POWER LEADER™

PMCS 6.8 for
CIMPLICITY© HMI
Interface Toolkit

User's Guide
DEH-210

GE Power Management Control System 6.8

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Introduction

Welcome

The PMCS Interface Toolkit is a POWER LEADER Power Management Control System (PMCS) tool that provides a custom toolkit to efficiently create flexible, accurate, and friendly user interfaces to your power management data. With the PMCS Wizards (accurate graphical representations of power management devices and other commonly encountered objects), you can create applications to provide a customized interface that accurately represents physical, electrical, and geographical plant layouts. The wizards can significantly cut new system development time, providing results in less than an hour.

The PMCS Interface Toolkit allows you to create one-line diagrams, elevation views, and floor plans that you can combine with tabular data screens and three-dimensional device wizards to create a virtual representation of your facility and equipment. With this graphical user interface, you actually see and control devices on the screen, without having to make a trip out to the meter or trip unit.

The Toolkit, which consists of the CIMPLICITY® HMI development environment coupled with GE's PMCS wizards, is easy to use, taking advantage of state-of-the-art drag-and-drop technology. Wizards are provided for all the devices most commonly used with the PMCS DDE Server. Creating a custom interface is as easy as selecting wizards for the devices installed in a facility and placing them on the screen.

Here's what you'll find in this guide:

- Chapter 2 explains the kinds of PMCS Wizards, their use and configuration – Small Faceplate wizards, Large Faceplate wizards, Tabular Data Screen wizards, One- Line wizards, Elevation wizards, and Floor Plan wizards. Includes instructions on using the PMCS Advanced Wizards, including Small Faceplates, Large Faceplates, and Tabular Wizards.
- Chapter 3 illustrates the use of the GE wizards described in Chapter 2 to create animated displays of the facility floor plan, switchgear elevations, and system one- line diagrams.
- Chapter 4 gives an example of application development, using the wizards described in Chapters 2 and 3 to create an actual PMCS application.
- Chapter 5 describes the functions available with each of the GE Large Faceplate wizards. These wizards are accurate graphical

representations of power management devices, complete with working controls that are linked to the corresponding devices in your facility.

- Chapter 6 describes the Tabular Data wizards. These wizards list the data and setpoints of power management devices in a tabular format. Simply point and click to select the appropriate tab of information to display and view the related data.

The examples and references in this guide enable you to create custom interfaces for your PMCS system, and allow you to access power management data in the way that best suits you.

How should I use this manual?

How you use this book depends on your level of expertise with CIMPLICITY. Consult the table below to determine where you should start.

If this describes you…	Start here:
I've never seen this stuff before! What's CIMPLICITY HMI? What are "Wizards"?	Refer to the documentation that came with your CIMPLICITY HMI package. Start with the introduction and tutorial sections, which will teach you about CIMPLICITY HMI and how to use it to create custom applications. When you understand what wizards are and how to use them, come back here.
I've just opened this package – where do I go first?	Go to Chapter 1, Introduction. Chapter 1 explains what the Interface Toolkit is, what it's good for, and where to go after that.
I'm familiar with CIMPLICITY HMI and I'd like to build a custom application for some GE power management devices.	Go to Chapter 1 for installation instructions, then to Chapter 2 for descriptions of the wizards and how to use them. Chapter 4 provides a demo of actual application development. This package contains wizards for the power management devices supported by GE's PMCS software.
The GE PMCS Wizards are already installed on my system, I'm already experienced with CIMPLICITY HMI , and I'm ready to start building custom applications.	Turn to Chapter 2 for information on how to use the GE PMCS Wizards, and Chapter 4 for a quick example of application development. For detailed descriptions of the Large Faceplate screens or the Tabular Data screens, refer to Chapters 5 and 6 respectively.
Just tell me about the wizards; I'm an old pro and ready to go!	Skim through Chapters 2 and 3 for an overview of what's in the package, then Chapter 4 for a quick example of application development. Chapter 5 describes the GE Large Faceplate screens and Chapter 6 the associated Tabular Data screens.

Conventions

You will find this book easy to use if you look for these simple conventions:

- **Boldface** type indicates the name of an item you need to select.
- `Monospace` type indicates an example or text that is displayed on the screen.
- UPPERCASE type indicates a file name, command name, or acronym.

About the Interface Toolkit

The Interface Toolkit consists of the CIMPLICITY HMI development environment and a special set of wizards developed for use with the power management devices supported by PMCS 6.8.

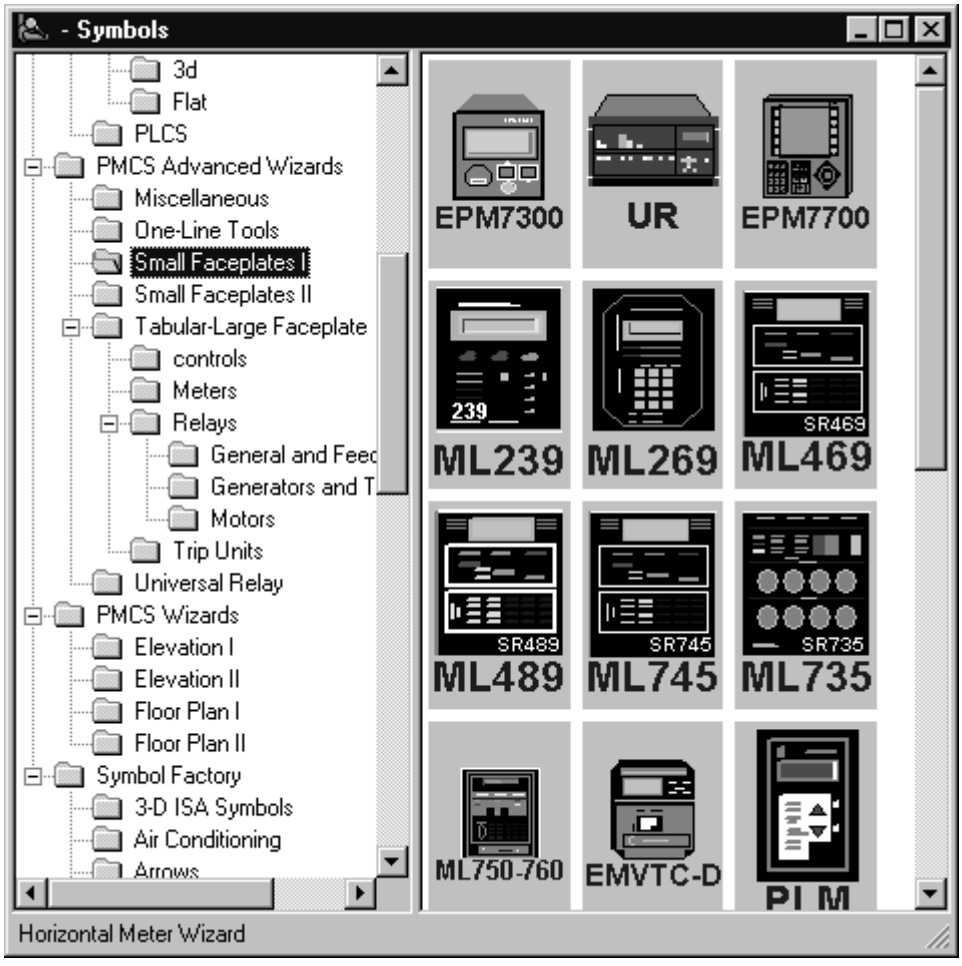
Installation

To install the Interface Toolkit from the CD-ROM, refer to the instructions provided in DEH-211, the PMCS Read This Book First. When installing CIMPLICITY HMI 4.01, be sure to include the Advanced DDE Communications" option.

For PMCS View Nodes, be sure to install the appropriate PMCS software to support CIMPLICITY wizard operation. A runtime view node installation provides files needed to operate the wizards, the wizard help files, and the EventViewer and Waveform client applications. Without these files, your screens will not function correctly on the view node.

For WebView users, please note that the EventViewer and Waveform client applications cannot be viewed, but all information displayed in the wizard is available.

You can verify successful installation of the PMCS Wizards into CIMPLICITY HMI by opening CimEdit, and clicking the Object Explorer button to display the symbols library window. The PMCS Wizards should be listed in the directory structure on the left side of the Symbols window as shown below. If they are not, reinstall from the PMCS CD-ROM. PMCS Advanced Wizards (device wizards) are located in the *PMCS Advanced Wizards* directory; standard PMCS Wizards (such as Elevation and Floor Plan wizards) are located in the *PMCS Wizards* directory.



Configuring and Using PMCS Wizards

About the Wizards

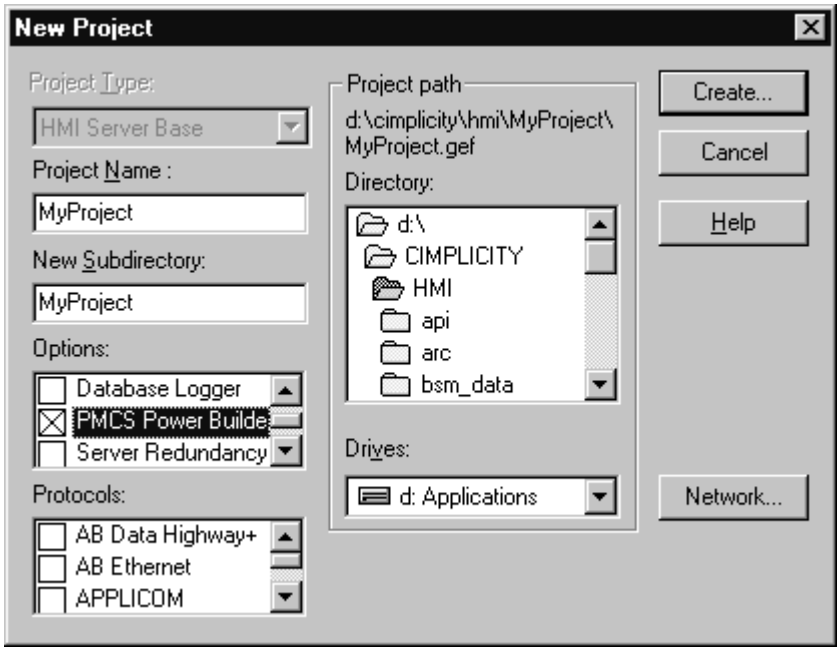
The wizards contained in the PMCS Interface Toolkit allow you to quickly build accurate and friendly user interfaces with CIMPLICITY HMI. In addition to the various wizards standard with CIMPLICITY HMI development systems, the User Screen Configurator provides five types of powerful GE wizards:

- GE Small Faceplate Wizards
- GE Large Faceplate/Tabular Data Wizards
- GE One-Line Tool Wizards
- GE Elevation Wizards
- GE Floor Plan Wizards

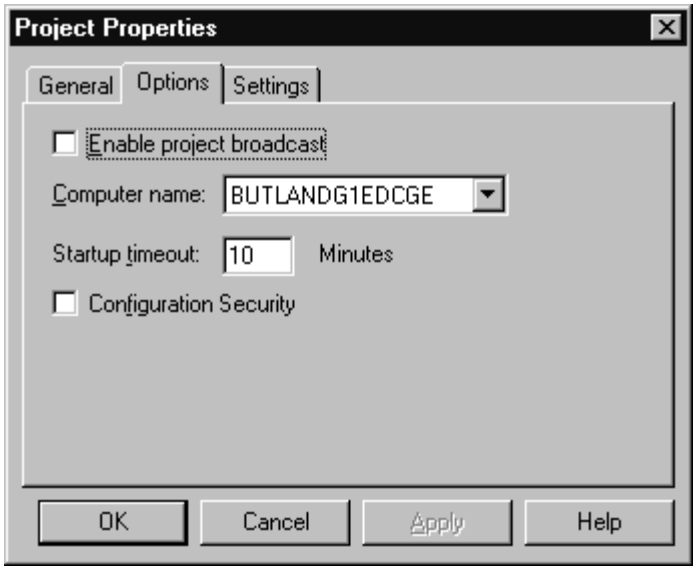
Configuring a CIMPLICITY Project for PMCS

Using the wizards is straightforward. The procedure outlined in this section describes how to place and configure a PMCS wizard in CIMPLICITY HMI. Later sections describe using/testing a wizard and go further into describing each kind of wizard.

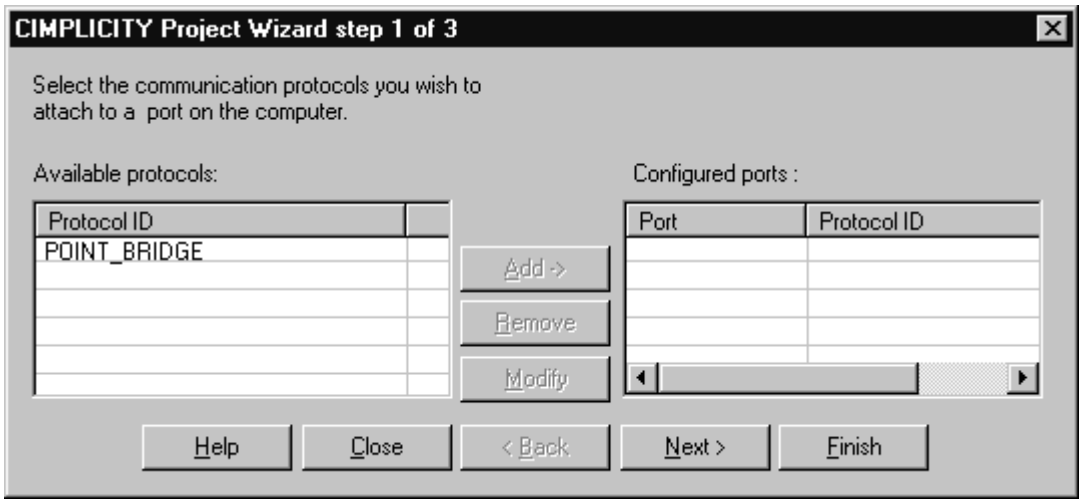
1. From CIMPLICITY HMI, create a new project by clicking the New Project button or selecting File: New Project. The New Project window appears:



2. Enter the Project Name and select a directory where the project should be stored (usually in the `cimplicity\hmi\projects\`). Under Options, select PMCS Power Builder. Finally, click the Create button to write the project file to disk and open the Project Properties window:

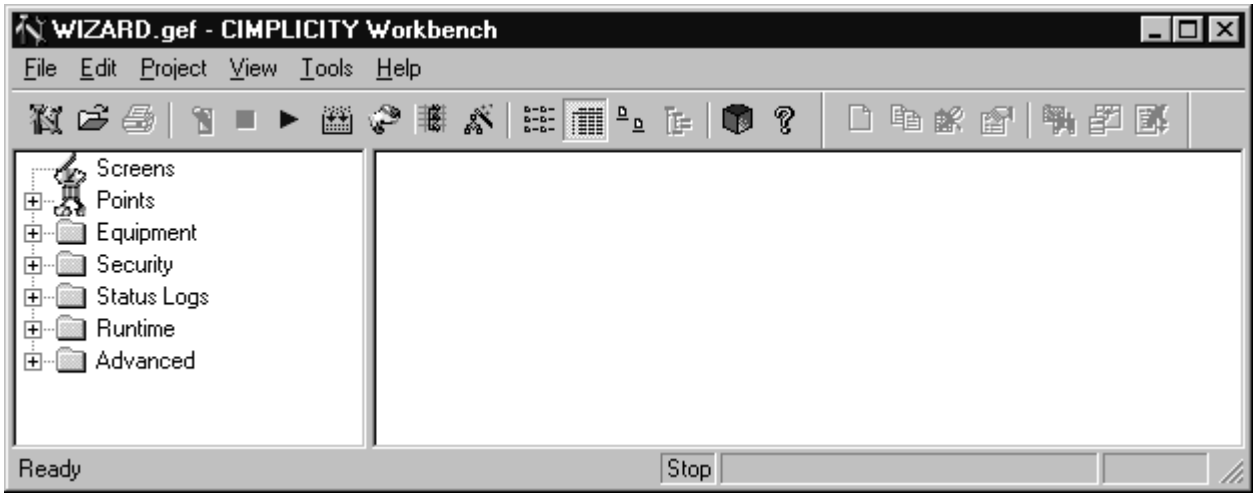


3. In the Project Properties window (Options tab), select the `Enable project broadcast` checkbox if you will be using CIMPLICITY HMI view nodes. Make sure the `Computer name` field matches the name of the host machine. Disregard the `Startup Timeout` field and the `General` tab. Select **OK** to open the CIMPLICITY HMI Project Wizard:



4. In the CIMPLICITY Project Wizard step 1 of 3 window, choose **Finish** to complete the project setup.

5. The CIMPLICITY Workbench is displayed as shown below:

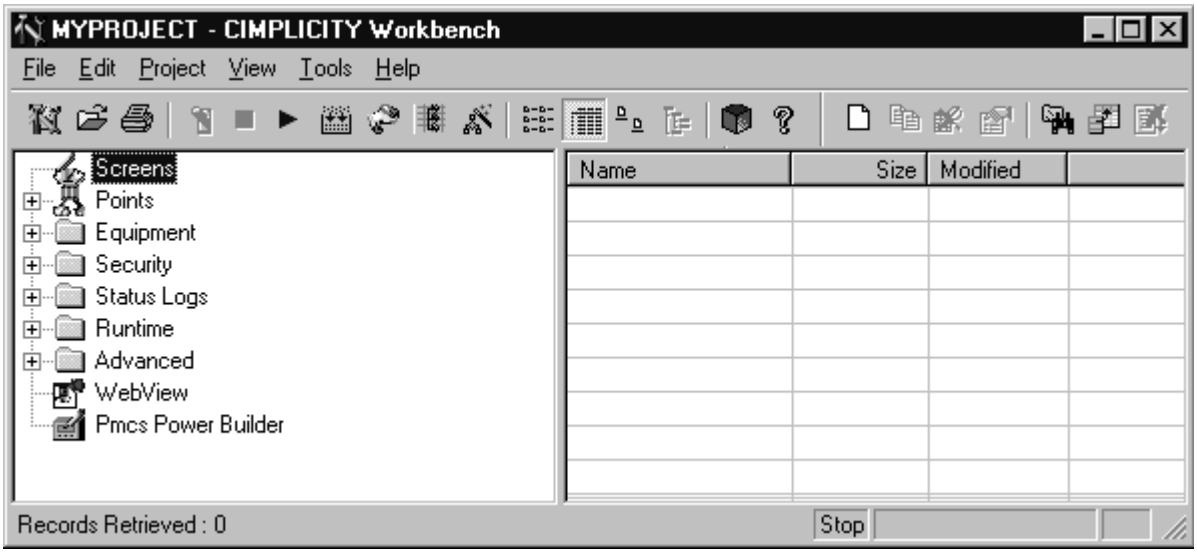


Double-click PMCS Power Builder to begin adding devices, and refer to *PMCS PowerBuilder - Configuring Advanced Wizards* in the following section for details on placing a PMCS Advanced Wizard in a CIMPLICITY project.

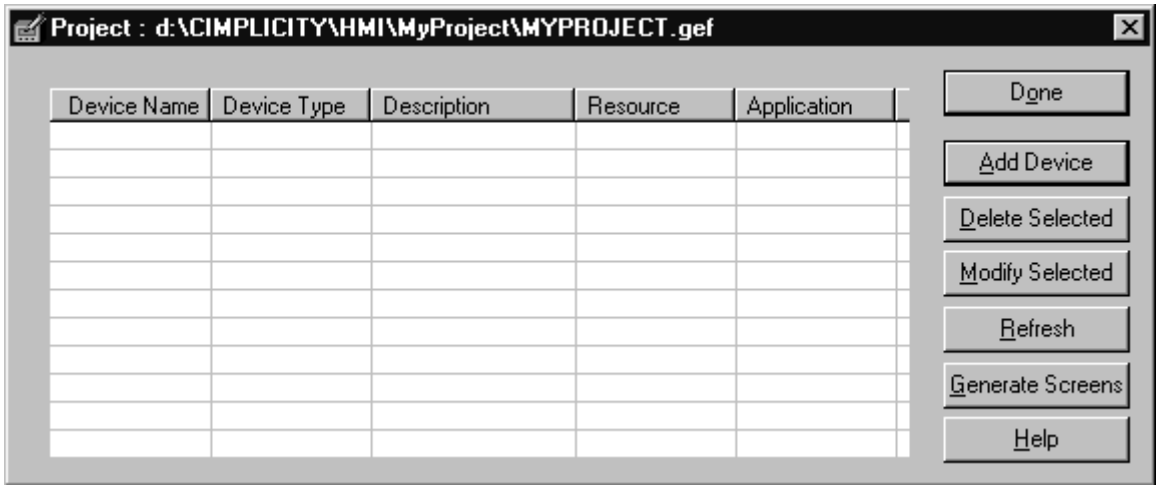
PMCS PowerBuilder - Configuring Advanced Wizards

PMCS Power Builder is a powerful tool to drastical reduce development time, enabling you to quickly and easily add many devices to a new CIMPLICITY project. Besides enhancing your productivity as a developer, PMCS Power Builder also allows you to create more efficient applications which use fewer system resources and enjoy greater performance. This is due to PMCS Power Builder's integration with the PMCS Advanced Wizards. These wizards employ technology and configuration techniques that take advantage of the power of CIMPLICITY HMI version 4.01. The PMCS Advanced Wizards use a two-step configuration process where the device data points are configured separately from the graphical portion of the wizards. This section explains the procedures for configuring and using these new wizards.

Beginning at the CIMPLICITY Workbench, double-click the PMCS Power Builder option to begin adding devices to this project.



The PMCS Power Builder tool appears:



The command buttons displayed in the PMCS Power Builder window are:

Add Device – use this button to create a new device in your application. You can also add a device by double clicking any empty line in the device information section of the PowerBuilder screen, or right clicking and selecting "Add" from the drop down menu.

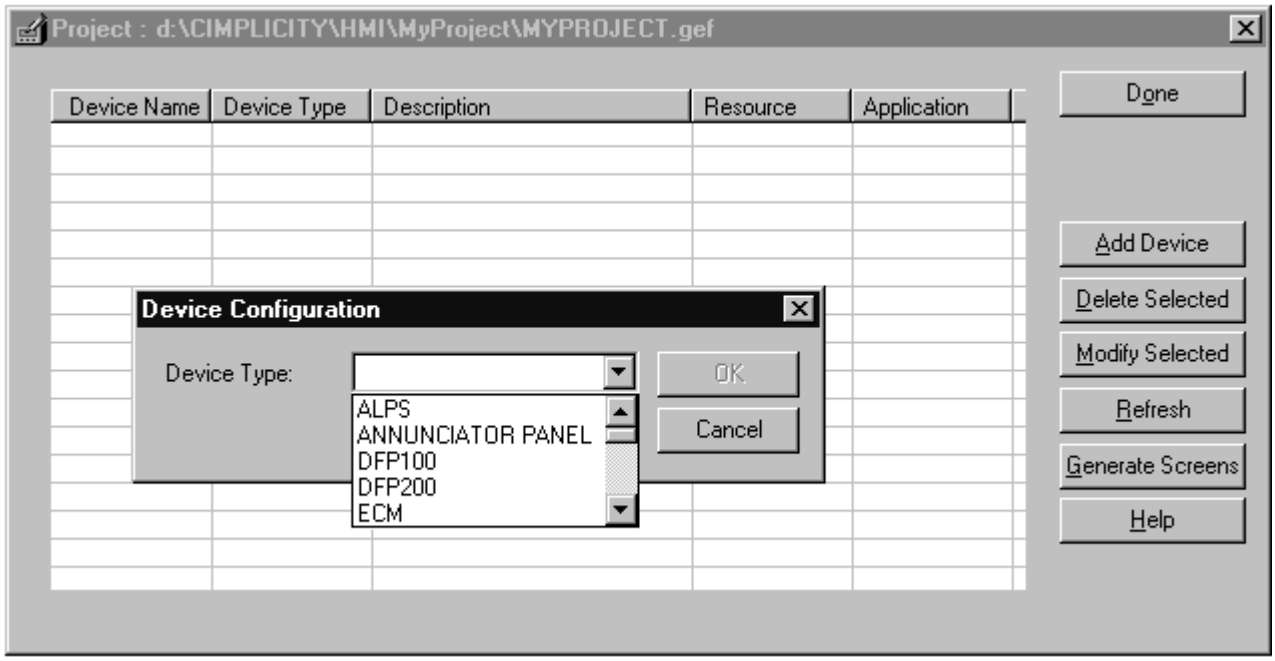
Modify Selected – use this button to change the Description, Resource, and application information for an existing (selected) device. You can also modify a device's configuration by double-clicking a listed device, or by right-clicking an existing device and selecting "Modify Selected" from the drop down menu. Device Name and Device Type cannot be modified once a device is created. If you need to change the device name or device type, you must delete the selected device and add a new one.

Delete Selected – use this button to completely remove the selected device and its points from the project. You also delete a device by right clicking and selecting "Delete Selected" from the drop down menu.

Refresh – use this button to refresh the display of devices in the PowerBuilder display. You can also refresh the display by right clicking anywhere within the device information area and selecting "Refresh" from the drop down menu.

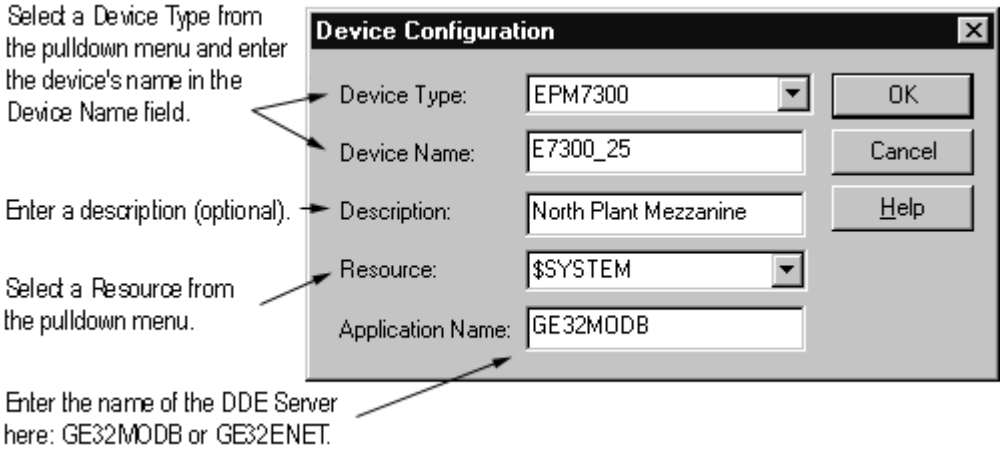
Help – use this button to access PMCS Power Builder help information.

Select the Add Device button to begin adding device points to this project. The Device Configuration dialog appears, prompting you to select a device type to add:

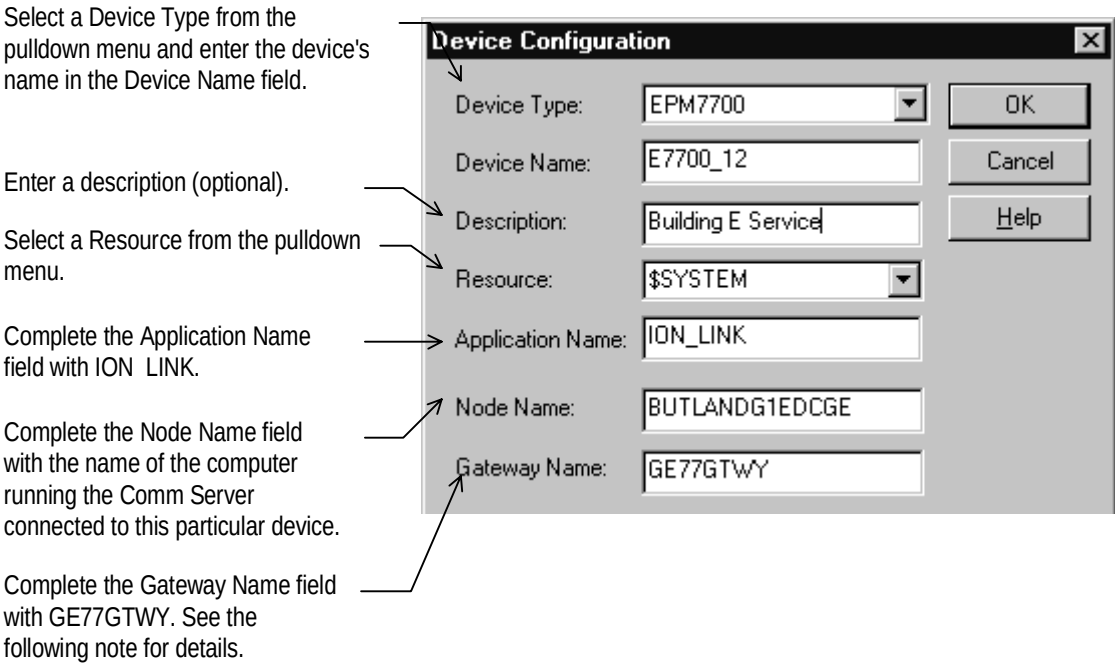


Select the device type to add, and the Device Configuration dialog dynamically expands to display the device-specific configuration parameters. For example, while most devices require only five parameters (Type, Name, Description, Resource, and the Server's Application name), some more complex device types require additional parameters, such as selecting which Tabs will appear on the Tabular wizard screen at runtime.

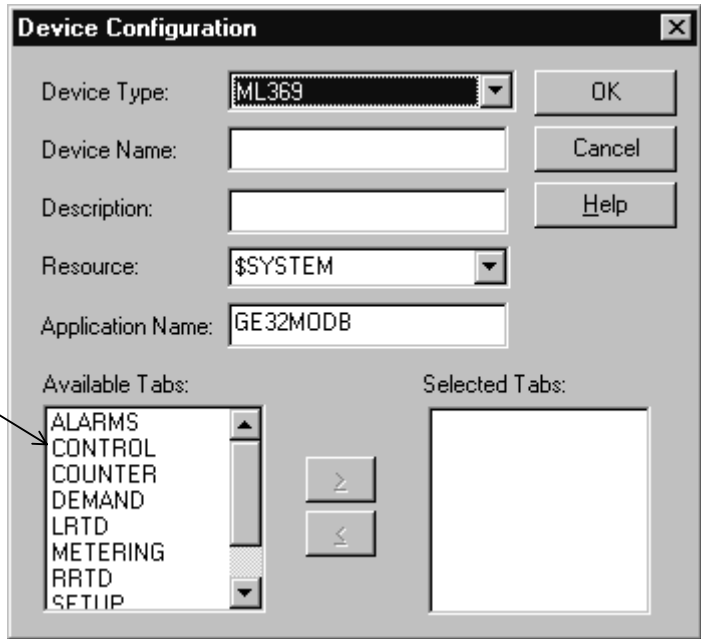
Most PMCS Advanced Wizards share a similar configuration dialog, as shown in the first example below. However, as mentioned above, some more complex device types such as the Universal Relay, Multilin 369, and EPM 7700, require some additional configuration information, and these examples are shown separately.



Device Configuration Dialog - most PMCS Advanced Wizards

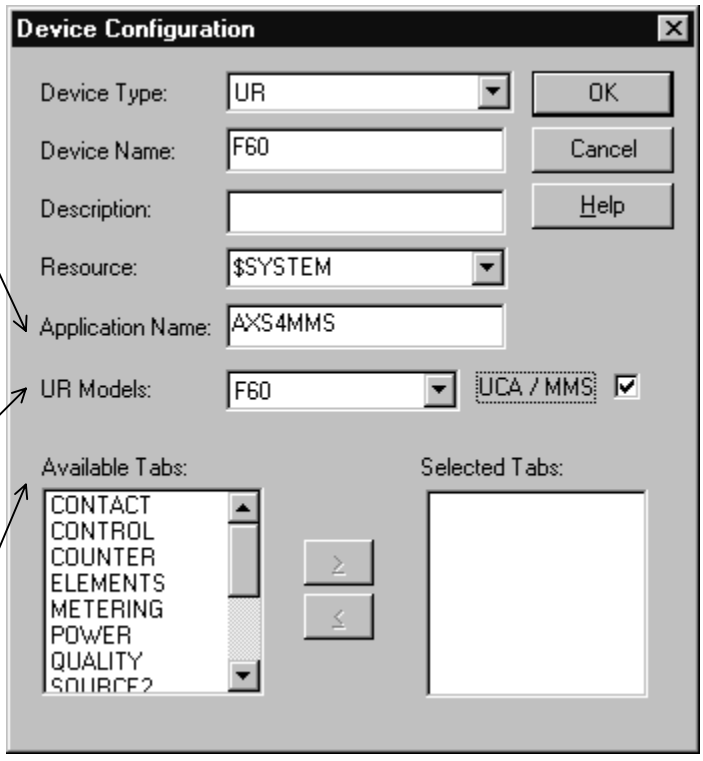


Device Configuration Dialog - EPM 7700



Choose the desired tabs to display on the Wizard, and use the right and left arrow buttons to move the desired tabs from the Available Tabs box to the Selected Tabs box.

Device Configuration Dialog - 369



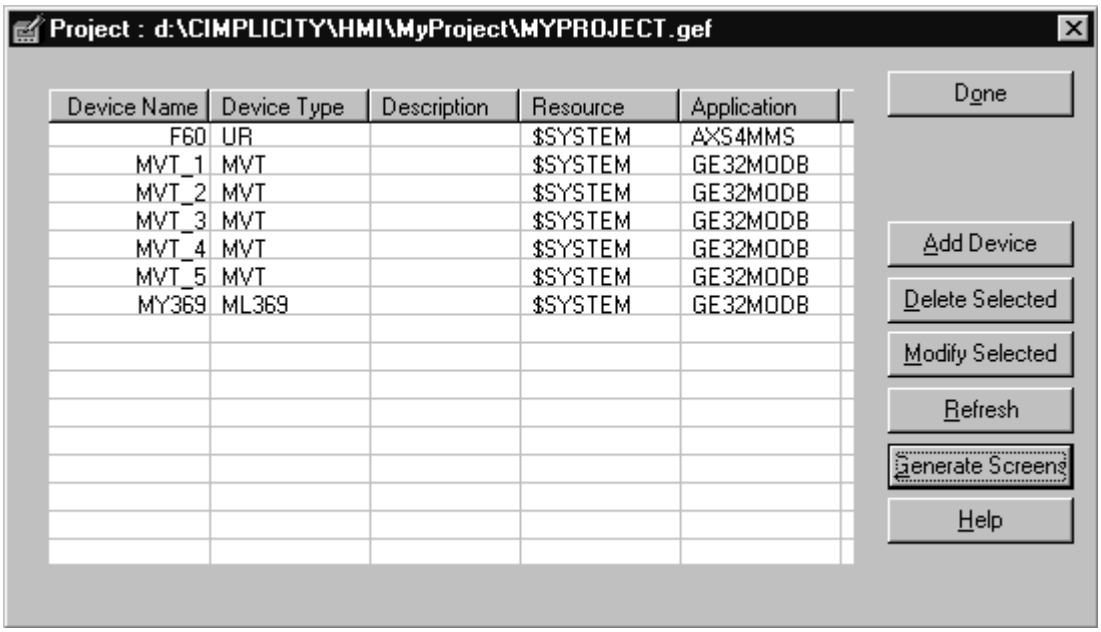
Complete the Application Name field; typically GE32MODB, but if UCA/MMS is selected, enter AXS4MMS or name of MMS Server.

Select the Model of UR which you are configuring. This determines the contents of the Available Tabs list.

Use the right and left arrow buttons to move the highlighted tabs between the Available and Selected Tabs fields.

Device Configuration Dialog - Universal Relay devices

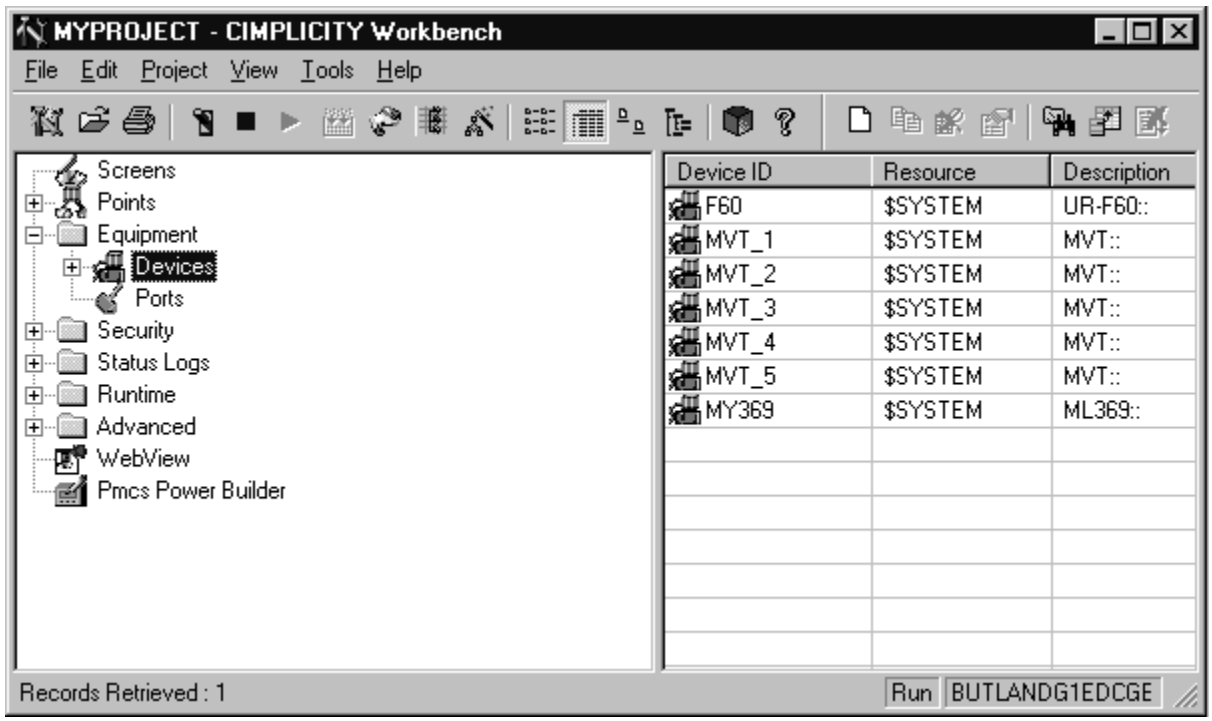
When you have completed the Device Configuration dialog for the selected device, click OK to add the device to the list displayed in the PMCS Power Builder window. In the example below, an F60 model UR, an ML 369, and five MicroVersaTrip devices have been added.



When you are done adding devices, you can generate the screens for all devices in one step by choosing the Generate Screens button. The PMCS Power Builder tool creates one tabular screen per device type and one small faceplate per individual device, following the many-to-one architecture of the PMCS Advanced Wizards.

Note: While PMCS Power Builder can generate screens for most of the PMCS Advanced wizards, there are some exceptions. The Annunciator Panel and the EPM7700 screens are not automatically drawn by PMCS Power Builder, but instead must be created manually after the points are created by PMCS Power Builder. Follow the manual configuration instructions provided elsewhere in this guide to configure the Annunciator Panel and EPM7700 points.

When PowerBuilder has finished generating screens for the configured devices, click the Done button to finish. PowerBuilder has automatically updated the project configuration and started the project for you. You can now browse the devices, points, and screens created for you by PowerBuilder in the Workbench. If you don't see some items, hit the F5 key to refresh the Workbench display.



For the highly-flexible UR and 369 type devices, Power Builder creates a blank "framework" wizard, with no pre-drawn tabs. In CimEdit the wizard will show no tabs - the tabs will be dynamically redrawn based on the physical device being accessed. For example, if you use different models of the Universal Relay in your application, you might need to display a unique set of tabs for each type of relay. With dynamic redraw, you only need a single tabular wizard in your project to show any combination of tabs for any UR device. (The dynamic redraw feature can be disabled; see *Disabling Dynamic Redraw (369 and UR Tabular Wizards)* for details.)

Device Configuration - Special Considerations for EPM 7700 only

The EPM 7700 Device Configuration dialog box contains two extra fields, which must be completed during configuration. The *Node Name* field requires that you enter the name of the computer running the Communications Server that connects to this particular device. Depending on the configuration of the EPM 7700 network, this can be either the Primary node computer, or a computer setup as a "Full Station" Secondary node. Refer to DEH-40035, the *GE 7700 Gateway Users Guide*, and GEH-6514, *PMCS Read This Book First*, for more information on network configuration. The Node Name field is required because the EPM 7700 does not use the same DDE server as the rest of the standard PMCS devices, and the wizard must be directed to the location of the correct Communications Server for proper configuration of DDE topic names.

Also, the *Application Name* field must be completed as ION_LINK rather than GE32MODB or GE32ENET for the EPM 7700 device. The ION LINK program is installed during initial PMCS setup if the EPM 7700 software option is selected.

When configuring Wizards on Secondary nodes, the Application Name field entry does not follow the PMCS wizard convention of "\\RemoteComputer\ION_LINK". EPM 7700 Secondary nodes run a local copy of the ION LINK server, thus the application name for EPM 7700 Large Faceplate wizards is always "ION_LINK" whether the wizard is installed on the Primary node or a Secondary node. The Node Name entry determines if the wizard is on a Secondary node.

The Gateway Name field must be completed with GE77GTWY, the application name of the GE 7700 Gateway Server program. When configuring the EPM 7700 Tabular wizard on a Secondary node, the Gateway Name *does* follow the PMCS wizard convention of "\\RemoteComputer\GE77GTWY" in the Gateway Name field, where 'RemoteComputer' is the name of the PC where the GE 7700 Gateway application is running – the Primary Node. The previous figure shows a Tabular Data Dialog box as it would appear when configuring a Tabular Data wizard on a Secondary node. The Node Name field contains the name of the Primary Node computer, the Application Name field is ION_LINK (as it is for ALL EPM 7700 wizards on ANY node) and the Gateway Name field points to the GE 7700 Gateway Server running on the Primary Node PC.

Refer to DEH-40035 for information on the Communications Server and 7700 Gateway Server.

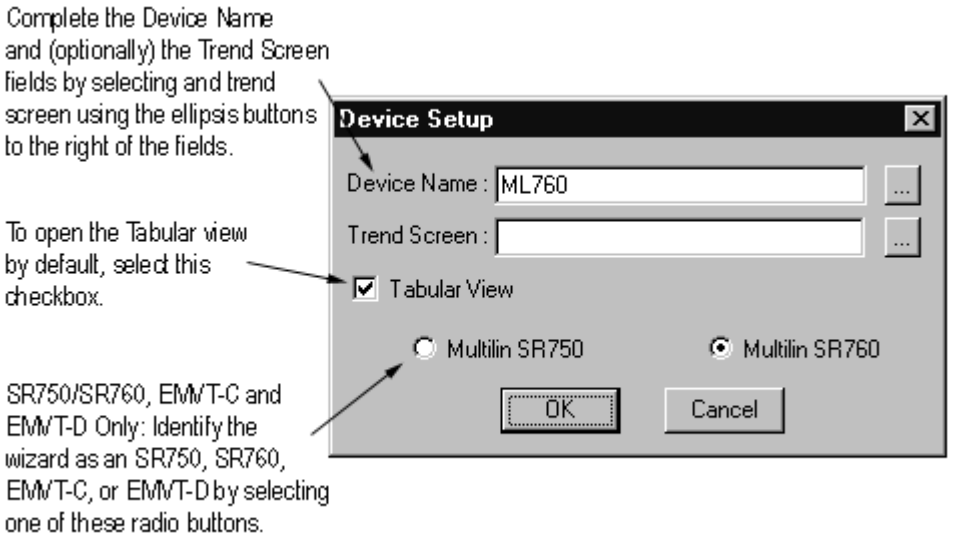
Manually Configuring Wizards without using PMCS Power Builder

This section explains the procedures for manually creating a device graphic wizard. With one exception (the EPM 7700 device type), the Advanced wizards all share the same configuration procedures.

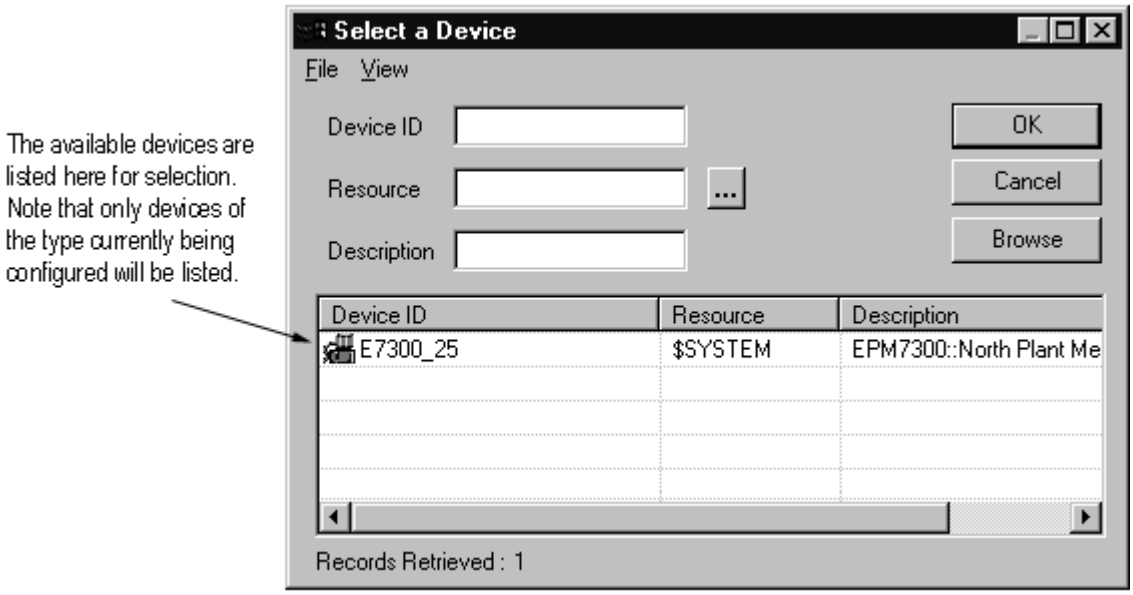
NOTE: If you are configuring an EPM 7700 wizard, skip this section and go to *Manually Configuring the EPM 7700* on page 17, which details this wizard's special requirements.

To configure the device graphics for a PMCS Advanced Wizard:

1. Open a new CimEdit screen.
2. Select a PMCS Advanced Wizard using the Object Explorer and drop it into the new window.
3. Dropping a wizard in the CimEdit screen causes the Device Setup dialog box to appear, as shown below.



4. Choose a default view for the wizard by selecting or deselecting the Tabular View checkbox. If the Tabular View checkbox is selected, the Tabular wizard will be displayed whenever this window is opened. If the Tabular View checkbox is not selected, the Large Faceplate wizard is displayed by default.
5. To complete the Device Name and Trend Screen fields, click the ellipsis button to the right of each of these fields. This button displays a list of the devices available in the project. (If no devices are available, stop and restart the project, then continue; the devices should appear.) The Select Device dialog box is shown in the following figure.



6. Select the appropriate device from the list and click OK.
7. After the wizard is configured, save the window and close it.
8. Once you have configured an Advanced large faceplate/tabular graphic wizard, you have two options. You can continue creating new wizard screens for each physical device in the system, or you can use a single device wizard to view the data of any physical device of that type using the new functionality provided by the Advanced small faceplate wizards. See the *Sample Application* section for more information.

Manually Configuring the EPM 7700 Wizard

The EPM 7700 device type is more complex than the other PMCS Advanced Wizards, and its wizard reflects this. Dropping the EPM 7700 wizard into a project creates eight separate screens, each linked to the others. Another unique property of the EPM 7700 wizard is that the wizard itself is disposable. It is used only for the initial configuration, and should be deleted after configuration is completed. The eight screens created by the wizard are left for run-time use. The procedure for configuring an EPM 7700 wizard is explained below.

Important: Follow the procedure to configure an EPM 7700 carefully - the wizard's configuration should not be altered after it has been dropped. Changing the wizard once it has been dropped requires you to delete the screens and re-create the wizard with the desired properties.

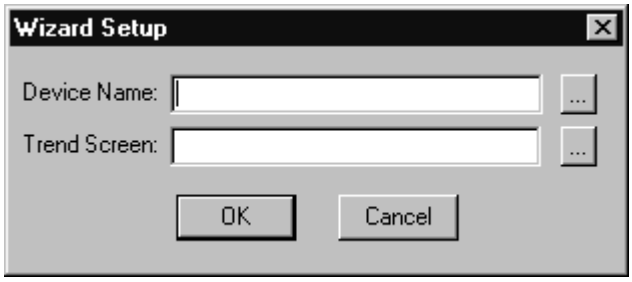
---

1. Open a new CimEdit screen, using the Screens>New command.

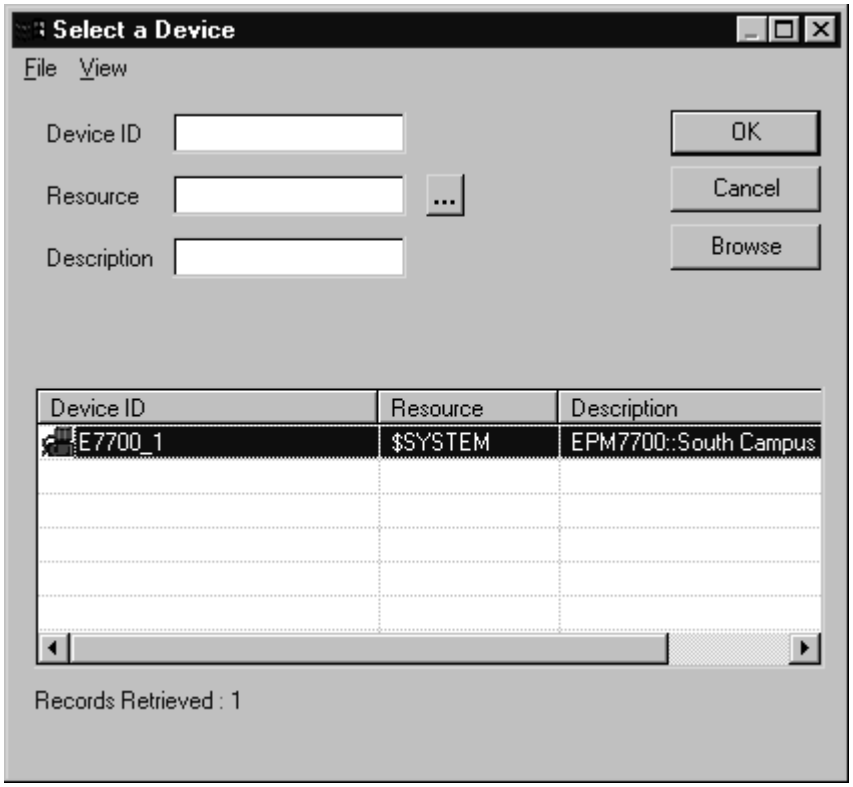
***Tip*:** If you plan to implement a Trend Window, create it before configuring the EPM 7700 wizard, so that it will be available when you configure the device graphics portion of the wizard.

---

2. Select an EPM 7700 wizard using the Object Explorer and drop it into the new window. You may see a warning message about not being able to undo this action - disregard this message.
3. Dropping a wizard in the CimEdit screen causes the Wizard Setup dialog box to appear, as shown below. Note that there is no Tabular View checkbox; because each of the Tabular screens is created independently of one another and the Large Faceplate screen is also an independent screen, you are free to navigate to any desired view. The notion of a default view does not apply to the EPM 7700 wizard.



4. To complete the Device Name and Trend Screen fields, click the ellipsis button to the right of each of these fields, which displays a list of the devices available in the project. (If no devices are available, stop and restart the project, then continue; the devices should appear.) The Select Device dialog box is shown below.

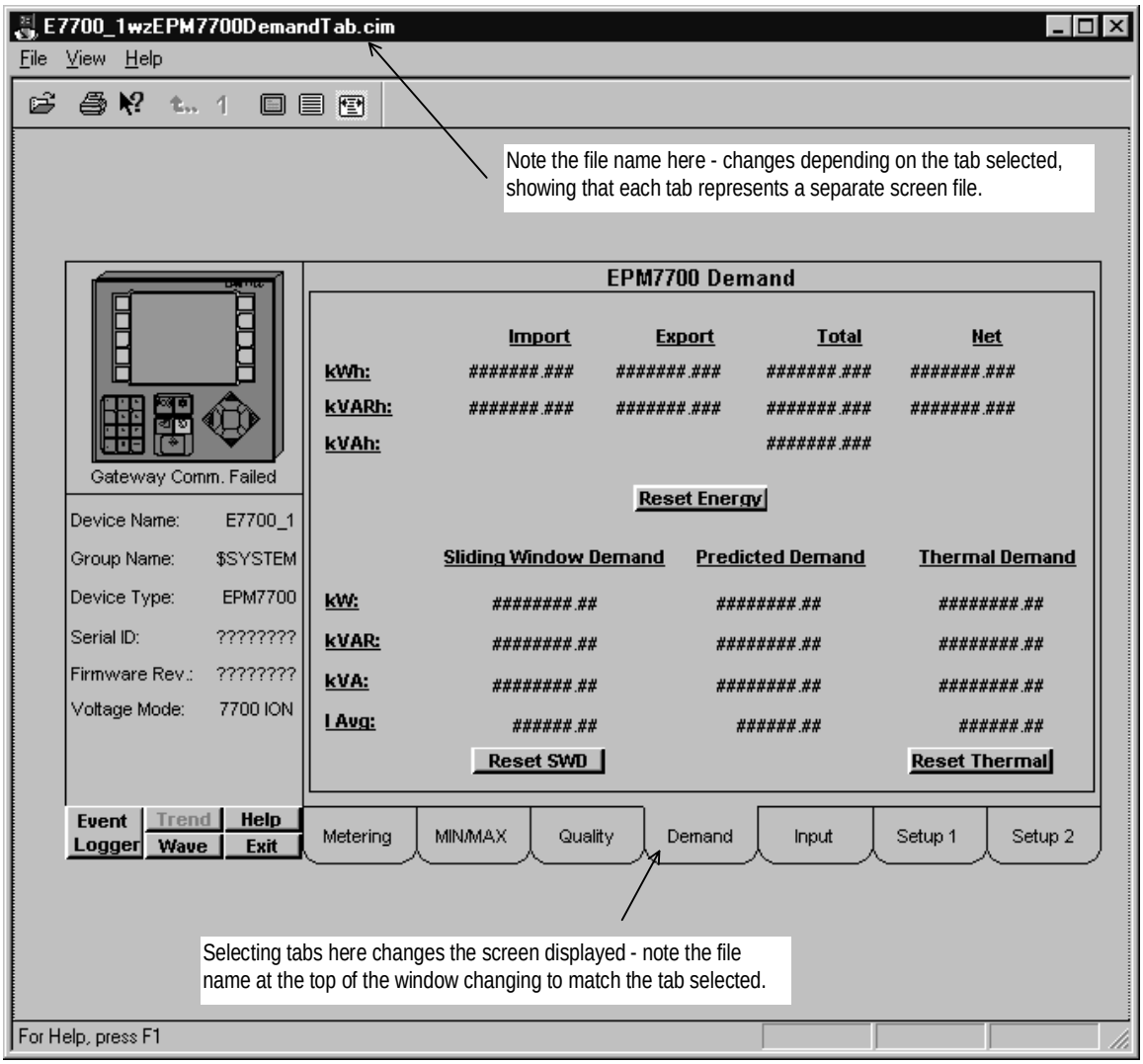


5. Select the appropriate EPM 7700 device from the list and click OK.
6. Select a Trend Window using the trend window list available by clicking the ellipsis to the right of the trend window text box.
7. When the wizard has completed its configuration, close the current window and **DO NOT** save it – it is not a functional part of the wizard, and it cannot be used to create graphics for additional devices. All of the functional wizard screens were created and saved during the configuration process.
8. Stop and restart the project, then hit F5 to refresh the list of screens in the project.

Repeat steps 1 – 8 to create additional EPM 7700 device screens as necessary for your application.

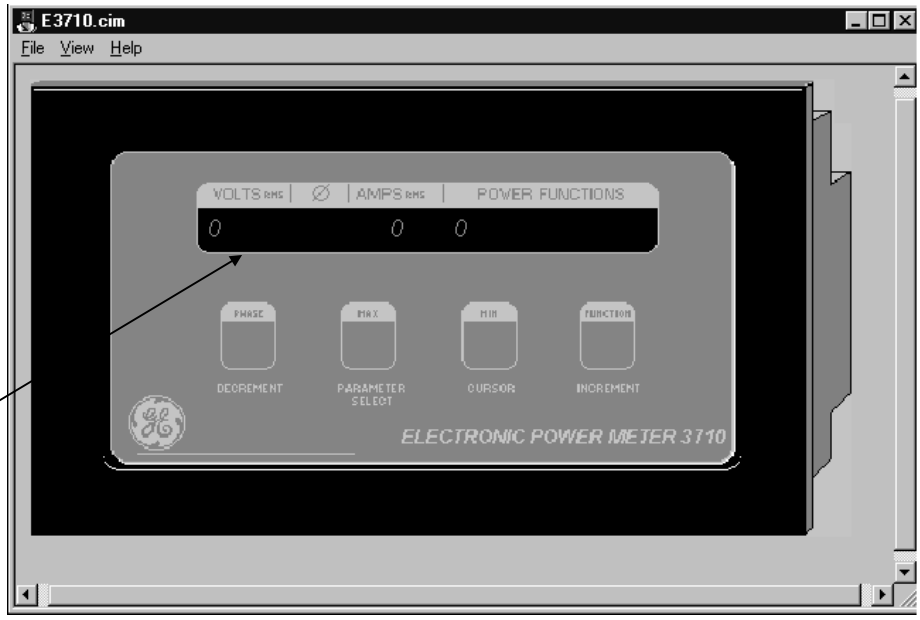
Note: Refer to the *Sample Application* section when designing your project to understand and take advantage of PMCS Advanced Wizard functions such as the many-to-one relationships possible with Advanced Small Faceplate Wizards and Large Faceplate/Tabular Wizards. The configuration techniques available may save considerable development time and effort, especially with regard to the EPM 7700 device type.

The figure below shows the one of the eight Tabular screens resulting from the correct configuration of the EPM 7700 wizard. You can verify that there are in fact eight separate screens rather than multiple pages of a single screen by selecting different tabs at the bottom of the tabular wizard. Observe the file name at the top of the window - the file name will change to match the selected tab.


E7700_1wzEPM7700DemandTab.cim
File View Help
Note the file name here - changes depending on the tab selected, showing that each tab represents a separate screen file.
EPM7700 Demand
Import
Export
Total
Net
kWh:
kVARh:
kVAh:
Reset Energy
Sliding Window Demand
Predicted Demand
Thermal Demand
kW:
kVAR:
kVA:
I Avg:
Reset SWD
Reset Thermal
Gateway Comm. Failed
Device Name: E7700_1
Group Name: $SYSTEM
Device Type: EPM7700
Serial ID: ????????
Firmware Rev.: ????????
Voltage Mode: 7700 ION
Event Logger
Trend
Wave
Help
Exit
Metering
MIN/MAX
Quality
Demand
Input
Setup 1
Setup 2
Selecting tabs here changes the screen displayed - note the file name at the top of the window changing to match the tab selected.
For Help, press F1

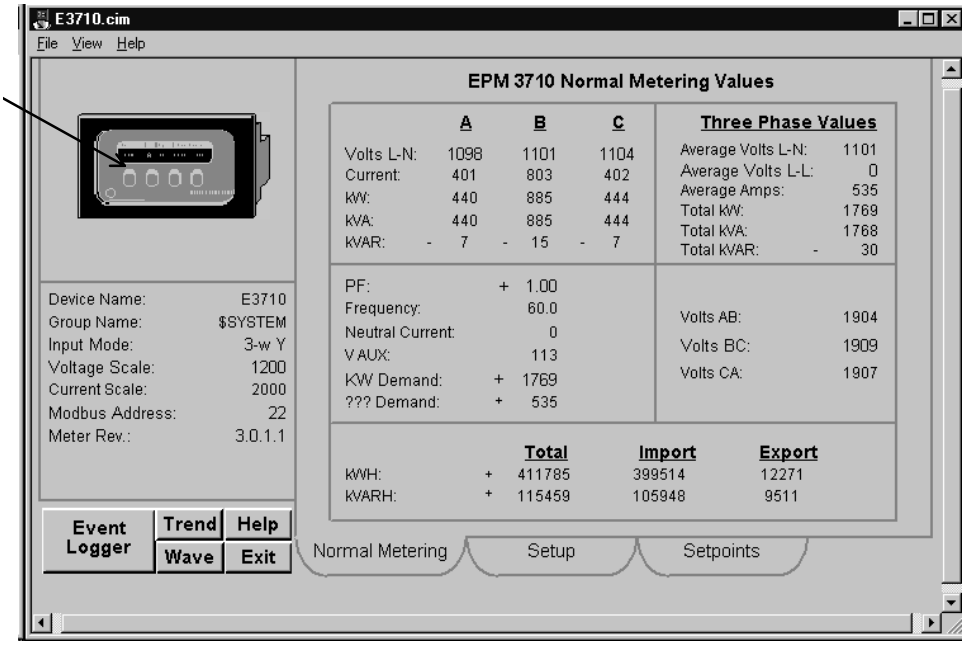
Using a PMCS Wizard

With the wizard configured, you can test it by launching the *.cim screen from Windows Explorer or add it to an existing project. Remember that the PMCS DDE Server must be running before launching the wizard if it is to display real data.



Click the Large Faceplate to open the Tabular Data view.

Click on the device's display in the large faceplate wizard to open the Tabular data screen wizard: Click on the device icon in the tabular wizard to return to the Large Faceplate screen.



Click the faceplate to open the Large Faceplate view.

Sample Application

The scenario described in this section illustrates the integration and time-saving benefits of the PMCS Advanced Wizards.

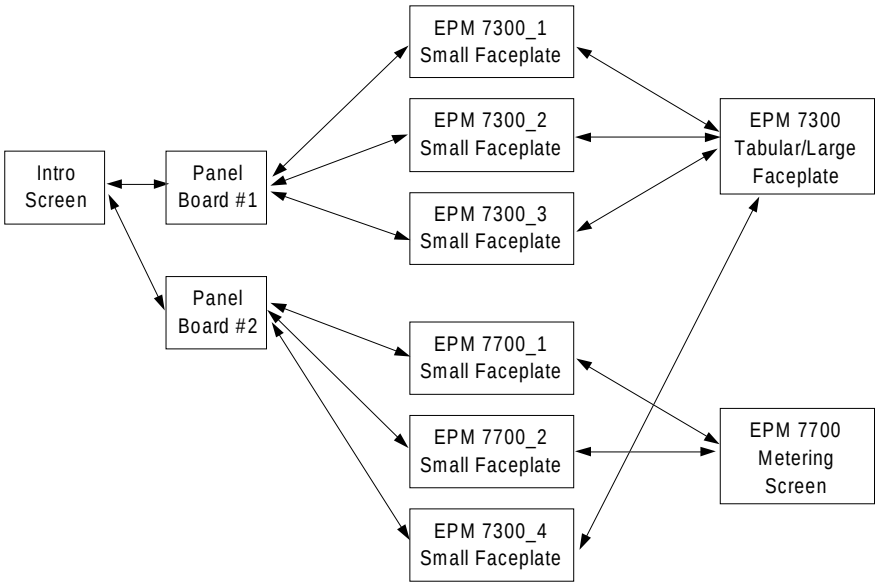
The Small Faceplate wizards are often used to create visually accurate representations of physical equipment line-up. Each Small Faceplate has a one-to-one relationship with not only the physical device, but also the Large Faceplate/Tabular wizard for that device. Clicking the Small Faceplate wizard for a particular device opens a unique Large Faceplate/Tabular wizard associated with the same physical device. We'll call this a one-to-one relationship of Small Faceplate to Large Faceplate/Tabular.

PMCS Advanced Wizards may be used in the standard, one-to-one manner. However, they also support many-to-one configuration. In this scenario, several Small Faceplate wizards of the same device type may all refer to a single Large Faceplate/Tabular wizard. When the user clicks a particular Small Faceplate wizard, the unique device identity information associated with that wizard is passed to the Large Faceplate/Tabular wizard, which displays the data for the requested device.

Thus, with a single Large Faceplate/Tabular wizard, all the devices of a given type may be viewed. The user navigates from the overview to the elevation view, then selects a small faceplate wizard to open the tabular screen. However, instead of configuring many separate tabular screens, only one is required. Obviously, this saves considerable configuration time, as well as saving substantial system memory during runtime. The one drawback of the many-to-one configuration is that since the Small Faceplates all share access to the same Large Faceplate/Tabular wizard, only one device's data may be displayed at a time. To display a Large Faceplate/Tabular screen for multiple PMCS Advanced Wizards at once, they must be configured in the one-to-one manner, sacrificing the configuration time and system memory savings.

