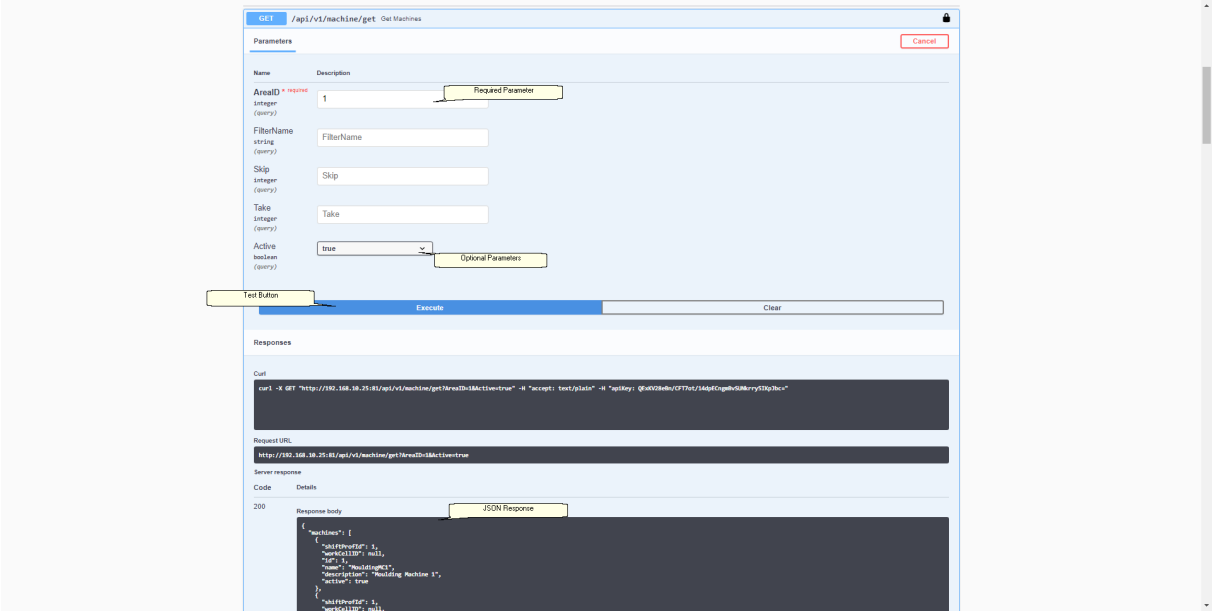


Fig. Provideam API - Swagger - Try it out!

In the above example the GET Request returns a list of the Machines for the specified Area .

The API also enables Report Data to be retrieved. For Report Data a POST Request is used. A POST Request allows the Client application to send query parameters to the endpoint in JSON format. To enable the Provideam API to return Report data the API Request must specify the parameters of the Report and these are sent to the API in JSON format.

The example below shows a typical POST Request for a Production Trend (ObjectByPeriod DataSet) Report.

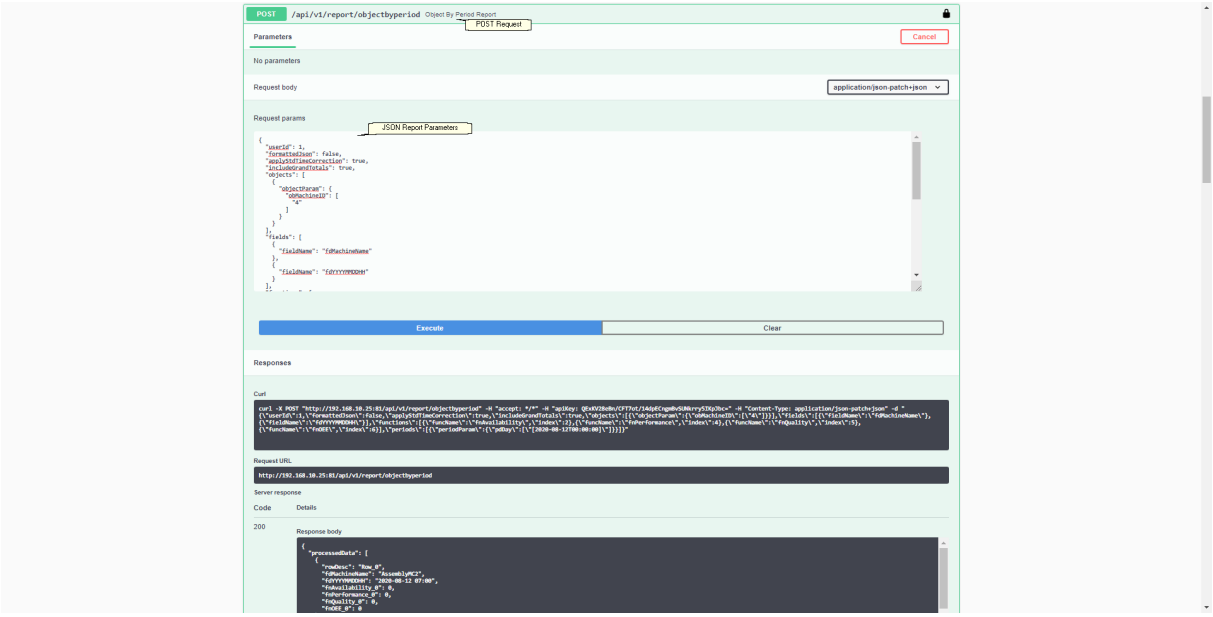


Fig. Provideam API - POST Request - Production Trend Report - Part 1

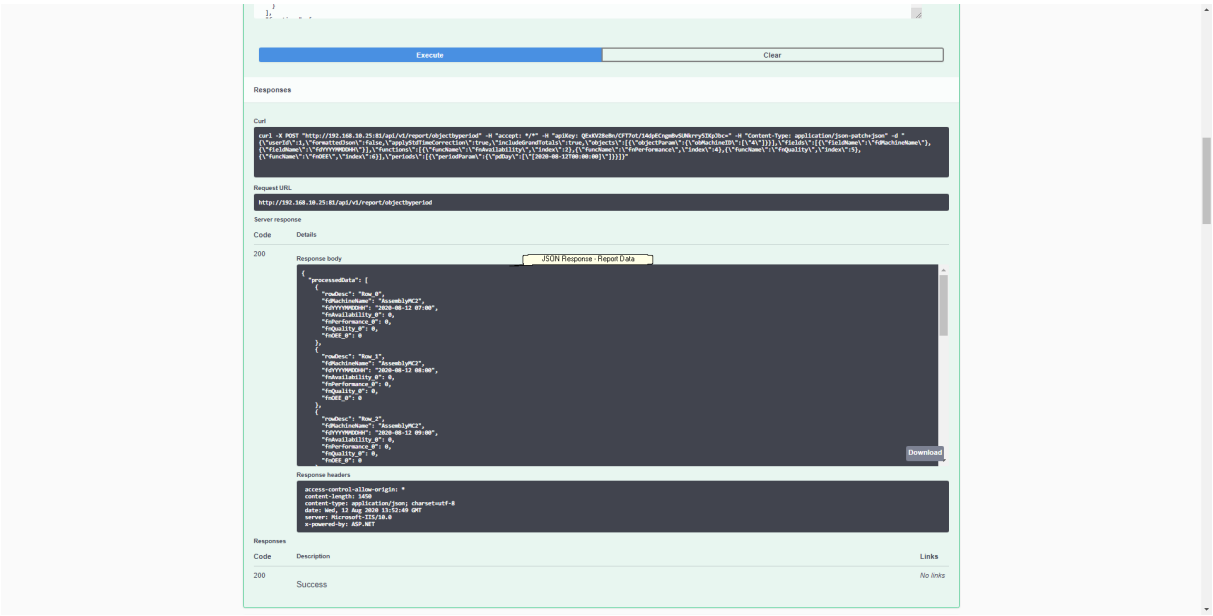


Fig. Provideam API - POST Request - Production Trend Report - Part 2

To help the User create the JSON Report Query Parameters required by the API, the Provideam Report Wizard includes a feature to display the JSON query for the selected Report Template.

In the image below the JSON text for the selected Report Template is displayed. Note also that the endpoint that must be used with this JSON is shown.

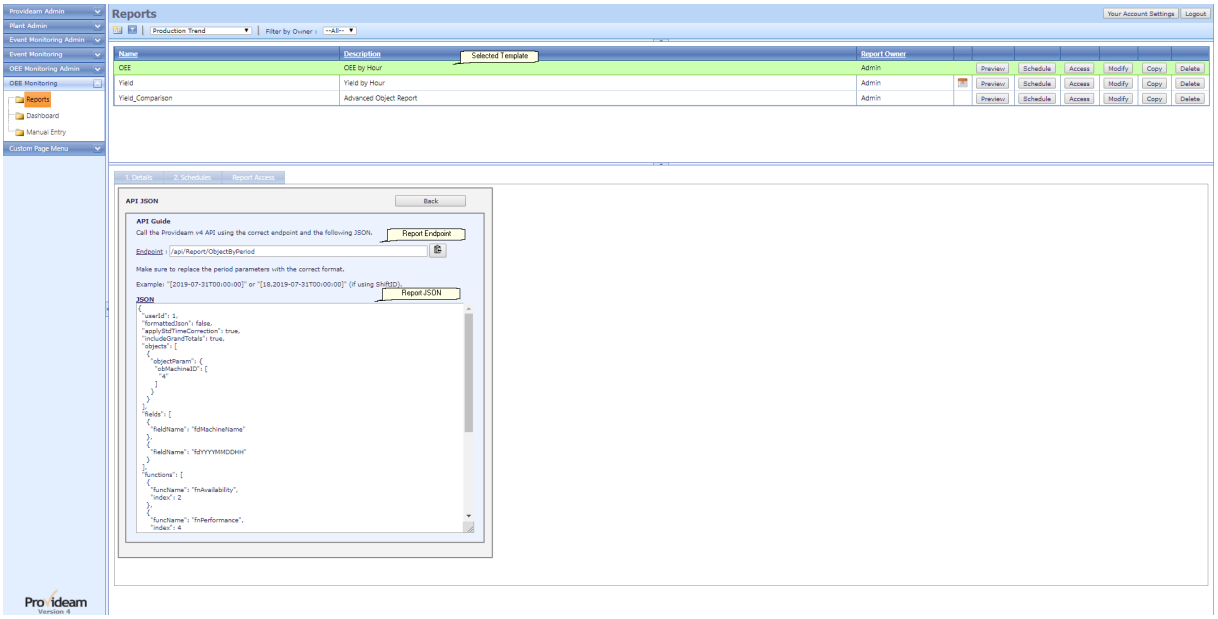


Fig. Provideam Report Wizard - JSON!

The API JSON can be viewed by clicking on the **Advanced** Button on the Report Wizard - Save Template Page. If the User Group Security has been configured to allow access to the JSON then an **API JSON** Button will be displayed, as shown below.

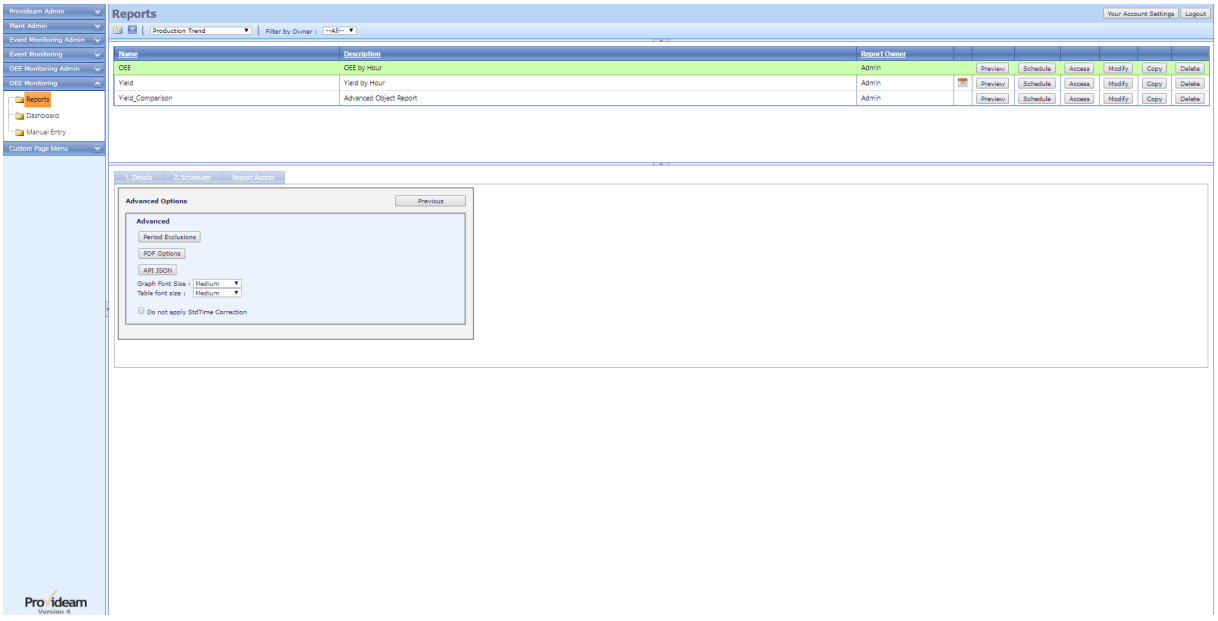


Fig. Provideam Report Wizard - API JSON Button

In the JSON Report Query, you can specify a date, or you can use a substitute to represent the current or previous Report Period.

- <**current**> can be used to represent the current Period.

- <**previous**> can be used to represent the previous Period.

These options work in the same way as for the Schedule Reports.

Section VIII:
Client Logos

Provideam 4.18
Manufacturing Productivity Solutions

8 Client Logos

Provideam allows you to display your own logos at specified locations on the Login Page, Menu Bar, and Reports.

Below we show where your logos would appear.

On the Login Page..

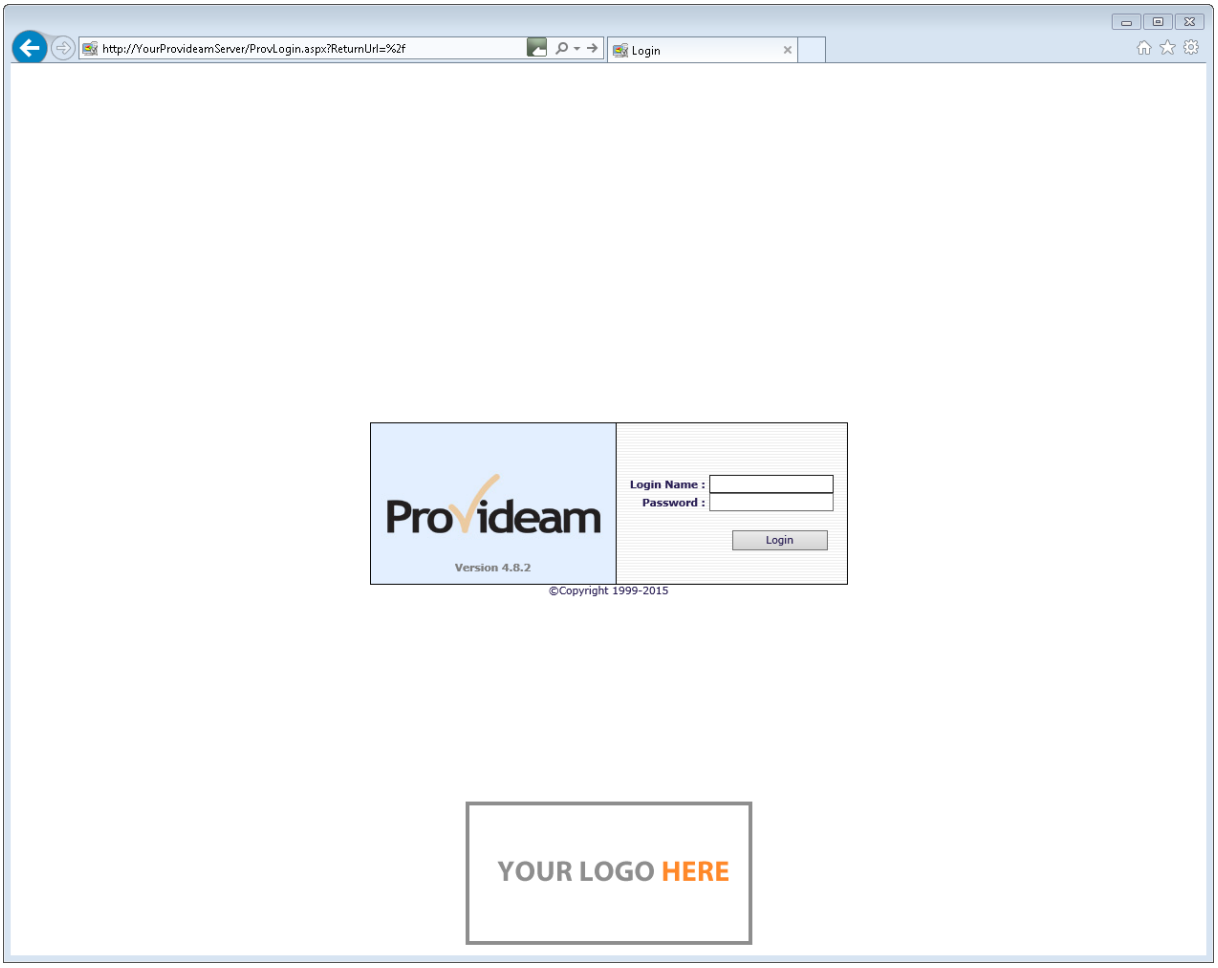


Fig. Provideam Login Page with Client Logo

On the Menu Bar..

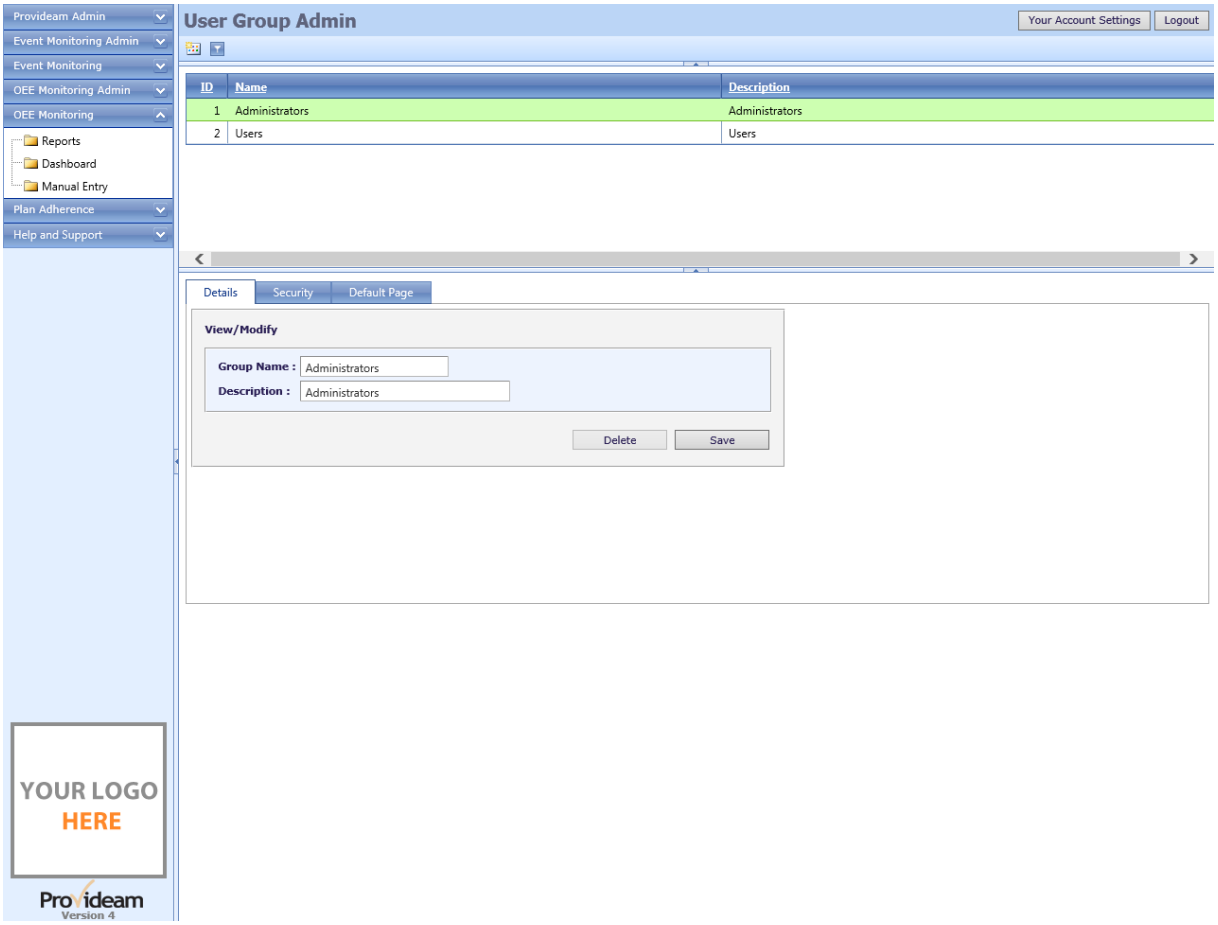


Fig. Provideam Menu Bar with Client Logo

And in Reports..

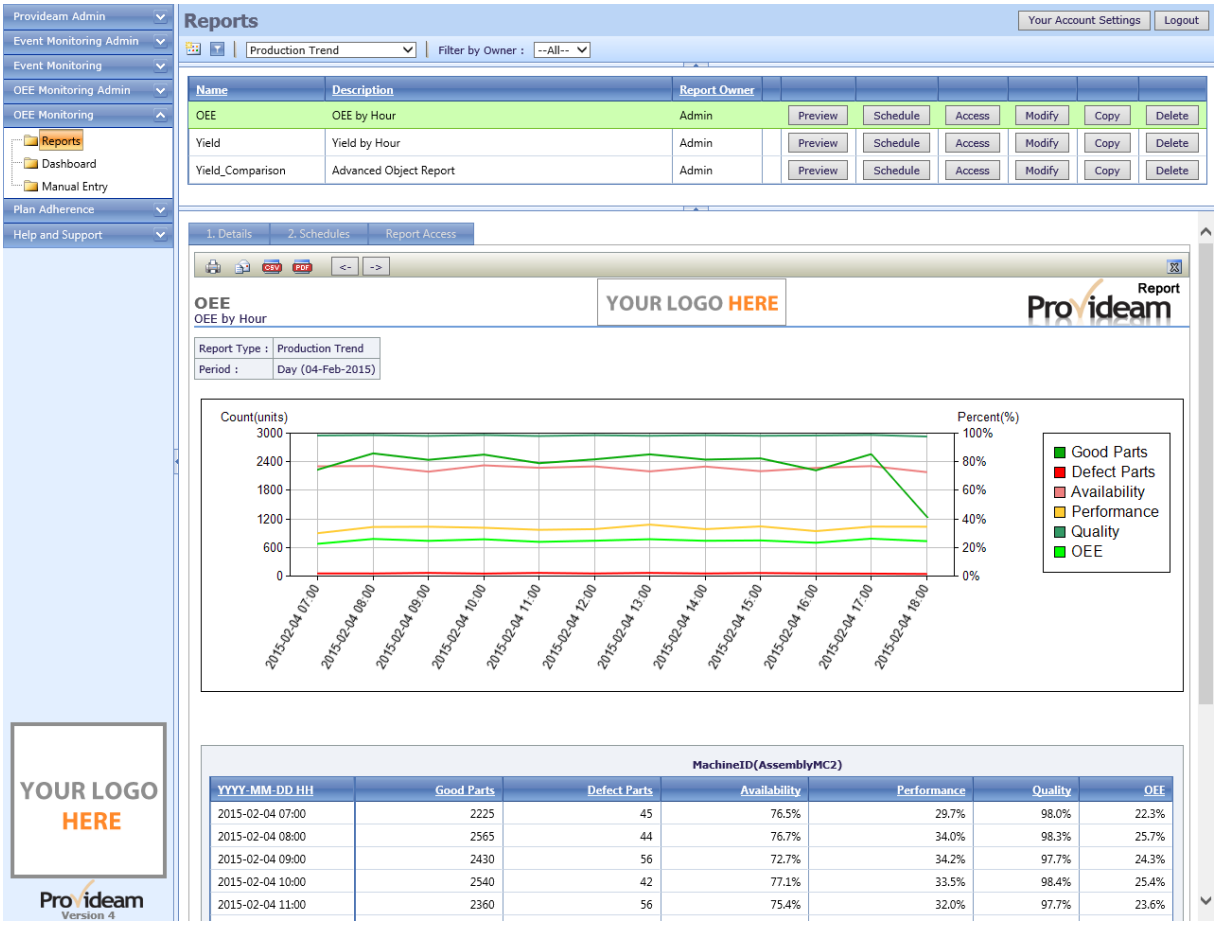


Fig. Provideam OEE Report with Client Logo

To use this feature you simply need to overwrite the three default logos which have been placed in the "*<Install Folder>\ProvWebApp\Branding*" folder.

The three images are as follows;

LoginLogo.png	Used on the Login Page under the Login Box. Max Dimensions: Width: 300px, Height: 150px
LogoSideMenu.png	Used at the bottom of Menu Bar. Max Dimensions: Width: 165px, Height: 165px
LogoReports.png	Used on all reports (Web/Emails/PDFs.). Max Dimensions: Width: 200px, Height: 50px

Warning: Please ensure that you do not exceed the maximum sizes indicated above as to do so will corrupt the Provideam Layout.

We have included sample Logo Images the "*<Install Folder>\ProvWebApp\Branding\Example*" folder. To see these images simply overwrite the images in the "*<Install Folder>\ProvWebApp\Branding*" folder with the images in the "*<Install Folder>\ProvWebApp\Branding\Example*" folder.

To remove the images simply overwrite the images in the "*<Install Folder>\ProvWebApp\Branding*" folder with the images in the "*<Install Folder>\ProvWebApp\Branding\NoBrand*" folder.

Warning: Because Internet Browsers tend to cache images you may need to clear your browser cache, and then restart your browser before you see these images.

Section IX:

ProvEdgeBox

Provideam 4.18

Manufacturing Productivity Solutions

9 ProvEdgeBox

9.1 ProvEdgeBox Description

The ProvEdgeBox is an intelligent Sensor Interface which uses the REST communications protocol to send production count and status data to the host Provideam Server.

Fig. The ProvEdgeBox

The unit is powered by a 24 Vdc Power Supply unit.

On the front panel of the ProvEdgeBox there is;

- 1 x RJ45 Ethernet Socket
- 1 x M12 4 Pole PNP Sensor Connector

On the rear panel of the ProvEdgeBox there is;

- 1 x Red LED for Power Indication
- 2 x Amber LEDs for Network and Connection Status
- 1 x Pushbutton for Reset
- 1 x Power Jack, 5.5 x 2.1mm

The ProvEdgeBox can be connected to the Internet via a wired Network, a 2.4GHz Wifi network, or via 4G when using the optional Teltonika Router.

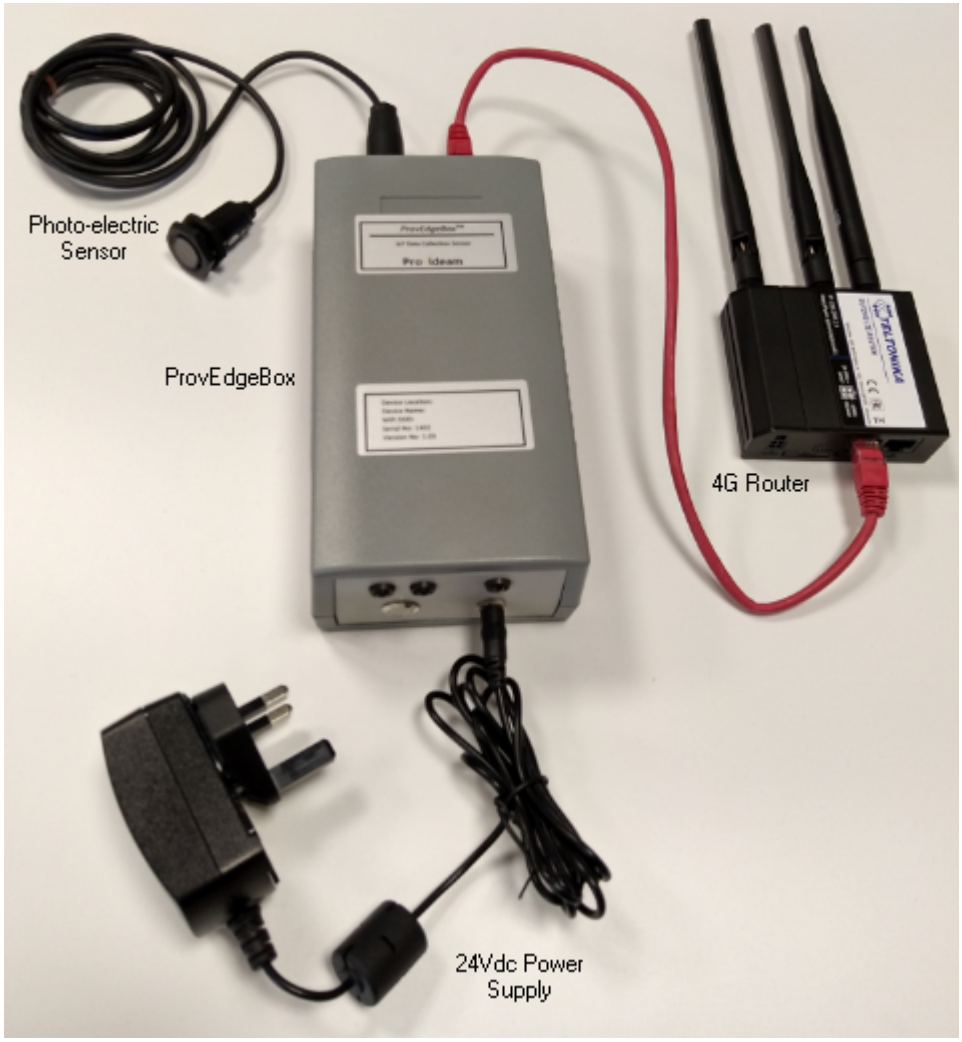


Fig. The ProvEdgeBox with optional 4G Teltonika Router

The ProvEdgeBox is supplied with a 24Vdc Power Supply, and an OMRON E3FA Diffuse PNP Photo-electric sensor.

The Sensor Inputs are used to count Good and Defect(optional) products exiting a Machine/Line. Every time the Good Count sensor input is activated, the Good Count value is incremented. Similarly, every time the Defect Count sensor is activated, the Defect Count value is incremented. When the Good Count sensor is activated the unit determines that the Machine/Line is in a Run state. If there has been no new Good Count sensor activation for a time greater than the configured "Max Cycle Time" then the unit determines that the Machine/Line is in a Stop state.

During normal operation the unit monitors the production Good and Defect Counts, and determines the Run/Stop state of the Machine/Line. When connected to the host Provideam Server, the unit will write the count and state values to the RESTful Server interface every 10seconds. The data being transmitted is a JSON file in the body of a HTTPS RESTful message. The messages are typically less than 300 text characters in size.

9.2 ProvEdgeBox Hardware

Power Supply:

Operating Voltage: 20 .. 28 Vdc

Max. Current: 300 mA @ 24 Vdc

Fig. 24 Vdc Power Connection

Networking:

Wired Ethernet: 10/100 Mbps

Wireless Ethernet: 802.11n

Sensor Input(s):

Connector 1: Good Count

Connector 2(optional): Defect Count

Connector Type: M12 Female 4 Pin

Sensor Input Type: PNP

Sensor Supply Voltage: Operating Voltage

Sensor Supply Current: max. 20mA

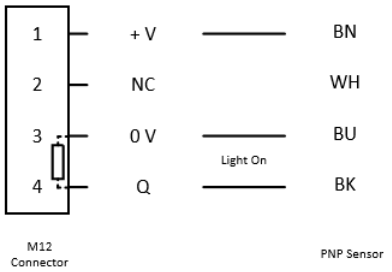


Fig. M12 Female 4 Pin Sensor Connector

LEDs:

Red LED: Power On Status

Amber LEDs:

Internet Connection Status	Device Configuration Status	Internet LED	Device LED
		LED1	**LED2**
No Internet	Configuration Error	Blink (1s on / 1s off)	Blink (1s on / 1s off)
Internet	Configuration Error	ON	Blink (1s on / 1s off)
No Internet	Configuration OK	Blink (1s on / 1s off)	ON
Internet but with Communication Error	Configuration OK	OFF	ON
Internet and Communication Success	Configuration OK	Blink (2.5s on / 2.5s off)	ON
Press and Hold Reset button. After 10s and until button released.		Blink (0.25s on / 0.25 off)	Blink (0.25s on / 0.25 off)

Reset Button:

To reset the ProvEdgeBox to factory settings, hold down the Reset button for 10s. After 10s the LEDs should blink rapidly. Release the button and the ProvEdgeBox will reboot back to default settings.

The default settings are:

Wired IP Address: 192.168.1.5

User Name and Password: Admin / Admin

9.3 ProvEdgeBox UI

The ProvEdgeBox hosts a web application which allows the Administrator to configure the device.

The web application is accessed by using the IP of the device and the Port Number 5001. In the example below the URL, http://192.168.1.5:5001, connects to the web application.

The ProvEdgeBox Home page shows general status information.

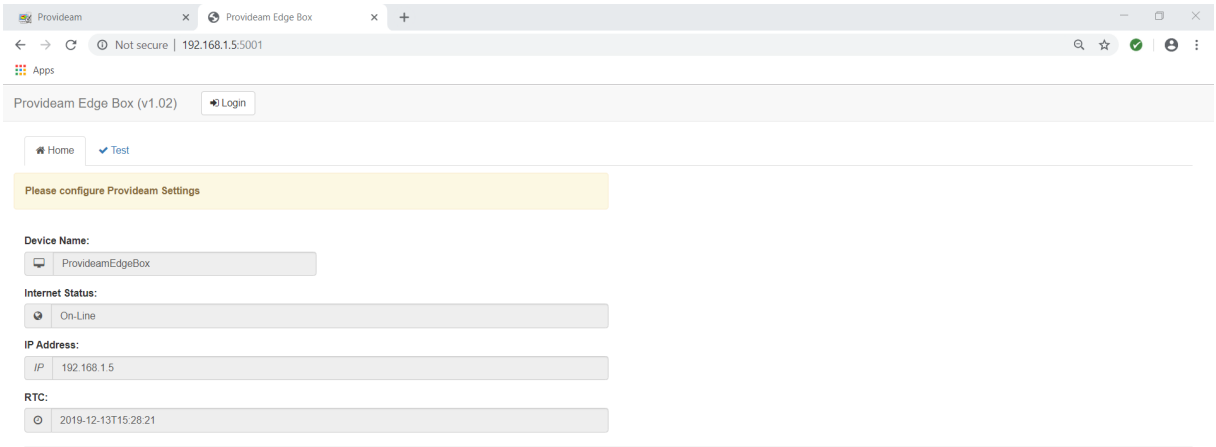


Fig: ProvEdgeBox Home Pane

Home Pane;

- The **Device Name** text box displays the name of the ProvEdgeBox which identifies in the Provideam application
- The **Internet Status** text box displays a status message which indicates whether or not the ProvEdgeBox is connected to the Internet
- The **IP Address** text box displays the IP address of the ProvEdgeBox.
- The **RTC** text box displays the Real Time Clock time in the ProvEdgeBox.

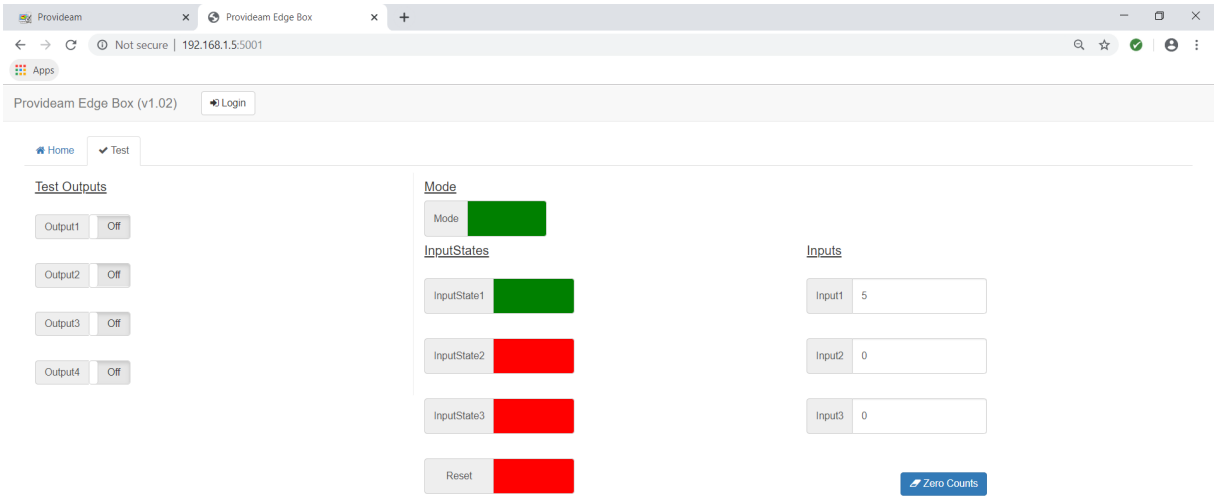


Fig: ProvEdgeBox Test Pane

Test pane;

- The **Mode** Label displays the current Mode of Operation of the Machine/Line being Monitored. (Red(0) = Stopped, Green(1) = Running)
- The **InputStates** Labels display the current State of the Input being monitored. (Red = Off, Green = On)
- The **Inputs** Labe displays the current value of the Input count being monitored.
- The **Zero Counts** button allows the user to reset the Counts. This has no impact on Data Collection.
- The **Test Outputs** buttons allows the user to set Outputs On/Off. This feature is not currently available.