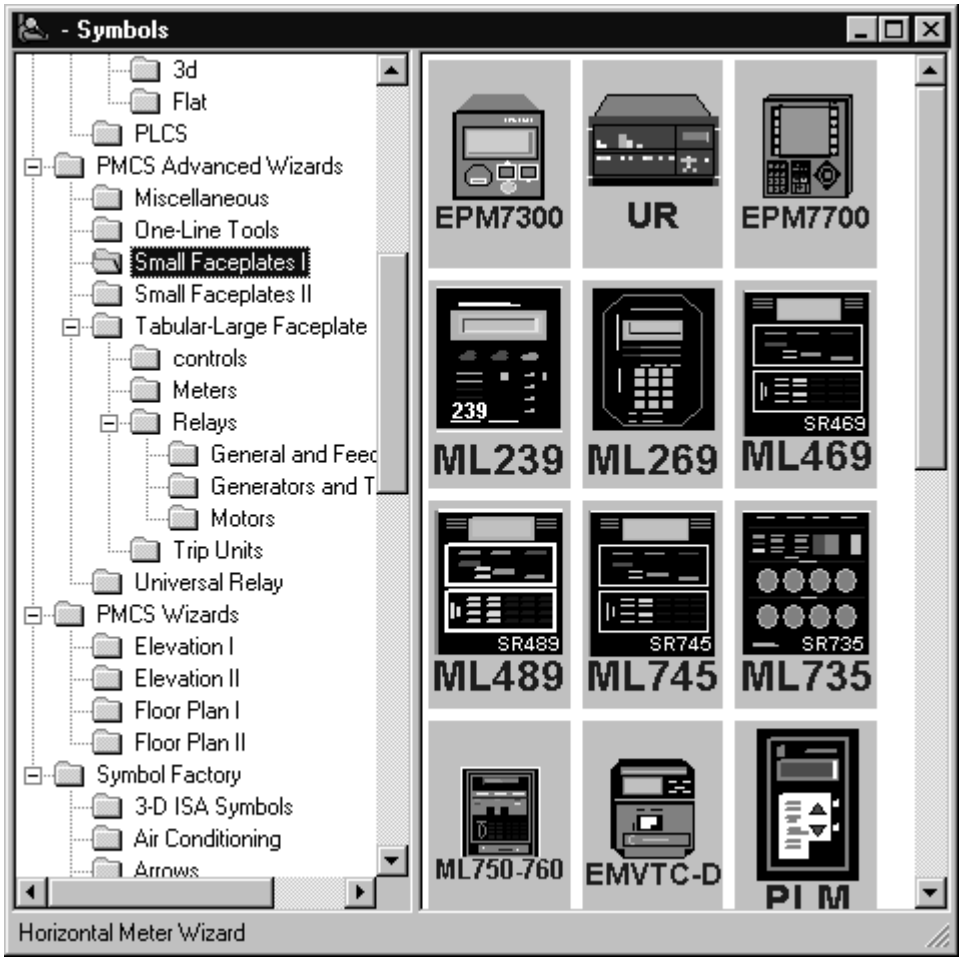
In the following example, the application has an Intro screen, from which the user can access either of two panel boards of equipment. Panel Board #1 is equipped with three EPM 7300 devices, while Panel Board #2 is equipped with two EPM 7700 devices and a single EPM 7300 device. Each device has an individual Small Faceplate Wizard, which provides access to the Large Faceplate/Tabular wizard.

With this architecture, only one Large Faceplate/Tabular wizard must be configured for each device type. Each of the Small Faceplate wizards has access to the appropriate Large Faceplate/Tabular wizard, and when a Small Faceplate wizard is invoked, it passes its identity information to the Large Faceplate/Tabular wizard, which displays the data corresponding to the device associated with the invoked Small Faceplate wizard.



The details of configuring one-to-one or one-to-many are described in *Small Faceplate Configuration* on page 24.

Small Faceplate Wizards



Usage

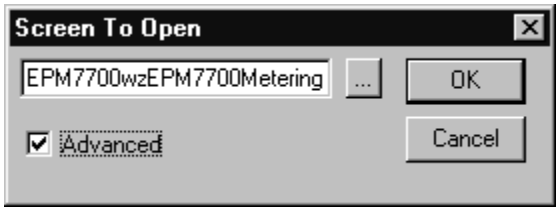
The Small Faceplate wizards are icon-sized graphics typically used to create accurate elevation views and one-line diagrams. These wizards are provided with logic to open another window, typically either a Large Faceplate/Tabular Data Screen wizard. There are several directories of Small Faceplate wizards to choose from.

Small Faceplate Configuration

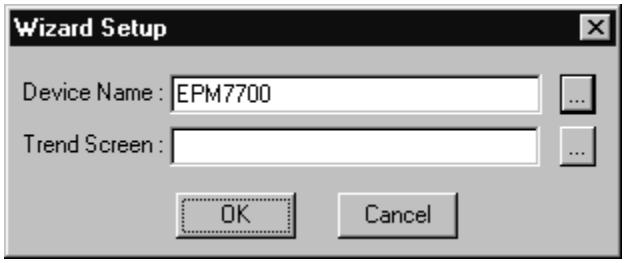
The Small Faceplate wizard for the PMCS Advanced Wizards offers additional functions beyond simply opening a designated window. If you so choose, you may configure a single Large Faceplate/Tabular wizard for each device type, regardless of how many actual devices of that type are installed, and use multiple Small Faceplate wizards to access data on each device. This feature operates by assigning an identity to each Small Faceplate wizard, and passing this identity information to the Large Faceplate/Tabular wizard when the Small Faceplate wizard is selected. The single Large Faceplate/Tabular wizard opens, displaying the data for the selected device.

The many-to-one wizard configuration offers substantial configuration time savings and memory savings, especially for the EPM 7700, where each Large Faceplate/Tabular wizard actually consists of eight separate screens. A minor drawback to this approach is that you may only display the Large Faceplate/Tabular wizard for a single device at a time. To view data on a different Advanced Wizard sharing this Large Faceplate/Tabular screen, you must close the Large Faceplate/Tabular wizard and open it again through the desired device's Small Faceplate wizard.

If you choose to use this many-to-one technique, select the Advanced checkbox in the Wizard Configuration dialog, as shown in the following figure. If the Advanced checkbox is not selected, the Small Faceplate wizard functions like any other Small Faceplate wizard, simply opening the selected screen.



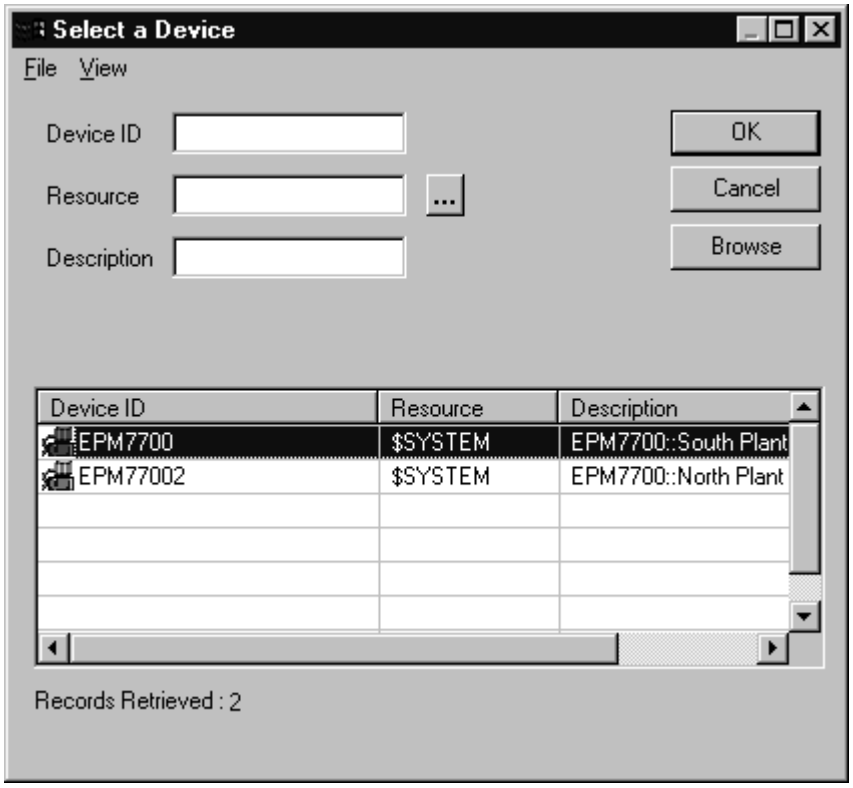
Selecting the OK button in the Screen To Open dialog box, with a device screen selected and the Advanced checkbox selected, displays the Wizard Setup dialog box (shown below), prompting you to choose the identity of the device you wish to associate with this Small Faceplate Wizard.



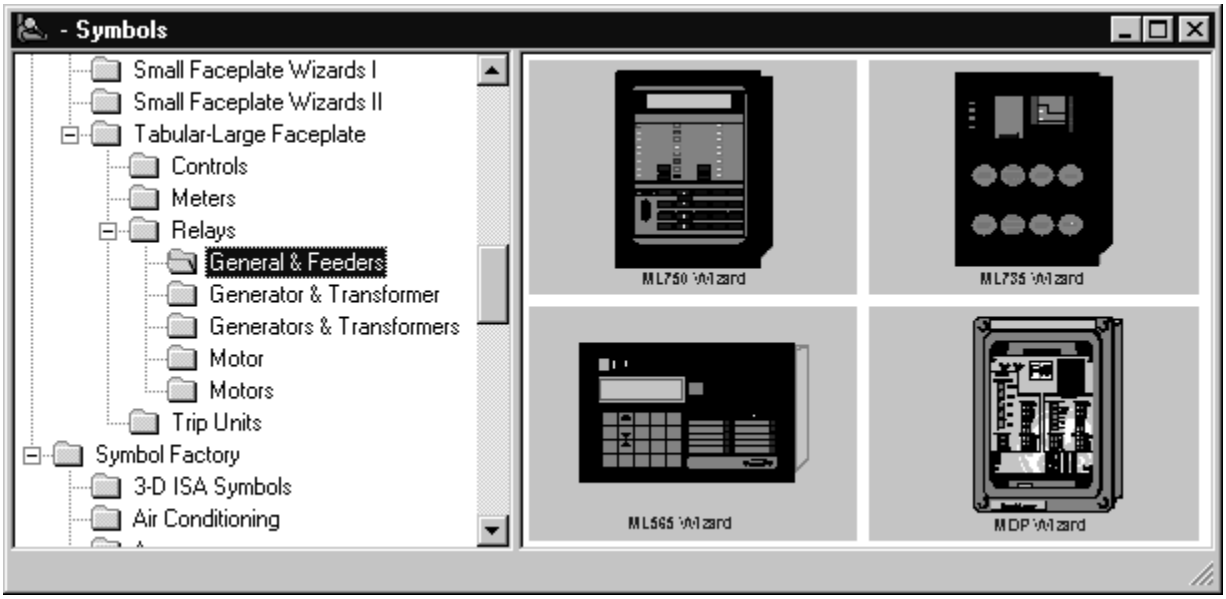
NOTE: If an advanced small faceplate wizard is configured to open a screen that does not contain a graphics wizard of the correct device type, a message similar to the one below will appear and the screen will not be opened.

The displayed graphic resulted when an EPM7300 small faceplate was configured to open a screen containing only an EPM 7700 device graphic wizard.

In the Wizard setup dialog box, use the ellipsis buttons for the Device Name and Trend Screen fields to display the selection dialogs for these items. Choose a Trend Screen if desired, then use the Select a Device window (shown below) to associate an individual device with the Small Faceplate wizard being configured. (The Device ID, Resource and Description fields may be ignored; select the device from the list box in the lower half of the window.)



Large Faceplate/Tabular Wizards



Usage

Large Faceplate/Tabular Data Screen wizards are three-dimensional representations of device faceplates that can be used to display data from the device. These three-dimensional wizards include extensive logic that provides an accurate reproduction of the actual display and keys of the device. Large Faceplate wizards are typically placed in overlay windows.

By clicking on the display of a Large Faceplate wizard, you can display a tabular data screen portion of the wizard. Tabular Data Screen wizards contain organized, comprehensive, tabular layouts of device parameters including additional configuration and remote control features. To make the Tabular Data Screen portion of the wizard display by default, select the Tabular Datasheet checkbox in the configuration window.

You can move and resize Tabular Data Screen wizards as desired.

Special Considerations

The button controls on the 3-D representation emulate the controls of the actual device. This may be useful for reducing software training time for personnel already familiar with device operation.

Each Tabular Data Screen wizard contains buttons for activating the help file, trend window, setup window (if applicable) Event Logger, Waveform Capture, and for closing the window.

Depending on the device, there may be multiple file-tabs beneath the tabular data section. These switch among various pages relating to data and setpoints.

The detailed features of each of the Tabular Data Screen wizards are described in the section titled **Features of Tabular Data Screen Wizards.** The detailed features of

each of the Large Faceplate wizards are described in the section titled **Features of Large Faceplate Wizards.**

Configuration

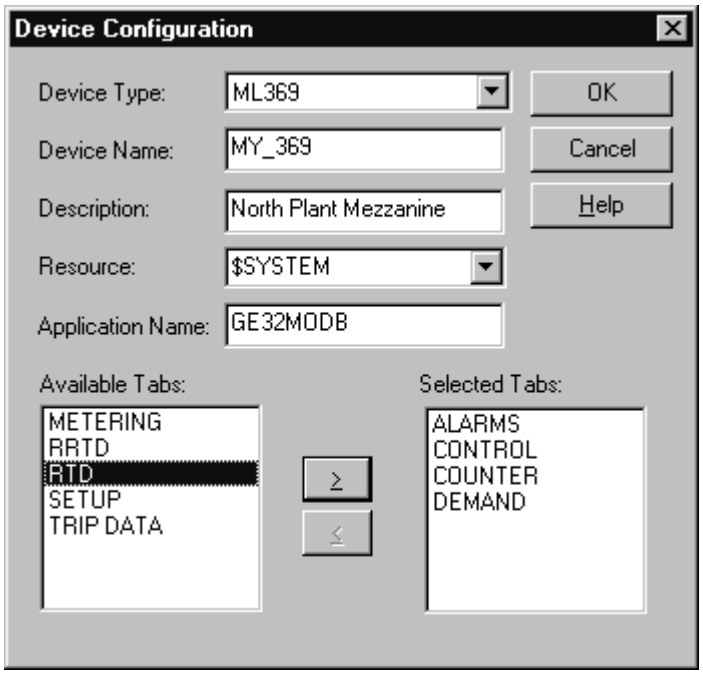
The PMCS Advanced Wizard device types require special configuration for their Large Faceplate/Tabular wizards. See the instructions provided in *Configuring PMCS Advanceds Wizards*, earlier in this chapter, and refer also to the *Sample Application* section, which provides an example of Advanced Wizards in use.

A summary of the Large Faceplate/Tabular wizard configuration procedure is:

1. Configure the Device Points.
2. Stop and restart the project.
3. Configure the Device Graphics.

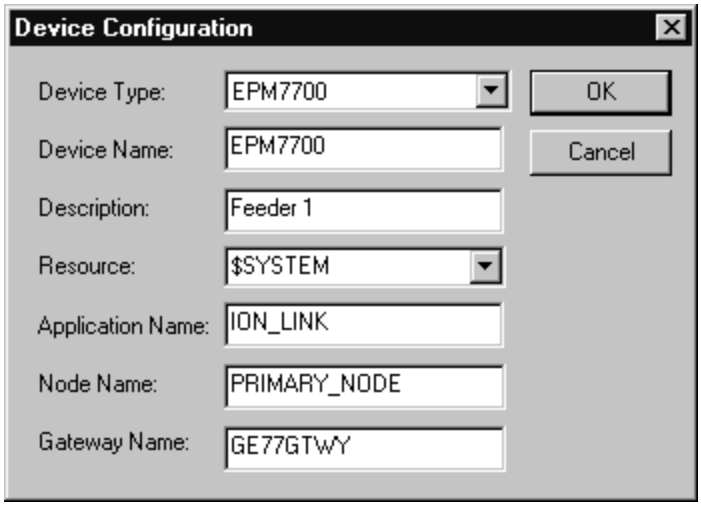
369 Motor Management Relay

The 369 wizard's Device Configuration dialog allows you to customize the appearance of the wizard by selecting only those tabs that display data of interest to you. For example, if you are not using optional Remote RTD accessory units with your 369 you can leave the RRTD tab de-selected. This results in fewer points in the CIMPLICITY database, yielding better performance.



EPM 7700

The EPM 7700 Device Configuration dialog box is slightly different from the other PMCS device types, containing two extra fields and requiring minor differences in configuration. The Device Configuration dialog for the EPM 7700 is shown below, followed by the special configuration requirements.

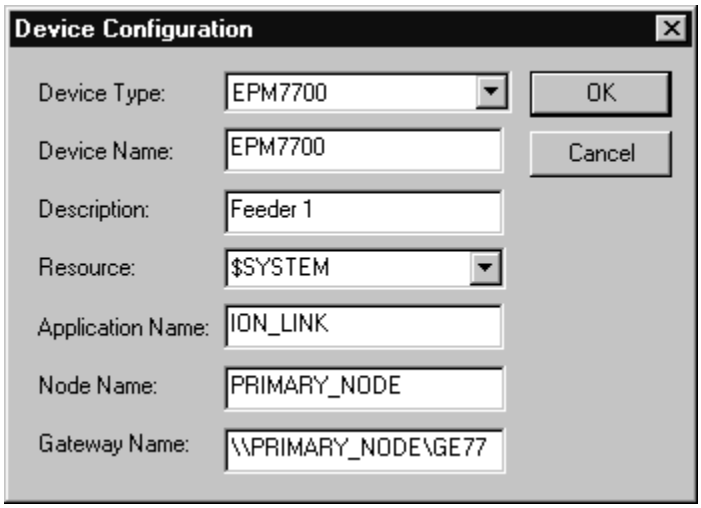


The *Node Name* field requires that you enter the name of the computer running the Communications Server that connects to this particular device. Depending on the configuration of the EPM 7700 network, this can be either the Primary node computer, or a computer setup as a "Full Station" Secondary node. Refer to DEH-40035, the *GE 7700 Gateway Users Guide*, and GEH-6514, *PMCS Read This Book First*, for more information on network configuration. The *Node Name* field is required because the EPM 7700 does not use the same DDE server as the rest of the standard PMCS devices, and the wizard must be directed to the location of the correct Communications Server for proper configuration of DDE topic names.

Also, the Application Name field must be completed as ION_LINK rather than GE32MODB or GE32ENET for the EPM 7700 device. The ION LINK program is installed during initial PMCS setup if the EPM 7700 software option is selected.

When configuring Wizards on Secondary nodes, the Application Name field entry does not follow the PMCS wizard convention of "\\RemoteComputer\ION_LINK". EPM 7700 Secondary nodes run a local copy of the ION LINK server, thus the application name for EPM 7700 Tabular Data Wizards is always "ION_LINK" whether the wizard is installed on the Primary node or a Secondary node. The Node Name entry determines if the wizard is on a Secondary node.

The Gateway Name field must be completed with GE77GTWY, the application name of the GE 7700 Gateway Server program. When configuring the EPM 7700 Tabular wizard on a Secondary node, the Gateway Name *does* follow the PMCS wizard convention of "\\RemoteComputer\GE77GTWY" in the Gateway Name field, where 'RemoteComputer' is the name of the PC where the GE 7700 Gateway application is running – the Primary Node. The following example shows a Device Configuration Dialog box as it would appear when configuring a Tabular Data wizard on a Secondary node. The Node Name field contains the name of the Primary Node computer, the Application Name field is ION_LINK (as it is for ALL EPM 7700 wizards on ANY node) and the Gateway Name field points to the GE 7700 Gateway Server running on the Primary Node PC.

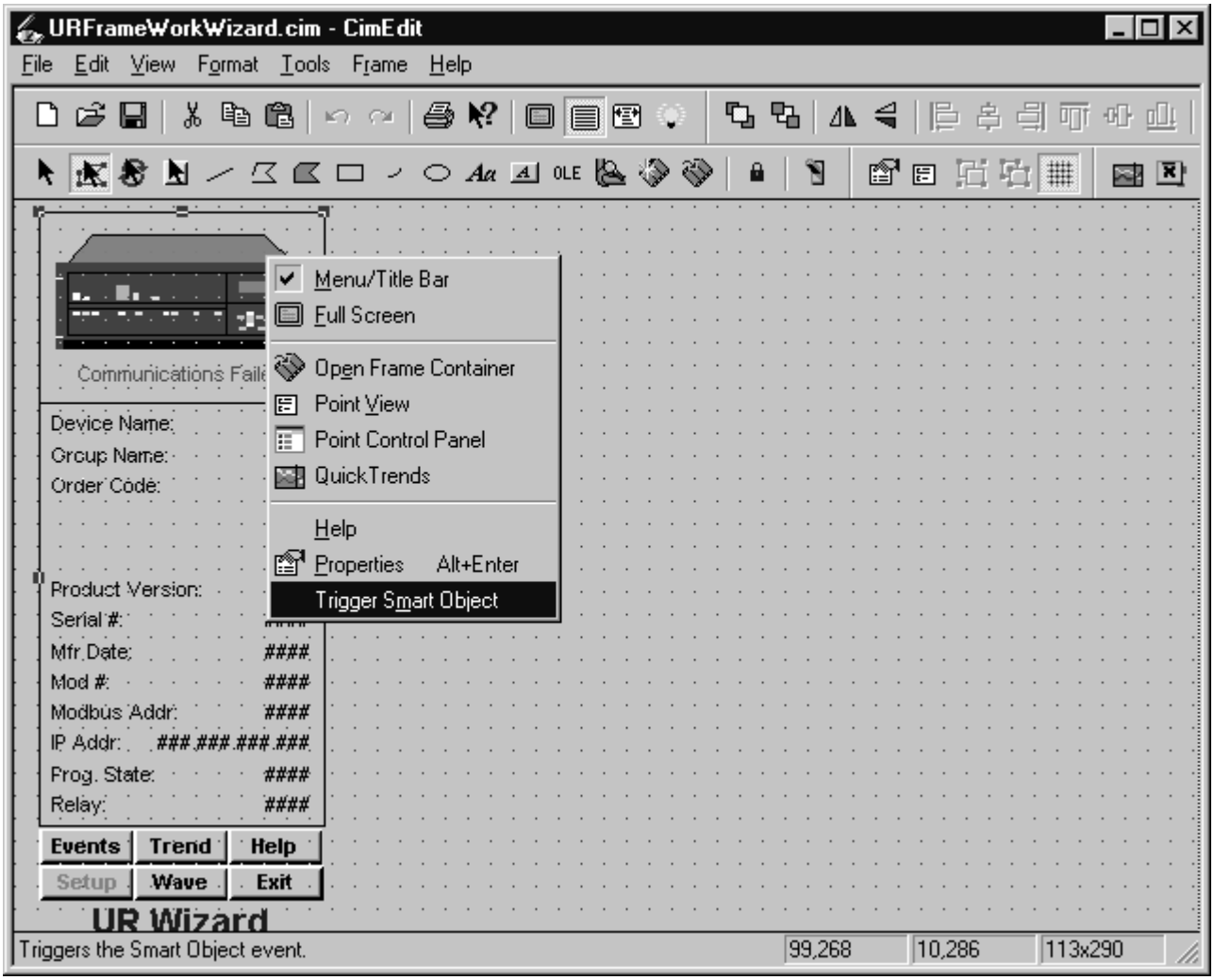


Refer to DEH-40035 for information on the Communications Server and 7700 Gateway Server.

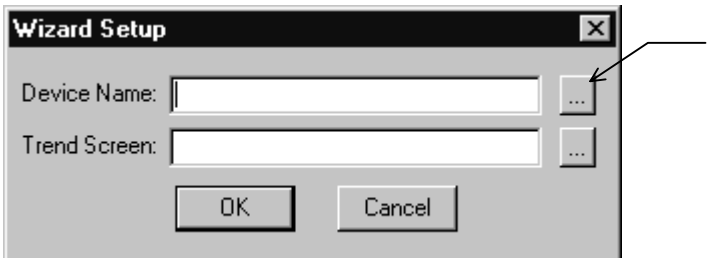
Disabling Dynamic Redraw (369 and UR Tabular Wizards)

As described earlier, UR and 369 type devices are highly flexible, and are typically redrawn on-the-fly by CIMPLICITY, rather than having a static set of tabs. For these devices, Power Builder creates a blank "framework" wizard, with no pre-drawn tabs. In CimEdit the wizard will show no tabs - the tabs will be dynamically redrawn based on the physical device being accessed. For example, if you use different models of the Universal Relay in your application, you might need to display a unique set of tabs for each type of relay. Dynamic redraw permits you to use a single tabular wizard to show any combination of tabs for any UR device.

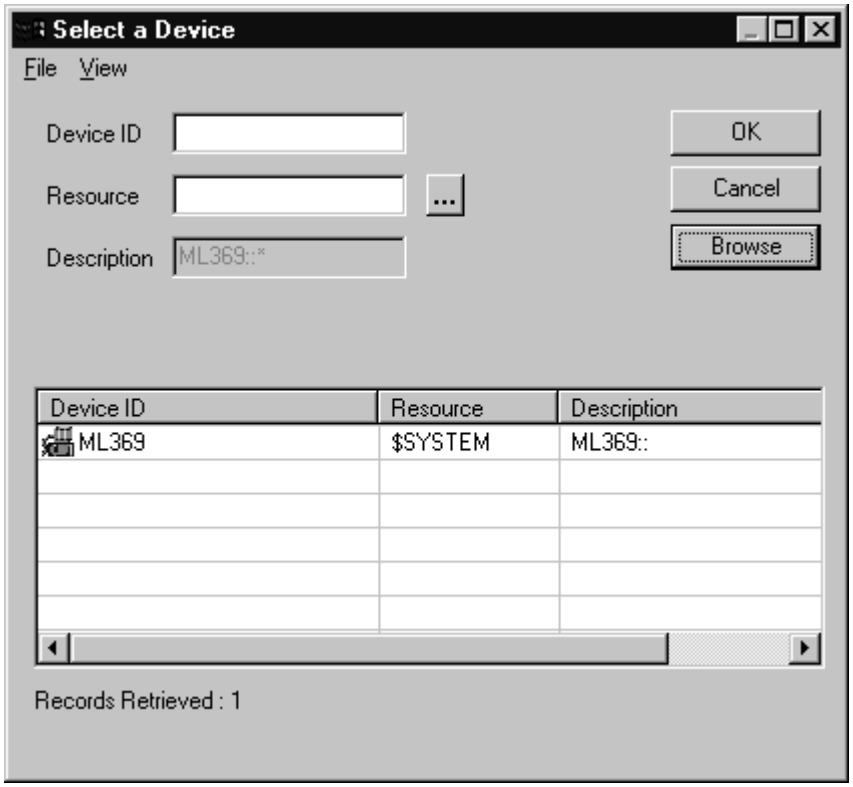
If for some reason you do not want to have the screen redraw itself, simply reconfigure the blank framework wizard. In CimEdit, open the framework wizard screen for the UR or 369 device. Right-click on the wizard graphic, and from the contextual menu displayed, choose "Trigger Smart Object," as shown in the following screenshot:



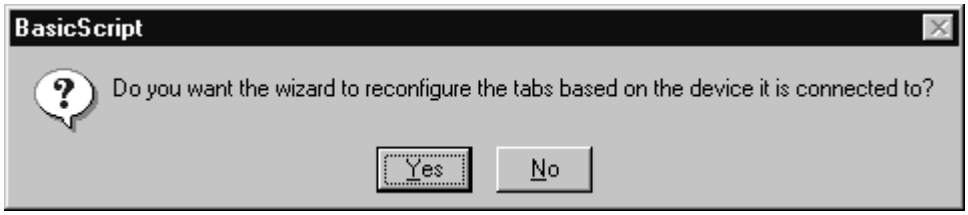
The Wizard Setup dialog appears, prompting you to select a device:



Click the Browse button (the ellipsis to the right of the Device Name field) to display a list of the devices you've already configured:



Select a device from the displayed list and click OK, then click OK again to accept the device you've selected. The following message appears:



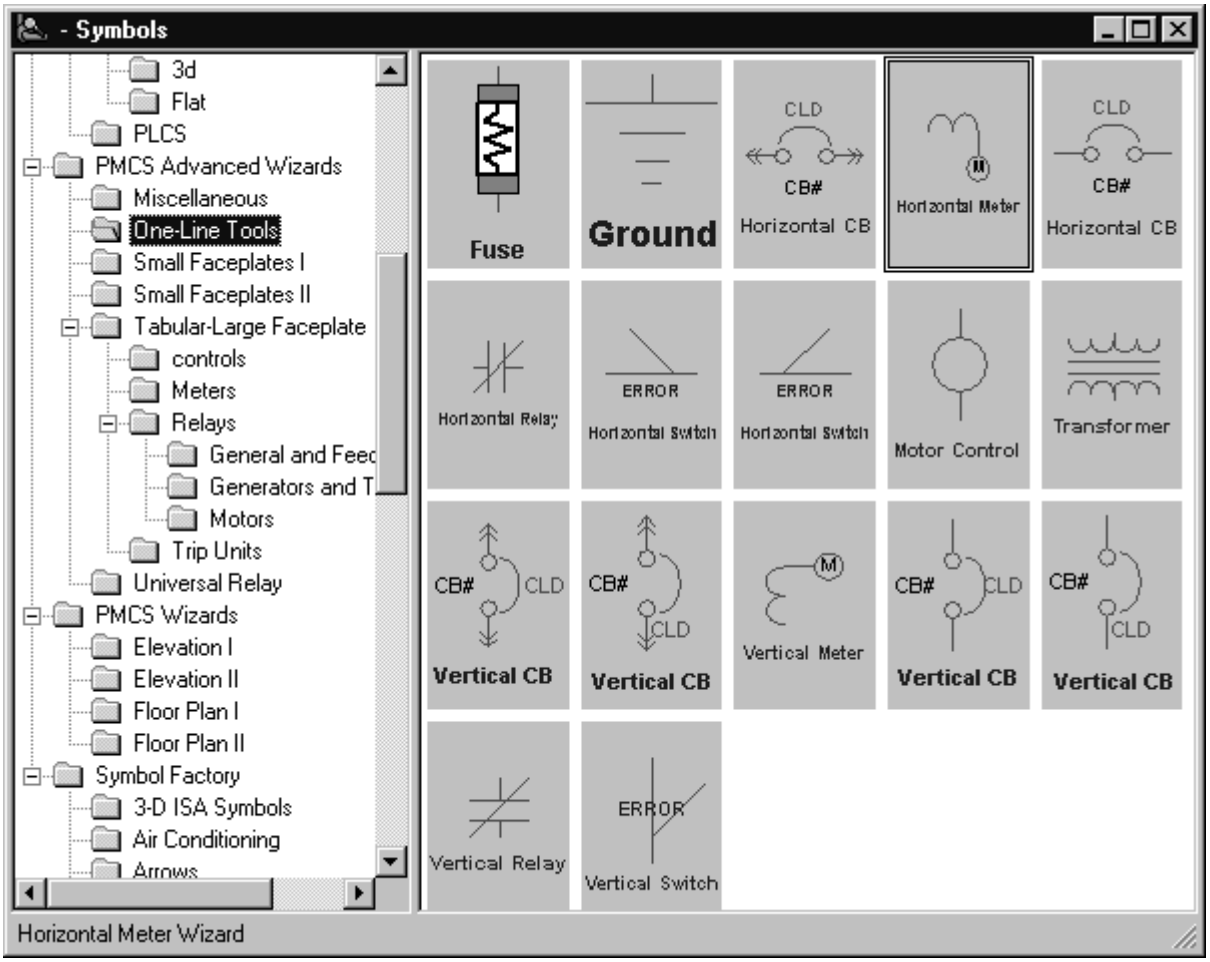
Choosing NO will cause the wizard to be redrawn once with the tabs specified for the selected device. The wizard's configuration is then fixed – it will function like a conventional wizard, displaying the configured tabs as soon as the window opens, without redrawing them. This way you can place one framework wizard into your project for each distinct flavor of 369 or UR device type you intend to use. For example, if you have two F60 UR devices, and a C30 UR device you could create two different UR framework wizards. The two F60 UR's can share a wizard since they display identical information. The C30 requires its own tabular wizard since its tab panel displays will not match the F60s. Once the various unique tabular wizards are created, modify the small faceplates created by Power Builder so that the small faceplates point to the correct tabular wizard screen.

After generating the screens and updating the configuration, small faceplates can then be taken from the MainMenu.cim file and placed in other screens such as switchgear elevations. These Small Faceplates act as device-specific front ends or links into the appropriate Tabular wizard screen. Each device you added with PMCS Power Builder is represented by its own Small Faceplate, but each class of device share a single Tabular wizard. In the sample application described earlier, five MVT small faceplates are generated, but only a single MVT Tabular Wizard. When a

specific MVT small faceplate is selected at runtime, its identity information is passed to the shared Tabular wizard, which recognizes which device is being selected and displays the data for that individual device. This many-to-one sharing of Tabular wizards provides a tremendous savings of system resources and dramatically increases performance. However, as has been discussed, the Universal Relay and 369 devices are highly flexible and may represent different models of physical devices, so the Tabular Wizard must be dynamically redrawn based on the nature of the selected device. This may result in momentary delays in the display of data as the dynamic redraw occurs.

You can still create individual device wizards independent of the many-to-one architecture. Creating individual device wizards by dropping a single wizard into a project without the use of PMCS Power Builder allows you to avoid the dynamic redraw case for UR and 369 device types, but requires additional system resources. This tradeoff must be evaluated on a case-by-case basis depending on the nature of the project being developed.

One-Line Wizards



Usage

You can use one-line wizards to create animated one-line diagrams that represent an electrical schematic of the devices monitored by the software. These wizards are provided with logic to either open another window or display device status.

One-Line wizards are divided into five functional groups according to the type of animation:

- Horizontal and Vertical Meter wizards display another window, such as a 3-D faceplate.
- Transformer, Fuse, Ground Symbol, and Motor Symbol wizards have a discrete color-change animation indicating the On/Off state of the device.
- Horizontal and Vertical Relay wizards also have discrete color-change animation indicating the On/Off state of the device.

- Horizontal and Vertical Switch wizards have four discrete animations; two are color changes indicating the On/Off state of the device and two are used for a three-state display (Open, Closed, and Error conditions).
- Circuit Breaker wizards have two discrete color-change animations for On/Off status display and one analog animation for a five-state display (Open, Closed, Out, Trip, and Error conditions).

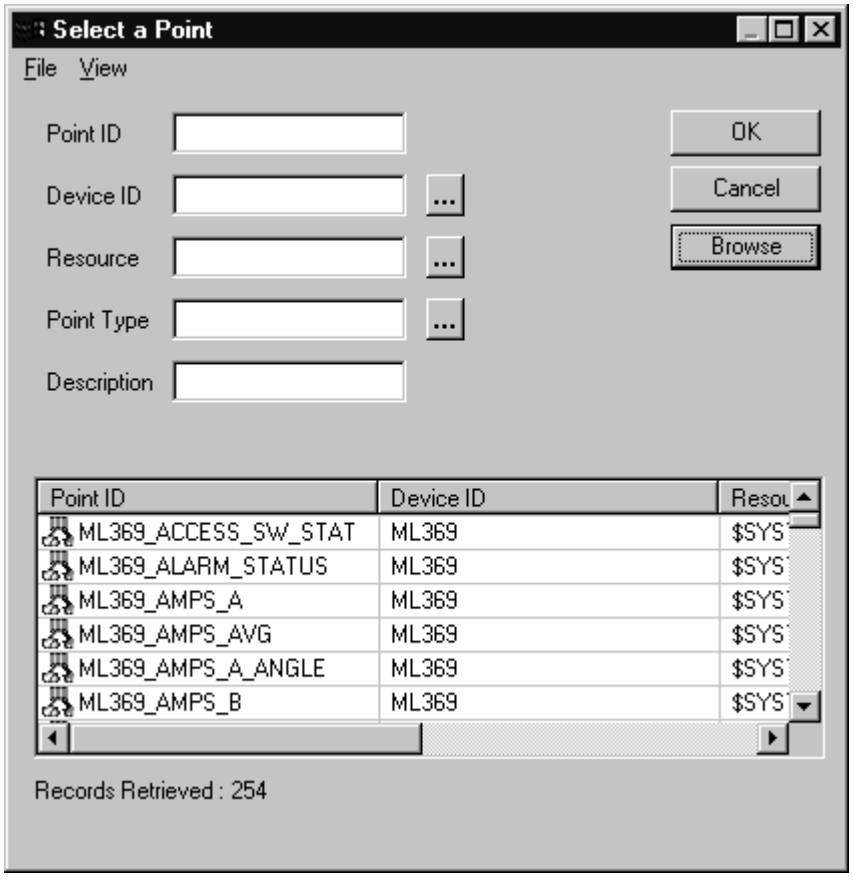
Configuration

In development mode, drag the one-line icon from the symbols dialog to your CimEdit screen. The wizard's Control Properties dialog will open automatically.

The following sub-sections describe the control properties dialog boxes for the various types of one-line wizards. Complete the fields shown, then choose OK.

All one-line wizards have three configuration items in common:

- `Line Width` is a number that sets the pixel width of the lines in the wizard.
- `Size` configuration consists of three radio buttons (`Small`, `Medium`, and `Large`) that determine the overall size of the wizard on the screen.
- The browse buttons ("…") allow you to select an individual point for a particular device from the **Browsing Points** window:

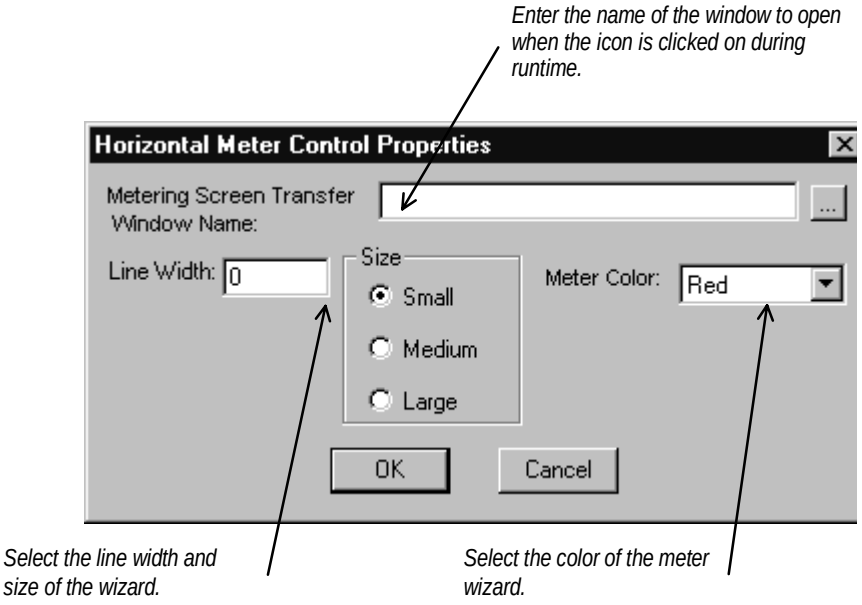


Use the snap-to-grid feature in CIMPLICITY to quickly align One-Line wizards.

Configuration of each of the five classes of One-Line wizards is described in the following section.

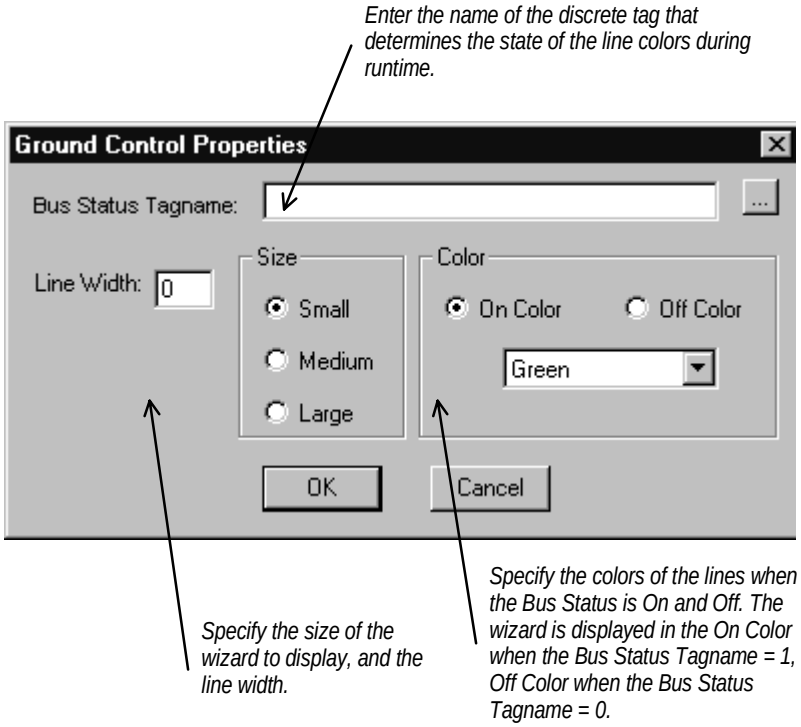
Meter One-Line Wizards

After placing a meter wizard in a window, double-click on it to display the dialog box shown below. Configure the wizard by entering the appropriate information into each of the boxes.

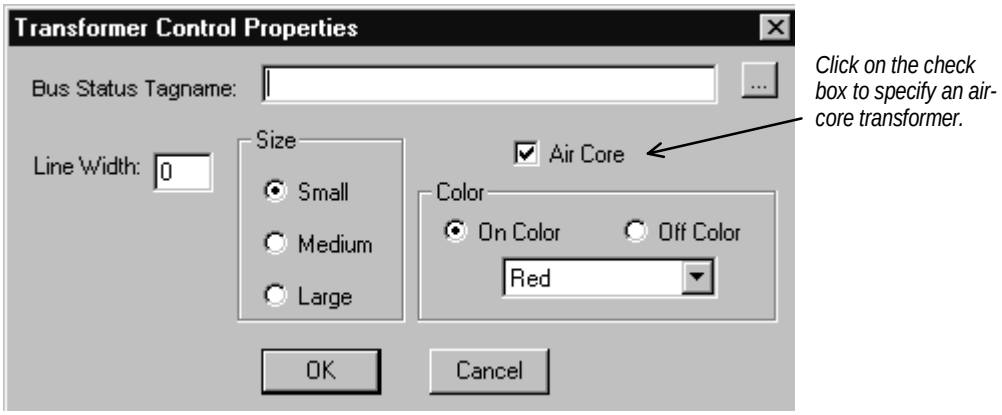


Transformer, Fuse, Ground, and Motor One-Line Wizards

After placing a Fuse, Ground, or Motor wizard in a window, double-click on it to display the dialog box shown below. Configure the wizard by entering the appropriate information into each of the boxes.

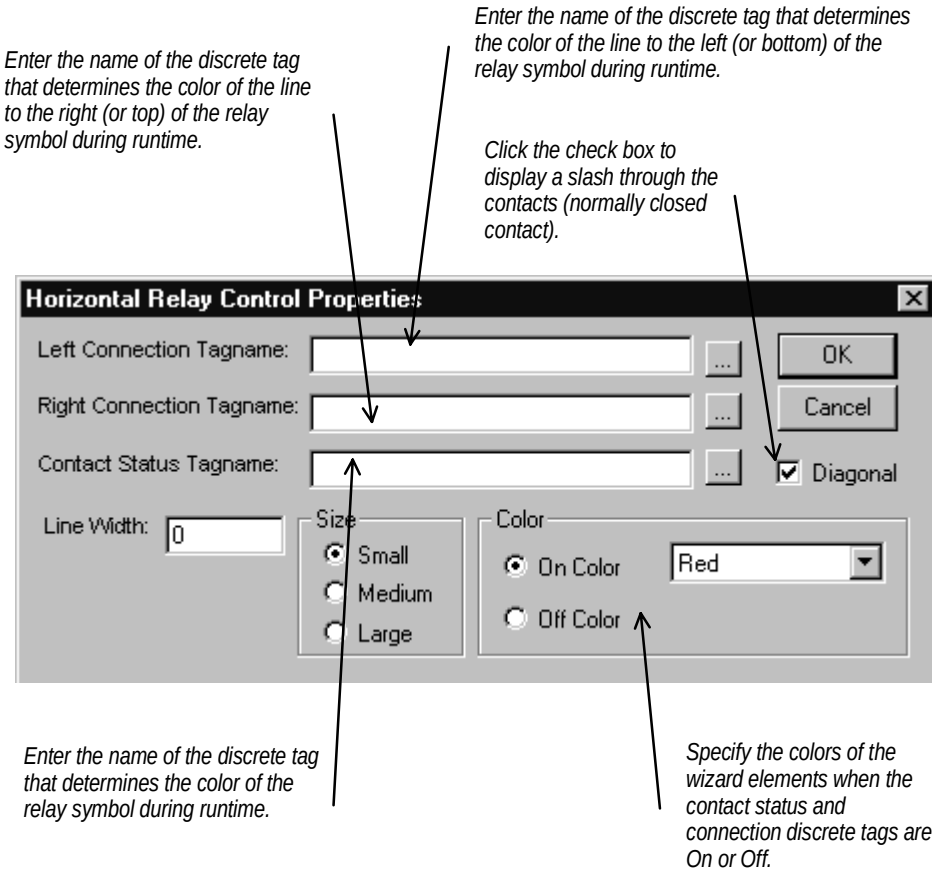


The dialog box for the Transformer wizard has an extra check box that specifies either an air-core or iron-core transformer, as shown below.



Horizontal and Vertical Relay One-Line Wizards

After placing a Horizontal or Vertical Relay wizard in a window, double-click on it to display the dialog box shown below. Configure the wizard by entering the appropriate information into each of the boxes.



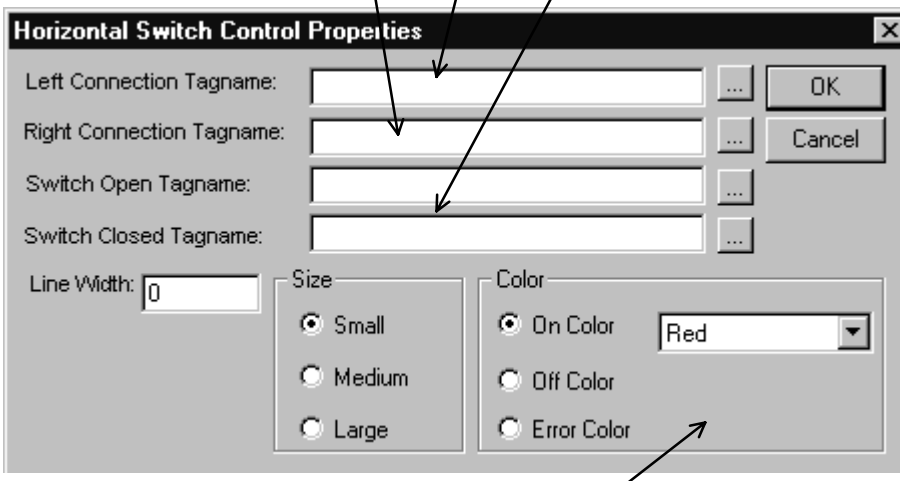
Horizontal and Vertical Switch One-Line Wizards

After placing a Horizontal or Vertical Switch wizard in a window, double-click on it to display the dialog box shown below. Configure the wizard by entering the appropriate information into each of the boxes.

Enter the name of the discrete tag that determines the color of the line to the right (or top) of the switch symbol during runtime.

Enter the name of the discrete tag that determines the color of the line to the left (or bottom) of the switch symbol during runtime.

Enter the names of the discrete tags that determine the state of the switch during runtime.

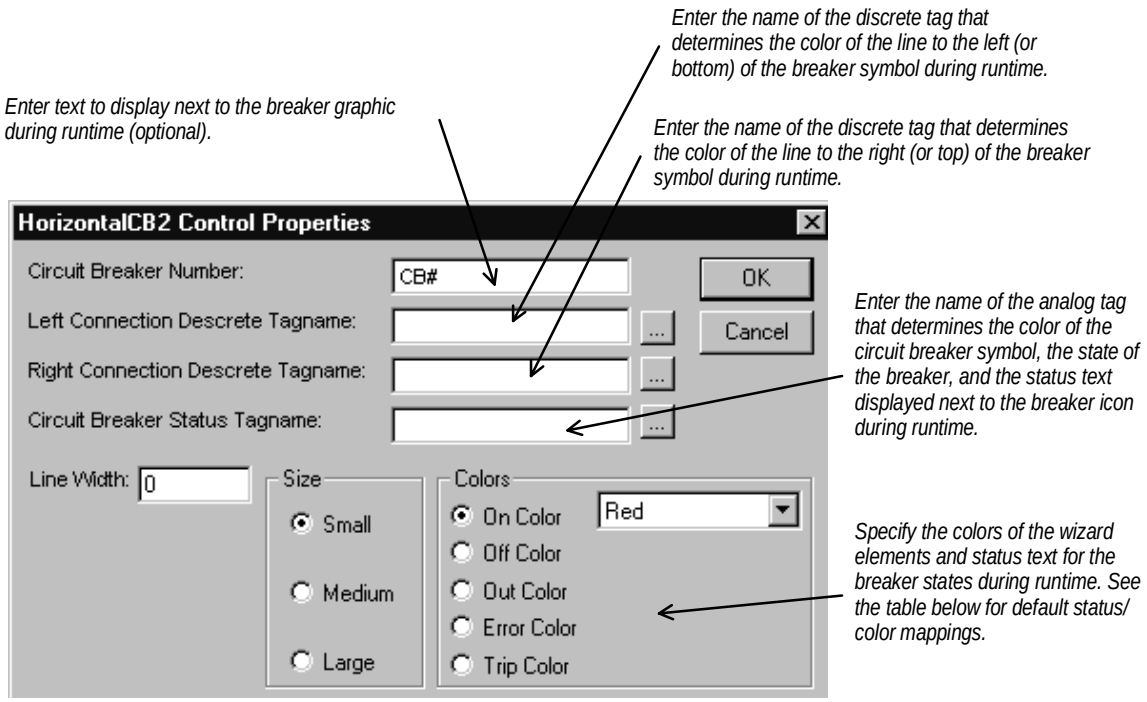


Specify the colors of the wizard elements when the connection and switch discrete tags are On and Off and when there is an Error condition. The switch symbol color is determined by the following logic:

SwOpen	*SwClosed*	*Color*
0	*0*	*error*
0	*1*	*on*
1	*0*	*off*
1	*1*	*error*

Circuit Breaker One-Line Wizards

After placing a Horizontal or Vertical Circuit Breaker wizard in a window, double-click on it to display the dialog box shown below. Configure the wizard by entering the appropriate information into each of the boxes.

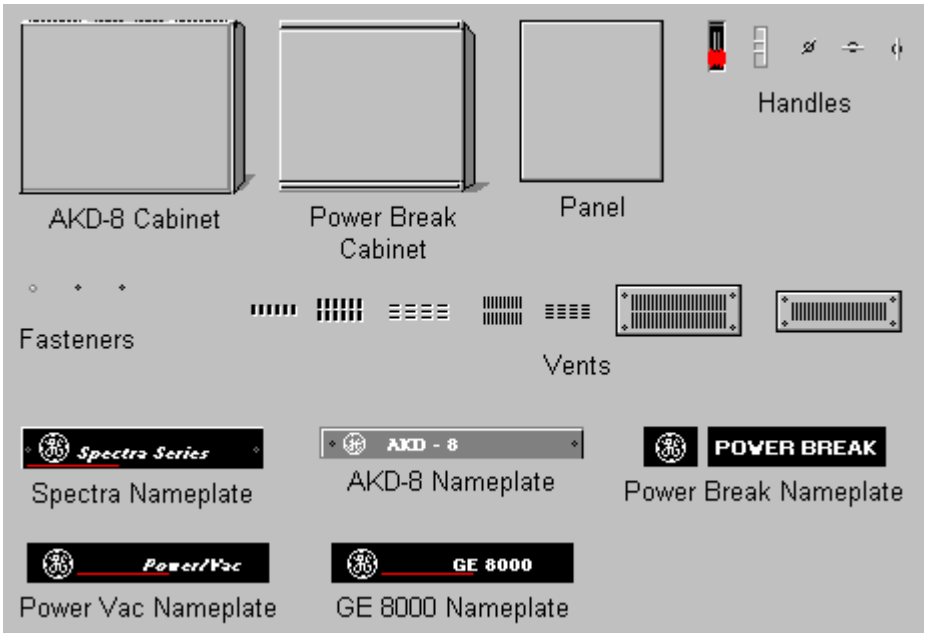


The breaker status values and the associated default colors are listed in the table below. Error status indicates that the breaker status inputs create an indeterminate state for the breaker.

Breaker Status	Value	Text	Default Color
Open	1	OPN	Green
Closed	3	CLD	Red
Drawn Out	5	OUT	Green
Tripped	7	TRP	Yellow
Error	9	ERR	Flashing Red

Breaker status values & display colors.

Elevation Wizards



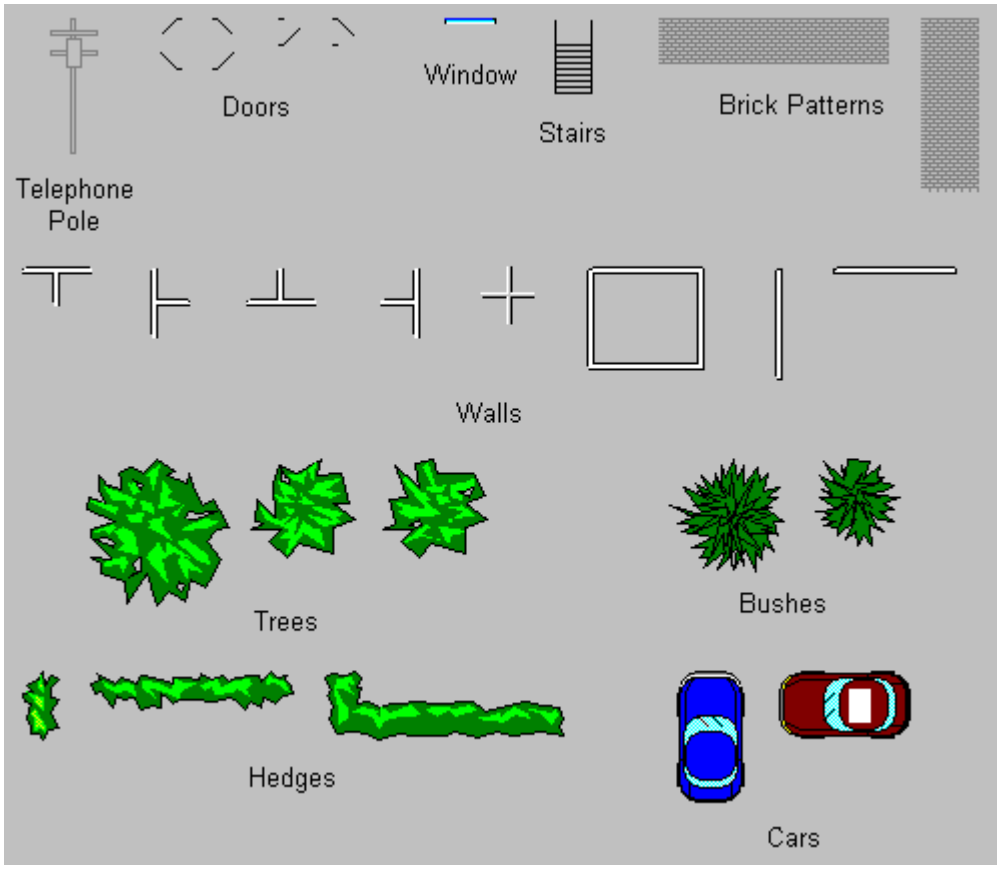
Usage

Elevation wizards are graphical elements that represent switchgear components useful for creating 3-D elevation views. These wizards are not associated with any logic or animation, but are provided to create more visually accurate screens and representations of equipment. Device icon wizards are typically placed on the Elevation wizards to show the breakers, trip units, and meters and provide navigation to device 3-D wizards, tabular displays, or arbitrary windows.

Configuration

After placing an Elevation wizard in an open window, it may be moved or resized, but no other configuration is possible. Elevation wizards are not provided with logic for opening another window.

Floor Plan Wizards



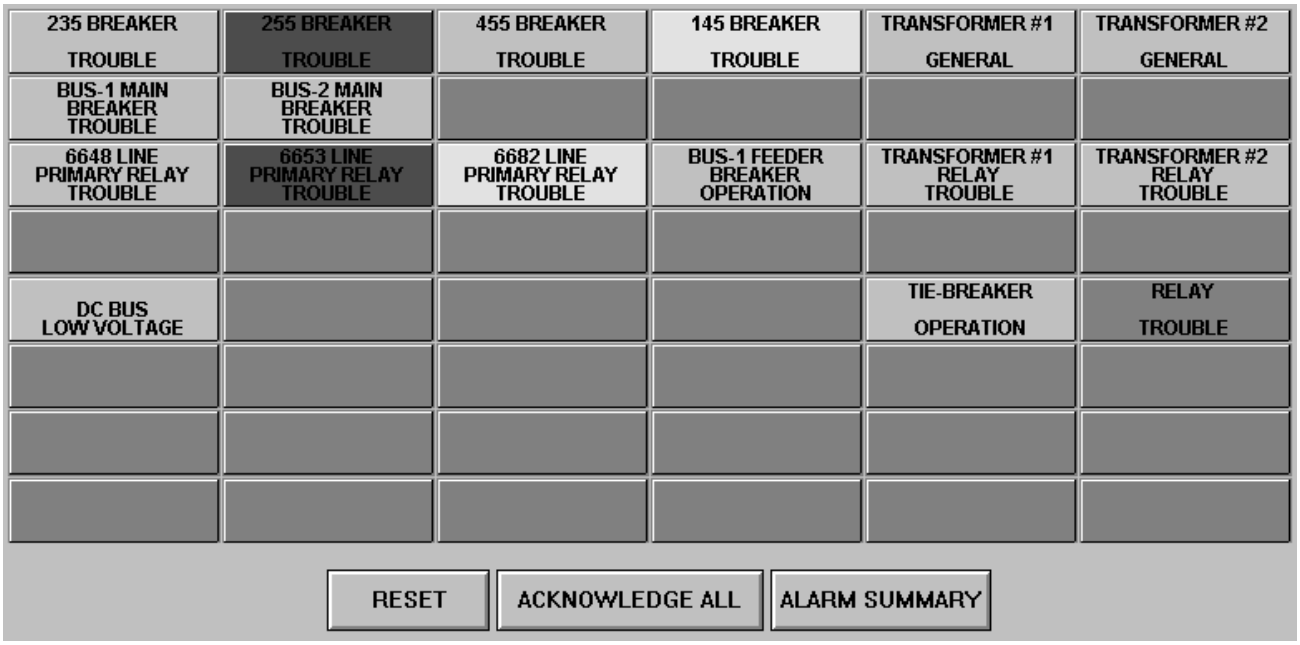
Usage

Floor Plan wizards are graphical elements that are useful for creating accurate representations of a facility layout. You can use a floor layout as an overview display of an entire plant, with animated areas for navigation to various switchgear elevation views or one-line diagrams. You can paste miniature elevation views as bitmap objects onto the floor layout, sized to fit, and then animate them as push buttons to display elevation views or one-line diagrams (see Chapter 3).

Configuration

After placing a Floor Plan wizard in an open window, it may be moved or resized, but no other configuration is possible. Floor Plan wizards are not provided with logic for opening another window.

Annunciator Panel Wizard



Usage

The Annunciator Panel wizard provides an industrial-style annunciator display panel, consisting of a bank of 48 indicator lights which change colors and blink to indicate various device conditions. For instance, a circuit breaker could be associated with an annunciator panel wizard to display grey when closed and change to red if it trips.

This wizard requires the PMCS Event Logger software to be installed and properly configured before it can be used, because it operates by monitoring special DDE tags which change state based on alarms or events recorded by the Event Logger.

The panel consists of an array of 48 buttons (six columns by eight rows), each of which may be labeled with up to three lines of text, and each of which is associated with a particular device (topic) at the PMCS DDE Server.

The annunciator panel wizard provides buttons for acknowledging alarms, resetting acknowledged alarms, and for viewing an alarm summary via the PMCS Event Logger.

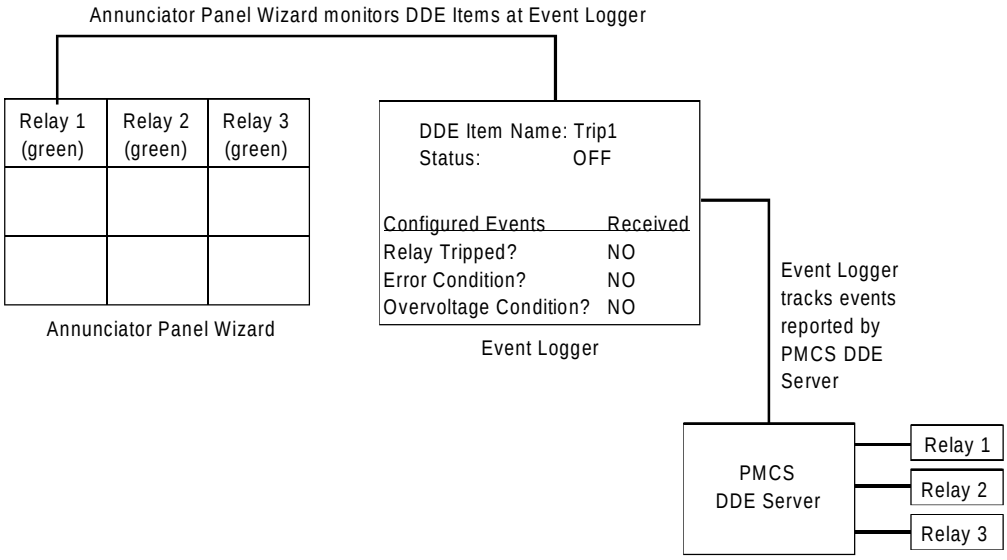
Annunciator Panel Theory of Operation

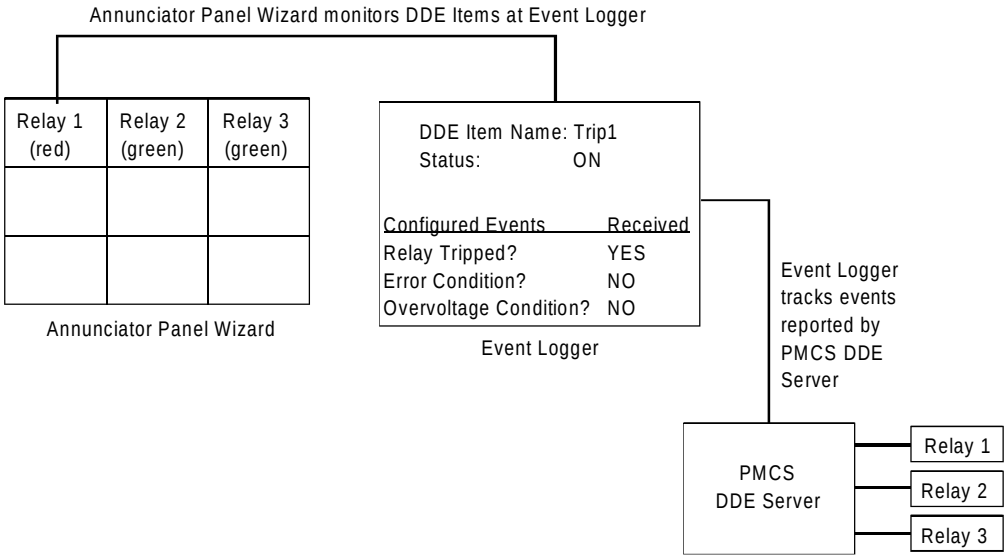
The Annunciator Panel wizard provides a screen full of indicator tiles, each relating to a particular device, event, or group of events. These tiles are displayed in different colors to indicate different alarm conditions. The Annunciator Panel wizard monitors selected DDE items in the Event Logger and responds to changes of state in these items by changing the colors of individual indicator tiles. For example, you might configure a relay trip event to have a tile in the Annunciator Panel wizard. The wizard monitors a DDE tag at the Event Logger corresponding to the trip status of the relay and displays a grey indicator if the relay is operating properly, and a red indicator if the relay has tripped.

From the Event Logger's perspective, there are two parts to configuring the Annunciator Panel. First, each DDE Item that will be displayed on the Annunciator Panel wizard must be added (using the Add Items dialog). For the example we're discussing, we'll assume you've created a DDE Item named Trip1. Each DDE item will connect to an individual tile in the Annunciator Panel wizard.

The second part consists of defining events which will turn individual DDE items ON or OFF. Each DDE item (or Annunciator Panel tile) can be turned on or off by any number of device events you define. The events are logically ORed together to determine ON or OFF conditions; i.e., if any of the events occurs, the DDE item is ON; if none of the events have occurred, the DDE item remains OFF.

We'll continue the relay example we began above. For example, you might configure the Trip1 DDE Item to be ON if any of the following events occurs: the relay is tripped, or the relay reports an error condition, or the relay senses an overvoltage condition. The Annunciator Panel wizard displays a grey indicator tile for the relay for as long as the DDE item remains in the OFF condition. If the Annunciator Panel wizard sees the DDE Item change from OFF to ON, it reacts by changing the indicator tile from grey to red. The Event Logger Annunciator Panel logic will also change the state of a DDE Item in response to actions performed at the Annunciator Panel Wizard. The user can both acknowledge and reset individual Annunciator DDE Items. The following diagram shows the relationship of the Annunciator Panel wizard, the Event Logger, and the PMCS DDE Server.





In the upper illustration, the Event Logger watches for any of the three events configured to cause a change of state to the Trip 1 DDE Item. None of these three events have occurred, so the status of the Trip 1 DDE Item is at OFF. The Annunciator Panel wizard is monitoring the configured DDE Items at the Event Logger, but all DDE Items are “OFF” so the Annunciator Panel displays green indicator tiles.

In the lower illustration, the Event Logger has recorded a “Trip” event for the unit in question, and changed the state of the Trip 1 DDE Item to “ON”. The Annunciator Panel wizard sees this change, and responds by changing the color of the annunciator panel tile for Relay 1 to red.

Each "Alarm indicator" as defined by the Event Logger will appear to CIMPLICITY as a DDE Integer item which can have the following values/states:

State	Tag Value	Default Color
Normal (no alarm)	10 - 19	Solid Gray
Alarm Active - Unacknowledged	20 - 29	Red Blinking
Alarm Active - Acknowledged	30 - 39	Solid Red
Alarm Reset - Unacknowledged (alarm occurred but later went off before being acknowledged)	40 - 49	Solid Yellow
Alarm Disabled (Event Logger has disabled this alarm indicator)	0	Dark Gray

Each panel button displays one of five different colors, based on the states defined above. A fill color animation link controlled by an indirect integer tag is used to change colors. The fill color link is set as follows:

<= 9: Dark Grey

10 -> 19: Grey

20-> 29: Grey (will also have a flashing Red animation link)

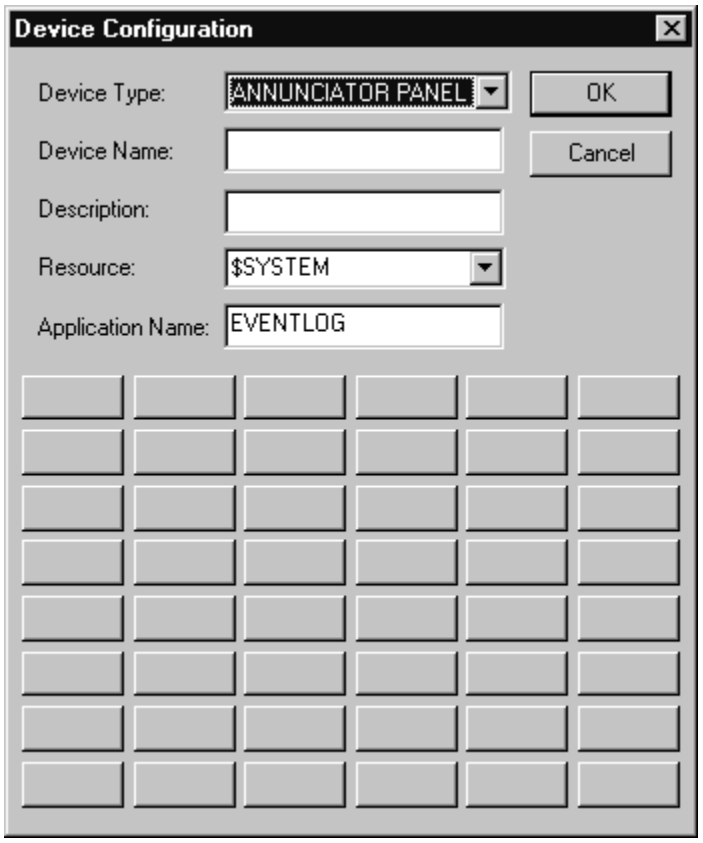
30 -> 39: Red

>= 40: Yellow

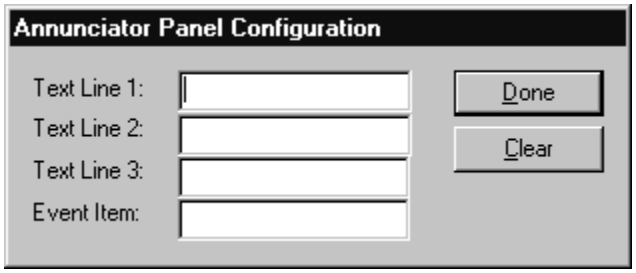
Configuration

Note: Prior to configuring an Annunciator Panel Wizard, you should have completed configuration of the Annunciator Panel Items at the PMCS Event Logger. Refer to GEH-6512, *PMCS Event Logger Users Guide*, for details.

Using PMCS Power Builder, add an Annunciator Panel device to your CIMPLICITY project by selecting Annunciator Panel in the Device Configuration dialog. The Device Configuration dialog box expands to display additional options specific to the Annunciator Panel:



Complete the Device Name, Description, and Application Name fields as desired, then configure the indicators of the Annuciator Panel with the desired text display. Clicking on any of the 48 indicators at the bottom of the Device Configuration dialog displays the Annunciator Panel Configuration dialog box:

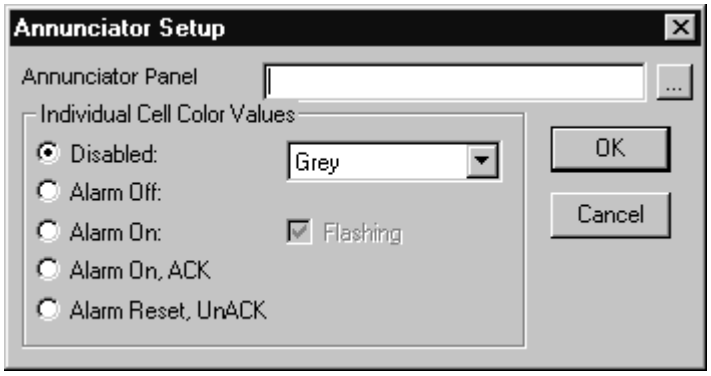


Enter up to three lines of text that you wish to display on the selected Annunciator Panel indicator. Complete the Event Item field with the DDE Event code that triggers this indicator. Finally, select Done to close this dialog box.

As each annunciator panel button is labeled, the Annunciator Panel Dialog reflects these changes by showing the Row/Column coordinates of the labeled buttons. For example, R1C1 indicates that the indicator button in Row 1, Column 1 has been configured.

After configuring each of the indicator panes, choose OK in the Device Configuration dialog box. When you close this dialog box, CIMPLICITY automatically creates virtual points for each panel button. These tags are named xxx_R1C1 through xxx_R8C6, where xxx is the name assigned to the wizard (for example, Panel1), and R1C1 indicates the row and column position on the annunciator panel.

You may now drop the Annunciator Panel wizard itself into a new screen in your project. Dropping the Annunciator Panel wizard displays the following configuration dialog box:



In the Annunciator Panel Name field, select the device name you entered in the Device Configuration window.

In the Individual Cell Color Values panel, assign colors to each of the annunciator indicator conditions by clicking in each radio button (Disabled, Alarm Off, Alarm On, etc) and choosing the desired color for each from the color pulldown menu. Selecting the Alarm On radio button enables the Flashing checkbox. You may select this checkbox to make the indicator flash during an Alarm On condition.

When you have configured the Colors for the selected Annunciator Panel, choose OK to finalize the Wizard being dropped into your project.

At run-time, CIMPLICITY will receive DDE data from the Event Logger which will control the colors of all indicators that have been configured properly.

Creating Floor Plans, Elevation Views, and One-Line Diagrams

Introduction

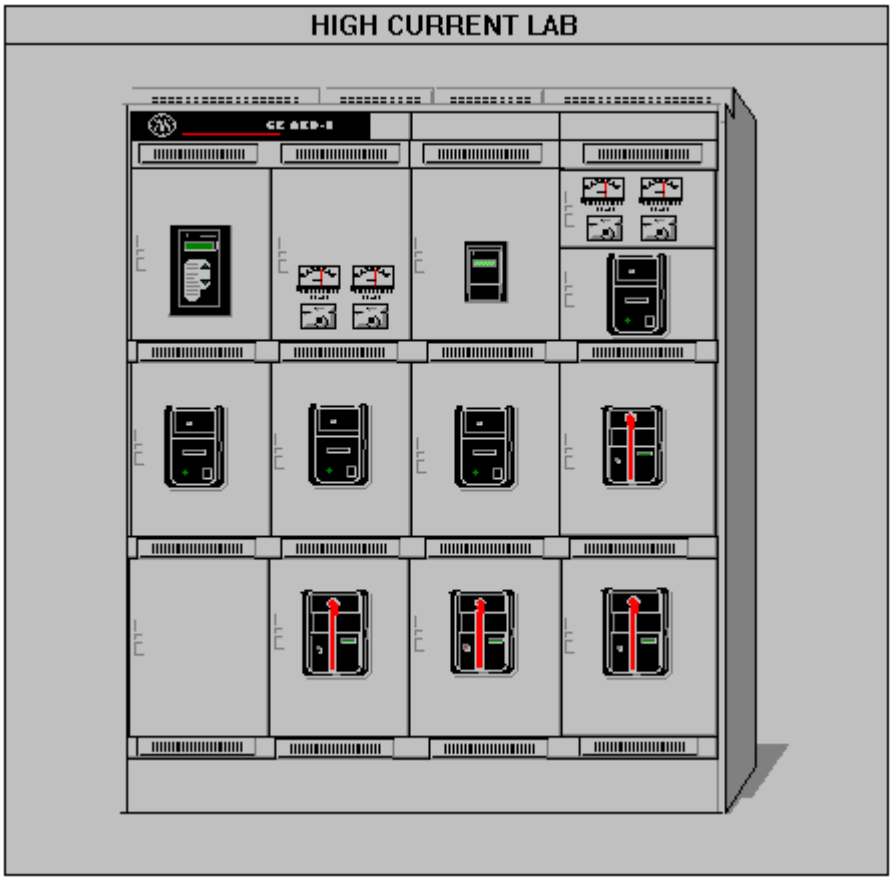
This section illustrates how to use the GE wizards described earlier to create animated displays of the facility floor plan, switchgear elevations, and system one-line diagrams. These examples are typical, but are not intended to display the limits of creative system design.

Elevation Views

Elevation views of switchgear and switchboards are typically created first, because miniature bitmaps of the elevations can be conveniently placed in floor plans as navigation items.

To build an elevation view, place GE Elevation and Small Faceplate wizards into the window, as follows:

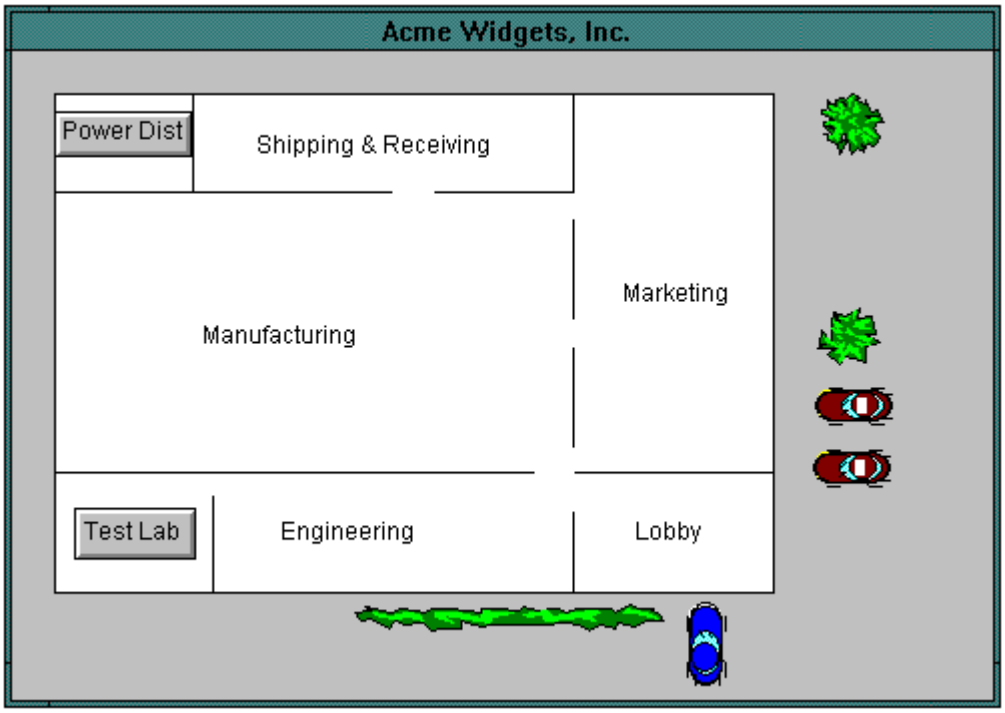
1. Place the appropriate cabinet.
2. Place panels onto the cabinet.
3. Add nameplates, louvers, handles, and fasteners to create the desired level of detail.
4. Place GE Small Faceplate wizards representing the components installed in the equipment on top of the elevation wizards, as shown in the figure on the following page.
5. Configure each of the Small Faceplate wizards to open a window containing an appropriate Large Faceplate or Tabular Data Screen for the device.



6. You can add additional navigation buttons (using standard CIMPLICITY controls) to open windows containing one-line views or other information.
7. If the switchgear shown in the elevation view is fed from or feeds another lineup, you can add buttons to navigate to elevation views representing those lineups.

Floor Plans

A floor plan should be a recognizable overhead representation of a facility. These windows are built using the GE Floor Plan wizards. They can be made as detailed or as simple as desired. The example below shows an overview of a facility, showing all of the areas containing equipment.



You can link each of these areas in the main window to a more detailed window by adding a labeled navigation button (using standard CIMPLICITY controls) that is configured to show that window. In this way, you can provide paths to move up and down through a complete floor plan hierarchy.

Floor plans may be as detailed as you desire and may include miniature bitmaps of equipment elevations. The procedure for creating a miniature bitmap in a floor plan view is as follows:

1. In the floor plan window, use the toolbox to create a bitmap object with the desired size of the miniature switchgear.
2. Switch to the desired elevation window, and select and copy the elevation view.
3. Switch back to the floor plan window.
4. In the floor plan window, use the Paste Bitmap command to insert the elevation view into the bitmap object.
5. Double-click on the miniature elevation bitmap to configure a link to the full-sized elevation view window.
6. You can add additional buttons, using standard CIMPLICITY controls, to navigate to windows containing one-line views of the switchgear or other information.

Electrical One-Line Diagrams

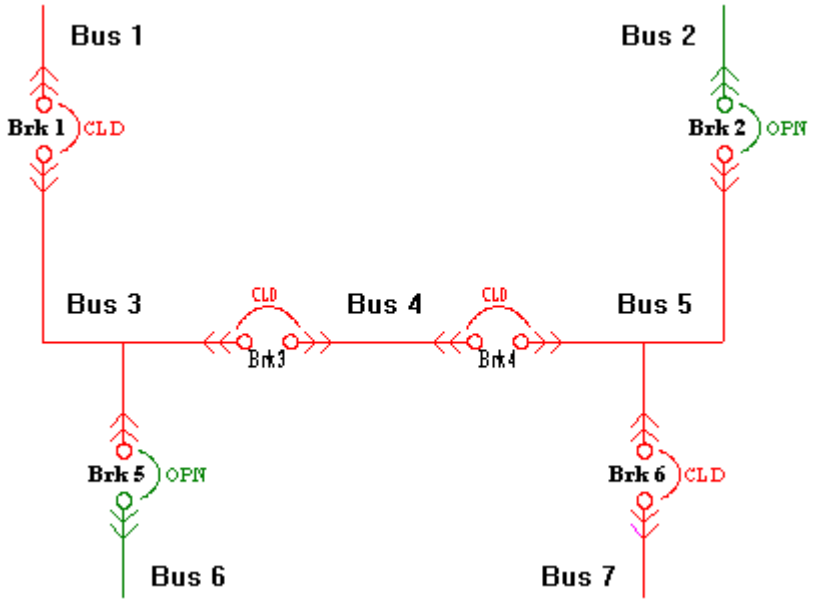
One-line diagrams are built by placing and linking circuit elements using the One-Line wizards, then creating scripts to provide animation for those wizards whose status can be determined or controlled, such as breakers and switches.

A one-line diagram is drawn by placing GE One-Line wizards into a window. All animated One-Line wizards have at least one discrete tag to indicate the status of the bus feed to the device, while others may have tags for in and out connections and for device status. If you do not require animation, link the wizard's discrete tags to a constant tag with a value of true.

After configuring Horizontal or Vertical Bus wizards, several objects can be selected and grouped together.

When a one-line diagram is too large to comfortably fit into a single window, place navigation buttons with links to other windows near each bus line that continues to another screen. This allows intuitive navigation up and down a distribution system hierarchy.

To accurately animate your one-line diagram once all the graphics are in place, *condition scripts* must be written with the logic for the distribution system. See the CIMPLICITY documentation for details of the scripting language. The following example shows a simple double-ended substation with a tie breaker and the scripting that animates it.



An example of the scripting for this one-line diagram is shown in the following pages:

```
Sub Main()
   Dim Brkr1S As New Point
   Dim Brkr2S As New Point
   Dim Brkr3S As New Point
   Dim Brkr4S As New Point
   Dim Brkr5S As New Point
   Dim Brkr6S As New Point

   Brkr1S.id = "BRKR1_S"
   Brkr2S.id = "BRKR2_S"
   Brkr3S.id = "BRKR3_S"
   Brkr4S.id = "BRKR4_S"
   Brkr5S.id = "BRKR5_S"
   Brkr6S.id = "BRKR6_S"

   Brkr1S.get
   Brkr2S.get
   Brkr3S.get
   Brkr4S.get
   Brkr5S.get
   Brkr6S.get

   Dim brk1 As Boolean
   Dim brk2 As Boolean
   Dim brk3 As Boolean
   Dim brk4 As Boolean
   Dim brk5 As Boolean
   Dim brk6 As Boolean

   brk1 = false
   brk2 = false
   brk3 = false
   brk4 = false
   brk5 = false
   brk6 = false

   If (Brkr1S.value = 3) Then
```

```
   brk1 = true
End If
If (Brkr2S.value = 3) Then
   brk2 = true
End If
If (Brkr3S.value = 3) Then
   brk3 = true
End If
If (Brkr4S.value = 3) Then
   brk4 = true
End If
If (Brkr5S.value = 3) Then
   brk5 = true
End If
If (Brkr6S.value = 3) Then
   brk6 = true
End If

Dim Bus1 As New Point
Dim Bus2 As New Point
Dim Bus3 As New Point
Dim Bus4 As New Point
Dim Bus5 As New Point
Dim Bus6 As New Point
Dim Bus7 As New Point

Bus1.id = "BUS1"
Bus2.id = "BUS2"
Bus3.id = "BUS3"
Bus4.id = "BUS4"
Bus5.id = "BUS5"
Bus6.id = "BUS6"
Bus7.id = "BUS7"
Bus1.Get
Bus2.Get
Bus3.Get
Bus4.Get
Bus5.Get
```

```
Bus6.Get
Bus7.Get
Dim Change3 As Boolean
Dim Change4 As Boolean
Dim Change5 As Boolean
Dim Change6 As Boolean
Dim Change7 As Boolean

If ((Bus1.value) And (brk1)) Then
      Bus3.value = 1
      Change3 = 1
ElseIf (Not Change3) Then
    Bus3.value = 0
End If

If ((Bus2.value) And (brk2)) Then
      Bus5.value = 1
      Change5 = 1
ElseIf (Not Change5) Then
    Bus5.value = 0
End If

If ((Bus3.value) And (brk3)) Then
      Bus4.value = 1
      Change4 = 1
ElseIf (Not Change4) Then
    Bus4.value = 0
End If

If ((Bus4.value) And (brk4)) Then
      Bus5.value = 1
      Change5 = 1
ElseIf (Not Change5) Then
    Bus5.value = 0
End If

If ((Bus3.value) And (brk5)) Then
      Bus6.value = 1
```

```
      Change6 = 1
ElseIf (Not Change6) Then
    Bus6.value = 0
End If

If ((Bus5.value) And (brk6)) Then
      Bus7.value = 1
      Change7 = 1
ElseIf (Not Change7) Then
    Bus7.value = 0
End If

If ((Bus7.value) And (brk6)) Then
      Bus5.value = 1
      Change5 = 1
ElseIf (Not Change5) Then
    Bus5.value = 0
End If

If ((Bus6.value) And (brk5)) Then
      Bus3.value = 1
      Change3 = 1
ElseIf (Not Change3) Then
    Bus3.value = 0
End If

If ((Bus5.value) And (brk4)) Then
      Bus4.value = 1
      Change4 = 1
ElseIf (Not Change4) Then
    Bus4.value = 0
End If

If ((Bus4.value) And (brk3)) Then
      Bus3.value = 1
      Change3 = 1
ElseIf (Not Change3) Then
    Bus3.value = 0
```

```
End If

   Bus3.Set
   Bus4.Set
   Bus5.Set
   Bus6.Set
   Bus7.Set

End Sub
```

(This page left blank intentionally.)

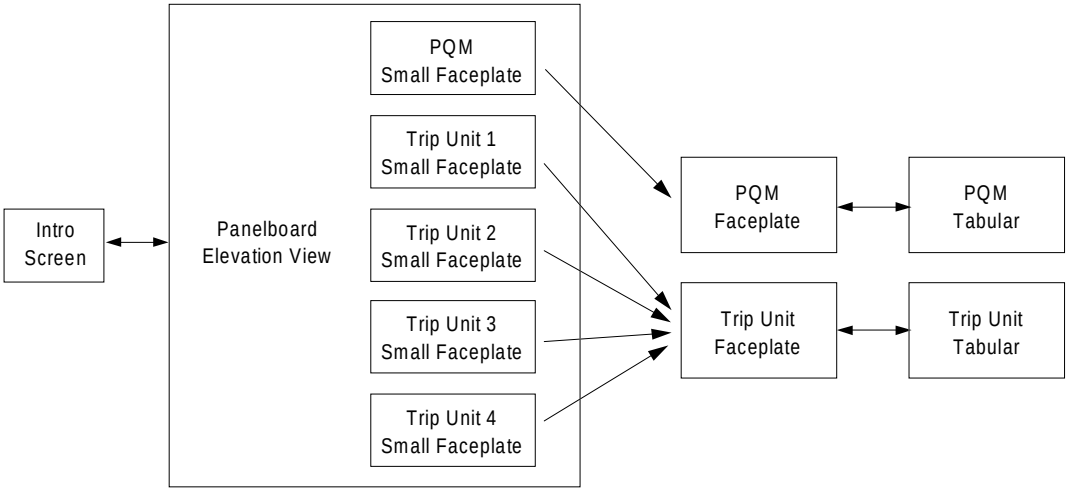
Sample Application

Creating a basic interface

We've learned about the various parts and pieces of the Interface Toolkit; now let's put it to work.

Suppose we have a very basic power management system installed at our corporate home office. The system consists of four trip units and a PQM (Power Quality Meter). We'd like to set up a computer in the front office to provide a front end to this system, allowing us to monitor all these devices at one station without having to walk back to the individual devices on the plant floor.

We plan the application on paper first so that we know how many screens to create and what each screen will look like. This will help us save time when in development by providing a starting point and a map of what we're trying to create. This 'storyboard' for our application looks something like this:



As shown above, for this basic application, we'll need four screens — an introduction screen, a shot of the panelboard showing all five of our power management devices, and then a large faceplate/tabular screen for each type of device, one for the PQM, and another for the trip units. We'll link the Large Faceplate/Tabular screen for each unit to the Small Faceplate wizard shown on the Panelboard screen, and, from the Large Faceplate, we can click on the device's display to jump to the Tabular data screen for that device. To make it easier to

navigate the screens, we'll create extra buttons on the bottom of the Faceplate and Tabular screens that will jump back to the Panelboard screen.

With our plan in hand, and after completing the installation procedures described in Chapter 1, we're ready to begin development.

Launch CIMPLICITY and create a new project file as described in Chapter 2. Use the PMCS PowerBuilder to create 5 new devices in your project:

PQM Device type = MLPQM

Trip1 Device type = EMVTC

Trip2 Device type = EMVTC

Trip3 Device type = EMVTC

Trip4 Device type = EMVTC

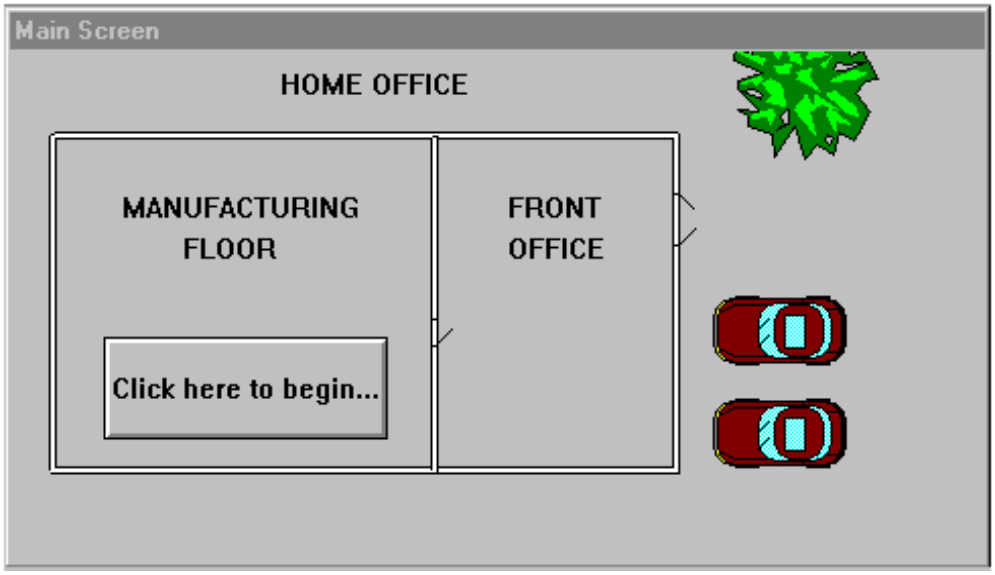
Click the "Generate Screens" button and let PowerBuilder create the device screens. When PowerBuilder is finished your project contains three windows:

MainMenu.cim – contains all the small faceplates for the project

wzEMVTC-D.cim – Trip Unit Faceplate/Tabular wizard

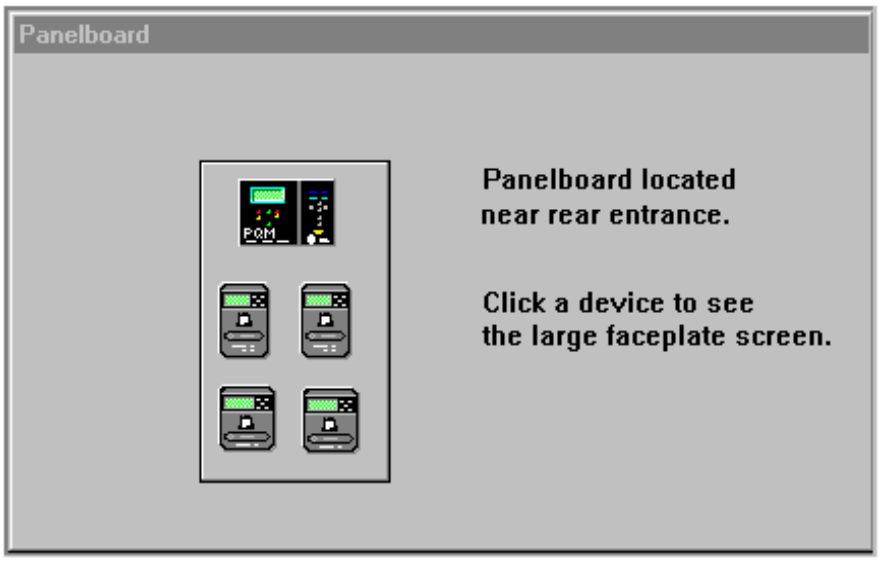
wzMLPQM.cim – PQM Faceplate/Tabular wizard

Rename the "MainMenu.cim" screen "Panelboard". Add a new window called "Main Screen", and use the CIMPLICITY tools to sketch a floorplan of the facility, as shown below:



In the Manufacturing Floor area, create a button labeled "Click here to begin…," and give it an animation link to the screen named Panelboard.

Open the Panelboard screen. Use the PMCS Elevation wizards to add a mock-up of the panelboard, then move the existing Small Faceplate wizards to populate the panelboard with our PQM meter and the four trip units. The Panelboard screen should look like this:



We'll include a note about the panelboard's location, describing where to find the real panel, and also a note of instruction: "Click a device to see the large faceplate screen."

Now we'll configure some navigation buttons to enable the user to return to the previous window. Select the "wzMLPQM.cim" window, then use CIMPLICITY's tools to create two new buttons, "HOME" and "Go back to Panel." Modify the button properties to tie these buttons to the Main Screen and Panelboard windows, respectively. The screen should look similar to the following:

Add similar navigation buttons to the "wzEMVTC-D.cim " window, and you're done. We've just developed a PMCS application using the GE CIMPLICITY HMI PowerBuilder and Wizards.

Note: If the you prefer to use screen names other than the default provided by PMCS PowerBuilder, simply open the screen in CimEdit and save it under a different name.

For our sample project, you could save the default "wzMLPQM.cim" screen as "PQM". Then open the Panelboard screen and reconfigure the PQM small faceplate to open the new "PQM" screen instead of the "wzMLPQM" screen. Finally, delete the "wzMLPQM" screen from the project. You can modify any of the PMCS PowerBuilder generated screens as your application requires.

Features of GE Large Faceplate Wizards

About the Large Faceplate Wizards

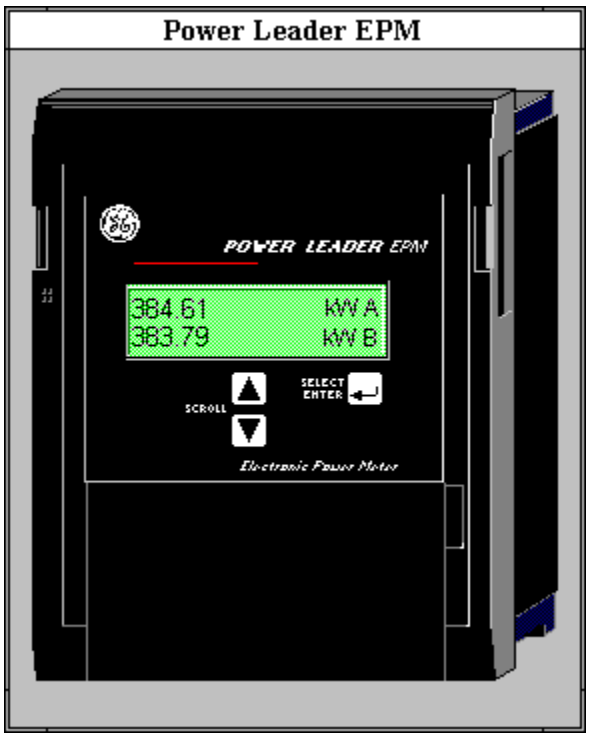
This chapter contains descriptions of the functions available with each of the GE Large Faceplate wizards. While a majority of the most popular data available at each device have been made available in the Wizards, some functions available with the actual devices are not provided in the Large Faceplate representations, such as the following:

- Test Mode or Simulation Mode on some devices is not fully supported
- Details on status/alarm/trips other than the information displayed by the front LEDs and a brief text message (see Tabular Data Screens for detailed status/alarm/trip information)
- Any flashing status messages which may be produced by a device
- Some actual values are not displayed on the Large Faceplate Wizard, but can be found on Tabular Data Screen Wizards

Users should be aware that not all values displayed by the GE Large Faceplate Wizards are automatically updated. Also, some rapidly changing values, especially those requiring calculation, cannot be displayed as rapidly on the wizard as on the actual device's screen.

For a more detailed description of the functions of a device, see the user's guide for that device.

POWER LEADER EPM



The large faceplate representation of the POWER LEADER EPM provides the following animated functions:

Click on...	Function
Display Window	Clicking on the display area opens the tabular data window specified during wizard configuration and sets the view to the Normal Metering page.
GE Logo	Clicking the GE logo opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
SELECT/ENTER Button	Toggles the display between the normal and alternate lists of metering parameters.
SCROLL Buttons	Loop through all metered parameters for the current mode, displaying two values at a time. The down arrow scrolls down through the parameter list, with the new value appearing on the lower line of the display. The up arrow scrolls up through the parameter list with the new value appearing on the display's upper line. Depending on whether the EPM has been configured as a Delta or Wye device, certain parameters display either line-to-line or line-to-neutral values.

Table 1. PLEPM Faceplate animated functions.

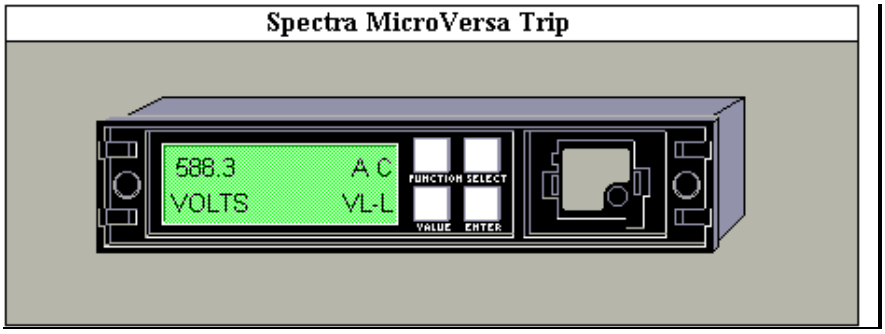
The electrical parameters and status information displayed by the EPM are listed in the following tables for both the normal and alternate scrolls. Note that the displayed

parameters differ depending on whether the EPM is configured as Wye or Delta. Please note that the Normal Scroll Delta and Alternate Scroll Delta lists contain several parameters marked with an asterisk; these parameters were included in the wizard for programming reasons, but are not valid for Delta configurations and should not be used.

Normal Scroll, Wye	Normal Scroll, Delta
Current, RMS Phase A	Current, Phase A
Current, RMS Phase B	Current, Phase B
Current, RMS Phase C	Current, Phase C
Current, RMS Neutral	Current, RMS Neutral *
Voltage, RMS Phase A–N	Voltage, RMS Phase A–N *
Voltage, RMS Phase B–N	Voltage, RMS Phase B–N *
Voltage, RMS Phase C–N	Voltage, RMS Phase C–N *
Voltage, RMS Phase A–B	Voltage, RMS Phase A–B
Voltage, RMS Phase B–C	Voltage, RMS Phase B–C
Voltage, RMS Phase C–A	Voltage, RMS Phase C–A
Watts, Phase A	Watts, Phase A–B
Watts, Phase B	Watts, Phase B–C
Watts, Phase C	Watts, Total
Watts, Total	Watts, Demand
Watts, Demand	Watts, Peak Demand
Watts, Peak Demand	Vars, Phase A–B
Vars, Phase A	Vars, Phase B–C
Vars, Phase B	Vars, Total
Vars, Phase C	Volt-amperes, Phase A–B
Vars, Total	Volt-amperes, Phase B–C
Volt-amperes, Phase A	Volt-amperes, Total
Volt-amperes, Phase B	Power Factor, Total
Volt-amperes, Phase C	Watthours, Total
Volt-amperes, Total	Varhours, Total Lag (+)
Power Factor, Total	Varhours, Total Lead (–)
Watthours, Total	Volt-ampere-hours, Total
Varhours, Total Lag (+)	Frequency, in hertz
Varhours, Total Lead (–)	
Volt-ampere-hours, Total	
Frequency, in hertz	

Alternate Scroll, Wye	Alternate Scroll, Delta
Current, Phase A Demand	Current, Phase A Demand
Current, Phase A Peak Demand	Current, Phase A Peak Demand
Current, Phase B Demand	Current, Phase B Demand *
Current, Phase B Peak Demand	Current, Phase B Peak Demand *
Current, Phase C Demand	Current, Phase C Demand
Current, Phase C Peak Demand	Current, Phase C Peak Demand
Watts Demand at Peak VA Demand	Watts Demand at Peak VA Demand
Vars, Demand Lag (+)	Vars, Demand Lag (+)
Vars, Demand Lead (–)	Vars, Demand Lead (–)
Vars, Peak Demand Lag (+)	Vars, Peak Demand Lag (+)
Vars, Peak Demand Lead (–)	Vars, Peak Demand Lead (–)
Volt-amperes, Demand	Volt-amperes, Demand
Volt-amperes, Peak Demand	Volt-amperes, Peak Demand
Q-hours, Total	Q-hours, Total
Power Factor, Phase A	Power Factor, Phase A–B
Power Factor, Phase B	Power Factor, Phase B–C
Power Factor, Phase C	Power Factor, Average Since Reset
Power Factor, Average Since Reset	Power Factor, Demand Average
Power Factor, Demand Average	Power Factor at Peak VA Demand
Power Factor at Peak VA Demand	Number of Demand Resets
Number of Demand Resets	Time Left in Demand Subinterval
Time Left in Demand Subinterval	Number of Power Outages
Number of Power Outages	Potential Transformer Ratio
Potential Transformer Ratio	Current Transformer Ratio
Current Transformer Ratio	

Spectra MicroVersaTrip® Trip Unit



The large faceplate representation of the Spectra MicroVersaTrip® trip unit provides the following animated functions:

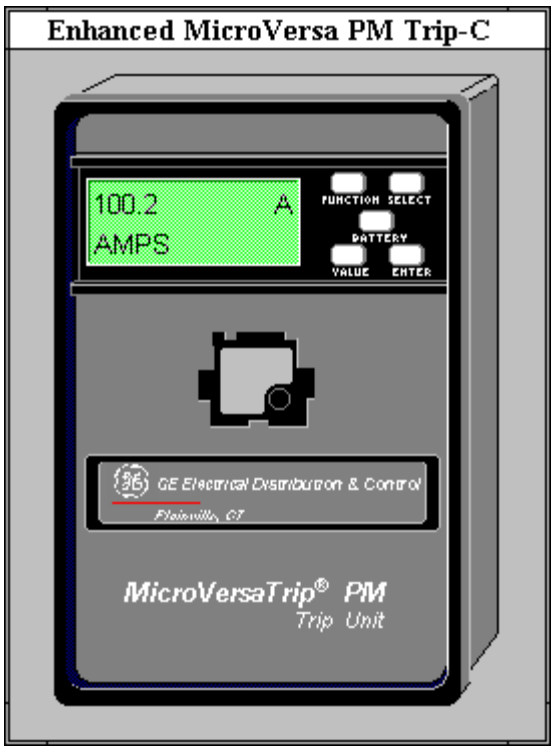
Click on...	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Normal Monitoring page.
FUNCTION Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
ENTER Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
VALUE Button	Changes phases in appropriate modes, depending on whether the device has been configured as Wye or Delta Phase is indicated by letters in the upper right of the display; press VALUE to display a different phase.
SELECT Button	Rotates among six different modes, as shown in the lower left of the display, with units in the lower right.

Table 2. Spectra MVT Faceplate animated functions.

The metering modes available with the SELECT button are as follows:

Mode	Description
AMPS	Current, with no label in the units area of the display. Phase shifting in both Delta and Wye configurations.
VOLTS	Voltage, displayed as line-to-line (V_{L-L}) for Delta and line-to-neutral (VL-N) for Wye. Phase shifting in both configurations.
ENGY	Energy, displayed in kWh; no phase shifting.
PWR	Real power indicated by non-blinking units symbol (kW). Apparent power indicated by blinking units symbol. Phase shifting in Wye configuration.
FREQ	Frequency, displayed in Hz. Phase shifting in both Delta and Wye configurations.

Enhanced MicroVersaTrip PM-C Trip Unit



The large faceplate representation of the Enhanced MicroVersaTrip-C trip unit provides the following animated functions:

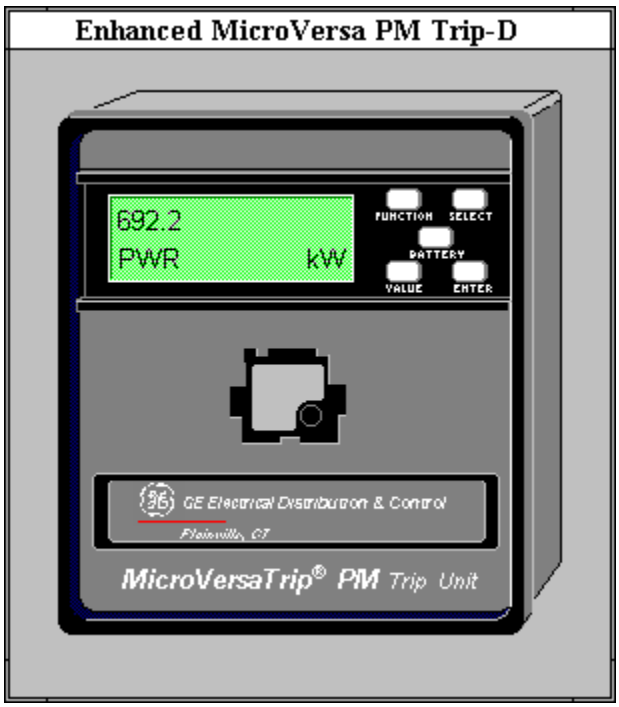
Click on ...	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Monitoring page.
FUNCTION Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
ENTER Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
BATTERY Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
VALUE Button	Changes phases in appropriate modes, depending on whether the device has been configured as Wye or Delta, Phase is indicated by numbers in the upper right of the display; press VALUE to display a different phase.
SELECT Button	Rotates among eight different modes, as shown in the lower left of the display, with units in the lower right.

Table 3. EMVT-C Faceplate animated functions.

The EMVT-C's metering modes available with the SELECT button are as follows:

Mode	Description
AMPS	Current, with no label in the units area of the display. Phase shifting in both Delta and Wye configurations.
VOLTS	Voltage, displayed as line-to-line (Ph-Ph) for Delta and line-to-neutral (Ph-N) for Wye. Phases shown as 01, 02, or 03 for Wye and 01 02, 01 03, or 02 03 for Delta.
kWh	Energy; no phase shifting.
kW	Real power; no phase shifting.
kVA	Apparent power; no phase shifting.
Demand	Power demand, displayed with steady kW symbol. Peak power demand, displayed with blinking kW symbol. No phase shifting.
FREQ	Frequency, displayed in Hz. Phase shifting in both Delta and Wye configurations.

Enhanced MicroVersaTrip PM-D Trip Unit



The large faceplate representation of the Enhanced MicroVersaTrip-D trip unit provides the following animated functions:

Feature	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Monitoring page.
FUNCTION Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
ENTER Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
BATTERY Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
VALUE Button	Changes phases in appropriate modes, depending on whether the device has been configured as Wye or Delta Phase is indicated by numbers in the upper right of the display; press VALUE to display a different phase.
SELECT Button	Rotates among eight different modes, as shown in the lower left of the display, with units in the lower right.

Table 4. EMVT-D Faceplate animated functions.

The metering modes available with the SELECT button are as follows:

Mode	Description
AMPS	Current, with no label in the units area of the display. Phase shifting in both Delta and Wye configurations.
VOLTS	Voltage, displayed as line-to-line (Ph-Ph) for Delta and line-to-neutral (Ph-N) for Wye. Phases shown as 01, 02, or 03 for Wye and 01 02, 01 03, or 02 03 for delta.
kWh	Energy; no phase shifting.
kW	Real power; no phase shifting.
kVA	Apparent power; no phase shifting.
Demand	Power demand, displayed with steady kW symbol. Peak power demand, displayed with blinking kW symbol. No phase shifting.
FREQ	Frequency, displayed in Hz. Phase shifting in both Delta and Wye configurations.

POWER LEADER™ Meter

The large faceplate representation of the POWER LEADER Meter provides the following animated functions:

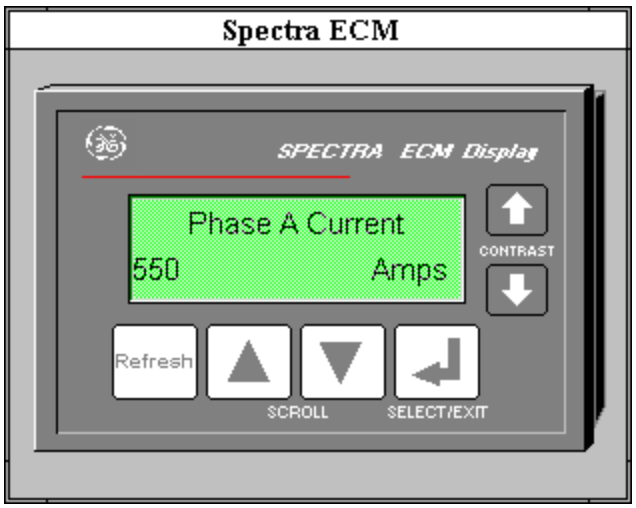
Feature	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Monitoring page.
GE Logo	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
RESET/ENTER Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
PHASE Button	Rotates among phase readings for appropriate modes, indicated by the phase LEDs below the display window.
SCROLL UP and SCROLL DOWN Buttons	Loop through display modes either down or up the list of parameters. Fourteen modes available with a Delta-configured device; one additional with Wye.

Table 5. PL Meter Faceplate animated functions.

The parameters available with the SCROLL buttons are listed below:

Mode	Description
RMS Current	Units in Amps; phase shifting among A, B, and C.
RMS Voltage L-N	Units in Volts; available only in Wye configuration, with phase shifting among A, B, and C.
RMS Voltage L-L	Units in Volts; phase shifting among AB, BC, and CA.
Watts	Units in kW; phase shifting among A, B, C, and total.
Vars	Units in kVARs; phase shifting among A, B, C, and total.
Volt-Amps	Units in kVA; phase shifting among A, B, C, and total.
Power Factor	No units; no phase shifting.
Watt-Hours	Units in kWH; no phase shifting.
VAR-Hours	Units in kVARH; no phase shifting.
Current Demand	Units in A; phase shifting among A, B, and C.
Peak Current	Units in A; phase shifting among A, B, and C.
Watt Demand	Units in kW; no phase shifting.
Peak Watt Demand	Units in kW; no phase shifting.
Frequency	Units in Hz; no phase shifting.
Harm Distortion	Value area of display is blank; degree of harmonic distortion is shown as negligible, mild, moderate, or severe.

Spectra ECM



The large faceplate representation of the Spectra ECM provides the following animated functions:

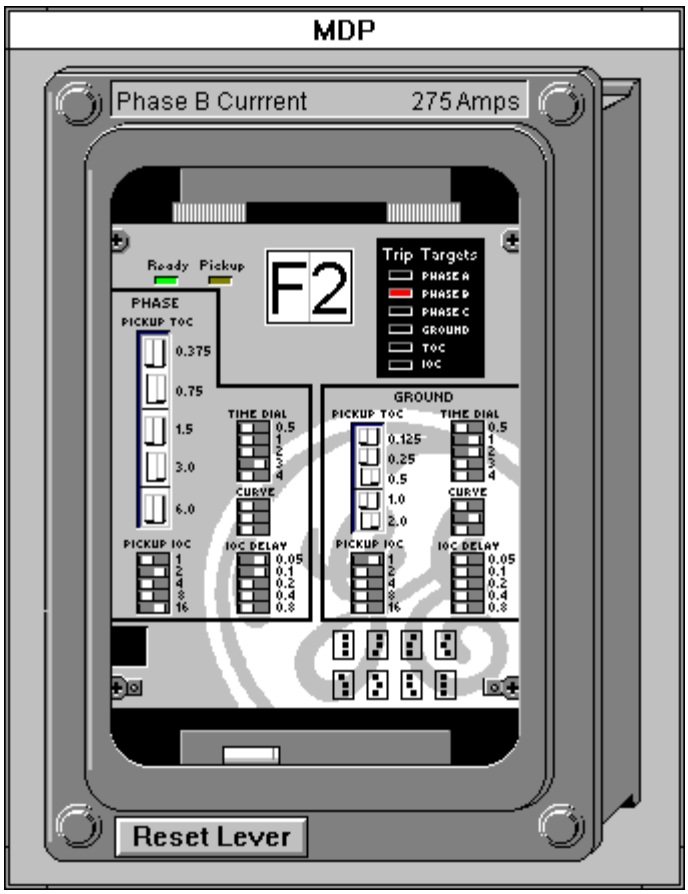
Feature	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Monitoring page.
CONTRAST Buttons	Open the tabular data window specified during wizard configuration and sets the view to the Setup page.
Refresh Button	Updates the display to the most current readings.
SCROLL Buttons	Loop through all selections for each of the valid modes accessed by the SELECT/EXIT button.
SELECT/EXIT Button	Displays the top-line message “Press SELECT for”. Press one of the SCROLL buttons to rotate among the four modes. Press SELECT/EXIT to display the first value of the current mode and the SCROLL buttons for all other values available in that mode. Press again to redisplay the “Press SELECT for” prompt for mode selection.

Table 6. Spectra ECM Faceplate animated functions.

The modes and the parameters available in each mode are as follows:

Mode	Parameters and Units
STATUS	Motor Status ECM Status Trip Status
SETPOINTS	FLA Setting, amps Rating Plug, amps Phase Unbalance, disabled/enabled Ground Fault, disabled/enabled Commnet Address
METERING	Phase A Current, amps Phase B Current, amps Phase C Current, amps Average Current, amps Phase Unbalance, percent Ground Current, amps Motor Load, percent
LAST TRIP INFO	Last Trip Cause Phase A @ Trip, amps Phase B @ Trip, amps Phase C @ Trip, amps Unbalance @ Trip, percent Ground Current @ Trip, amps

MDP Digital Overcurrent Relay



The large faceplate representation of the MDP Digital Overcurrent Relay provides the following animated functions:

Feature	Function
Meter Display	Opens the tabular data window specified during wizard configuration and sets the view to the Monitoring page.
Informational Display	Opens the tabular data window specified during wizard configuration and sets the view to the Monitoring page.
LEDs and Toggles	Display only animation showing the current meter status and settings.
RESET LEVER Button	Rotates the display through ten parameters. Press to display values, repeat to advance through all the parameters.

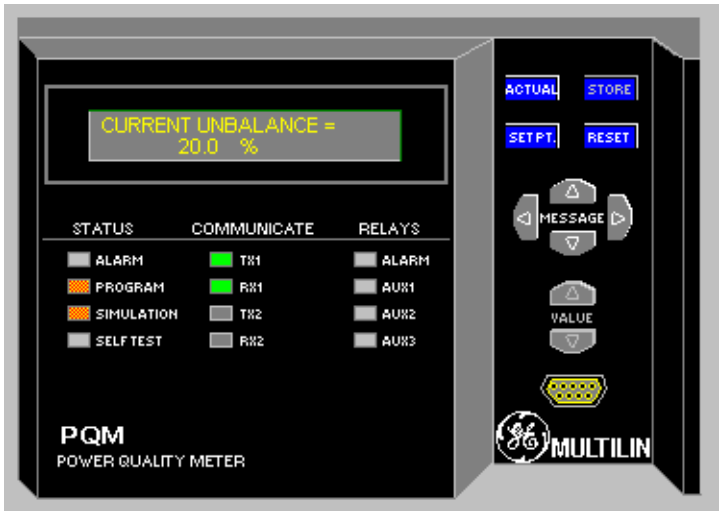
Table 7. MDP Faceplate animated functions.

The parameters displayed by the RESET LEVER button are shown in the following table. The first column lists the contents of the meter display, then the informational display.

Meter Display	Informational Display
F0	Breaker Status xxxxxx (Open or Closed)
F1	Phase A Current xxxx Amps
F2	Phase B Current xxxx Amps
F3	Phase C Current xxxx Amps
F4	Ground Current xxxx Amps
F5	Phase A Trip Current xxxx Amps
F6	Phase B Trip Current xxxx Amps
F7	Phase C Trip Current xxxx Amps
F8	Ground Trip Current
F9	Trip Time xxxx Sec

If a CT ratio has not been set, the first press of the RESET LEVER button displays "CT Ratio Not Entered" in the informational window. Click on one of the display windows to switch to the tabular data screen and enter a valid CT ratio, then return to the MDP window.

Power Quality Meter (PQM)



The PQM's large faceplate wizard provides the following animated functions:

Feature	Function
Meter Display	Opens the tabular data window specified during wizard configuration and sets the view to the Metering tab.
Setpoint button	Opens the tabular data window specified during wizard configuration and sets the view to the Setpoints tab.
Reset button	Opens the tabular data window specified during wizard configuration and sets the view to the Metering tab, which offers a button to issue a RESET command to the device.
Actual button	Pressing the ACTUAL button rotates through the three Main Actual Value pages on the device: A1 Metering, A2 Status, and A3 Product Info. If the ACTUAL button is pressed while the display shows a subgroup or a line, the display will jump back to the Page header.
Message Up/Down buttons	Scrolls forward/backward through the subgroups for the currently selected page.
Message Right/Left buttons	Scrolls through individual lines for each subgroup within a page. For most lines, an actual value and units from the device are displayed.
Panel Display Lights	Display animation that shows the status of the PQM relay.

Table 8. PQM Faceplate animated functions.

NOTE: The PQM Large Faceplate Wizard cannot display values greater than 2 to the 31st power. Therefore, numbers greater than 2^{31} (unscaled) for Energy and Apparent Energy may appear negative. The values affected are kWh, kvarh, kVAh, Energy Cost and kVA. The Tabular Data Screen wizard show the correct values.

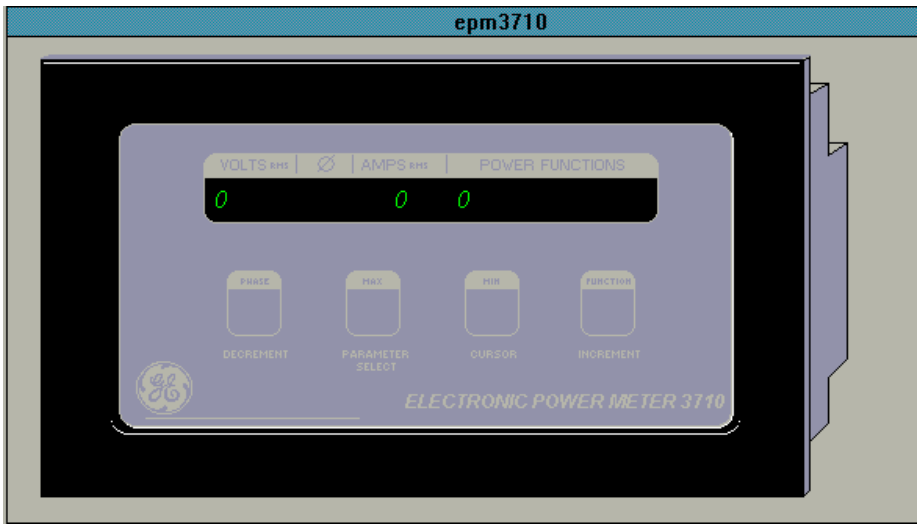
The Wizard displays the following Subgroups and Lines shown in Chapter 5, *Actual Values*, of the PQM Instruction Manual, revision 1.20.

Page 1: METERING	Current	
	Voltage	
	Power	Power Factor values are not continuously updated.
	Frequency	
Page 2: STATUS		A static message is displayed based on GENERAL_STATUS bit 0, indicating whether or not an alarm condition exists.
Page 4: PRODUCT INFORMATION	Software Versions	Values are not continuously updated
	Model Information	Values are not continuously updated

The subgroups listed below are displayed by the device but are not implemented in the 3-D wizard.

Page 1:METERING	Current	Min/Max values are not displayed
	Voltage	Min/Max values are not displayed
	Power	KVA values and all Min/Max values are not displayed
	Energy	
	Demand	
	Frequency	Min/Max values are not displayed
	Pulse Counter	
	Analog Input	
Page 2: STATUS	Alarms	
	Switches	
	Clock	
	Programmable Message	
Page 3: POWER ANALYSIS	Power Quality Values	
	Total Harmonic Distortion	
	Data Logger	
	Event Recorder	

EPM 3710 Meter



The large faceplate representation of the EPM 3710 provides the following animated functions:

Feature	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Monitoring page.
MIN/MAX Buttons	Open the tabular data window specified during wizard configuration and set the view to the Setup page.
PHASE Button	Rotates the left side of the display through eight sets of instantaneous values, as described in the table below.
FUNCTION Button	Rotates the right side of the display through 13 accumulated values.

Table 9. EPM 3710 Faceplate animated functions.

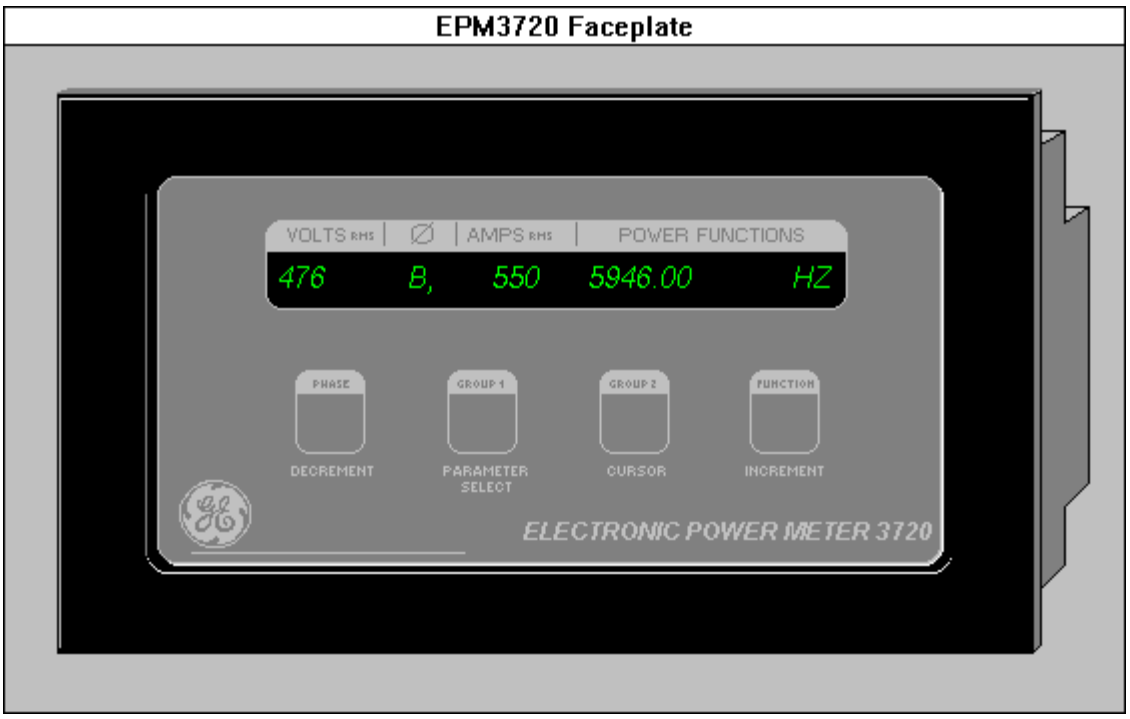
The parameters displayed by the PHASE button are listed in the following table.

Display Indication	Parameters
A	Phase A current and line-to-neutral voltage
B	Phase B current and line-to-neutral voltage
C	Phase C current and line-to-neutral voltage
*	Average current and line-to-neutral voltage
A,	Phase A current and A-B line-to-line voltage
B,	Phase B current and B-C line-to-line voltage
C,	Phase C current and C-A line-to-line voltage
*,	Average current line-to-line voltage

The parameters displayed by the FUNCTION button are listed in the following table. If any of the import or export values are zero, they are not displayed and the next nonzero value is shown. When any of these parameters are displayed, the AMPS portion of the display window is used to allow display of the complete value.

Display Indication	Parameter
kW	Total real power
kVA	Total apparent power
kQ	Total reactive power
PFLG or PFLD	Power factor; lagging or leading
Hz	Frequency
kWD	Kilowatt total demand
A or kVA	Current average demand or apparent power demand
VX	RMS auxiliary voltage
I4	RMS neutral current
kWH-F	Import energy
kWH-R	Export energy
kVARH-F	Import reactive energy
kVARH-R	Export reactive energy

EPM 3720 Meter



The large faceplate representation of the EPM 3720 meter provides the following animated functions:

Feature	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Monitoring page.
GROUP Buttons	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
PHASE Button	Rotates the left side of the display through eight sets of instantaneous values, as described in the table below. May also affect the POWER FUNCTIONS portion of the display, depending on the FUNCTION selection.
FUNCTION Button	Rotates the right side of the display through 24 accumulated values, in conjunction with the PHASE button.

Table 10. EPM 3720 Faceplate animated functions.

The parameters displayed by the PHASE button are listed in the following table.

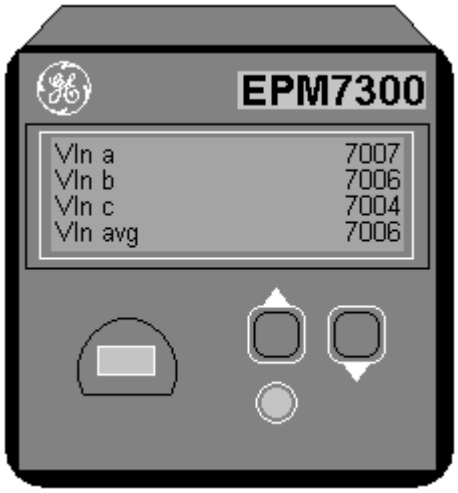
Display Indication	Parameters
A	Phase A current and line-to-neutral voltage
B	Phase B current and line-to-neutral voltage
C	Phase C current and line-to-neutral voltage
*	Average current and line-to-neutral voltage
A,	Phase A current and A-B line-to-line voltage

Display Indication	Parameters
B,	Phase B current and B-C line-to-line voltage
C,	Phase C current and C-A line-to-line voltage
*,	Average current line-to-line voltage

The parameters displayed by the FUNCTION button are listed in the following table. When any of the import, export, or net parameters are displayed, the AMPS portion of the display window is used to allow display of the complete value.

Display Indication	Parameter
kW	Real power for phase A, B, or C as set by PHASE button, or total real power if PHASE is set to * or *,.
kVR	Reactive power for phase A, B, or C as set by PHASE button, or total reactive power if PHASE is set to * or *,.
kVA	Apparent power for phase A, B, or C as set by PHASE button, or total apparent power if PHASE is set to * or *,.
PFLG or PFLD	Power factor, lagging or leading, for phase !A, B, or C as set by PHASE button, or total power factor if PHASE is set to * or *,.
I4	RMS neutral current
Hz	Frequency
VX	RMS auxiliary voltage
kWH IM	Import energy
kWH EX	Export energy
kVARH IM	Import reactive energy
kVARH EX	Export reactive energy
kVAH NET	Net reactive energy

EPM 7300 Meter



The large faceplate representation of the EPM 7300 meter provides the following animated functions:

Feature	Function
LCD display window	Opens the tabular data window specified during wizard configuration and sets the view to the Metering page.
Function Buttons	Opens the tabular data window specified during wizard configuration and sets the view to the Metering page.
UP and DOWN arrow keys	Rotate among 16 pages of actual values, metering, and fixed value information.

Table 11. EPM 7300 Faceplate animated functions.

The parameters displayed by the UP and DOWN buttons are listed in the following table.