Administrator Login;

- The **Login** button allows the user, with appropriate privileges to log in as an Administrator. Until the user logs in, the settings are read-only and cannot be changed.

The ProvEdgeBox Login Page

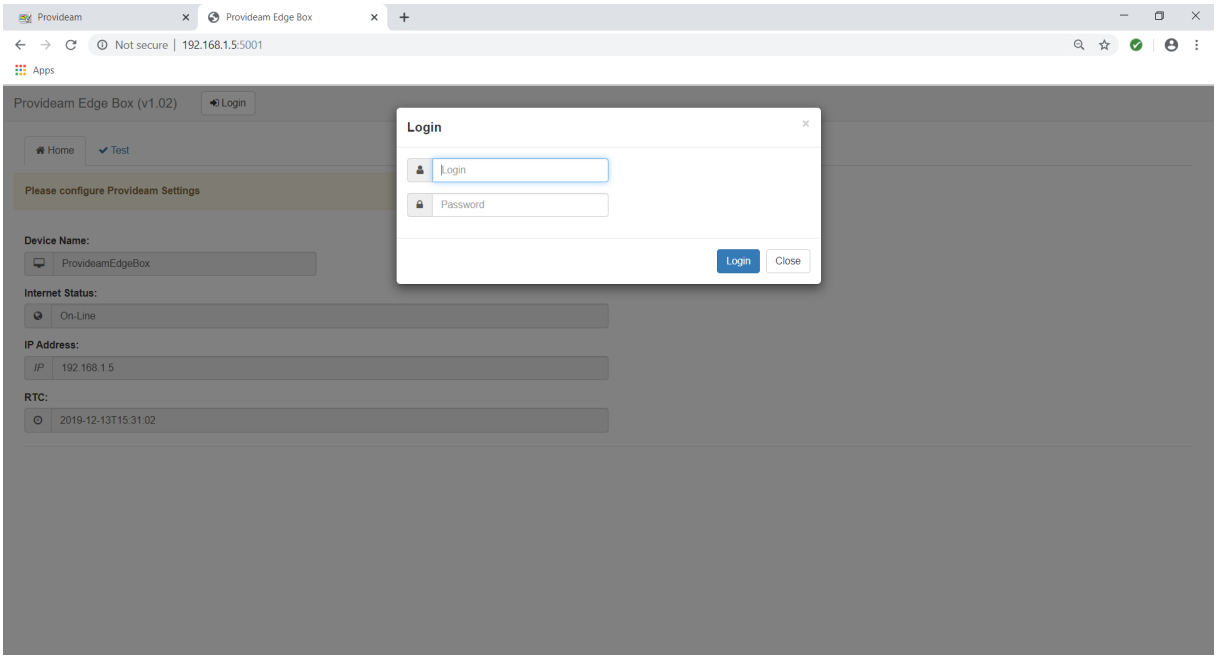


Fig: ProvEdgeBox Login Page

Login;

- The **Login** text box allows the user to enter the Administrator User Name
- The **Password** text box allows the user to enter the Administrator Password
- The **Login** button allows the user to submit the User Name and Password details
- The **Close** button allows the user to close the Login Page and return to the Home Page without submitting authentication details

The ProvEdgeBox Networking Page allows the Administrator to configure the settings required to allow the device to join a customer network and connect to the Internet.

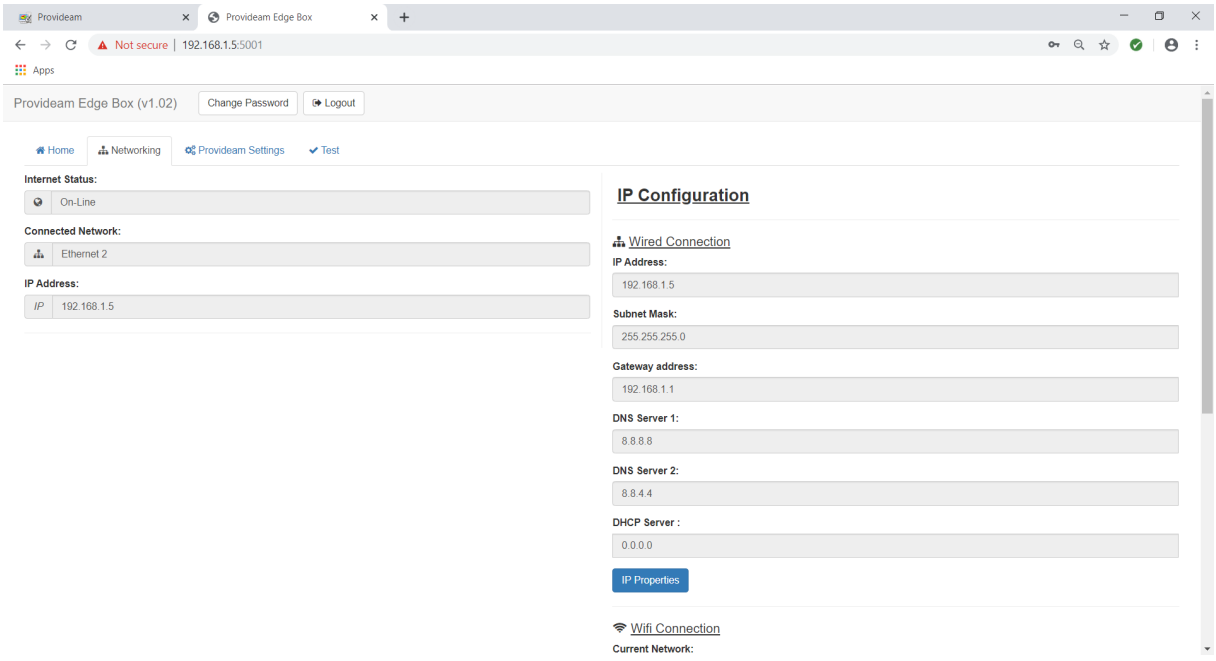


Fig: ProvEdgeBox Network Configuration - Part 1

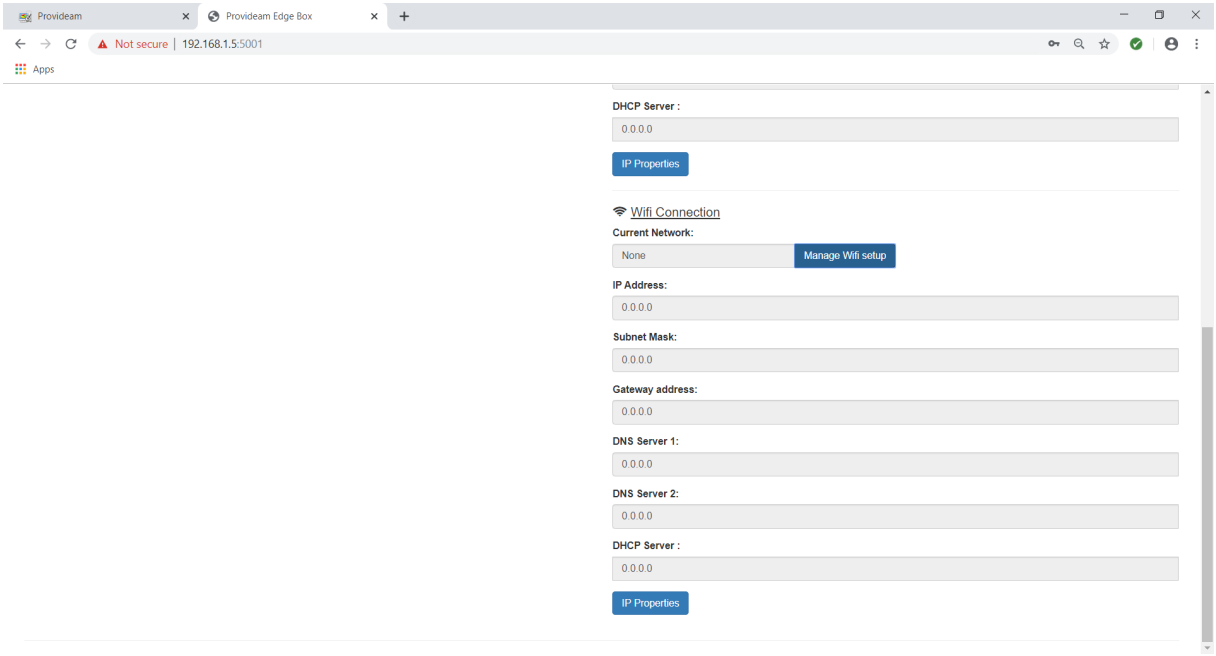


Fig: ProvEdgeBox Network Configuration - Part 2

The Proxy Server and Network Settings are configurable once the user has logged in as an Administrator.

- The **Internet Status** text box displays a status message which indicates whether or not the ProvEdgeBox is connected to the Internet
- The **Connected Network** text box displays a status message which indicates whether the ProvEdgeBox is connected to a wired or wireless network
- The **IP Address** text box displays the IP address of the Network connected to the Internet of the ProvEdgeBox.
- The **IP Properties(Wired)** button opens a window to allow the Administrator to configure the Wired network settings
- The **Manage Wifi setup** button opens a window to allow the Administrator to connect to a Wifi network
- The **IP Properties(Wifi)** button opens a window to allow the Administrator to configure the Wifi network settings

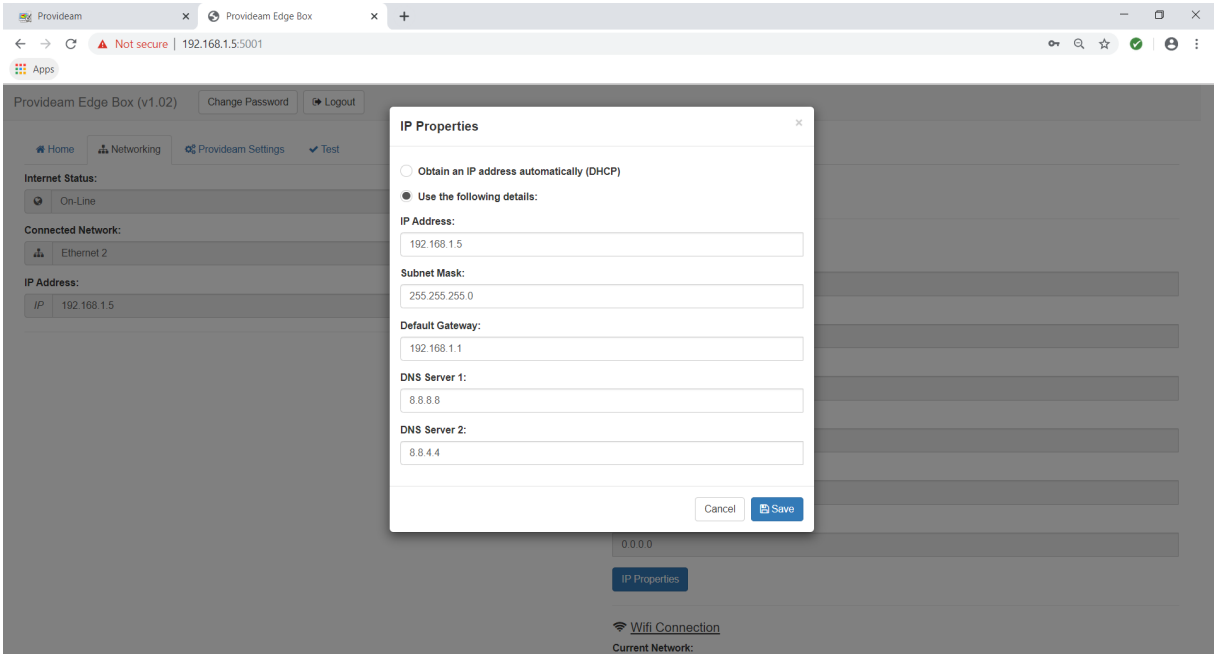


Fig: ProvEdgeBox Network Configuration - Wired Connection Settings

Wired Connection Settings:

- The **Obtain an IP address automatically (DHCP)** option button allows the Administrator to set whether the Device uses DHCP or a Fixed IP on the Wired Ethernet Connection.
- The **IP Address** text box allows the Administrator to set the IP Address for a Fixed IP Ethernet Connection
- The **Subnet Mask** text box allows the Administrator to set the Subnet Mask for a Fixed IP Ethernet Connection

- The **Default Gateway** text box allows the Administrator to set the Gateway for a Fixed IP Ethernet Connection
- The **DNS Server 1** text box allows the Administrator to set DNS Server 1 for a Fixed IP Ethernet Connection
- The **DNS Server 2** text box allows the Administrator to set DNS Server 2 for a Fixed IP Ethernet Connection
- The **Save** button allows the Administrator to Save Fixed IP Ethernet Settings
- The **Cancel** button closes the window without changes

The ProvEdgeBox Networking Page - Wifi Settings

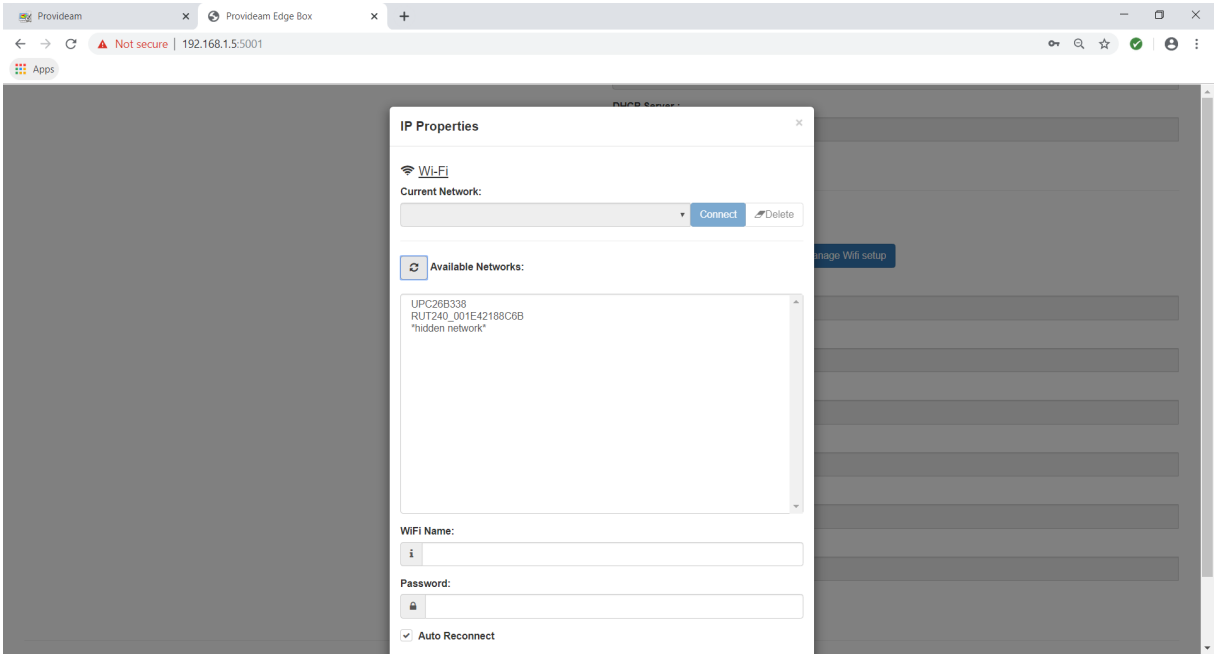


Fig: ProvEdgeBox Network Configuration - Wifi Settings

Wi-Fi;

- The **Current Network** text box displays the selected Wifi Network
- The **Available Networks Refresh** button allows the Administrator to scan for Wifi Networks
- The **Available Networks** list box displays all Wifi Networks which have been discovered and allows the Administrator to select a Network
- The **WiFI Name** text box allows the Administrator to enter the name of a 'hidden' Wifi Network

- The **Password** text box allows the Administrator to set the Wifi Password for the selected Wifi Network(SSID)
- The **Auto Reconnect** checkbox allows the Administrator to set the Wifi Auto Reconnect flag. If this checkbox is set then the Device will automatically attempt to connect to the selected Network if it is within range.

The ProvEdgeBox Provideam Settings Page allows the Administrator to configure the settings required to connect to the Provideam ProvEdgeBox Server Interface

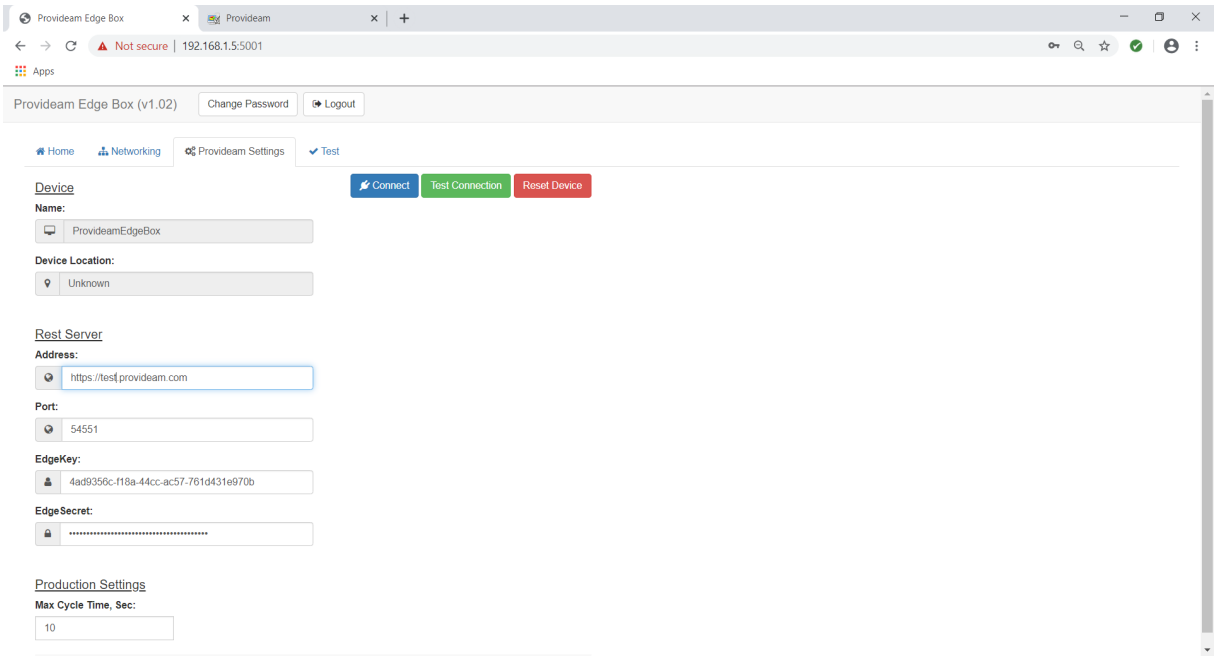


Fig: ProvEdgeBox Provideam Connection Settings

The Provideam Connection Settings are configurable once the user has logged in as an Administrator.

Device Settings (Display Only - values are set in Provideam Plant Admin settings);

- The **Name** text box displays the unique Name of the ProvEdgeBox. This identifies the ProvEdgeBox to the Provideam application.
- The **Location** text box displays the Location of the ProvEdgeBox. This helps to identify the ProvEdgeBox to the Provideam application.

REST Server Settings:

- The **Address** text box allows the Administrator to set the address (URL) of the Provideam ProvEdgeBox Server interface
- The **Port** text box allows the Administrator to set the IP Port to be used to connect to the Server interface
- The **EdgeKey** text box allows the Administrator to set the EdgeKey provided in the Provideam ProvEdgeBox setup page.
- The **EdgeSecret** text box allows the Administrator to set the EdgeSecret provided in the Provideam ProvEdgeBox setup page.

Production Settings;

- The **Max Cycle Time, Sec** text box allows the Administrator to set the maximum time it should take for the Machine/Line to complete a cycle(ie to produce a good product). This setting is used to determine when the Machine/Line is running or stopped.

Buttons;

- The **Connect** button prompts the ProvEdgeBox to connect to the Provideam ProvEdgeBox Server interface using the details supplied.
- The **Test** button causes some system checks to be carried out and displays the results.
- The **Reset** button allows the User to reset the ProvEdgeBox to default settings.

9.4 ProvEdgeBox Configuration Quick Guide

Provideam Quick Guide

Configuring the ProvEdgeBox to use onboard WIFI

Requirements;

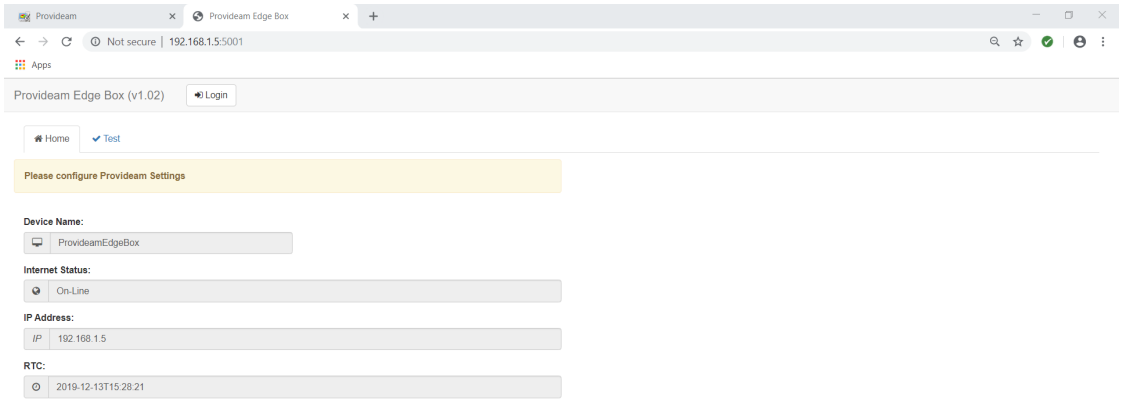
1) ProvEdgeBox
2) Cat 5 Patch Lead
3) Laptop to configure ProvEdgeBox
4) WIFI Network

Procedure

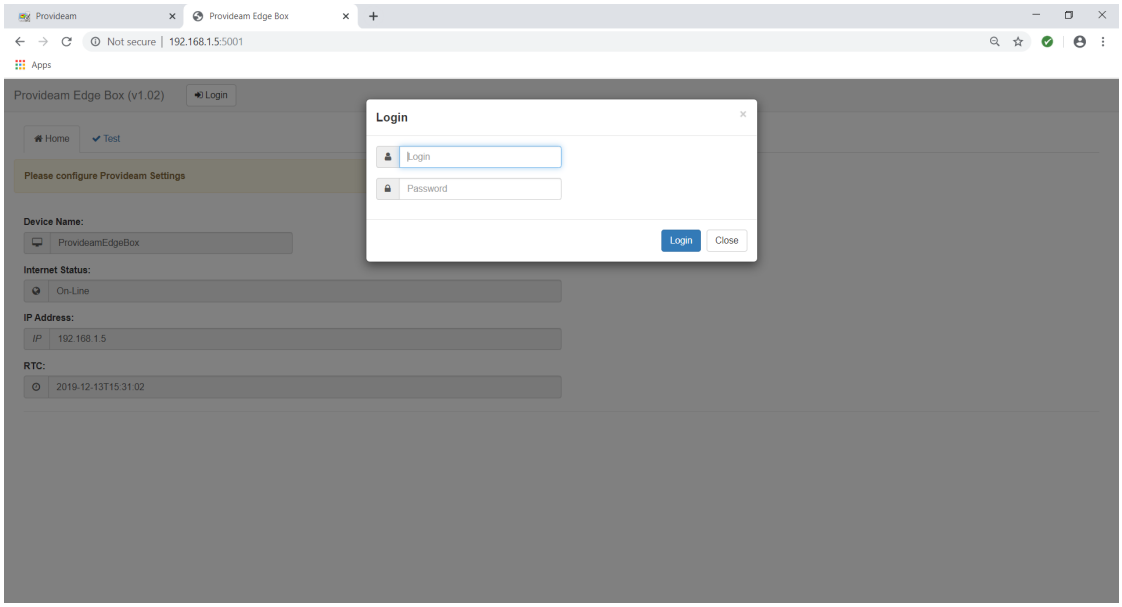
1) Power up the ProvEdgeBox
2) Connect the ProvEdgeBox Ethernet Port to the Router LAN Port
3) Reset the ProvEdgeBox to default settings;
   a. Wait until the Amber LEDs have illuminated after power up.
   b. Hold in the Reset Button on the ProvEdgeBox for 10s. (Until amber lights flash rapidly)
   c. Release the Reset Button and wait for about 1minute while the ProvEdgeBox restarts. When the ProvEdgeBox has restarted the Amber lights will be on/flashing.
4) Connect Laptop to ProvEdgeBox LAN Port.

   Set the Laptop Network Card to use the following values;

   a. IP Address 192.168.1.10
   b. Subnet Mask: 255.255.255.0
5) On your laptop, using a Web Browser such as Google Chrome, open the ProvEdgeBox User Interface with the following link http://192.168.1.5:5001

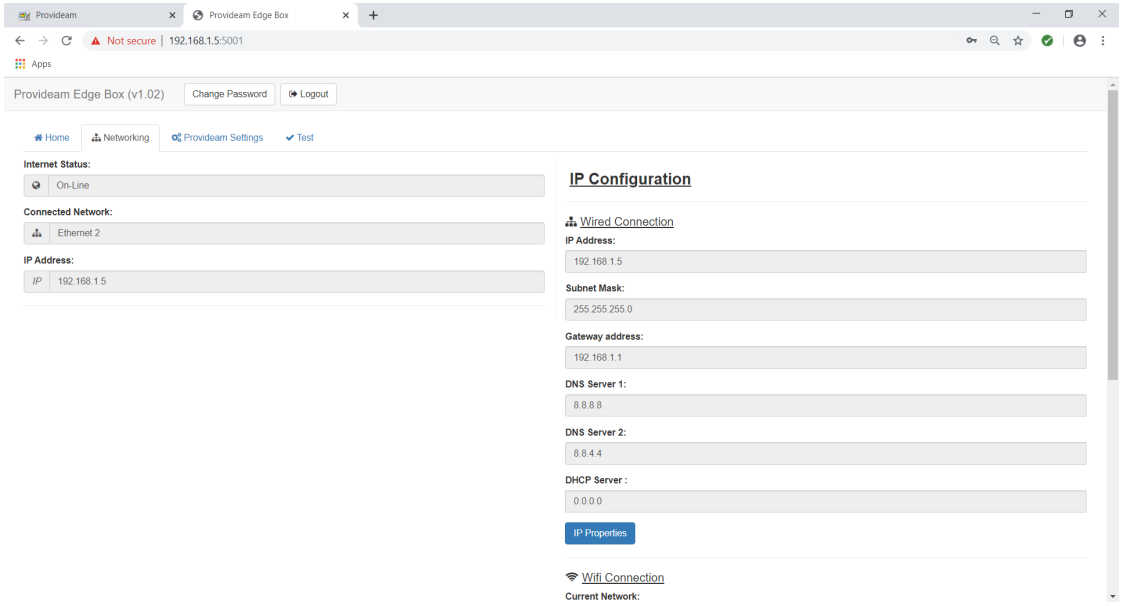


6) Log in to the ProvEdgeBox UI using the Default User Name and Password (Admin / Admin)

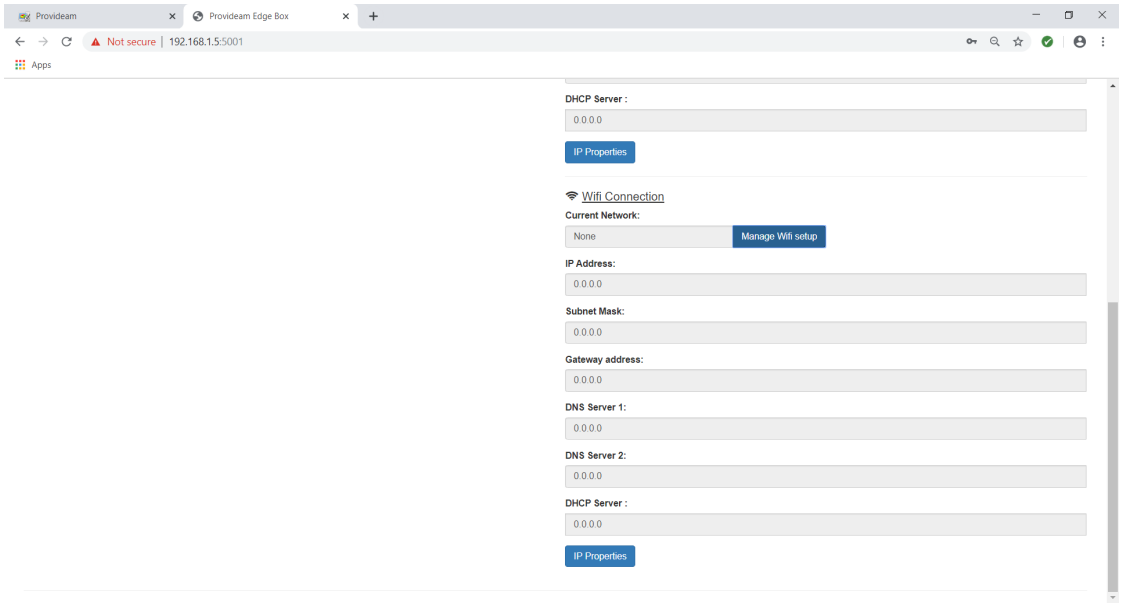


7) Connect to WIFI

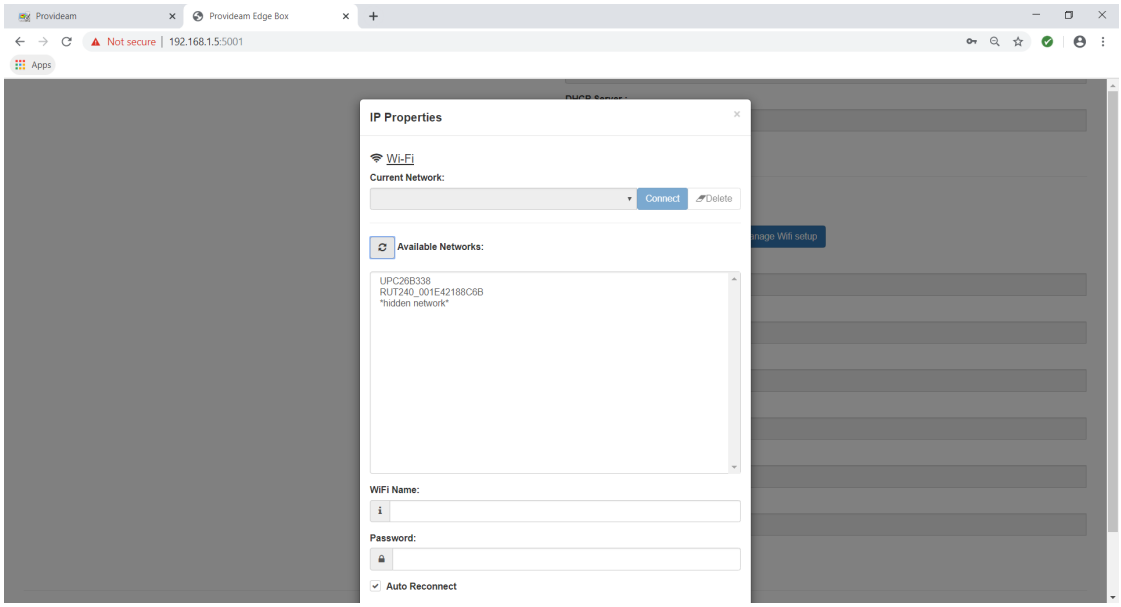
a. Open the Network Settings Tab



b. Scroll down the page to view the WIFI Settings



c. Click the Manage Wifi Setup Button and then click the  Button to scan available Wifi networks



d. Select the WiFi you want, enter the Password and click the Connect button

e. Refresh the page to view the Wifi IP address.

8) Disconnect the Laptop from the Wired Ethernet connection and connect the Laptop to the Wifi SSID

9) Open the ProvEdgeBox User Interface using the new IP address:

http://NewIPAddress:5001

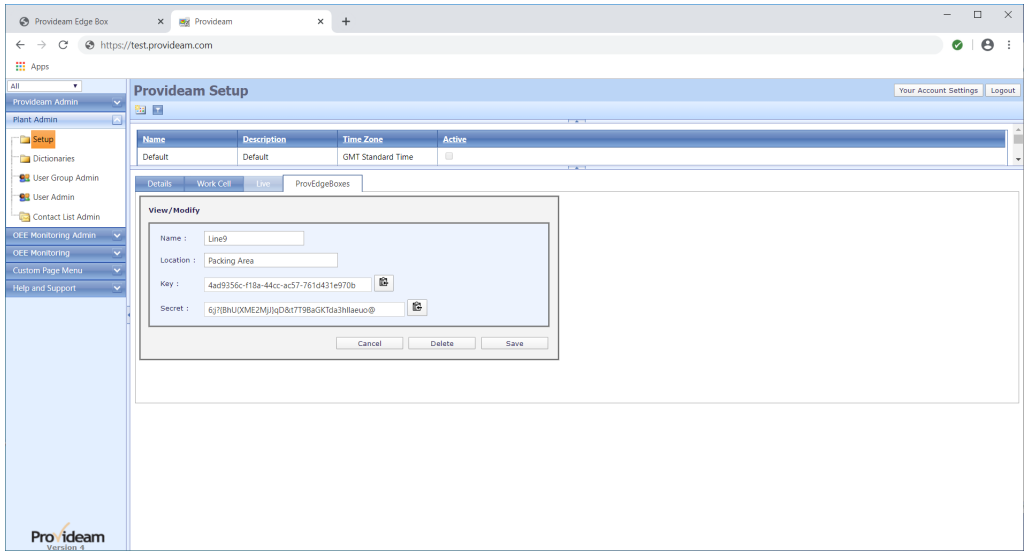
10) Log in to the Provideam WebSite

a. Browse the Plant Admin > Setup Section

b. Click on the Plant

c. Click on the ProvEdgeBoxes Tab

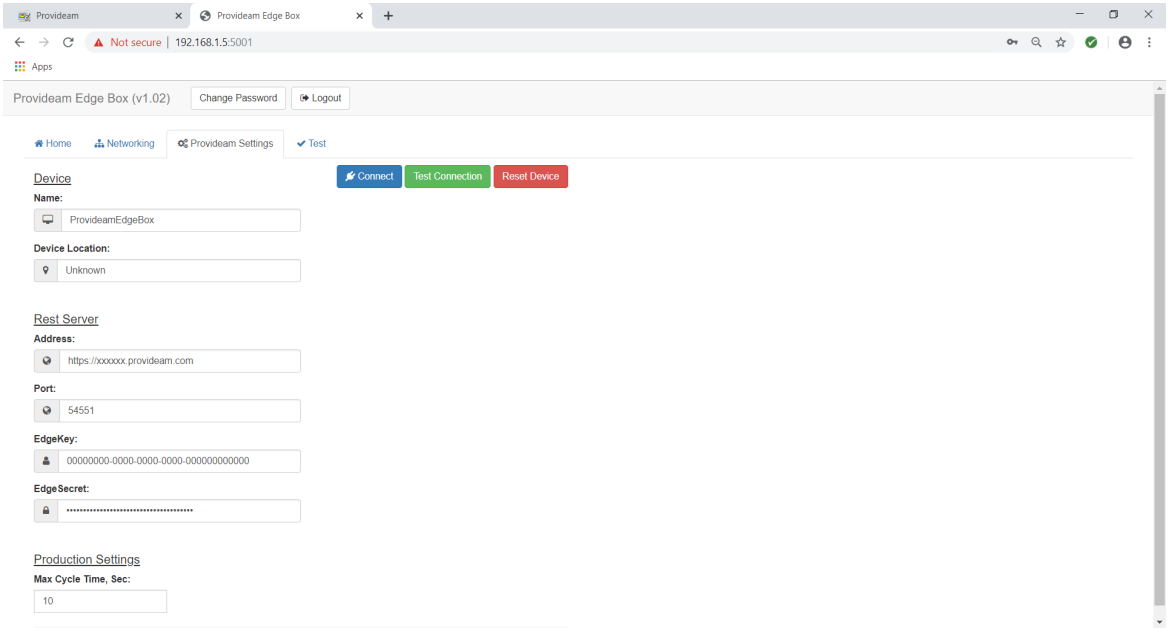
d. Click on the Add New Button



e. Enter Name and Location for the new ProvEdgeBox. Take care to use properly descriptive names as otherwise you may find it difficult to identify your ProvEdgeBoxes in future.

f. Copy the Key and Secret to a notepad and click the Save button.