Page	Text Displayed	Description
1	Vln A	Units in Volts
	Vln B	Units in Volts.
	Vln C	Units in Volts.
	Vln Avg.	Units in Volts.
2	Vll ab	Units in Volts.
	Vll bc	Units in Volts.
	Vll ca	Units in Volts.
	Vll avg	Units in Volts.
3	Ia	Units in Amps
	Ib	Units in Amps
	Ic	Units in Amps.
	Iavg	Units in Amps
4	V unbalance	% deviation from Vln or Vll avg for the phase having the greatest unbalance
	I unbalance	% deviation from I avg for the phase having the greatest current unbalance
	Line Frequency	Fundamental Frequency of Phase A voltage.
	Phase Reversal	Boolean register indicating if there is a phase reversal. When the voltage phases do not rotate in the sequence specified by the phase order setup, this register is ON.
5	kW a	Real Power for phase a
	kW b	Real Power for phase b
	kW c	Real Power for phase c
	kW total	Total Real Power
6	kVAR a	Reactive power for phase a
	kVAR b	Reactive power for phase b
	kVAR c	Reactive power for phase c
	kVAR total	Total Reactive power
7	kVA a	Apparent Power for phase A
	kVA b	Apparent Power for phase B
	kVA c	Apparent Power for phase C
	kVA total	Total Apparent Power
8	PF signed a	Signed Power Factor Phase A
	PF signed b	Signed Power Factor Phase B
	PF signed c	Signed Power Factor Phase C
	PF sign Total	Signed Power Factor Total
9	kW SD	Real Power Sliding Demand
	kW PD	Real Power Predicted Demand
	kVAR SD	Reactive Power Sliding Demand
	kVAR PD	Reactive Power Predicted Demand
10	kVA SD	Apparent Power Sliding Demand
	kVA PD	Apparent Power Predicted Demand
	Vln avg MAX	Maximum Average Voltage
	I avg MAX	Maximum Average Current
11	kW MAX	Maximum Real Power
	kVAR MAX	Maximum Reactive Power

	kVA MAX	Maximum Apparent Power
	Frequency MAX	Maximum Frequency
12	Vln avg MIN	Minimum Average Voltage
	I avg MIN	Minimum Average Current
	Frequency MIN	Minimum Frequency
13	kWh Import	Forward Real Energy
	kWh Export	Reverse Real Energy
	kWh Total	Total Real Energy
	kWh Net	Net Real Energy
14	kVARh Import	Forward Reactive Energy
	kVARh Export	Reverse Reactive Energy
	kVARh Total	Total Reactive Energy
	kVARh Net	Net Reactive energy
15	kVAh	Total Apparent Energy
	V1 Total HD	Harmonic Distortion, V1
	V2 Total HD	Harmonic Distortion, V2
	V3 Total HD	Harmonic Distortion, V3
16	I1 Total HD	Harmonic Distortion, I1
	I2 Total HD	Harmonic Distortion, I2
	I3 Total HD	Harmonic Distortion, I3

EPM 7700 Meter

The large faceplate representation of the EPM 7700 meter provides the following animated functions:

Feature	Function
LCD display window	Opens the tabular data window specified during wizard configuration and sets the view to the Metering page.
ESC	Opens the displays the main menu on the faceplate as shown above.
Blank Buttons	Pressing the keys adjacent to the LCD Display window displays the selected screen. For instance, selecting the Total Power button displays the Total Power screen of data.

Table 12. EPM 7700 Faceplate animated functions.

The parameters displayed by the various data screen buttons are listed in the following table.

Screen Selected	Description
1 - Total Power	• KW Total • KVAR Total • KVA Total • PF Signed Total
2 - Three-Phase Measurements	• Vln a; Vln b: n/a when Voltage Mode is DELTA • Vln c: n/a when Voltage Mode is DELTA or SINGLE • Vln Avg: n/a when Voltage Mode is DELTA • Vll ab • Vll bc; Vll ca; Vll avg: n/a when Voltage Mode is SINGLE • Ia, Ib, I4, Iavg • Ic: n/a when Voltage Mode is SINGLE • V unbal • I unbal • Line Frequency
3 - Per-Phase Power	• KW a; KW b: n/a when Voltage Mode is DELTA • KW c: n/a when Voltage Mode is DELTA or SINGLE • KW Total • KVAR a; KVAR b: n/a when Voltage Mode is DELTA • KVAR c: n/a when Voltage Mode is DELTA or SINGLE • KVAR Total • KVA a; KVA b: n/a when Voltage Mode is DELTA • KVA c: n/a when Voltage Mode is DELTA or SINGLE • KVA Total • PF Signed a; PF Signed b: n/a when Voltage Mode is DELTA • PF Signed c: n/a when Voltage Mode is DELTA or SINGLE
4 - Energy	• KWh Import; KWh Export; KWh Total; KWh Net • KVARh Import; KVARh Export; KVARh Total; KVARh Net • KVAh Total • KW Total Min; KVAR Total Min; KVA Total Min • KW Total Max; KVAR Total Max; KVA Total Max
5 - Symmetrical Components	• I ZeroSeqMag; I PosSeqMag; I NegSeqMag • V ZeroSeqMag; V PosSeqMag; V NegSeqMag • I ZeroSeqPhs; I PosSeqPhs; I NegSeqPhs • V ZeroSeqPhs; V PosSeqPhs; V NegSeqPhs

***NOTE:** If the Sliding Demand Reset is initiated, or a SWD setup register is changed, SWD values are "N/A" in the meter until the number of sub-intervals specified in the #sub intervals setup register have expired. The 3-D faceplate and Tabular wizard will display 0 for these values during this state.

239 Motor Protection Relay

The large faceplate representation of the 239 provides the following animated functions:

Feature	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Metering page.
SETPOINTS Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
RESET Button	Opens the tabular data window specified during wizard configuration and sets the view to the Metering page, which offers a RESET button to issue a reset command to the device.
ACTUAL Button	Rotates through the three Main Actual Value pages available: A1 Status, A2 Metering, and A3 Product Info. If the display was in a subgroup or line when ACTUAL was pressed, the display will jump back to the page header.
MESSAGE UP/DOWN Buttons	Scrolls forward or backward through the subgroup titles of the current Actual Value page.
MESSAGE RIGHT/LEFT Buttons	Scrolls through the individual lines of each subgroup within the current page, showing actual values and units.
Panel Display Lights	Display animation that shows the status of the 239 relay.

Table 13. 239 Faceplate animated functions.

The Wizard displays the following Subgroups and Lines shown in Chapter 5, *Actual Values*, of the 239 Instruction Manual, revision 2.10.

Page 1: STATUS	General	Static messages display general Alarm and Motor Status
Page 2: METERING	Current	
	Motor Capacity	
	Temperature	
Page 3: PRODUCT INFORMATION	Software Versions	Values are not continuously updated
	Model Information	Values are not continuously updated

The subgroups listed below are displayed by the device but are not implemented in the 3-D wizard.

Page 1: STATUS	General	Individual Alarm conditions are not displayed by the Wizard.
	Last Trip Data	
	Switch Status	
	Programmable Message	

269 Plus Motor Management Relay

The large faceplate representation of the 269 Plus provides the following animated functions:

Feature	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Monitoring page.
SET POINTS Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
RESET Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
CLEAR Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
VALUE Buttons	Open the tabular data window specified during wizard configuration and set the view to the Setup page.
HELP Button	Displays a Windows help screen for PMCS.
ACTUAL VALUES Button	Brings the meter to an initial setting point and displays ACTUAL VALUES HAS SEVEN PAGES OF DATA.
REFRESH Button	Updates the display to the current meter reading.

Feature	Function
STORE Button	Resets the meter at two special points in the display of values. Press STORE to toggle the response on the bottom line.
PAGE Buttons	Rotate among seven pages of parameter data. Press one of the arrow keys to display PAGE #: ACTUAL VALUES on the top line, a description on the bottom, and reset to the first parameter value. The seven pages are listed in the following tables.
LINE Buttons	Rotate among parameters within a page. Certain configurations or meter values may prevent display of all parameters within a page. The parameters in each page are listed in the table below.
Panel Display Lights	Display animation that shows the status of the 269 Plus relay. If a trip or alarm has occurred, auxiliary relay 1 or 2 is active. If the meter fails its self-test, the dark red square to the left of the label appears bright red.

Table 14. 269+ Faceplate animated functions.

The following table lists the pages that can be accessed with the PAGE buttons, with the parameters available in each page that can be accessed with the LINE buttons.

Page	Value	Text Displayed	Description
1	1	PAGE 1: ACTUAL VALUES PHASE CURRENT DATA	Page header
	2	I1=xxx I2=xxx I3=xxx (AMPS)---	Phase current in amps; --- or RUN based on motor status
	3	I(3 Ph avg.)=xxx AMPS Max Stator RTD=xxx C	Average phase current Hottest stator temperature
	4	UNBALANCE RATIO (In/Ip) U/B=xx PERCENT	
	5	GROUND FAULT CURRENT G/F=xxx.0 AMPS	Units = *.1 if G/F CT ratio = 2000:1
	6	ST/HR TIMERS (MIN) xx xx xx xx xx	Starts per hour
	7	TIME BETWEEN STARTS TIMER = xxx MIN	
	8	END OF PAGE ONE ACTUAL VALUES	Page footer
2	1	PAGE 2: ACTUAL VALUES RTD TEMPERATURE DATA	Page header
	2	HOTTEST STATOR RTD RTD #xx = xxx	
	3-12	RTD TEMPERATURE RTD # xx = xxx	Displays temperatures of RTDs #1-10
	13	MAX STATOR SINCE LAST ACCESS: RTD #x = xxx DEGREES C	
	14-17	MAXIMUM RTD #x TEMP SINCE LAST ACCESS: xxx DEGREES C	Displays #7-10 max
	18	CLEAR LAST ACCESS DATA? NO	Press STORE to clear; message changes to YES
	19	END OF PAGE TWO ACTUAL VALUES	Page footer

Page	Value	Text Displayed	Description
	1	PAGE 3: ACTUAL VALUES MOTOR CAPACITY DATA	Page header
	2	ESTIMATED TIME TO TRIP = xxx SECONDS	
3	3	MOTOR LOAD AS A PERCENT FULL LOAD = xxx PERCENT	
	4	THERMAL CAPACITY USED = xxx PERCENT	
	5	END OF PAGE THREE: ACTUAL VALUES	Page footer
	1	PAGE 4: ACTUAL VALUES STATISTICAL DATA	Page header
	2	RUNNING HOURS SINCE LAST COMMISSIONING xxx HOURS	
	3	MEGAWATTHOURS SINCE LAST COMMISSIONING xxx MWHR	Displayed only if MTM unit is installed in 269
	4	# OF STARTS SINCE LAST COMMISSIONING xxx	
	5	# OF TRIPS SINCE LAST COMMISSIONING xxx	
	6	# O/L TRIPS SINCE LAST COMMISSIONING xxx	Overload trips
	7	# RAPID TRIPS SINCE LAST COMMISSIONING xxx	
	8	# U/B TRIPS SINCE LAST COMMISSIONING xxx	Unbalance trips
4	9	# G/F TRIPS SINCE LAST COMMISSIONING xxx	Ground-fault trips
	10	# RTD TRIPS SINCE LAST COMMISSIONING xxx	
	11	# S/C TRIPS SINCE LAST COMMISSIONING xxx	Short-circuit trips
	12	# START TRIPS SINCE LAST COMMISSIONING xxx	
	13	# U/V TRIPS SINCE LAST COMMISSIONING xxx	Undervoltage trips
	14	# O/V TRIPS SINCE LAST COMMISSIONING xxx	Overvoltage trips
	15	# PF TRIPS SINCE LAST COMMISSIONING xxx	Power-failure trips
	16	VOLTAGE PHASE REVERSALS SINCE COMMISSIONING xxx	
	17	START NEW COMMISSIONING NO	Press STORE to start; message changes to YES
4	18	END OF PAGE FOUR: ACTUAL VALUES	Page footer
	1	PAGE 5: ACTUAL VALUES PRE-TRIP DATA	Page header

Page	Value	Text Displayed	Description
5	2	CAUSE OF LAST TRIP message	Message is a brief explanation of trip cause
	3	PRE-TRIP AVERAGE MOTOR CURRENT = xxx AMPS	
	4	PRE-TRIP U/B RATIO (lI/Ip) xxx PERCENT	Unbalance
	5	PRE-TRIP G/F CURRENT G/F=xxx.0 AMPS	Units = *.1 if G/F CT ratio = 2000:1
	6	PRE-TRIP MAX STATOR RTD RTD #XX = xxx C	
	7	PRE-TRIP AVERAGE VOLTAGE VOLTS = xxx	Displayed only if MTM unit is installed in 269
	8	PRE-TRIP KWATTS KW = xxx	Displayed only if MTM unit is installed in 269
	9	PRE-TRIP KVARS KVAR = xxx	Displayed only if MTM unit is installed in 269
	10	PRE-TRIP POWER FACTOR PF = xxx	Displayed only if MTM unit is installed in 269
	11	PRE-TRIP FREQUENCY HZ = xxx	Displayed only if MTM unit is installed in 269
	12	END OF PAGE FIVE ACTUAL VALUES	Page footer
6	1	PAGE 6: ACTUAL VALUES LEARNED PARAMETERS	Page header
	2	LEARNED Istart (AVG OF 4 STARTS)=xxx AMPS	
	3	LEARNED Istart (last one) =xxx AMPS	
	4	LEARNED K FACTOR K = xxx AMPS	
	5	LEARNED RUNNING COOL TIME-xxx MIN	
	6	LEARNED STOPPED COOL TIME = xxx MIN	
	7	LEARNED ACCEL TIME ACCEL TIME = xxx SEC	
	8	LEARNED Start Capacity Required = xxx PERCENT	
	9	END OF PAGE SIX ACTUAL VALUES	Page footer
	1	PAGE 7: ACTUAL VALUES METERING DATA	Page header
	2	Vab = xxx Vbc = xxx Vac = xxx (VOLTS) or MTM METER MODULE NOT INSTALLED	Displayed only if MTM unit is on line
	3	3 PHASE KWATTS KW = xxx	Displayed only if MTM unit is on line

Page	Value	Text Displayed	Description
7	4	3 PHASE KVARS KVAR = xxx	Displayed only if MTM unit is on line
	5	POWER FACTOR PF = xxx	Displayed only if MTM unit is on line
	6	FREQUENCY HZ = xx.x	Displayed only if MTM unit is on line
	7	END OF PAGE SEVEN ACTUAL VALUES	Page footer

SR469 Motor Management Relay

The large faceplate representation of the SR469 provides the following animated functions:

Feature	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Metering page.
SET POINTS Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setpoints page.
RESET Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setpoints page.
VALUE UP and DOWN Buttons	Opens the Tabular Data window with the view set to the Setpoints tab.
HELP Button	Displays a help screen for the SR469.
ACTUAL VALUES Button	Rotates the display through the three main Actual Value pages on the device: A1 Status, A2 Metering, and A3 Product Info. If pressed while the display was in a Subgroup or Line, jumps back to the page header.
ENTER Button	Scrolls the display down one level. For example, if the display was on a Page, pressing ENTER moves the display to the Page's first Subgroup.
ESCAPE Button	Scrolls the display up one level. For example, when displaying a Subgroup, pressing ENTER moves the display to the Page containing that Subgroup.
MESSAGE UP or DOWN Buttons	Pressing these buttons scrolls up or down through the lines of a Subgroup, displaying the actual value and units.

Feature	Function
Panel Display Lights	Display animation that shows the status of the SR469 relay.

Table 15. SR469 Faceplate animated functions.

The Wizard displays the following Pages, Subgroups and Lines shown in Chapter 5, *Actual Values*, of the SR469 Instruction Manual, revision 30D220A8.000.

Page 1: STATUS	Motor Status	Values are not continuously updated except for Estimated Motor Trip Time and Thermal Capacity.
	Voltage	
	Frequency	
Page 2: METERING	Current	A static message is displayed based on GENERAL_STATUS bit 0, indicating whether or not an alarm condition exists.
	Temperature	
	Voltage	
	Speed	
	Power	Power Factor values are not continuously updated.
	Demand	
	Analog Inputs	Name and Units are not continuously updated.
Page 6: PRODUCT INFORMATION	Model Information	Values are not continuously updated
	Calibration Information	Values are not continuously updated

The subgroups listed below are displayed by the device but are not implemented in the 3-D wizard.

Page 1:STATUS	Last Trip Data	
	Alarm Status	
	Start Blocks	
	Digital Inputs	
	Real Time Clock	
Page 3: LEARNED DATA	Motor Starting	
	Average Motor Load	
	RTD Maximums	
	Analog In Min/Max	
Page 4: MAINTENANCE	Trip Counters	
	General Counters	
	Timers	
Page 5: EVENT RECORD	Event 01, Event 02,…	

SR489 Generator Management Relay

The large faceplate representation of the SR489 Generator Management Relay provides the following animated functions:

Feature	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Metering page.
SET POINTS button	Opens the tabular data window specified during wizard configuration and sets the view to the Setpoints page.
RESET button	Opens the tabular data window specified during wizard configuration and sets the view to the Metering tab, where there is a button to issue a RESET command.
HELP button	Displays a Windows help screen for PMCS with information on the SR489.
ACTUAL button	Rotates through the three main Actual Value pages: A1, Status; A2, Metering; and A3, Product Info. If the display showed a subgroup or line when the ACTUAL button was pushed, the display will change to the header of whichever subgroup was being displayed.
ENTER button	Scrolls the display down one level. For example, if the display was on a Page, pressing ENTER moves the display to the first Subgroup within the Page.
ESCAPE button	Scrolls the display up one level. For example, when displaying a Subgroup, pressing ENTER moves the display to the Page containing that Subgroup.
MESSAGE UP / MESSAGE DOWN buttons	Pressing these buttons scrolls up or down through the lines of a Subgroup, displaying the actual value and units.
Panel Display Lights	The SR489 Faceplate wizard displays LED's animated to match the LED's at the actual device.

Table 16. SR489 Faceplate animated functions.

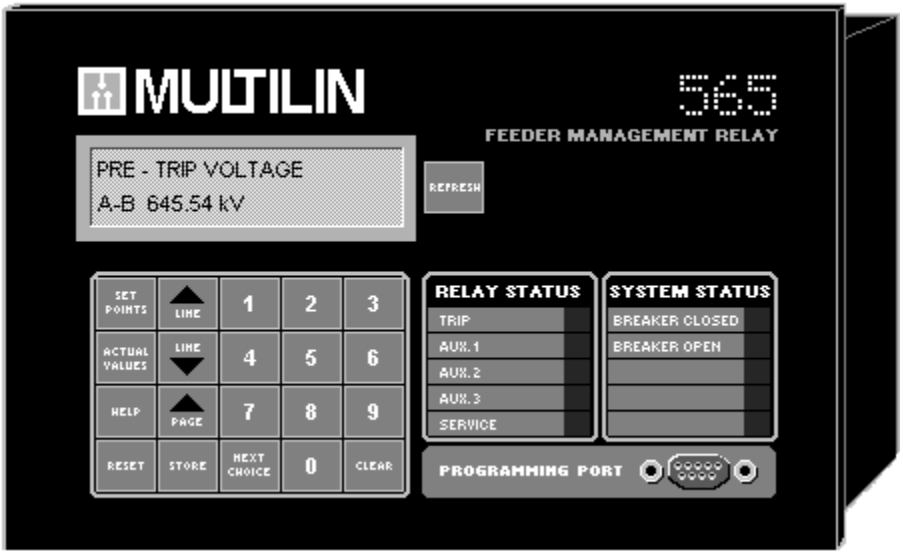
The Wizard displays the following Pages, Subgroups and Lines shown in Chapter 5, *Actual Values*, of the SR489 Instruction Manual, revision 32E120A8.000.

Page 1: STATUS	Generator Status	Value is not continuously updated.
Page 2: METERING	Current	
	Voltage	
	Power	Power Factor values are not continuously updated.
	Temperature	
	Demand	
	Analog Inputs	Name and Units are not continuously updated.
	Speed	
Page 6: PRODUCT INFORMATION	Model Information	Values are not continuously updated
	Calibration Information	Values are not continuously updated

The following subgroups are displayed by the device but are not implemented in the 3-D wizard.

Page 1:STATUS	Generator Status	Thermal Capacity Used and Estimated Trip Time
	Last Trip Data	
	Alarm Status	
	Trip Pickups	
	Alarm Pickups	
	Digital Inputs	
	Real Time Clock	
Page 2: METERING	Current	Neutral Current and Differential Current are not displayed. Phase Angles are not displayed.
	Voltage	Phase Angles are not displayed. Neutral and Term Voltages are not displayed.
Page 3: LEARNED DATA	Parameter Averages	
	RTD Maximums	
	Analog In Min/Max	
Page 4: MAINTENANCE	Trip Counters	
	General Counters	
	Timers	
Page 5: EVENT RECORD	Event 01, Event 02,…	

565 Feeder Management Relay



The large faceplate representation of the 565 provides the following animated functions:

Feature	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to Monitoring page.
SET POINTS Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
RESET Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
CLEAR Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
NEXT CHOICE	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
0 to 9 Buttons	Open the tabular data window specified during wizard configuration and set the view to the Setup page.
HELP Button	Displays a Windows help screen for PMCS.
ACTUAL VALUES Button	Brings the meter to an initial setting point and displays ACTUAL VALUES HAS NINE PAGES OF DATA.
REFRESH Button	Updates the display to the current meter reading.
STORE Button	Resets the meter at six special points in the display of values. Press STORE to toggle the response on the bottom line.
PAGE UP Button	Rotates among nine pages of parameter data. Press the key to display ACTUAL VALUES on the top line, a description on the bottom, and reset to the first parameter value. The nine pages are listed in the table below.
LINE Buttons	Rotate among parameters within a page. Certain configurations or meter values may prevent display of all parameters within a page. The parameters in each page are listed in the table below.
Panel Display Lights	Display animation that shows the status of the 565 relay. The dark red square to the left of the label appears bright red to indicate an active state. The TRIP bar shows the current trip condition. Auxiliary relays 1, 2, and 3 show user-selected function status. The BREAKER CLOSED and BREAKER OPEN bars show the status of the monitored feeder breaker. The SERVICE bar is not animated.

Table 17. 565 Faceplate animated functions.

The following table lists the pages that can be accessed with the PAGE UP button, with the parameters available in each page that can be accessed with the LINE buttons.

Page	Value	Text Displayed	Description
1	1	ACTUAL VALUES CURRENT	Page header
	2	PHASE A CURRENT xxx	Value in amps
	3	PHASE B CURRENT xxx	Value in amps
	4	PHASE C CURRENT xxx	Value in amps
	5	GROUND CURRENT xxx	Value in amps
	6	PHASES A = xxx B = xxx C = xxx or PHASES A<1% FS B<1% FS C<1% FS	Value in amps Breaker is closed and current <1% of trip level in all phases
	7	CURRENT END OF PAGE	Page footer
2	1	ACTUAL VALUES ANALOG INPUT	Page header
	2	<analog input name> xxx <units> or ANALOG INPUT DISABLED	Name entered by user, value given in user-defined units Displayed if disabled
	3	ANALOG INPUT END OF PAGE	Page footer
3	1	ACTUAL VALUES MAINTENANCE DATA	Page header
	2	BRKR mm/dd/yy DATE: xx/xx/xx	
	3	BREAKER TRIPS xxx	Number of trips since last reset
	4	ACCUMULATED KA PHASE A xxx	
	5	ACCUMULATED KA PHASE B xxx	
	6	ACCUMULATED KA PHASE C xxx	
	7	MAINTENANCE DATA CLEAR NO	Press STORE button to reset trip counter
	8	DATA CLEARED LAST: xx/xx/xx	Date of last reset
	9	MAINTENANCE DATA END OF PAGE	Page footer
	1	ACTUAL VALUES OPERATIONS DATA	Page header

Page	Value	Text Displayed	Description
4	2	TIMED PHASE O/C TRIPS ###	
	3	INST PHASE O/C TRIPS ###	
	4	TIMED GROUND O/C TRIPS ###	
	5	INST GROUND O/C TRIPS ###	
	6	OVERVOLTAGE TRIPS ###	
	7	UNDERVOLTAGE TRIPS ###	
	8	ANALOG INPUT TRIPS ###	
	9	CLEAR OPERATIONS DATA? NO	Press STORE button to clear trip counters
	10	DATA CLEARED LAST 0/0/0	
	11	OPERATIONS DATA END OF PAGE	Page footer
5	1	ACTUAL VALUES PRE-TRIP DATA	Page header
	2	ALARM PHASE O/C	
	3	ALARM: GROUND O/C	
	4	ALARM: OVERVOLT	
	5	ALARM: UNDERVOLT	
	6	ALARM: ANALOG INPUT	
	7	ALARM: ACCUMULATED KA	
	8	SWITCH ALARM 1	
	9	ALARM: AMPS DEMAND	
	10	ALARM: KW DEMAND	
	11	ALARM: KVAR DEMAND	
	12	ALARM: POWER FACTOR	
	13	ALARM: FREQUENCY	
	14	ALARM: TRIP COIL	
	15	ALARM: MTM COMM	
	16	CAUSE OF LAST TRIP:	

Page	Value	Text Displayed	Description
	17	TIME OVERCURRENT PHASE ABC or TIME OVERCURRENT GROUND or INST OVERCURRENT PHASE ABC or UNDERVOLTAGE FAULT or OVERVOLTAGE FAULT or EXTERNAL TRIP #x or ANALOG INPUT or POWER FACTOR FAULT or FREQUENCY FAULT	Only phases in alarm are displayed x is in range 1-4
	18	PHASE A PRE-TRIP CURRENT xxx A	Value in amps
	19	PHASE B PRE-TRIP CURRENT xxx A	Value in amps
	20	PHASE C PRE-TRIP CURRENT xxx A	Value in amps
	21	GROUND PRE-TRIP CURRENT xxx A	Value in amps
	22	PRE -TRIP VOLTAGE A-B xxx.xx kV or A-N xxx.xx kV	 If configured as Delta or If configured as Wye
	23	PRE -TRIP VOLTAGE B-C xxx.xx kV or B-N xxx.xx kV	 If configured as Delta or If configured as Wye
	24	PRE -TRIP VOLTAGE C-A xxx.xx kV or C-N xxx.xx kV	 If configured as Delta or If configured as Wye
	25	FREQUENCY AT TRIP xxx.xx Hz	
	26	DATE OF TRIP xx/xx/xx	mm/dd/yy
	27	TIME OF TRIP xx:xx:xx	hh:mm:ss
	28	PRE-TRIP DATA END OF PAGE	Page footer

Page	Value	Text Displayed	Description
6	1	ACTUAL VALUES VOLTAGE	Page header
	2	VOLTAGE A-B xxx.xx kV	
	3	VOLTAGE B-C xxx.xx kV	
	4	VOLTAGE C-A xxx.xx kV	
	5	FREQUENCY OF FEEDER xxx.xx Hz	
	6	VOLTAGE END OF PAGE	Page footer
7	1	ACTUAL VALUES EVENT	Page header
	2	NO OF EVENTS xxx or EVENT RECORDING DISABLED	Displayed only if enabled
	3	CLEAR EVENTS? NO	Press STORE button to clear event counter
	4	EVENTS CLEARED LAST: xx/xx/xx	Date of last reset: mm/dd/yy
	5	EVENT END OF PAGE	Page footer
8	1	ACTUAL VALUES DEMAND DATA	Page header
	2	PH-A PEAK DEMAND xxx A or AMPS DEMAND DISABLED	Value in amps or Next prompt is CLEAR AMP DEMAND
	3	PH-B PEAK DEMAND xxx A	Value in amps
	4	PH-C PEAK DEMAND xxx A	Value in amps
	5	CLEAR AMP DEMAND DATA? NO	Press STORE button to reset amp data
	6	DATA CLEARED LAST: xx/xx/xx	Date of last reset: mm/dd/yy
	7	PEAK KW DEMAND xxx kW or KW DEMAND DISABLED	 or Displayed if disabled
	8	CLEAR KW DEMAND DATA? NO	Press STORE button to reset kilowatt data
	9	KW DEMAND DATA CL'D: xx/xx/xx	Date of last reset: mm/dd/yy

Page	Value	Text Displayed	Description
	10	PEAK KVAR DEMAND xxx kVAR or KVAR DEMAND DISABLED	 or Displayed if disabled
	11	CLEAR KVAR DEMAND DATA? NO	Press STORE button to reset kVAR data
	12	KVAR DEMAND DATA CL'D: xx/xx/xx	Date of last reset: mm/dd/yy
	13	DEMAND DATA END OF PAGE	Page footer
9	1	METERING DATA DEMAND DATA	Page header
	2	POWER FACTOR LAGGING: x.xx or LEADING: x.xx	 If PF < 0 or If PF > 0
	3	FREQUENCY MTM x.xx Hz	
	4	REAL POWER xxx kW	
	5	REACTIVE POWER xxx kVAR	
	6	ENERGY USED xxx MWHRS	
	7	METERING DATA END OF PAGE	Page footer

735 Feeder Relay

The large faceplate representation of the 735 provides the following animated functions:

Feature	Function
LED's	The LED's on the Faceplate wizard accurately represent the LED's on the actual device.
Bar Graph	The 735's bar graph is accurately represented on the Faceplate wizard, with active display of data from the device showing current as a percentage of CT.
Rotary Dials	Each of the 735's eight rotary dials is represented on the Faceplate wizard as a circle with a text field in the center showing the setting of the dial at the device. These dials are read-only and do not provide any additional functionality beyond displaying the settings of the dials.
CLEAR button	Pressing the CLEAR button displays the tabular data screen's Metering tab, which contains a button for issuing a CLEAR command to the device.
Comm. Area button	Clicking anywhere in the Communications area of the Faceplate wizard displays the tabular data screen's Metering tab. The DIP switches shown in the Comm. area are not selectable.

Table 18. 735 Faceplate animated functions.

SR745 Transformer Management Relay

The large faceplate representation of the SR745 provides the following animated functions:

Feature	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Metering tab.
SET POINTS button	Opens the tabular data window specified during wizard configuration and sets the view to the Setpoints tab.
RESET button	Opens the tabular data window specified during wizard configuration and sets the view to the Metering tab, where there is a button to issue a RESET command.
VALUE UP / DOWN buttons	Pressing the VALUE UP or VALUE DOWN button opens the tabular data screen and displays the Setpoints tab.
HELP button	Displays a Windows help screen for PMCS with information on the SR745.
ACTUAL button	Rotates through the three main Actual Value pages: A1, Status; A2, Metering; and A3, Product Info. If the display showed a subgroup or line when the ACTUAL button was pushed, the display will change to the header of whichever subgroup was being displayed.
ENTER button	Scrolls the display down one level. For example, if the display was on a Page, pressing ENTER moves the display to the first Subgroup within the Page.
ESCAPE button	Scrolls the display up one level. For example, if the display was on a Subgroup, pressing ENTER moves the display to the Page containing that Subgroup.
MESSAGE UP / MESSAGE DOWN buttons	Pressing these buttons scrolls up or down through the lines of a Subgroup, displaying the actual value and units.

Feature	Function
Panel Display Lights	The SR745 Faceplate wizard displays LED's which are animated to match the LED's at the actual device.

Table 19. SR745 Faceplate animated functions.

The Wizard displays the following Pages, Subgroups and Lines shown in Chapter 6, *Actual Values,* of the SR745 Instruction Manual, revision 200-000.

Page 2: METERING	Current	Only the Winding 1, 2, and 3 RMS Current magnitude values are displayed, along with their % of rated load. ***NOTE:*** Winding 3 values are only displayed if the Transformer Type configured on the device is for 3 windings.
	Frequency	
	Tap Changer	
	Voltage	
	Ambient Temperature	
Page 4: PRODUCT INFORMATION	Revision Codes	Values are not continuously updated
	Calibration Information	Dates are not continuously updated

The following subgroups are displayed by the device but are not implemented in the 3-D wizard.

Page 1:STATUS	Date and Time	
	Logic Inputs	
	Output Relays	
Page 2: METERING	Current	Wizard does not display any Winding phase values, Positive/Negative/Zero Differential Sequence Currents, or Restraint Current for this Subgroup of the Metering page.
	Harmonic Content	
	Demand	
	Analog Input	
Page 3: EVENT RECORD	Event Data Reset	
	Event 01, Event 02,…	

SR750/SR760 Feeder Management Relay

The large faceplate representation of the SR750 and 760 are very similar. The same graphical wizard is selected for each device, and at the Wizard Configuration dialog box, you specify whether the wizard represents an SR750 or SR760 using option buttons provided. The wizard (regardless of which device it represents) provides the following animated functions:

Feature	Function
Display Window	Clicking the device's display opens the tabular data window and sets the view to the Metering page.
SETPOINTS Button	Opens the tabular data window and sets the view to the Setpoints tab.
RESET Button	Clicking the RESET button opens the tabular data window and sets the view to the Metering tab, where a button to RESET the device is available.
BREAKER OPEN/CLOSE	Clicking the BREAKER OPEN button displays the tabular data window and sets the view to the I/O tab, which contains logic for issuing BREAKER OPEN/CLOSE commands and for checking to see if the device is in LOCAL mode.
HELP Button	Displays a Windows help screen for PMCS and the SR750.
VALUE UP/DOWN Buttons	Pressing the VALUE UP/DOWN button rotates through the three pages of actual values: A1 Status, A2 Metering, and A3 Product Info. If the display showed a subgroup or line when the VALUE UP or VALUE DOWN button is pressed, the display jumps back to the page header.
ENTER Button	Pressing the ENTER button scrolls the display down one level (from page to subgroup or from subgroup to line). If the display shows a page when the ENTER button is pressed, the display will change to the first subgroup within that page. If the display shows a subgroup when the ENTER button is pressed, the display will change to the first line within that subgroup.

Feature	Function
ESCAPE Button	Pressing the ESCAPE button while in line mode jumps the display up one level, from line to subgroup.
MESSAGE UP/DOWN Buttons	Pressing the MESSAGE UP or MESSAGE DOWN button scrolls the display through individual lines of the current subgroup within the current page, showing the available values listed below.
Panel Display Lights	The SR750/SR760 Faceplate wizard displays LEDs which are animated to match the LEDs at the actual device.

Table 20. SR750/SR760 Faceplate animation functions.

The Wizard displays the following Pages, Subgroups and Lines shown in Chapter 5, *Actual Values*, of the SR750/SR760 Instruction Manual.

Page 1: STATUS	Feeder Status	A single text value is displayed, indicating whether or not an alarm condition exists. This text is not continuously updated.
Page 2: METERING	Current	
	Voltage	
	Power	Power Factor is not continuously updated.
	Frequency	
	Energy Use	
Page 5: PRODUCT INFORMATION	Revision Codes	Values are not continuously updated.
	Calibration Information	Dates are not continuously updated.

The subgroups listed below are displayed by the device but are not implemented in the 3-D wizard.

Page 1:STATUS	Clock	
	Last Trip Data	
	Fault Locations	
	Hardware Inputs	
Page 2: METERING	Current	All values supported except Current Phase Angles.
	Voltage	All values supported except Voltage Phase Angles and Synchronizing Voltages.
	Demand	
	Energy	All values supported except Watthour Costs and Last Reset Date.
	Analog Input	
Page 3: MAINTENANCE	Trip Counters	
	Arcing Current	
Page 4: EVENT RECORDER	Event 01, Event 02,…	
	Last Reset Date	

The subgroups listed below are displayed by the device but are not implemented in the 3-D wizard.

Page 1:STATUS	Clock	
	Last Trip Data	
	Fault Locations	
	Hardware Inputs	
Page 2: METERING	Current	All values supported except Current Phase Angles.
	Voltage	All values supported except Voltage Phase Angles and Synchronizing Voltages.
	Demand	
	Energy	All values supported except Watthour Costs and Last Reset Date.
	Analog Input	
Page 3: MAINTENANCE	Trip Counters	
	Arcing Current	
Page 4: EVENT RECORDER	Event 01, Event 02,…	
	Last Reset Date	

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Features of Tabular Data Screen Wizards

Introduction

This chapter describes the features available with tabular data screens. The set of features basic to all tabular data screens is described first, then any unique features are described for each device.

Features of Tabular Data Screens

The upper left-hand area of every tabular data screen contains a 3-D graphic of the device faceplate. This graphic is simply to verify identification and is not animated.

The middle area on the left-hand side displays common information about the device. It provides a quick indication of how the device is configured and contains no animation.

The buttons on the lower-left of the screen provide features described below. Not all devices support all of these buttons, so on some screens one or more of the buttons may be grayed out.

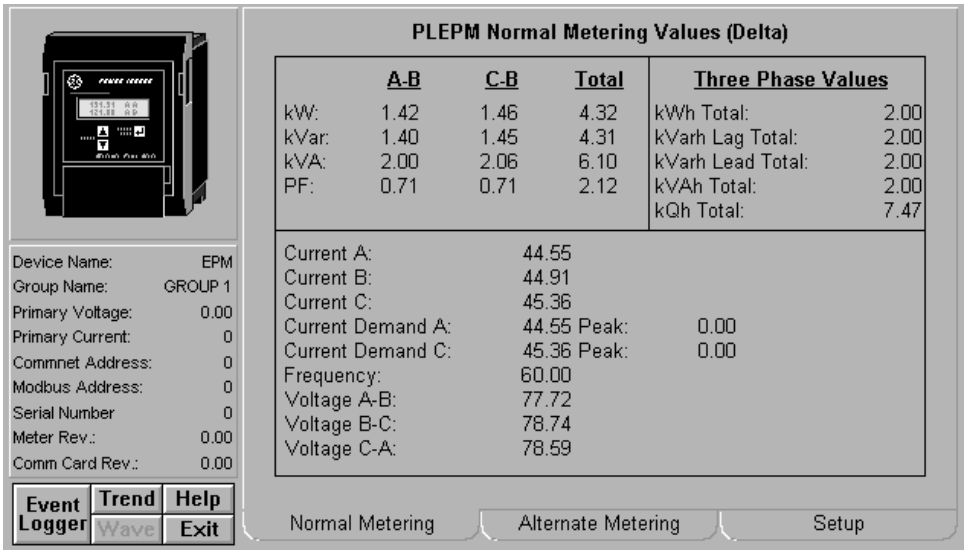
- The Help button calls up the PMCS help file with regard to the current device.
- The Exit button closes the tabular data screen.
- The Events button starts or jumps to the PMCS Event Logger client program and displays its window in the foreground.
- The Trend button displays the trend window that was specified in the configuration dialog. The button will be disabled if no trend window was specified during configuration of the Wizard.
- The Wave button runs the PMCS Waveform Capture client program for that device. This button is only enabled for devices supporting waveform capture.
- The Setup button, when present on Multilin device wizards, attempts to launch the xxxPC device setup program. The exception to this is the PMCS Advanced Wizards (EPM 7300, EPM 7700, and SR750/SR760), for which the Setup button has no function. It is up to the system

integrator to provide the necessary scripting to associate a function with the Setup button for these device types.

The right side of the screen contains a display of the device data. The tabs at the bottom enable you to select among the various data tables which can be displayed. The number of tabs (screens) varies according to the type and amount of data available from the device. The two main types of data are *metering*, which shows the data being monitored by the device, and *setup*, which is used to configure the device. Other tabs may be available depending on the device's capabilities.

Some devices have push buttons that reset events or clear accumulated data; these will be discussed below in the individual device sections. These functions are represented by 3-D push buttons on the tabular data screens. When a button is pressed, a dialog box appears that either asks for confirmation of the action or states that the operator has an insufficient access level to perform the operation. If security is enabled in your application, the current operator must have an Access level greater than or equal to the Access level configured for each tabular wizard in order to issue device commands. See the CIMPLICITY documentation for more information on how to use security features.

Power Leader EPM



The Power Leader EPM Tabular Data Screen wizard provides the following command buttons:

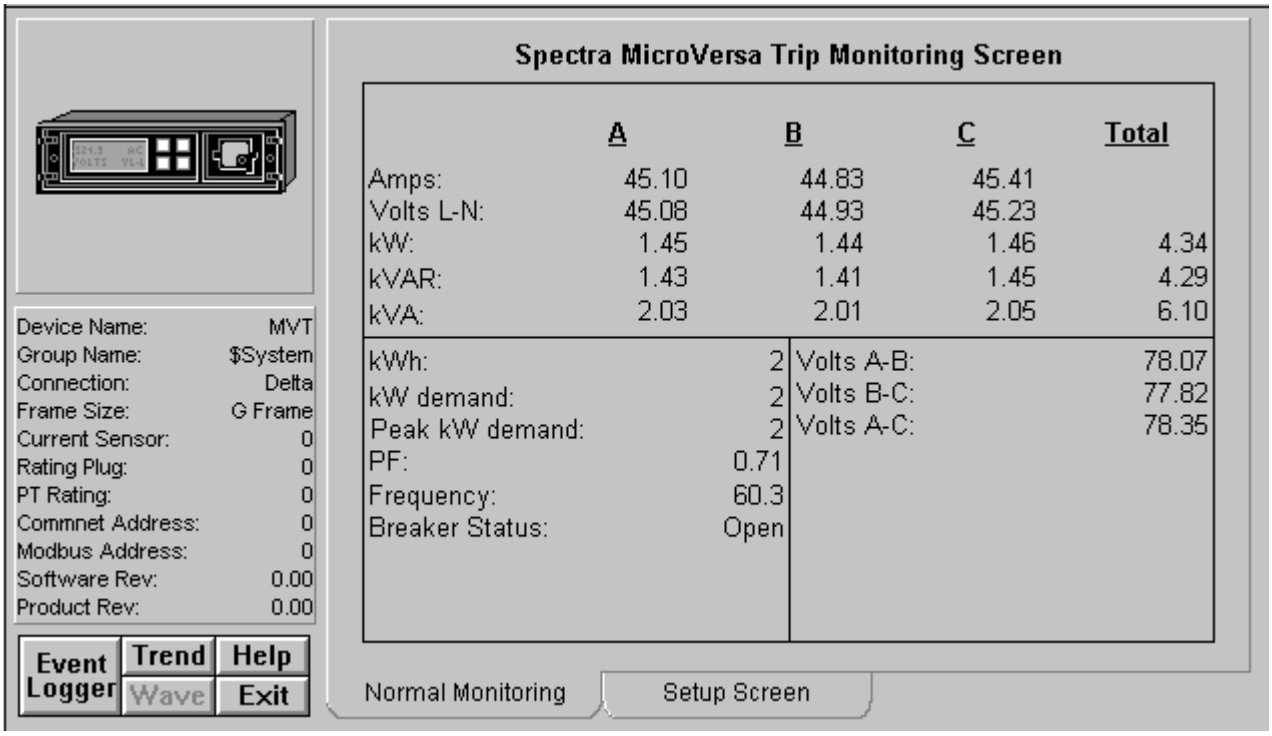
Tab	Button	Function
Setup	Meter Initialize	Performs a complete meter reset
	Clear Errors	Clears the event log in the meter
	Demand Reset	Clears the watt demand register in the meter
	Energy Reset	Clears the accumulated energy registers in the meter

Table 21. PLEPM Tabular data screen commands.

Another feature to bear in mind when working with the PLEPM tabular wizard is:

- The Normal Metering screen displays one of two tables depending on whether the meter is configured as Delta or Wye.

Spectra MicroVersaTrip



The Spectra MicroVersaTrip Tabular Data Screen wizard provides the following command buttons on the Setup screen:

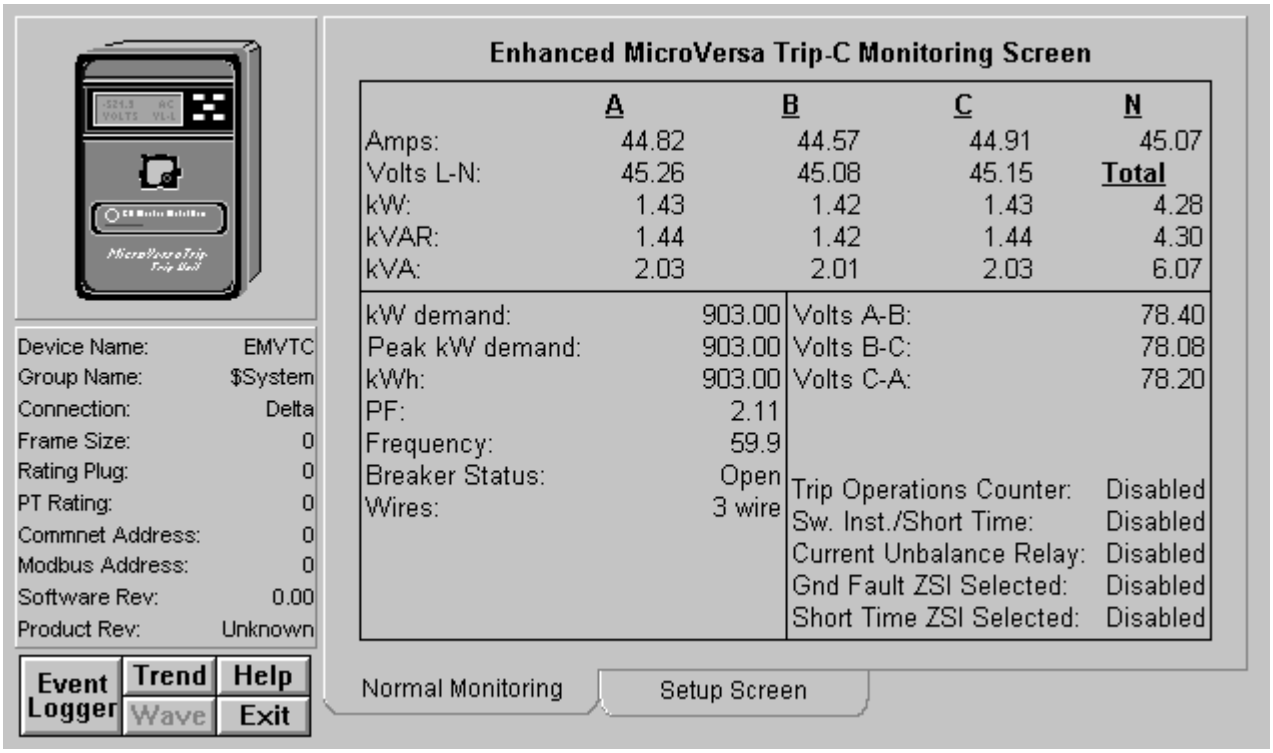
Tab	Button	Function
Setup	Download	Downloads the energy demand interval to the DDE Server
	Refresh	Loads the energy demand interval from the DDE Server into the screen display
	Clear Demand	Clears the accumulated energy

Table 22. Spectra MVT Tabular data screen commands.

Another feature to bear in mind when working with the Spectra MicroVersaTrip tabular wizard is:

- The data entry field for the energy demand interval can be set to values of 5 to 60 minutes in increments of 5 minutes.

Enhanced MicroVersaTrip-C Trip Unit

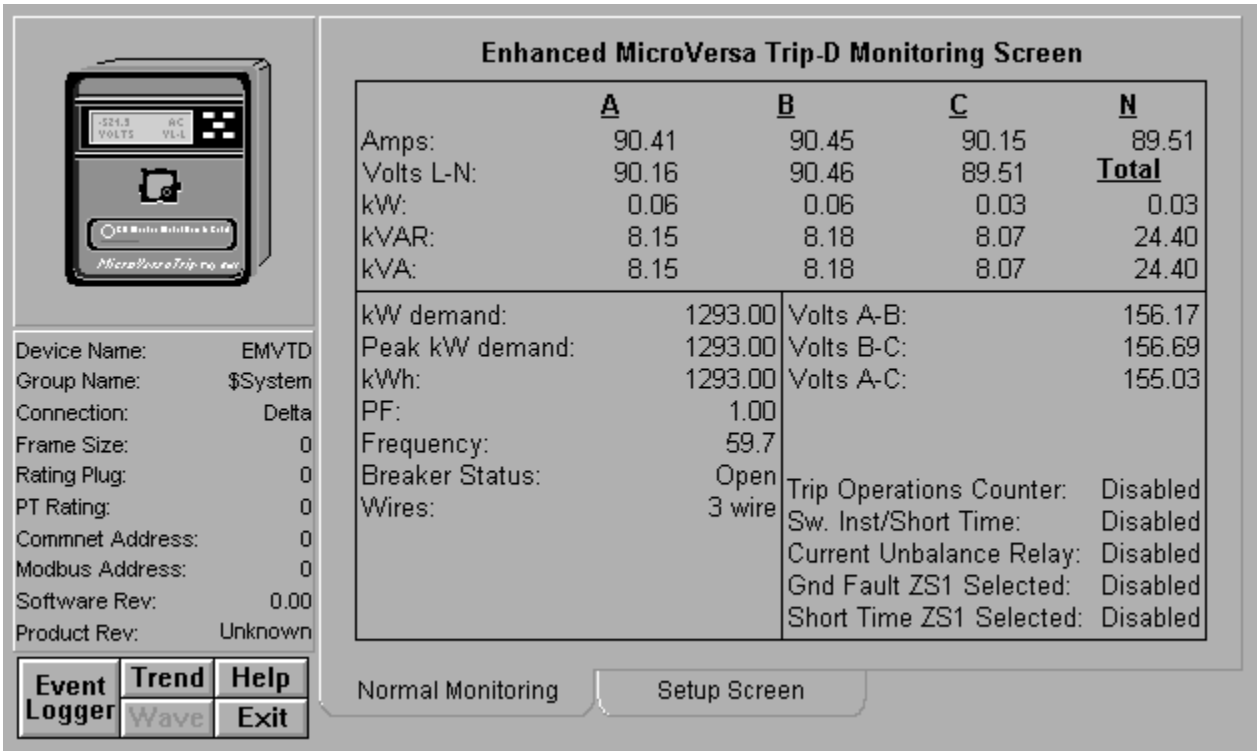


The Enhanced MicroVersaTrip-C Tabular Data Screen provides six push buttons on the Setup screen:

Tab	Button	Function
Setup	Energy	Clears the accumulated energy registers in the trip unit
	Demand	Clears the peak demand register in the trip unit
	Inst. Trip	Resets the instantaneous trip counter in the trip unit
	Short Trip	Resets the short-time trip counter in the trip unit
	Long Trip	Resets the long-time trip counter in the trip unit
	Ground Fault	Resets the ground fault trip counter in the trip unit

Table 23. EMVT-C Tabular data screen commands.

Enhanced MicroVersaTrip-D Trip Unit

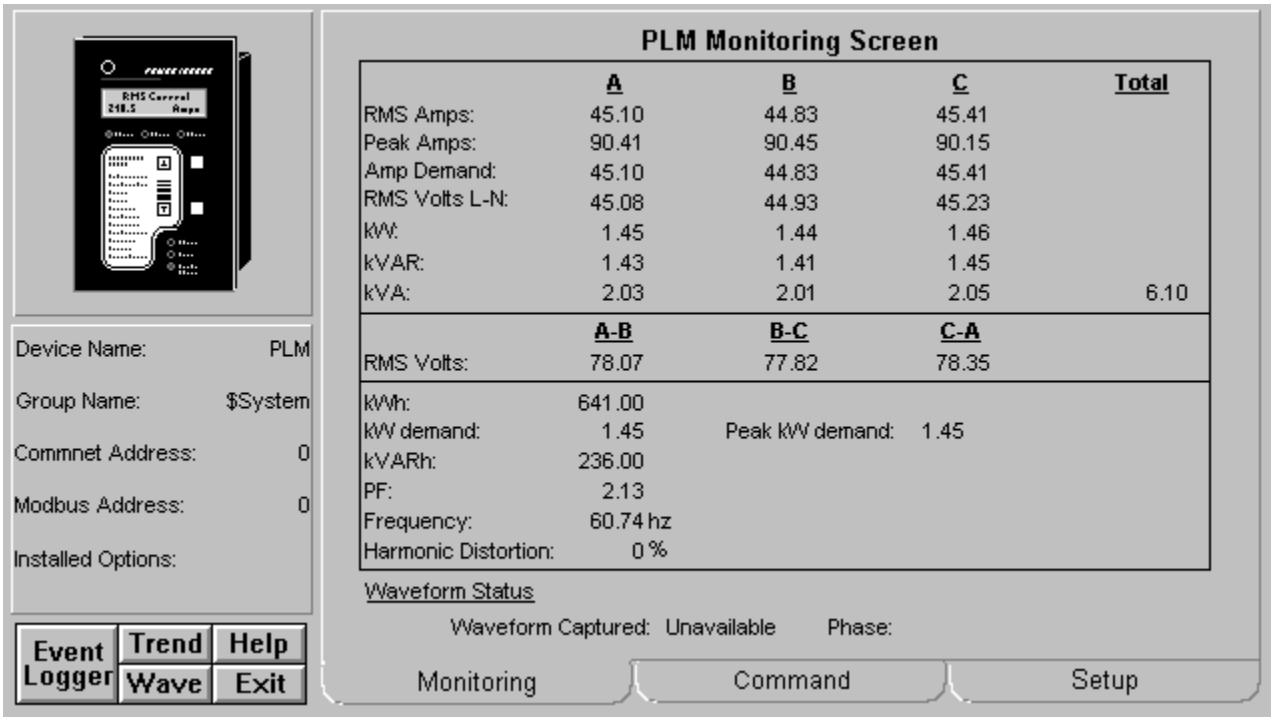


The Enhanced MicroVersaTrip-D Tabular Data Screen provides six push buttons on the Setup tab:

Tab	Button	Function
Setup	Energy	Clears the accumulated energy registers in the trip unit
	Demand	Clears the peak demand register in the trip unit
	Inst. Trip	Resets the instantaneous trip counter in the trip unit
	Short Trip	Resets the short-time trip counter in the trip unit
	Long Trip	Resets the long-time trip counter in the trip unit
	Ground Fault	Resets the ground fault trip counter in the trip unit

Table 24. EMVT-D Tabular data screen commands.

POWER LEADER Meter

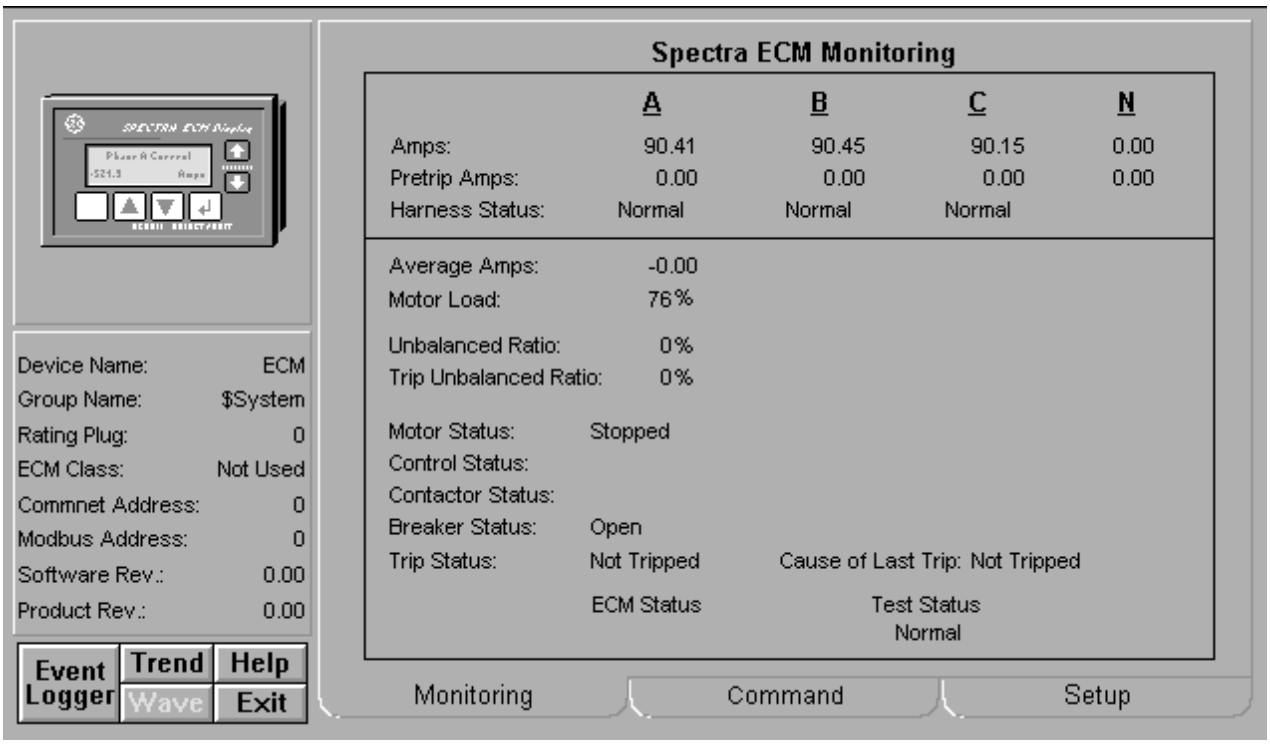


The POWER LEADER Meter Tabular Data Screen wizard provides three push buttons on the Command screen:

Tab	Button	Function
Command	Energy /VARH Clear	Clears the accumulated energy registers in the meter
	Peak Current Clear	Clears the peak current register in the meter
	Peak Watt Demand Clear	Clears the peak demand in the meter

Table 25. PL Meter Tabular data screen commands.

Spectra ECM

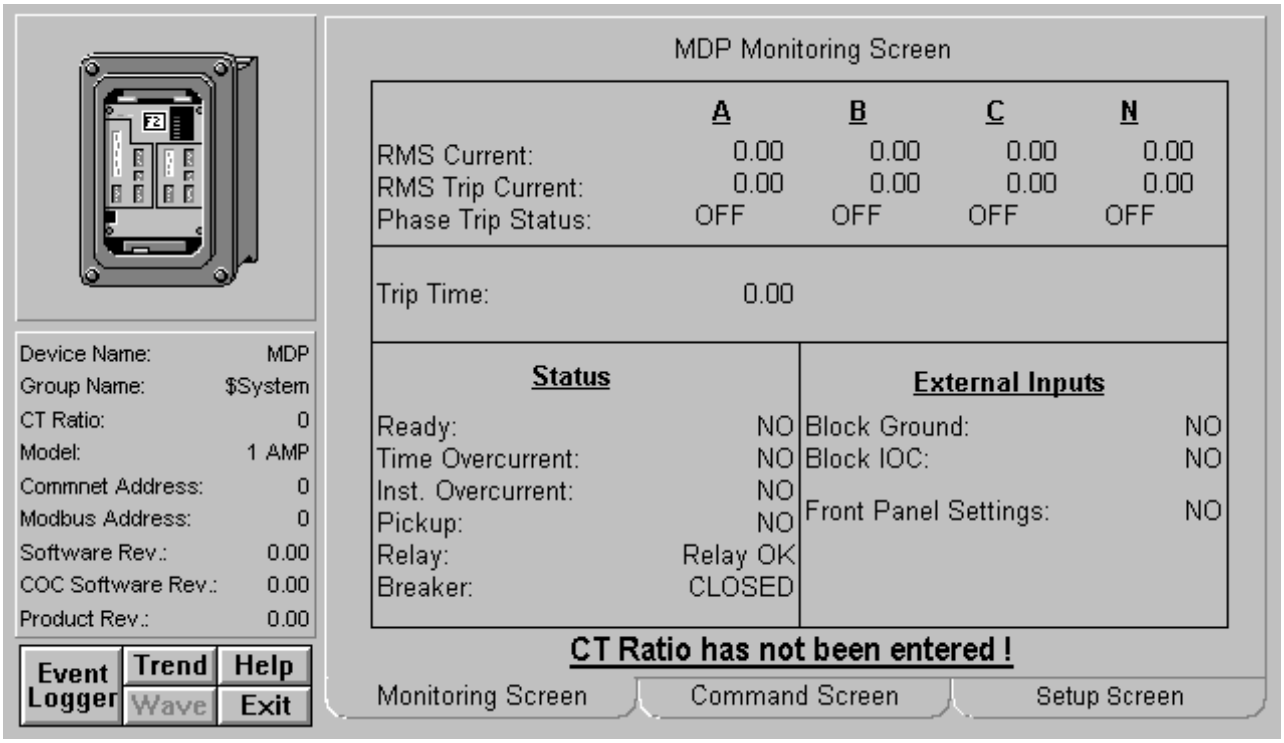


The Spectra ECM Tabular Data Screen wizard performs the following actions with push buttons on the Command screen:

Tab	Button	Function
Command	Contactor 1 Start	Closes contactor 1
	Contactor 2 Fast Start	Initiates a fast start of contactor 2
	Contactor 2 Rev Start	Reverse closes contactor 2
	Stop 1 & 2	Opens contactors 1 and 2
	ECM Reset	Completely resets the ECM
	Initialize Temperature	Resets the temperature memory in the ECM
	Trip ECM Contactor	Trips the ECM contactors

Table 26. Spectra ECM Tabular data screen commands.

MDP Digital Overcurrent Relay



The MDP Tabular Data Screen wizard has three command buttons:

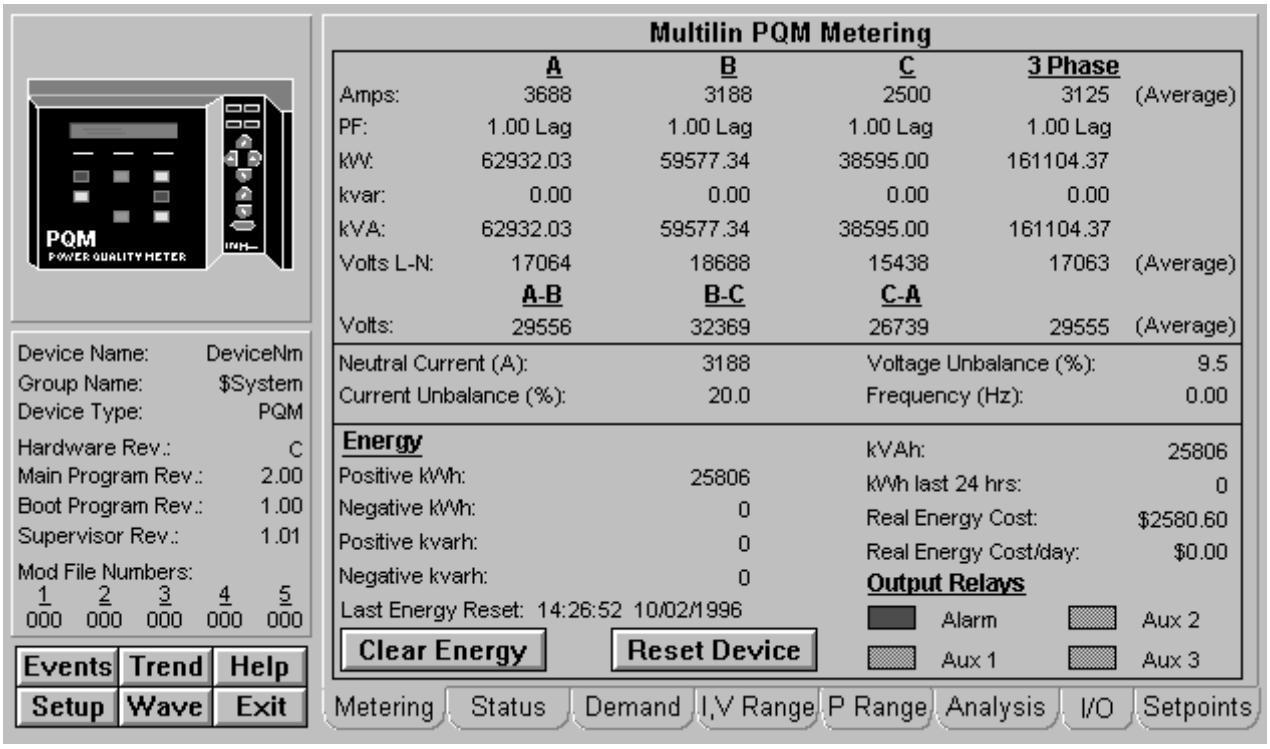
Tab	Button	Function
Command	Open Breaker	Opens the breaker.
	Close Breaker	Closes the breaker.
	Reset Fault	Clears the event table in the MDP

Table 27. MDP Tabular data screen commands.

Another feature to bear in mind when working with the MDP tabular wizard is:

- On the Setup screen, you must enter a value into the CT Ratio box. This value is multiplied by the values in the amp registers to convert the latter into user units. If you do not enter a value for the CT Ratio, the message "CT Ratio has not been entered" appears on the bottom of the Tabular Data Screen and on the Large Faceplate wizard.

PQM (Power Quality Meter)



All six function buttons under the Info box are enabled for the PQM. Pressing the Setup button launches the PQMPC program for viewing and configuring setpoints.

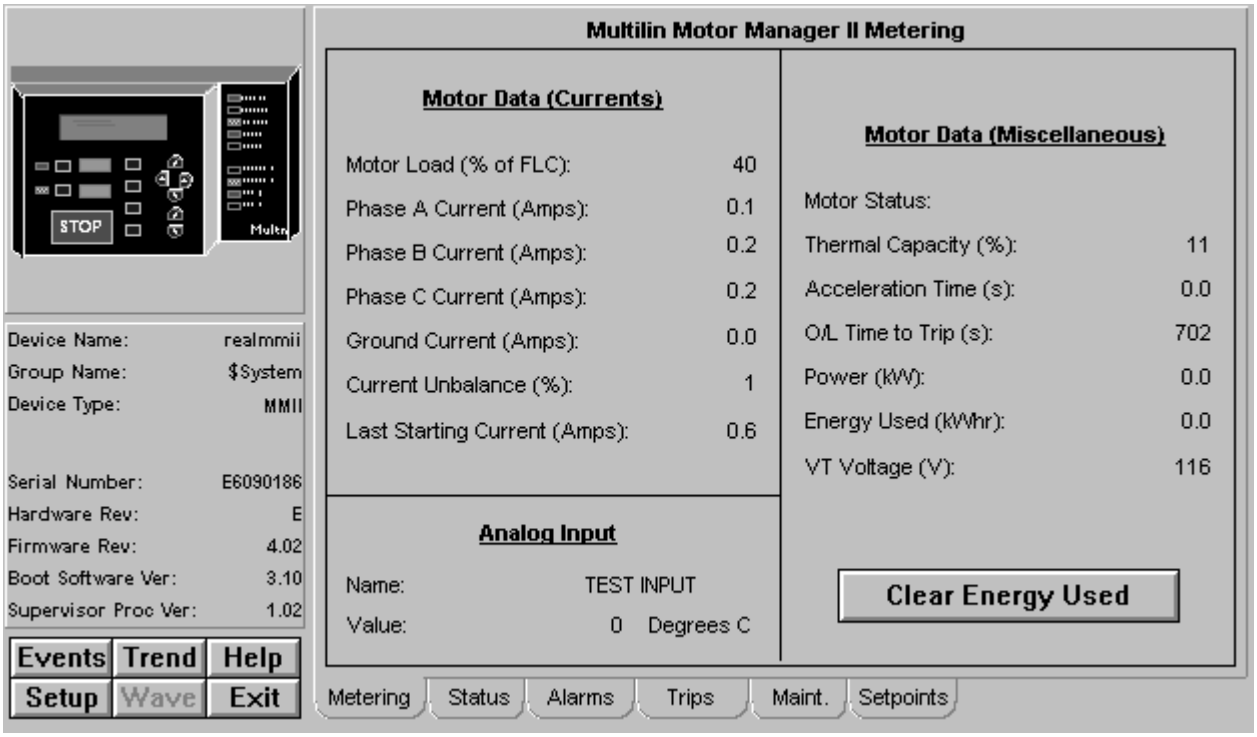
The PQM Tabular Data Screen wizard has nine command buttons, described below.

Tab	Button	Function
Metering	Clear Energy	Clears the PQM's energy counters
	Reset Device	Issues a RESET command to the PQM
Demand	Clear Max Demand Values	Clears the PQM's Max Demand values from memory
	Clear Frequency Values	Clears the PQM's Max Frequency values from memory
I, V Range	Clear Current Min/Max	Clears the PQM's Current Min/Max values from memory
	Clear Voltage Min/Max	Clears the PQM's Voltage Min/Max values from memory
P Range	Clear Power Min/Max	Clears the PQM's Power Min/Max values from memory
Analysis	Clear Max THD Values	Clears the PQM's Max THD values from memory
I/O	Reset Pulse Counter	Resets the PQM's pulse counter

Table 28. PQM Tabular data screen commands.

See the PQM Instruction Manual (Chapter 5, *Actual Values*) for information on the display of data values under different device configurations. Values not configured for use are displayed as N/A.

Motor Manager II (MMII)



Five of the six function buttons under the Info box are enabled for the MMII; the Wave button is not supported for the MMII.

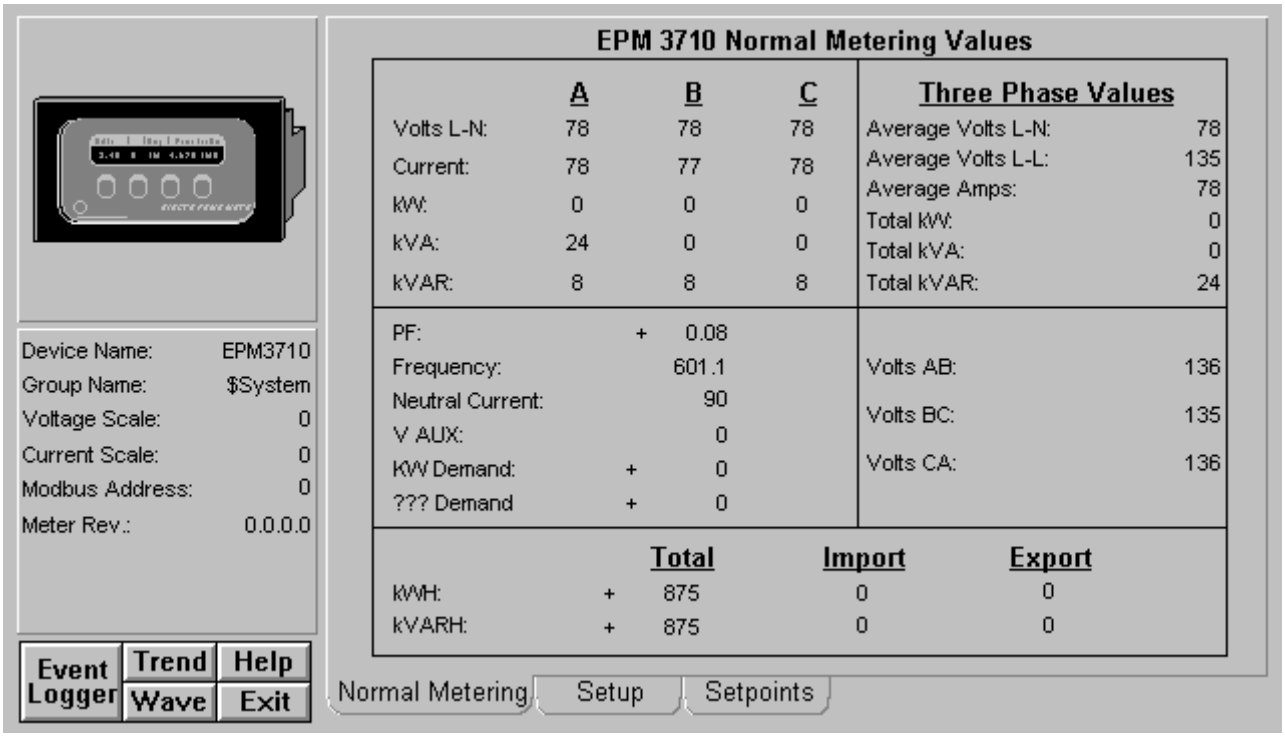
The MMII Tabular Data Screen wizard has four command buttons, described below.

Tab	Button	Function
Metering	Clear Energy	Clears the MMII's energy counters
Maintenance	Clear Start/Trip Counters	Clears the MMII's Start and Trip count values from memory
	Clear Timers	Clears the MMII's Timer values from memory
	Clear Interlock Counter	Clears the MMII's Interlock Counter values from memory

Table 29. MMII Tabular data screen commands.

See the MMII's Instruction Manual (Chapter 5, *Actual Values*) for information on the display of data values under different device configurations. Values not configured for use are displayed as N/A.

EPM 3710 Meter

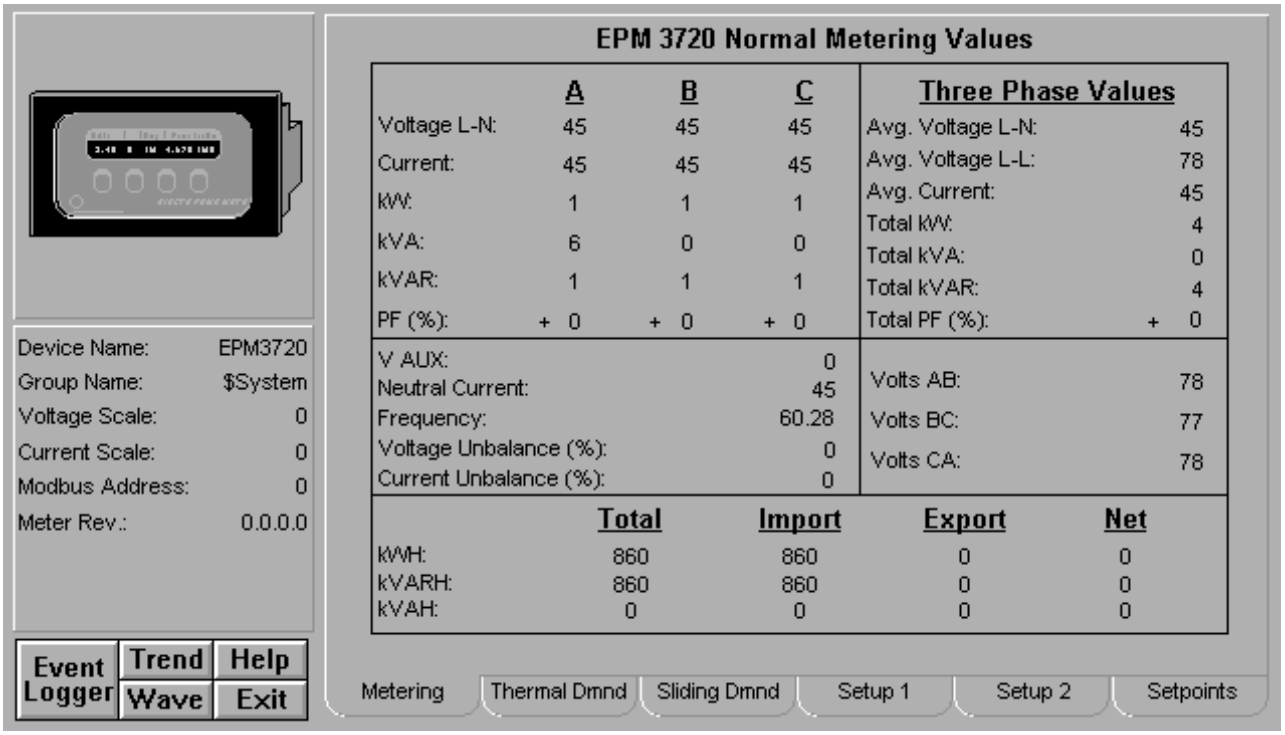


The EPM 3710 Tabular Data Screen wizard provides the following special features:

- The Normal Metering Values screen has a label that displays either kVA Demand or Amps Demand, depending on how the meter is configured.
- The Setpoints screen has two scroll buttons that determine which setpoint is displayed.
- The Setup tab contains a field "Iout Key" corresponding to the Iout Key display on the actual device. On the actual device, this field displays text messages such as "Voltage A" or "Current C". In the Tabular Data Screen wizard, these messages are presented as a numeric code and must be referenced against the following table.

Code	Meaning	Code	Meaning	Code	Meaning
0	Voltage A	9	KVA A	18	KVA Total
1	Voltage B	10	KVA B	19	KVAR Total
2	Voltage C	11	KVA C	20	PF
3	Current A	12	KVAR A	21	KW Demand
4	Current B	13	KVAR B	22	Amp Demand
5	Current C	14	KVAR C	23	Frequency
6	KVA	15	VOLTAGE AVG	24	Vaux
7	KWB	16	CURRENT AVG	25	Current I4
8	KWC	17	KW Total		

EPM 3720 Meter



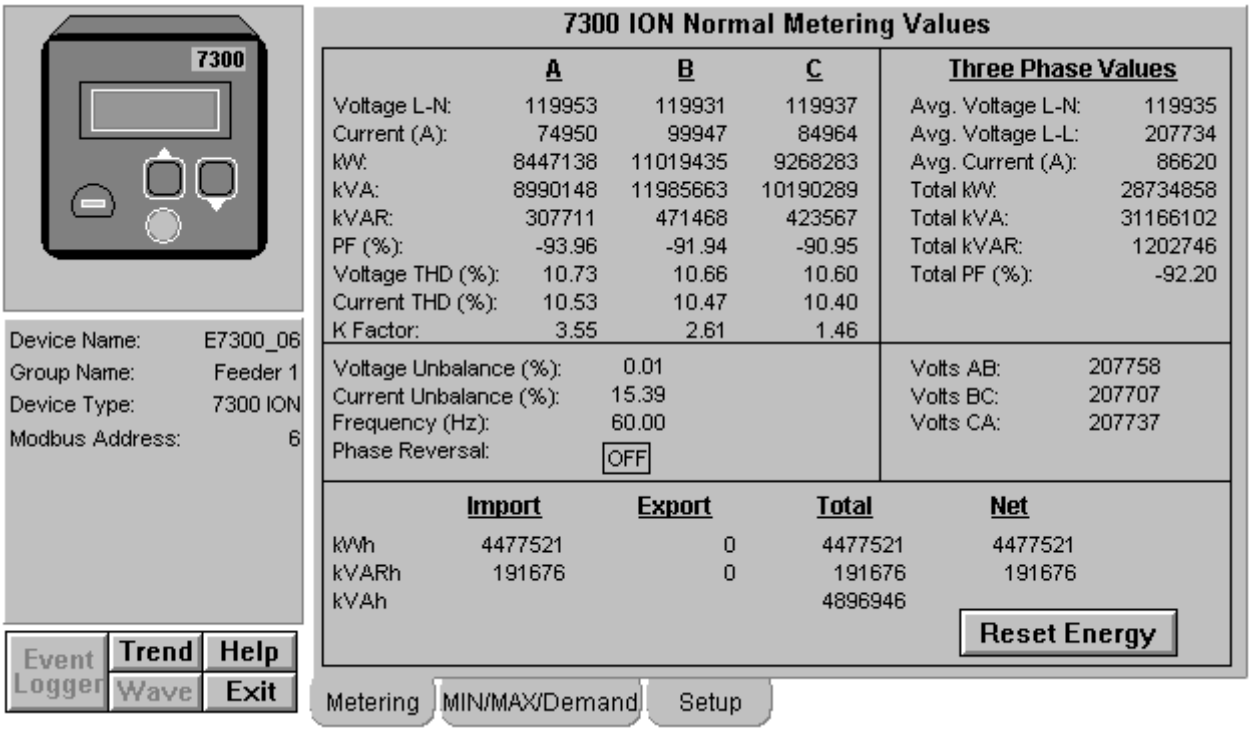
The EPM 3720 Tabular Data Screen wizard has several special features. You can use the Setup 1, Setup 2, and Setpoints screens to change the meter configuration. Values displayed in white boxes are changeable. Some are changed by clicking on the displayed value, while others provide scroll buttons, and some have both.

- The Download and Refresh buttons on the Setup 1 and Setup 2 screens upload and download the values for all of the setup parameters.
- The Download and Refresh buttons on the Setpoints screen upload and download all of the setpoints from the device.
- The Reset Energy Integrators and Reset All Min/Max buttons on the Setup 1 screen provide the named functions.
- The Sliding Demand tab supports downloading of up to 10 sliding demand measurements to the device. See Appendix B for information on setting the sliding demand keys.

To change setpoints at the device, first press the Refresh button to upload current setpoint values from the device (otherwise the defaults are shown and used for download). Modify setpoints as desired, then press the Download button to send all setpoints to unit.

When you first open the EPM 3720 Tabular Data Screen, you may see values of zero in all fields. The EPM 3720 Tabular Data Screen requires some user interaction (such as pressing a key) to update its values.

EPM 7300 Meter



The EPM 7300 Tabular Data Screen wizard has several special features. You can use the Setup screen to change the meter configuration. Values displayed in white boxes are changeable. Some are changed by clicking on the displayed value, while others are changed by clicking on the associated scroll button. The Download and Refresh buttons on the setup screen upload and download all of the setpoints from the device.

To change setpoints at the device, first press the refresh button to upload current setpoint values from the device (otherwise the defaults are shown and used for download). Modify setpoints as desired, then press the download button to send all setpoints to the unit.

The EPM 7300 Tabular Data Screen's command buttons are described below:

Tab	Button	Function
Metering	Reset Energy	Resets all Energy Integrators in the meter.
MIN/MAX Demand	Digital Input Labels	The user can enter descriptive text (up to 20 characters) for each digital input. These labels are retentive.
	Force ON	For each digital output, this button will force the output to the ON state.
	Force OFF	For each digital output, this button will force the output to the OFF state.
	Reset Sliding Demand	Resets all Sliding Demand Values in the device.
	Reset Min/Max	Resets all Min/Max values in the device.

Table 30. EPM 7300 Tabular data screen commands.

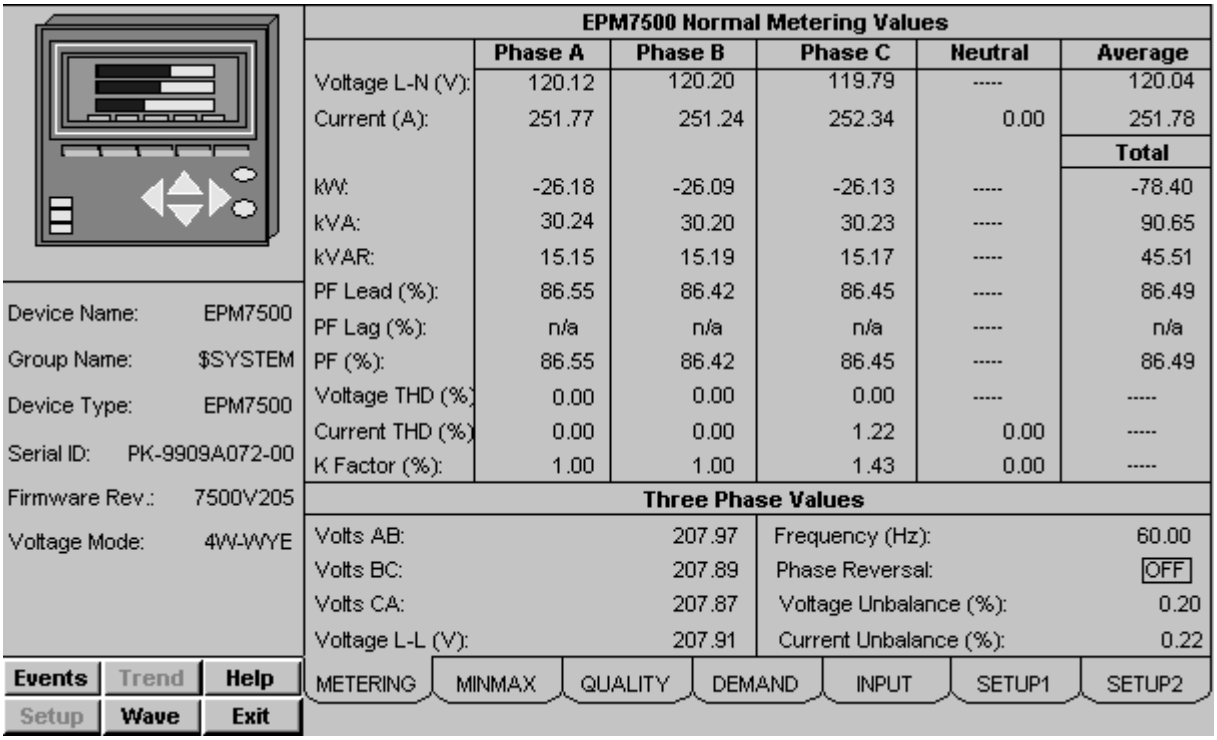
EPM 7500/7600 Meter

The EPM 7500/7600 Tabular Data Screen wizard has several special features. You can use the Setup screen to change the meter configuration. Values displayed in white boxes are changeable. Some are changed by clicking on the displayed value, while others are changed by clicking on the associated scroll button. The Download and Refresh buttons on the setup screen upload and download all of the setpoints from the device.

To change setpoints at the device, first press the refresh button to upload current setpoint values from the device (otherwise the defaults are shown and used for download). Modify setpoints as desired, then press the download button to send all setpoints to the unit.

In the following pages, each of the 7500/7600 Meter's Tabular Data Screen Wizards' tabs will be displayed and detailed.

Metering Tab



EPM 7500/7600 Meter - Metering Data Screen

The Metering tab displays the following metered values from the EPM 7500/7600.

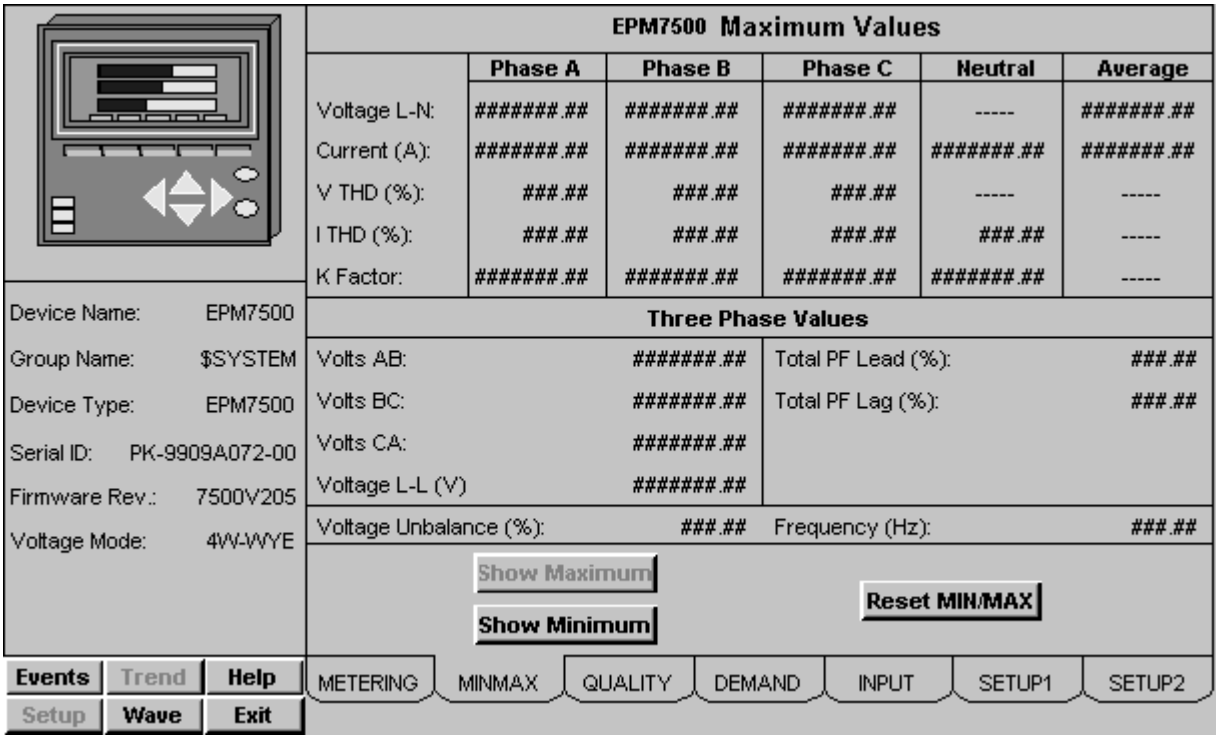
- Vln A, B: n/a when Voltage Mode is DELTA
- Vln C: n/a when Voltage Mode is DELTA or SINGLE
- Vln Avg: n/a when Voltage Mode is DELTA
- Vll AB
- Vll BC, CA, and Avg: n/a when Voltage Mode is SINGLE
- I A, B, Neutral, and Avg

- I C: n/a when Voltage Mode is SINGLE
- KW A, B: n/a when Voltage Mode is DELTA
- KW C: n/a when Voltage Mode is DELTA or SINGLE
- KW Total
- KVA A, B: n/a when Voltage Mode is DELTA
- KVA C: n/a when Voltage Mode is DELTA or SINGLE
- KVA Total
- KVAR A, B: n/a when Voltage Mode is DELTA
- KVAR C: n/a when Voltage Mode is DELTA or SINGLE
- KVAR Total
- Power Factor Lead A, B: n/a when Voltage Mode is DELTA or PF is Lagging
- Power Factor Lead C: n/a when Voltage Mode is DELTA or SINGLE or PF is Lagging
- Power Factor Lead Total: n/a when PF is Lagging
- Power Factor Lag A, B: n/a when Voltage Mode is DELTA or PF is Leading
- Power Factor Lag C: n/a when Voltage Mode is DELTA or SINGLE or PF is Leading
- Power Factor Lag Total: n/a when PF is Leading
- Power Factor Total A, B: n/a when Voltage Mode is DELTA
- Power Factor Total C: n/a when Voltage Mode is DELTA or SINGLE
- Power Factor Total
- Total Harmonic Distortion – Voltage A, B, and C: n/a when Source is n/a.
- Total Harmonic Distortion – Current A, B, C, and Neutral: n/a when Source is n/a.
- K Factor A, B, C, and Neutral: n/a when Source is n/a.

Three-Phase Values

- Vab, Vbc, Vca
- Voltage Unbalance
- Current Unbalance
- Frequency
- Phase Reversal (On, Off) : n/a when Voltage Mode is SINGLE

Min/Max Tab



EPM 7500/7600 Meter - Min/Max Tab

The Minimum/Maximum Values tab displays a variety of minimum and maximum values recorded by the EPM 7500/7600. Select Show Minimum or Show Maximum buttons to display either the minimum or maximum values for the displayed parameters. To reset all min/max values, select the Reset Min/Max button.

Min/Max values may be displayed for the following parameters:

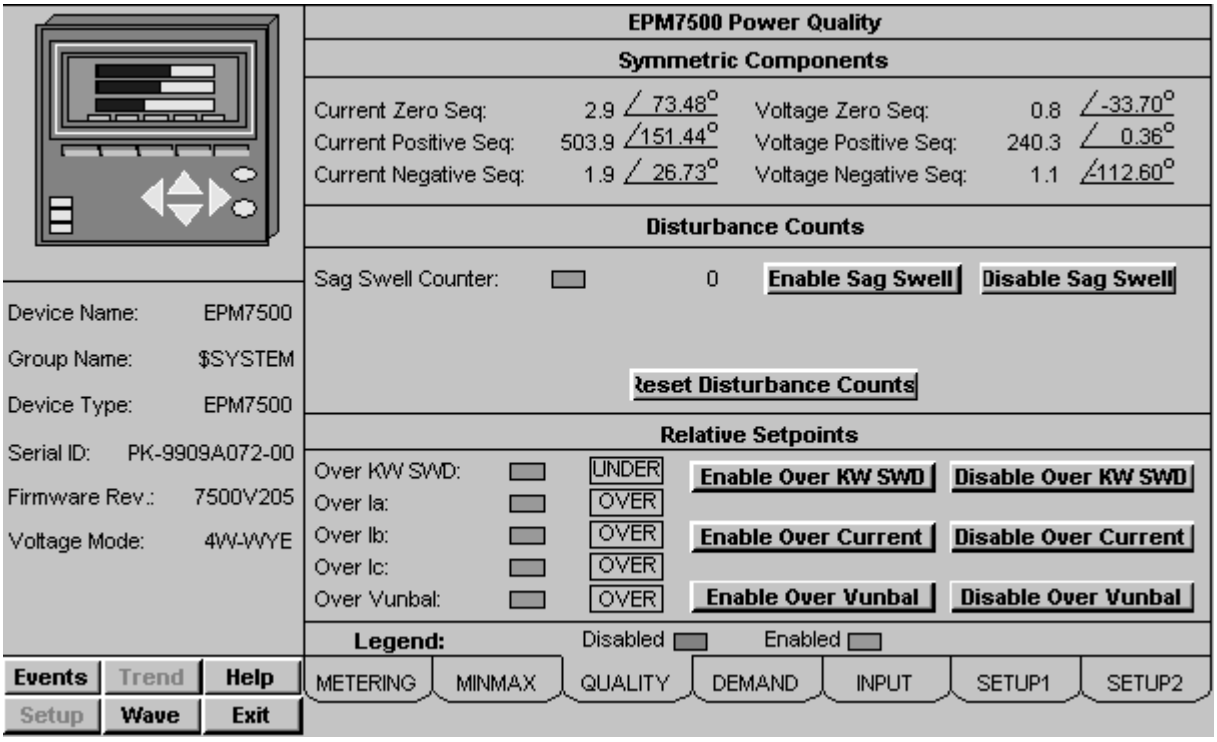
Phase A, B, C, Neutral and Average Values

- Vln A, B: n/a when Voltage Mode is DELTA
- Vln C: n/a when Voltage Mode is DELTA or SINGLE
- Vln Avg: n/a when Voltage Mode is DELTA
- Vll AB; Vll BC, CA, and Avg: n/a when Voltage Mode is SINGLE
- I A, B, Neutral, and Avg
- I C: n/a when Voltage Mode is SINGLE
- Total Harmonic Distortion – Voltage A, B, and C: n/a when Source is n/a.
- Total Harmonic Distortion – Current A, B, C, and Neutral: n/a when Source is n/a.
- K Factor A, B, C, and Neutral: n/a when Source is n/a.

Three-Phase Values

- Vab, Vbc, Vca
- Power Factor Lead Total: n/a when PF is Lagging
- Power Factor Lag Total: n/a when PF is Leading
- Voltage Unbalance
- Frequency

Power Quality Tab



EPM 7500/7600 Meter - Power Quality Tab

The Power Quality tab displays the following power quality values from the EPM 7500/7600.

Symmetric Components

- Zero Sequence Phase and Magnitude for Current and Voltage
- Positive Sequence Phase and Magnitude for Current and Voltage
- Negative Sequence Phase and Magnitude for Current and Voltage

Disturbance Counts

- Sag / Swell Counter

Relative Setpoints

- Over KW Sliding Window Demand Status
- Over Current Phase A Status
- Over Current Phase B Status
- Over Current Phase C Status
- Over Voltage Unbalance Status

*Note: no color code is used for the Relative Setpoint Status.

The Power Quality tab also provides push buttons for performing the following commands:

Reset Sag Swell Disturbance Counter – Resets Sag Swell Counter.

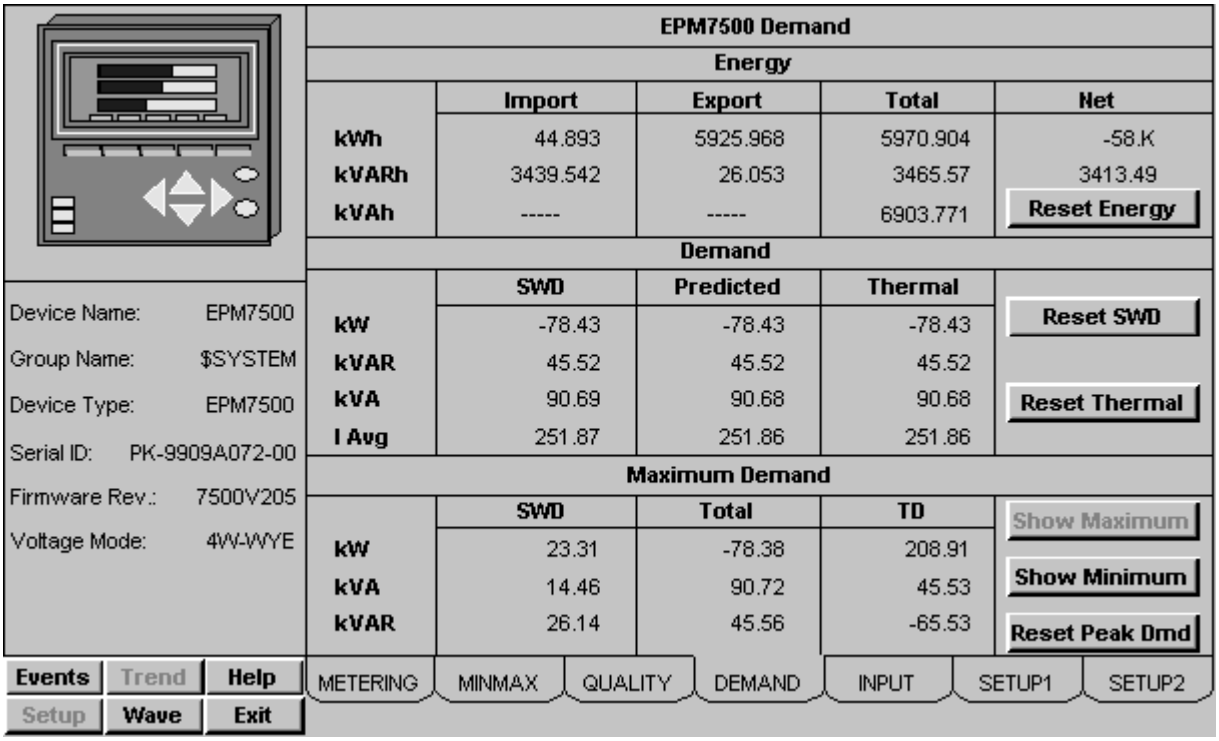
Enable/Disable Sag Swell – Enables or Disables Sag Swell Tracking.

Enable/Disable Over KW SWD – Enables or Disables Over Real Power Sliding Window Demand for Relative Setpoint Tracking.

Enable/Disable Over Current – Enables or Disables Over Current for Phases A, B, and C for Relative Setpoint Tracking.

Enable/Disable Over Vunb – Enables or Disables Over Voltage Unbalance for Relative Setpoint Tracking.

Demand Tab



EPM 7500/7600 Meter - Demand Tab

The Demand tab displays the following demand values from the EPM 7500/7600.

Energy

- Real Energy Import, Export, Total, and Net
- Reactive Energy Import, Export, Total, and Net
- Apparent Energy Total

Demand

- Real Power Sliding Window Demand, Predicted Demand, and Thermal Demand
- Reactive Power Sliding Window Demand, Predicted Demand, and Thermal Demand
- Apparent Power Sliding Window Demand, Predicted Demand, and Thermal Demand
- Average RMS Current Sliding Window Demand, Predicted Demand, and Thermal Demand

Minimum/Peak Demand

- Minimum or Peak Real Power Sliding Window Demand, Total Demand, and Thermal Demand

- Minimum or Peak Reactive Power Sliding Window Demand, Total Demand, and Thermal Demand
- Minimum or Peak Apparent Power Sliding Window Demand, Total Demand, and Thermal Demand

The Demand tab also provides push buttons for performing the following commands:

Reset Energy – Resets Energy Demand values identified above.

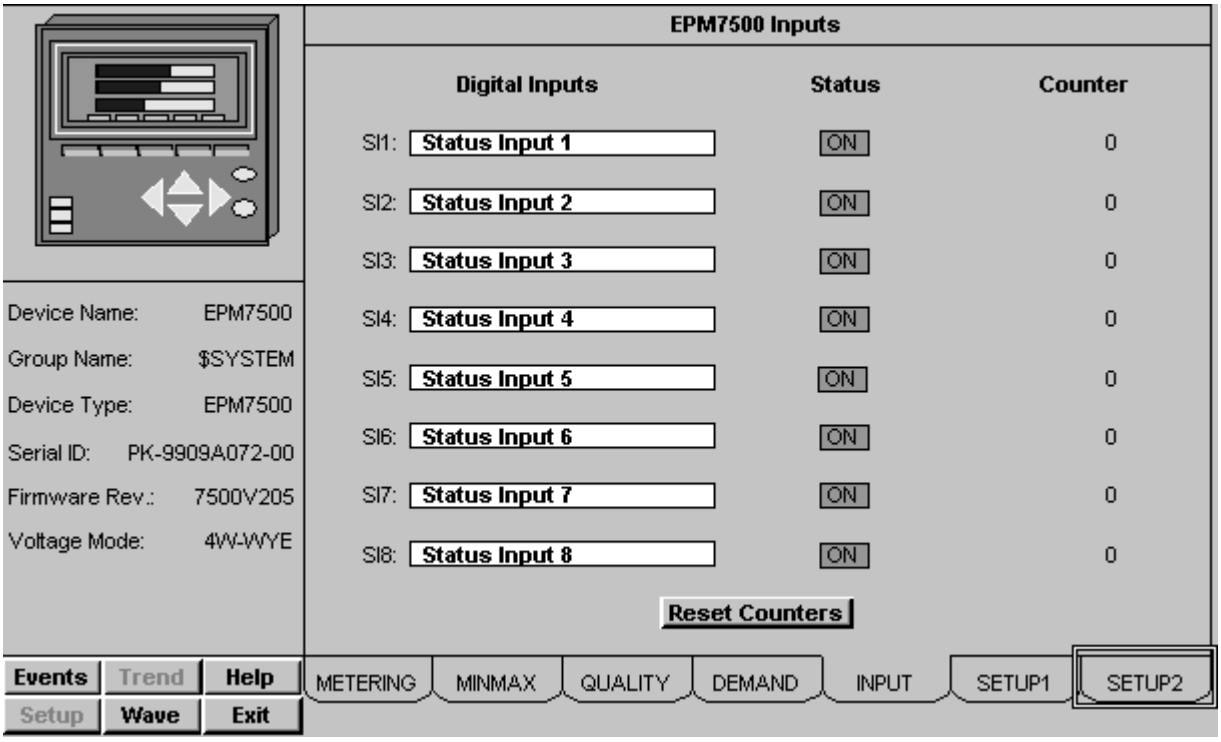
Reset SWD– Resets Sliding Window Demand values identified above.

Reset Thermal – Resets Thermal Demand values identified above.

Reset Peak – Resets Peak Demand values identified above.

The Minimum/Peak panel's Show Maximum and Show Minimum buttons can be used to toggle the display between minimums and peaks.

Inputs Tab



EPM 7500/7600 Meter - Inputs Tab

The Inputs tab displays the following values from the EPM 7500/7600.

Digital Inputs

- Status (On, Off) for Status Inputs (SI) 1-8. (Color Code: Green – ON, Grey – OFF).
- Counters for SI1-8.

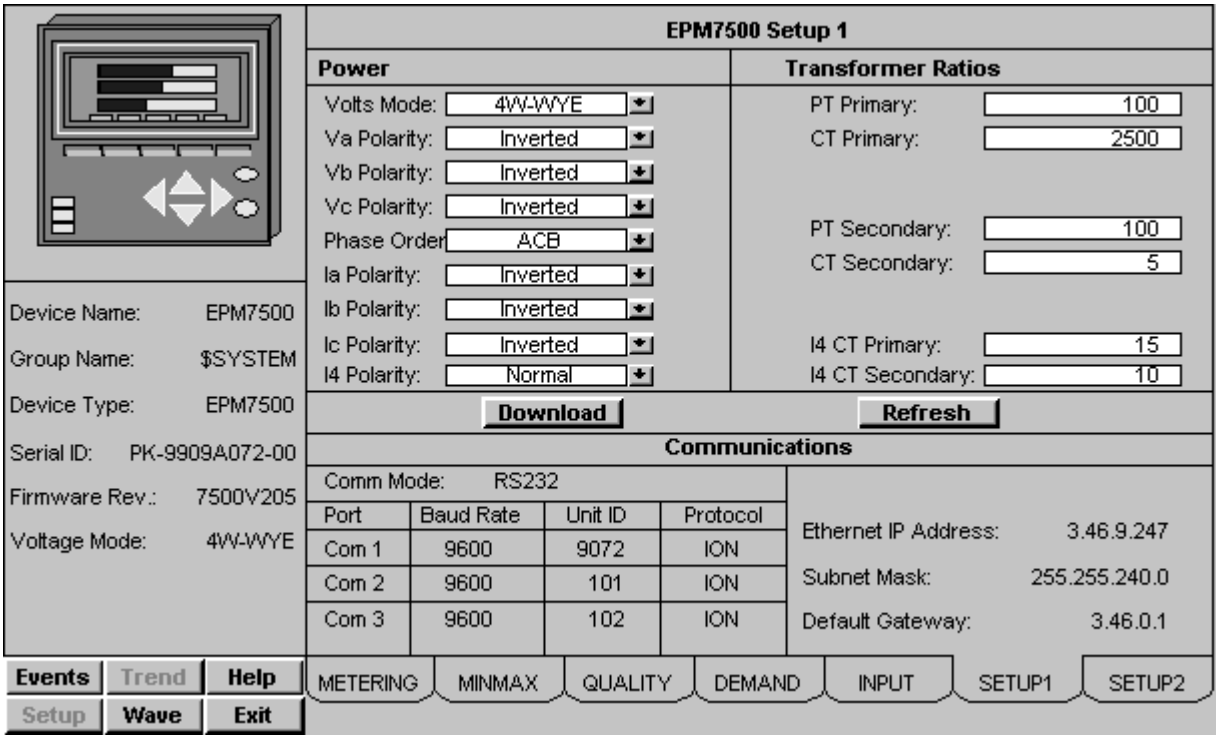
The Inputs tab also provides push buttons for performing the following commands:

Reset Counters – Resets Digital Input Status Counters for SI1-8.

The Inputs tab also provides retentive memory inputs for the following:

Digital Input Names for SI1-8.

Setup 1 Tab



EPM 7500/7600 Meter - Setup 1 Tab

The Setup 1 tab displays the following demand values from the EPM 7500/7600.

Power Settings

- Volts Mode
- Phase Order
- Voltage Polarity for A, B, and C
- Current Polarity for A, B, C, and Neutral

Transformer Ratio Settings

- PT and CT Primary
- PT and CT Secondary
- Neutral CT Primary and Secondary

Communications

- Baud Rate for Comm 1, 2, and 3.
- Unit ID for Comm 1, 2, and 3.
- Protocol for Comm 1, 2, and 3.
- Mode for Comm 1.
- IP Address, Subnet Mask, and Default Gateway.

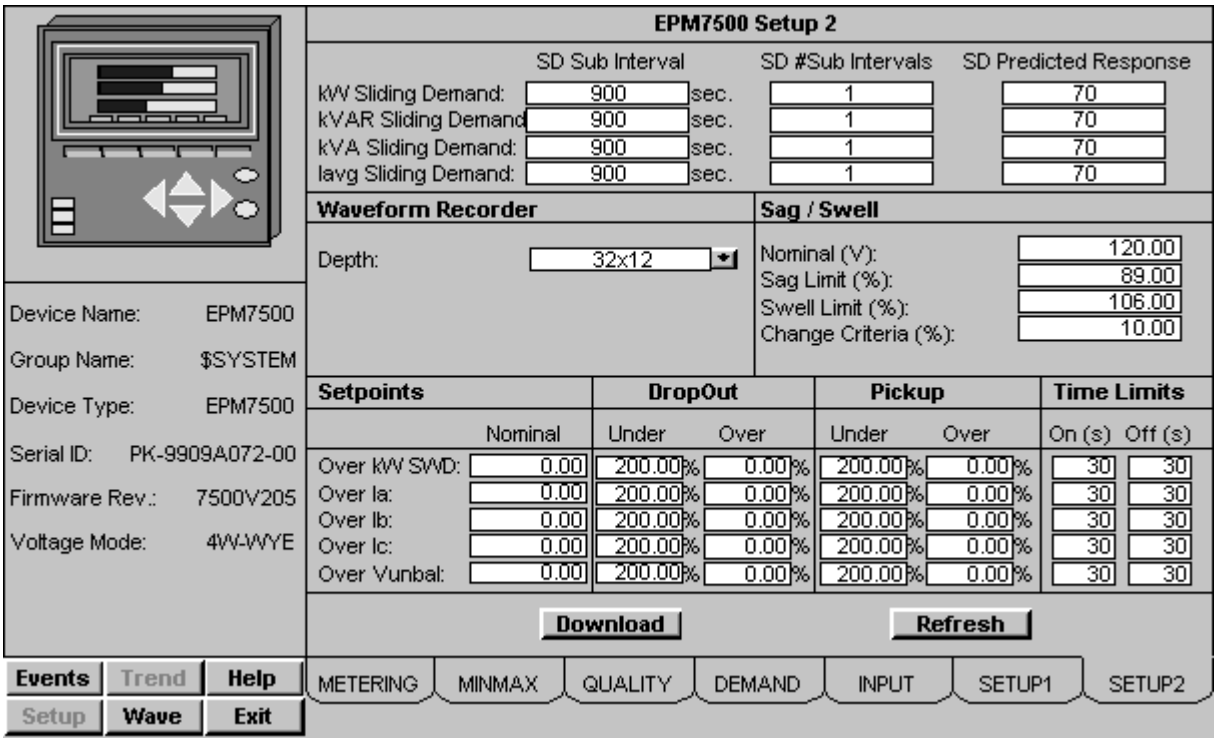
The Setup 1 tab also provides push buttons for performing the following commands:

Download – Executes a script to check for values that have changed and downloads those values to the device via the GE 7700 Gateway.

Refresh – Executes a script to upload all of the meter values for the settings on the screen.

Note: Be sure to click the Refresh button prior to changing or downloading any settings to the EPM7500 or EPM7600, as the latest settings may not be displayed.

Setup 2 Tab



EPM 7500/7600 Meter - Setup 2 Tab

The Setup 2 tab displays the following demand values from the EPM 7500/7600.

Sliding Window Demand Settings

- Sliding Demand Sub Interval Settings for KW, KVAR, KVA, and Iavg.
- Sliding Demand Number of Sub Intervals for KW, KVAR, KVA, and Iavg.
- Sliding Demand Predicted Response for KW, KVAR, KVA, and Iavg.

Waveform Recorder Settings

- Depth of Waveform Recorder

Sag / Swell / Transient Settings

- Sag / Swell Nominal
- Sag Limit
- Swell Limit
- Change Criteria

Relative Setpoint Settings

- Nominal value for Over KW, Over Current, and Over Vunbal.
- Under Dropout for Over KW, Over Current, and Over Vunbal.
- Over Dropout for Over KW, Over Current, and Over Vunbal.
- Under Pickup for Over KW, Over Current, and Over Vunbal.
- Over Pickup for Over KW, Over Current, and Over Vunbal.

- Time On for Over KW, Over Current, and Over Vunbal.
- Time Off for Over KW, Over Current, and Over Vunbal.

The Setup 2 tab also provides push buttons for performing the following commands:

Download– Executes a script to check for values that have changed and downloads those values to the device via the GE 7700 Gateway.

Refresh– .Executes a script to upload all of the meter values for the settings on the screen.

Note: Be sure to click the Refresh button prior to changing or downloading any settings to the EPM7500 or EPM7600, as the latest settings may not be displayed.

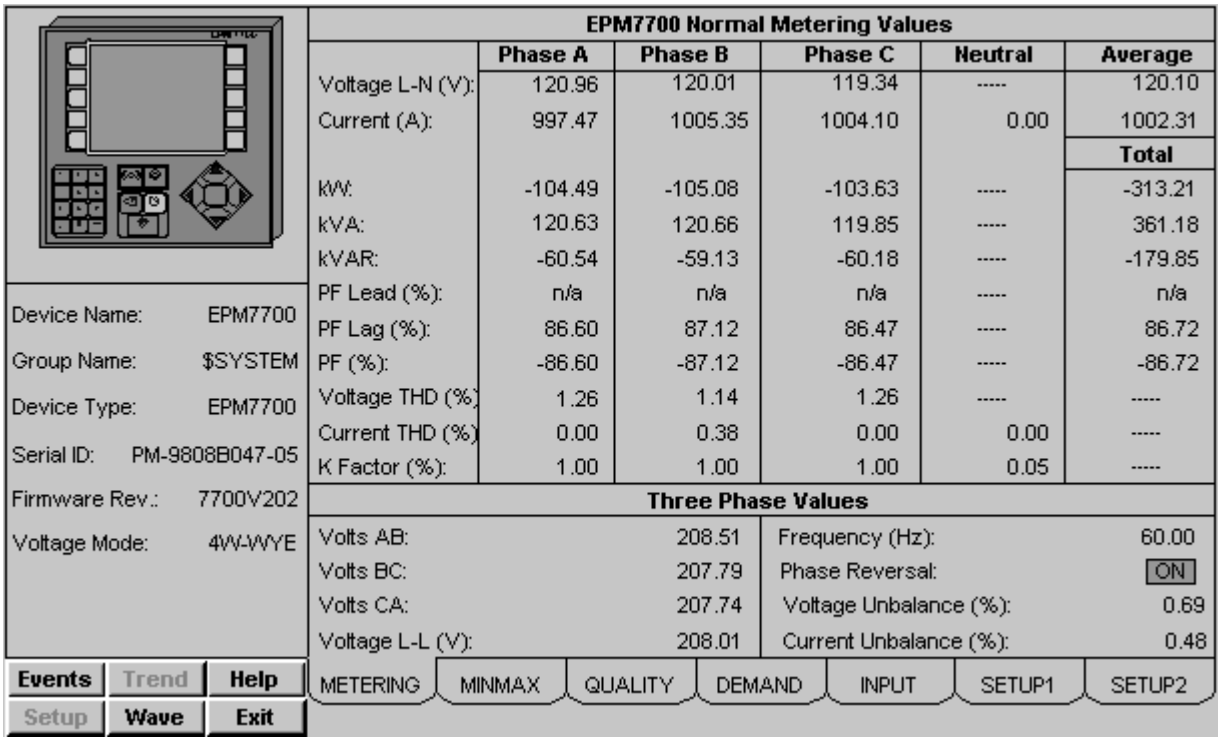
EPM 7700 Meter

The EPM 7700 Tabular Data Screen wizard has several special features. You can use the Setup screen to change the meter configuration. Values displayed in white boxes are changeable. Some are changed by clicking on the displayed value, while others are changed by clicking on the associated scroll button. The Download and Refresh buttons on the setup screen upload and download all of the setpoints from the device.

To change setpoints at the device, first press the refresh button to upload current setpoint values from the device (otherwise the defaults are shown and used for download). Modify setpoints as desired, then press the download button to send all setpoints to the unit.

In the following pages, each of the 7700 ION Meter's Tabular Data Screen Wizards' tabs will be displayed and detailed.

Metering Tab



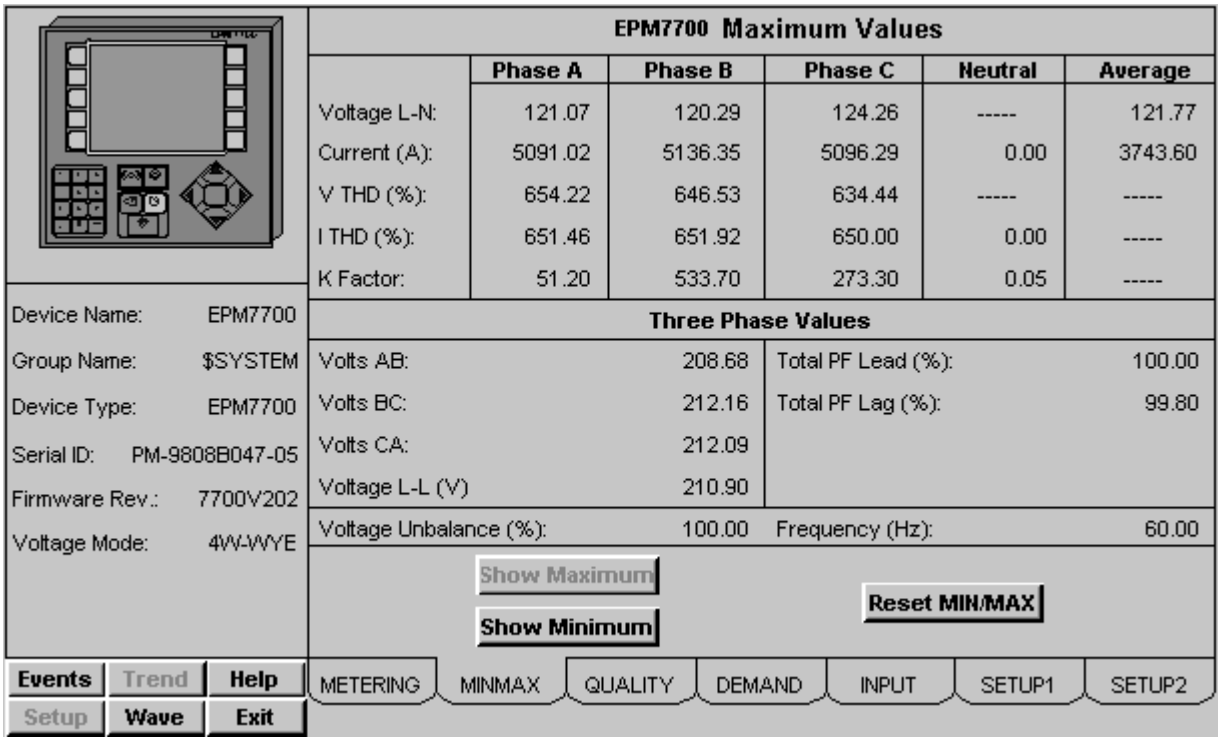
EPM 7700 ION Meter - Metering Data Screen

The Metering tab displays the following metered values from the EPM 7700.

- Vln A, B: n/a when Voltage Mode is DELTA
- Vln C: n/a when Voltage Mode is DELTA or SINGLE
- Vln Avg: n/a when Voltage Mode is DELTA
- I A, B, Neutral, and Avg
- I C: n/a when Voltage Mode is SINGLE
- Vll AB

- Vll BC, CA, and Avg: n/a when Voltage Mode is SINGLE
- KW A, B: n/a when Voltage Mode is DELTA
- KW C: n/a when Voltage Mode is DELTA or SINGLE
- KW Total
- KVAR A, B: n/a when Voltage Mode is DELTA
- KVAR C: n/a when Voltage Mode is DELTA or SINGLE
- KVAR Total
- KVA A, B: n/a when Voltage Mode is DELTA
- KVA C: n/a when Voltage Mode is DELTA or SINGLE
- KVA Total
- Power Factor Lead A, B: n/a when Voltage Mode is DELTA or PF is Lagging
- Power Factor Lead C: n/a when Voltage Mode is DELTA or SINGLE or PF is Lagging
- Power Factor Lead Total: n/a when PF is Lagging
- Power Factor Lag A, B: n/a when Voltage Mode is DELTA or PF is Leading
- Power Factor Lag C: n/a when Voltage Mode is DELTA or SINGLE or PF is Leading
- Power Factor Lag Total: n/a when PF is Leading
- Power Factor Total A, B: n/a when Voltage Mode is DELTA
- Power Factor Total C: n/a when Voltage Mode is DELTA or SINGLE
- Power Factor Total
- Total Harmonic Distortion – Voltage A, B, and C: n/a when Source is n/a.
- Total Harmonic Distortion – Current A, B, C, and Neutral: n/a when Source is n/a.
- K Factor A, B, C, and Neutral: n/a when Source is n/a.
- Voltage Unbalance
- Current Unbalance
- Frequency
- Phase Reversal (On, Off) : n/a when Voltage Mode is SINGLE

Min/Max Tab



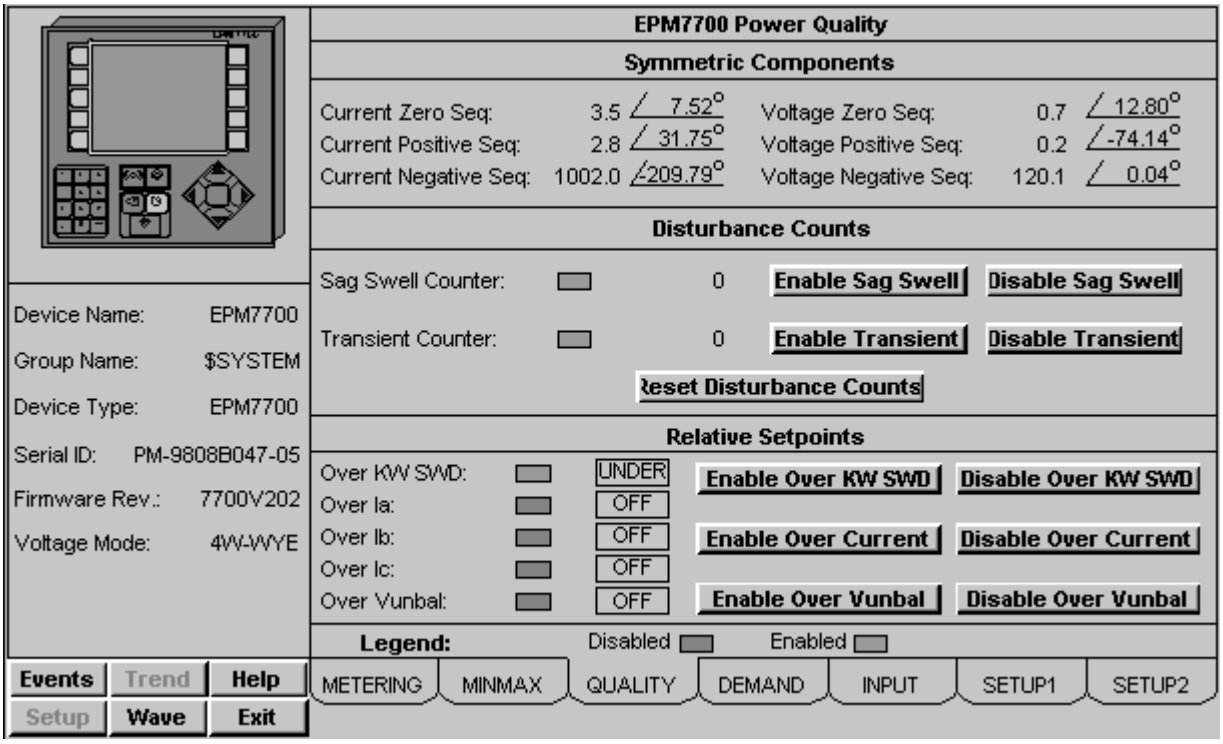
EPM 7700 ION Meter - Min/Max Tab

The Minimum/Maximum Values tab displays a variety of minimum and maximum values recorded by the EPM 7700. Select Show Minimum or Show Maximum buttons to display either the minimum or maximum values for the displayed parameters. To reset all min/max values, select the Reset Min/Max button.

Min/Max values may be displayed for the following parameters:

- Vln A, B: n/a when Voltage Mode is DELTA
- Vln C: n/a when Voltage Mode is DELTA or SINGLE
- Vln Avg: n/a when Voltage Mode is DELTA
- I A, B, Neutral, and Avg
- I C: n/a when Voltage Mode is SINGLE
- Vll AB
- Vll BC, CA, and Avg: n/a when Voltage Mode is SINGLE
- KW Total
- KVAR Total
- KVA Total
- Power Factor Lead Total: n/a when PF is Lagging
- Power Factor Lag Total: n/a when PF is Leading
- Power Factor Total Total
- Total Harmonic Distortion – Voltage A, B, and C: n/a when Source is n/a.
- Total Harmonic Distortion – Current A, B, C, and Neutral: n/a when Source is n/a.
- K Factor A, B, C, and Neutral: n/a when Source is n/a.
- Voltage Unbalance
- Frequency

Power Quality Tab



EPM 7700 ION Meter - Power Quality Tab

The Power Quality tab displays the following power quality values from the EPM 7700.

Disturbance Monitoring

- Sag / Swell Counter
- Transient Counter
- Over KW Sliding Window Demand Status
- Over Current Phase A Status
- Over Current Phase B Status
- Over Current Phase C Status
- Over Voltage Unbalance Status

*Note: no color code is used for the Relative Setpoint Status.

Symmetric Components

- Zero Sequence Magnitude for Current and Voltage
- Zero Sequence Phase for Current and Voltage
- Positive Sequence Magnitude for Current and Voltage
- Positive Sequence Phase for Current and Voltage
- Negative Sequence Magnitude for Current and Voltage
- Negative Sequence Phase for Current and Voltage

The Power Quality tab also provides push buttons for performing the following commands:

Reset Disturbance Counters – Resets Sag Swell and Transient Counters.

Enable/Disable Sag Swell – Enables or Disables Sag Swell Tracking.

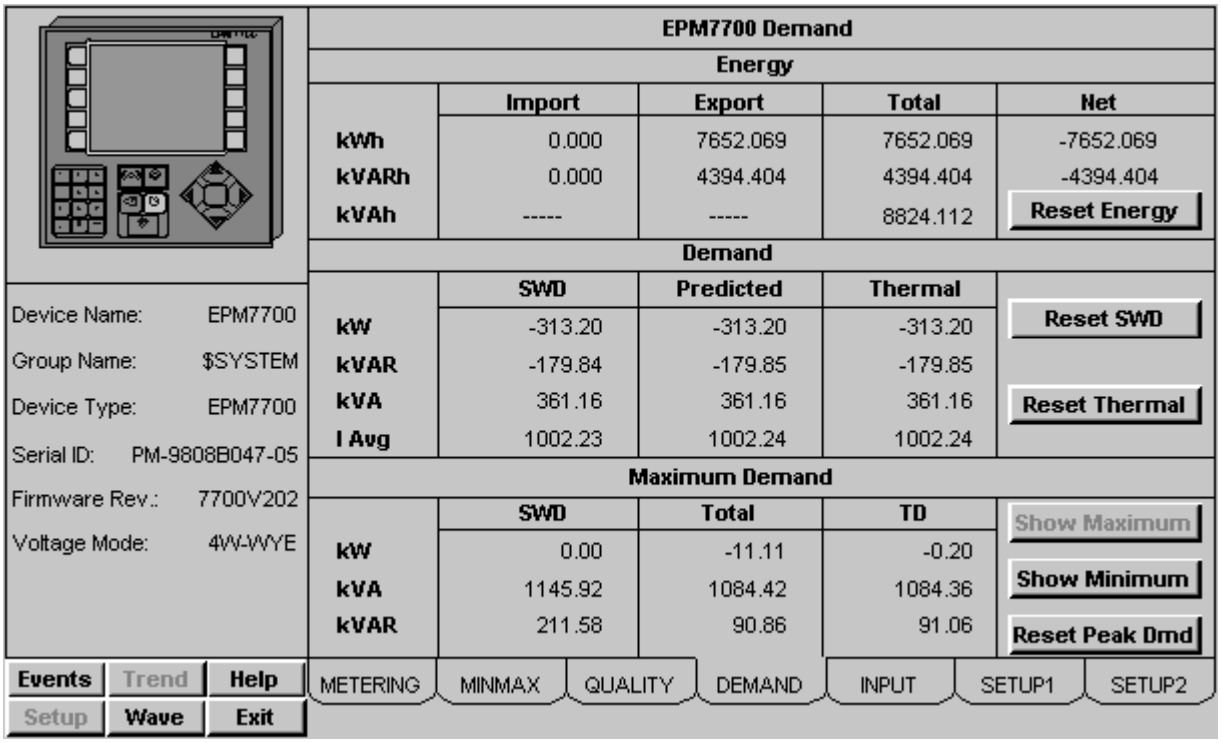
Enable/Disable Transient – Enables or Disables Transient Tracking.

Enable/Disable Over KW – Enables or Disables Over Real Power Sliding Window Demand for Relative Setpoint Tracking.

Enable/Disable Over Amps – Enables or Disables Over Current for Phases A, B, and C for Relative Setpoint Tracking.

Enable/Disable Over Vunb – Enables or Disables Over Voltage Unbalance for Relative Setpoint Tracking.

Demand Tab



EPM 7700 ION Meter - Demand Tab

The Demand tab displays the following demand values from the EPM 7700.

Energy

- Real Energy Import, Export, Total, and Net
- Reactive Energy Import, Export, Total, and Net
- Apparent Energy Total

Sliding Window Demand (SWD)

- Real Power Sliding Window Demand and Predicted Demand
- Reactive Power Sliding Window Demand and Predicted Demand
- Apparent Power Sliding Window Demand and Predicted Demand
- Average RMS Current Sliding Window Demand and Predicted Demand

Thermal Demand

- Real Power Thermal Demand
- Reactive Power Thermal Demand
- Apparent Power Thermal Demand
- Average RMS Current Thermal Demand

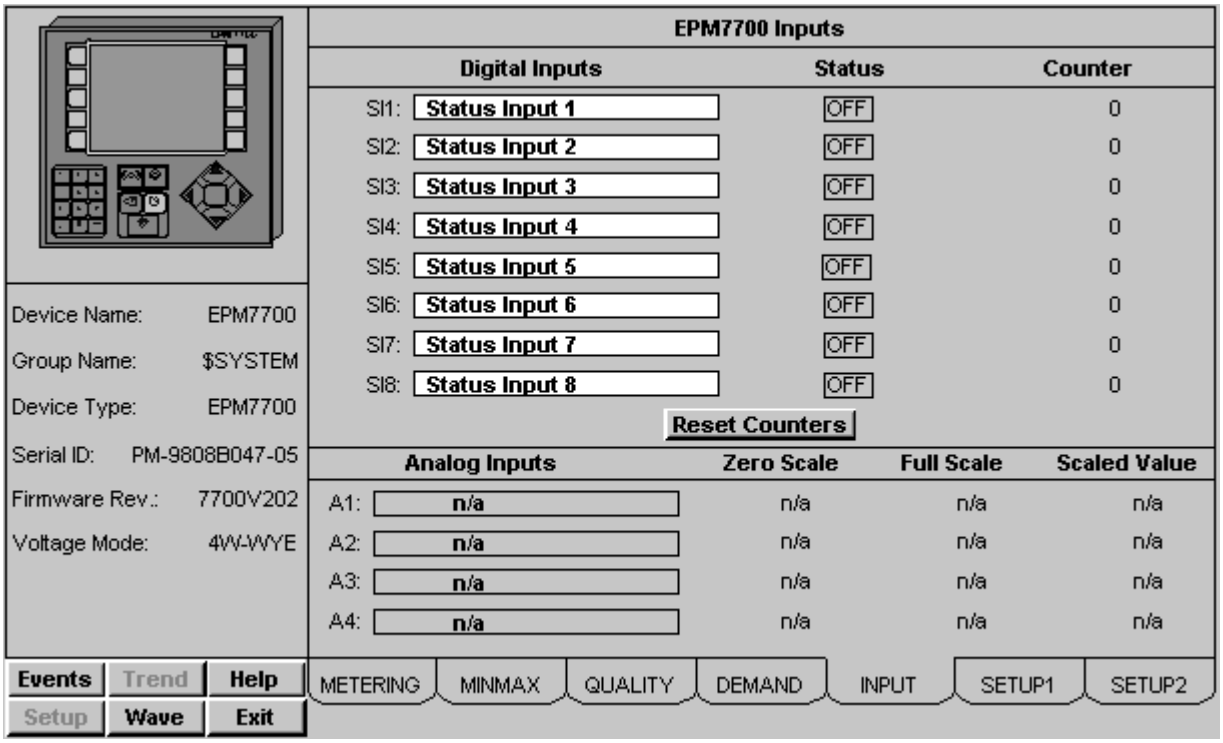
The Demand tab also provides push buttons for performing the following commands:

Reset Energy – Resets Energy Demand values identified above.