11) Switch back to the ProvEdgeBox UI and open the Provideam Settings Page.



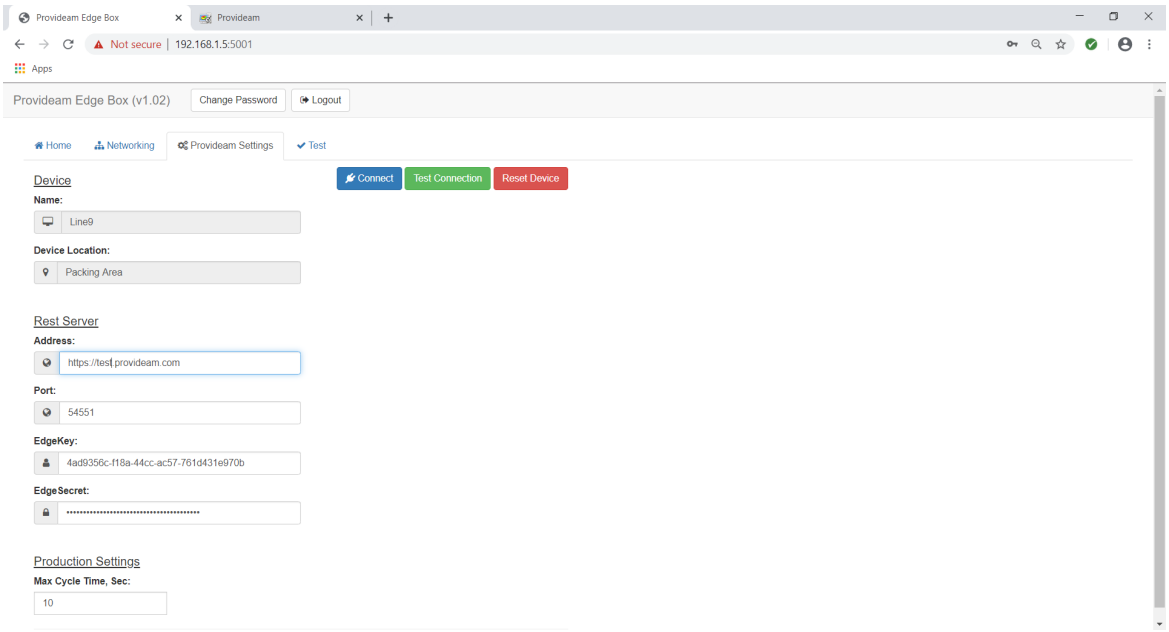
12) Enter the;

a. Provideam Web Address

b. Enter the Port Number used for ProvEdgeBox communications (Default: 54551)

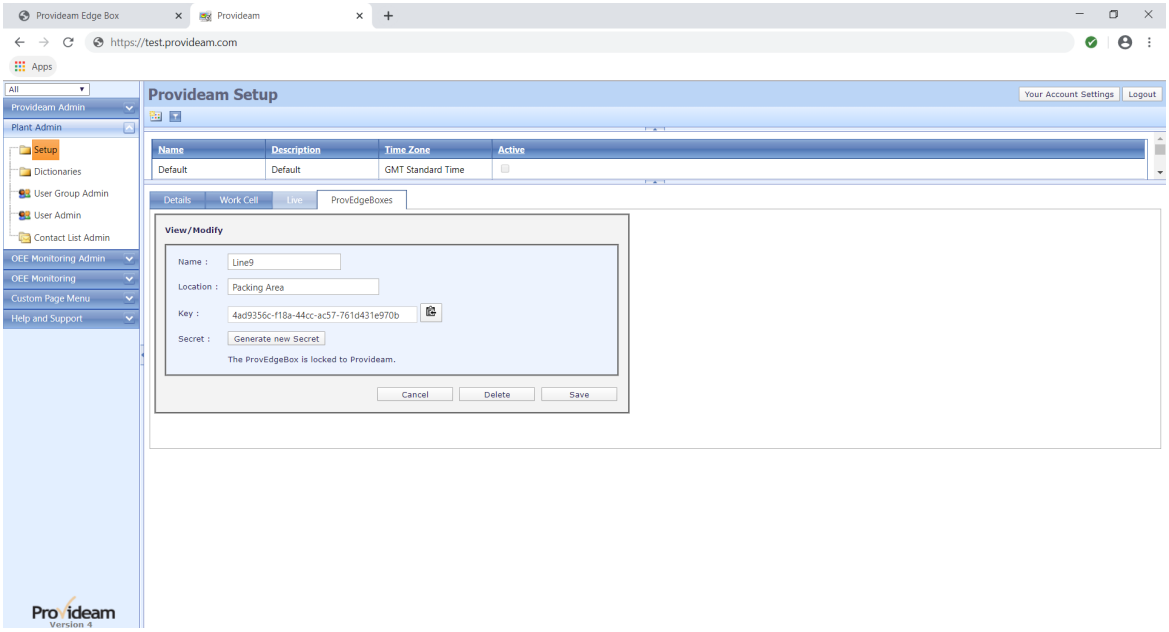
c. Enter the Key and Secret which you saved to a notepad in step 9.f above.

13) Click the Connect button.



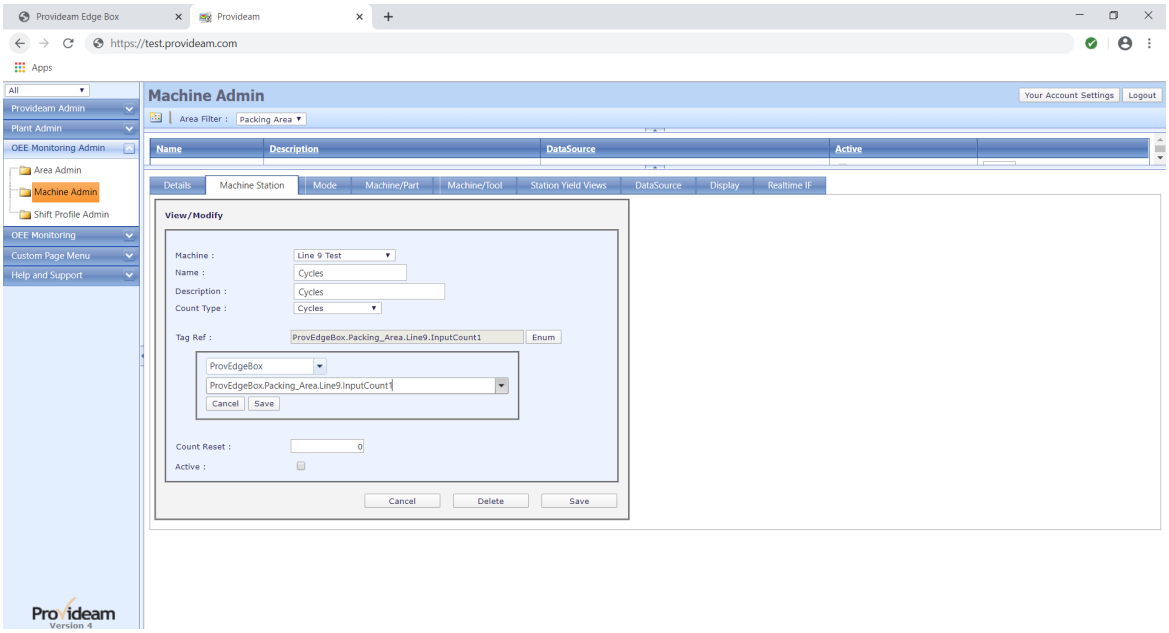
If the connection has been successful the Name and Device Location will be updated with the values that you entered in the Provideam Website.

14) Now check that the ProvEdgeBox has been locked to the Provideam Configuration. Refresh the Provideam ProvEdgeBox page.

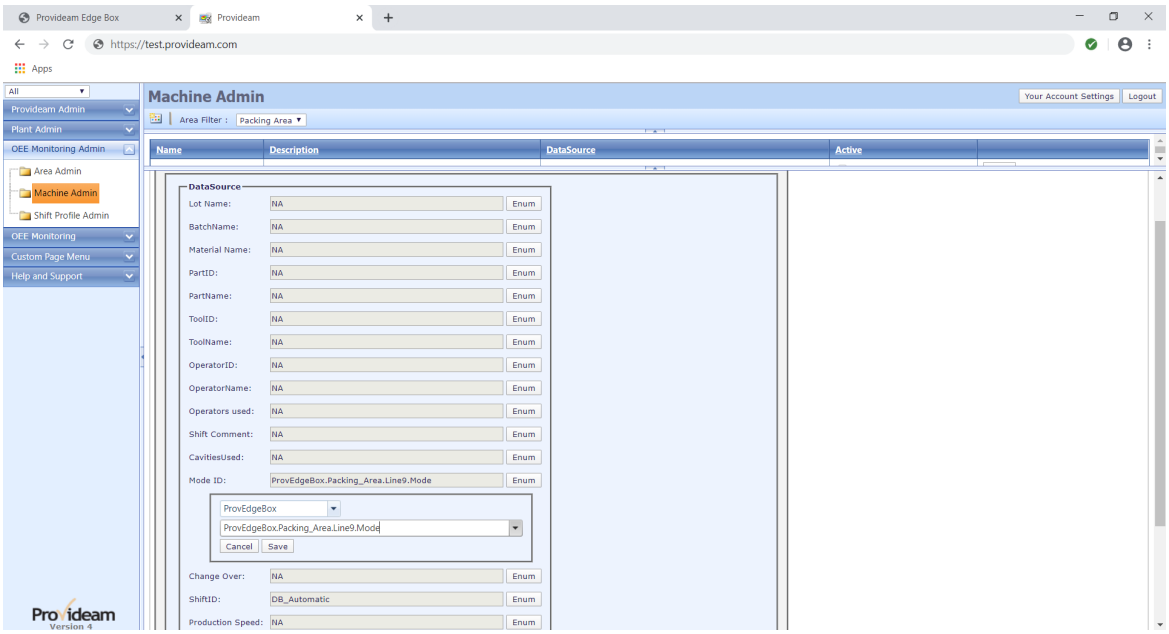


15) The last step is to link the Machine Data Collection configuration with the ProvEdgeBox. Open the Provideam Machine Admin > Station Counts Page and for the required Machine.

In the TagRef selection, select ProvEdgeBox and the DeviceName/Location of the ProvEdgeBox you have configured.



Likewise, on the DataSources page link the Machine Mode Tag to the ProvEdgeBox.



16) Finally click the Update Button on the Machine Admin > Details page. This will download the new configuration to the Data Collection Service.

Note: When commissioning the photo-electric sensor, follow the manufacturer's instructions to tune the sensitivity of the sensor to the appropriate level for your application.

Section X:
ProvideamApps

Provideam 4.18
Manufacturing Productivity Solutions

10 ProvideamApps

ProvideamApps is an easy-to-use, web-based, standalone application which allows us to analyze data stored in the Provideam database.

ProvideamApps is available when your Provideam Licence includes the Provideam API subscription. To access ProvideamApps you need to use one of the recommended web browsers (e.g.:Google Chrome, Microsoft Edge etc.).

Access to the individual Apps is controlled in User Group Security.

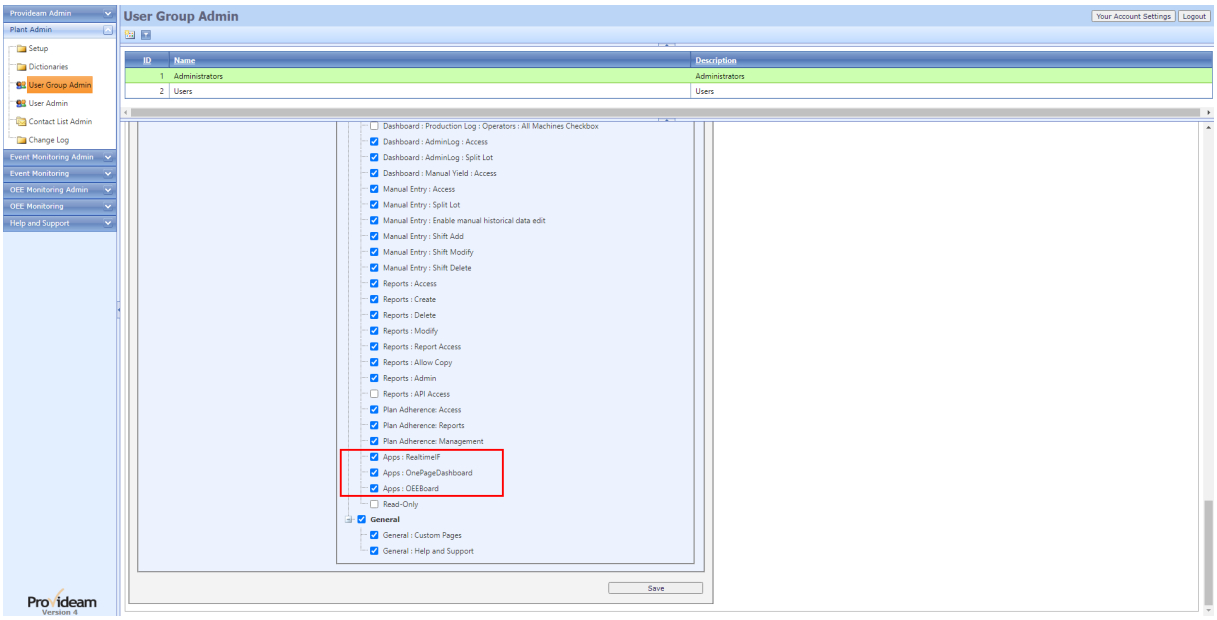


Fig. ProvideamApps User Group Security Settings.

Opening ProvideamApps

Type the ProvideamApps address in the browser address bar. In the screenshot below the address is: http://ProvideamServer:85, where ProvideamServer represents the name of the Server (PC) on which the Provideam Application has been installed, and 85 represents the Port Number. If another Port Number has been assigned - then you should use that number.

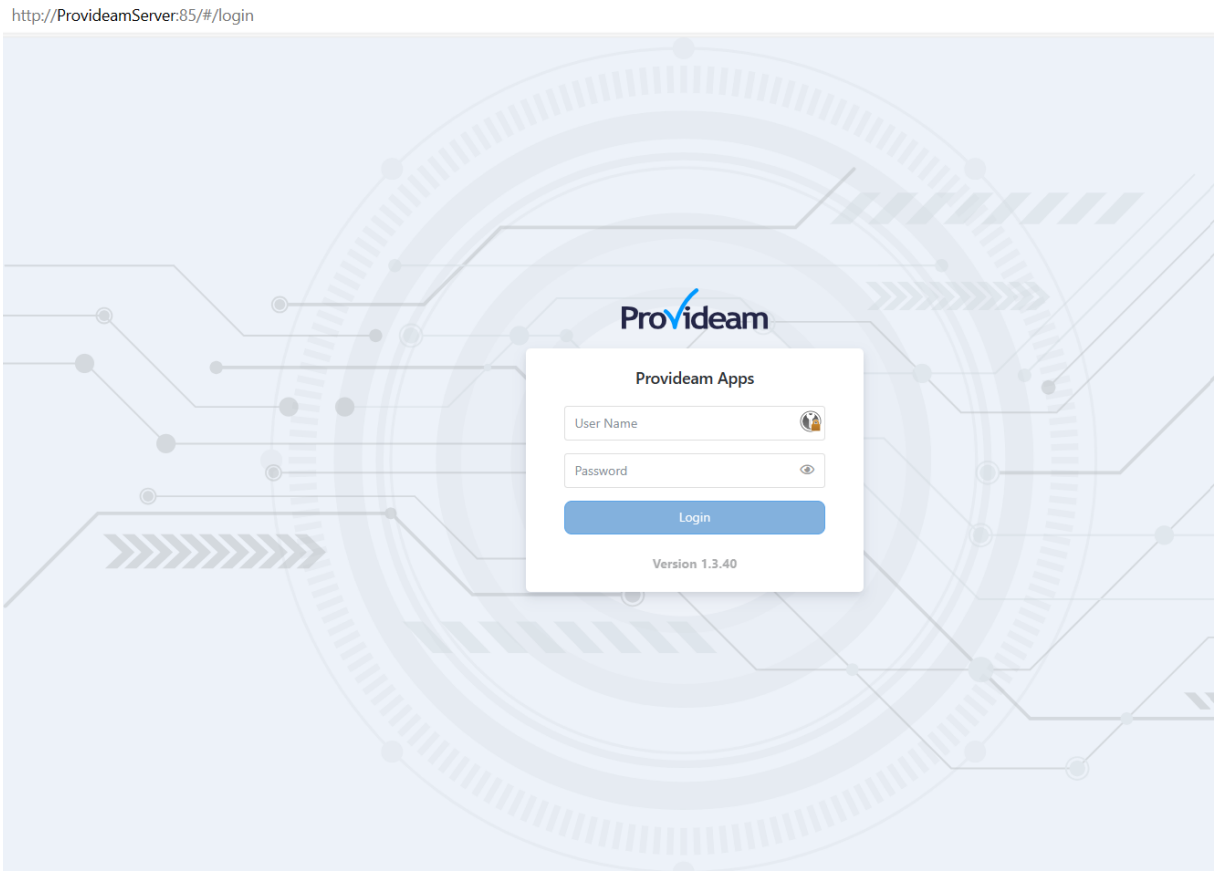


Fig. ProvideamApps Login Page.

To log in you must enter your user name and password. These will initially be set by the Provideam Administrator.

The default User Login is:

User ID: User

Password: User

The default Administrator Login is;

User ID: Admin

Password: Admin

Warning: If a user attempts to log in with an incorrect password, three times in a row, their account will be locked-out for 5 minutes. An Administrator can reset the locked-out user from the User Admin section

When we log in, the ProvideamApps homepage opens. From the homepage we can click on the dashboard we want to open. The dashboards are:

- OEEBoard (2).
- OnePageDashboard (3).
- RealtimeIF (4).

To log out, we click the Logout (1) button on the top-right-hand corner of the home page

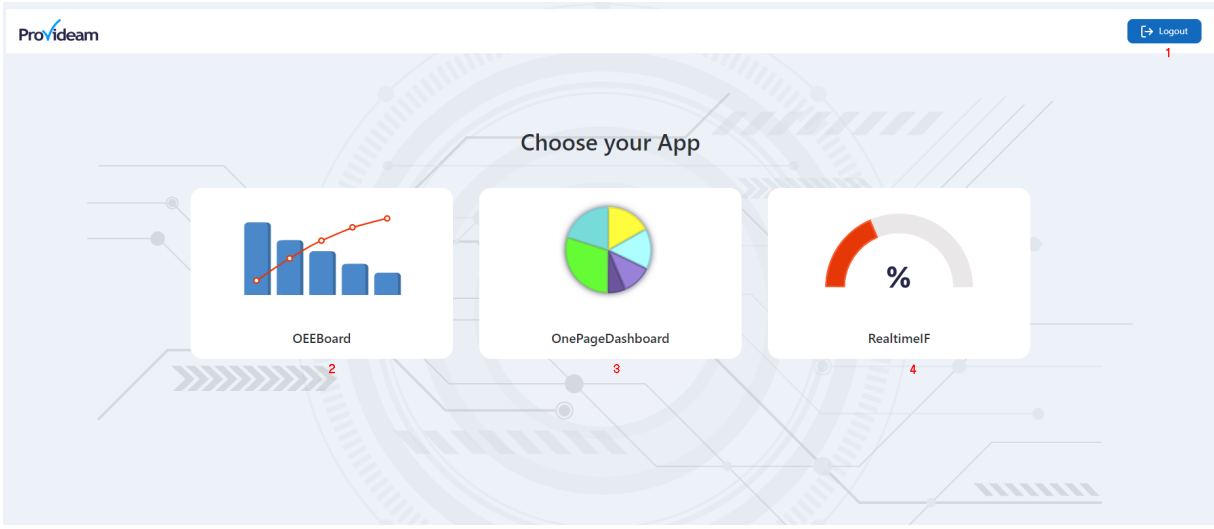


Fig. ProvideamApps Homepage.

10.1 OEEBoard

The OEEBoard is designed to allow us to view Area and Machine performances over the last thirty days.

There are four panels on the OEEBoard:

- OEE & Yield by Machine (selected date).
- OEE by day (30 days).
- Top 5 Losses (selected date).
- Top 5 Losses (30 days).

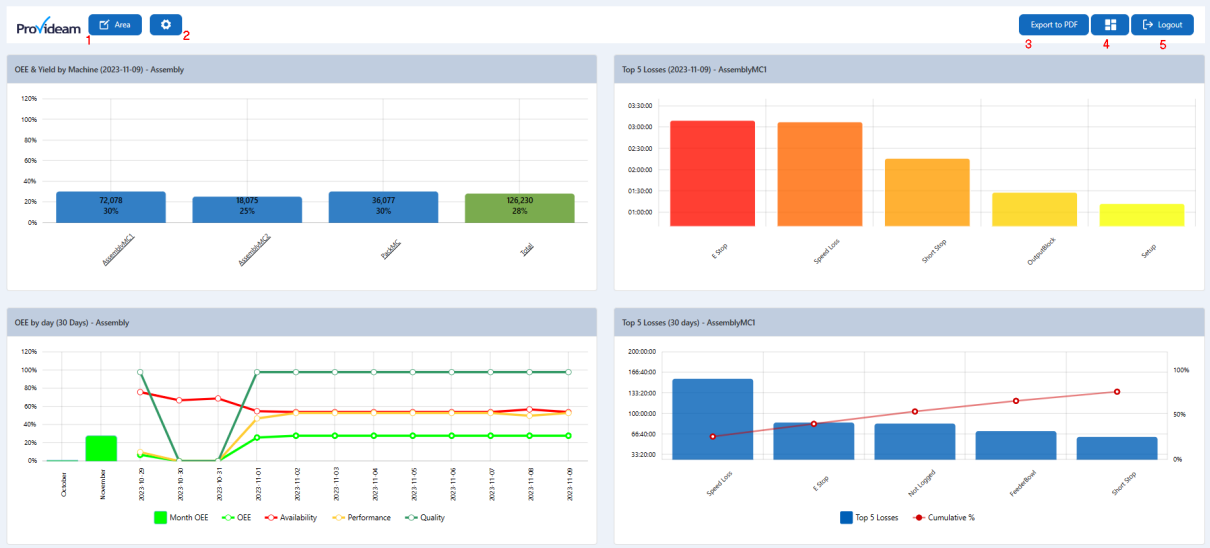


Fig. ProvideamApps OEEBoard.

On the top-left-hand corner there are two buttons:

- **Area** selection (1). The **Area** selection button allows us to select any Area that has been configured in Provideam.
- **Settings** (2)**.** The **Settings** button allows us to refine the data we wish to see on the OEEBoard.
- **Export to PDF** button (3)**.** The **Export to PDF** button allows us to export a snapshot of the screen to PDF format. The PDF document will automatically appear in the download section of your browser.
- **Homepage** button (4). The **Homepage** button takes us back to the ProvideamApps homepage.
- **Log-out** button (5). The **Log-out** button logs us out of ProvideamApps.

Settings

The settings Window allows us to set the following filters:

- **Selected machines**
- **Parts**
- **Date**
- **Exclude Day**
- **Refresh Rate**

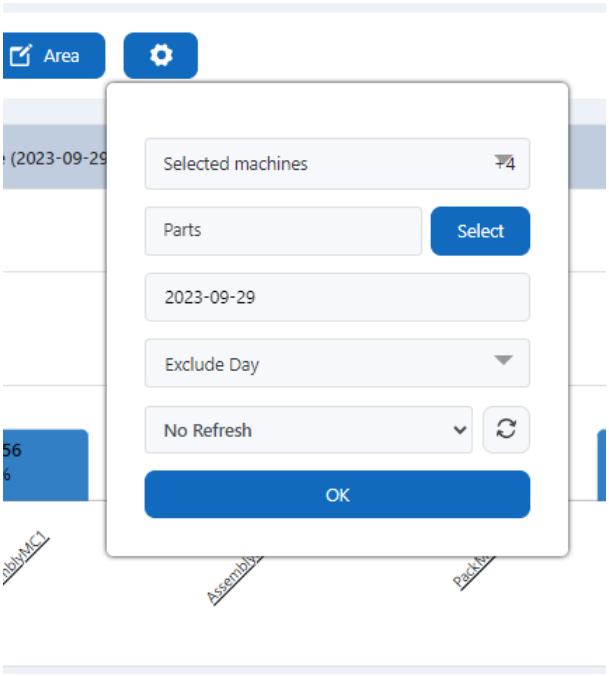


Fig. ProvideamApps OEEBoard, Settings window.

Selected Machines

The **Selected Machines** filter allows us to select which Machines will be included in the OEEBoard Analysis.

When we select an Area, all the Machines in that Area will be displayed, and selected.

If we do not wish to select all Machines, we can uncheck the Machines we do not wish to see.

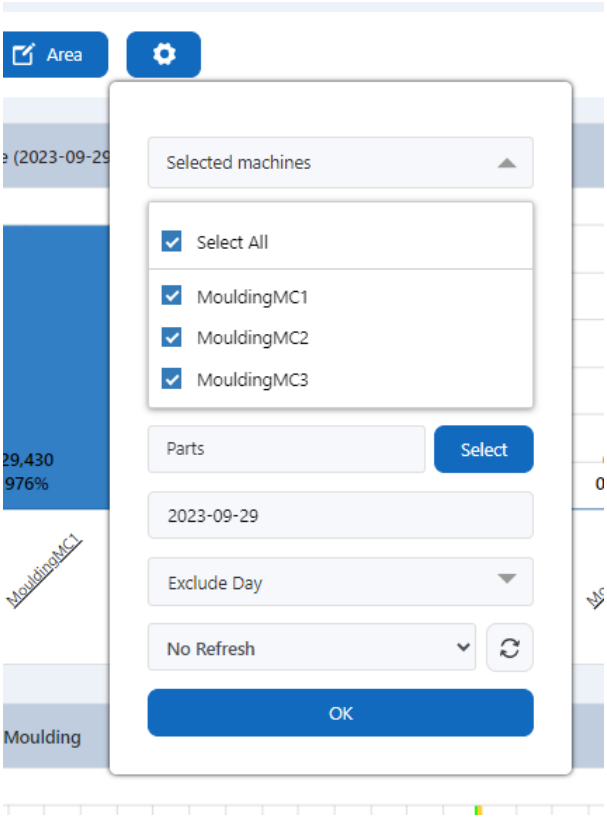


Fig. ProvideamApps OEEBoard, Machine Selection Menu with the Machines available in the Moulding Area.

Parts

The Parts filter allows us to limit the data in the Charts to specific Parts. Clicking the **Select** button opens a windows showing the available Parts for the selected Area.

Click on the individual Parts buttons to include the Part in the filter.

Click on the icon next to the Part name to deselect the Part.

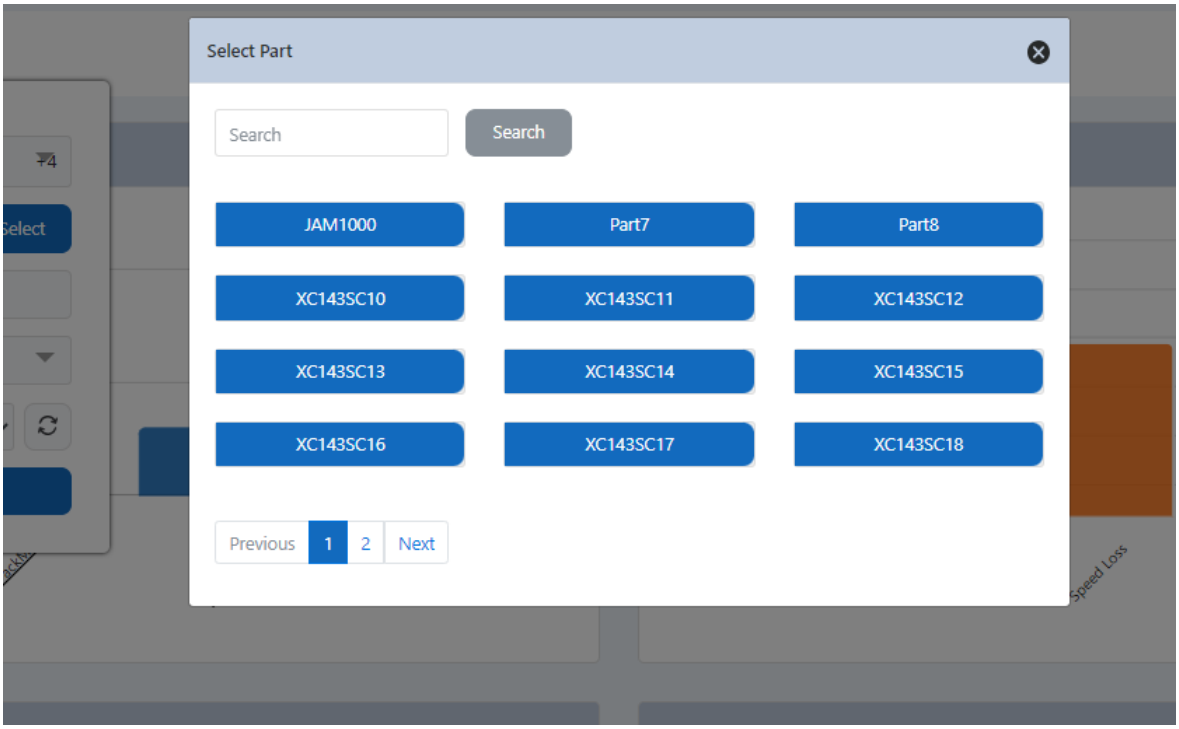


Fig. ProvideamApps OEEBoard, Parts selection.

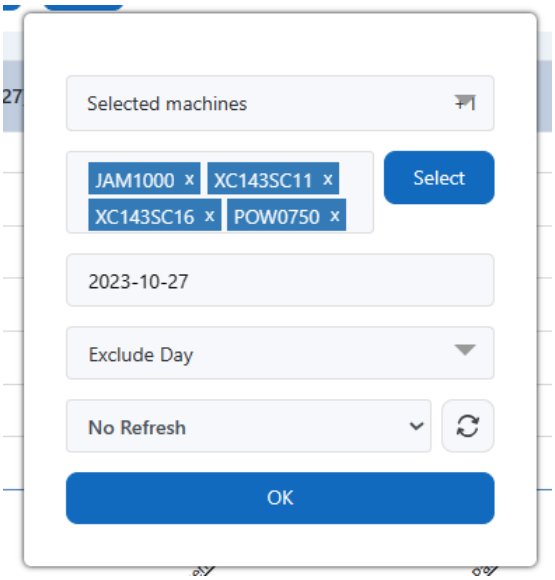


Fig. ProvideamApps OEEBoard, Parts selected

Date

The **Date** filter allows us to select a specific date. By default, the **Date** filter shows the current date. If we select a different date, it will be automatically set to all panels.

Exclude Day

The **Exclude Day** filter allows us to exclude selected days of the week, or all days of the week - which is possible by checking the **Select All** checkbox.

To remove Days from the **Exclude Day** filter just click on the icon near the name of Day.

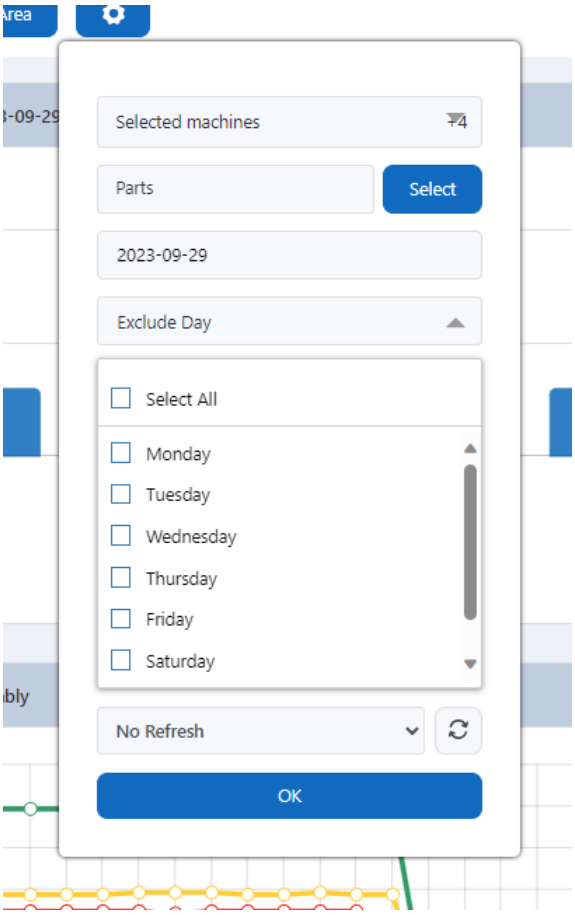


Fig. ProvideamApps OEEBoard, Exclude Day filter.

Refresh Rate

The **Refresh Rate** filter allows us to configure the OEEBoard to update automatically on regular intervals. We can choose to set the refresh rate to either 5 or 15 minutes, or to disable automatic refresh by clicking on the **No Refresh** voice in the drop-down menu.

Zoom Feature

All panels on the OEEBoard include a zoom feature on the vertical axes. To use this function, click on the area of the Chart you want to zoom and drag the mouse down. When the mouse is released, the Chart will zoom to the selected region.

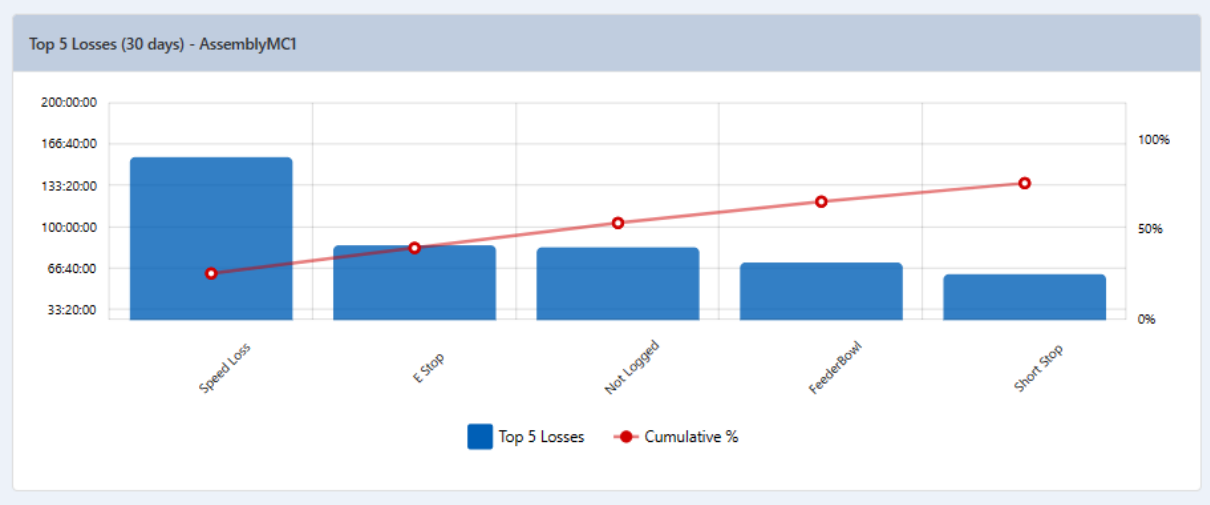


Fig. ProvideamApps OEEBoard, Top 5 Losses (30 Days) panel before zoom.

To cancel the zoom, click the  icon button.

-  icon button (3).