Reset SWD– Resets Sliding Window Demand values identified above.

Thermal Demand – Resets Thermal Demand values identified above.

Inputs Tab



EPM 7700 ION Meter - Inputs Tab

The Inputs tab displays the following values from the EPM 7700.

Digital Inputs

- Status (On, Off) for Status Inputs (SI) 1-8. (Color Code: Green – ON, Grey – OFF).
- Counters for SI1-8.

Analog Inputs

- Zero Scale Setting for AI1-4. : n/a when doesn't exist on the meter
- Full Scale Setting for AI1-4. : n/a when doesn't exist on the meter
- Scaled Value for AI1-4. : n/a when doesn't exist on the meter

The Inputs tab also provides push buttons for performing the following commands:

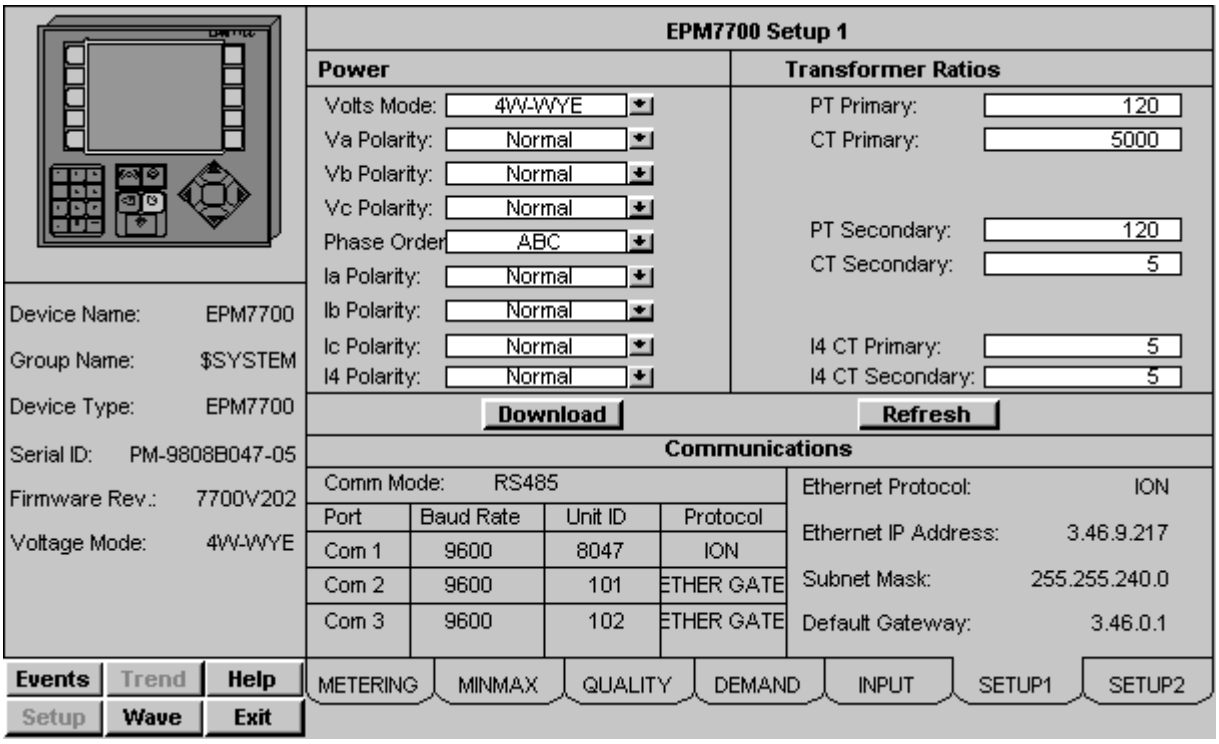
Reset Counters – Resets Digital Input Status Counters for SI1-8.

The Inputs tab also provides retentive memory inputs for the following:

Digital Input Names for SI1-8.

Analog Input Names for AI1-4. : n/a when doesn't exist on the meter

Setup 1 Tab



EPM 7700 ION Meter - Setup 1 Tab

The Setup 1 tab displays the following demand values from the EPM 7700.

Power Settings

- Volts Mode
- Phase Order
- Voltage Polarity for A, B, and C
- Current Polarity for A, B, C, and Neutral

Transformer Ratio Settings

- PT and CT Primary
- PT and CT Secondary
- Neutral CT Primary and Secondary

Communications

- Baud Rate for Comm 1, 2, and 3.

- Unit ID for Comm 1, 2, and 3.
- Protocol for Comm 1, 2, and 3.
- Mode for Comm 1.
- Ethernet Protocol, IP Address, Subnet Mask, and Default Gateway.

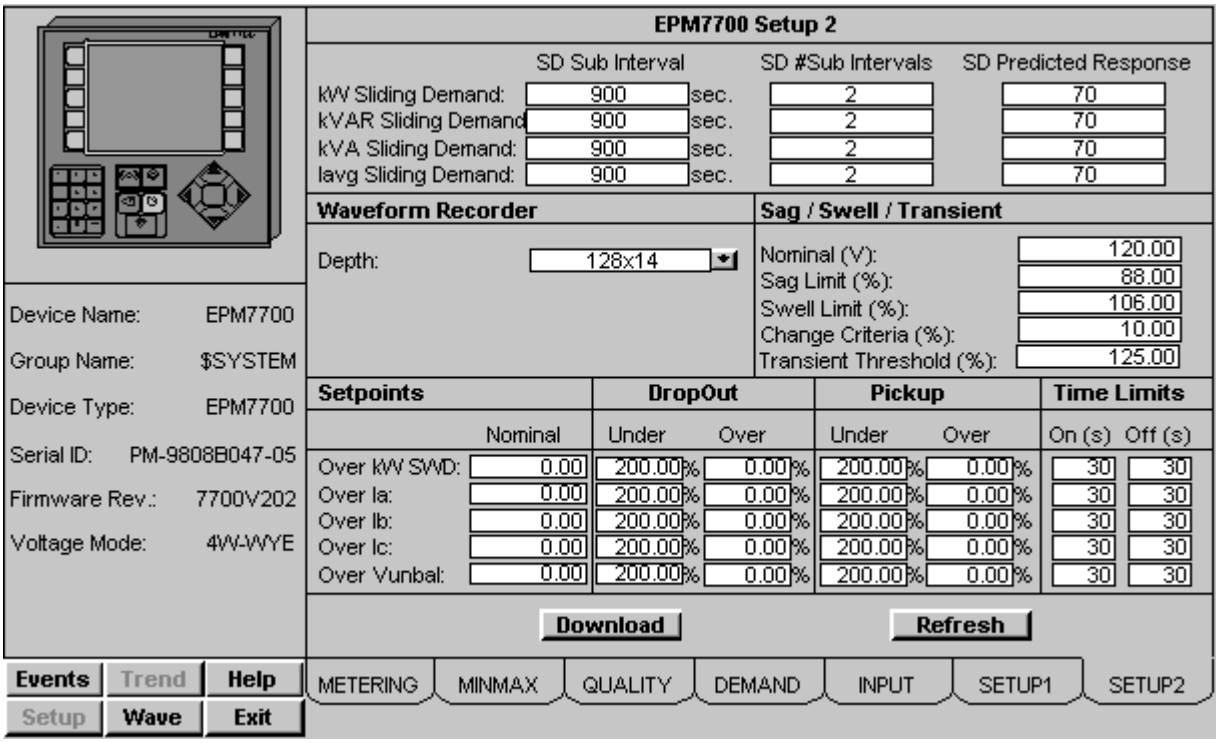
The Setup 1 tab also provides push buttons for performing the following commands:

Download – Executes a script to check for values that have changed and downloads those values to the device via the GE 7700 Gateway.

Refresh – Executes a script to upload all of the meter values for the settings on the screen.

Note: Be sure to click the Refresh button prior to changing or downloading any settings to the EPM7700, as the latest settings may not be displayed.

Setup 2 Tab



EPM 7700 ION Meter - Setup 2 Tab

The Setup 2 tab displays the following demand values from the EPM 7700.

Sliding Window Demand Settings

- Sliding Demand Sub Interval Settings for KW, KVAR, KVA, and Iavg.
- Sliding Demand Number of Sub Intervals for KW, KVAR, KVA, and Iavg.
- Sliding Demand Predicted Response for KW, KVAR, KVA, and Iavg.

Waveform Recorder Settings

- Depth of Waveform Recorder

Sag / Swell / Transient Settings

- Sag / Swell Nominal
- Sag Limit
- Swell Limit
- Change Criteria
- Transient Threshold

Relative Setpoint Settings

- Nominal value for Over KW, Over Current, and Over Vunbal.
- Under Dropout for Over KW, Over Current, and Over Vunbal.
- Over Dropout for Over KW, Over Current, and Over Vunbal.
- Under Pickup for Over KW, Over Current, and Over Vunbal.

- Over Pickup for Over KW, Over Current, and Over Vunbal.
- Time On for Over KW, Over Current, and Over Vunbal.
- Time Off for Over KW, Over Current, and Over Vunbal.

The Setup 2 tab also provides push buttons for performing the following commands:

Download– Executes a script to check for values that have changed and downloads those values to the device via the GE 7700 Gateway.

Refresh– .Executes a script to upload all of the meter values for the settings on the screen.

Note: Be sure to click the Refresh button prior to changing or downloading any settings to the EPM7700, as the latest settings may not be displayed.

Universal Relay

The Universal Relay devices are a highly-flexible family of power management devices based on the concept of a backplane and CPU supporting a wide variety of plug-in modules. These modules provide metering, monitoring, protection and control functions, and other abilities.

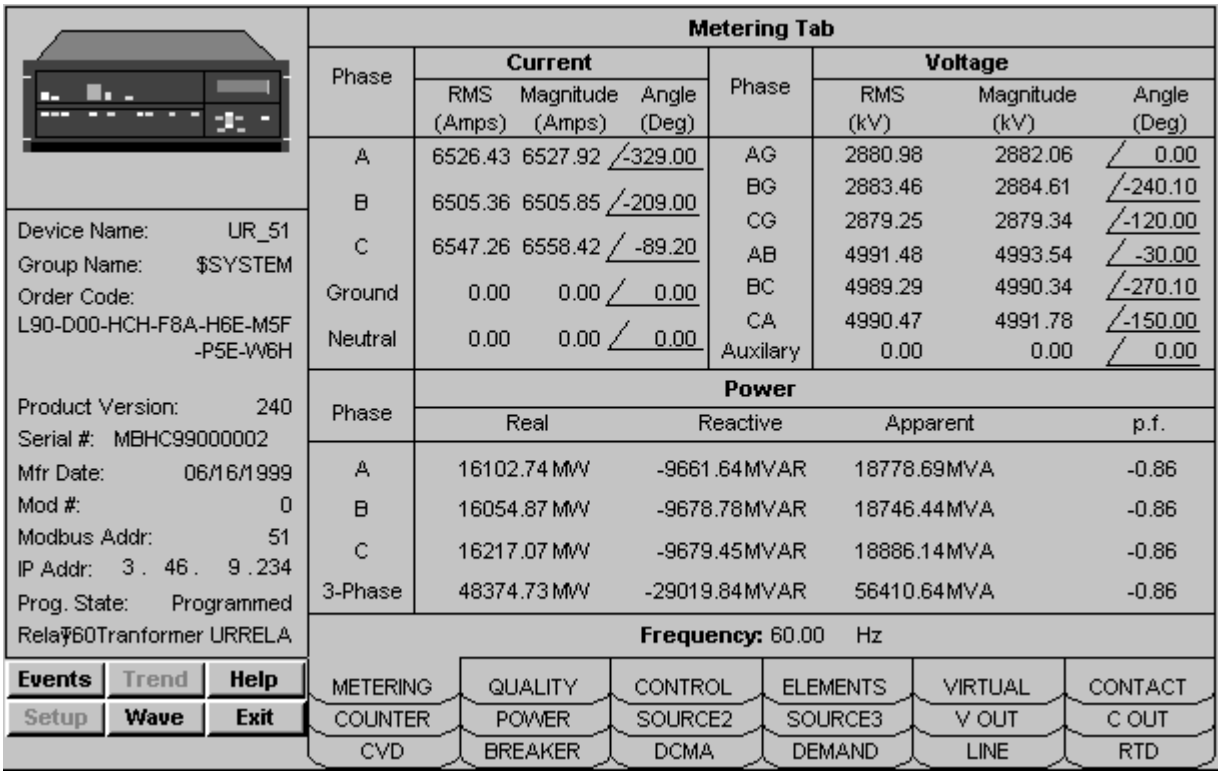
A UR tabular wizard can display between one and eight screens of data – the number of screens is determined by the user during wizard configuration. There are a total of thirteen screens available, depending on the type of UR device connected. For example, the C30 device does not support any metering functions, so the metering an source tabs are not available for this device.

The UR wizard supports connection to the PMCS Modbus and Ethernet servers and third party MMS servers. A UCA/MMS check box is provided on the wizard configuration dialog to correctly set up the Intouch tag names for use with MMS.

Note: If WindowViewer is running when the wizard configuration dialog is called up, a message appears warning that any changes made to the UR wizard configuration will not take effect until WindowViewer is shut down and restarted. For example, if a user elects to change the number of tabs configured for a device, the changes will not be reflected in the runtime environment until WindowViewer is restarted.

In the following pages, each of the Tabular Data Screen Wizards' tabs will be displayed and described.

Metering Tab



Universal Relay - Metering Data Screen

The Metering tab displays the following metered values from the B30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 devices: Actual Values for Voltage, Current, Power, Power Factor, and Frequency. These values are detailed below.

Current

RMS Current for each phase, ground, and neutral

Phasor magnitude and angle for each phase, ground and neutral

Voltage

RMS voltage for each phase-to-phase, phase-to-neutral, and auxiliary voltage value.

Phasor magnitude and angle for phase-to-phase, phase-to-neutral and auxiliary voltage value.

Phase-to-neutral voltages are displayed as "N/A" if derived from a source wired in a delta configuration.

Power

Shows Real (Watts), Reactive (VAR), and Apparent (VA) power values per phase and 3-phase.

By default, all power values are displayed in terms of kW, kVAR, and kVA. These values will scale as appropriate to MW, MVAR, and MVA.

Power values derived from a source wired in a delta configuration are displayed as "N/A".

Power Factor

Shows the signed power factor value in percent.

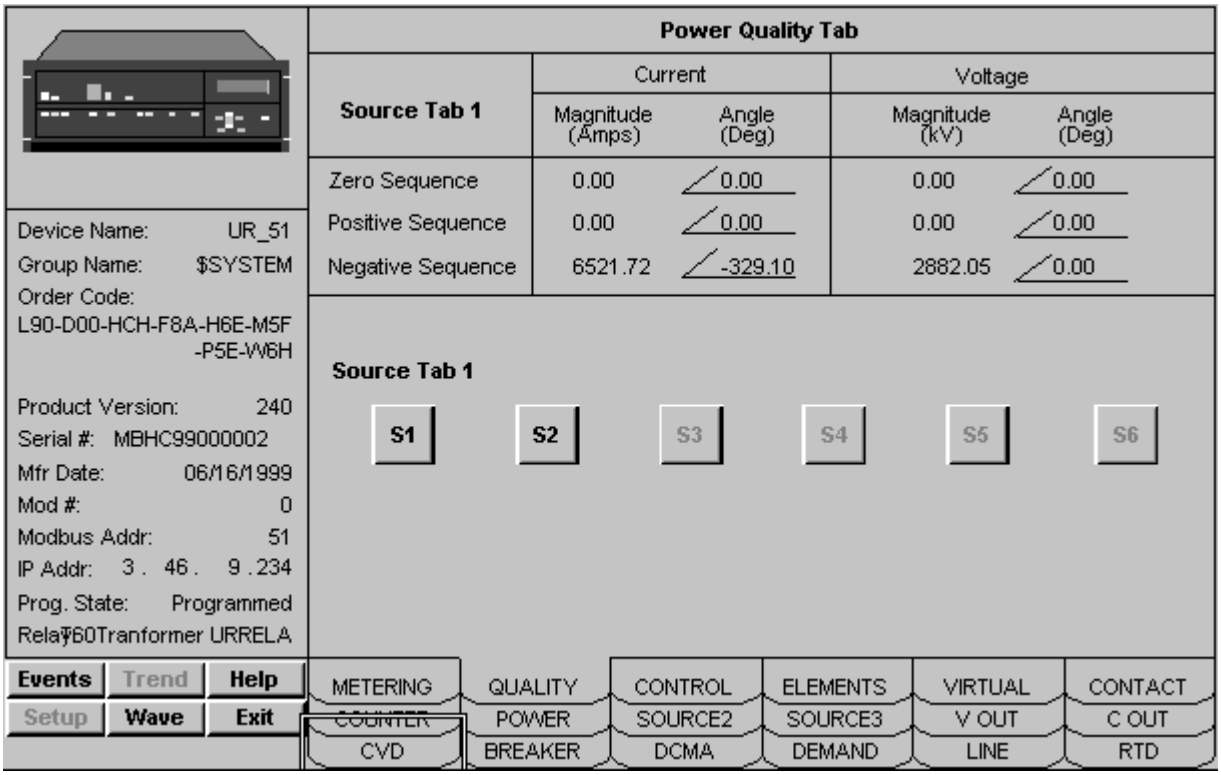
Power Factor values derived from a source wired in a delta configuration are displayed as "N/A".

Frequency

Frequency is shown in units of hertz.

Frequency is only displayed if the Frequency Tracking Reference setpoint is set to a non-zero value.

Power Quality Tab



Universal Relay - Quality Tab

The Quality tab provides six buttons labeled S1 – S6. These buttons enable you to select the source (1 – 6) for display. The text in the upper left corner of the tab indicates which source is currently displayed. Buttons are disabled for sources that have not been configured or enabled in the attached device. The Voltage parameters displayed are dependent on CT/VT configuration of the device hardware.

For the selected source, the Quality tab displays actual values for Zero Sequence, Positive Sequence, and Negative Sequence currents and voltages. The following devices are supported: B30, C30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60. The displayed values are described below.

Current

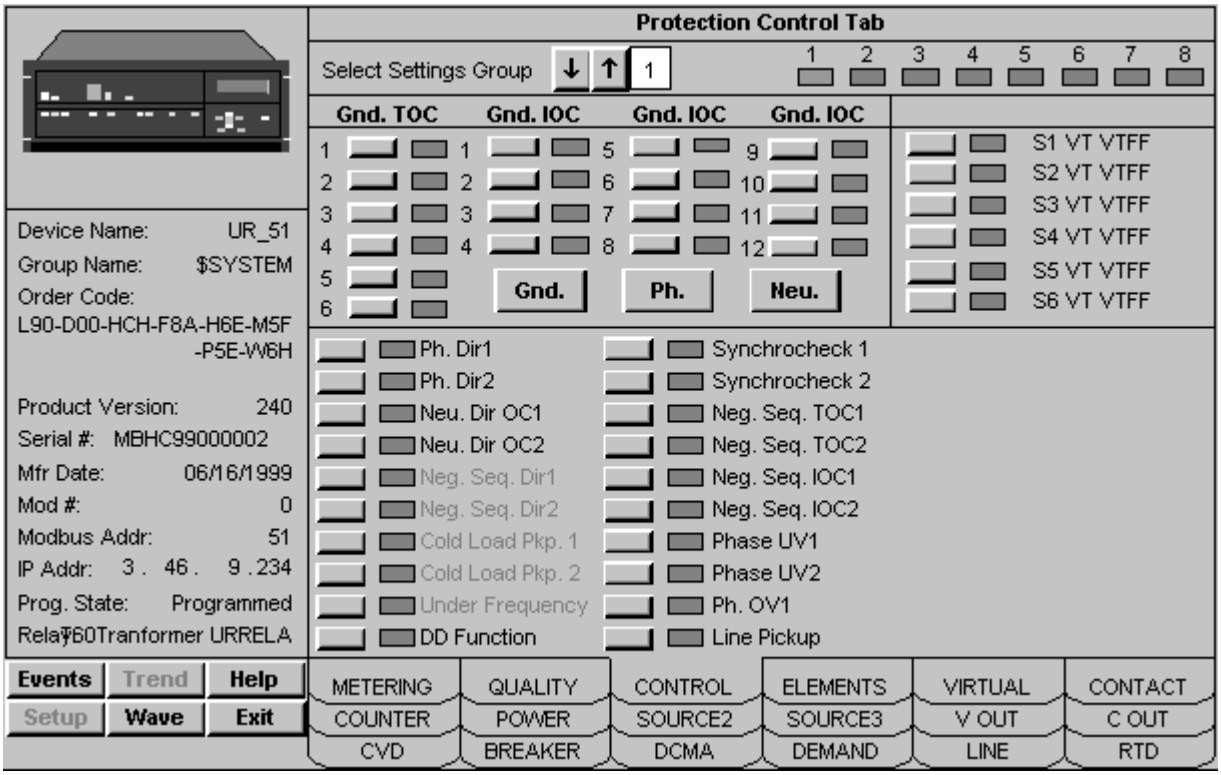
Phasor magnitude and angle for negative, positive and zero sequence currents.

Voltage

Phasor magnitude and angle for negative, positive and zero sequence voltages.

Voltage values derived from a source wired in a delta configuration will appear as "N/A".

Protection Control Tab

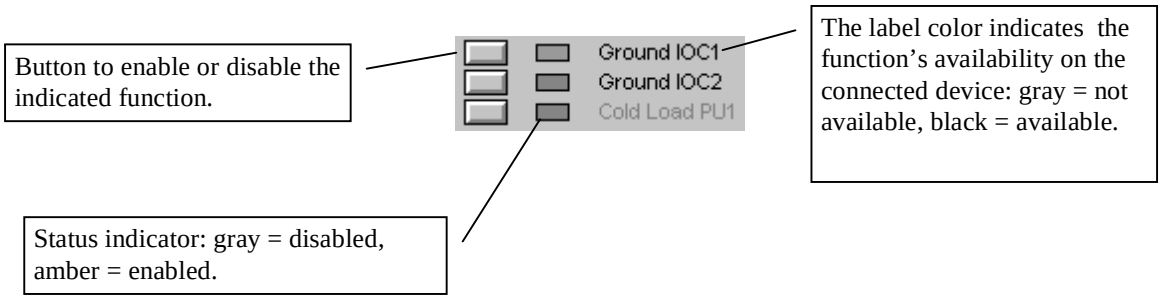


Universal Relay - Protection Control Tab

The Protection Control tab is supported for the following devices: B30, C30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60. The Protection Control tab provides the features described below.

Grouped Protection Settings

There are eight identical groups of protection settings in the UR - this tab provides an enable/disable status indication of selected protection elements, as well as a pushbutton to change the enable/disable status of those elements in each group. Function availability is determined by the Order Code read from the device – those functions that are not available in the connected device will be grayed out and disabled, as shown below:



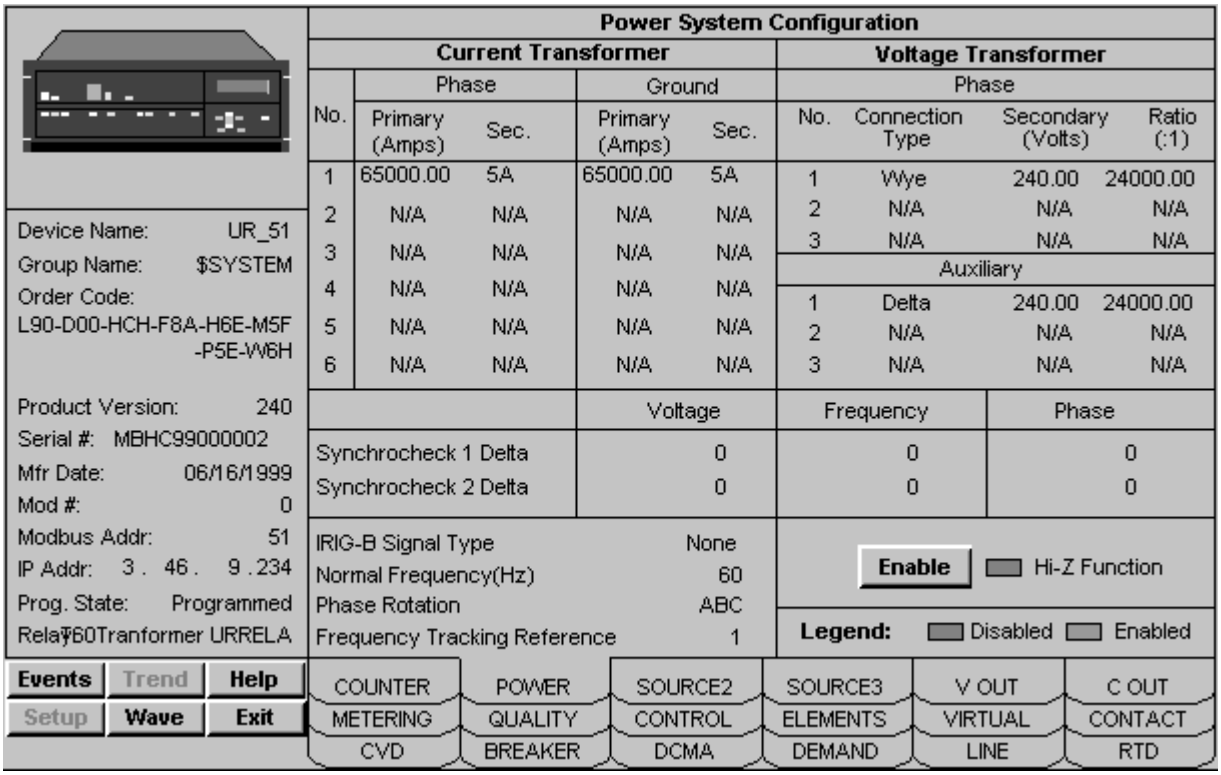
To use this tab, the user selects one of the eight settings groups for editing using the control labeled "Select Settings Group". The status of the settings in the selected group will then be displayed, and the user can enable/disable functions without affecting settings in the other seven groups. Note that the displayed group may not be

the active group currently in use by the relay's protection algorithms. The pushbuttons are subject to user level security in Intouch.

Phase TOC and IOC Settings

The Phase, Neutral, and Ground buttons in this section may be used to select the display of the TOC and IOC values.

Power System Configuration Tab



Universal Relay - Power System Configuration Tab

The Power System Configuration tab supports the B30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 UR devices, and shows the source CT and VT configuration of the entire relay. The supported UR devices can be configured with one to three DSP cards containing voltage and/or current transformers for measurement purposes.

Current Transformers (CT)

Primary: indicates the current rating of the CT primary.

Secondary: indicates the output current of the CT secondary, either 1A or 5A.

Displays "N/A" if the Order Code indicates no CT is installed in the affected location.

Voltage Transformers (VT)

Secondary: indicates the output voltage of the VT.

Ratio: the turns ratio of the VT.

Displays "N/A" if the Order Code indicates no VT is installed in the affected location.

Synchrocheck 1/2 Delta

The Delta values for Synchrocheck 1 and 2, voltage frequency, and phase.

IRIG-B Signal Type

Displays the IRIG-B signal type in use, if applicable.

Normal Frequency

The system nominal frequency in hertz.

Phase Rotation

The system phase rotation, ABC or ACB.

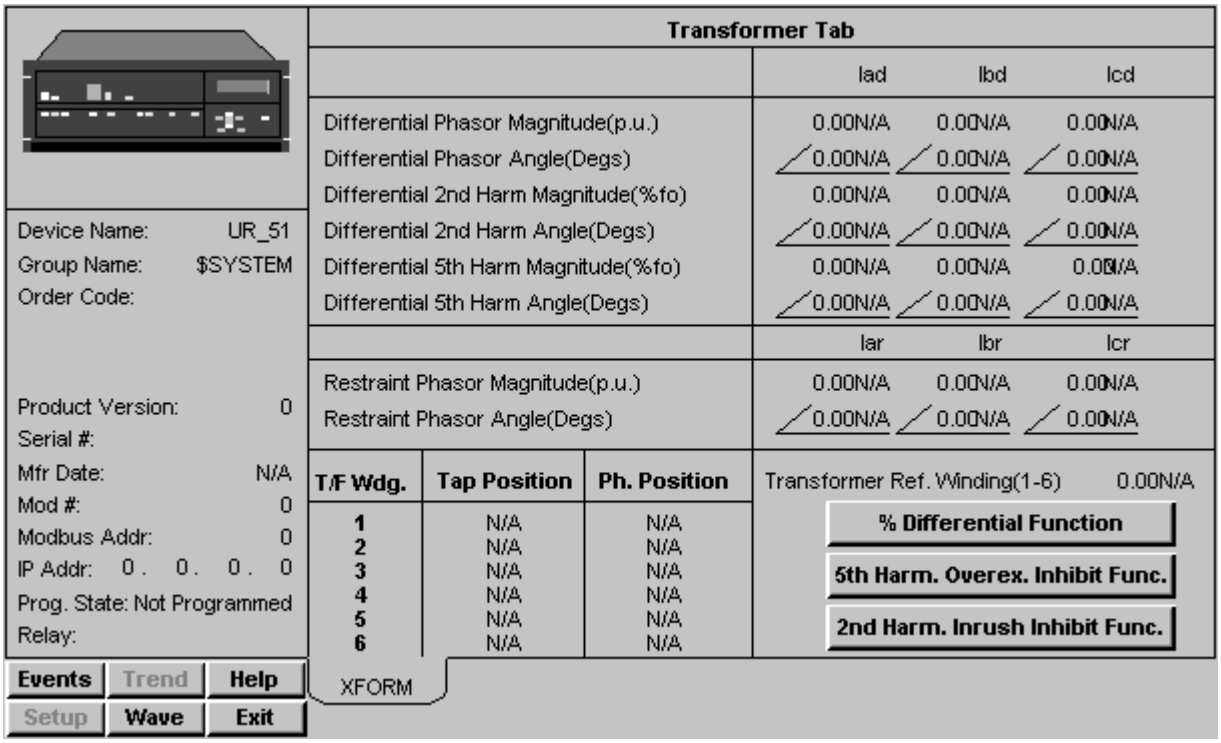
Frequency Tracking Reference

A numerical setpoint value associated with a specific source. The indicated source is used by the relay for developing frequency metering information. A value of zero indicates that the relay is not intended to meter frequency.

Hi-Z Function

Enable or Disable the device's High Impedance (Hi-Z) function, if equipped.

Transformer Tab



Universal Relay - Transformer Tab

The T60 device alone supports a Transformer Tab on its wizard. This tab is unique to the T60 device type. The following values are shown:

Differential Current

Phasor magnitude and angle.

Differential 2nd Harmonic

Phasor magnitude and angle

Differential 5th Harmonic

Phasor magnitude and angle

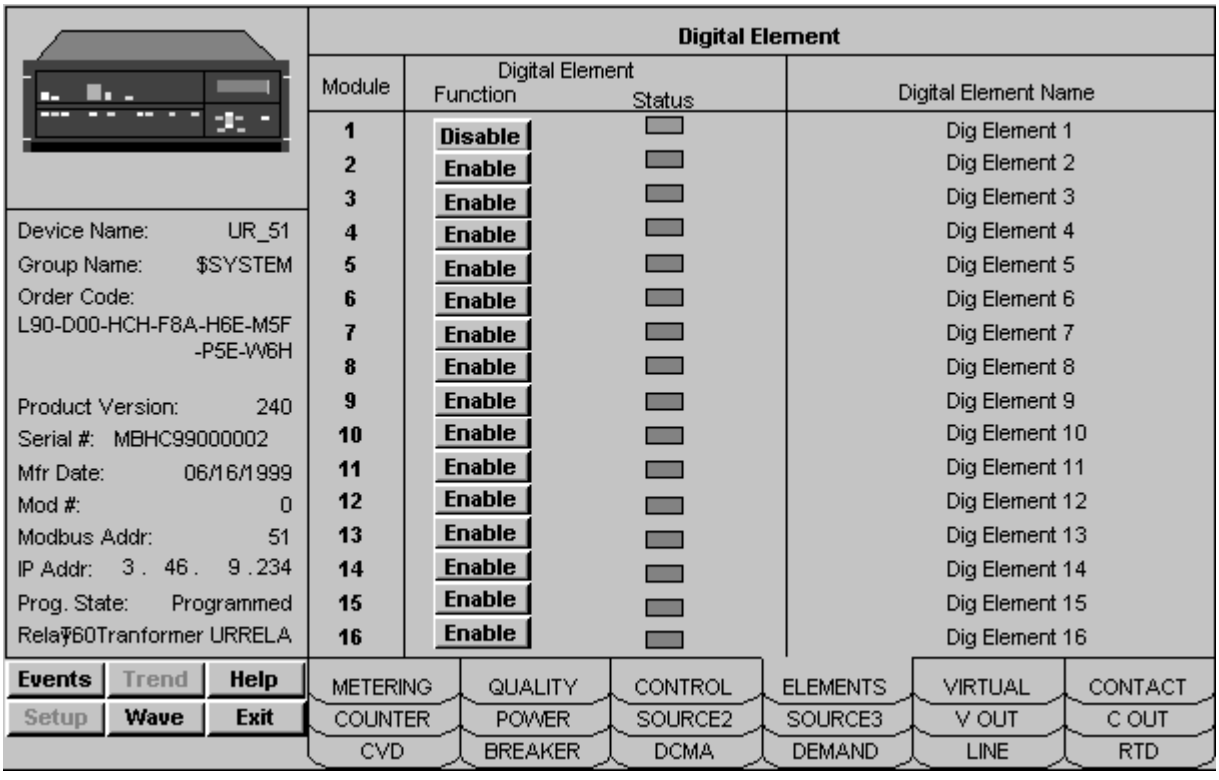
Restraint Current

Phasor Magnitude and angle

Transformer Winding Reference

Indicates which of the six possible transformer windings will serve as the reference winding.

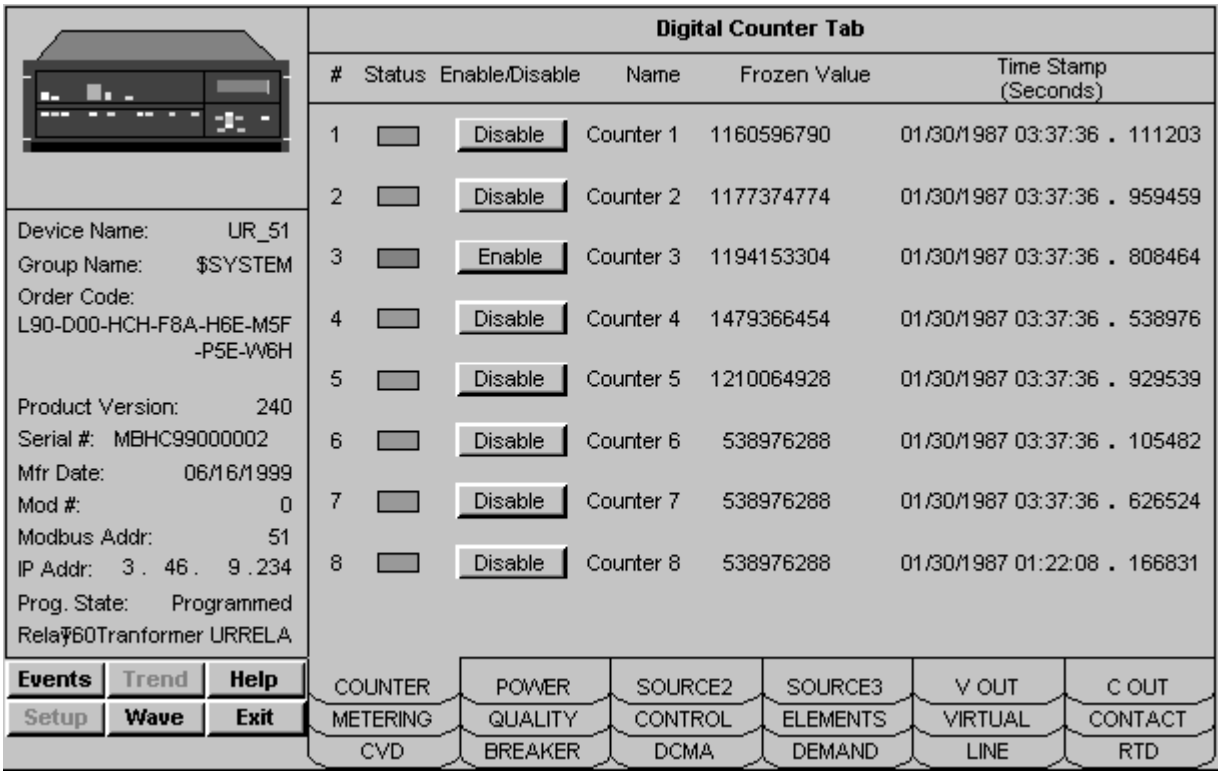
Elements Tab



Universal Relay - Digital Elements Tab

The Elements tab displays user-defined name and current status of the sixteen digital elements in the UR. The status indicator color is amber if an element is enabled, gray if it is disabled. The B30, C30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 devices are supported.

Digital Counter Tab



Universal Relay - Digital Counter Tab

The digital counter tab supports B30, C30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 device types, showing information about the eight digital counters provided in each UR.

Status – this indicator is amber if the counter is enabled, gray if disabled.

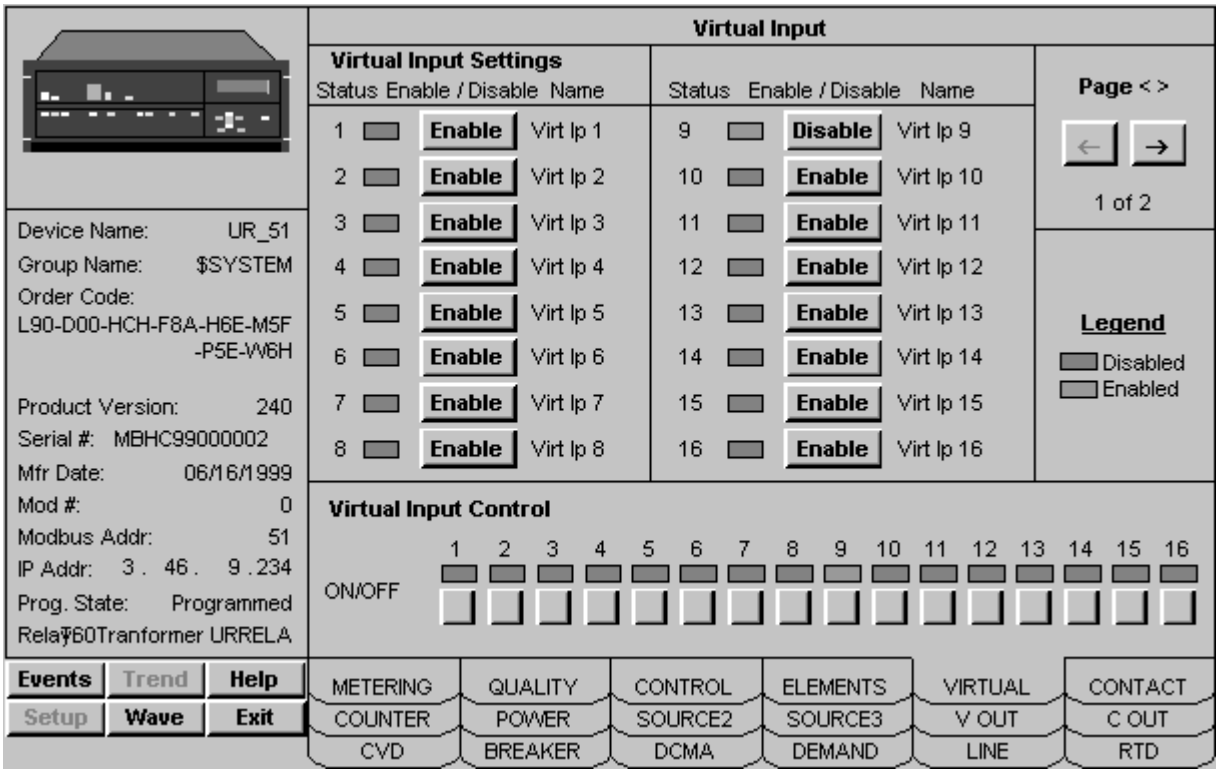
Enable/Disable – this button gives the user the ability to enable or disable the specified counter.

Name – displays the user-defined name assigned to the counter.

Frozen Value – shows the counter's value when last frozen.

Time Stamp – shows the time and date when the frozen count was acquired.

Virtual Inputs Tab



Universal Relay - Virtual Inputs Tab

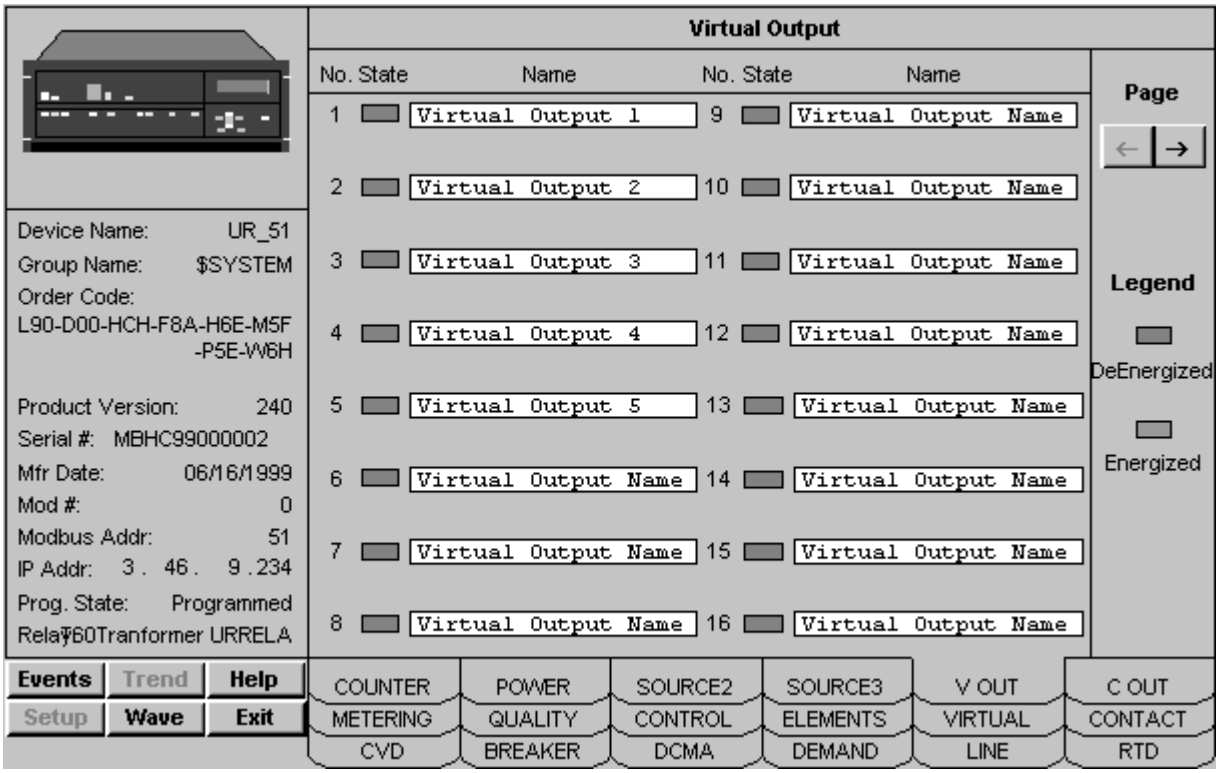
The Virtual Inputs (VInputs) tab allows the user to enable/disable all configured virtual inputs in the connected device and provides indication of their status. The 32 virtual inputs can be manually operated with the pushbuttons provided at the bottom of the screen. This tab supports the B30, C30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 devices.

Virtual Inputs

The enable/disable controls and status indicators are presented as a series of pages. To view the virtual inputs, the use the Page arrow keys provided to navigate between the pages. The arrow keys are disabled when the virtual inputs are not being displayed.

The state of each virtual input can be controlled with the pushbuttons along the bottom of the screen. Clicking one of these buttons toggles the status of the virtual input, changing its state as shown in the indicator blocks associated with each button. Note that a virtual input must be enabled before the toggling action will take effect in the relay.

Virtual Outputs Tab



Universal Relay - Virtual Outputs Tab

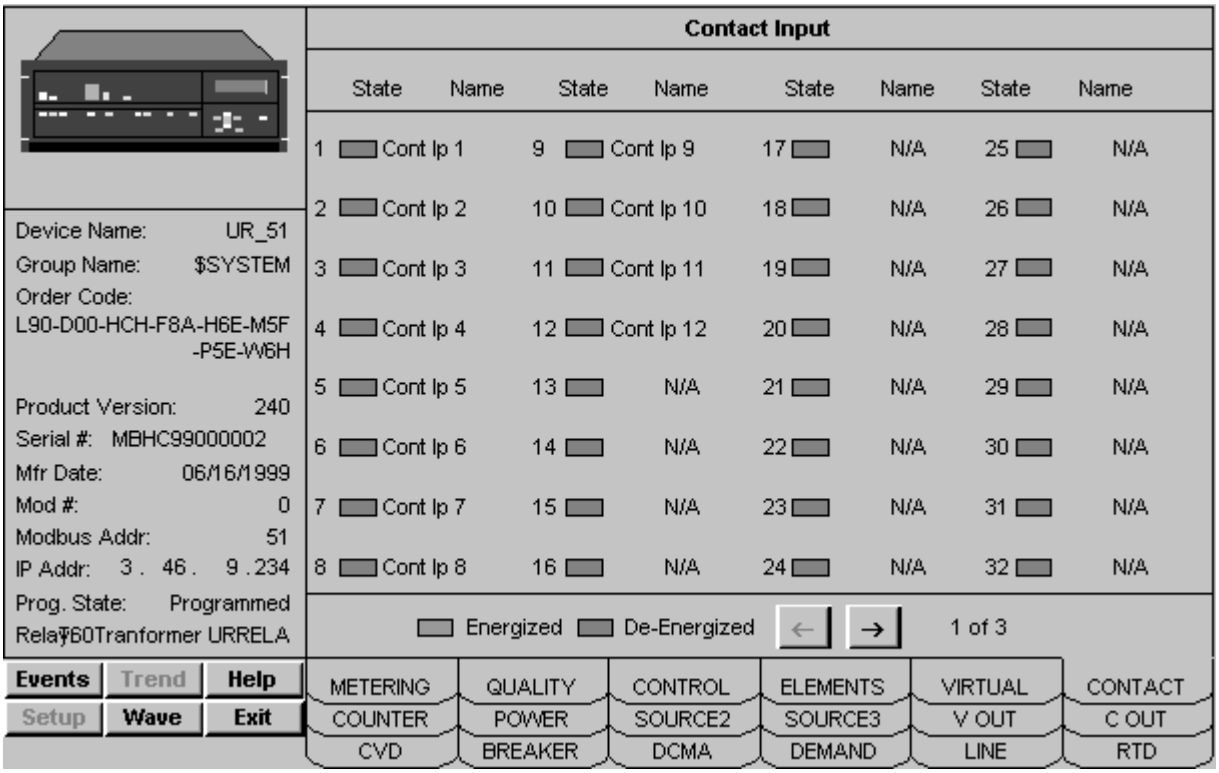
The Virtual Outputs (VOutput) tab allows the user to view the status (energized/de-energized) of all available virtual outputs on the device. The user can also assign a textual name to each of the outputs. Up to 64 virtual outputs can be diplayed. This tab supports the B30, C30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 devices.

Virtual Outputs

The outputs and their status indicators are presented as a series of pages. To view the virtual outputs, the use the Page arrow keys provided to navigate between the pages.

To assign a name to a virtual output, click in the text field to the right of the output number label. The field becomes editable; make any desired changes, then press Enter.

Contact Inputs Tab



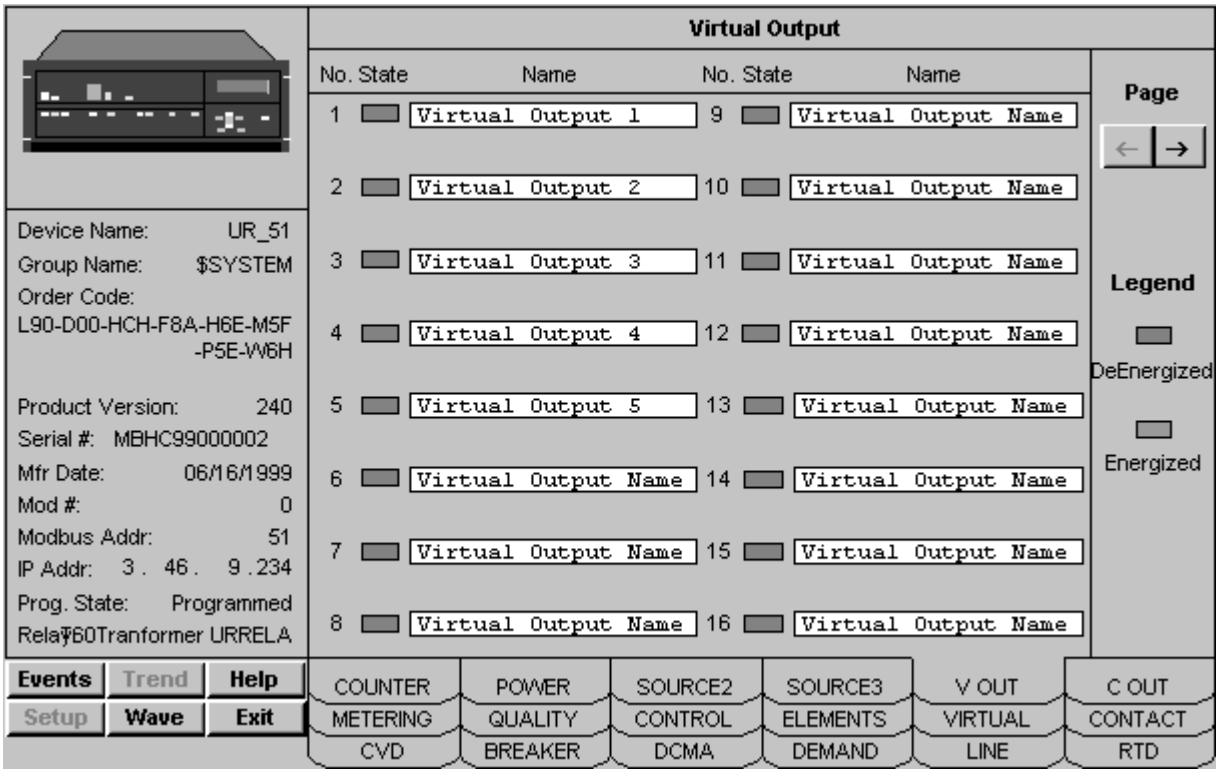
Universal Relay - Contact Input Tab

The Contact Input tab supports the B30, C30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 UR devices, and shows the contact inputs installed on the selected relay. Up to 96 contact inputs may be displayed.

Contact Inputs

The contacts are presented as a series of pages. To view the contact inputs, use the Prev(ious) and Next keys provided to navigate among the pages. The number of contact inputs available is determined from the Order Code read from the device, and is dependent on the number of digital I/O cards installed in the relay. If a contact input is not available in the connected relay, the associated control button is grayed and disabled, and the input name field shows "N/A". If the corresponding Contact Input State is Energized then the LED is lit with an amber color; otherwise the LED remains gray (un-energized).

Contact Output Tab



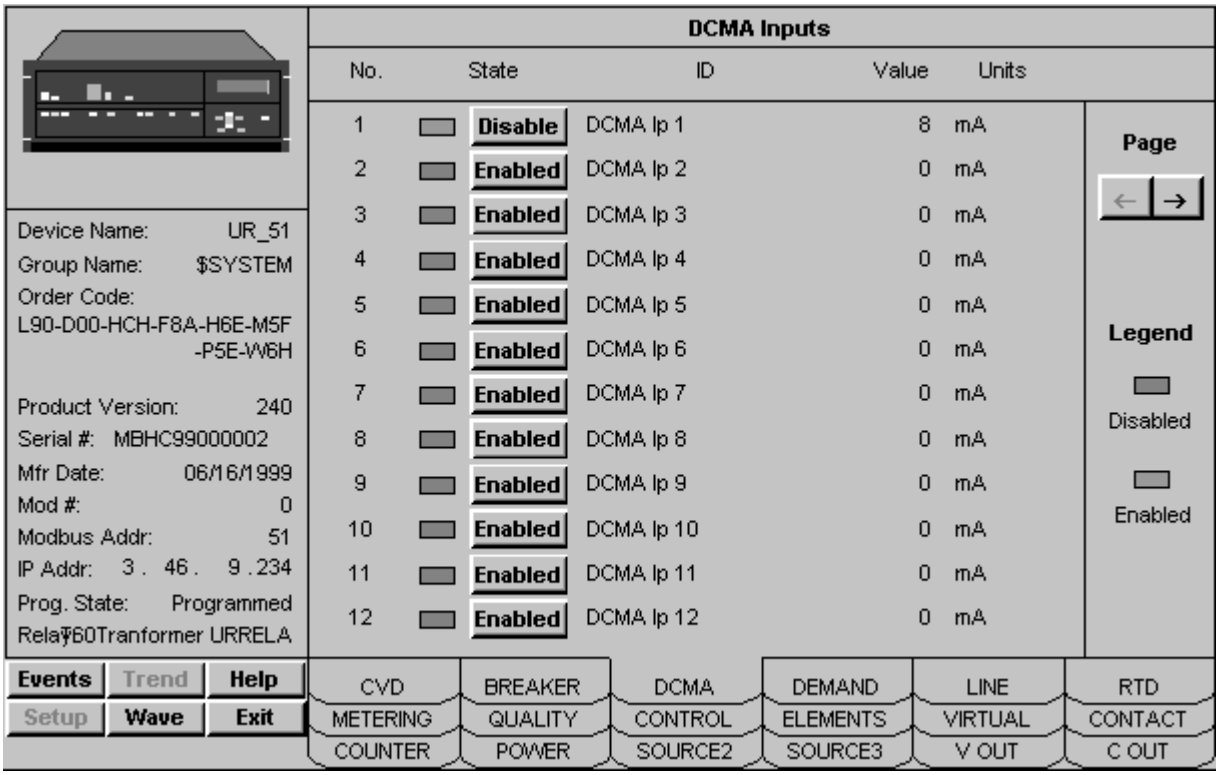
Universal Relay - Contact Output Tab

The Contact Output tab supports the B30, C30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 UR devices, and shows the contact outputs installed on the selected relay. Up to 64 contact outputs may be displayed.

Contact Output

The contacts are presented as a series of pages. To view the contact outputs, use the Page arrow keys provided to navigate among the pages. The number of contact outputs available is determined from the Order Code read from the device, and is dependent on the number of digital I/O cards installed in the relay. If a contact output is not available in the connected relay, the associated control button is grayed and disabled, and the output name field shows "N/A".

DCMA Tab



Universal Relay - DCMA Tab

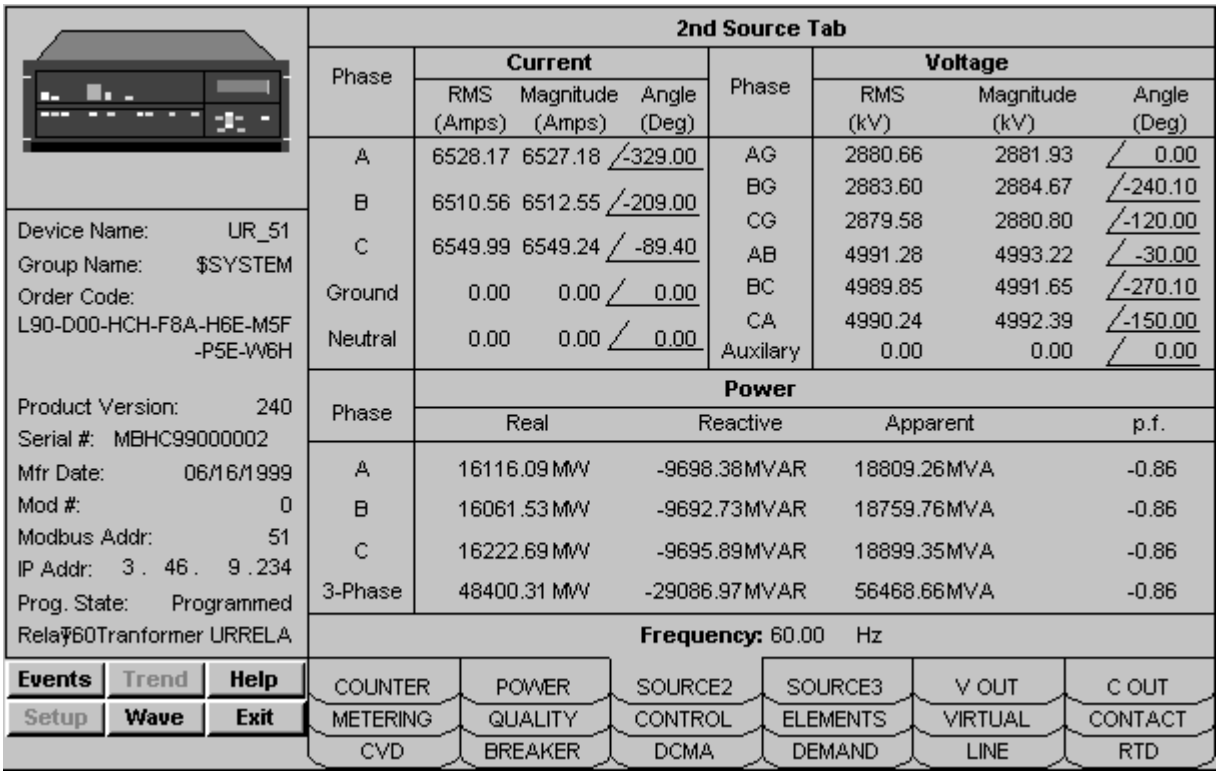
The Direct Current MilliAmperes (DCMA) tab supports the B30, C30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 UR devices, and shows the state of the relay's DCMA inputs. DCMA inputs are analog inputs used to read external transducer values. An example might be rotational speed on a generator, translated into a 4-20 mA current loop. Up to 24 inputs may be enabled or disabled.

DCMA Inputs

The DCMA inputs and their parameters are presented as a series of pages. To view the inputs, the use the Page arrow keys provided to navigate between the pages.

For each DCMA input, its ID number, value, and units are displayed as read from the device. To enable or disable a selected input, click the Enable button next to its ID number.

Source Tabs



2nd Source Tab

Phase	Current RMS (Amps)	Current Magnitude (Amps)	Current Angle (Deg)	Phase	Voltage RMS (kV)	Voltage Magnitude (kV)	Voltage Angle (Deg)
A	6528.17	6527.18	/-329.00	AG	2880.66	2881.93	/ 0.00
B	6510.56	6512.55	/-209.00	BG	2883.60	2884.67	/-240.10
C	6549.99	6549.24	/ -89.40	CG	2879.58	2880.80	/-120.00
Ground	0.00	0.00	/ 0.00	AB	4991.28	4993.22	/ -30.00
Neutral	0.00	0.00	/ 0.00	BC	4989.85	4991.65	/-270.10
				CA	4990.24	4992.39	/-150.00
				Auxilary	0.00	0.00	/ 0.00

Phase	Power Real	Power Reactive	Power Apparent	p.f.
A	16116.09 MW	-9698.38 MVAR	18809.26 MVA	-0.86
B	16061.53 MW	-9692.73 MVAR	18759.76 MVA	-0.86
C	16222.69 MW	-9695.89 MVAR	18899.35 MVA	-0.86
3-Phase	48400.31 MW	-29086.97 MVAR	56468.66 MVA	-0.86

Device Name: UR_51
Group Name: $SYSTEM
Order Code: L90-D00-HCH-F8A-H6E-M5F-P5E-W6H
Product Version: 240
Serial #: MBHC99000002
Mfr Date: 06/16/1999
Mod #: 0
Modbus Addr: 51
IP Addr: 3 . 46 . 9 .234
Prog. State: Programmed
Relay60Tranformer URRELA

Frequency: 60.00 Hz

Events | Trend | Help | Setup | Wave | Exit

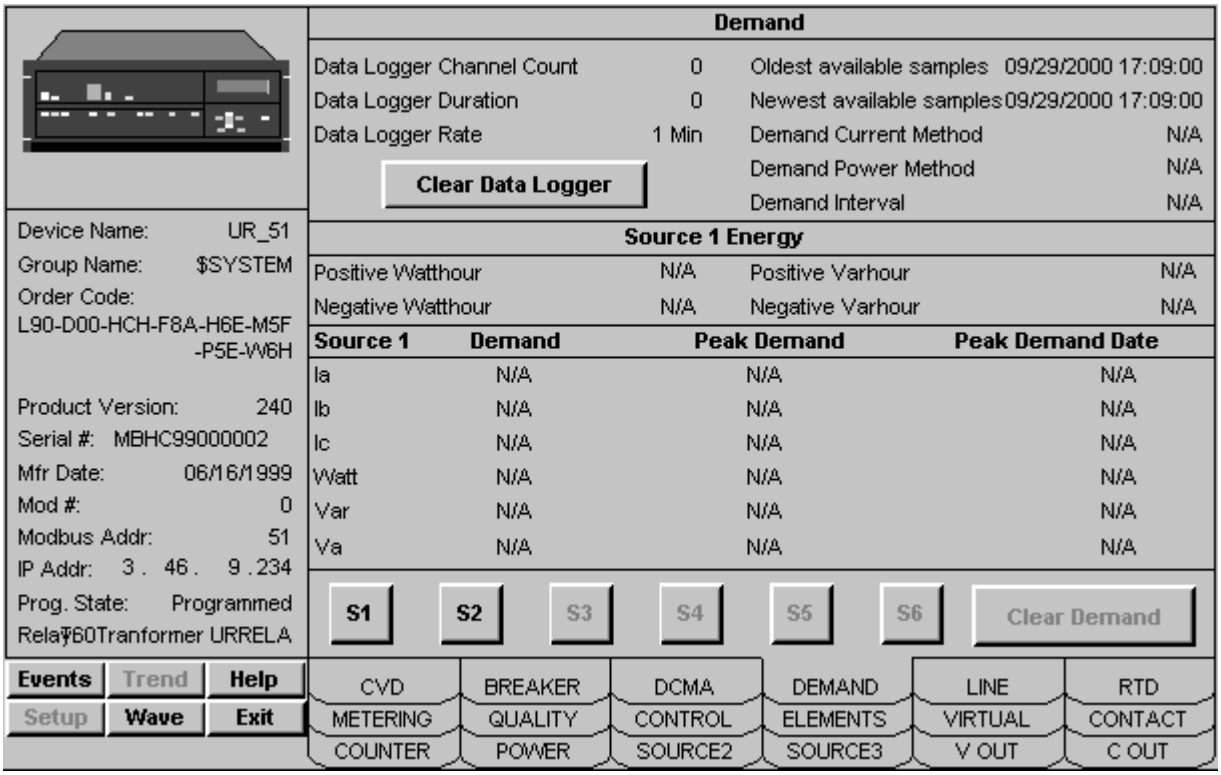
COUNTER | POWER | SOURCE2 | SOURCE3 | V OUT | C OUT
METERING | QUALITY | CONTROL | ELEMENTS | VIRTUAL | CONTACT
CVD | BREAKER | DCMA | DEMAND | LINE | RTD

Universal Relay - Source Tab Example

Similar in operation to the metering tab (except that frequency information is not displayed), there are five identical "Source" tabs (2 – 6) which display actual values information specific to the indicated source. There is no "Source 1" tab, since the Metering tab serves as the "Source 1" display. The B30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 UR device types are supported.

The display rules for the metering tab also apply to each Source tab.

Demand Tab



Universal Relay - Demand Tab

The Demand tab supports the B30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 UR devices, and shows a variety of energy measurements and demand parameters for a selected source.

These values are displayed for up to six sources, which may be toggled between using the S1 - S6 buttons. The Clear Demand button clears the values for the selected source. Note: Energy data is displayed as N/A for the L90 and L60 device types, and data logger data is displayed as N/A for the B30 device type.

Demand Values

The Demand panel shows the Data Logger parameters, which may be cleared using the Clear Data Logger button, the time/date stamps of the oldest and newest samples available, and information on the Demand Current and Demand Power Methods, and Demand Interval (if applicable).