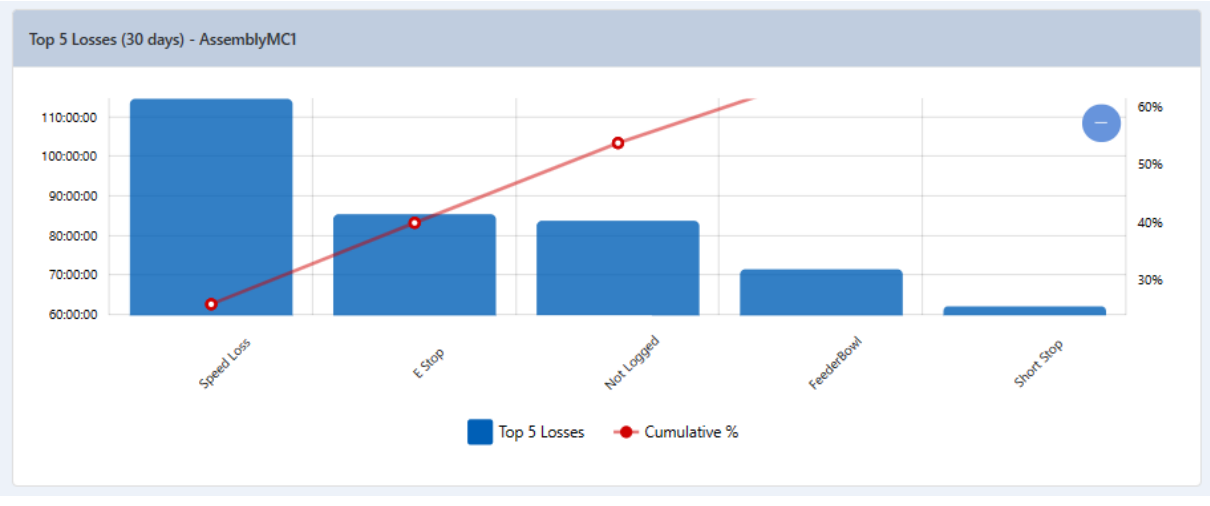


Fig. ProvideamApps OEEBoard, Top 5 Losses (30 Days) panel after zoom.

10.1.1 OEE & Yield by Machine (selected date)

The **OEE & Yiled by Machine (selected date) Panel** displays the OEE values for each selected Machine in the selected Area, on a selected date.

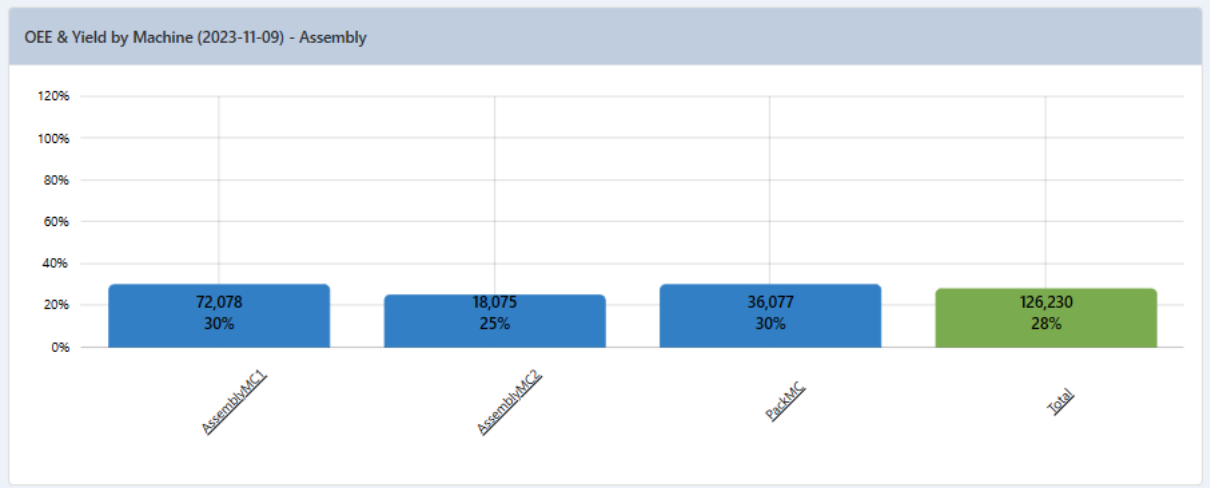


Fig. ProvideamApps OEEBoard, OEE & Yield by Machine (selected date) panel.

By default, the Chart opens with the current day selected.

It is possible to change the day through the **Select Day** filter in the Settings window. Changing the date will automatically change the day of the other panels too.

By default, the data we will see in the next panels are the ones from the first Machine appearing in the OEE & Yield by Machine (selected date) panel. To display the data from another Machine, click on that Machine name.

10.1.2 Top 5 Losses (selected date)

The **Top 5 Losses (selected date) Panel** displays a Pareto Chart of the top 5 OEE losses for the selected Machine or Machines on a selected day.

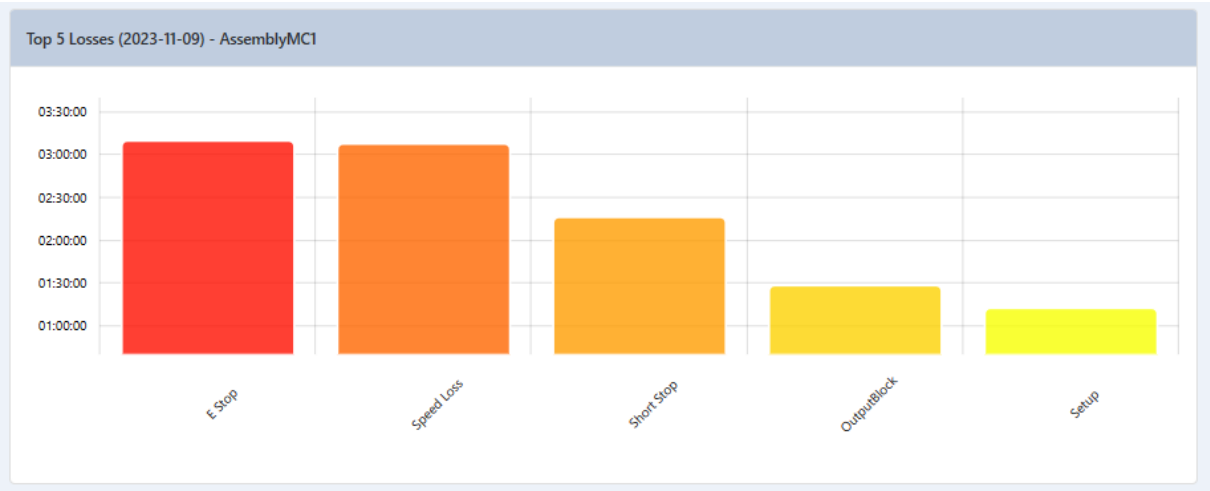


Fig. ProvideamApps OEEBoard, Top 5 Losses (selected date) panel.

By default, the panel opens with the current day selected.

It is possible to change the day through the **Select Day** filter in the Settings window. Changing the date will automatically change the day of the other panels too.

10.1.3 Top 5 Losses (30 Days)

The **Top 5 Losses (30 Days) Panel** displays a Pareto Chart of the top 5 losses for the selected Machine or Machines for the last 30 days.

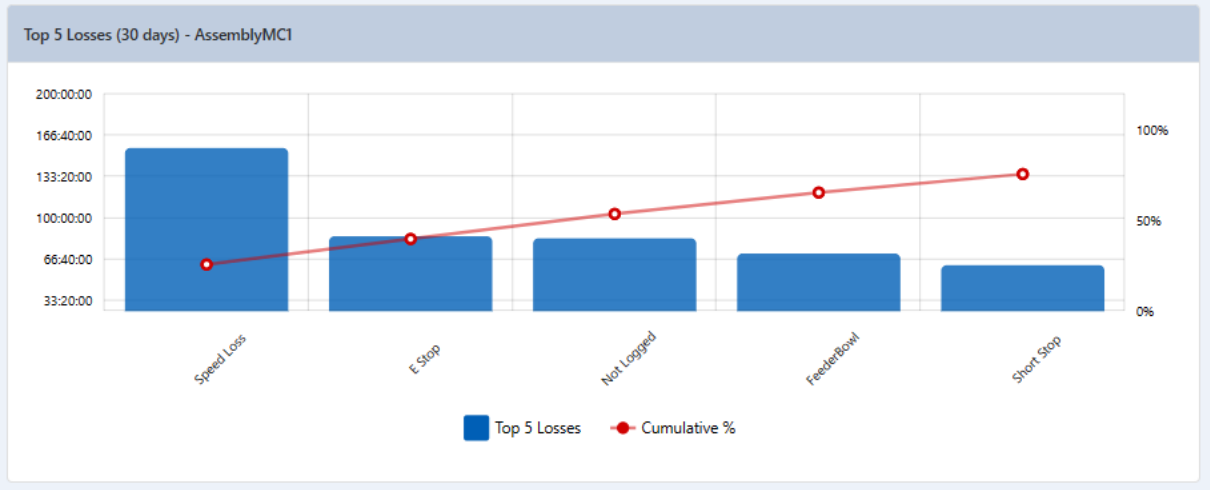


Fig. ProvideamApps OEEBoard, Top 5 Losses (30 Days) panel.

If we do not wish to see a percentage we can hide it.

Hiding Percentages

Click on the percentages we do not wish to see to hide them.

Click on the hidden (grey) percentages to make them visible again.

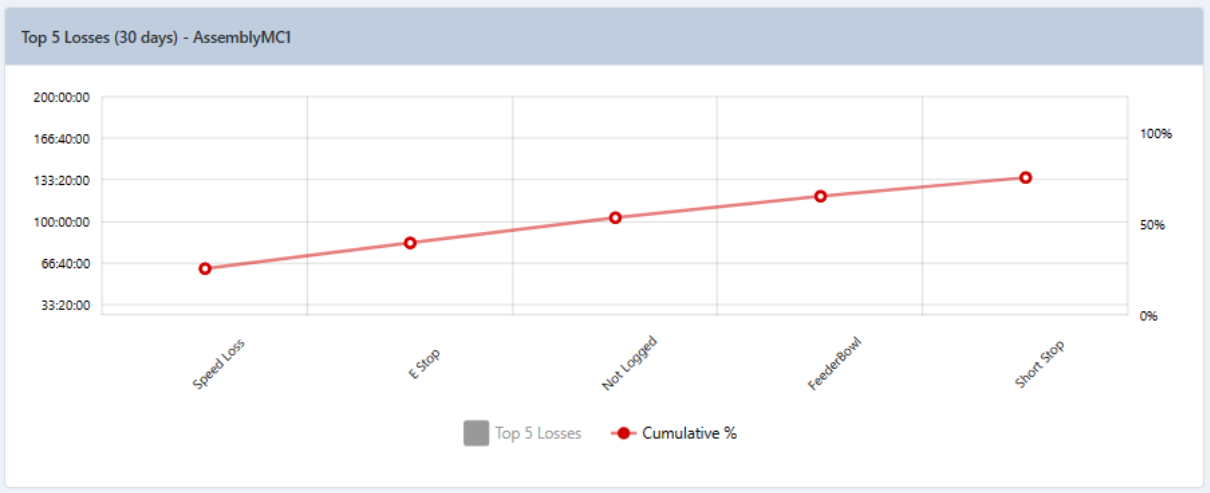


Fig. ProvideamApps OEEBoard, Top 5 Losses (30 Days) panel with the Top 5 Losses percentages hidden.

10.1.3.1 *OEE by day (30 Days)*

The **OEE by day (30 Days) Panel** displays a percentage of the *OEE*, *Availability*, *Performance* and *Quality* for the selected Area for the last 30 days.

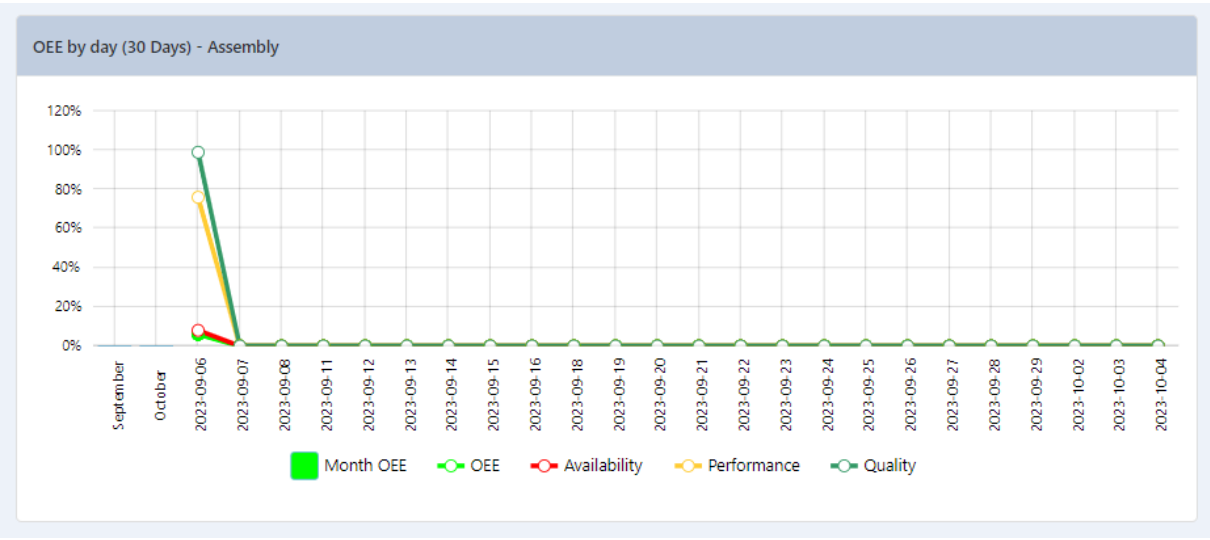


Fig. ProvideamApps OEEBoard, OEE by day (30 Days) panel.

The left-hand-side of the Chart displays the average monthly OEE value (*Month OEE*) for the past month.

If we do not wish to see certain percentages we can hide them.

Hiding Percentages

Click on the percentages we do not wish to see to hide them.
Click on the hidden (grey) percentages to make them visible again.

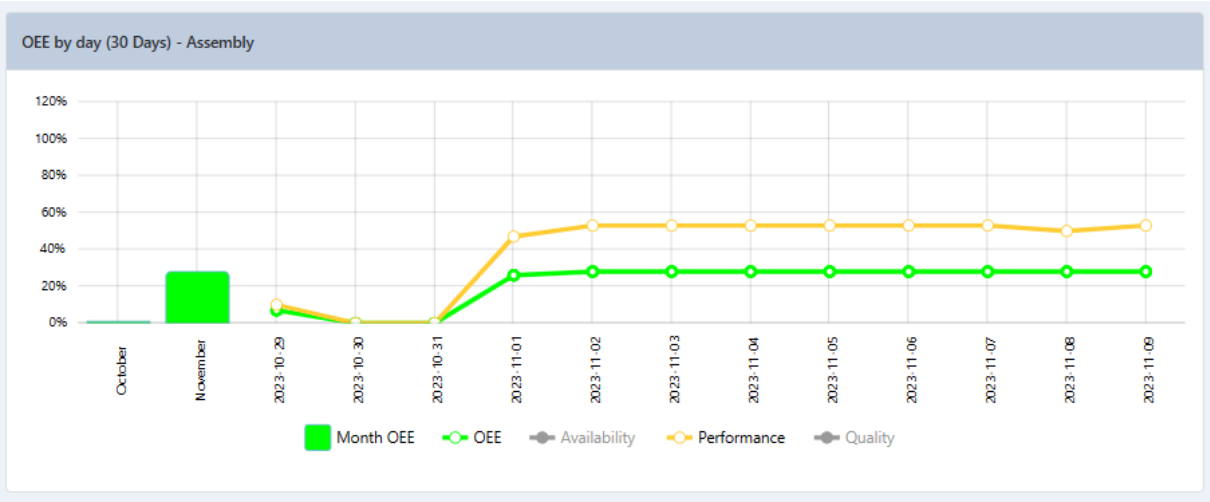


Fig. ProvideamApps OEEBoard, OEE by day (30 Days) panel with Availability and Quality percentages hidden.

10.2 OnePageDashboard

The OnePageDashboard is designed to provide us with a live Machine status display.

The OnePageDashboard has 5 panels. These panels highlight different aspects of live production performance.

- Header Panel - Overall View
- Status box Panel - Current Status View
- Top Losses by Hour Panel - Hourly Yield View
- OEE Pie Panel.
- Top 5 Losses Panel - Top Losses View

In the following pages we will describe the operation of these panels in detail.

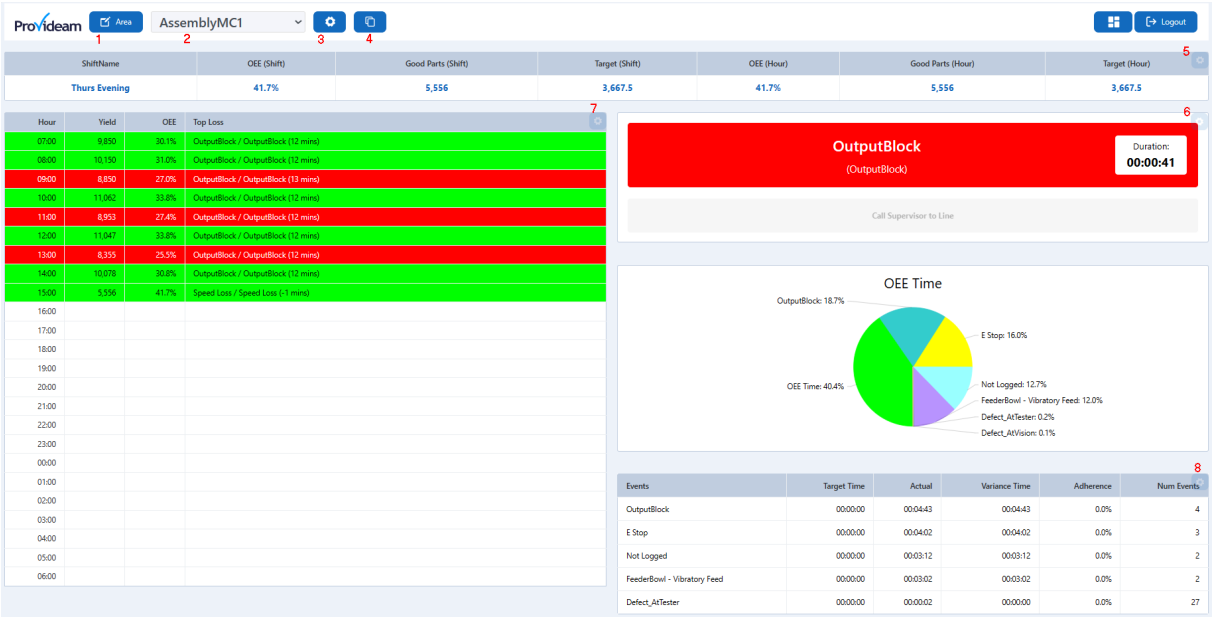


Fig. ProvideamApps OnePageDashboard.

On the top of the page there are the buttons:

- The **Area** button box allows you to select an Area (1).
- The **Machine** selection box allows you to select a Machine, from the selected Area (2).
- The  icon button in the page header opens the OnePageDashboard Machine Settings window. This window allows us to enable or disable the sections in the dashboard (3).
- The  icon button opens the OnePageDashboard CopySettingsTo window. This window allows us to copy the dashboard settings from one Machine to another (4).
- The  icon button at the top corner of each panel opens the settings windows for the related panel (5, 6, 7, 8). This button will only appear if the User has administration permissions.

Machine Settings

The Machine Settings window allow us to:

- Decide which panels to display by clicking on the  toggle switch of each panel.
- Click the **Save** button to save the changes.

- Click the  icon button or the **Close** button to close the window without saving the changes.

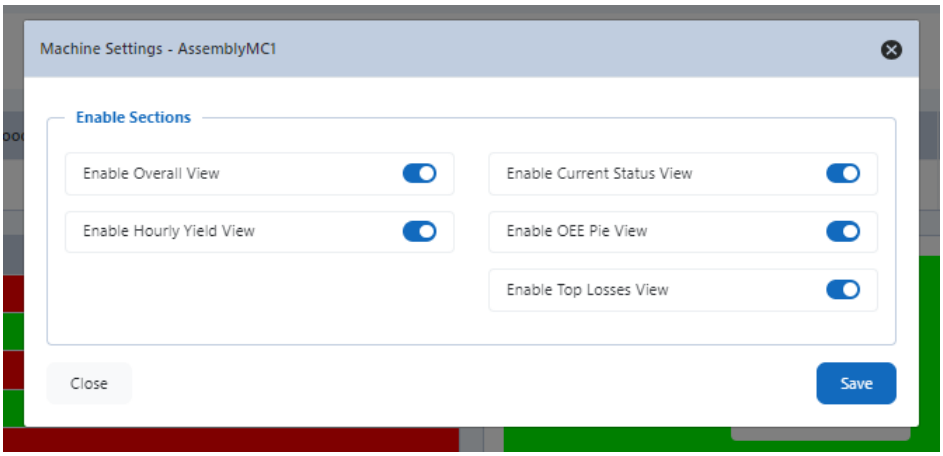


Fig. ProvideamApps OnePageDashboard, Enable Sections window.

Copy Settings to

Clicking the  icon button opens the CopySettingsTo window. Through this function we select which Machine(s) to copy the set dashboard configurations to.

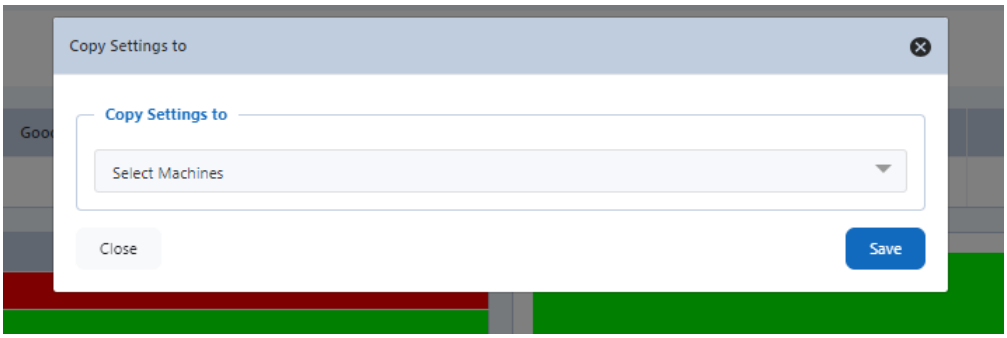


Fig. ProvideamApps OnePageDashboard, CopySettingsTo window.

Click on the *Select Machines* drop down box and select the target Machine(s).

Click the **Save** button to save the changes. Click the  icon button or the **Close** button to close the window without saving the changes.

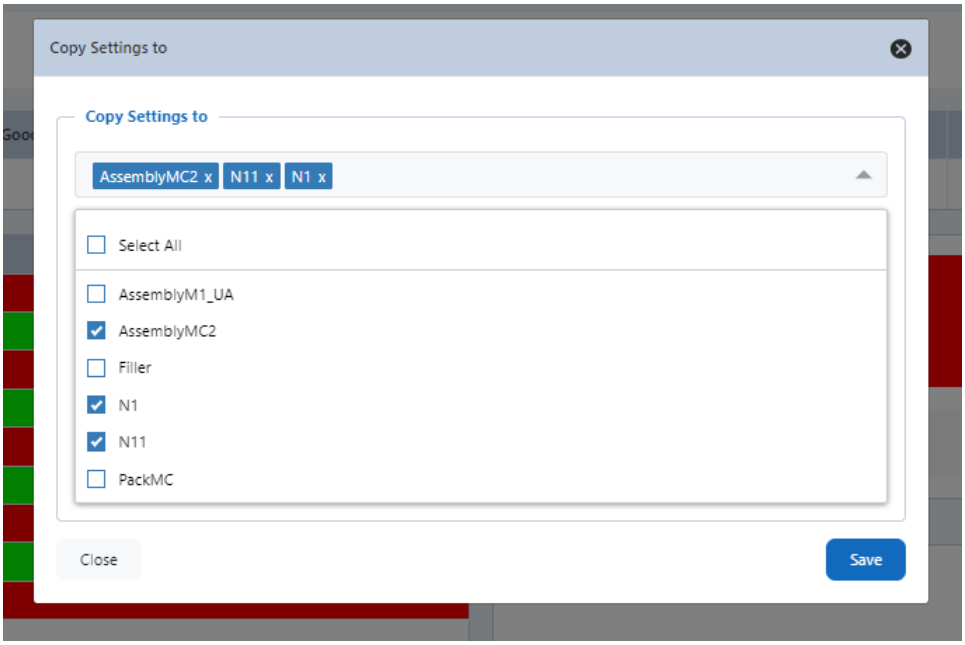


Fig. ProvideamApps OnePageDashboard, CopySettingsTo Machine Selection.

10.2.1 Header Panel

The **Header Panel** displays a selection of Fields and Functions (KPIs).

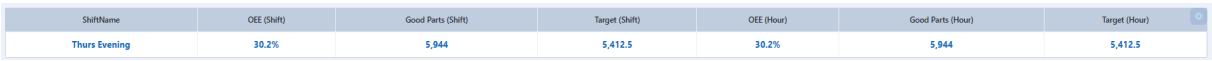


Fig. ProvideamApps OnePageDashboard, Header panel.

The icon button opens the Machine Settings window. This window allows us to modify the Fields and Functions (KPIs) displayed in the Header Panel. (Note: The icon button is only visible to Administrators).

Machine Settings

- The **Add Column** button opens the *Add Column* window control. (Note: The maximum number of columns which can be displayed is 10).
- The icon button allows us to adjust the order of the columns. Click and hold the icon of the selected column, and drag and drop it to the required position.
- The icon button opens the configuration window for the selected column. (Note: each KPI has different parameters that can be modified).
- The icon button deletes the selected column.

- The  icon button and the **Close** button close the Machine Settings window without saving the changes.
- The **Save** button saves the changes, and closes the Machine Settings window.
- Allows us to manage the Header Columns which are displayed on the Header Panel. This window shows the list of configured columns, and the order in which they will appear. Each column record is displayed in the following format: "*Column Name* | *Format* | *Alignment*".

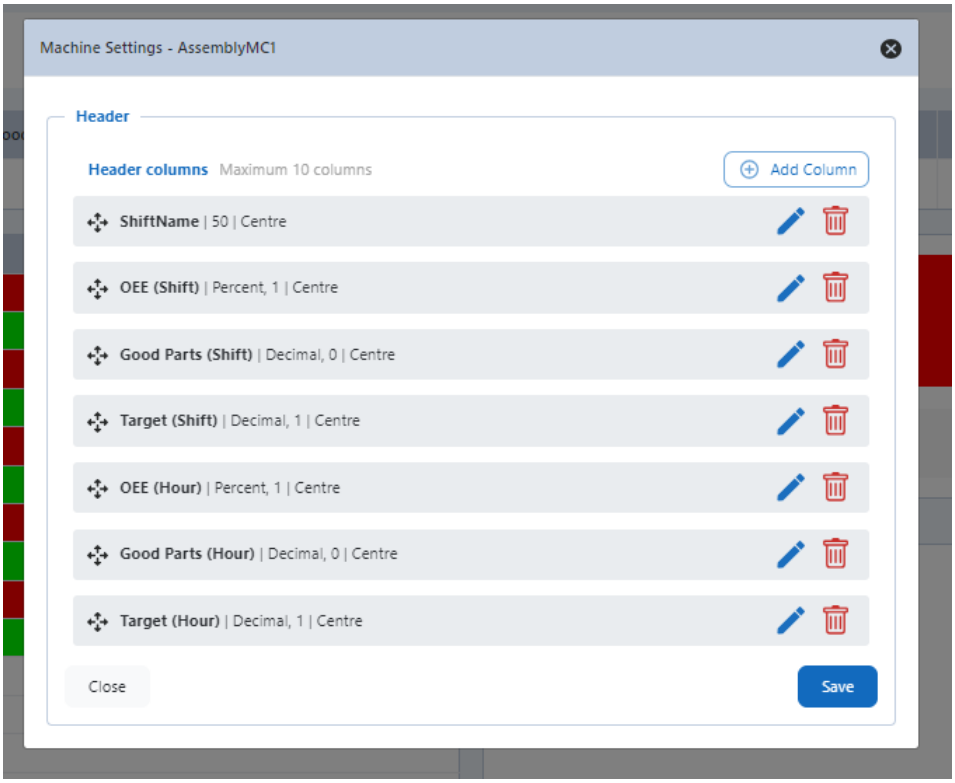


Fig. ProvideamApps OnePageDashboard, Header panel Machine Settings window.

Add Column

- The **Field** button opens the window control to add a new Field to the Header Panel.
- The **Function** button opens the window control to add a new Function to the Header Panel.

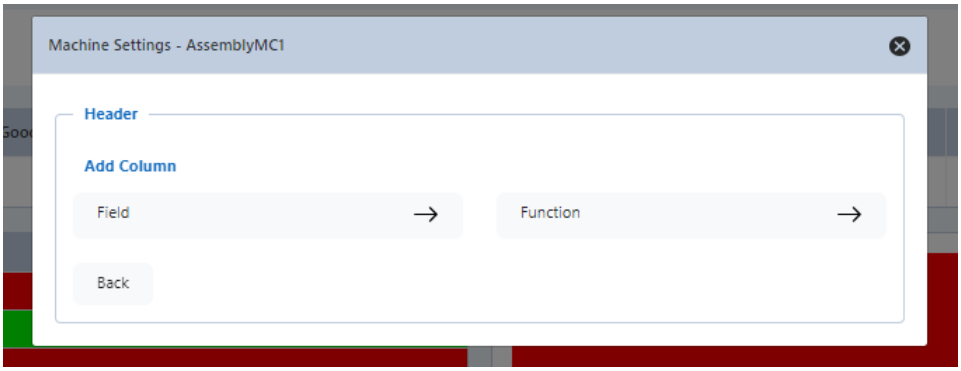


Fig. ProvideamApps OnePageDashboard, choosing between Field or Function Column when adding a new Column.

Add Field Column window

- The **Select Field** drop-down menu button allows us to choose from the Fields: *LotName*; *BatchName*; *MaterialName*; *PartName*; *StdTime*; *OperatorName*; *ShiftName*.
- The **Maximum Length** option allows us to choose the maximum length for the Field Column.
- The **Align** option makes us choose the alignment for the new Field Column.
- Through the **Hide** checkbox we can decide whether or not to hide the new Field Column.
- The **Back** button goes back to the previous window without saving the changes.
- The **Add** button adds the new Field Column.

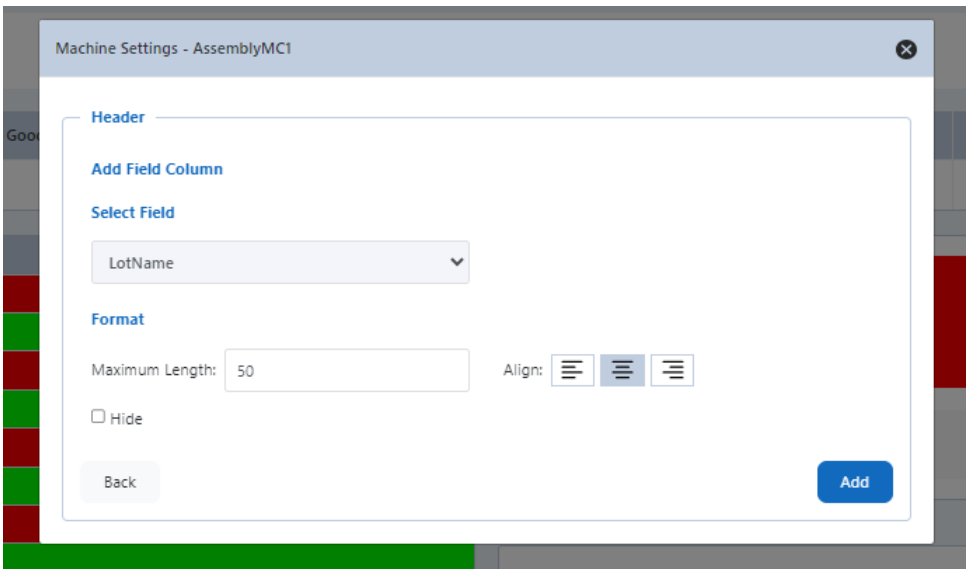


Fig. ProvideamApps OnePageDashboard, creating a new Field Column.

Note: to end the creation of the new KPI, click the  icon on the top-right-hand corner of the window.

Add Function Column window

- The **Select Function** drop-down menu button allows us to choose from a series of Functions (like *OEE*; *Availability*; *DefectParts*; *PartName*; *Downtime*; *Good Parts*; *Idle DT* etc) and from the Values *Hour*, *Lot*, *Shift*, *Day*.
- In the **Name** option we can write a name for the new Function Column.
- The **Format** drop-down menu button makes us choose the format we want for the new Function Column between: *Percent*, *Decimal; Time*.
- The **Align** option makes us choose the alignment for the new Function Column.
- Through the **Hide** checkbox we can decide whether or not to hide the new Function Column.
- In the **Conditional Table Format** section we can assign the new Function Column lower than/greater than values. To these values we can assign a colour. The new Function Column will turn the assigned colour when the set values are passed. We can decide whether or not to see the colours assigned to the values by checking the checkboxes next to the values.
- The **Back** button goes back to the previous window without saving the changes.
- The **Add** button adds the new Function Column.

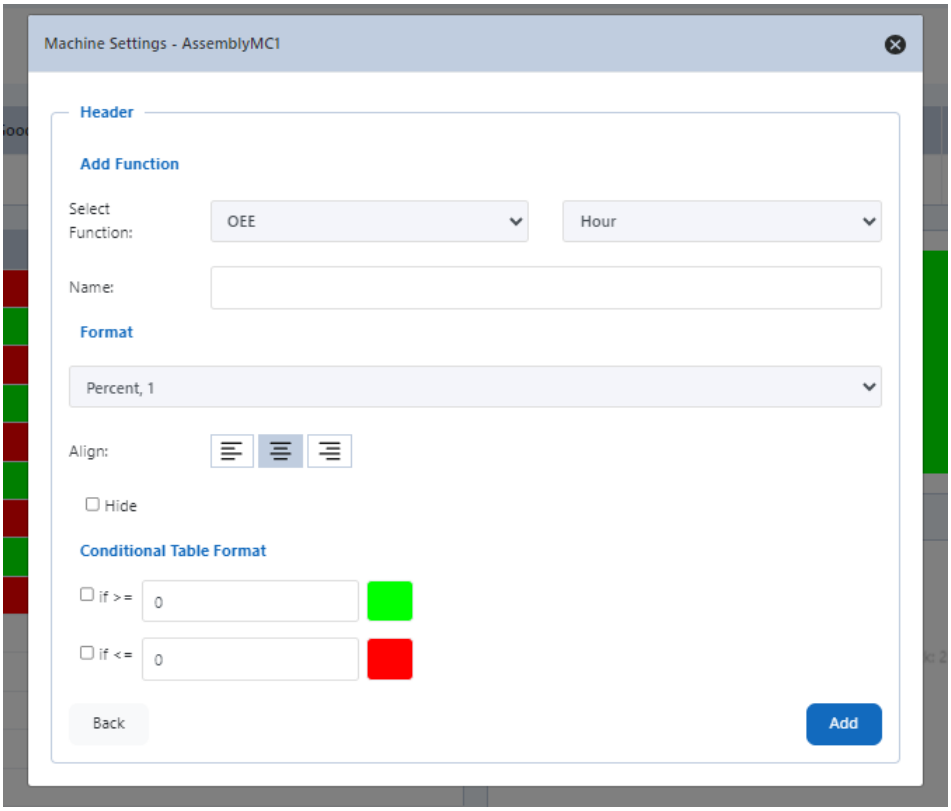


Fig. ProvideamApps OnePageDashboard, creating a new Function Column.

Note: to end the creation of the new KPI, click the icon on the top-right-hand corner of the window.

Edit Column

Click on the icon button to edit a Column. Field and Function columns have different parameters that can be edited.

Note: to end the editing of a KPI, click the icon on the top-right-hand corner of the window.

Edit Field Column

- We can change the type of Field by opening the **Select Field** drop-down menu button.
- We can modify the length of the Field Column through the **Maximum Length** option.

- In the **Align** option we can change the alignment of the Field Column.
- Through the **Hide** checkbox we can decide whether or not to hide the Field Column.
- The **Back** button goes back to the previous window without saving the changes.
- The **Update** button updates the edited Field Column.

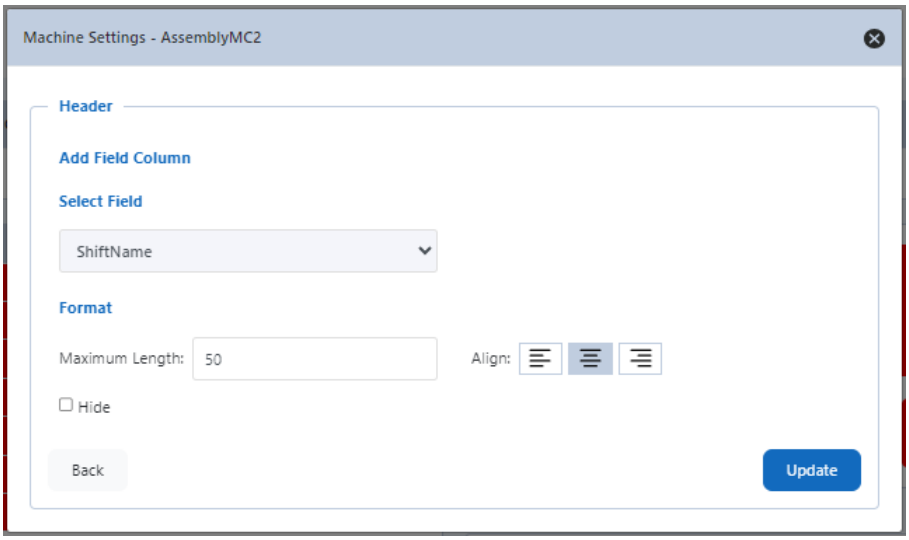


Fig. ProvideamApps OnePageDashboard, editing a Field Column.

Edit Function Column window - Details

- The **Select Function** drop-down menu button allows us to change the previously set Function and Value.
- In the **Name** option we can write a new name for the Function Column.
- The **Format** drop-down menu button allows us to change the value of the Function Column.
- In the **Align** option we can change the alignment of the Function Column.
- Through the **Hide** checkbox we can decide whether or not to hide the Function Column.
- The **Conditional Table Format** section allows us to change the previously set Conditional formatting values (if such values have been set), or to create new ones if not previously set.
- The **Back** button goes back to the previous window without saving the changes.
- The **Update** button updates the edited Function Column.

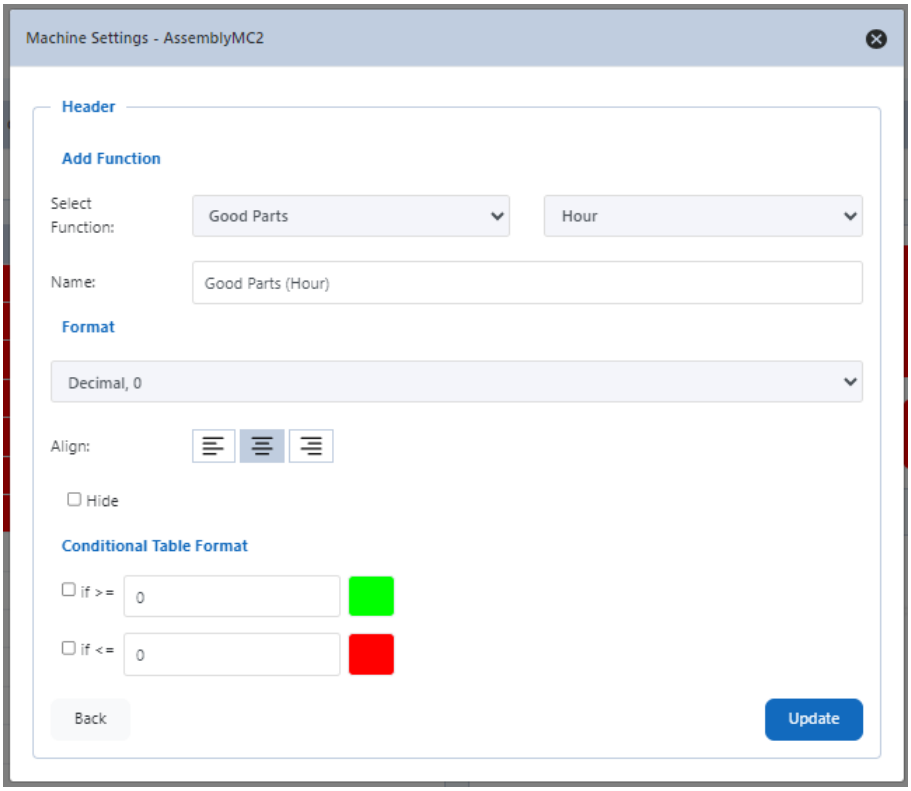


Fig. ProvideamApps OnePageDashboard, editing a Function Column.

10.2.2 Status Box Panel

The **Status Box Panel** displays the current operating mode of the selected Machine.

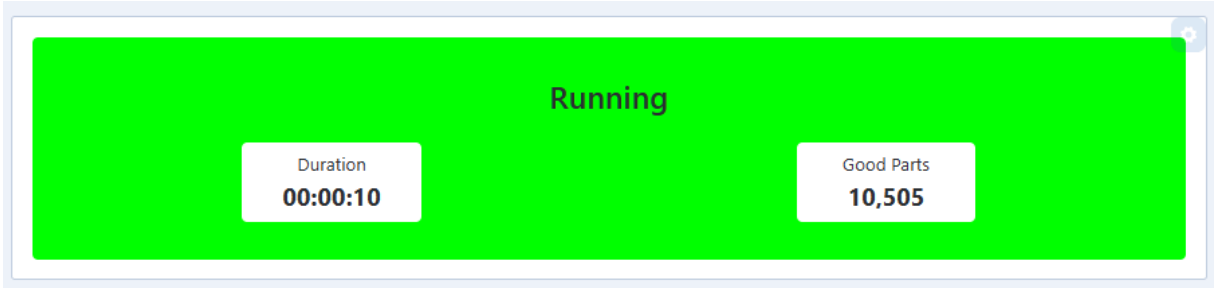


Fig. ProvideamApps OnePageDashboard, Status Box panel.

The possible operating modes are: *Running*; *ChangeOver*; *Downtime.*

Based on the operating mode of the Machine, the status box will appear in different colours and display different KPIs.

The icon button opens the Machine Settings window. This window allows us to configure the KPIs and the colours displayed for the different modes. (Note: The icon button is only visible to Administrators).

Machine Settings

In the Machine Settings window we can configure the settings for the *Running*, *ChangeOver* and *Downtime* modes.

In the ChangeOver Mode, the KPI *Target Time* is a property of the Mode and can be set in the Provideam Machine Administration section. The KPI *Time Remaining* is the Target Time less the duration of the ChangeOver mode so far.

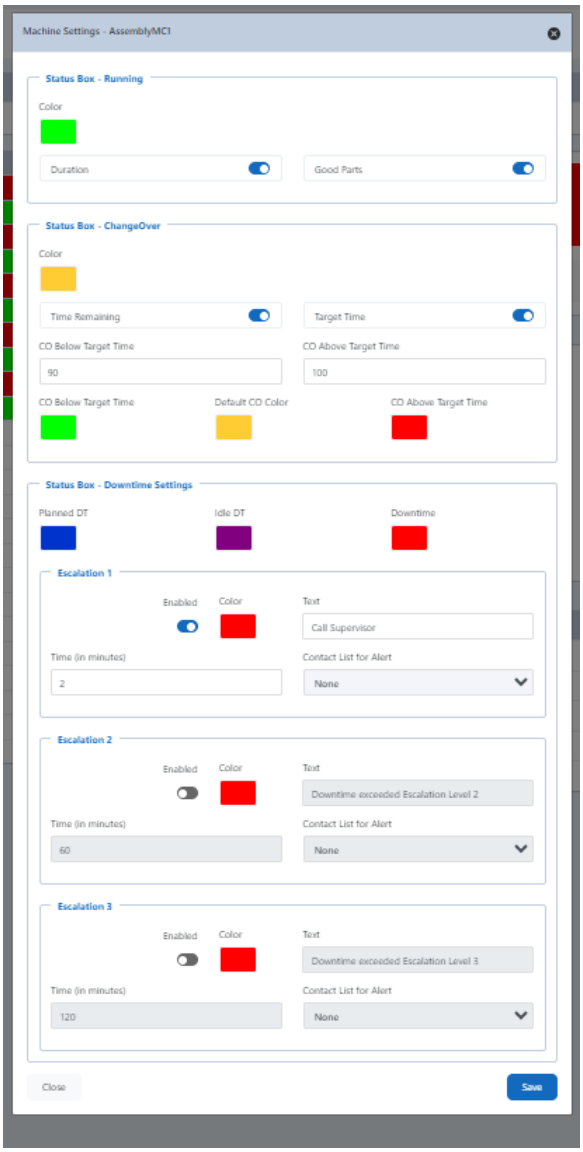


Fig. ProvideamApps OnePageDashboard, Status Box panel Machine Settings window.

Machine Settings window - Running Mode

- We can decide whether or not to see the Duration and GoodParts KPIs, and what colour the Status box should be when the selected Machine is in *Running Mode*.
- We can change the colour of the Status Box by clicking on the coloured rectangle.
- Click the toggle switches to decide whether or not to show the *Duration* and *Good Parts* KPIs.
- Click the icon button or the **Close** button to close the window without saving the changes.
- The **Save** button saves the changes, and closes the window.

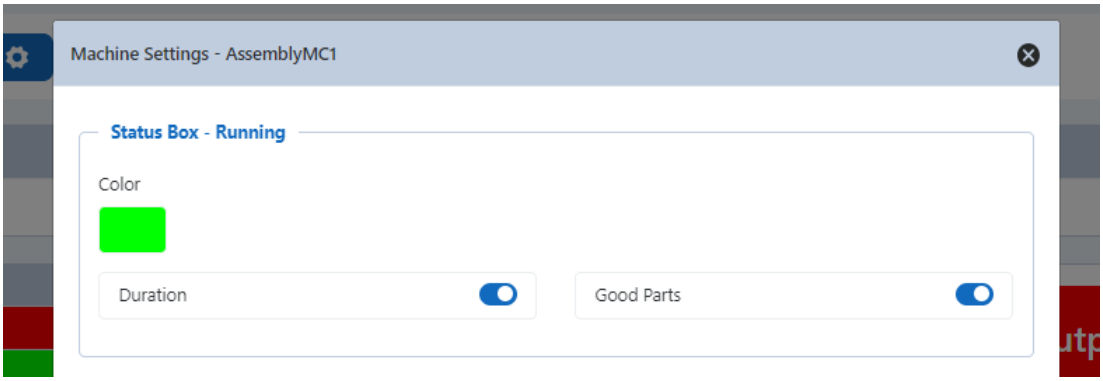


Fig. ProvideamApps OnePageDashboard, Running Mode settings in Status Box panel Machine Settings window.

Machine Settings window - ChangeOver Mode

- Click on the toggle switches to decide whether or not to display the KPIs *Target Time* and *Time Remaining*.
- We can set a value for when the ChangeOver will be below target time (*CO Below Target Time*) and above target time (*CO Above Target Time*). Setting these values to 0% disables these features.
- The *ChangeOver Mode* colour and the *Default CO Color* are the same and we will see the Status Box in this colour when the *ChangeOver* is on *Target Time*. Whereas, should the *ChangeOver* go below or above the *Target Time*, the Status Box colour will change to the *CO Below Target Time* or *CO Above Target Time* colours.

- The **Close** button closes the window without saving the changes.
- The **Save** button saves the changes, and closes the window.

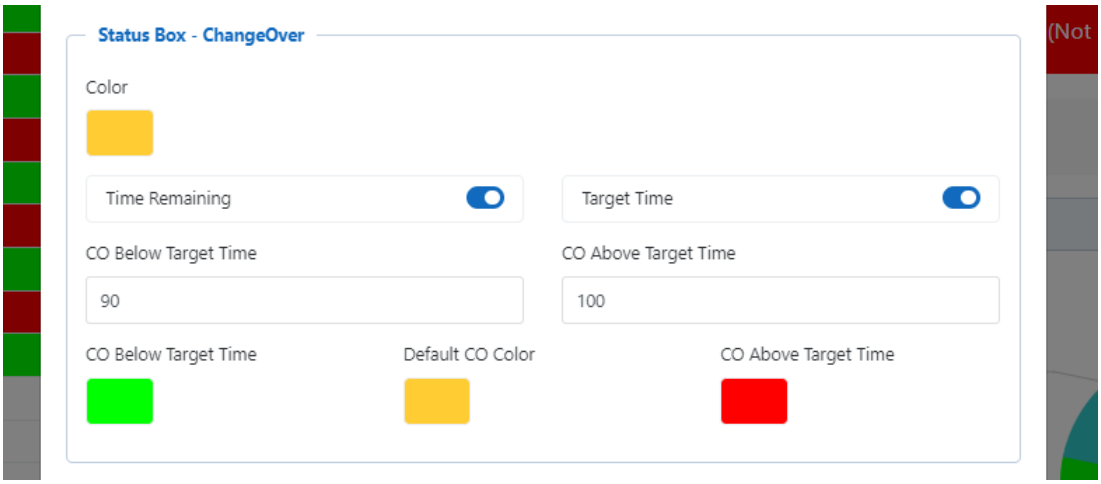


Fig. ProvideamApps OnePageDashboard, ChangeOver Mode settings in Status Box panel Machine Settings window.

Machine Settings window - Downtime Mode

- We can set a colour for *Planned DT*, *Idle DT* and standard *Downtime*.
- For standard *Downtime* we can create up to three *Escalation Alerts* to trigger escalation events.
- If the duration of the *Downtime* mode exceeds the set escalation time (expressed in minutes), then the alert escalation box will be displayed with the text we have given it.
- The escalation can be linked to an email contact list (if been defined in Provideam) so that a message will be emailed when an escalation alert is triggered.
- The **Close** button closes the window without saving the changes.
- The **Save** button saves the changes, and closes the window.

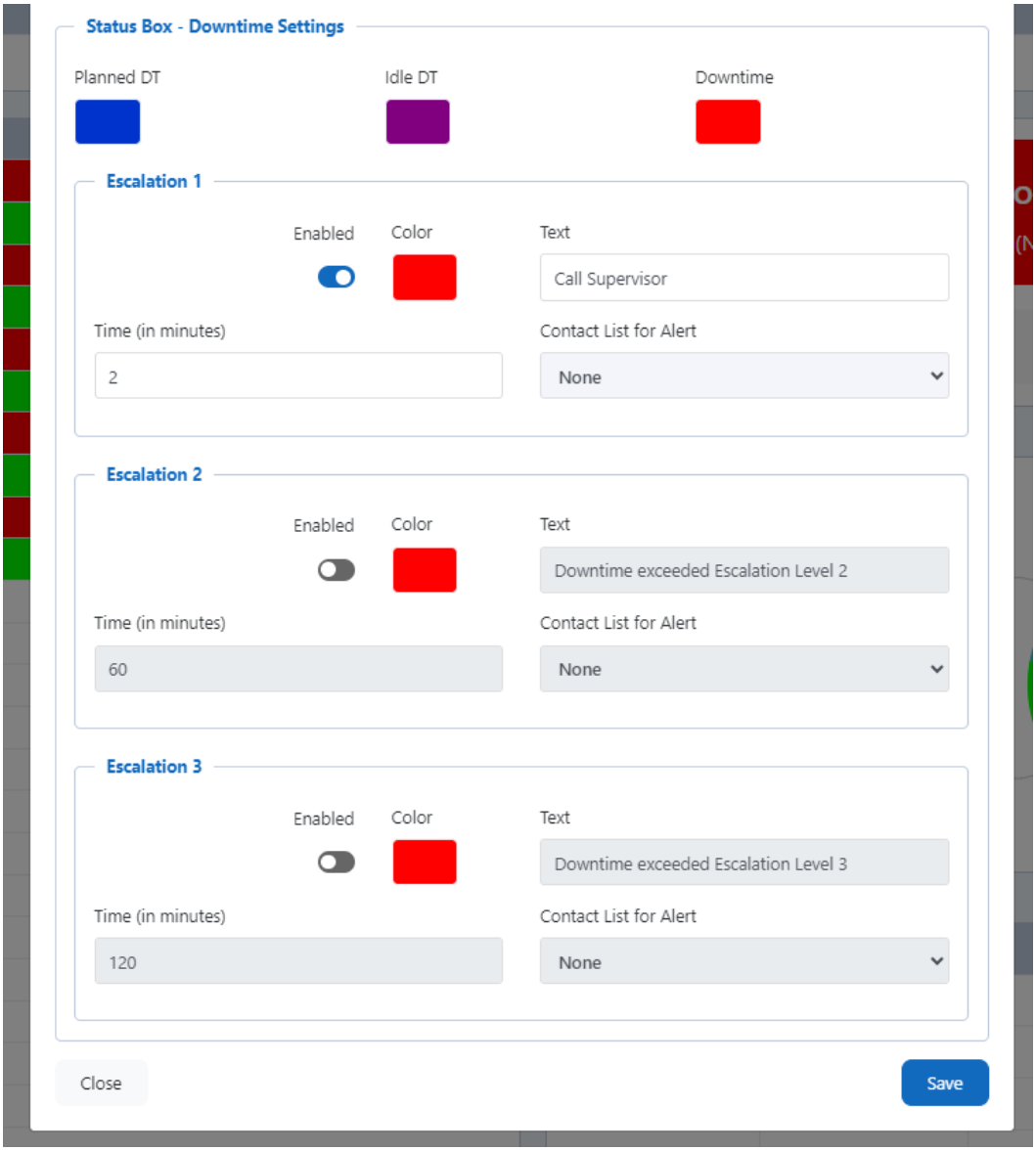


Fig. ProvideamApps OnePageDashboard, Downtime Mode settings in Status Box panel Machine Settings window.

10.2.3 Top Losses by Hour Panel

The **Top Losses by Hour Panel** displays an hourly value for the *Yield*, *OEE*, and *Top Loss* for each hour.

Hour	Yield	OEE	Top Loss
07:00	9,850	30.1%	OutputBlock / OutputBlock (12 mins)
08:00	10,150	31.0%	OutputBlock / OutputBlock (12 mins)
09:00	8,850	27.0%	OutputBlock / OutputBlock (13 mins)
10:00	11,062	33.8%	OutputBlock / OutputBlock (12 mins)
11:00	8,953	27.4%	OutputBlock / OutputBlock (12 mins)
12:00	11,047	33.8%	OutputBlock / OutputBlock (12 mins)
13:00	8,355	25.5%	OutputBlock / OutputBlock (12 mins)
14:00	10,078	30.8%	OutputBlock / OutputBlock (12 mins)
15:00	9,922	30.3%	OutputBlock / OutputBlock (12 mins)
16:00	681	27.4%	E Stop / E Stop (2 mins)
17:00			
18:00			
19:00			
20:00			
21:00			
22:00			
23:00			
00:00			
01:00			
02:00			
03:00			
04:00			
05:00			
06:00			

Fig. ProvideamApps OnePageDashboard, Top Losses by Hour panel.

Each row can be colour-coded based on the OEE value for that hour.

The icon button opens the Machine Settings window. This window allows us to configure the KPIs and the colours displayed for the different modes. (Note: The icon button is only visible to Administrators).

Machine Settings

- We can configure the: *OEE below Target*; *OEE above Target*; *ChangeOver PC*; *Planned DT PC*; *Idle DT*.
- These values are then listed below (plus the *OEE, between)*, together with the colour assigned to each one. These colours can be changed.
- We can enable the options *Display Future Manual Data, Rolling 24h view* and *Display Top Loss Minutes* by clicking their respective toggle switches.

- Click the  icon or the **Close** button to close the window without saving the changes.
- The **Save** button saves the changes, and closes the window.

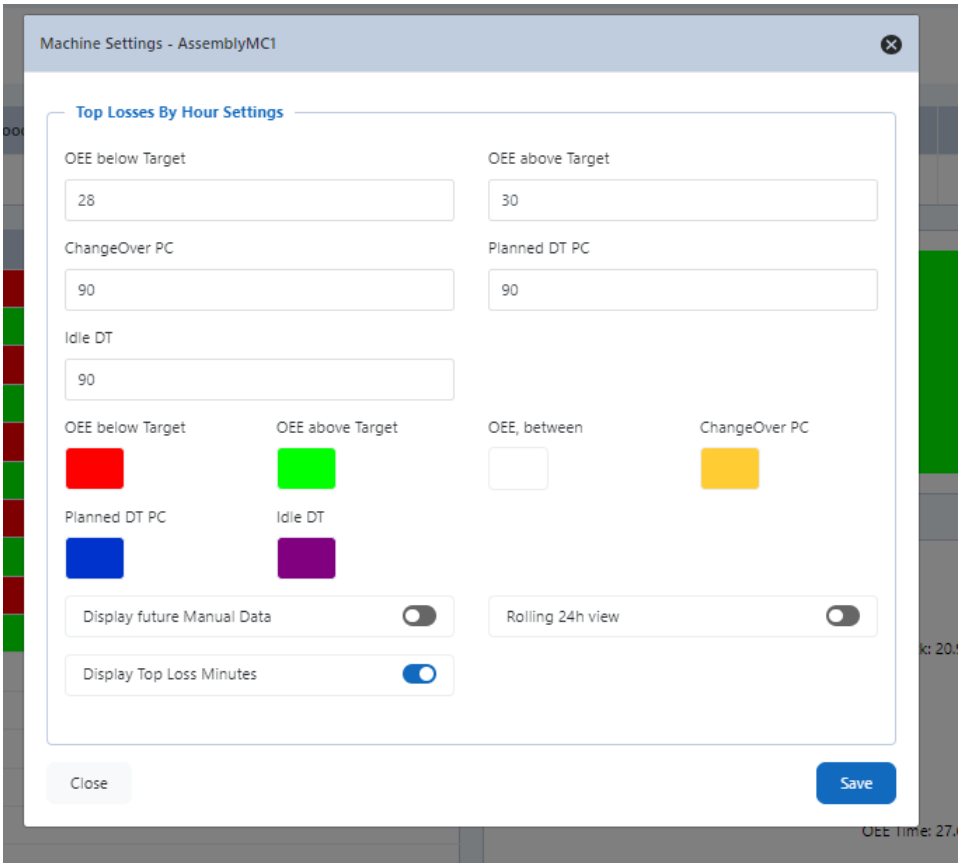


Fig. ProvideamApps OnePageDashboard, Top Losses by Hour panel Machine Settings window.

10.2.4 OEE Pie View Panel

The **OEE Pie View Panel** displays the breakdown of losses for the current Shift.

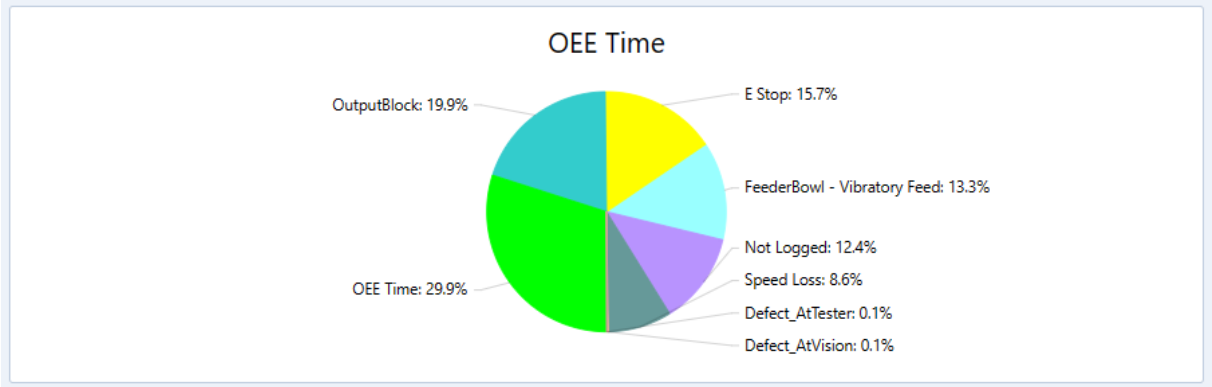


Fig. ProvideamApps OnePageDashboard, OEE Pie View panel.

It updates every 10 seconds.

10.2.5 Top 5 Losses Panel

The **Top 5 Losses Panel** displays a series of KPIs.

Events	Target Time	Actual	Variance Time	Adherence	Num Events
OutputBlock	00:00:00	00:13:09	00:13:09	0.0%	10
E Stop	00:00:00	00:12:06	00:12:06	0.0%	9
FeederBowl - Vibratory Feed	00:00:00	00:08:16	00:08:16	0.0%	6
Not Logged	00:00:00	00:07:33	00:07:33	0.0%	6
Speed Loss	00:00:00	00:04:13	00:00:00	0.0%	0

Fig. ProvideamApps OnePageDashboard, Top 5 Losses panel.

The  icon button opens the Machine Settings window. This window allows us to modify the KPIs displayed in this Panel. (Note: The  icon button is only visible to Administrators).

Machine Settings

- The KPIs displayed are: *Target Time*; *Actual Time*; *Variance Time*; *Adherence*; *Num Events*; *% Loss Time*.
- Click the  toggle switches of the KPIs we want to display.
- The *Adherence target* section allows us to set an adherence target value.
- We can set a colour for the *Adherence below target* and the *Adherence above target*.
- Click the  icon button or the **Close** button to close the window without saving the changes.
- Clicking the **Save** button saves the changes.
- We can choose the KPIs we wish to display.
- The *Variance Time* is the *Target Time* minus the *Actual Time*, and the *Adherence* is the *Actual Time* divided by the *Target Time*.

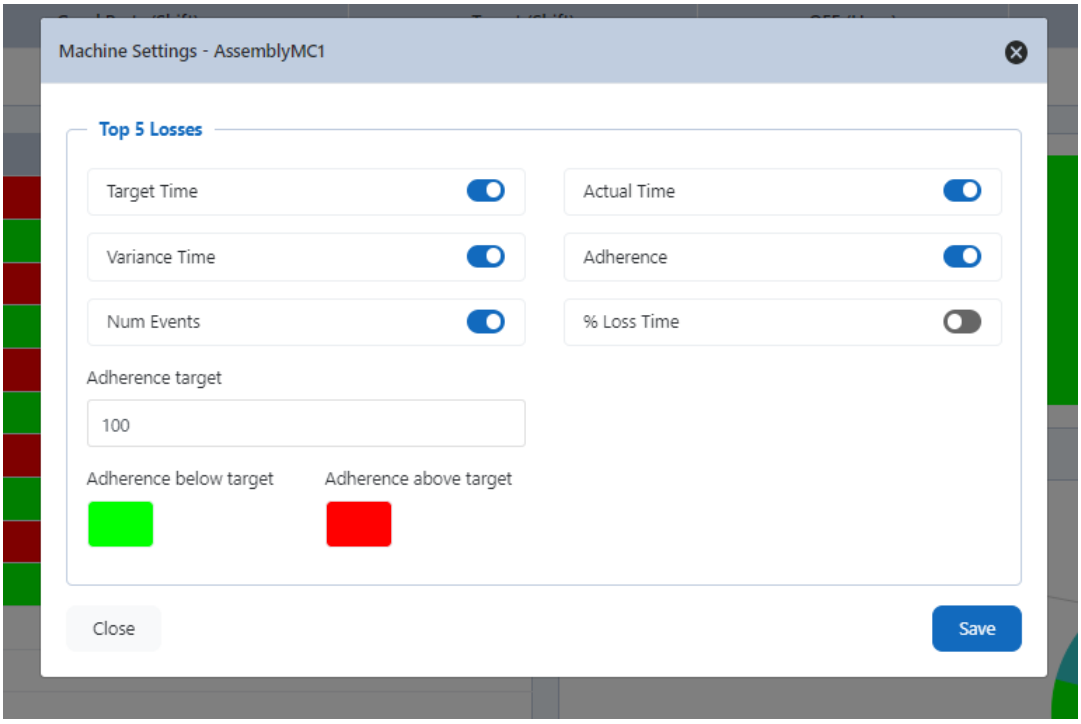


Fig. ProvideamApps OnePageDashboard, Top 5 Losses panel Machine Settings window.

10.3 RealtimeIF

The RealtimeIF is designed to allow operators to add or edit recent production data manually and displays the current production data for the selected Machine.

The RealtimeIF has 5 panels. These panels highlight different aspects of live production performance:

- Mode data.
- Yield data.
- Lot data.
- Shift Details data.
- Command Entry.

In the following pages we will describe these sections in detail.

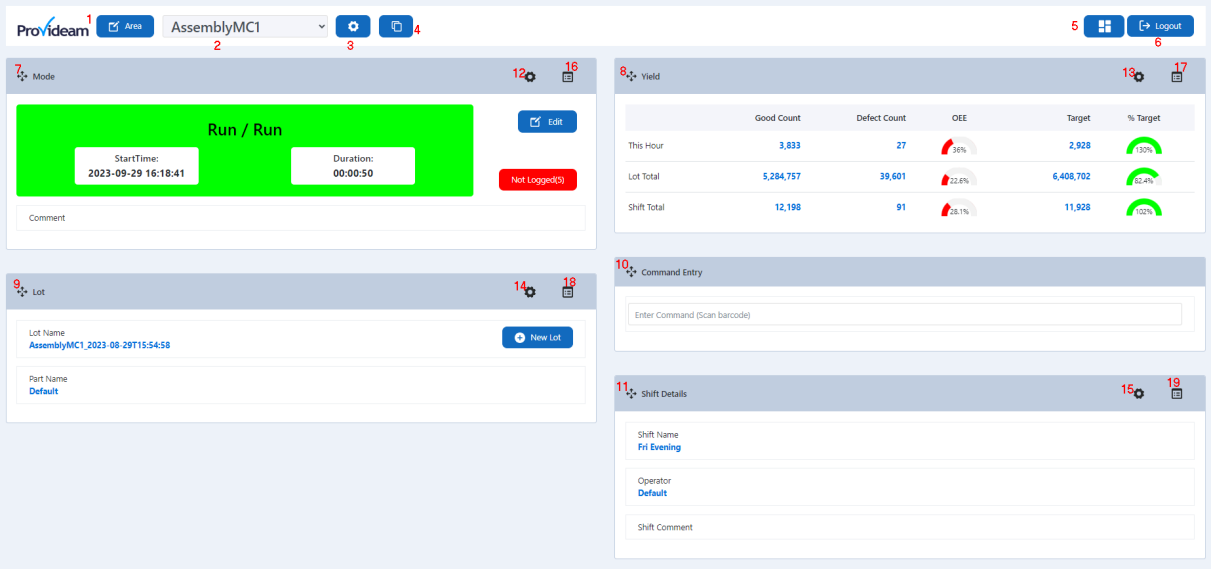


Fig. ProvideamApps RealtimeIF.

The buttons on the dashboard are:

- The **Area** button box allows you to select an Area (1).
- The **Machine** selection box allows you to select a Machine, from the selected Area (2).
- The  icon button opens the Machine Settings window. This window allows us to enable or disable the sections in the dashboard (3).
- The  icon button opens the CopySettingsTo window. This window allows us to copy dashboard settings from one Machine to another (4).
- **Homepage** button (5).
- **Logout** button (6).
- The  icon button allows us to drag and drop each Panel in a different position (7, 8, 9, 10, 11).
- The  icon button on the top-right-hand corner of each panel opens the Settings window for each panel (12, 13, 14, 15).
- The  icon button allows us to compare the previous details with the current details. The possibility to edit the details (by clicking on the  icon button of the detail row) depends on whether or not the Edit setting in the Settings window of a panel has been enabled (16, 17, 18, 19).

Machine Settings

Through the  icon button we can:

- Enable or disable the RealtimeIF for a Machine.
- Enable or disable panels.
- Set mode colours.
- Set Machine targets.

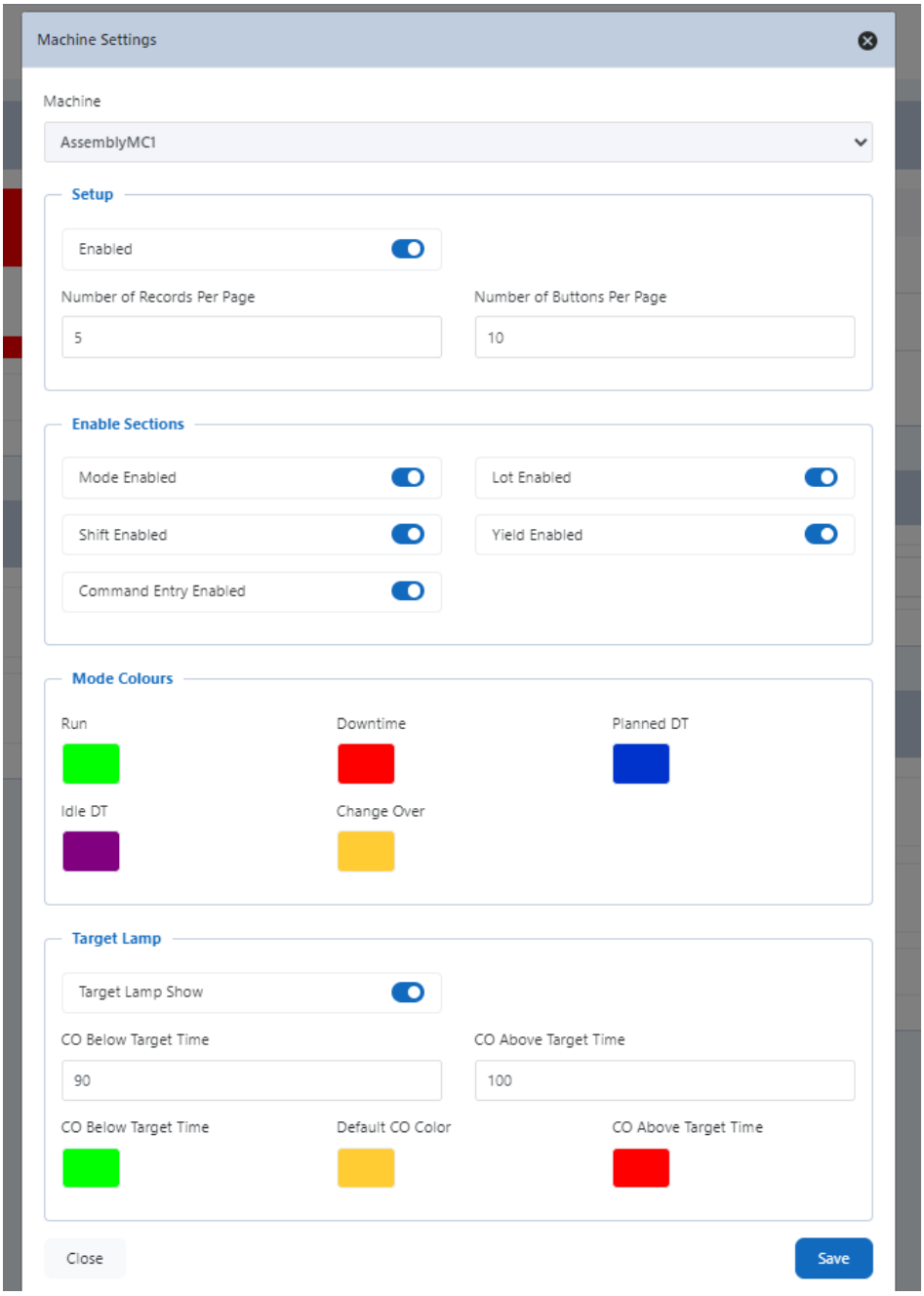


Fig. ProvideamApps RealtimeIF, Configuration window.

Machine Settings window - Machine and Setup section

We can switch off the RealtimeIF for a Machine by clicking on the Machine drop-down menu button, selecting the Machine we want to turn off, and clicking the toggle switch in the Setup section.

The *Number of Records Per Page* and the *Number of Buttons Per Page* options allow us to set the values.

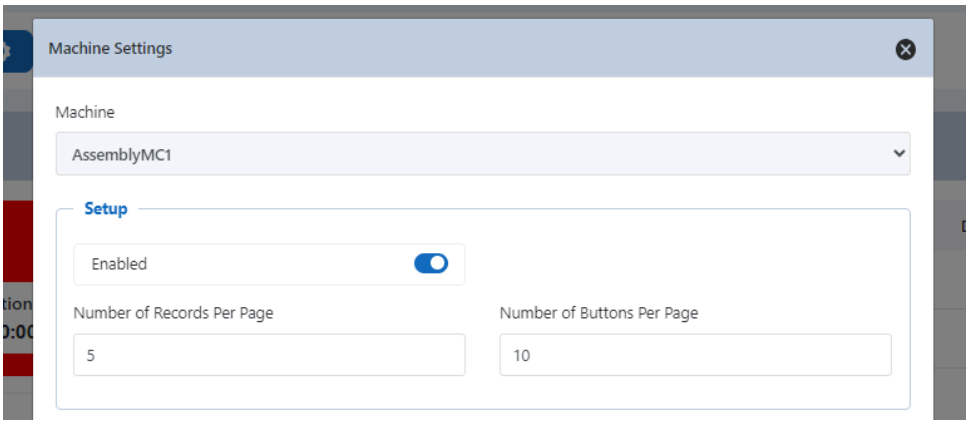


Fig. ProvideamApps RealtimeIF, Machine Menu and Setup section of Machine Settings window.

Machine Settings window - Enable Sections section

We can choose the panels we want to display by clicking the toggle switch of each panel.