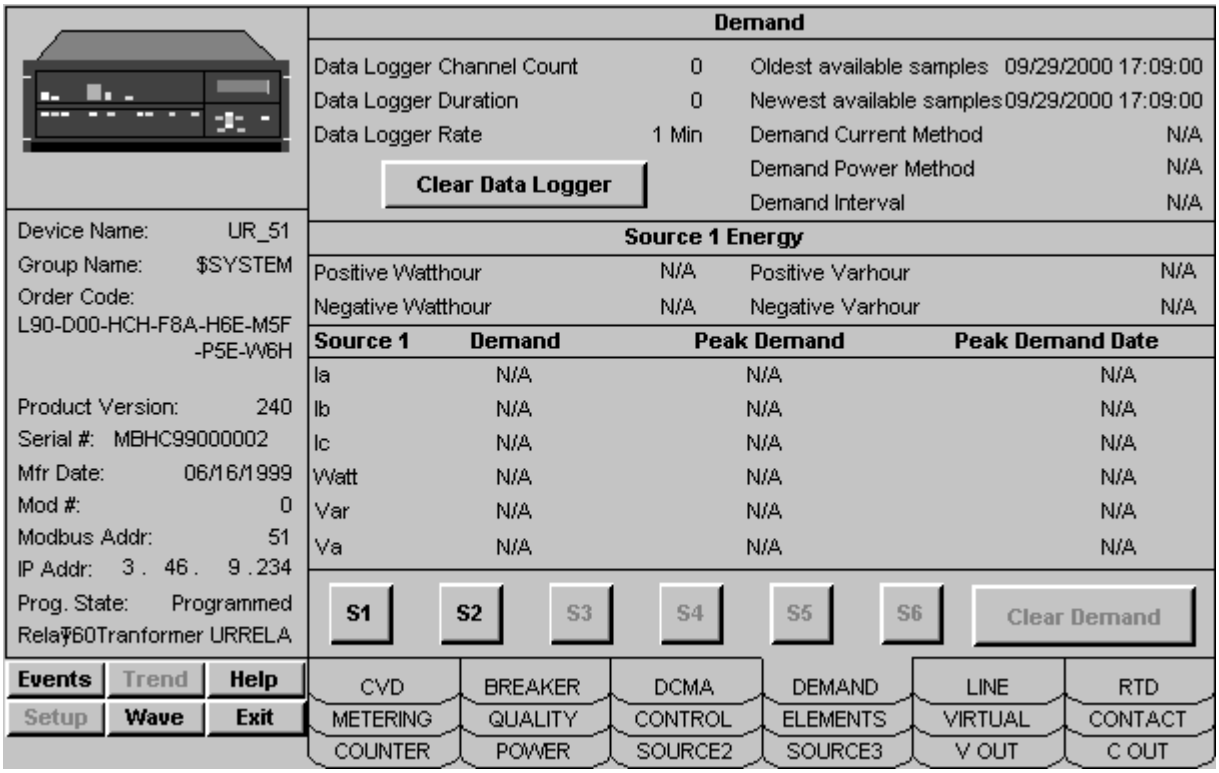
Source (x) Energy

Displays positive and negative Watthour and Varhour values for the selected source.

Source (x) Demand, Peak Demand, Peak Demand Date

Displays Demand, Peak Demand, and Peak Demand Date values for a variety of measurements for the selected source.

Line Tab



Universal Relay - Line Tab

The Line tab supports the D60, F30, F60, G60, L60, L90 and UR devices, and shows a variety of energy measurements and demand parameters for a selected source.

These values are displayed for up to six sources, which may be toggled between using the S1 - S6 buttons. The Clear Demand button clears the values for the selected source.

Line Tab

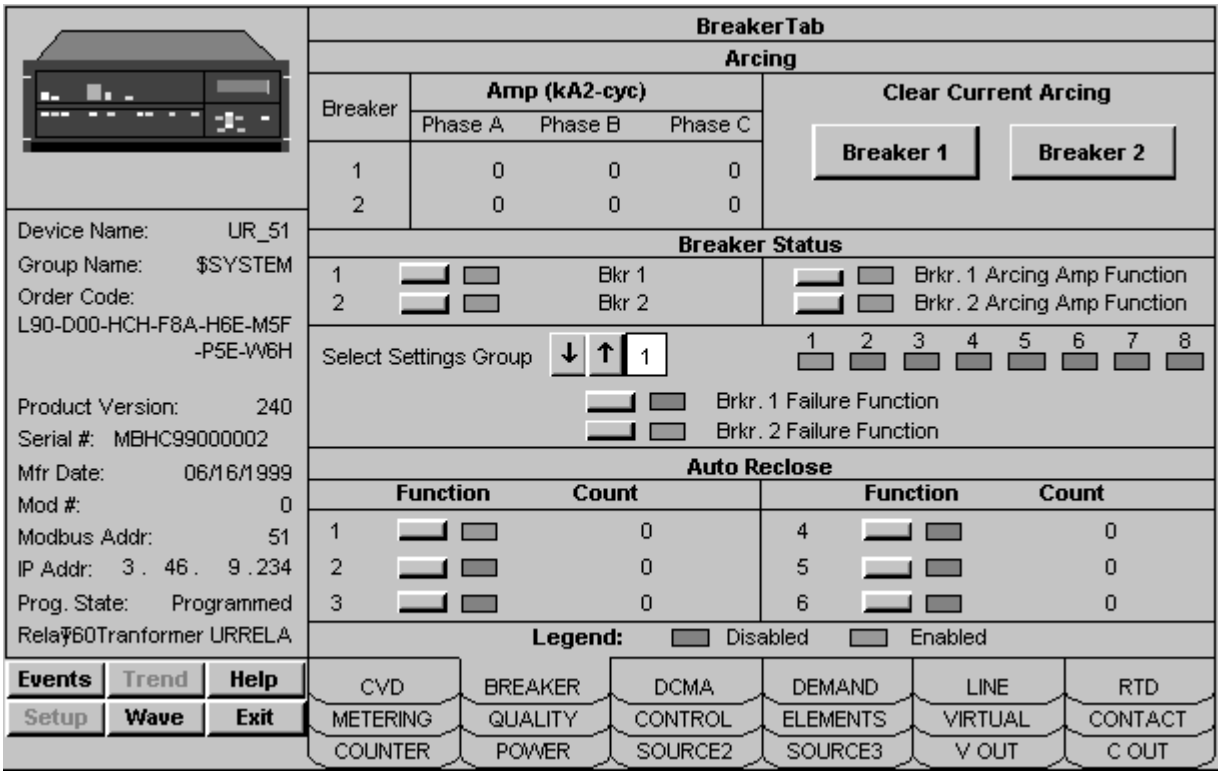
Displays (for Remote 1, Remote 2, Local, and Differential) the magnitude and angle on phase A, B, and C.

Also displays information on various Direct Inputs, L90 Channels 1 and 2, and Line Position and Line Zero values.

Control Functions

The Control Functions panel displays status (enabled/disabled) and allows control of various relay elements, for example 87L and 87PC protection elements. Elements are greyed out if not installed or applicable to the device type. Each element's may be enabled or disabled by clicking the button next to its name.

Breaker Tab



Universal Relay - Breaker Tab

The Breaker tab supports the B30, C30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 UR devices, and shows a variety amperage measurements and breaker status, as well as allowing control of breaker functions and auto reclosers.

Arcing

Amperage at Breaker 1 and 2 is displayed for Phases A, B, and C. The Clear Current Arcing functions allow current arcing conditions to be cleared.

Breaker Arcing Current features are available for Breakers 1 and 2. This element calculates an estimate of the per-phase wear on the breaker contacts by measuring and integrating the current squared passing through the breaker contacts as an arc. These per-phase values are added to accumulated totals for each phase and compared to a programmed threshold value. When the threshold is exceeded in any phase, the relay can set an output operand to "1". The accumulated value for each phase can be displayed as an actual value.

Breaker Functions

Breaker control can be enabled or disabled using these controls, and the Breaker Arcing Amp function can be enabled or disabled for Breakers 1 and 2. These controls will be disabled if the connected device does not support breaker control.

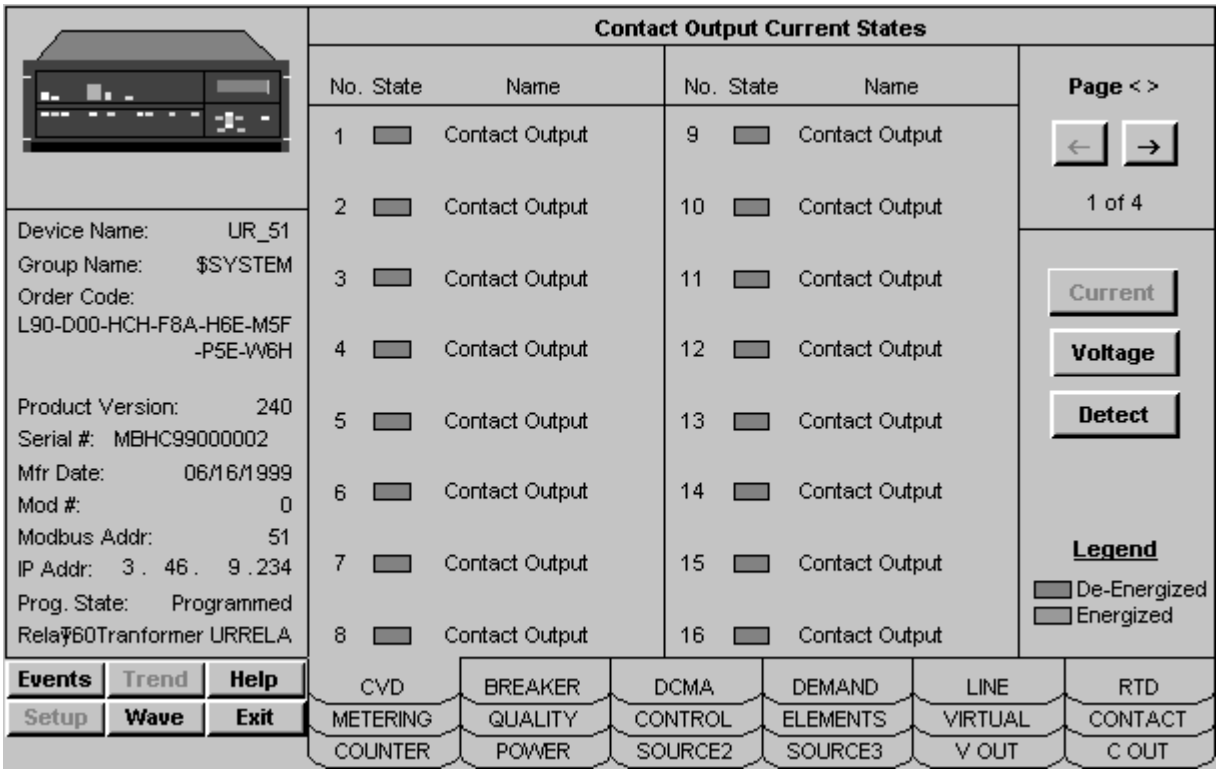
Breaker Status

Selecting a settings group changes the display of functions. Up to 8 settings groups are available for display.

Auto Reclose

If the breaker is so equipped, the status of and reclose count for up to six Auto Reclose functions can be displayed, and each recloser may be enabled or disabled. Click the button next to each ID number to enable/disable the autorecloser.

Contact Output Current States Tab



Universal Relay - Contact Output Current States Tab

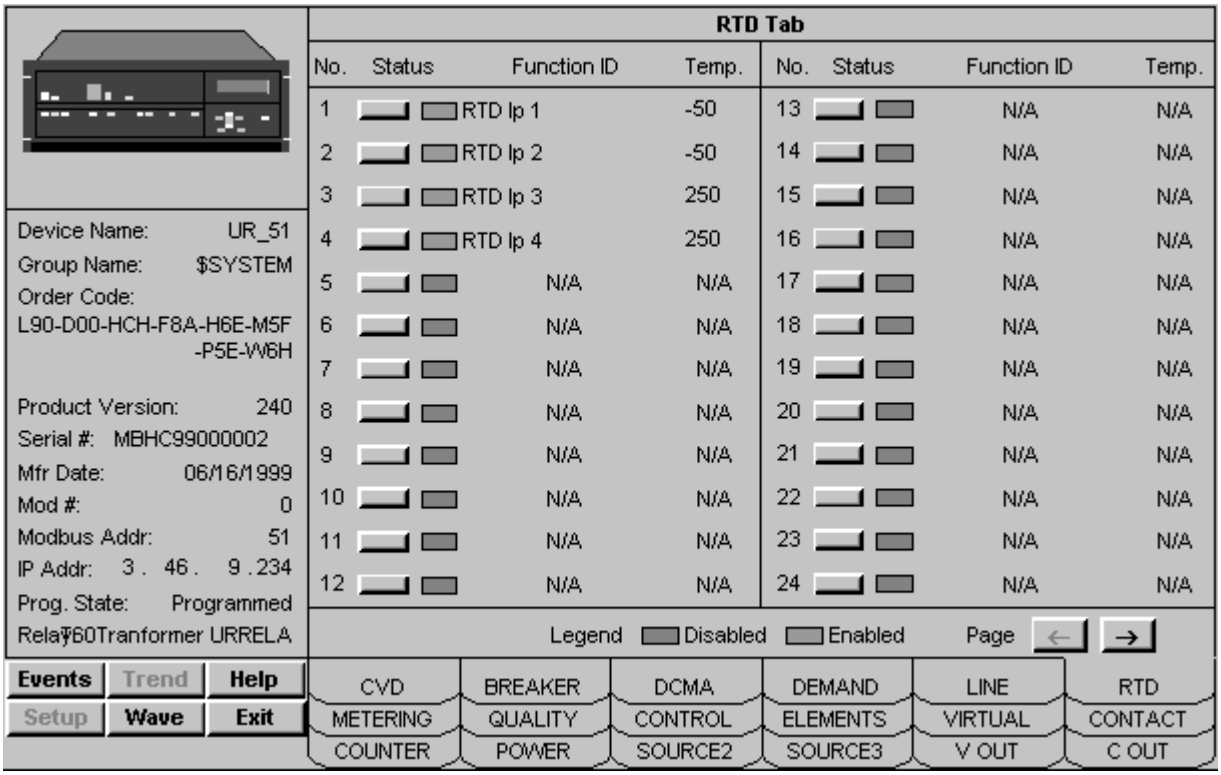
The Contact Output Current State tab supports the B30, C30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 UR devices, and indicates the current state of the contact outputs installed on the selected relay. Up to 64 contact outputs may be displayed.

Contact Output Current State

The Current, Voltage, and Detect buttons enable the user to shift the viewing mode of the contacts displayed.

The contacts are presented as a series of pages. To view the contact outputs, use the Page arrow keys provided to navigate among the pages. The number of contact outputs available is determined from the Order Code read from the device, and is dependent on the number of digital I/O cards installed in the relay. If a contact output is not available in the connected relay, the associated control button is grayed and disabled, and the output name field shows "N/A".

Remote Temperature Detection Tab



Universal Relay - Contact Output Tab

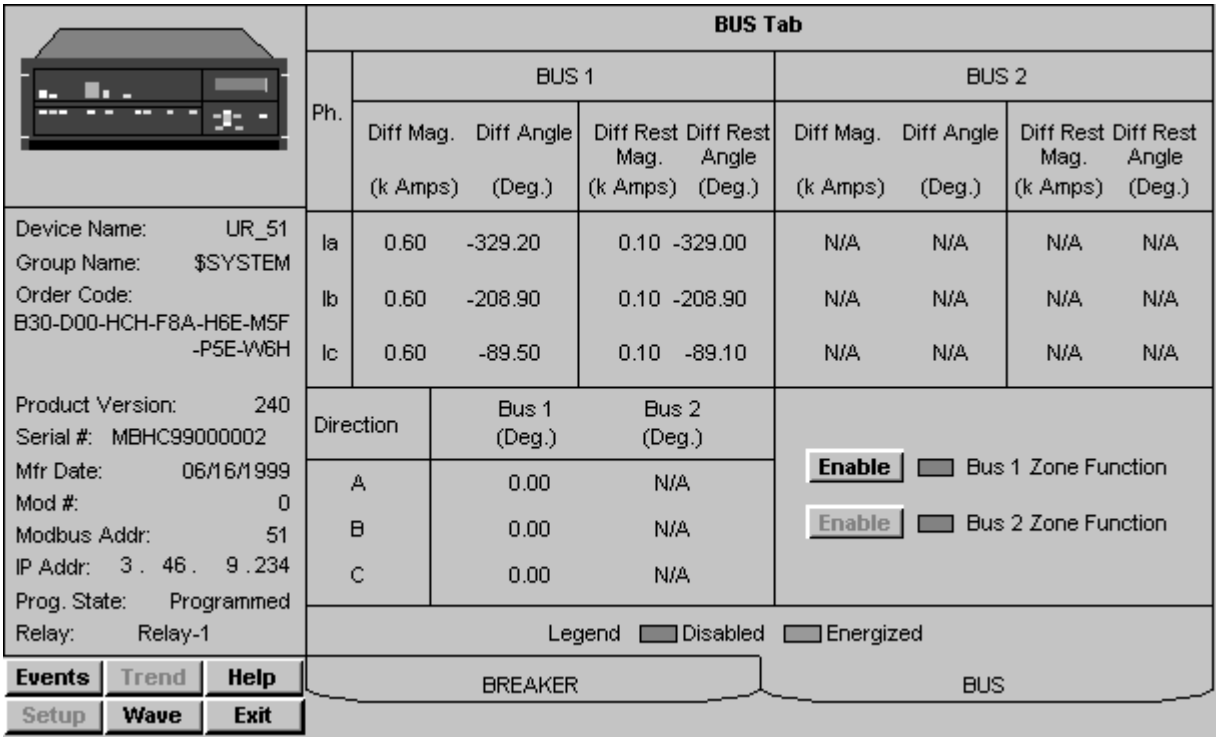
The RTD tab supports the B30, C30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 UR devices, and shows the RTD sensors installed on the selected relay. Up to 48 input sensors may be displayed.

RTD Tab

Each RTD sensor's status, function (name), and current temperature are shown. Individual RTD's may be disabled or enabled using the control button next to the RTD number.

The sensors are presented as a series of pages. To view each page of RTD's, use the Prev(ious) and Next keys provided to navigate among the pages. The number of parameters displayed is determined from the Order Code read from the device, and is dependent on the number of RTD sensors wired to the relay. If a sensor is not available in the connected relay, the associated control button is grayed and disabled, and the name field shows "N/A".

Bus Tab

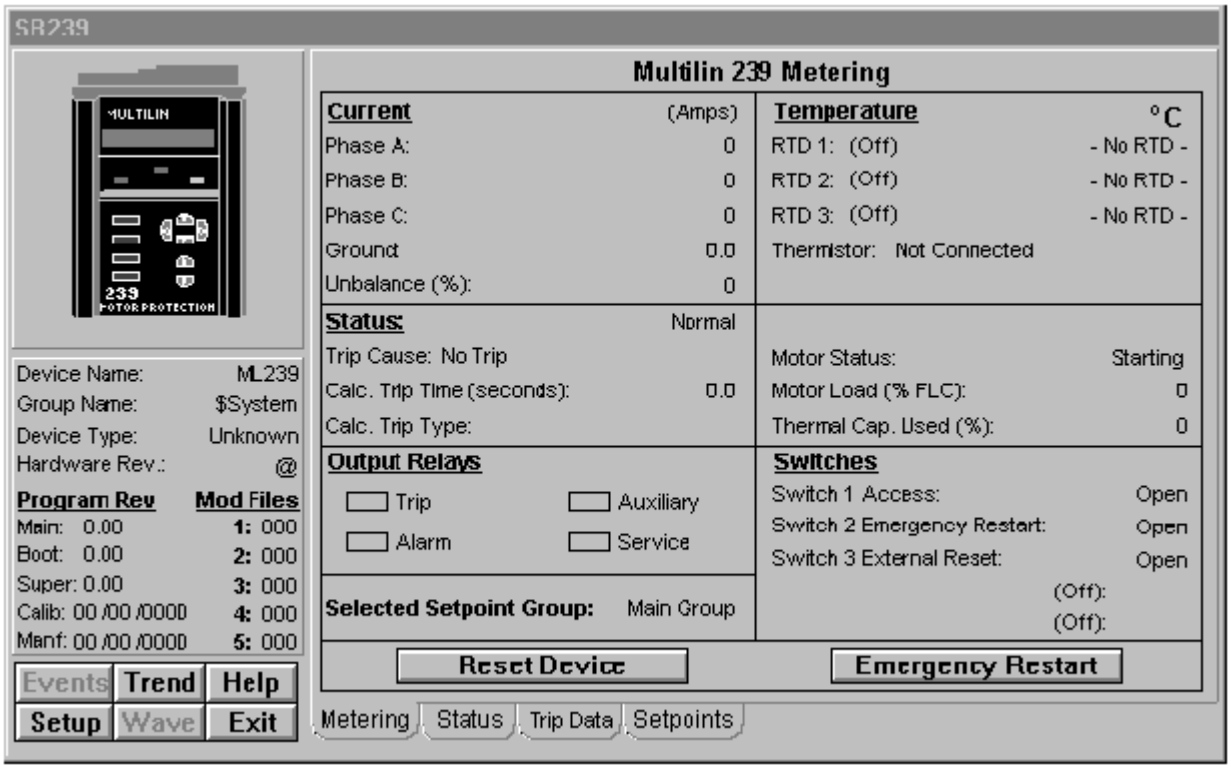


Universal Relay - Bus Tab

The Bus tab is supported for the B30 UR device only. It displays Phase Magnitude and Angle measurements on Bus 1 and Bus 2 for phases A, B, and C.

Current direction is shown in degrees for each phase, and the Zone function can be enabled or disabled on each Bus.

239 Motor Protection Relay



The 239 does not support Waveform Capture or Event generation, therefore these buttons are disabled beneath the Info box.

The 239 Tabular Data Screen's command buttons are described below:

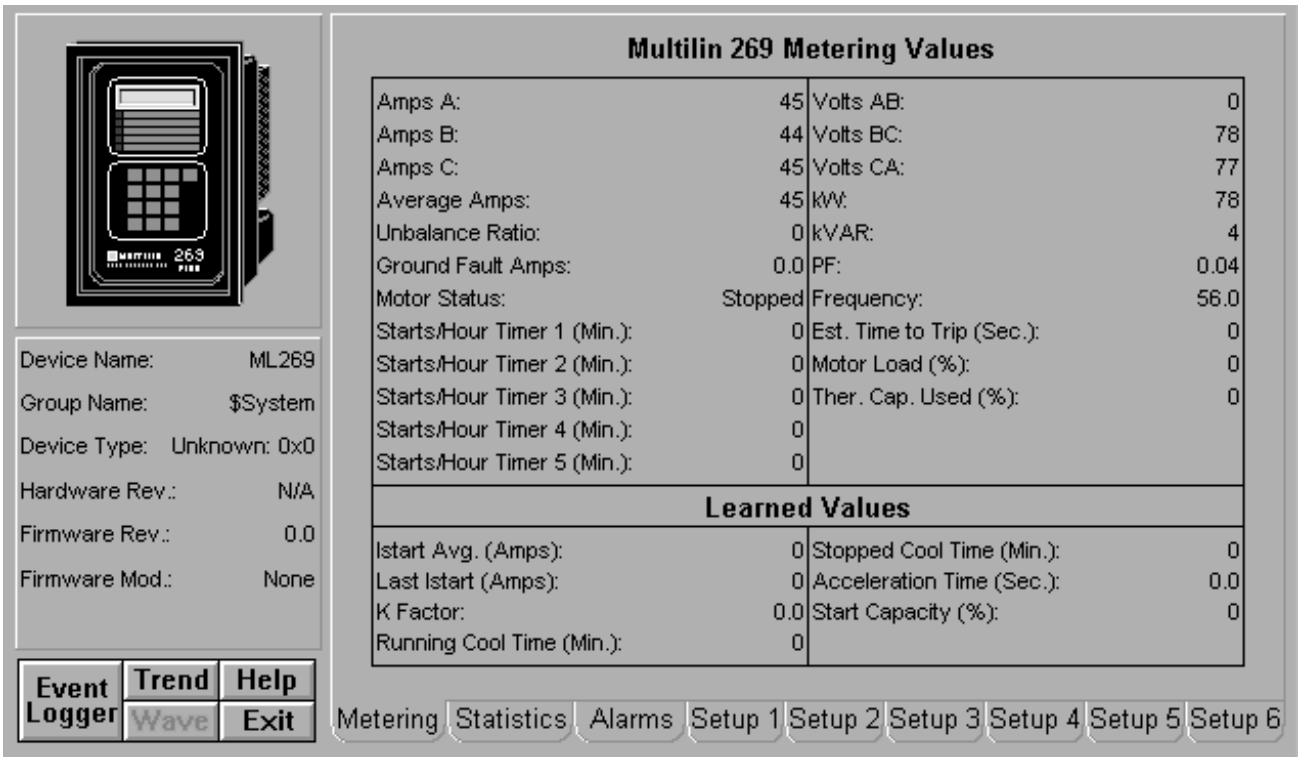
Tab	Button	Function
Metering	Reset Device	Issues a RESET command to the 239
	External Restart	Issues an External Restart command to the 239
Trip Data	Clear Trip Data	Clears the last 5 trip causes from the 239's memory

Table 31. 239 Tabular data screen commands.

- The Status tab displays 35 Pickup LEDs (amber) and 35 Alarm LEDs (red), along with a text string for each alarm condition on the Status tab.

See the 239 Motor Protection Relay Instruction Manual (Chapter 5, *Actual Values*) for information on the display of data values under different device configurations. Values not configured for use are displayed as N/A.

269 Plus Motor Management Relay



The 269 Tabular Data Screen wizard provides two reset push buttons on the Setup 6 tab.

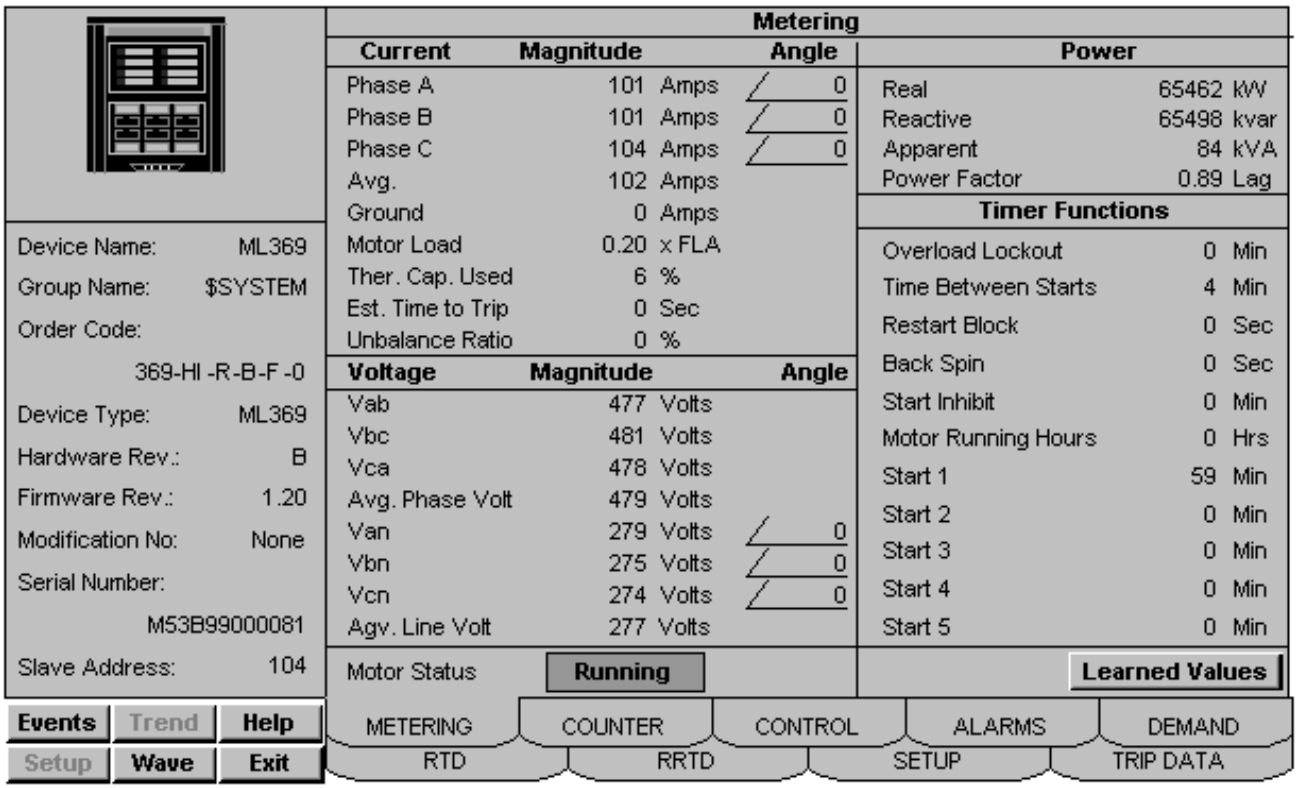
Tab	Button	Function
Status 6	Clear Last RTD Data	Clears the RTD last access registers
	Clear Commissioning Data	Clears the commissioning data registers

Table 32. 269+ Tabular data screen commands.

For complete explanations of parameters, refer to the 269+ *Users Guide*.

369 Motor Management Relay

Metering Tab



369 - Metering Data Screen

The Metering tab displays the following metered values from the 369 device: Actual Values for Voltage, Current, Power, Power Factor, and Frequency. These values are detailed below.

Current

- Per phase magnitude and angle
- Phase average
- Ground current
- Motor Load as a percentage of the Full Load Current rating defined in setpoints.
- Thermal Capacity used in percent
- Estimated time to trip
- Current Unbalance ratio

Voltage

Voltage values are only displayed if the Metering or Backspin option is installed in the relay, and if a voltage transformer (VT) connection has been programmed in the relay.

Line - Line voltage magnitude.

Average Line-Line voltage.

Line – Neutral voltage magnitude and angle (only shown for wye configurations)

Average Line-Neutral voltage. (only shown for wye configurations)

Power

Power values are displayed only if the Metering or Backspin option is installed in the relay and a VT connection has been programmed.

- Real power
- Reactive power
- Apparent power
- Power Factor

Motor Status

The current status of the motor is shown in a colored indicator block

Timer Functions & Learned Values

The lower right quadrant of the metering tab has two pages – Timer Functions and Learned Values. You can toggle between these two displays by clicking on the button located in the bottom right corner of the metering tab display.

Timer Functions: this section displays the current values of several internal timers within the device. Most of these functions must be programmed in the relay in order to function. Refer to the device manual for specific usage details.

Learned Values: this section displays items tracked by the relay. For full details on their usage, consult the relay manual.

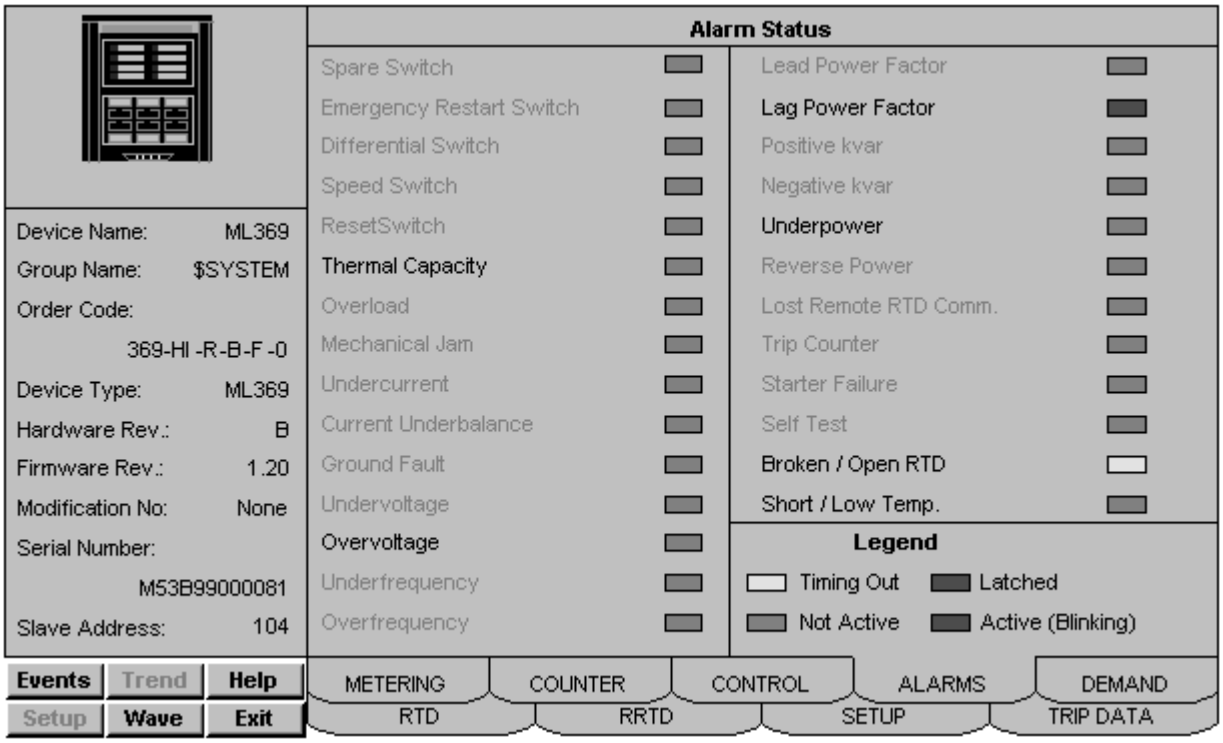
Backspin features – these are only enabled when the Backspin option is installed in the relay.

Learned cool time constants – these are enabled only if the "Enable Learned Cool Times" feature is programmed.

Learned k factor is only enabled by setting the unbalance biasing of thermal capacity to on/learned.

Clearing Motor Data (see control tab) will set all these values to their defaults.

Alarms Tab

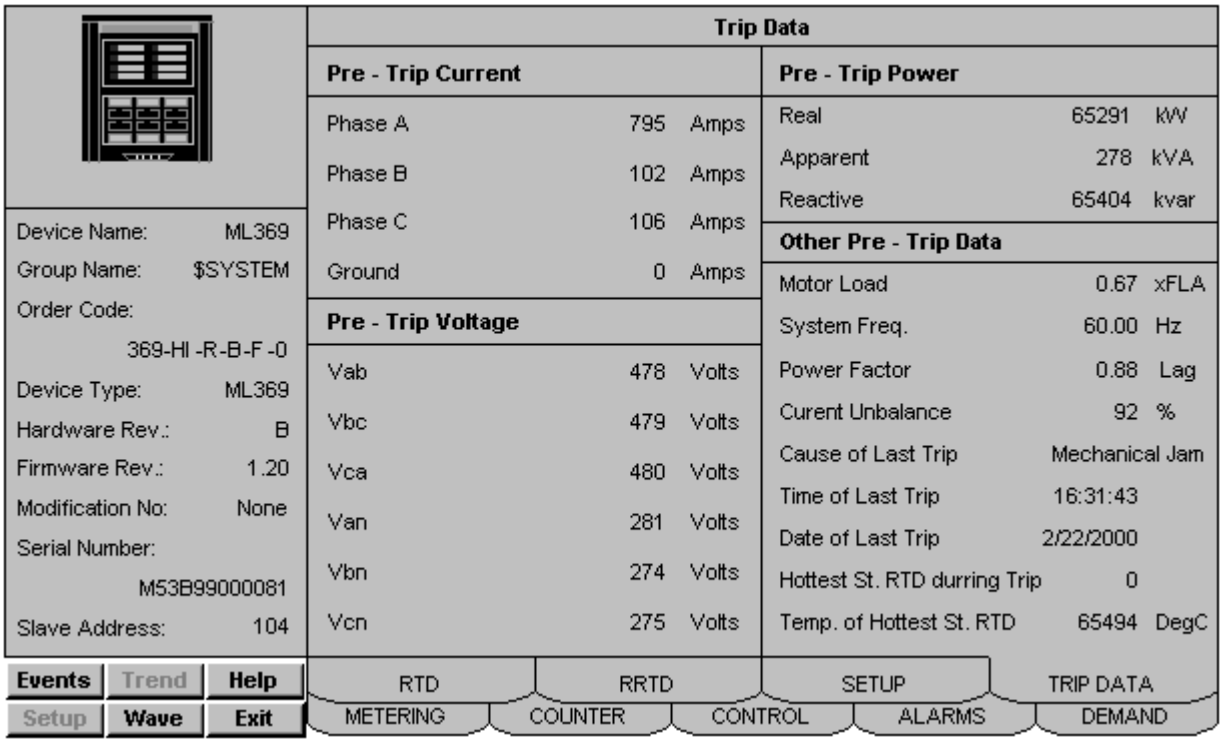


369 Relay - Alarms Tab

This page displays the current status of the alarm functions within the relay. If a function is disabled or not programmed, its label will appear as dark gray text, and its associated indicator will be dark gray at all times.

If a function is enabled its label will appear as black text, and its indicator will show the current status of that function.

Trip Data Tab



369 Relay - Trip Data Tab

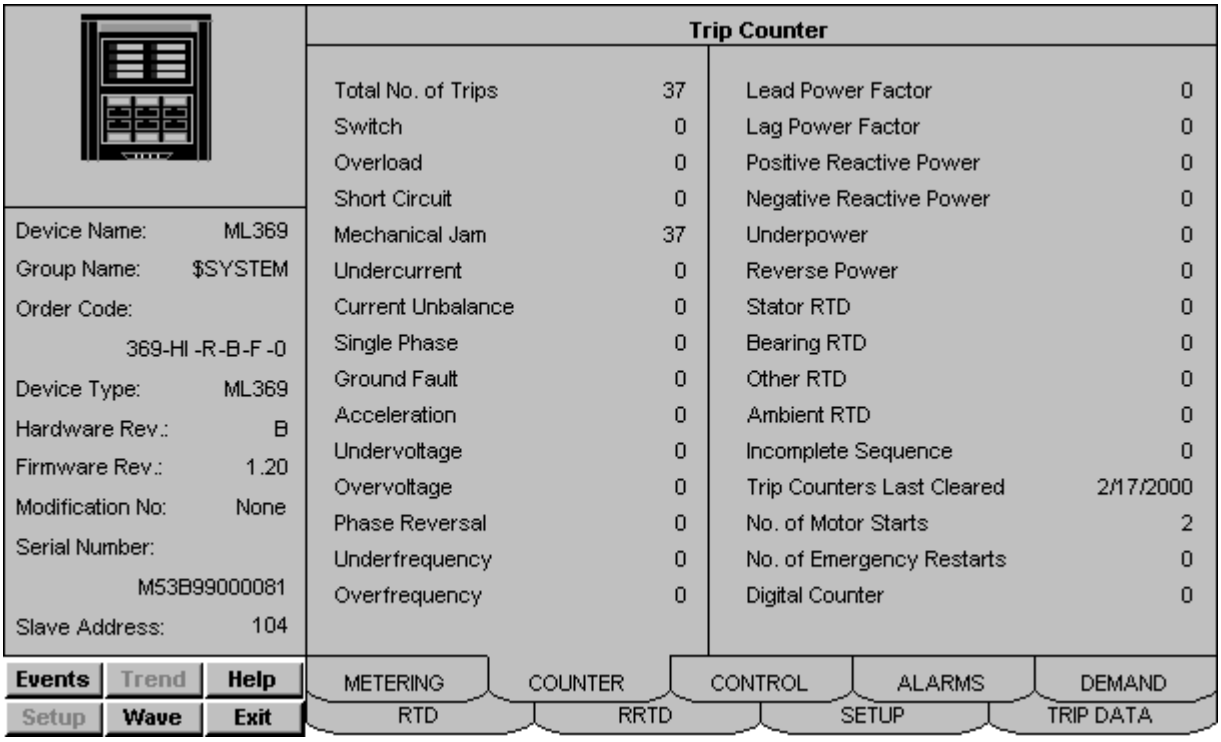
This tab displays information about the last trip event.

Voltage, power, and power factor values are only indicated if the Metering or Backspin option is installed and a VT connection has been programmed in the relay.

Line-Neutral voltages are only displayed when the VT is connected in a wye configuration.

The Hottest Stator RTD field is only shown if a Stator RTD is programmed.

Trip Counter Tab

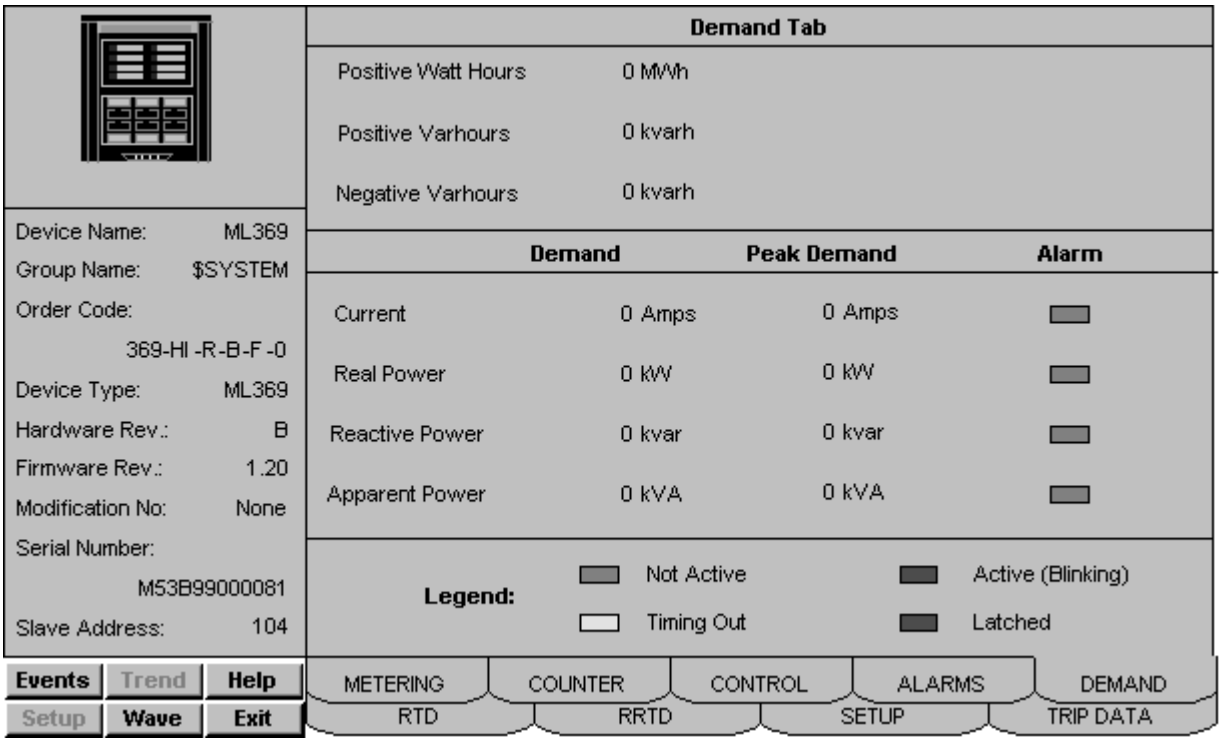


369 Relay - Trip Counter Tab

This tab displays information about the accumulated trips experienced by the relay.

Data on this page can be cleared using the Clear Last Trip Data button on the Control tab.

Demand Tab



369 Relay - Demand Tab

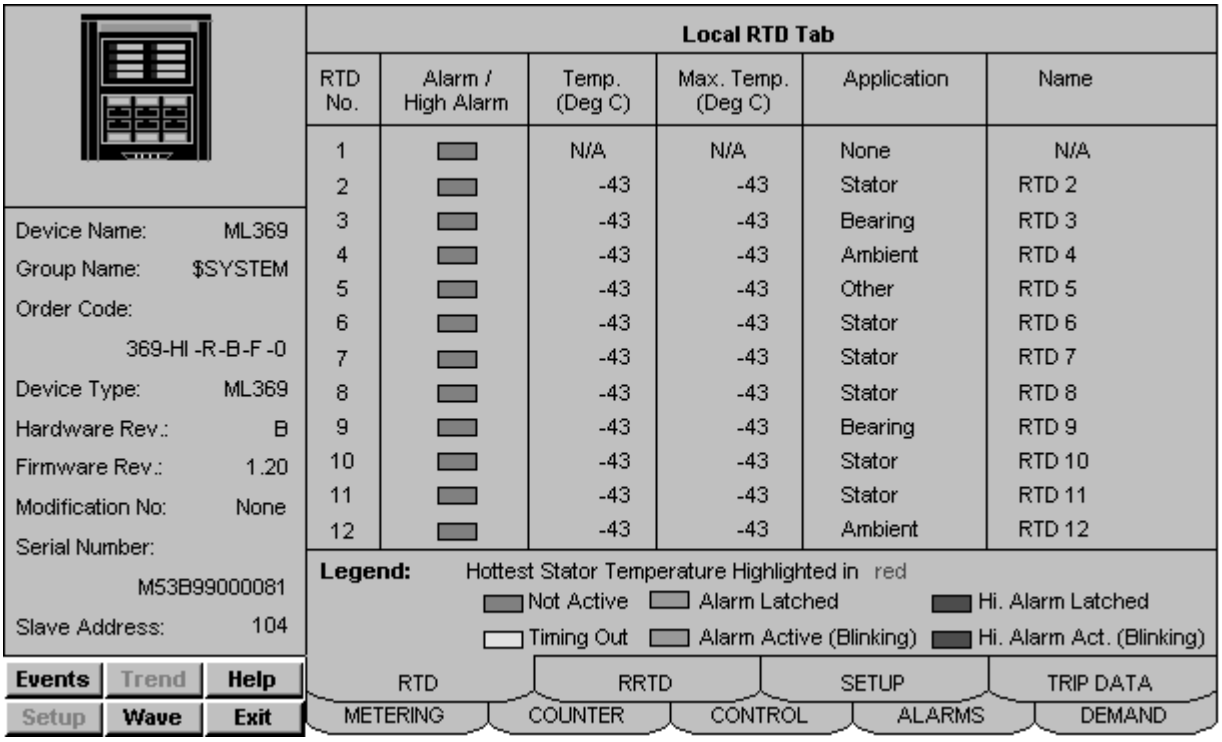
This tab displays current and power demand metering information.

Current demand is indicated regardless of options/VT settings.

Power demand values are only available when the Metering or Backspin option is installed on the relay and a VT connection is programmed.

Peak demand values may be cleared using the Clear Peak Demand Data button on the Control tab.

Local RTD Tab



369 Relay - Local RTD Tab

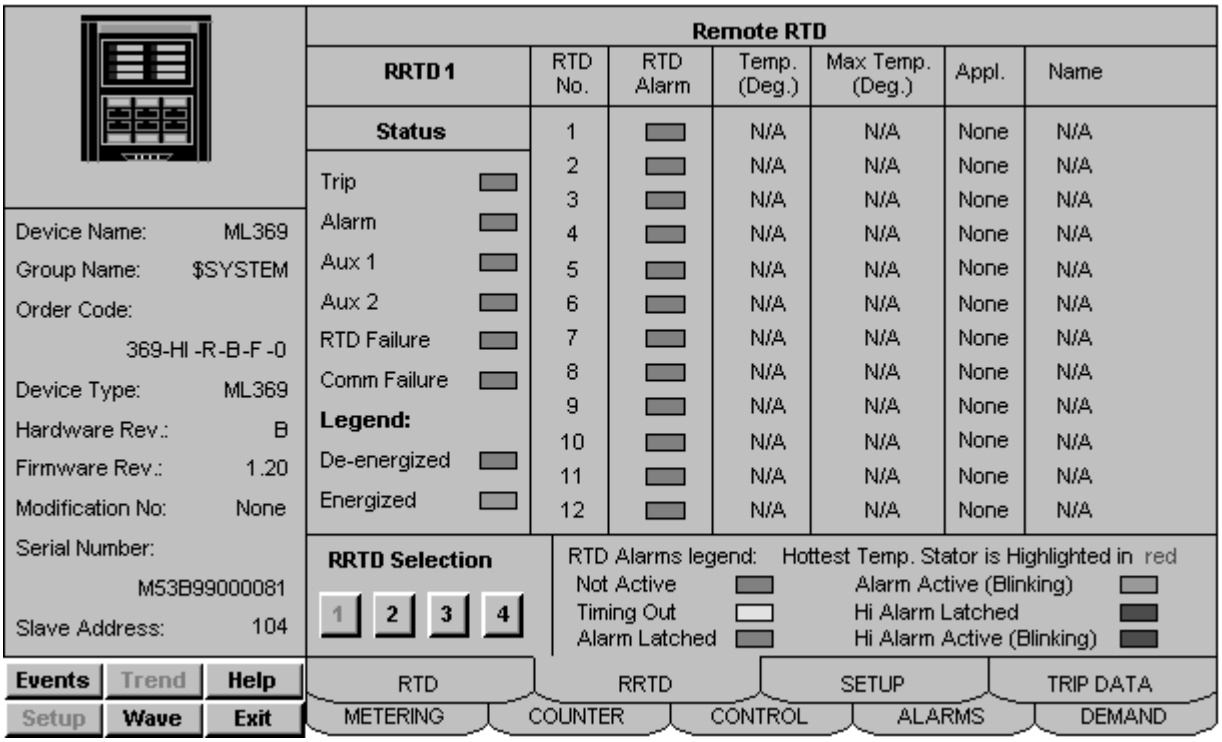
This tab displays information about any RTD temperature probes connected directly to the device. Information on this tab is only available if the RTD option is installed in the relay.

Information and alarm indication for each RTD is only available when that RTD is programmed for operation. If an RTD's Application is set to "none" then all fields for that RTD display "N/A".

The hottest Stator RTD indicates which RTD is currently returning the highest temperature. This condition is indicated by red text in the Temperature field.

Only one alarm condition can be displayed at a time – highest priority alarms are displayed in the alarm indicator. For example, if a "High Alarm" was triggered and latched and the RTD value returned to the "Alarm Active" state, the "High Alarm" latched indicator would persist.

Remote RTD Tab



369 Relay - RRTD Tab

This tab displays information about any RTD temperature probes connected to one or more Remote RTD units. These external accessories connect via Modbus to the 369 relay. A maximum of four RRTD modules can be connected to a 369 relay – each module is assigned a page on this tab. Use the RRTD Selection buttons in the lower left corner of the tab to navigate between pages.

Information on this tab is only available if an RRTD module is connected to the relay.

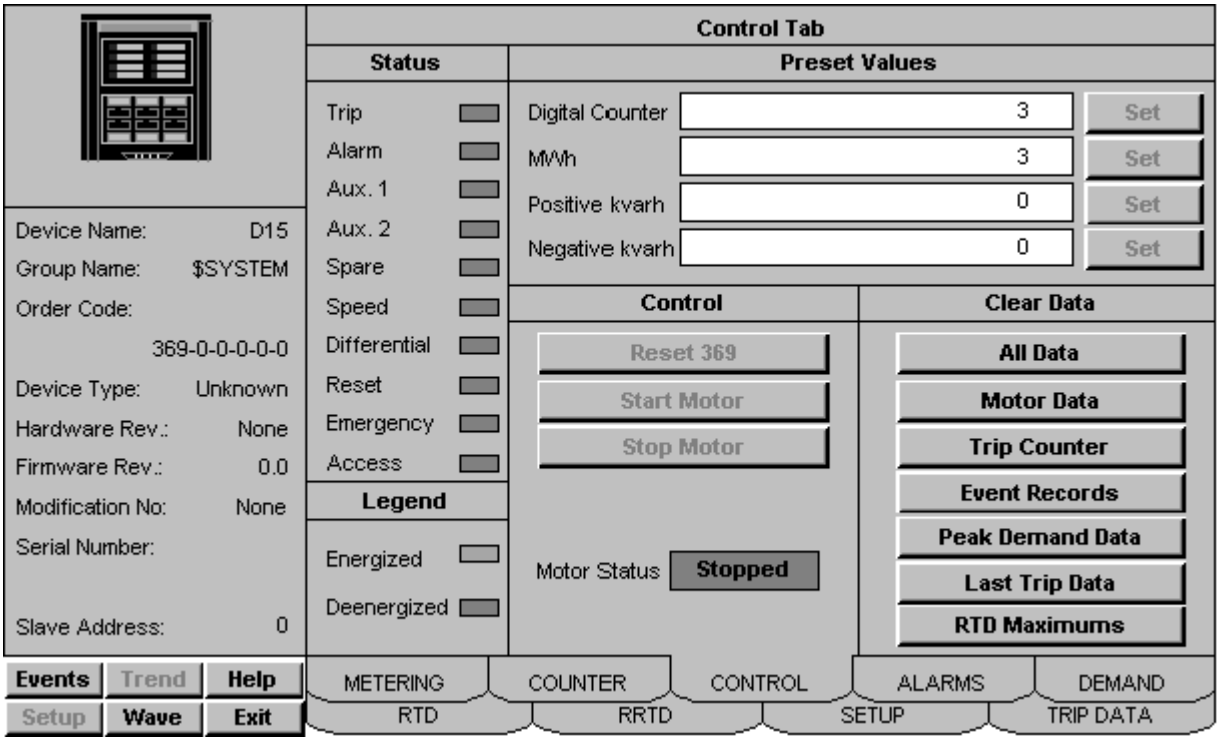
Information and alarm indication for each RTD is only available when that RTD is programmed for operation. If an RTD's Application is set to "none" then all fields for that RTD display "N/A".

The hottest Stator RTD indicates which RTD is currently returning the highest temperature. This condition is indicated by red text in the Temperature field.

Only one alarm condition can be displayed at a time – highest priority alarms are displayed in the alarm indicator. For example, if a "High Alarm" was triggered and latched and the RTD value returned to the "Alarm Active" state, the "High Alarm" latched indicator would persist.

The Status indicators are dedicated to the indicated RRTD module, except for the Comm. Failure indicator – this will be energized if any configured RRTD module stops communicating.

Control Tab



369 Relay - Control Tab

This tab provides limited control functionality over Modbus.

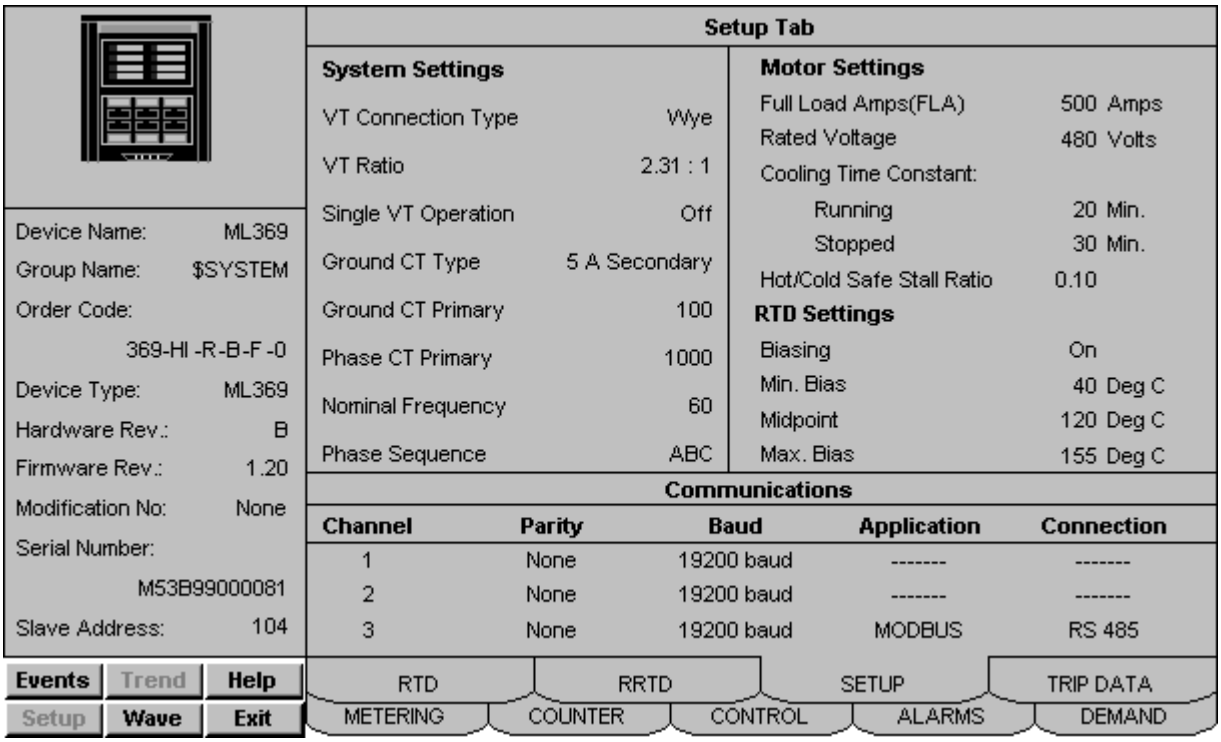
Status – indicates the current status of the output relays and general digital inputs.

Preset Values – shows the current value of the indicated field and allows you to preset a new value. To preset a new value, click the white box containing the value you want to change. Type a new value into the dialog box that appears and click OK. The new value is now displayed in the Control tab and the Set button is enabled, but the new value has not yet been sent to the device. Click the Set button: a confirmation dialog appears. Choose Yes to set the new value to the device, No to cancel the operation and display the value currently held in the device.

Control – These buttons are disabled unless the Serial Communications Control setpoint in the relay is programmed to "On". · Motor status is identical to the indicator on the Metering tab.

Clear Data – These buttons clear the designated values within the device.

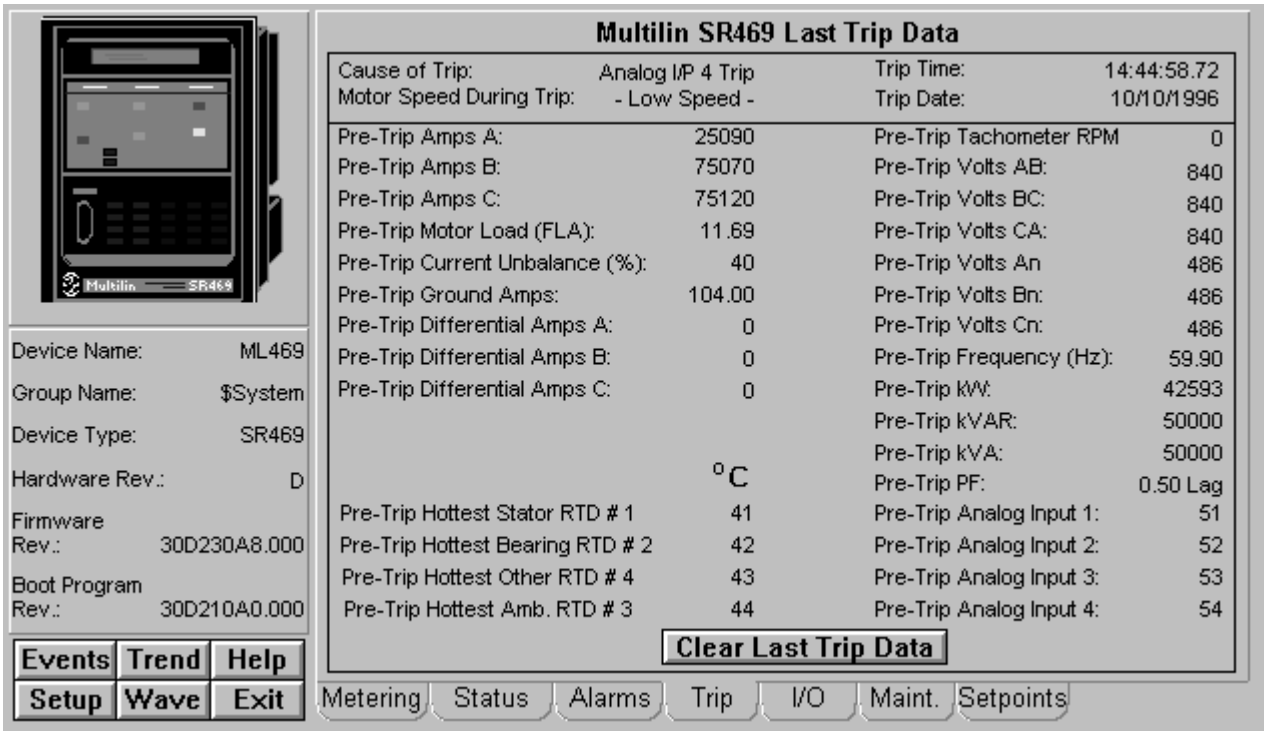
Setup Tab



369 Relay - Setup Tab

This tab displays selected setpoints from the device. All fields on this tab are read-only. Setpoints may be changed via the relay's own setup program or manually via the front panel.

SR469 Motor Management Relay



All six function buttons under the Info box are enabled for the SR469.

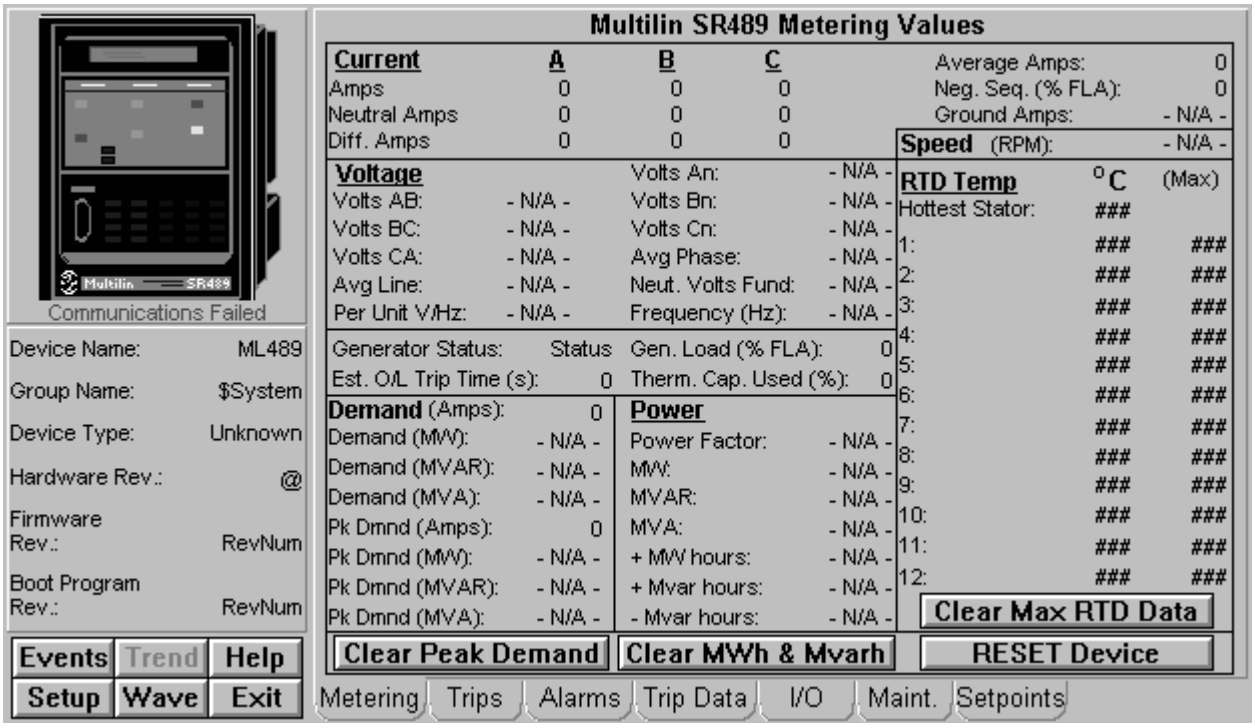
The SR469 Tabular Data Screen wizard has nine command buttons, described below.

Tab	Button	Function
Metering	Reset Device	Issues a RESET command to the SR469
	Clear MWh and Mvarh	Clears these values from the SR469's memory
	Clear Peak Demand	Clears this data from memory
Status	Motor Start/Motor Stop	Issues Motor Start or Motor Stop commands
	Clear RTD Maximums	Resets the RTD Maximums data
Trip	Clear Last Trip Data	Clears this data from memory
I/O	Clear Analog Input Min/Max Data	Clears this data from memory
Maintenance	Preset Digital Counter	Allows presetting of digital counters.
	Clear Trip Counters	Clears the trip count data from memory.

Table 33. SR469 Tabular data screen commands.

See the SR469 Motor Management Relay manual (Chapter 5, *Actual Values*) for information on the display of data values under different device configurations. Values not configured for use are displayed as N/A.

SR489 Generator Management Relay



All the SR489's function buttons below the Info box are enabled.