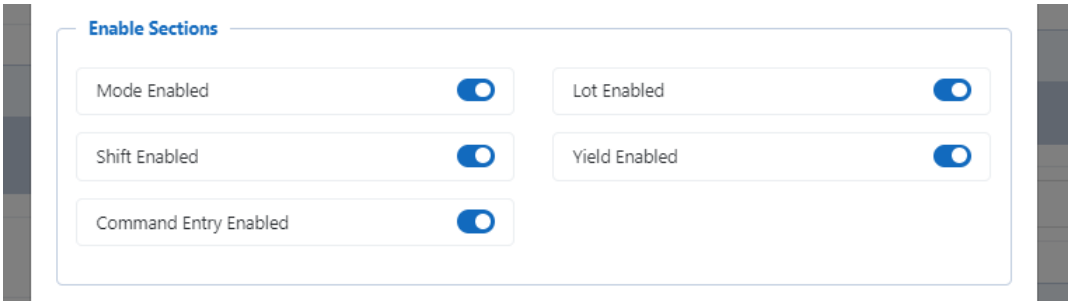


Fig. ProvideamApps RealtimeIF, KPI Enable Switches Section of Machine Settings window.

Machine Settings window - Mode Colours section

The mode colours for the Mode Panel can be set. Each mode has a default colour but we can choose the colours for each mode.

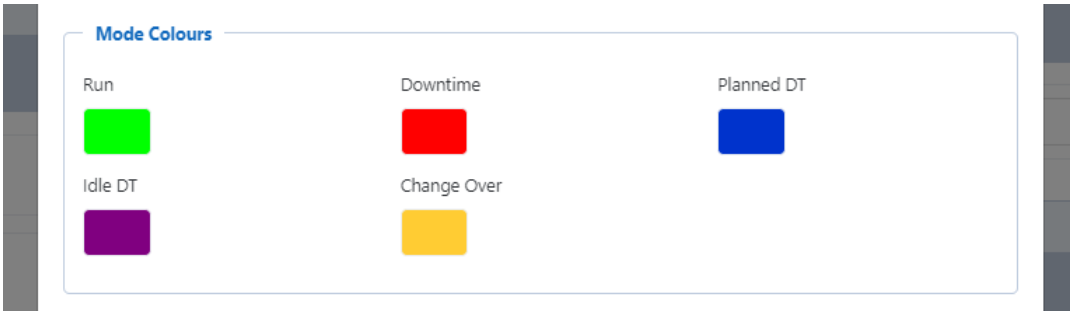


Fig. ProvideamApps RealtimeIF, Mode Colours section of Machine Settings window.

Machine Settings window - Target Lamp section

Here we can choose whether or not to see the Target Lamp by clicking the *Target Lamp Show* .

We can set a value for when the ChangeOver will be below target time (*CO Below Target Time*) and above target time (*CO Above Target Time*). Setting these values to 0% disables these features.

We can also set the colours for the *CO Below Target Time*, *Default CO Colour* and *CO Above Target Time*.

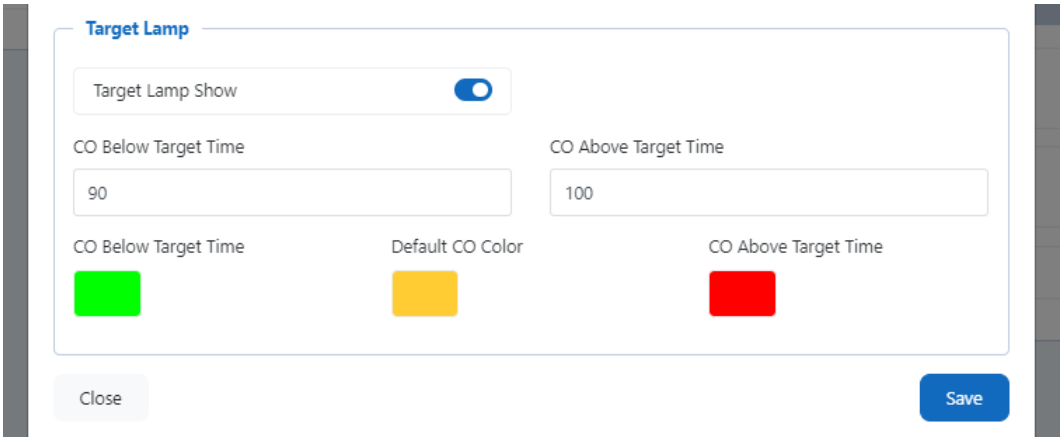


Fig. ProvideamApps RealtimeIF, Target Lamp section of Machine Settings window.

Copy Settings To

Clicking the icon button opens the CopySettingsTo window. Through this function we select which Machine(s) to copy the set dashboard configurations to.

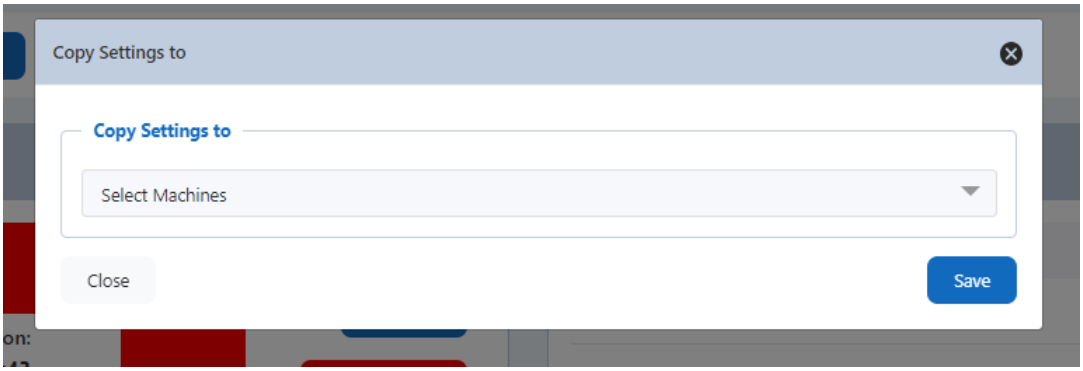


Fig. ProvideamApps OnePageDashboard, CopySettingsTo window.

Click on the *Select Machines* drop down box button and select the target Machine(s).

Click the **Save** button to save the changes. Click the icon button or the **Close** button to close the window without saving the changes.

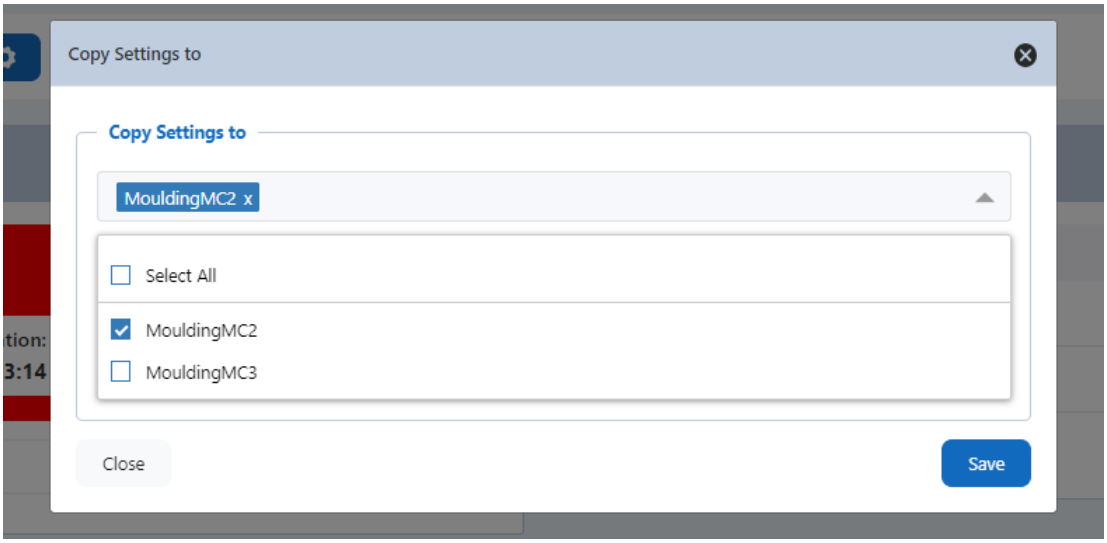


Fig. ProvideamApps OnePageDashboard, CopySettingsTo Machine Selection.

10.3.1 Mode Panel

The **Mode Panel** displays the current Mode description, the Mode *StatrTime* and the Mode *Duration*.

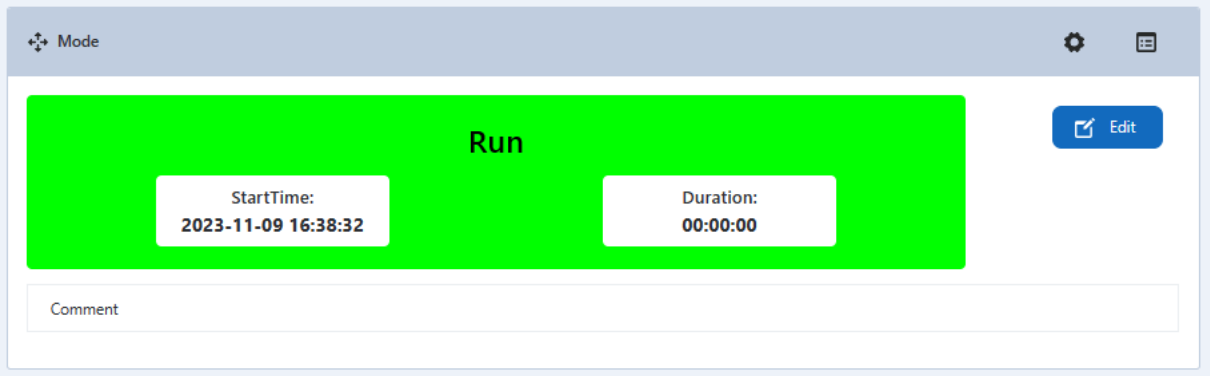


Fig. ProvideamApps RealtimeIF, Mode panel.

The icon button opens the Mode Settings window. This window allows us to enable the values and the commands we want to display in the Mode Panel. (Note: The icon button is only visible to Administrators).

The icon button opens the Details window.

Mode Settings

- We can click the *Mode Edit* so to edit the Mode values. If this function is disabled the Mode values can be seen but not edited.
- Click the *StartTime* and *Duration* toggle switches to see these values in the panel.
- The *Mode Select* drop-down menu button allows us to choose between a two-stage selection of Mode group and Mode descriptions (BY_GROUP_AND_DESC) or a single-stage selection of Mode description only (BY_DESC_ONLY).
- Through the *Minimum NotLogged value (in seconds)* section we can set the minimum not logged value. After setting this value, if there is any not logged downtime event longer than the value we have set, we will be prompted to enter a meaningful reason for it. Setting the value to 0 disables this feature. If there are any not logged events we can click the button for a list of them and drill down to assign a reason to any of them.
- The *Limit NotLogged to Current Shift* value limits the not logged alerts above two events that occurred in the current Shift.
- The *Comment* enables the system to accept operator mode comments.

- The *New Mode Button* causes a button to appear on the dashboard to create a new mode.
- The *Split* allows us to split Mode Details.

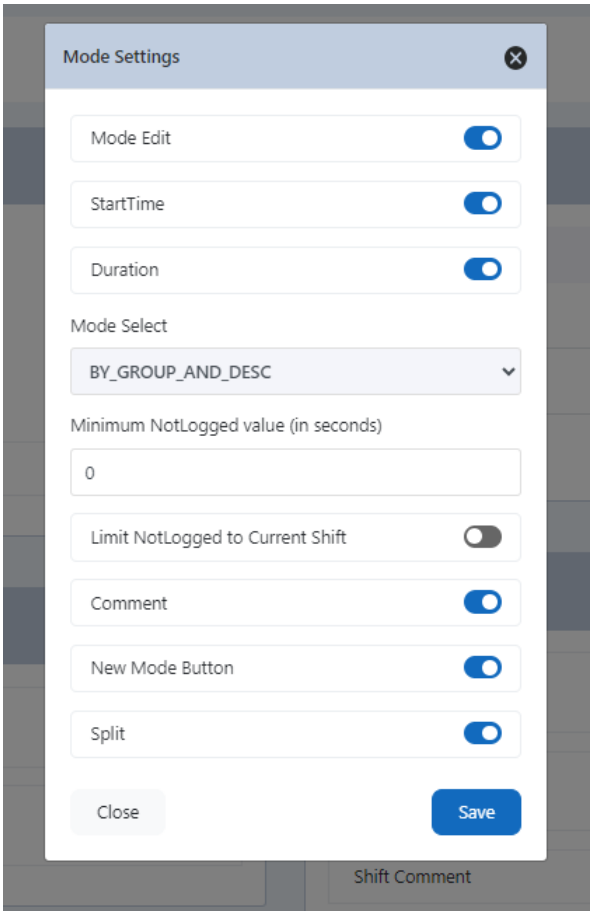


Fig. ProvideamApps RealtimeIF, Mode Settings window.

Details window

- The icon button opens a list of the current and previous Mode Details.
- Based on the commands we enabled in the Mode Settings window, we can see different options in the Details window.
- The *New* button allows us to see a new Mode Detail.
- Click the icon button to edit a Mode Detail.
- Click the *Split* button to split a Mode Detail.

- If the mode selection is two stage, we will select the Mode group first followed by the Mode description. Click on the **Mode Description** button to select the Mode, or click the **Close** button to return to the previous page without selecting the mode.

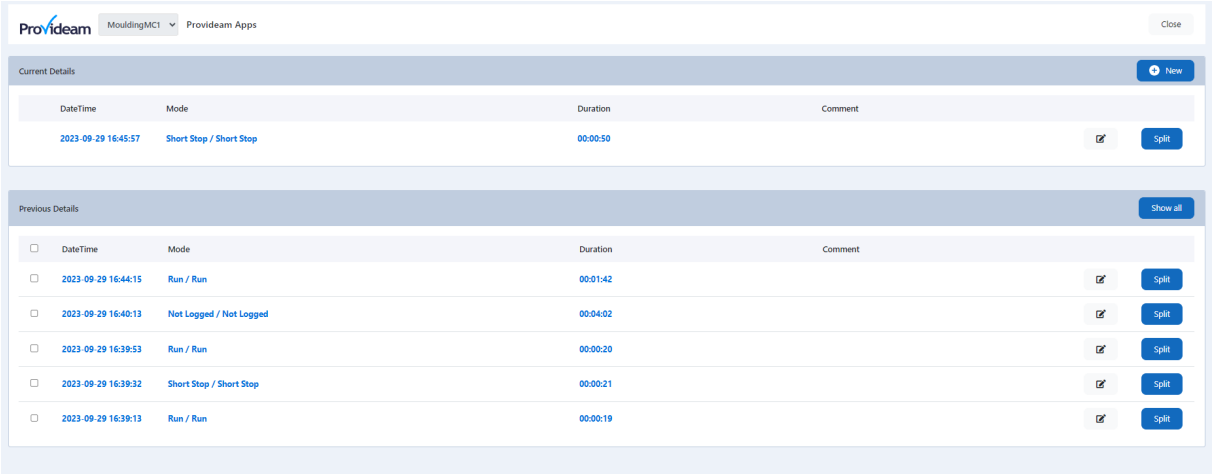


Fig. ProvideamApps RealtimeIF, Mode panel Details window.

Edit Mode Details

- Clicking the  icon button opens this window where we are prompted to write a comment.
- Click the **Modify** button to save the modified Mode.
- Click the **Close** button to go back to the Details Window without saving the changes.

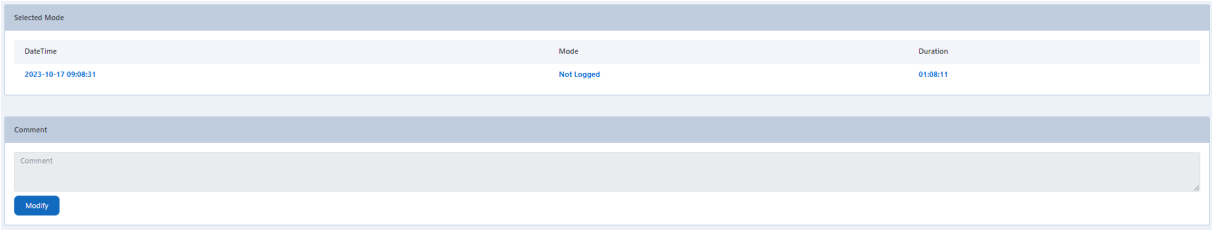


Fig. ProvideamApps RealtimeIF, Modifying a Mode Detail.

Split Mode Details

- Clicking the *Split* button of a Mode opens this window.

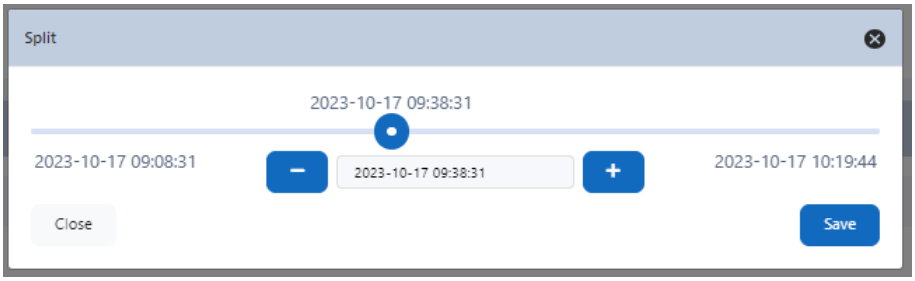


Fig. ProvideamApps RealtimeIF, splitting a Mode Detail.

- We can choose where to split the Mode by dragging the cursor forward and back, or through the  icon button and the  icon button (but they will only move the Mode forward and back one second at a time).
- Click the **Save** button to save the split Mode. It will appear like in the picture below:

Fig. ProvideamApps RealtimeIF, the Mode Detail after having been split.

- Click the **Close** button to go back to the Details Window without saving the changes.

10.3.2 Yield Panel

The **Yield Panel** displays the *Good Count*, *Defect Count*, *OEE, Target* and *% Target* for the Shift.

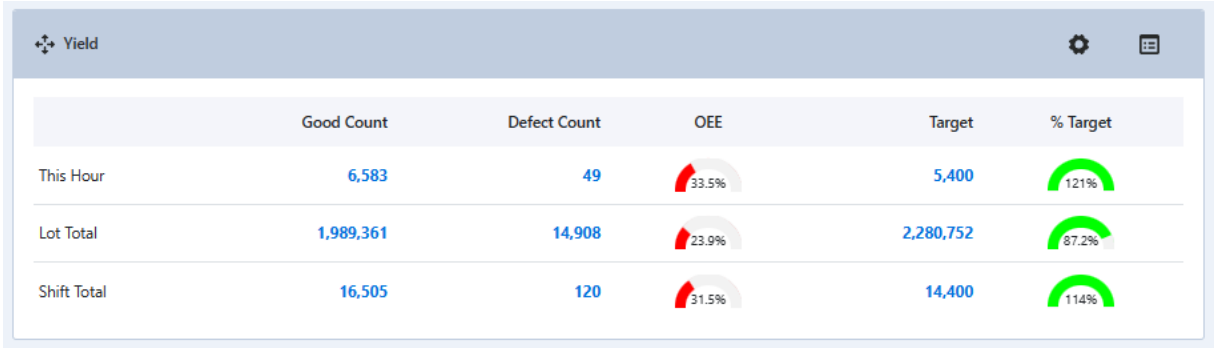


Fig. ProvideamApps RealtimeIF, Yield panel.

The  icon button opens the Yield Settings window. This window allows us to enable the values and the commands we want to display in the Yield Panel. (Note: The  icon button is only visible to Administrators).

The  icon button opens the Details Window.

Yield Settings

- Through the  icon button we can enable actions, KPIs and specific settings for the Yield Panel.

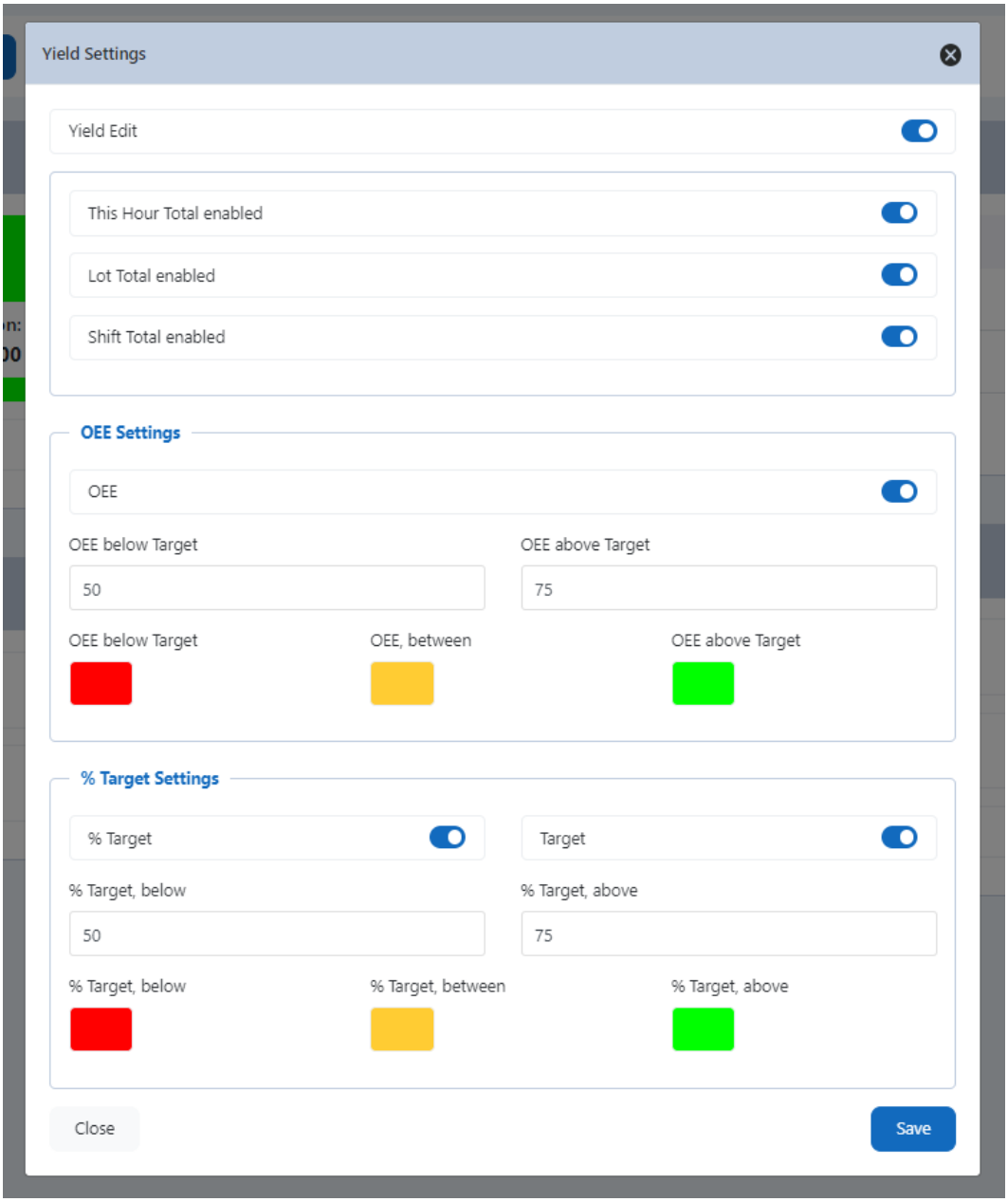


Fig. ProvideamApps RealtimeIF, Yield Settings window.

Yield Settings window details - Enable section

- In the Yield Settigns window we can decide whether or not to edit yield values by clicking the *Yield Edit* .
- We can decide which KPIs to display by clicking the toggle switches *This Hour Total enabled*, *Lot Total enabled* and *Shift Total enabled*.

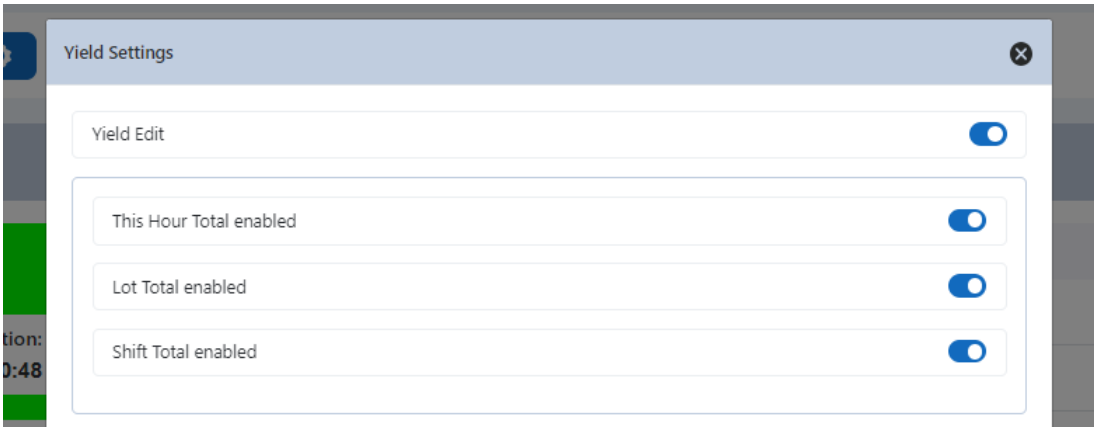


Fig. ProvideamApps RealtimeIF, KPI enable switches section - Yield Settings window.

Yield Settings window details- OEE Settings

- In this section we can decide whether or not to show the OEE by clicking the toggle switch.
- We can set an *OEE below Target* and an *OEE above Target* value.
- We can decide which colour to set for the *OEE below Target*, *OEE, between* and *OEE above Target*.

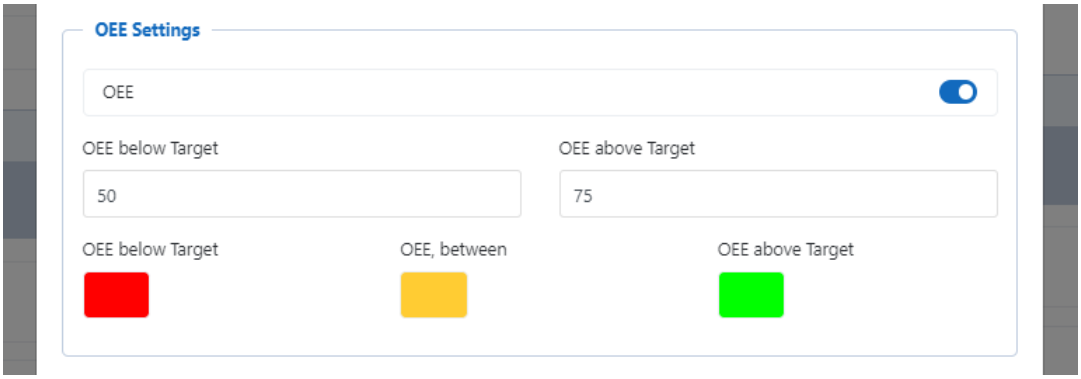


Fig. ProvideamApps RealtimeIF, OEE Settings section - Yield Settings window.

Yield Settings window details - % Target Settings

- It allow us to decide whether or not to enable the *% Target* and *Target* option by clicking the toggle switch.
- We can set a value for the *% Target, below* and *% Target, above.*

- We can set a colour for *% Target, below*, *% Target, between* and *% Target, above.*

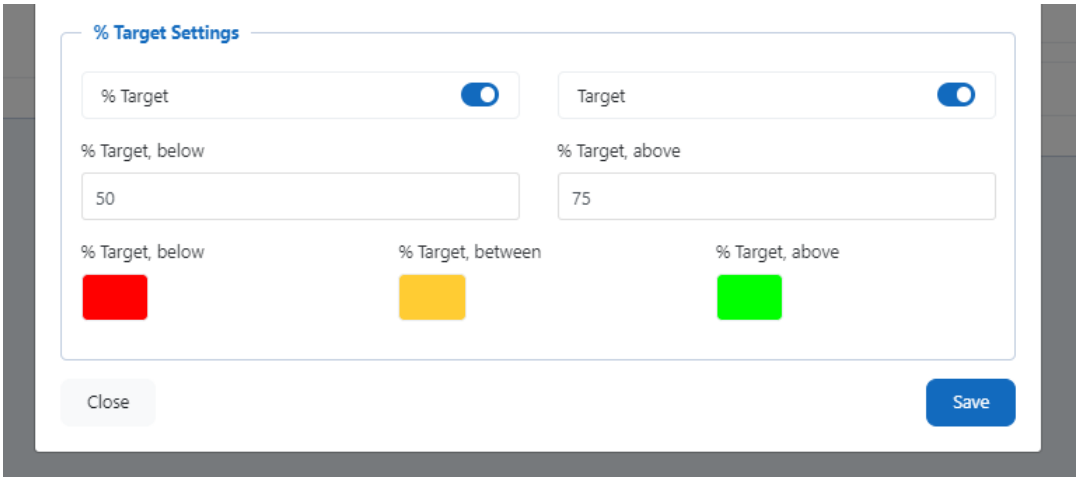


Fig. ProvideamApps RealtimeIF, % Target Settings section - Yield Settings window.

Details

- The icon button opens a list of the current and previous Mode Details.
- We can edit the Details by clicking the icon button of the Detail we want to edit.

Fig.ProvideamApps RealtimeIF, Yield panel Details window.

Edit Yield Details

- If we click the icon button, a window opens where we can edit the *Good Counts*, *Defect_AtVision* and *Defect_AtTester* values by typing different values than the ones appearing.
- Click the **Save** button to save the edited values.
- Click the **Close** button to go back to the Details window without saving the changes.

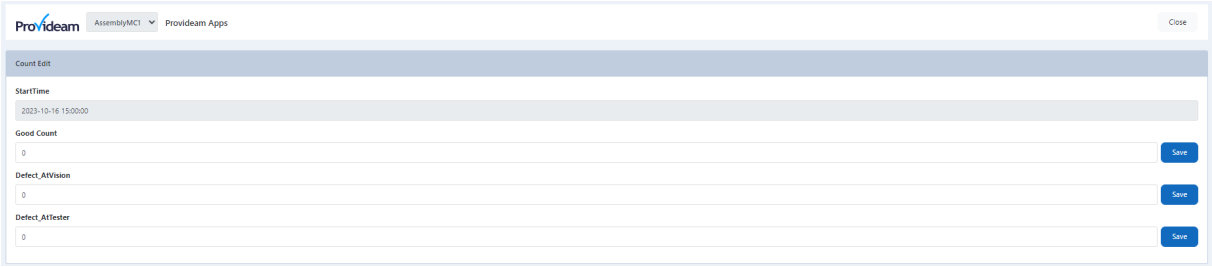


Fig. ProvideamApps RealtimeIF, editing a Yield Detail.

10.3.3 Lot Panel

The **Lot Panel** displays the Lot values and indicators.

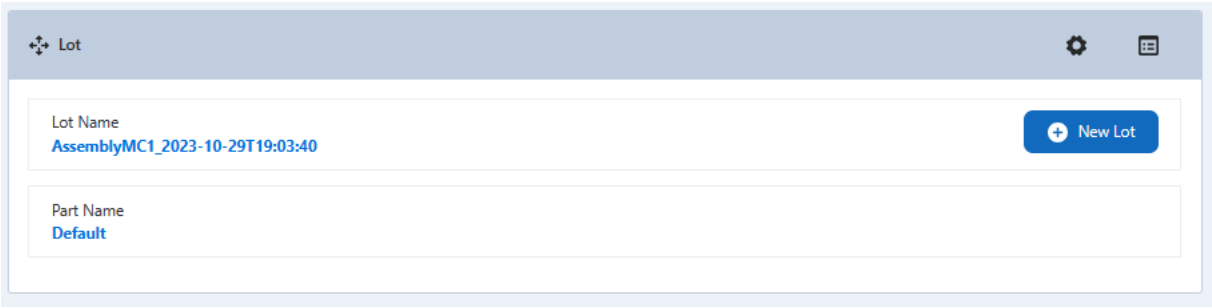


Fig. ProvideamApps RealtimeIF, Lot panel.

The icon button opens the Lot Settings window, where we are presented with a series of functions we can enable or disable. (Note: The icon button is only visible to Administrators).

The icon button opens the Details window.

Lot Settings

- In the Lot Settings window we can decide whether or not to edit lot values by clicking the *Lot Edit* toggle switch.

- By clicking the *NewLot Btn* toggle switch, a button is created on the panel through which we can initiate a new Lot.
- Similarly we can click the *NewBatch Btn* toggle switch, which creates a button on the panel through which we can initiate a new Batch.
- There are also several options we can enable to view other values and metrics. We can edit all the values and metrics we enable, if their editing counterpart has been enabled.
- Click on the **ShowFlexFields** button to see a series of FlexFields we can enable.

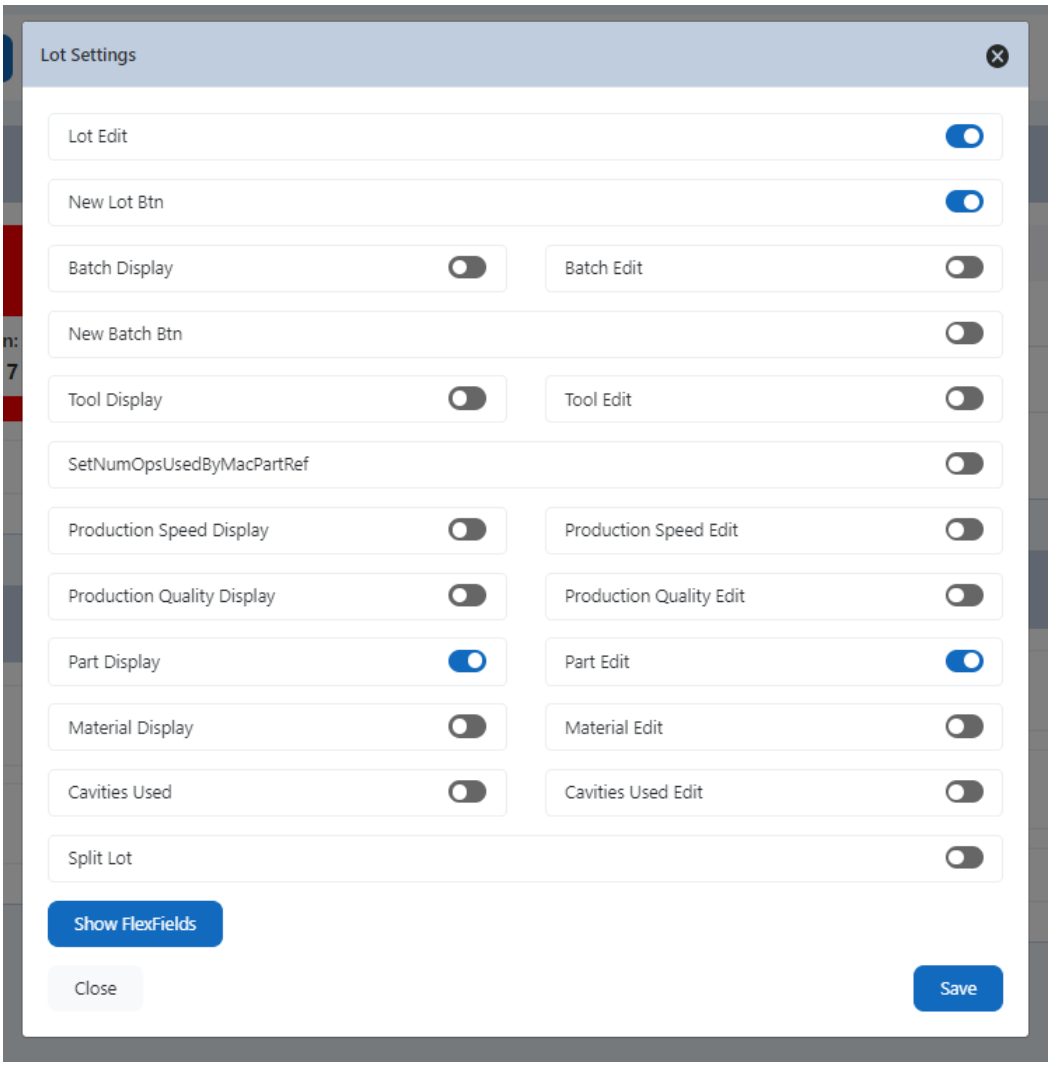


Fig. ProvideamApps RealtimeIF, Lot Settings window.

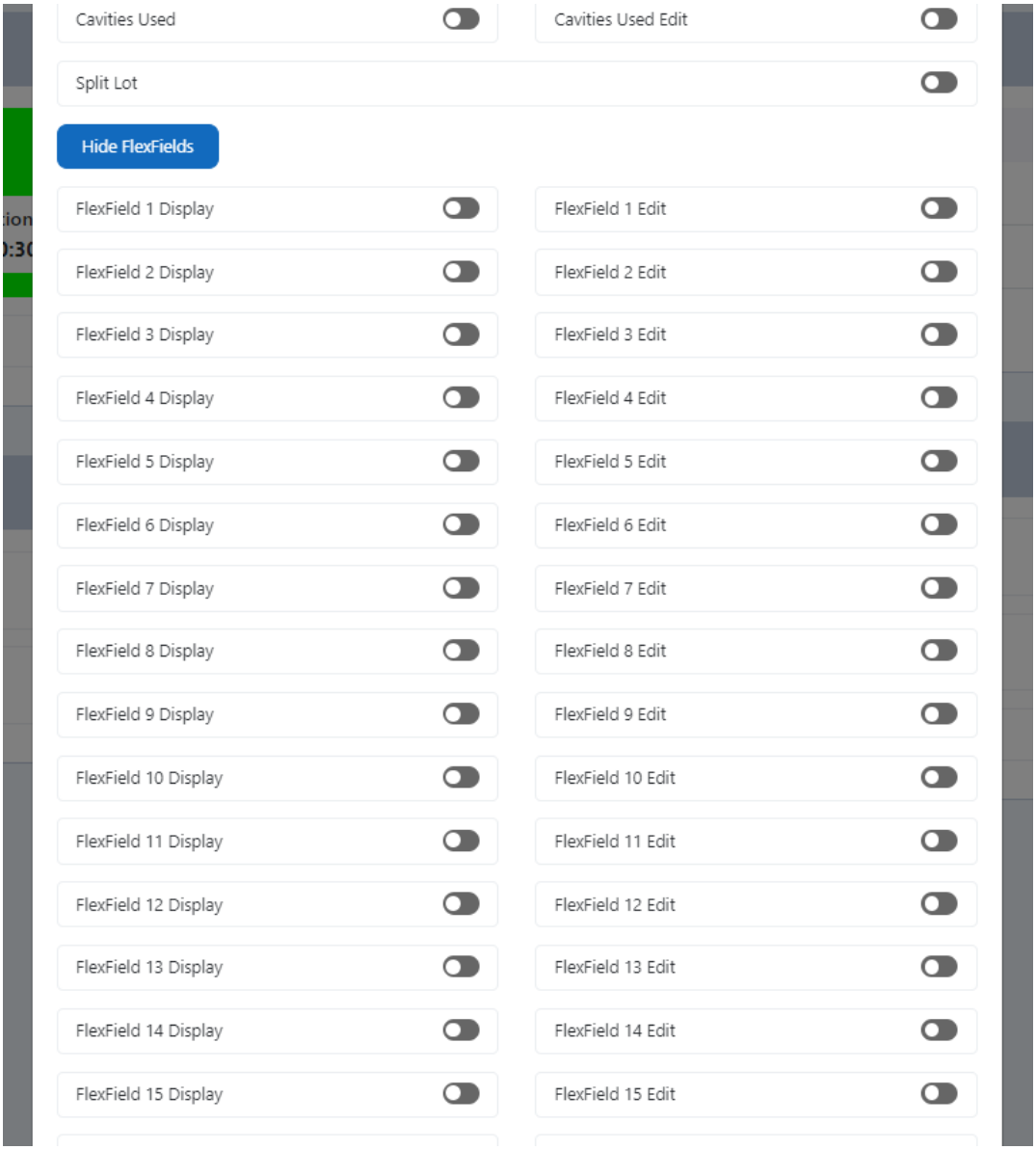


Fig. ProvideamApps RealtimeIF, Lot Settings window with the ShowFlexFields button clicked.

Details window

- The icon button opens a list of the current and previous Details for the Lot Panel.
- We can edit the Details by clicking the icon button of the Detail we want to edit.

Fig. ProvideamApps RealtimeIF, Lot panel Detail window.

Edit Lot Details

- We can edit a Lot Detail by editing the values which have been enabled in the Configuration Window.
- Click the **Save** button to save the edited Lot Detail.
- Click the **Close** button to go back to the Details Window without saving the changes.

Fig. ProvideamApps RealtimeIF, editing a Lot Detail.

10.3.4 Shift Details Panel

The **Shift Details Panel** displays the *Shift Name*.

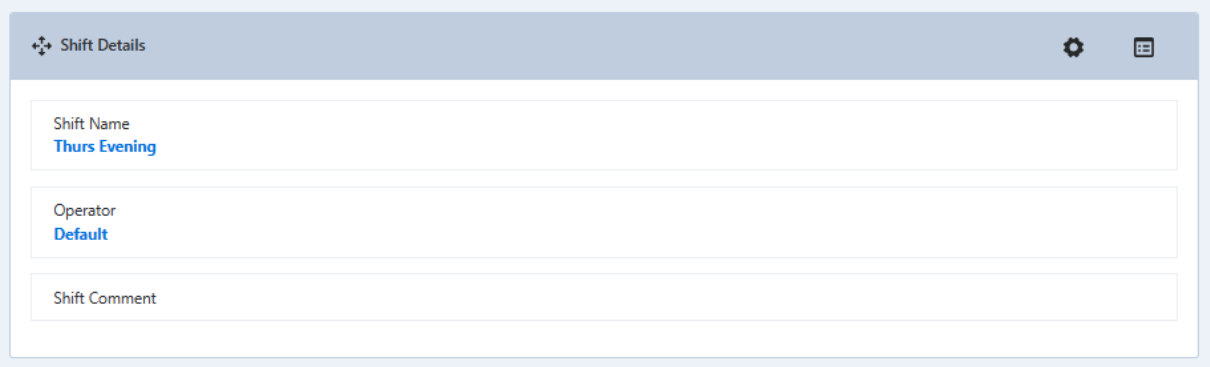


Fig. ProvideamApps RealtimeIF, Shift Details panel.

It can display other values but those values have to be enabled.

The ⚙ icon button opens the Shift Settings window. This window allows us to enable the values and the commands we want to display in the Shift Details Panel. (Note: The ⚙ icon button is only visible to Administrators).

The ☰ icon button opens the Details window.

Shift Settings

- We can click the toggle switches of the values *Operator Display*, *Operator Used Display*, *Operator Edit*, *Operator Used Edit* and *Shift Comment* to enable them.

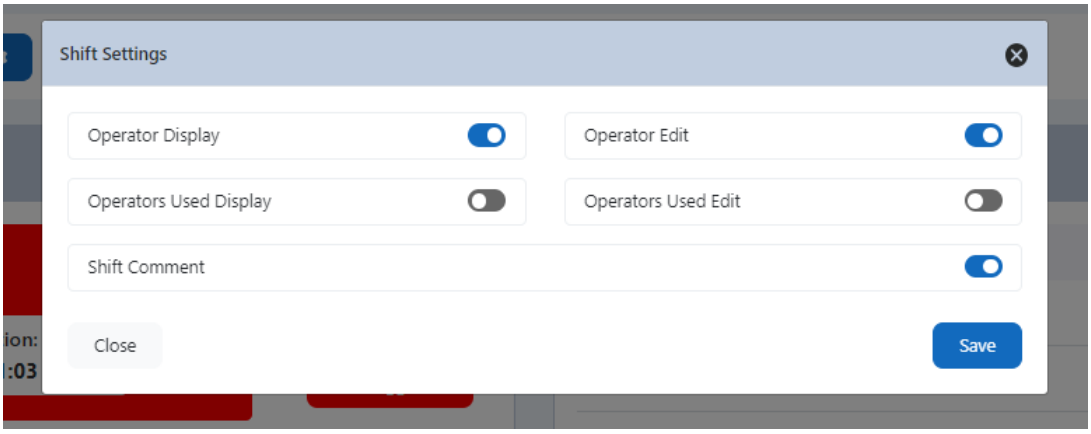


Fig. ProvideamApps RealtimeIF, Shift Details Settings window.

Details window

- By clicking on the  icon button we can edit a Detail.

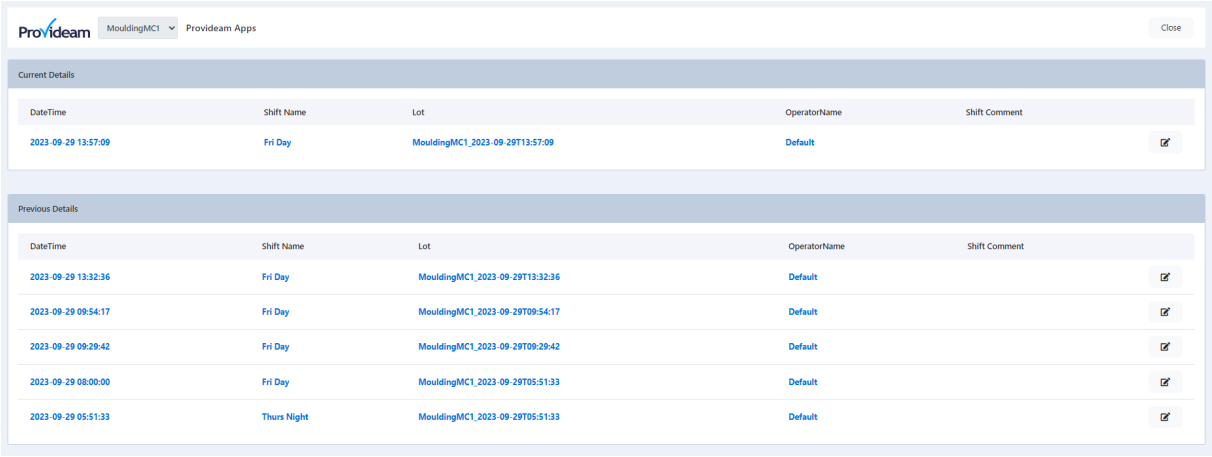


Fig. ProvideamApps RealtimeIF, Shift Details details window.

Edit Shift Detail Details

- The values we can enable in the Configuration Window and that we can edit in the Details Window are: *Operator Edit*; *Operators Used Edit*; *Shift Comment*.

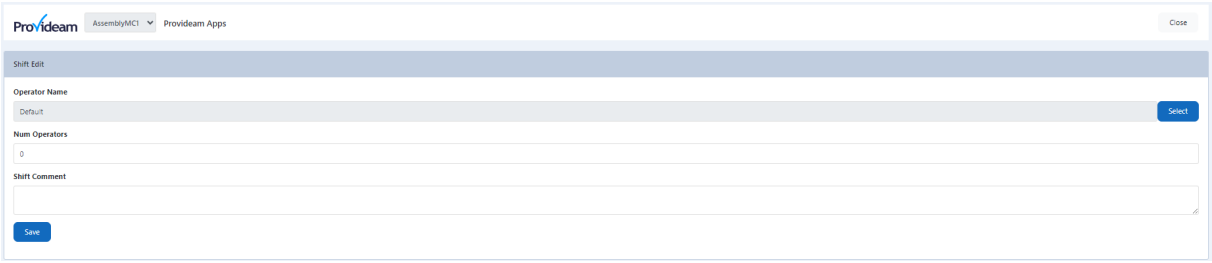


Fig. ProvideamApps RealtimeIF, editing a Shift detail.

10.3.5 Command Entry Panel

The **Command Entry Panel** supports the following commands:

Command	Description	Example
SetModelID=***parameter***	Set the current ModelID to the validated parameter value. The ***parameter*** must be an integer ModelID which has been configured for the selected Machine.	SetModelID=1

SetNewModeID=***parameter***	Set the new ModeID to the validated parameter value. The ***parameter*** must be an integer ModeID which has been configured for the selected Machine.	SetNewModeID=1
SetPartID=***parameter***	Set the current PartID to the validated parameter value. The ***parameter*** must be an integer PartID which has been configured for the selected Machine.	SetPartID=1
SetPartName=***parameter***	Set the current PartName to the validated parameter value. The ***parameter*** must be a string PartName which has been configured for the selected Machin	SetPartName=MyWidg et
SetMacPartRef=***parameter***	Set the current MacPartRef to the validated parameter value. The ***parameter*** must be a string MacPartRef which has been configured for the selected Machine and selected Part.	SetMacPartRef=MyMa cPartRef
SetPartIDAndMacPartRef=***parameter1 ,parameter2***	Set the current PartID to the validated parameter value1, and set the current MacPartRef to the validated parameter value2. The parameters will be in a comma separated list. The ***parameter1*** value must be an integer PartID which has been configured for the selected Machine, and the ***parameter2*** value must be a string MacPartRef which has been configured for the selected Machine and Part.	SetPartIDAndMacPart Ref=1,MyMacPartRef
SetPartNameAndMacPartRef=***parameter1 ,parameter2***	Set the current PartName to the validated parameter value1, and set the current MacPartRef to the validated parameter value2. The parameters will be in a	SetPartNameAndMacP artRef=MyWidget,MyM acPartRef

	comma separated list. The ***parameter1*** value must be a string PartName which has been configured for the selected Machine, and the ***parameter2*** value must be a string MacPartRef which has been configured for the selected Machine and Part.	
SetToolID=***parameter***	Set the current ToolID to the validated parameter value. The ***parameter*** must be an integer ToolID which has been configured for the selected Machine.	SetToolID=1
SetToolName=***parameter***	Set the current ToolName to the validated parameter value. The ***parameter*** must be a string ToolName which has been configured for the selected Machine.	SetToolName=MyTool
SetCavitiesUsed=***parameter***	Set the current CavitiesUsed to the validated parameter value. The ***parameter*** must be an integer value which is between 1 and the NumCavities for the selected Tool.	SetCavitesUsed=1
SetOperatorID=***parameter***	Set the current OperatorID to the validated parameter value. The ***parameter*** must be an integer OperatorID which has been configured for the selected Machine.	SetOperatorID=1
SetOperatorName=***parameter***	Set the current OperatorName to the validated parameter value. The ***parameter*** must be a string OperatorName which has been configured for the selected Machine.	SetOperatorName=My Operator
SetOperatorsUsed=***parameter***	Set the current OperatorsUsed to the validated parameter value. The ***parameter*** must be a	SetOperatorUsed=1.1

	decimal value and must use '.' for decimal point.	
SetChangeOverFlag=***parameter***	Set the current SetChangeOverFlag. The ***parameter*** must be an integer value 1.	SetChangeOverFlag=1
SetLotName=***parameter***	Set the current LotName to the validated parameter value. The ***parameter*** must be a string LotName.	SetLotName=MyLotName
SetMaterialName=***parameter***	Set the current MaterialName to the validated parameter value. The ***parameter*** must be a string MaterialName.	SetMaterialName=MyMaterialName
SetBatchName=***parameter***	Set the current BatchName to the validated parameter value. The ***parameter*** must be a string BatchName.	SetBatchName=MyBatchName
SetMacStationIDIncrement=***parameter1 ,parameter2***	Set the selected MacStation count value to be incremented by the value of ***parameter2***. The ***parameter1*** value must be an integer MacStationID, and the ***parameter2*** value must be a decimal value not less than 0 and not greater than 2,000,000	SetMacStationIDIncrement=1,5
SetMacStationIDCount=***parameter1 ,parameter2***	Set the selected MacStation count value to the value of ***parameter2***. The ***parameter1*** value must be an integer MacStationID, and the ***parameter2*** value must be a decimal value not less than 0 and not greater than 2,000,000	SetMacStationIDIncrement=1,5

In order to enter a command, type the command code in the Enter Command bar.

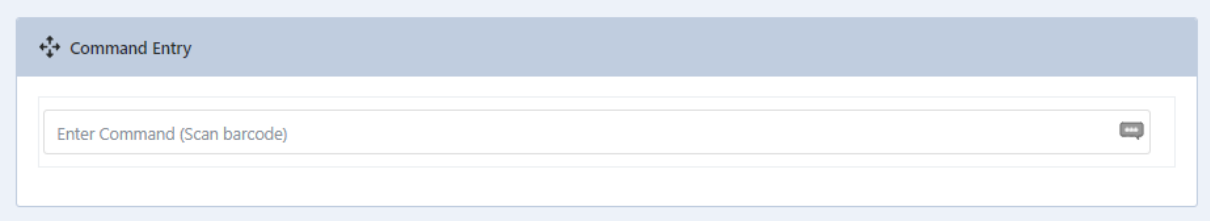


Fig. ProvideamApps RealtimeIF, Command Entry panel.

Note: The Command Entry filters out any characters other than alphanumeric characters and the symbols "= ,"

If your parameters contain symbols, these will be filtered out unless you use the escape character |. The filter is disabled following a | character, until the next | character.

For example, the command: SetLotName=|***parameter***| will allow symbols to be included in the parameter.

10.4 Plan Adherence

The Plan Adherence App is designed to allow us to plan our work, set targets and keep track of their progress.

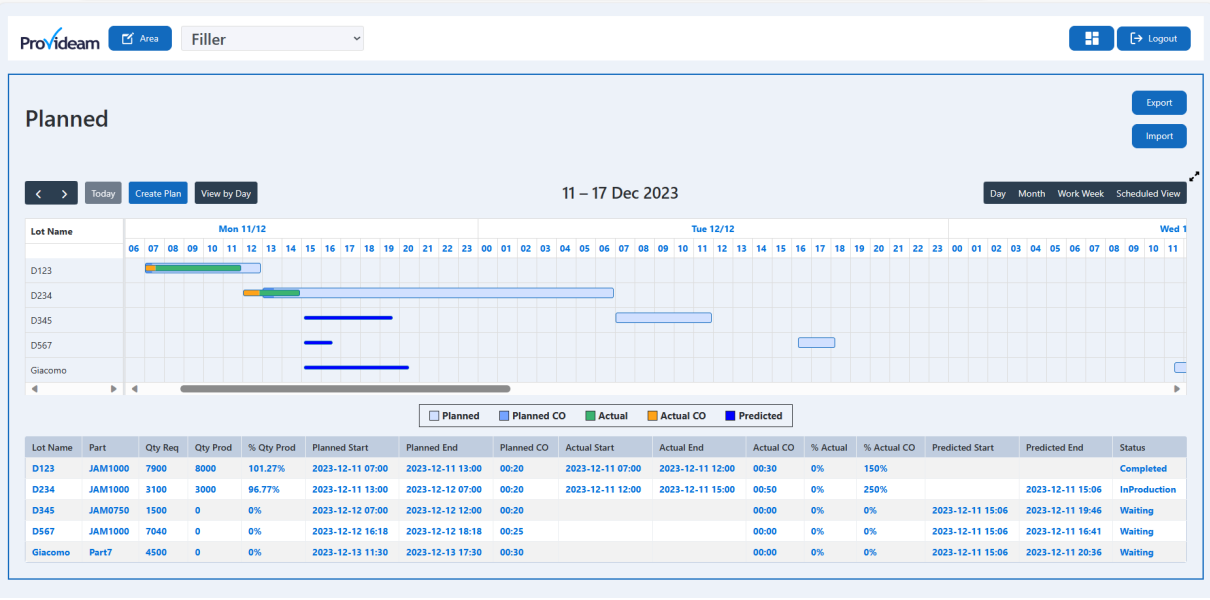


Fig. Plan Adherence, Scheduled View - View by Day with newly imported Production Plan.

In the Plan Adherence Schedule View we can compare the Production Plans we have set versus actual production data.

Note in the chart above how the Planned Production appears in light blue bars, and is overlaid with Actual Production in green. Also, periods of Planned Change Over in darker blue, are overlaid with Actual Change Over in orange.

10.4.1 Calendar View

The Plan Adherence Module allows us to create and manage plans.

Plans can be viewed and managed on the Calendar View - "Day", "Month" and "Work Week" pages.

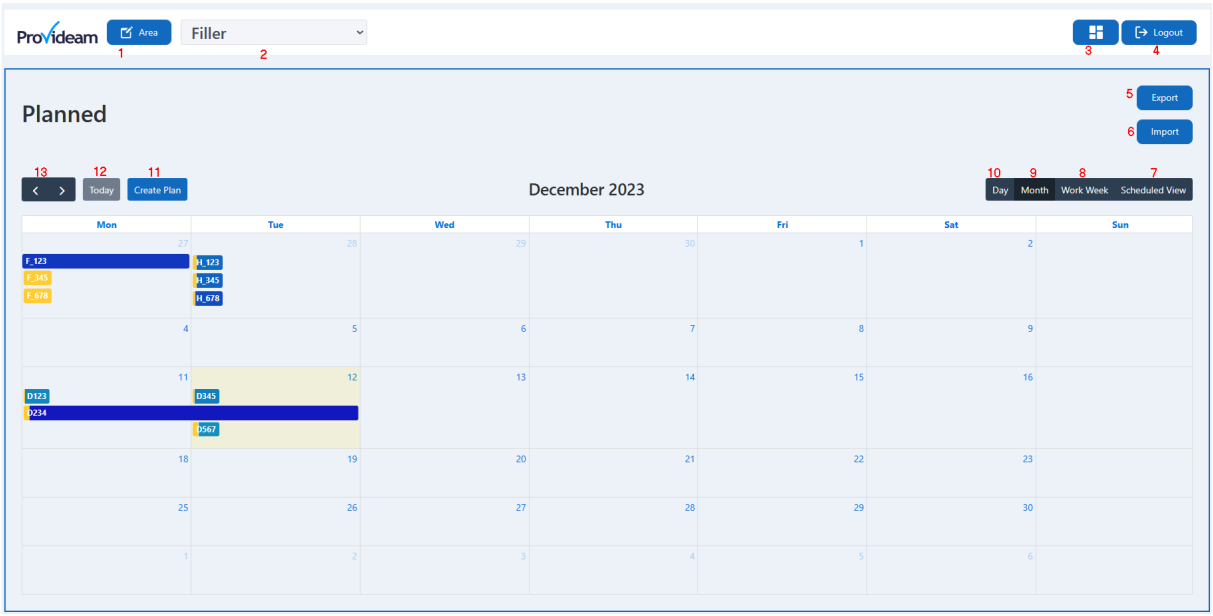


Fig. Plan Adherence, Month view.

In the header section of the page there is the:

- **Area** selection (1), which allows us to select any Area that has been configured in Provideam.
- The **Machine** selection box (2), which allows us to select a Machine from the selected Area.
- **Homepage** button (3), which takes us back to the ProvideamApps homepage.
- **Log-out** button (4), which logs us out of ProvideamApps.

Planned section

In the Planned section we can view the Production Plans. In this area there is the:

- **Export** button (5), which creates and downloads an Excel document of the current view in the Planned area.
- **Import** button (6), which allows us to import a file by either dragging and dropping it into the Import window or browsing it.
- **Scheduled View** button (7), which provides a detailed and up-to-date view of our Production Plans.
- **Work Week** button (8), which breaks down the view by workweek.
- **Month** button (9), which breaks down the view by month.
- **Day** button (10), which breaks down the view by day.
- **Create Plan** button (11), which allows us to create a new Production Plan.
- **Today** button (12), which allows us to go back to the current day.
- **Backwards and Forward arrows** buttons (13), which allow us to move backwards and forward in days, months and work weeks.

NB: in the Month and Work Week views, the current day appears in yellow.

10.4.2 Create Plan

There are three methods we can use to create a new Production Plan in the Plan Adherence:

1. Manual.
2. Through the **Import / Export Template** buttons.
3. With an API.

Manual

To create a new Production Plan manually, select the Area and Machine for which we want to create a new plan, and then click the **Create Plant** button.

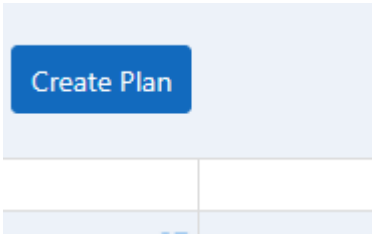


Fig. Plan Adherence, Create Plan button.

The following window will open.

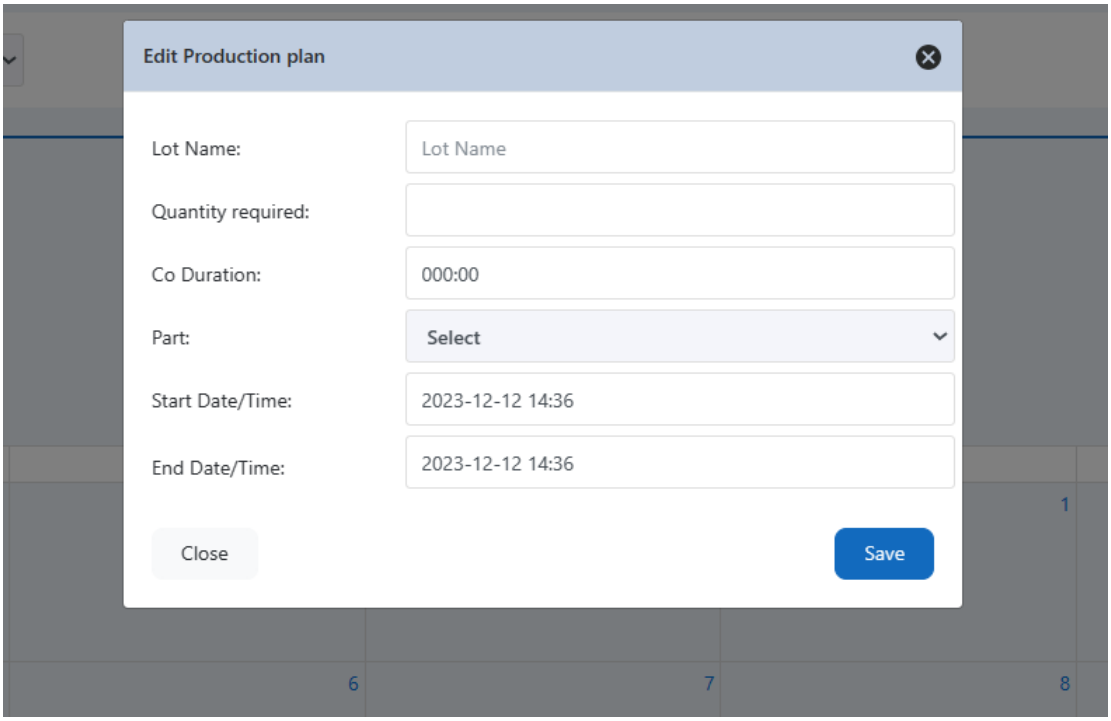


Fig. Plan Adherence, Create Plan window.

Here we can choose the name of the new Lot, type the quantity required, the duration of the Changeover, select the part (from those available in the Area and Machine selected), and the start and end date/time of the production plan.

If we are happy with our settings, we can click the **Save** button and the new Lot will appear.

If we do not wish to save the new Lot, we can click the **Close** button or the icon button to close the window.

Import / Export Template button

We can create a new Production Plan through these two buttons.

If we already have a Production Plan ready to be imported, simply click the **Import** button and drag and drop the file in the Import window, or browse it through the **Browse** button.

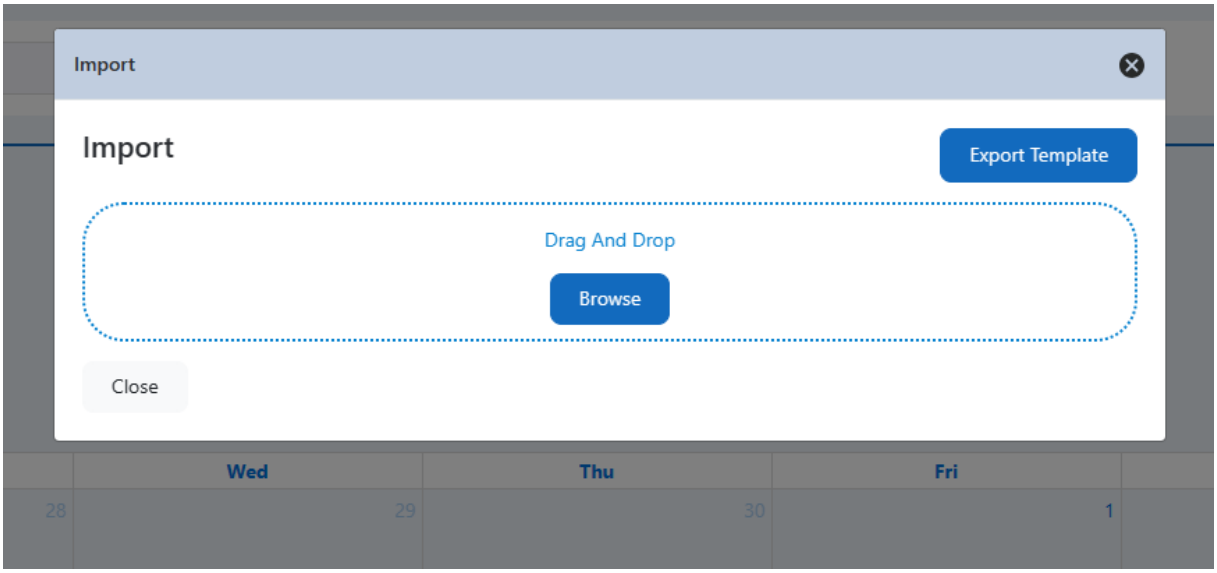


Fig. Plan Adherence, Import window.

If we do not already have a Production Plan to import, we can create one.

Click the **Export Template** button to download an Excel document with the base structure of a Production Plan.

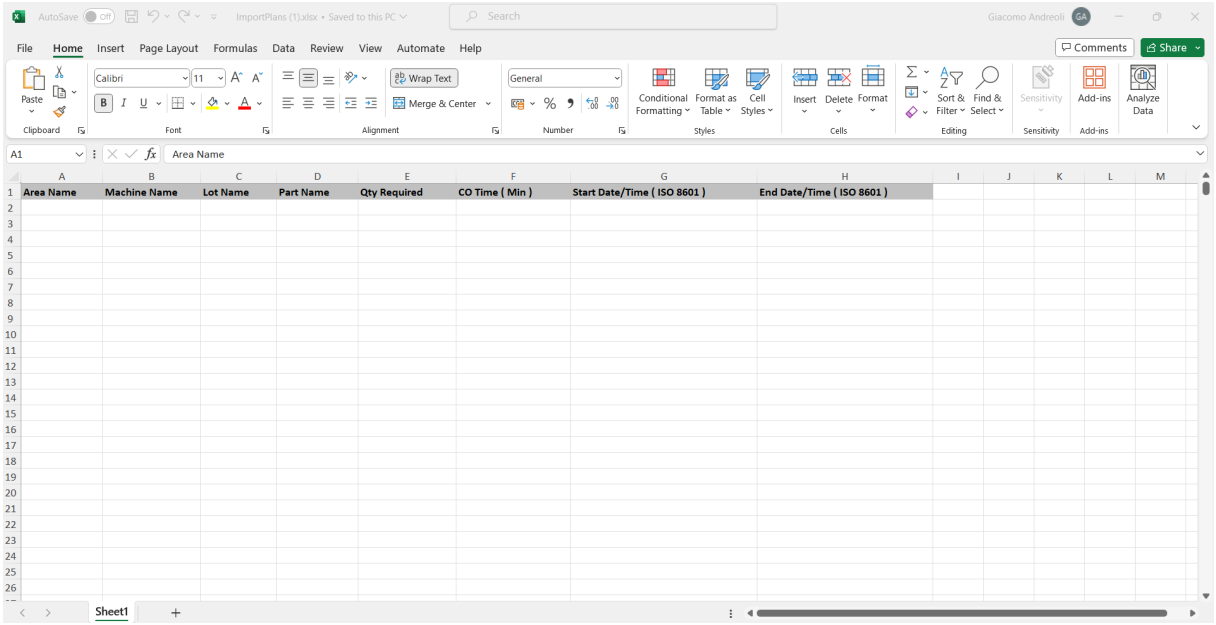


Fig. Plan Adherence, Production Plan Template blank.

Fill in the required parameters.

Now that we have created a new Production Plan, we can import it through the **Import** button.

Now that we have imported the new Production Plan, it will appear among our Plans.

NB: CO Time (Min), Start Date/Time (ISO 8601) and End Date/Time (ISO 8601) have to be written in Integer values or the App will not allow you to import the file).

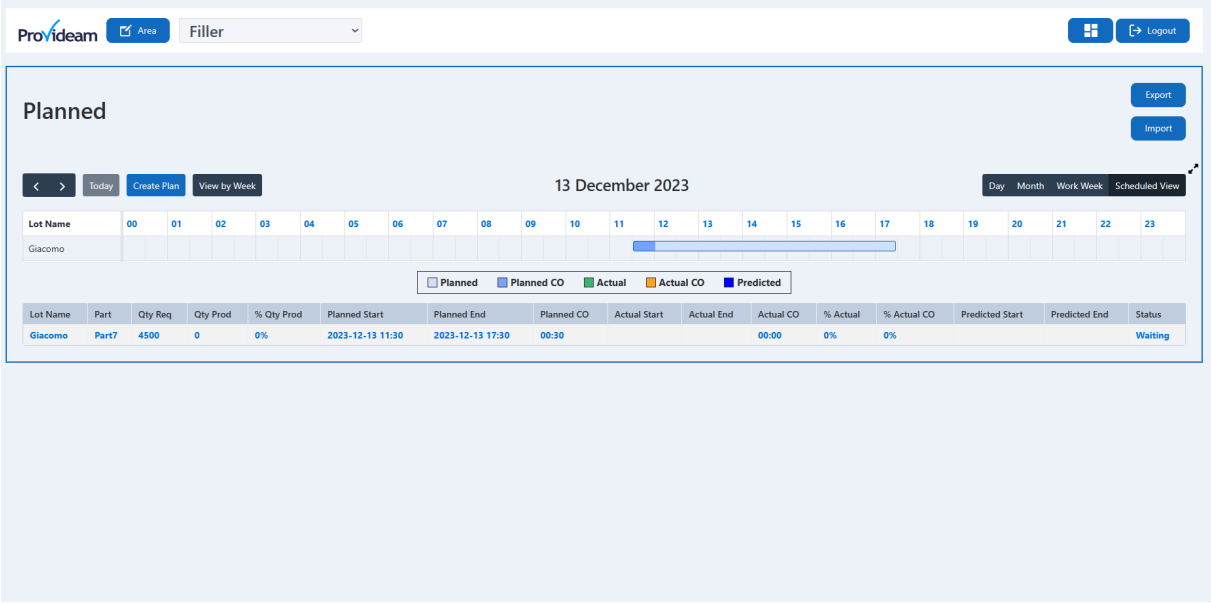


Fig. Plan Adherence, Scheduled View view with the newly imported Production Plan.

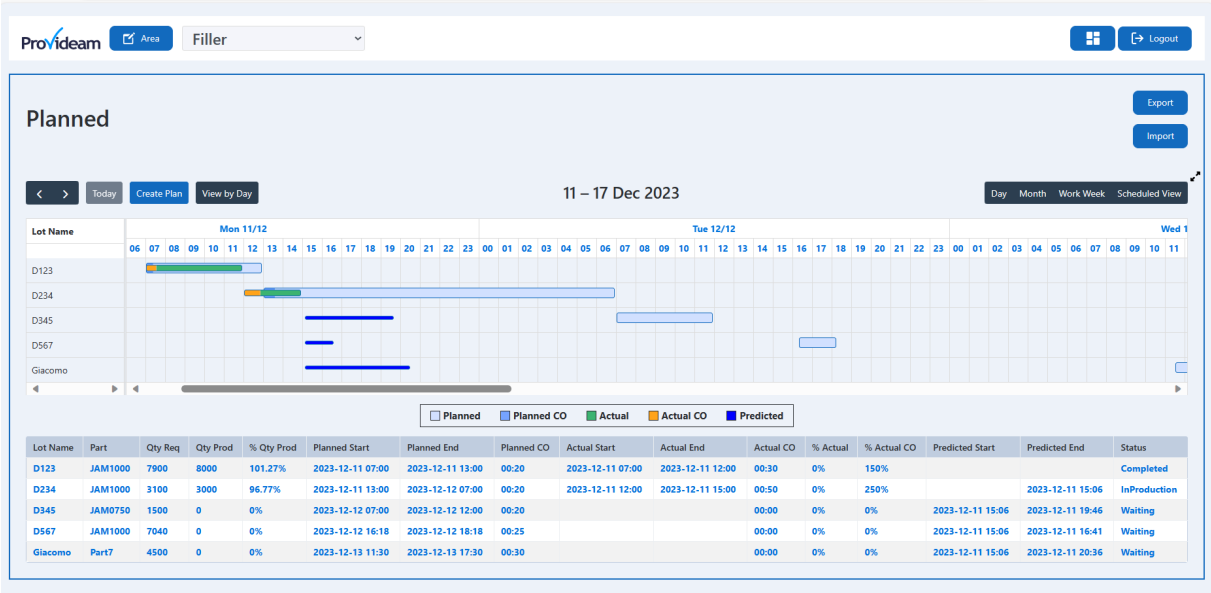


Fig. Plan Adherence, Scheduled View - View by Week - with the newly imported Production Plan.

10.4.3 Edit Plan

The Plan Adherence also allows us to edit already created Plans.

Select the Area and the Machine from which we want to edit a Production Plan.

If necessary, look for the selected Production Plan by clicking through the days, months or work weeks using the **Backwards and Forward arrows** button.

Then, click on the selected Production Plan and the following window will appear.

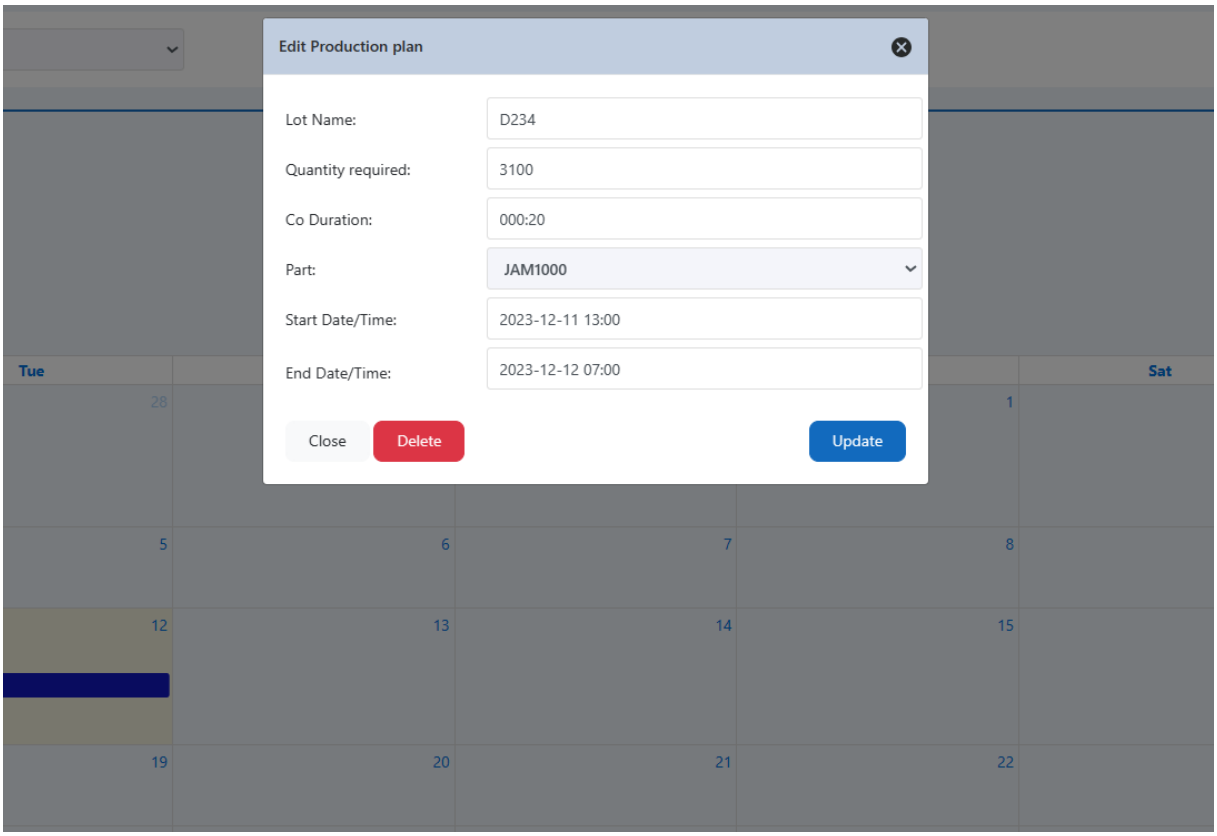


Fig. Plan Adherence Edit Production plan Window.

In the Edit Production plan window we can edit the parameters of the selected Plan.

If we are happy with our changes we can click the **Update** button to update and save the edited Plan.

If we wish to delete the selected Production Plan, click the **Delete** button.

If we do not wish to save the changes, click the **Close** button or the  icon button to close the Edit Production plan window.

10.4.4 Scheduled View

The Scheduled View option allows us to get a detailed view of the created Production Plans.

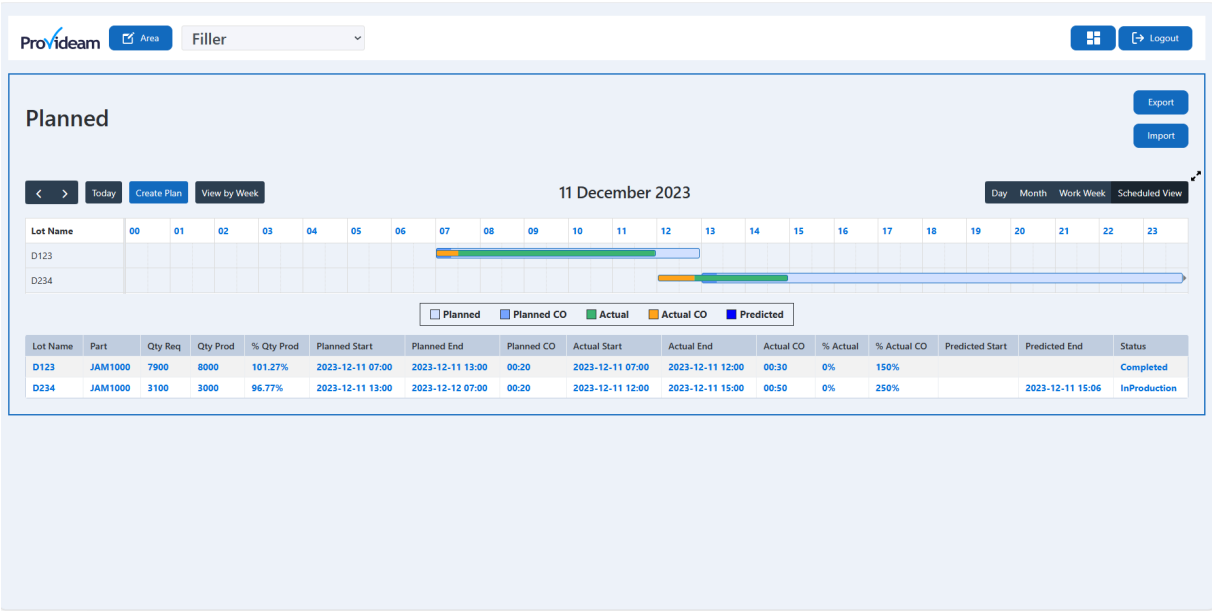


Fig. Plan Adherence, Scheduled View.

We can present the data in a daily or weekly view.

The daily view is the default view. To get a weekly view, click the **View by Week** button (to go back to a daily view, click the **View by Day** button.

We can move from one day to another through the **Backwards and Forward arrows** button.

The Scheduled View displays a column with the Lot names of the Production Plans created, and a table with the 24 hours of the day.

Below this table there is a key with the colours indicating the parameters of each Production Plan in the table.

The table at the bottom of the page breaks down the parameters of each Production Plan.

View by Week

The View by Week option allows us to view Production Plans by week.

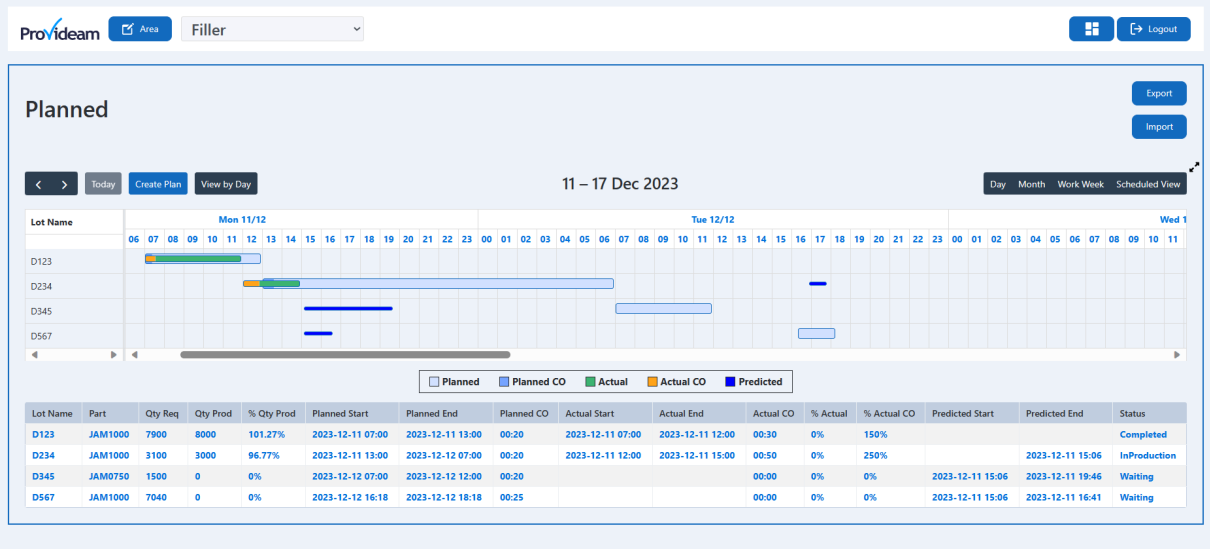


Fig. Plan Adherence Scheduled View, View by Week.

We can move from one week to another through the **Backwards and Forward arrows** button.

We can move forward and backwards in the week by clicking and dragging the bar at the bottom of the table.

The Scheduled View - View by Week option displays a column with the Lot names of the Production Plans created. The table is divided into the days of the week, and all day-cells of the week contain the cells with the 24 hours of the day.

Below this table there is a key with the colours indicating the parameters of each Production Plan in the table.

The table at the bottom of the page breaks down the parameters of each Production Plan.

As this view includes all the days of the week, we can see more Production Plans.

Section XI:

Lean Manufacturing Tutorial

Provideam 4.18

Manufacturing Productivity Solutions

11 Lean Manufacturing Tutorial

The success of modern manufacturing methodologies, such as Lean Manufacturing and Total Productive Maintenance, is heavily reliant on the accurate measurement and analysis of production data.

This Section introduces the Overall Equipment Effectivity metric system of production loss analysis. OEE is a highly sophisticated approach to the analysis of production losses which enables the user to identify the real causes of loss.

Provideam provides the tools to automatically collect production data and to analyse this data through the lens of the OEE metric system.

Implementation of the OEE metric system on its own will not result in productivity improvements. However when it is used as part of management style which is based on Continuous Improvement the real causes of loss can be identified and eliminated. By eliminating losses, be they downtimes, defects or slow running, substantial increases in productivity can be achieved.

11.1 Modern Production Metrics - OEE

OEE, Overall Equipment Effectivity, is the most popular KPI, Key Performance Indicator, in manufacturing productivity philosophies such as WCM, World Class Manufacturing, TPM, Total Productive Maintenance etc.

OEE is a measure of a machine's efficiency based on six general loss classifications, i.e. Breakdowns, Changeovers, Short Stops, Slow Running(Speed Losses), Yield Losses and Start-up Losses. These losses are grouped under the general headings; Availability Losses, Performance Losses and Quality Losses as described below. Put simply, OEE is a measure of the amount of time a machine is actually producing good product compared to the time it should be producing good product (the total planned production time for that machine). Any difference between these two measures of time is considered a loss. The figure below shows an OEE Level 1 Pie Chart Report which divides the loss into three groups, Availability, Performance and Quality.

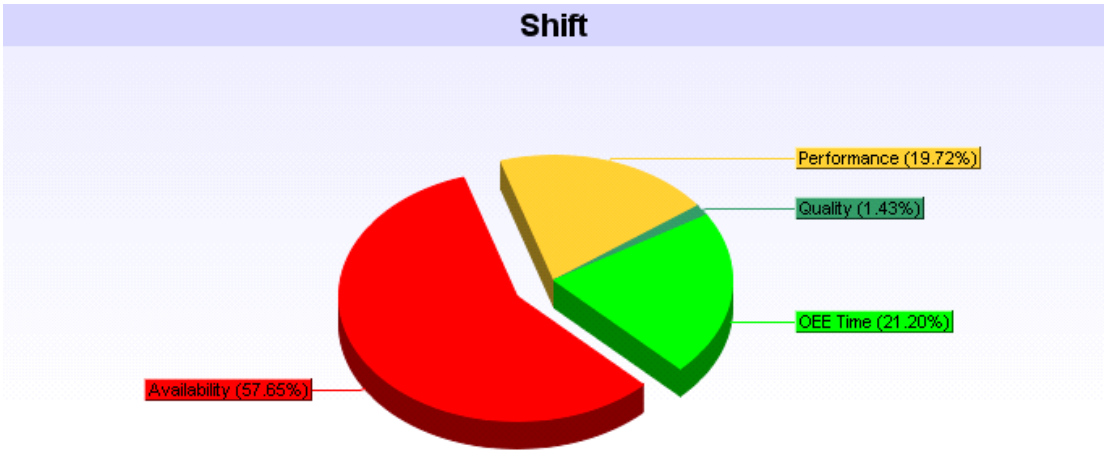


Fig. OEE Level 1 Pie Chart Report.

The Six Losses are listed and categorised as follows:

Availability Losses

- Breakdowns
- Changeovers

Performance Losses

- Short Stops
- Slow Running(Speed Losses)

Quality Losses

- Yield Losses
- Start-up Losses

11.1.1 Availability Losses

Availability Loss is a general term for any loss which causes a machine to be unavailable to produce good products.

Breakdowns

When a machine has broken down it is unavailable for production. In some OEE systems a machine is only considered to be 'broken down' if a technician is required to restart the machine. However this would require manual classification of each loss and in automatic OEE Production Monitoring Systems manual classification is considered cumbersome. Consequently the compromise is generally made that if the downtime duration is longer than, say, 5minutes the downtime is automatically classified as a Breakdown, otherwise the downtime is classified as a Short Stop.

Changeovers

Changeover is the time lost when a machine is being reconfigured to manufacture a new product. Again the machine is unavailable for production.

11.1.2 Performance Losses

Performance Loss is a general term for a loss occurring during production which reduces the performance of the machine. Performance Loss is sometimes also referred to as Speed Loss.

Short Stops

When a machine is in production and it stops for a short period of time for a minor fault that the operator can correct in a few seconds, this is called a Short Stop. If an operator is operating more than one machine these Short Stops are highly significant. It may only take a few seconds to fix the machine, but if the operator is busy with another machine or taking a break, then the machine will be stopped for a significant amount of time. If these minor faults occur frequently, then over the course of a day the amount of time lost can accumulate quite rapidly. This is especially true where an operator is running a large number of machines as it will not be possible to keep them all running if there are a lot of minor faults happening simultaneously.

Speed Loss(Slow Running)

This loss is not usually apparent by simply looking at a machine. Generally when a machine is running and producing good parts, it may appear that all is well. However there may still be a loss occurring if the machine is operating below its designed speed. That is, if the machine is designed to produce 1000 parts per hour but for some reason is actually only producing 750 units per hour then it is only running at 75% of its capability and there is a 25% loss due to Slow Running.

11.1.3 Quality Losses

Quality Loss is the general term for the time lost producing bad or reject parts.

Yield Loss

When a machine produces a defect not only is the material used in producing the defect lost or in need of rework but the time and other resources used producing the piece are also wasted. A machine with ten defects per hundred is in effect only achieving a yield of ninety per cent of its capability.

Start- up Loss

If a machine needs to be set up by doing some trial production then the material used is wasted. For example setting up a machine at the start of a shift could involve producing one or two test pieces and then making adjustments until the set up is perfect. The material lost and the time spent producing it are both wasted and again this is a problem

11.1.4 Key Implications

- Classifying the losses in terms of Availability, Performance and Quality helps to identify the nature of the most significant losses impacting production.
- From knowing the nature of the most significant losses it becomes easier to identify the root causes and to implement strategies to eliminate the losses.
- It's only when you multiply the 3 elements,Availability, Performance Rate and Quality Rate together that you see the compound effect.
- This compound effect often highlights a surprisingly aggressive erosion of OEE! (Remember that two fractions multiplied together will always result in a smaller fraction!)

11.2 Calculating OEE

OEE may be expressed as a time value or as a percentage (rate). Below it is shown how to calculate the OEE value as either a time or a percentage.

11.2.1 Expressing OEE as a Time Value

The figure below shows the losses occurring on a machine over a given time frame.

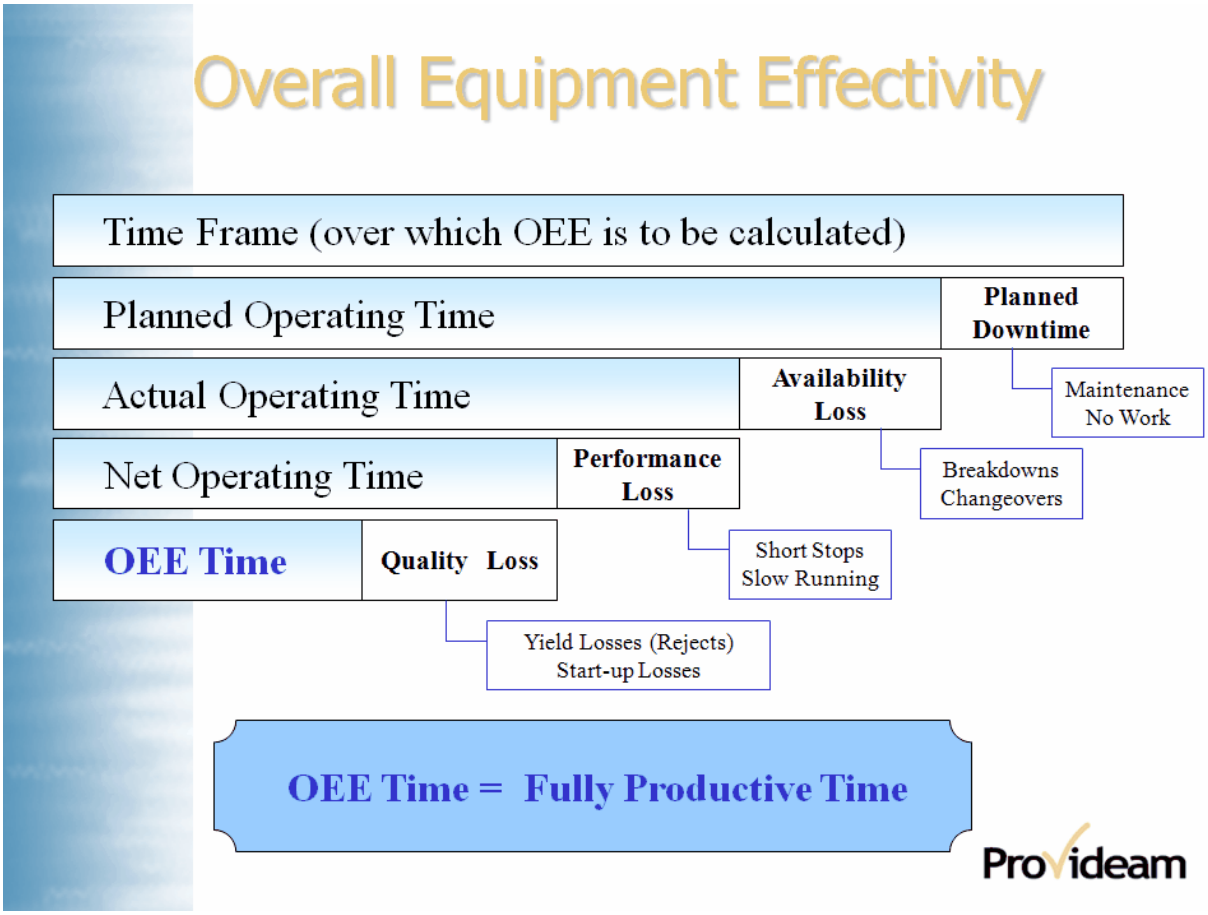


Fig. OEE Times

Time Frame
The period over which the OEE is to be calculated.

Planned Operating Time
The amount of time for which it is planned that the machine should be producing good parts. It is the Time Frame less any planned downtime such as preventative maintenance or operator training etc.

Availability Loss
The total amount of time for which the machine has been broken down or on changeover.

Actual Operating Time
The Planned Operating Time less the Availability Loss.

Performance Loss
The combination of Short Stops and Slow Running.

Net Operating Time
The Actual Operating Time less the Performance Loss.

Quality Loss
The amount of time lost producing bad or reject parts. It is calculated by multiplying the number of reject parts by the optimum (design) machine cycle time.

OEE Time (Fully Productive Time)
The total amount of time that the machine was operating at its optimum or designed rate. It is the Planned Operating Time less the Availability Loss, less the Performance Loss and less the Quality Loss. The OEE Time is also known as the Fully Productive Time.

11.2.2 Expressing OEE as a Percentage

Availability (Rate)
The percentage of time the machine is actually available to produce good parts. In other words, the Actual Operating Time (Planned Operating Time – Availability Loss) compared to the Planned Operating Time.

$$\text{Availability} = \frac{\text{Actual Operating Time}}{\text{Planned Operating Time}} \times 100\%$$

Performance (Rate)

The Net Operating Time (Actual Operating Time - Performance Loss) compared to the Actual Operating Time.

$$\text{Performance} = \frac{\text{Net Operating Time}}{\text{Actual Operating Time}} \text{ x } 100\%$$

Quality (Rate)

The OEE Time (Net Operating Time – Quality Loss) compared to the Net Operating Time. The Quality Rate is equivalent to the Yield.

$$\text{Quality} = \frac{\text{OEE Time}}{\text{Net Operating Time}} \text{ x } 100\%$$

Finally, OEE is calculated by multiplying these three figures together as follows;

$$\text{OEE} = \text{Availability x Performance x Quality x } 100\%$$

which is equivalent to;

$$\text{OEE} = \frac{\text{OEE Time}}{\text{Planned Operating Time}} \text{ x } 100\%$$

Which in graphical format can be represent as shown in the figure below.

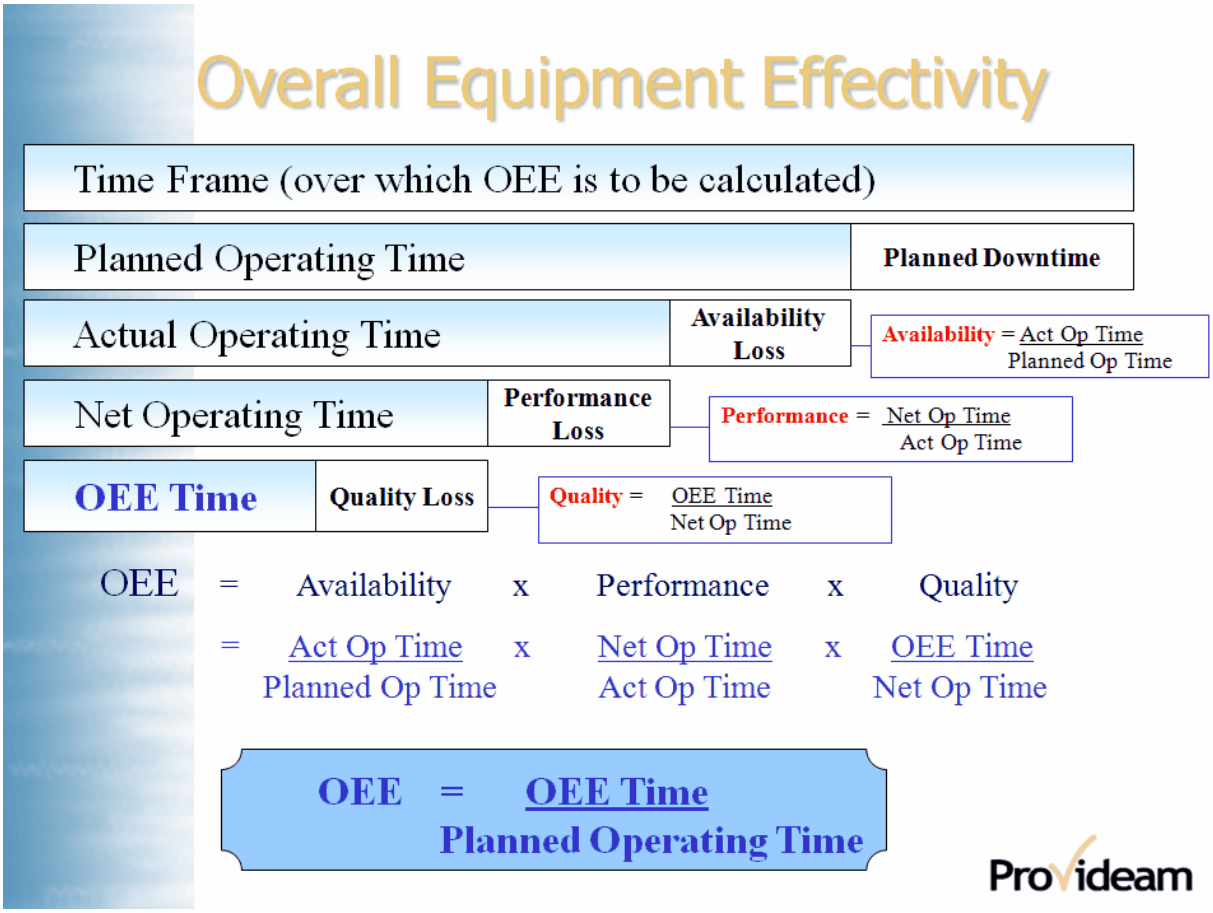


Fig. OEE Rates

11.3 Interpreting OEE Values

As you will see from the figure above, Availability, Performance and Quality Losses eat into the Planned Operating Time for the machine. The greater the losses the less output from the machine. The aim therefore is to keep these losses to a minimum.

This is equivalent to saying that the Availability, Performance and Quality Rate must be kept as high as possible.

If, for example, the Availability (Rate) is 0%, this means that the machine was either broken down or on changeover for the whole time period. Whereas if the Availability is 100% it means there were no breakdowns or changeover losses during the time period.

The key value is the percentage OEE. This indicates how well the machine is performing. The higher the value the better the machine is performing. An OEE of 100% indicates that there were no losses during the time period and that the machine was running at its optimum rate.

The OEE value that can be achieved for a particular machine will depend on a wide variety of factors but in general companies tend to aim for an OEE value of between 70 – 90%.

The purpose of separating losses into different categories is to help focus on the reasons and effects of the different types of losses. The reasons for breakdown losses are often for totally different reasons then reject losses.

Availability Losses will generally be related to poor machine reliability, bad maintenance or overloading the machine causing failure.

Performance Losses can often relate to material problems requiring the machine speed to be reduced, poor design requiring regular operator intervention for minor stoppages, poor operation due to insufficient operator training.

Quality Losses can be related to faulty raw material, or machine problems.

11.3.1 OEE Loss Levels

There are three levels in the hierarchical OEE model of grouping losses.

Level 1 Losses are Availability, Performance and Quality losses. The figure below shows a Pie chart type OEE Level 1 Loss Report. Each slice represents the fraction of Total Loss which is attributed to each category.

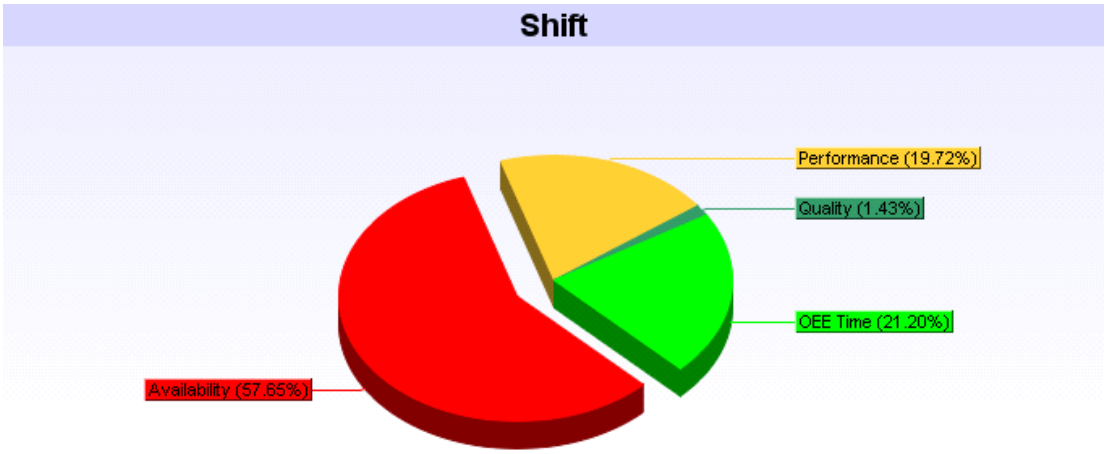


Fig. OEE Level 1 Pie Chart Report

Level 2 Losses are simply Level 1 Losses sub-divided by the six major losses defined above, Breakdowns, Changeover's, Short Stops, Slow Running, Yield Losses and Start-up Losses. The figure below shows a Pie chart type OEE Level 2 Loss Report. Again each slice represents the fraction of Total Loss which is attributed to each category.

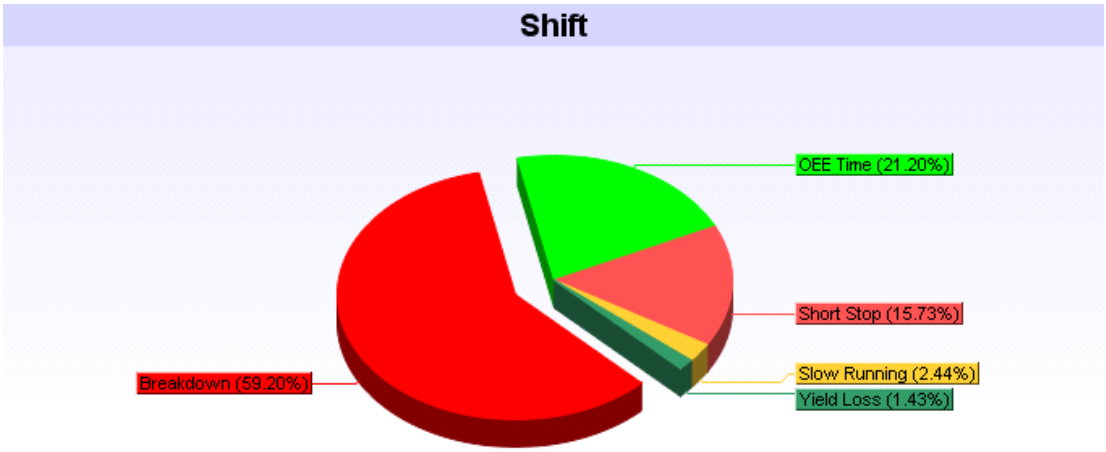


Fig. OEE Level 2 Pie Chart Report

Level 3 Losses are the individual reasons for each Level 2 Loss. An example of a Level 3 Loss might be “jam on station 1” where this is a specific reason for the machine to stop – causing a loss. The figure below shows OEE Level 3 Pie Chart Loss Report. Here each slice represents the fraction of Total Loss which is attributed to each individual loss reason.

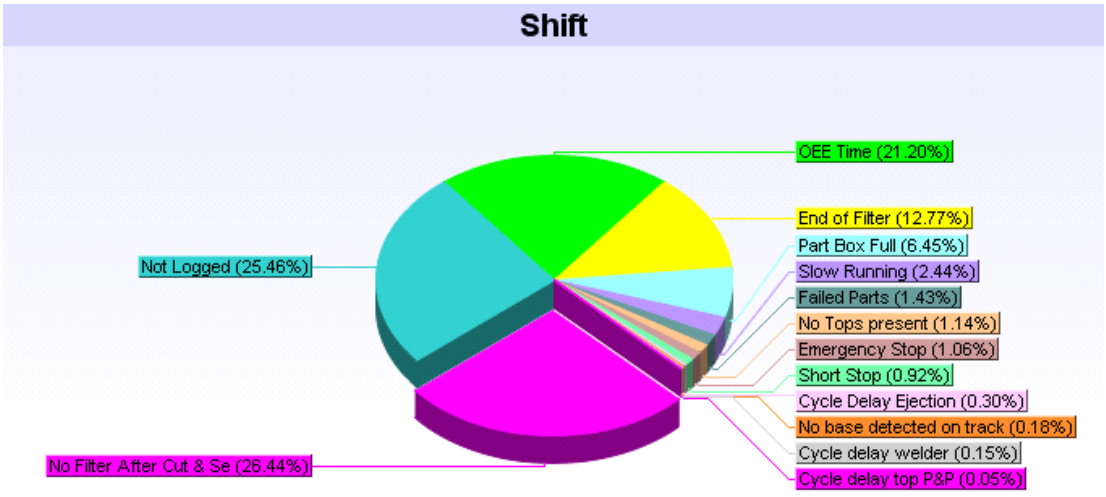


Fig. OEE Level 3 Pie Chart Report

Using Provideam to identify and prioritise improvement activity...

Provideam provides the tools to analyse your production data to identify the real reasons for loss. Thus you can focus improvement activities on the eliminating these 'real' losses. Thereby ensuring that you do not waste time eliminating 'perceived' losses which are not actually significant in the overall productivity equation.

Section XII:
Glossary

Provideam 4.18
Manufacturing Productivity Solutions

12 Glossary

21CFR11	FDA Regulation regarding the use of Electronic Signatures
DB	Data Base
DNS	Domain Name System
FDA	Food and Drugs Administration
GUI	Graphical User Interface
IIS	Microsoft Internet Information Services
Intranet	Intranet is a private computer network that uses Internet protocols and network connectivity to securely share part of an organization's information or operations with its employees.
JPEG(JPG)	Joint Photographic Experts Group. Common method for compression of photographic images
JSON	JavaScript Object Notation
KPI	Key Performance Indicator
LAN	Local Area Network
ODBC	Open Data Base Connectivity
OEE	Overall Equipment Effectivity (Effectiveness)
OPC	Open Process Control (formerly OLE for Process Control)
PNG	Portable Network Graphic. A bit mapped image format that employs loss-less data compression
SMS	Short Message Service (Text Message)
SMTP	Simple Mail Transfer Protocol
TCP/IP	Transmission Control Protocol / Internet Protocol
TPM	Total Productive Maintenance
TAP	Telocator Alphanumeric Protocol
WCM	World Class Manufacturing
XML	Extensible Markup Language

Section XIII:

Provideam End User Licence Agreement

Provideam 4.18

Manufacturing Productivity Solutions

13 Provideam End User Licence Agreement

DTL Systems Limited
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Provideam Software

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(vii) not to modify or remove any copyright or proprietary notices on the Software or the Documentation;
(viii) to comply with all relevant import and export laws, rules and regulations affecting the Software or any portion of it. Regardless of any disclosure made by you to the Licensor of the destination of the Software, you will not export or re-export, directly or indirectly, the Software without first obtaining all written consents or authorisations which may be required by any such laws, rules or regulations.
You agree that neither the Software nor any direct product of it will be exported, directly, or indirectly, in violation of these laws, or will be used for any purpose prohibited by these laws including, without limitation, nuclear, chemical, or biological weapons proliferation;

8. WARRANTIES:
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The Licensor does not guarantee that the information accessed by the Software will be accurate or complete.
You acknowledge that performance of the Software may be affected by any number of factors, including without limitation, technical failure of the Software, the acts or omissions of third parties and other causes reasonably beyond the control of the Licensor.
Certain features of the Software may not be forward-compatible with future versions of the Software and use of such features with future versions of the Software may require purchase of the applicable future version of the Software.

9. LIMITATION OF LIABILITY:
9.1 Nothing in this Clause [9] shall limit the Licensor's liability for death or personal injury.

9.2 The aggregate liability of the Licensor in respect of any loss or damage suffered by you and arising out of or in connection with this Agreement, whether in contract, tort (including negligence) or for breach of statutory duty or in any other way, shall not exceed the amount of the License Fee actually paid by you to the Licensor pursuant to this Agreement.

9.3 The Licensor shall not be liable, in contract, tort (including negligence) or for breach of statutory duty or in any other way for:
(i) any economic losses (including loss of revenues, profits, contracts, business, data, data use or anticipated savings); or
(ii) any loss of goodwill or reputation; or
(iii) any special or indirect or consequential losses in any case, whether or not such losses were within the contemplation of the parties at the date of this Agreement, or were suffered or incurred by the a party arising out of or in connection with the use of the Software or any matter arising under this Agreement.

10. TERM AND TERMINATION
10.1 Either party may terminate this Agreement by giving not less than 3 months notice in writing of such termination to the other.

10.2 Either party (the "Non-Defaulting Party") may terminate this Agreement and/or require payment of any amounts due under this Agreement (without prejudice to its other rights and remedies) with immediate effect by written notice to the other party (the "Defaulting Party") if the Defaulting Party

commits a breach of its material obligations under this Agreement and if the breach is capable of remedy, fails to remedy it during the period of 30 days starting on the date of receipt of notice from the Non-Defaulting Party requiring it to be remedied.

10.3 If this Agreement terminates, you shall immediately cease using the Software; and represent in writing to the Licensor within five days after termination that you have destroyed or have returned to the Licensor the Software, Documentation and all copies of the Software and Documentation and any of the Licensor's Confidential Information in its possession, custody or control. This requirement applies to copies and storage in all forms, partial and complete, in all types of media and computer memory, whether or not modified or merged into other materials.

10.4 The provisions of Clauses [1, 2, 3, 4, 5, 6, 7, 9, 10.3, 11 and 12] shall survive termination of this Agreement.

11. ASSIGNMENT:
11.1 Neither party shall assign or purport to assign this Agreement without the prior written consent of the other party.

12. LAW AND JURISDICTION:
12.1 This Agreement shall be exclusively governed by and construed in accordance with the laws of Ireland whose courts shall have exclusive jurisdiction in any dispute.