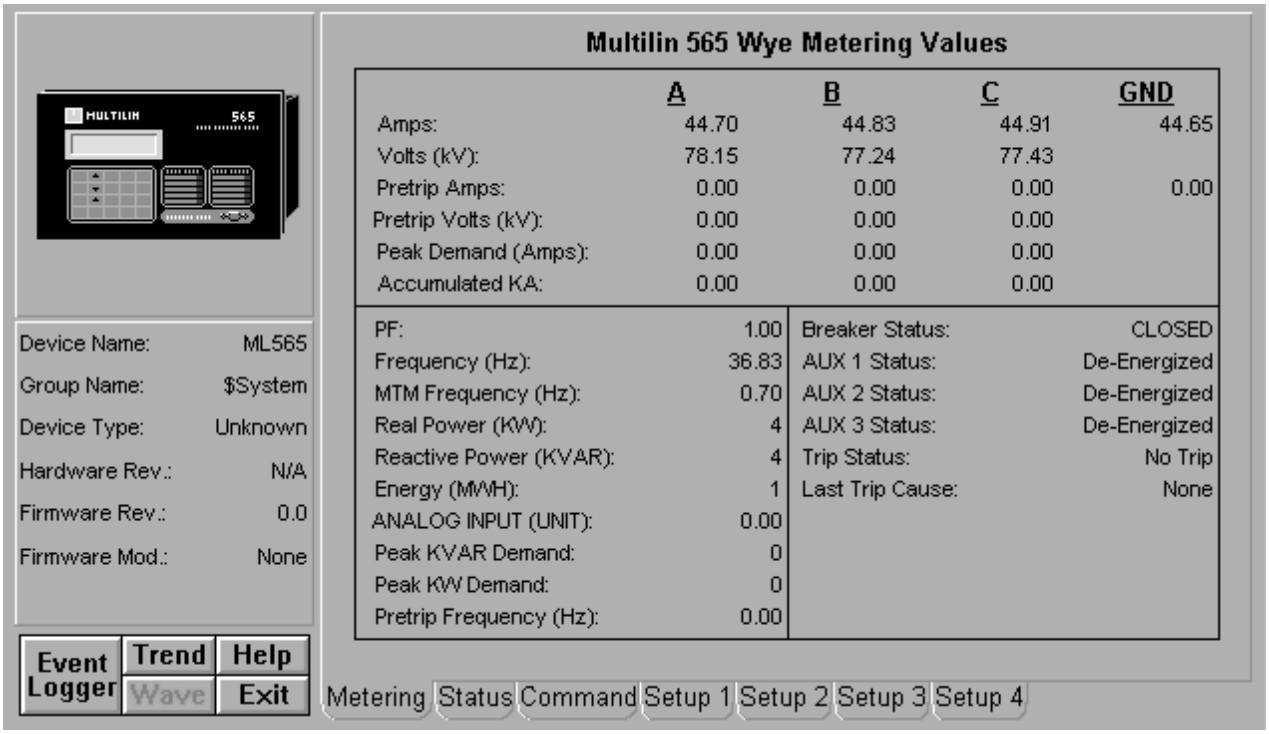
The SR489 Tabular Data Screen wizard has nine command buttons, described below.

Tab	Button	Function
Metering	Reset Device	Issues a RESET command to the device.
	Clear Peak Demand	Clears the peak demand data from memory.
	Clear MWh and Mvarh	Clears the MWh and Mvarh data from memory.
	Clear Max RTD Data	Clears the maximum RTD data from memory.
Trip Data	Clear Last Trip Data	Clears the last trip data from memory.
I/O	Clear Analog I/P Min/Max Data	Clears the analog input minimum/maximum data from memory.
Maintenance	Clear Trip Counters	Clears the trip counter data from memory.
	Clear Generator Information	Clears the generator data from memory.
	Clear Breaker Information	Clears the breaker data from memory.

Table 34. SR489 Tabular data screen commands.

See the SR489 Generator Management Relay manual (Chapter 5, *Actual Values*) for information on the display of data values under different device configurations. Values not configured for use are displayed as N/A.

565 Feeder Management Relay



The 565 Tabular Data Screen wizard has the following buttons on the Command tab:

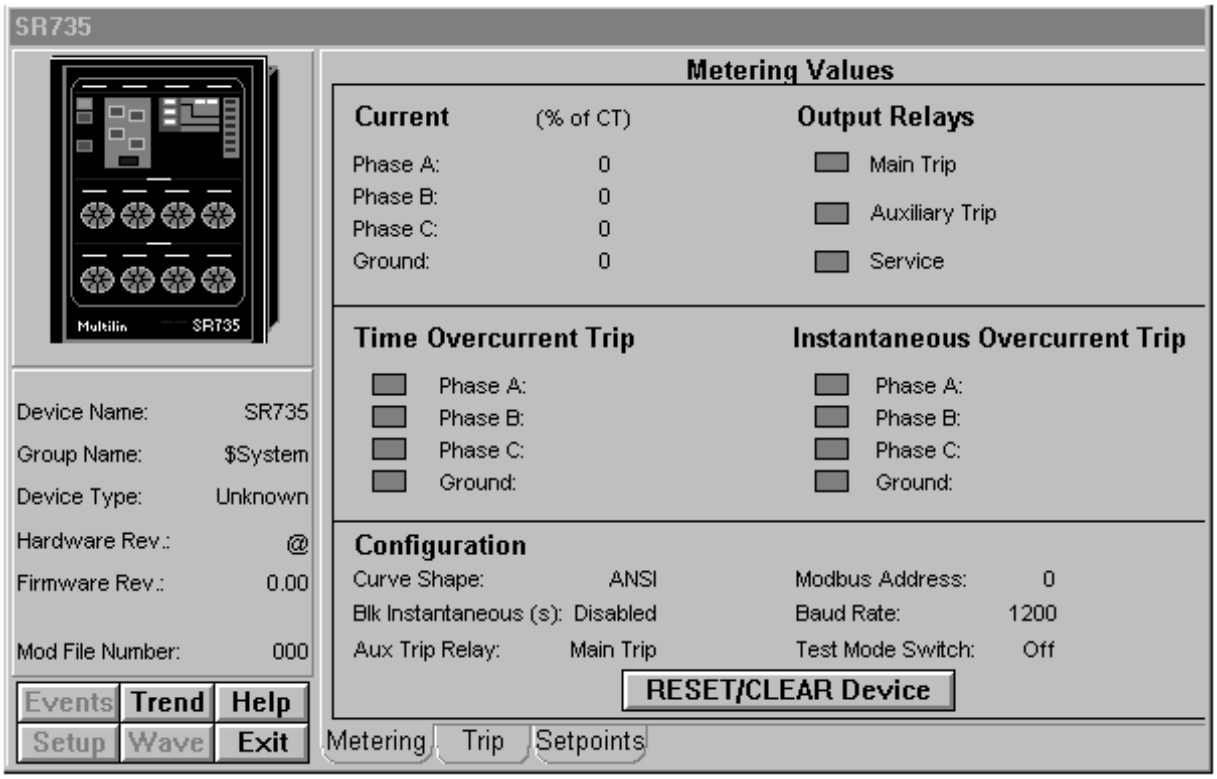
Tab	Button	Function
Command	Maint Data	Clears the maintenance data
	Operation Data	Clears the operation data
	Amp Demand	Clears the amp demand registers
	KW Demand	Clears the kW demand registers
	KVAR Demand	Clears the kVAR demand registers
	Events	Clears the events table
	Energy	Clears the energy used data
	Reset Keypad	Performs a keypad reset
	End of Relay Test	Ends the relay test
	End of LED Test	Ends the LED test
	End of Analog Output Test	Ends the analog output test
	Test LCD Display	Sends a test pattern to the LCD
	Test LEDs	Starts the LED test

Table 35. 565 Tabular data screen commands.

The Setup 2 tab has two data input areas. Analog Input Title creates a user label for the analog input used in the device. Analog Input Units performs the same function for the units of the analog input. These labels appear on the Metering tab and on the Large Faceplate wizard when the analog input is displayed. The analog input can be scaled to display any desired units from the front of the device, but these labels are not sent to the DDE Server.

For complete explanations of parameters, refer to the 565 *Users Guide*.

SR735 Feeder Relay



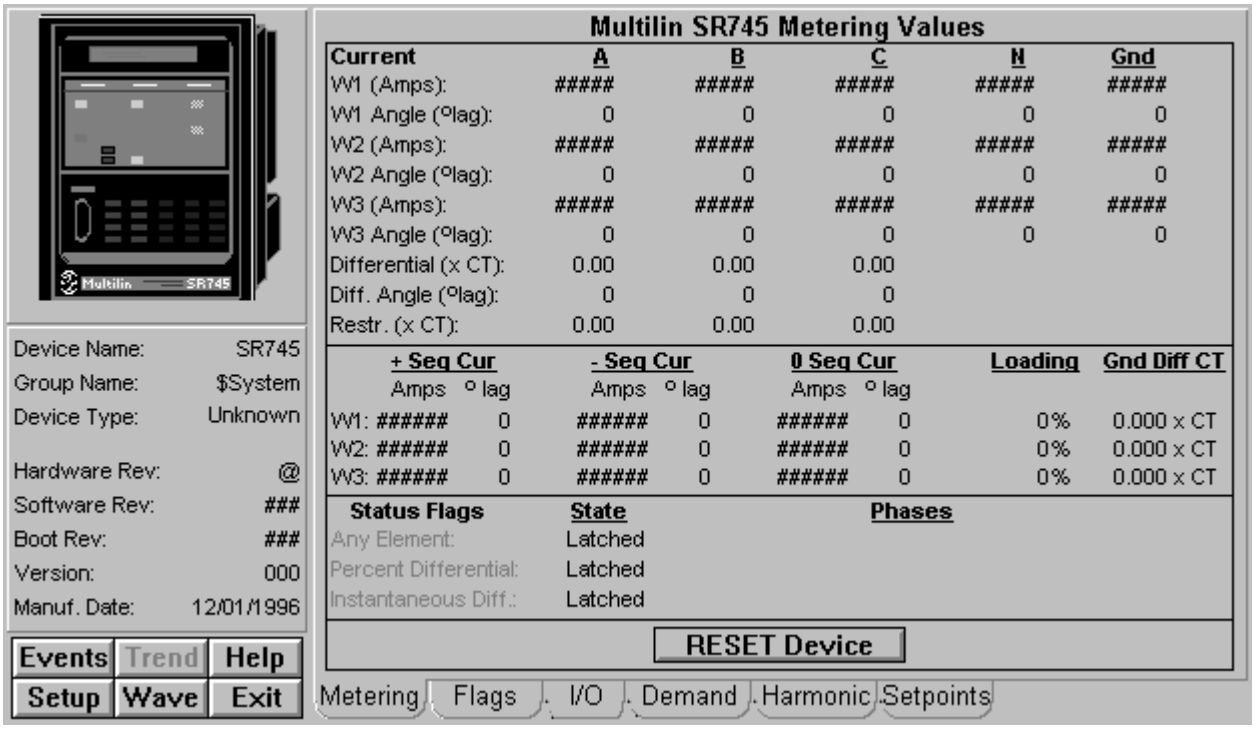
The Events and Wave function buttons below the Info box are disabled since the SR735 does not support Waveform Capture or Event generation.

The SR735 Tabular Data Screen wizard has two command buttons, described below.

Tab	Button	Function
Metering	Reset Device	Issues a RESET command to the 735
Trip	Clear Last Trip Data	Clears the trip causes log

Table 36. 735 Tabular data screen commands.

SR745 Transformer Management Relay



Under the Info box, the SR745's function buttons are all enabled.

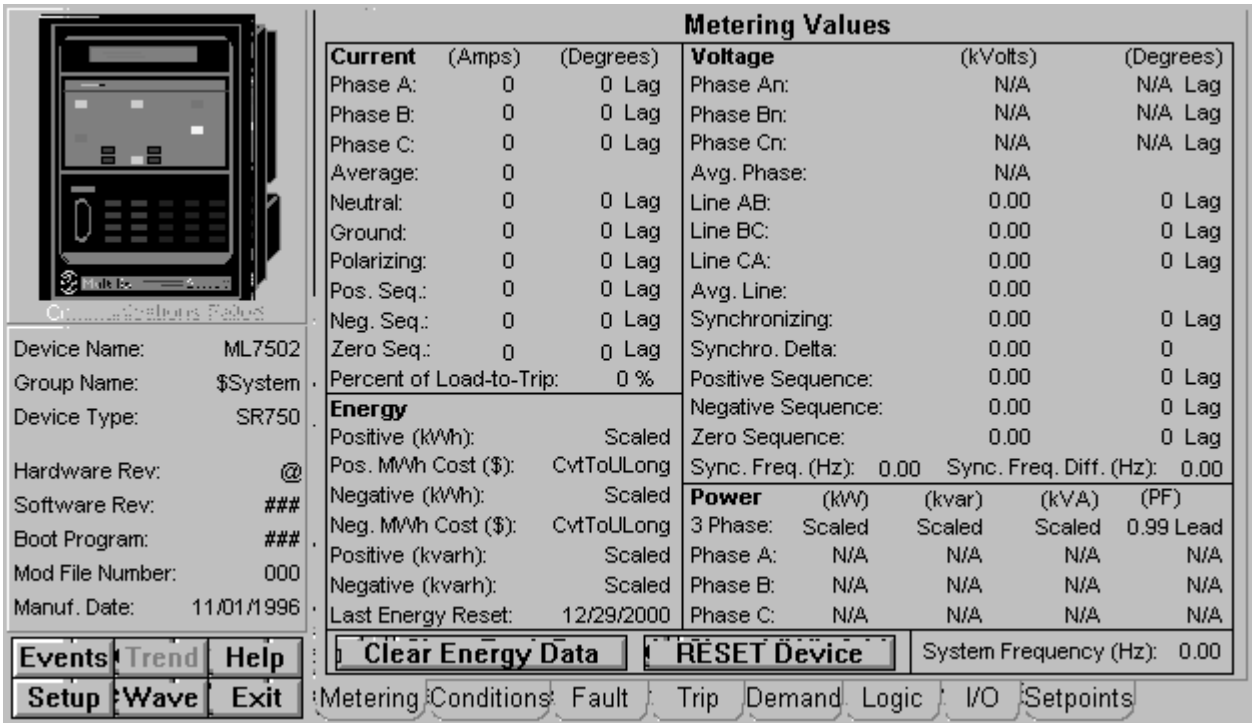
The SR745 Tabular Data Screen wizard has three command buttons:

Tab	Button	Function
Metering	Reset Device	Issues a RESET command to the device
Demand	Clear Max Demand Data	Clears the maximum demand data from the SR745's memory
Harmonics	Clear Loss-of-Life Data	Clears loss-of-life data from the SR745's memory

Table 37. SR745 Tabular data screen commands.

See the SR745 Transformer Management Relay Instruction Manual (Chapter 6, *Actual Values*) for information on the display of data values under different device configurations. Values not configured for use are displayed as N/A. When configured for only 2 Windings, the Winding 3 fields on the Tabular Data wizard are not visible.

SR750/SR760 Feeder Management Relay



The SR750 and SR760 are very similar devices and share a common Tabular Data Screen wizard. During wizard configuration, select which type of device the wizard represents (SR750 or SR760) by selecting the corresponding radio button in the Wizard Configuration dialog box.

Under the Info area, the SR750/760's function buttons are all enabled.

The SR750/760 Tabular Data Screen wizard has eight command buttons:

Tab	Button	Function
Metering	Clear Energy	Resets the energy counters to zero.
	Reset Device	Issues a RESET command to the SR750/760.
Demand	Reset Max Demand	Clears the Max Demand data from the SR750/SR760's memory.
Trip	Reset Trip Counters	Resets the SR750/760's trip counters to zero.
I/O	Open Breaker	Issues Open Breaker command.
	Close Breaker	Issues Close Breaker command.
	Reset Count	Resets the SR750/760's reclosure counter to zero.
Fault	Reset Arcing Current	Resets the arcing current data.

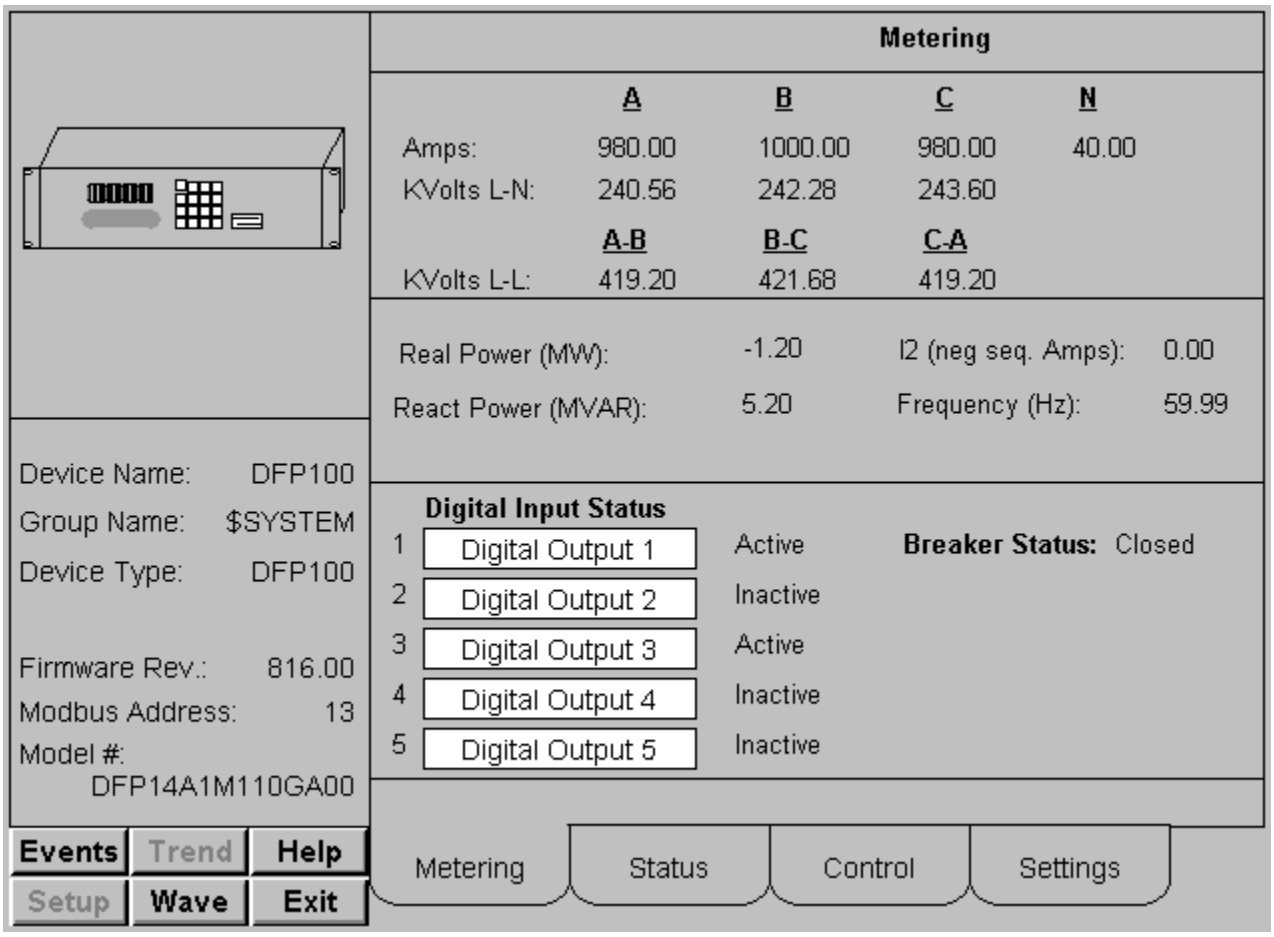
Table 38. SR750/SR760 Tabular data screen commands.

The SR750/SR760 Tabular screen offers a tab labeled LOGIC. This tab allows you to access the SR750/SR760's 20 logic inputs. You can use these logic inputs to

operate a variety of logic functions for circuit breaker control, external trips, blocking of protection elements, etc., and use the PCMS Wizard to monitor the status of the logic inputs. For more information, refer to the SR750/SR760 user manual, in the section titled *Setpoints - S3 Logic Inputs.*

See the SR750/SR760 Feeder Management Relay Instruction Manual (Chapter 5, *Actual Values*) for information on the display of data values under different device configurations. Values not configured for use are displayed as N/A.

DFP100 Relay



The DFP100 Tabular Data Screen wizard provides several command buttons, described in the following table:

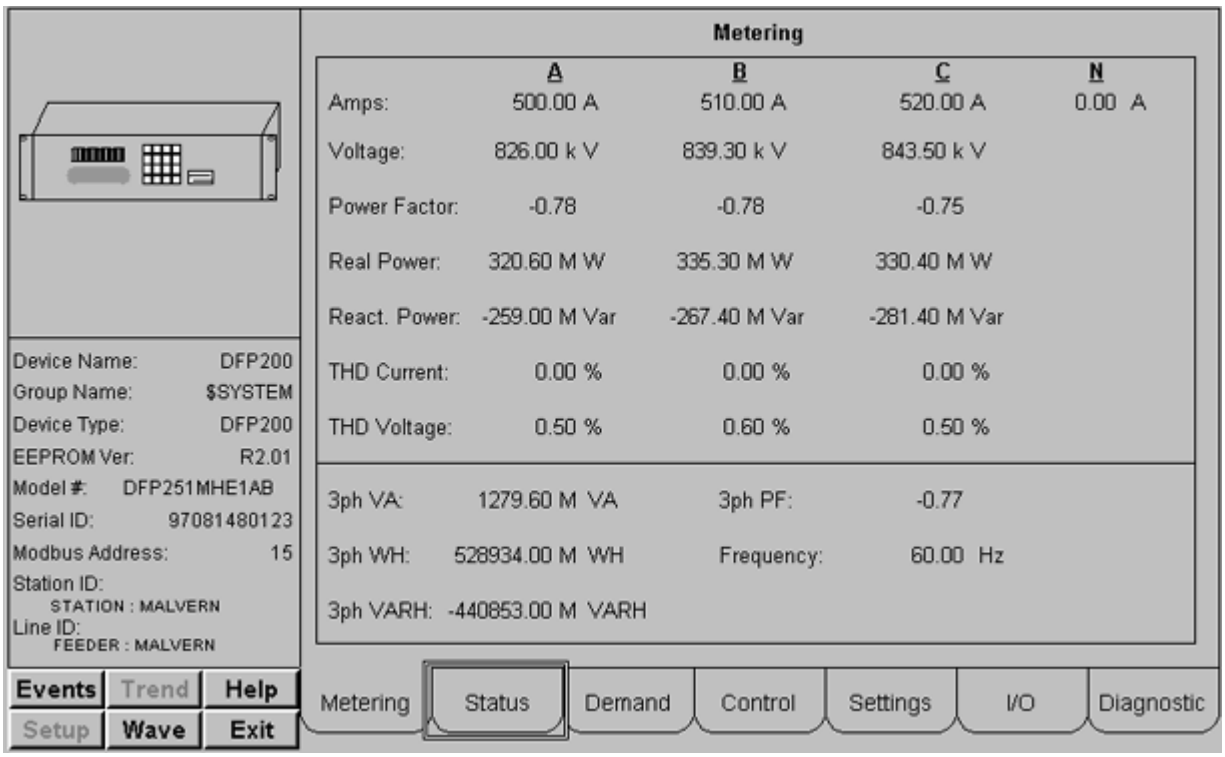
Tab	Button	Function
Metering	Digital Input Labels	The user can enter descriptive text (limited to 22 characters) for each digital input. These labels are retentive.
Control	Trigger Demand Report	Initiates a "current report" download to a file after prompting the user to confirm the requested action. Report status is indicated during the download. When the report is complete the path to the new file is displayed.
	Block/Unblock Reclosure	Blocks or Unblocks the recloser remotely after confirmation by the user. Active only if the recloser function is available in the device. Will not unblock reclosers blocked locally.
	Open/Close Breaker	Opens or closes the breaker attached to the device after confirmation by the user. This button is disabled if the relay's breaker status input is unwired. See the relay manual for details.
Control	Reset Fault Log	Clears the device fault log record after confirmation by the user.
	Reset Event Log	Clears the device event log record after confirmation by the user.
	Disable Relay	Toggles the relay Enable/Disable setpoint after confirmation by the user.
	Group 1 - 6	Changes the relay's active setpoint group to the selected value (1 – 6) after confirmation by the user.

Table 39. DFP100 Tabular data screen commands.

General notes on controls:

1. If the communications link between the device and the wizard has failed (as indicated by the "Communications failed" warning) then all Control tab command buttons will display the message "Communications Failure – please wait" in response to command requests.
2. While a warning or prompt message box is displayed by the wizard, all wizard controls such as command buttons and tab selectors are disabled.
3. A 15 second consecutive-command delay is enforced between command requests. While this delay is in progress, additional command requests will display the message "Device Busy – please wait".

DFP200 Relay



The DFP200 Tabular Data Screen wizard provides several command buttons, described in the following table:

Tab	Button	Function
Control	Lockout Recloser	If the recloser status is "In Progress" and the breaker is open, this command forces the recloser to the Lockout state.
	Reset Recloser	If the recloser status is "In Progress" and the breaker is closed, this command forces the recloser to the Reset State.
	Open/Close Breaker	Sends the "Open Breaker" or “Close Breaker” command.
	Enable/Disable Digital Outputs	Toggles the status of the Digital Outputs between Enabled and Disabled.
	Reset Fault Data	Clears Regular and RMS oscillography records.
	Reset Latched Alarms	Resets all Latched Alarms. Use this button to clear relay front panel alarm indicators.
	Reset Event/Diag. Logs	Clears the Event and Diagnostic logs.
	Reset THD Osc. Data	Clears all THD Oscillography records.
	Reset Demand Data	Clears all demand values and resets all timestamps to the current time.
	Reset Energy Meter Data	Zeros energy metering values for Watt-hours and Var-hours.
	Group 1 – Group 8	Selects the active settings group. If the "Remote Configuration" jumper is installed, attempts to operate these controls will generate the error message "Remote Setpoint Changes Not Allowed: Unable to Perform Operation".
I/O	Digital Input and Output Labels	The user may replace the existing labels for each I/O point. These labels are retentive.

Table 40. DFP200 Tabular data screen commands.

Notes on Control Tab:

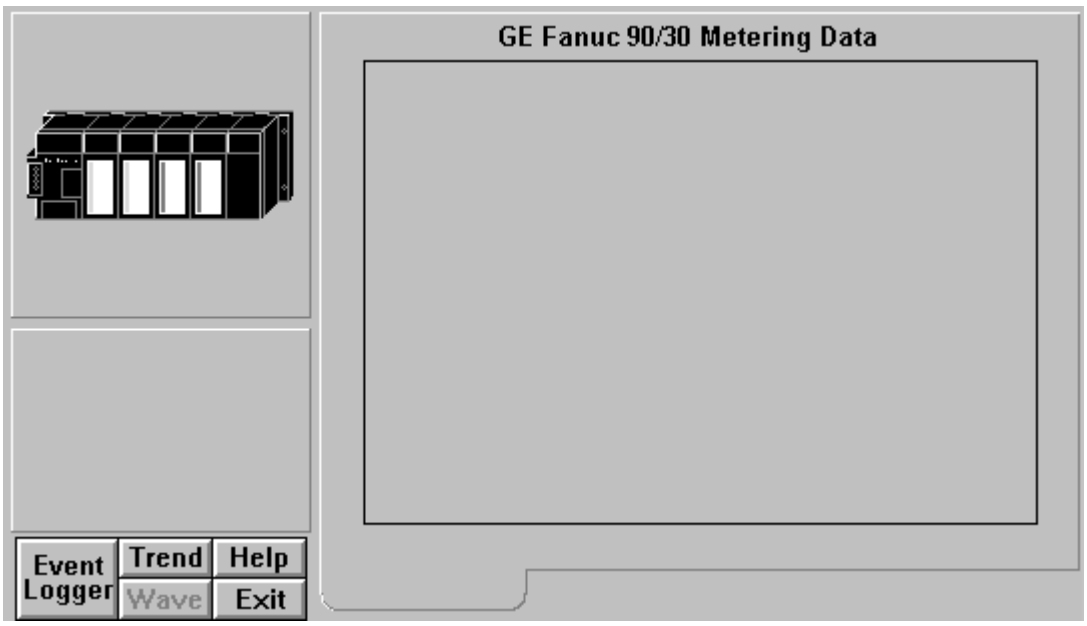
1. Attempts to operate command buttons during DDE communication failure will generate the error message "Communications Failure: please wait".
2. All command buttons, tab selectors, and function buttons are disabled until wizard message boxes are acknowledged.

Notes on breaker controls: the following configuration options will affect the operation of the breaker command controls:

1. If the "Remote Breaker Operations Disabled" jumper is installed on the relay, attempts to issue Breaker Open and Breaker Close commands will generate the error message "Remote Breaker Operations Not Allowed – Unable to Perform Operation".

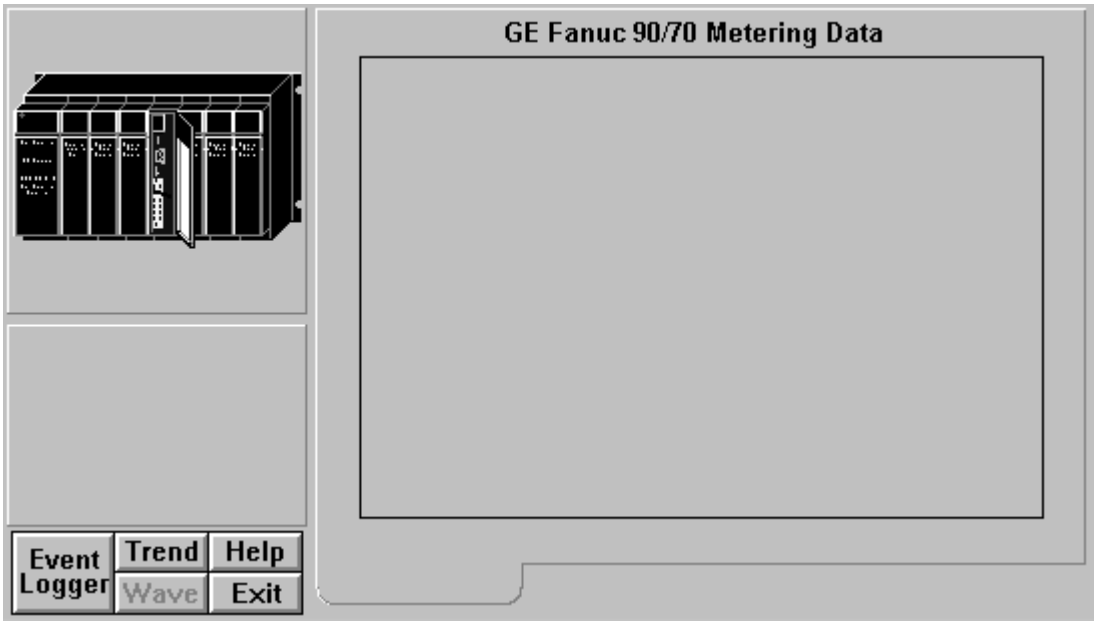
3. If the Digital Outputs are Disabled, attempts to issue Breaker Open and Breaker Close commands will generate the error message "Digital Outputs Disabled: Unable to Perform Operation".

Fanuc 90/30



The Fanuc 90/30 Tabular Data Screen wizard is blank. This allows any desired data to be placed on the screen.

Fanuc 90/70



The Fanuc 90/70 Tabular Data Screen wizard is blank. This allows any desired data to be placed on the screen.

Troubleshooting

EPM 3710/EPM 3720 – no data or incorrect data displayed

Q: The values on the EPM 3710/3720 wizards come up showing zeros or incorrect data.

A: The EPM 3710/3720 wizards require you to click the Refresh button on the wizard before the display is updated. Also, the first time the wizard is displayed, it may take a few moments for the DDE conversation to be established and data to be displayed.

EPM 3720 – KVAH import values incorrect

Q: On the EPM 3720 Tabular data screen, the KVAH import value does not equal the value of KVAH total or KVAH net when KVAH export equals zero.

A: Some rapidly changing values and/or values requiring extensive calculations cannot be updated on the wizards quickly enough to reflect the data displayed on the device in real time. Be patient while the software catches up with the device.

Long update when changing setpoints

Q: I attempted to change a device setpoint (such as changing the VT connection type from WYE to DELTA). It took a long time to update the Wizards setpoint tab to reflect the changes.

A: When changing setpoints, which are polled very slowly, the display may take a long time (a minute or more) to update. This means the metering data will be postponed while the display updates. Setpoint changes are a relatively rare change to make - please be patient during the delay.

PLEPM – Wrong Metering tab displayed

Q: When I double-click the display on the PLEPM's Large Faceplate wizard to go to the Tabular data screen, the DELTA metering tab is displayed, even though the PLEPM is configured as WYE.

A: Click another tab and then click back to the Metering tab. The correct configuration will now be displayed.

Appendix A: EPM 3720 Sliding Window Demand Keys

Downloading Sliding Demand Window Keys to the EPM 3720

The EPM 3720 supports up to 10 sliding demand measurements that are user-programmable via the Tabular Data screen wizard. The Sliding Demand tab offers a set of adjustable fields, into which a user can enter a key (a unique string of values) which, when downloaded to the EPM 3720, will trigger a measurement.

For explanations of what the EPM 3720's various parameters mean, refer to the EPM 3720 Users Guide, in the section titled *Sliding Window Demand*.

To set the EPM 3720's sliding demand keys, first locate the key code for the parameter you wish to measure in the following table.

Next, open the EPM 3720 Tabular Data screen wizard and select the Sliding Demand tab. Enter the appropriate sliding demand window key by clicking the on-screen thumbwheels up or down until the key code is displayed. Press the Download button to send the key to the device.

Allow several seconds for transmission time, then press the Refresh button to verify that the device has accepted the setup parameter. The values displayed should be those downloaded. When it receives the downloaded key, the meter will perform a sliding demand measurement for the parameter selected by the key.

Table A-1. EPM 3720 Sliding Window Demand Keys.

#1	#2	#3 & #4	Sliding Window Key Thumbwheel Settings	
Class	**Sub-class**	**Instance**	**Measurement**	**Supported Modes**
4	3	00	Volts LN Average	HS STD TD SD PD
4	3	01	Volts LN Phase A	HS STD TD SD PD
4	3	02	Volts LN Phase B	HS STD TD SD PD
4	3	03	Volts LN Phase C	HS STD TD SD PD
4	3	04	Volts LL Average	HS STD TD SD PD
4	3	05	Volts LL Phase AB	HS STD TD SD PD
4	3	06	Volts LL Phase BC	HS STD TD SD PD
4	3	07	Volts LL Phase CA	HS STD TD SD PD
4	3	08	Amps Average	HS STD TD SD PD
4	3	09	Amps Phase A	HS STD TD SD PD
4	3	0A	Amps Phase B	HS STD TD SD PD
4	3	0B	Amps Phase C	HS STD TD SD PD
4	3	0C	Amps Neutral	HS STD TD SD PD
4	3	0D	Reserved	
4	3	0E	Volts Imbalance (0-100)	HS STD TD SD PD
4	3	0F	Amps Imbalance (0-100)	STD TD SD PD
4	3	10	kW Total	HS STD TD SD PD HRS
4	3	11	kW Phase A	HS STD TD SD PD
4	3	12	kW Phase B	HS STD TD SD PD
4	3	13	kW Phase C	HS STD TD SD PD
4	3	14	kVAR Total	STD TD SD PD HRS
4	3	15	kVAR Phase A	STD TD SD PD
4	3	16	kVAR Phase B	STD TD SD PD
4	3	17	kVAR Phase C	STD TD SD PD
4	3	18	kVA Total	HS STD TD SD PD HRS
4	3	19	kVA Phase A	HS STD TD SD PD
4	3	1A	kVA Phase B	HS STD TD SD PD
4	3	1B	kVA Phase C	HS STD TD SD PD
4	3	1C	PF Total	STD TD SD PD
4	3	1D	PF Phase A	STD TD SD PD
4	3	1E	PF Phase B	STD TD SD PD
4	3	1F	PF Phase C	STD TD SD PD
4	3	20	Frequency	HS STD TD SD PD
4	3	21-23	Reserved	
4	3	24	Phase Reversal (0 or 1)	HS STD
4	3	25-27	Reserved	
4	3	28	VAUX	STD TD SD PD
4	3	29-2F	Reserved	
4	3	30	I2T Avg. (0 = Off, 1= On)	HS
4	3	31	I2T Phase A (0=Off, 1=On)	HS
4	3	32	I2T Phase B (0=Off, 1=On)	HS
4	3	33	I2T Phase C (0=Off, 1=On)	HS
4	3	34-67	Reserved	
4	3	68	V1 HD - K-Factor	STD TD SD PD

#1	#2	#3 & #4	Sliding Window Key Thumbwheel Settings	
Class	**Sub-class**	**Instance**	**Measurement**	**Supported Modes**
4	3	69	V2 HD - K-Factor	STD TD SD PD
4	3	6A	V3 HD - K-Factor	STD TD SD PD
4	3	6B	VAUX HD - K-Factor	STD TD SD PD
4	3	6C	I1 HD - K-Factor	STD TD SD PD
4	3	6D	I2 HD - K-Factor	STD TD SD PD
4	3	6E	I3 HD - K-Factor	STD TD SD PD
4	3	6F	I4 HD - K-Factor	STD TD SD PD
4	3	70	V1 HD - Total Odd	STD TD SD PD
4	3	71	V2 HD - Total Odd	STD TD SD PD
4	3	72	V3 HD - Total Odd	STD TD SD PD
4	3	73	VAUX HD - Total Odd	STD TD SD PD
4	3	74	I1 HD - Total Odd	STD TD SD PD
4	3	75	I2 HD - Total Odd	STD TD SD PD
4	3	76	I3 HD - Total Odd	STD TD SD PD
4	3	77	I4 HD - Total Odd	STD TD SD PD
4	3	78	V1 HD - Total Even	STD TD SD PD
4	3	79	V2 HD - Total Even	STD TD SD PD
4	3	7A	V3 HD - Total Even	STD TD SD PD
4	3	7B	VAUX HD - Total Even	STD TD SD PD
4	3	7C	I1 HD - Total Even	STD TD SD PD
4	3	7D	I2 HD - Total Even	STD TD SD PD
4	3	7E	I3 HD - Total Even	STD TD SD PD
4	3	7F	I4 HD - Total Even	STD TD SD PD
4	3	80	V1 HD - Total	STD TD SD PD
4	3	81	V2 HD - Total	STD TD SD PD
4	3	82	V3 HD - Total	STD TD SD PD
4	3	83	VAUX HD - Total	STD TD SD PD
4	3	84	I1 HD - Total	STD TD SD PD
4	3	85	I2 HD - Total	STD TD SD PD
4	3	86	I3 HD - Total	STD TD SD PD
4	3	87	I4 HD - Total	STD TD SD PD
4	3	88	V1 HD - Harmonic #1	STD TD SD PD
4	3	89	V2 HD - Harmonic #1	STD TD SD PD
4	3	8A	V3 HD - Harmonic #1	STD TD SD PD
4	3	8B	VAUX HD - Harmonic #1	STD TD SD PD
4	3	8C	I1 HD - Harmonic #1	STD TD SD PD
4	3	8D	I2 HD - Harmonic #1	STD TD SD PD
4	3	8E	I3 HD - Harmonic #1	STD TD SD PD
4	3	8F	I4 HD - Harmonic #1	STD TD SD PD
4	3	90	V1 HD - Harmonic #2	STD TD SD PD
4	3	91	V2 HD - Harmonic #2	STD TD SD PD
4	3	92	V3 HD - Harmonic #2	STD TD SD PD
4	3	93	VAUX HD - Harmonic #2	STD TD SD PD
4	3	94	I1 HD - Harmonic #2	STD TD SD PD
4	3	95	I2 HD - Harmonic #2	STD TD SD PD
4	3	96	I3 HD - Harmonic #2	STD TD SD PD

#1	#2	#3 & #4	Sliding Window Key Thumbwheel Settings	
Class	**Sub-class**	**Instance**	**Measurement**	**Supported Modes**
4	3	97	I4 HD - Harmonic #2	STD TD SD PD
4	3	98	V1 HD - Harmonic #3	STD TD SD PD
4	3	99	V2 HD - Harmonic #3	STD TD SD PD
4	3	9A	V3 HD - Harmonic #3	STD TD SD PD
4	3	9B	VAUX HD - Harmonic #3	STD TD SD PD
4	3	9C	I1 HD - Harmonic #3	STD TD SD PD
4	3	9D	I2 HD - Harmonic #3	STD TD SD PD
4	3	9E	I3 HD - Harmonic #3	STD TD SD PD
4	3	9F	I4 HD - Harmonic #3	STD TD SD PD
4	3	A0	V1 HD - Harmonic #4	STD TD SD PD
4	3	A1	V2 HD - Harmonic #4	STD TD SD PD
4	3	A2	V3 HD - Harmonic #4	STD TD SD PD
4	3	A3	VAUX HD - Harmonic #4	STD TD SD PD
4	3	A4	I1 HD - Harmonic #4	STD TD SD PD
4	3	A5	I2 HD - Harmonic #4	STD TD SD PD
4	3	A6	I3 HD - Harmonic #4	STD TD SD PD
4	3	A7	I4 HD - Harmonic #4	STD TD SD PD
4	3	A8	V1 HD - Harmonic #5	STD TD SD PD
4	3	A9	V2 HD - Harmonic #5	STD TD SD PD
4	3	AA	V3 HD - Harmonic #5	STD TD SD PD
4	3	AB	VAUX HD - Harmonic #5	STD TD SD PD
4	3	AC	I1 HD - Harmonic #5	STD TD SD PD
4	3	AD	I2 HD - Harmonic #5	STD TD SD PD
4	3	AE	I3 HD - Harmonic #5	STD TD SD PD
4	3	AF	I4 HD - Harmonic #5	STD TD SD PD
4	3	B0	V1 HD - Harmonic #6	STD TD SD PD
4	3	B1	V2 HD - Harmonic #6	STD TD SD PD
4	3	B2	V3 HD - Harmonic #6	STD TD SD PD
4	3	B3	VAUX HD - Harmonic #6	STD TD SD PD
4	3	B4	I1 HD - Harmonic #6	STD TD SD PD
4	3	B5	I2 HD - Harmonic #6	STD TD SD PD
4	3	B6	I3 HD - Harmonic #6	STD TD SD PD
4	3	B7	I4 HD - Harmonic #6	STD TD SD PD
4	3	B8	V1 HD - Harmonic #7	STD TD SD PD
4	3	B9	V2 HD - Harmonic #7	STD TD SD PD
4	3	BA	V3 HD - Harmonic #7	STD TD SD PD
4	3	BB	VAUX HD - Harmonic #7	STD TD SD PD
4	3	BC	I1 HD - Harmonic #7	STD TD SD PD
4	3	BD	I2 HD - Harmonic #7	STD TD SD PD
4	3	BE	I3 HD - Harmonic #7	STD TD SD PD
4	3	BF	I4 HD - Harmonic #7	STD TD SD PD
4	3	C0	V1 HD - Harmonic #8	STD TD SD PD
4	3	C1	V2 HD - Harmonic #8	STD TD SD PD
4	3	C2	V3 HD - Harmonic #8	STD TD SD PD
4	3	C3	VAUX HD - Harmonic #8	STD TD SD PD
4	3	C4	I1 HD - Harmonic #8	STD TD SD PD

#1	#2	#3 & #4	Sliding Window Key Thumbwheel Settings	
Class	**Sub-class**	**Instance**	**Measurement**	**Supported Modes**
4	3	C5	I2 HD - Harmonic #8	STD TD SD PD
4	3	C6	I3 HD - Harmonic #8	STD TD SD PD
4	3	C7	I4 HD - Harmonic #8	STD TD SD PD
4	3	C8	V1 HD - Harmonic #9	STD TD SD PD
4	3	C9	V2 HD - Harmonic #9	STD TD SD PD
4	3	CA	V3 HD - Harmonic #9	STD TD SD PD
4	3	CB	VAUX HD - Harmonic #9	STD TD SD PD
4	3	CC	I1 HD - Harmonic #9	STD TD SD PD
4	3	CD	I2 HD - Harmonic #9	STD TD SD PD
4	3	CE	I3 HD - Harmonic #9	STD TD SD PD
4	3	CF	I4 HD - Harmonic #9	STD TD SD PD
4	3	D0	V1 HD - Harmonic #10	STD TD SD PD
4	3	D1	V2 HD - Harmonic #10	STD TD SD PD
4	3	D2	V3 HD - Harmonic #10	STD TD SD PD
4	3	D3	VAUX HD - Harmonic #10	STD TD SD PD
4	3	D4	I1 HD - Harmonic #10	STD TD SD PD
4	3	D5	I2 HD - Harmonic #10	STD TD SD PD
4	3	D6	I3 HD - Harmonic #10	STD TD SD PD
4	3	D7	I4 HD - Harmonic #10	STD TD SD PD
4	3	D8	V1 HD - Harmonic #11	STD TD SD PD
4	3	D9	V2 HD - Harmonic #11	STD TD SD PD
4	3	DA	V3 HD - Harmonic #11	STD TD SD PD
4	3	DB	VAUX HD - Harmonic #11	STD TD SD PD
4	3	DC	I1 HD - Harmonic #11	STD TD SD PD
4	3	DD	I2 HD - Harmonic #11	STD TD SD PD
4	3	DE	I3 HD - Harmonic #11	STD TD SD PD
4	3	DF	I4 HD - Harmonic #11	STD TD SD PD
4	3	E0	V1 HD - Harmonic #12	STD TD SD PD
4	3	E1	V2 HD - Harmonic #12	STD TD SD PD
4	3	E2	V3 HD - Harmonic #12	STD TD SD PD
4	3	E3	VAUX HD - Harmonic #12	STD TD SD PD
4	3	E4	I1 HD - Harmonic #12	STD TD SD PD
4	3	E5	I2 HD - Harmonic #12	STD TD SD PD
4	3	E6	I3 HD - Harmonic #12	STD TD SD PD
4	3	E7	I4 HD - Harmonic #12	STD TD SD PD
4	3	E8	V1 HD - Harmonic #13	STD TD SD PD
4	3	E9	V2 HD - Harmonic #13	STD TD SD PD
4	3	EA	V3 HD - Harmonic #13	STD TD SD PD
4	3	EB	VAUX HD - Harmonic #13	STD TD SD PD
4	3	EC	I1 HD - Harmonic #13	STD TD SD PD
4	3	ED	I2 HD - Harmonic #13	STD TD SD PD
4	3	EE	I3 HD - Harmonic #13	STD TD SD PD
4	3	EF	I4 HD - Harmonic #13	STD TD SD PD
4	3	F0	V1 HD - Harmonic #14	STD TD SD PD
4	3	F1	V2 HD - Harmonic #14	STD TD SD PD
4	3	F2	V3 HD - Harmonic #14	STD TD SD PD

#1	#2	#3 & #4	Sliding Window Key Thumbwheel Settings	
Class	**Sub-class**	**Instance**	**Measurement**	**Supported Modes**
4	3	F3	VAUX HD - Harmonic #14	STD TD SD PD
4	3	F4	I1 HD - Harmonic #14	STD TD SD PD
4	3	F5	I2 HD - Harmonic #14	STD TD SD PD
4	3	F6	I3 HD - Harmonic #14	STD TD SD PD
4	3	F7	I4 HD - Harmonic #14	STD TD SD PD
4	3	F8	V1 HD - Harmonic #15	STD TD SD PD
4	3	F9	V2 HD - Harmonic #15	STD TD SD PD
4	3	FA	V3 HD - Harmonic #15	STD TD SD PD
4	3	FB	VAUX HD - Harmonic #15	STD TD SD PD
4	3	FC	I1 HD - Harmonic #15	STD TD SD PD
4	3	FD	I2 HD - Harmonic #15	STD TD SD PD
4	3	FE	I3 HD - Harmonic #15	STD TD SD PD

Appendix B: Automatic Waveform Capture and Waveform Retrieval on EPM 3720

Using a setpoint to trigger waveform capture or record on the EPM 3720

When a Setpoint is programmed from the wizard, the EPM 3720 has the ability to automatically capture or record waveforms based on the value of a specified parameter. In order to display a Waveform Capture, the meter takes 128 samples from a full cycle of any single selected channel. For a Waveform Record, the meter takes 16 samples per cycle from multiple cycles on all 8 inputs simultaneously. The device will store 36 cycles of 1 event, 18 cycles of 2 events, or 12 cycles of 3 events, depending on the Record Depth programmed by the user. Please follow the instructions below to use a Setpoint to trigger a waveform capture or record on the EPM 3720.

For explanations of what the EPM 3720's various parameters mean, refer to the EPM 3720 Users Guide, in the section titled *Sliding Window Demand*.

9. In the EPM 3720 wizard's tabular data screen, click on the Setpoints tab.
6. Choose an unassigned setpoint number. Either Standard or High Speed may be used, but High Speed is recommended for quicker response. (See Section 6 of the 3720 ACM Installation & Operation Manual for more details on configuring Setpoints.)
7. Based on the parameter that will be set in the Trigger Key, select the Setpoint Type.
8. Set the Trigger Key. The Trigger Key is a code for the parameter that, when its value passes a set limit, triggers an Action. Refer to the table in this section for a list of Trigger Key codes.
9. Enter the High and Low Limits as well as any Time Delays to operate and release.
10. Select the required Action. To record a waveform, choose **Waveform Recorder**. For Waveform Capture, remember that the waveform of

only one input may be automatically captured. Choose **Waveform Capture Channel** X where X represents an integer between 1 and 8. Following are the Channel assignments for Wye and Delta systems.

11. Press the **Download** key. This will transmit the values entered into the Setpoints tabular screen for the selected setpoint number to the device. After several seconds press the **Refresh** button and scroll to the selected setpoint to verify that the device has accepted the setpoint entered parameters.
12. For waveform record, open the Waveform Capture program from within the wizard. On the main screen, select the appropriate Topic or device name and click on the **Record** radio button. Then, under the menu Waveform>Configure>Record Depth, select a depth of either 1 event x 36 cycles, 2 events x 18 cycles, or 3 events x 12 cycles. Press OK. The Trigger, Arm, and Retrieve buttons will become inactive as the depth is downloaded to the meter. For waveform capture proceed directly to step 9.
13. Once the **Trigger**, **Arm**, & **Retrieve** buttons become active, press the **Arm** button. The **Trigger**, **Arm**, & **Retrieve** buttons will momentarily become inactive. When the buttons become active, the meter is now ready to record/capture a waveform when the setpoint conditions are reached.
14. Once the waveform has been automatically captured or recorded and the event has been logged, choose the appropriate Topic and function; i.e., in the main screen of the Waveform Capture program, press **Retrieve**.
15. View and save waveforms as desired.
16. To rearm the meter and clear the waveform data out of the device's memory, press **Arm** on the main screen of the Waveform Capture program.

Table B-1. EPM 3720 Trigger Keys.

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting
Class	**Sub-class**	**Instance**	**Meaning**
0	0	00	Null Object Identifier
1	0	00-05	Digital Inputs (Status Inputs)
1	1	00-02	Digital Outputs (Relays)
1	2	00-07	Analog Inputs (Voltage & Current Inputs)
1	3	00	Analog Outputs (IOUT)
1	4	00-05	Digital Inputs (Status Inputs) -- Status
1	5	00-02	Digital Outputs (Relays) -- Status
1	8	00-05	Digital Inputs (Status Inputs) -- Counter
1	9	00-02	Digital Outputs (Relays) -- Counter
1	C	00-05	Digital Inputs (Status Inputs) -- Preset/Reset
1	D	00-02	Digital Outputs (Relays) -- Reset
1	E	00-03	Digital Inputs (Status Inputs) -- Scale
1	F	00-03	Digital Inputs (Status Inputs) -- Rollover
4	0	see valid instances below	High-speed Present
4	1	see valid instances below	Standard Present
4	2	see valid instances below	Thermal Demand Present
4	3	see valid instances below	Sliding Window Demand Present
4	4	see valid instances below	High-speed Minimum
4	5	see valid instances below	Standard Minimum
4	6	see valid instances below	Thermal Demand Minimum
4	7	see valid instances below	Sliding Window Demand Minimum
4	8	see valid instances below	High-speed Maximum
4	9	see valid instances below	Standard Maximum

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	**Sub-class**	**Instance**	**Meaning**	
4	A	see valid instances below	Thermal Demand Maximum	
4	B	see valid instances below	Sliding Window Demand Maximum	
4	C	see valid instances below	Hours - Net (Import - Export)	
4	D	see valid instances below	Hours - Import	
4	E	see valid instances below	Hours - Export	
4	F	see valid instances below	Hours - Total (Import + Export)	
		⇓		
		Instance	Measurement	Supported Modes
		00	Volts LN Average	HS STD TD SD PD
		01	Volts LN Phase A	HS STD TD SD PD
		02	Volts LN Phase B	HS STD TD SD PD
		03	Volts LN Phase C	HS STD TD SD PD
		04	Volts LL Average	HS STD TD SD PD
		05	Volts LL Phase AB	HS STD TD SD PD
		06	Volts LL Phase BC	HS STD TD SD PD
		07	Volts LL Phase CA	HS STD TD SD PD
		08	Amps Average	HS STD TD SD PD
		09	Amps Phase A	HS STD TD SD PD
		0A	Amps Phase B	HS STD TD SD PD
		0B	Amps Phase C	HS STD TD SD PD
		0C	Amps Neutral	HS STD TD SD PD
		0D	Reserved	
		0E	Volts Imbalance (0-100)	HS STD TD SD PD
		0F	Amps Imbalance (0-100)	STD TD SD PD
		10	kW Total	HS STD TD SD PD HRS
		11	kW Phase A	HS STD TD SD PD
		12	kW Phase B	HS STD TD SD PD
		13	kW Phase C	HS STD TD SD PD
		14	kVAR Total	STD TD SD PD HRS
		15	kVAR Phase A	STD TD SD PD
		16	kVAR Phase B	STD TD SD PD
		17	kVAR Phase C	STD TD SD PD

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	**Sub-class**	**Instance**	**Meaning**	
		18	kVA Total	HS STD TD SD PD HRS
		19	kVA Phase A	HS STD TD SD PD
		1A	kVA Phase B	HS STD TD SD PD
		1B	kVA Phase C	HS STD TD SD PD
		1C	PF Total	STD TD SD PD
		1D	PF Phase A	STD TD SD PD
		1E	PF Phase B	STD TD SD PD
		1F	PF Phase C	STD TD SD PD
		20	Frequency	HS STD TD SD PD
		21-23	Reserved	
		24	Phase Reversal (0 or 1)	HS STD
		25-27	Reserved	
		28	VAUX	STD TD SD PD
		29-2F	Reserved	
		30	I2T Avg. (0 = Off, 1= On)	HS
		31	I2T Phase A (0=Off, 1=On)	HS
		32	I2T Phase B (0=Off, 1=On)	HS
		33	I2T Phase C (0=Off, 1=On)	HS
		34-67	Reserved	
		68	V1 HD - K-Factor	STD TD SD PD
		69	V2 HD - K-Factor	STD TD SD PD
		6A	V3 HD - K-Factor	STD TD SD PD
		6B	VAUX HD - K-Factor	STD TD SD PD
		6C	I1 HD - K-Factor	STD TD SD PD
		6D	I2 HD - K-Factor	STD TD SD PD
		6E	I3 HD - K-Factor	STD TD SD PD
		6F	I4 HD - K-Factor	STD TD SD PD
		70	V1 HD - Total Odd	STD TD SD PD
		71	V2 HD - Total Odd	STD TD SD PD
		72	V3 HD - Total Odd	STD TD SD PD
		73	VAUX HD - Total Odd	STD TD SD PD
		74	I1 HD - Total Odd	STD TD SD PD
		75	I2 HD - Total Odd	STD TD SD PD
		76	I3 HD - Total Odd	STD TD SD PD
		77	I4 HD - Total Odd	STD TD SD PD
		78	V1 HD - Total Even	STD TD SD PD
		79	V2 HD - Total Even	STD TD SD PD
		7A	V3 HD - Total Even	STD TD SD PD
		7B	VAUX HD - Total Even	STD TD SD PD
		7C	I1 HD - Total Even	STD TD SD PD

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	**Sub-class**	**Instance**	**Meaning**	
		7D	I2 HD - Total Even	STD TD SD PD
		7E	I3 HD - Total Even	STD TD SD PD
		7F	I4 HD - Total Even	STD TD SD PD
		80	V1 HD - Total	STD TD SD PD
		81	V2 HD - Total	STD TD SD PD
		82	V3 HD - Total	STD TD SD PD
		83	VAUX HD - Total	STD TD SD PD
		84	I1 HD - Total	STD TD SD PD
		85	I2 HD - Total	STD TD SD PD
		86	I3 HD - Total	STD TD SD PD
		87	I4 HD - Total	STD TD SD PD
		88	V1 HD - Harmonic #1	STD TD SD PD
		89	V2 HD - Harmonic #1	STD TD SD PD
		8A	V3 HD - Harmonic #1	STD TD SD PD
		8B	VAUX HD - Harmonic #1	STD TD SD PD
		8C	I1 HD - Harmonic #1	STD TD SD PD
		8D	I2 HD - Harmonic #1	STD TD SD PD
		8E	I3 HD - Harmonic #1	STD TD SD PD
		8F	I4 HD - Harmonic #1	STD TD SD PD
		90	V1 HD - Harmonic #2	STD TD SD PD
		91	V2 HD - Harmonic #2	STD TD SD PD
		92	V3 HD - Harmonic #2	STD TD SD PD
		93	VAUX HD - Harmonic #2	STD TD SD PD
		94	I1 HD - Harmonic #2	STD TD SD PD
		95	I2 HD - Harmonic #2	STD TD SD PD
		96	I3 HD - Harmonic #2	STD TD SD PD
		97	I4 HD - Harmonic #2	STD TD SD PD
		98	V1 HD - Harmonic #3	STD TD SD PD
		99	V2 HD - Harmonic #3	STD TD SD PD
		9A	V3 HD - Harmonic #3	STD TD SD PD
		9B	VAUX HD - Harmonic #3	STD TD SD PD
		9C	I1 HD - Harmonic #3	STD TD SD PD
		9D	I2 HD - Harmonic #3	STD TD SD PD
		9E	I3 HD - Harmonic #3	STD TD SD PD
		9F	I4 HD - Harmonic #3	STD TD SD PD
		A0	V1 HD - Harmonic #4	STD TD SD PD
		A1	V2 HD - Harmonic #4	STD TD SD PD
		A2	V3 HD - Harmonic #4	STD TD SD PD
		A3	VAUX HD - Harmonic #4	STD TD SD PD
		A4	I1 HD - Harmonic #4	STD TD SD PD

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	**Sub-class**	**Instance**	**Meaning**	
		A5	I2 HD - Harmonic #4	STD TD SD PD
		A6	I3 HD - Harmonic #4	STD TD SD PD
		A7	I4 HD - Harmonic #4	STD TD SD PD
		A8	V1 HD - Harmonic #5	STD TD SD PD
		A9	V2 HD - Harmonic #5	STD TD SD PD
		AA	V3 HD - Harmonic #5	STD TD SD PD
		AB	VAUX HD - Harmonic #5	STD TD SD PD
		AC	I1 HD - Harmonic #5	STD TD SD PD
		AD	I2 HD - Harmonic #5	STD TD SD PD
		AE	I3 HD - Harmonic #5	STD TD SD PD
		AF	I4 HD - Harmonic #5	STD TD SD PD
		B0	V1 HD - Harmonic #6	STD TD SD PD
		B1	V2 HD - Harmonic #6	STD TD SD PD
		B2	V3 HD - Harmonic #6	STD TD SD PD
		B3	VAUX HD - Harmonic #6	STD TD SD PD
		B4	I1 HD - Harmonic #6	STD TD SD PD
		B5	I2 HD - Harmonic #6	STD TD SD PD
		B6	I3 HD - Harmonic #6	STD TD SD PD
		B7	I4 HD - Harmonic #6	STD TD SD PD
		B8	V1 HD - Harmonic #7	STD TD SD PD
		B9	V2 HD - Harmonic #7	STD TD SD PD
		BA	V3 HD - Harmonic #7	STD TD SD PD
		BB	VAUX HD - Harmonic #7	STD TD SD PD
		BC	I1 HD - Harmonic #7	STD TD SD PD
		BD	I2 HD - Harmonic #7	STD TD SD PD
		BE	I3 HD - Harmonic #7	STD TD SD PD
		BF	I4 HD - Harmonic #7	STD TD SD PD
		C0	V1 HD - Harmonic #8	STD TD SD PD
		C1	V2 HD - Harmonic #8	STD TD SD PD
		C2	V3 HD - Harmonic #8	STD TD SD PD
		C3	VAUX HD - Harmonic #8	STD TD SD PD
		C4	I1 HD - Harmonic #8	STD TD SD PD
		C5	I2 HD - Harmonic #8	STD TD SD PD
		C6	I3 HD - Harmonic #8	STD TD SD PD
		C7	I4 HD - Harmonic #8	STD TD SD PD
		C8	V1 HD - Harmonic #9	STD TD SD PD
		C9	V2 HD - Harmonic #9	STD TD SD PD
		CA	V3 HD - Harmonic #9	STD TD SD PD
		CB	VAUX HD - Harmonic #9	STD TD SD PD
		CC	I1 HD - Harmonic #9	STD TD SD PD

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	Sub-class	Instance	Meaning	
		CD	I2 HD - Harmonic #9	STD TD SD PD
		CE	I3 HD - Harmonic #9	STD TD SD PD
		CF	I4 HD - Harmonic #9	STD TD SD PD
		D0	V1 HD - Harmonic #10	STD TD SD PD
		D1	V2 HD - Harmonic #10	STD TD SD PD
		D2	V3 HD - Harmonic #10	STD TD SD PD
		D3	VAUX HD - Harmonic #10	STD TD SD PD
		D4	I1 HD - Harmonic #10	STD TD SD PD
		D5	I2 HD - Harmonic #10	STD TD SD PD
		D6	I3 HD - Harmonic #10	STD TD SD PD
		D7	I4 HD - Harmonic #10	STD TD SD PD
		D8	V1 HD - Harmonic #11	STD TD SD PD
		D9	V2 HD - Harmonic #11	STD TD SD PD
		DA	V3 HD - Harmonic #11	STD TD SD PD
		DB	VAUX HD - Harmonic #11	STD TD SD PD
		DC	I1 HD - Harmonic #11	STD TD SD PD
		DD	I2 HD - Harmonic #11	STD TD SD PD
		DE	I3 HD - Harmonic #11	STD TD SD PD
		DF	I4 HD - Harmonic #11	STD TD SD PD
		E0	V1 HD - Harmonic #12	STD TD SD PD
		E1	V2 HD - Harmonic #12	STD TD SD PD
		E2	V3 HD - Harmonic #12	STD TD SD PD
		E3	VAUX HD - Harmonic #12	STD TD SD PD
		E4	I1 HD - Harmonic #12	STD TD SD PD
		E5	I2 HD - Harmonic #12	STD TD SD PD
		E6	I3 HD - Harmonic #12	STD TD SD PD
		E7	I4 HD - Harmonic #12	STD TD SD PD
		E8	V1 HD - Harmonic #13	STD TD SD PD
		E9	V2 HD - Harmonic #13	STD TD SD PD
		EA	V3 HD - Harmonic #13	STD TD SD PD
		EB	VAUX HD - Harmonic #13	STD TD SD PD
		EC	I1 HD - Harmonic #13	STD TD SD PD
		ED	I2 HD - Harmonic #13	STD TD SD PD
		EE	I3 HD - Harmonic #13	STD TD SD PD
		EF	I4 HD - Harmonic #13	STD TD SD PD
		F0	V1 HD - Harmonic #14	STD TD SD PD
		F1	V2 HD - Harmonic #14	STD TD SD PD
		F2	V3 HD - Harmonic #14	STD TD SD PD
		F3	VAUX HD - Harmonic #14	STD TD SD PD
		F4	I1 HD - Harmonic #14	STD TD SD PD

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	**Sub-class**	**Instance**	**Meaning**	
		F5	I2 HD - Harmonic #14	STD TD SD PD
		F6	I3 HD - Harmonic #14	STD TD SD PD
		F7	I4 HD - Harmonic #14	STD TD SD PD
		F8	V1 HD - Harmonic #15	STD TD SD PD
		F9	V2 HD - Harmonic #15	STD TD SD PD
		FA	V3 HD - Harmonic #15	STD TD SD PD
		FB	VAUX HD - Harmonic #15	STD TD SD PD
		FC	I1 HD - Harmonic #15	STD TD SD PD
		FD	I2 HD - Harmonic #15	STD TD SD PD
		FE	I3 HD - Harmonic #15	STD TD SD PD
		FF	I4 HD - Harmonic #15	STD TD SD PD
6	0-2	Reserved	Reserved	
6	3	see valid instances below	Predicted Sliding Window Demand Present	
6	4-6	Reserved	Reserved	
6	7	see valid instances below	Predicted Sliding Window Demand Minimum	
6	8-A	Reserved	Reserved	
6	B	see valid instances below	Predicted Sliding Window Demand Maximum	
6	C-F	Reserved	Reserved	
		⇓		
		Instance	Measurement	Supported Modes
		00	Volts LN Average	HS STD TD SD PD
		01	Volts LN Phase A	HS STD TD SD PD
		02	Volts LN Phase B	HS STD TD SD PD
		03	Volts LN Phase C	HS STD TD SD PD
		04	Volts LL Average	HS STD TD SD PD
		05	Volts LL Phase AB	HS STD TD SD PD
		06	Volts LL Phase BC	HS STD TD SD PD
		07	Volts LL Phase CA	HS STD TD SD PD
		08	Amps Average	HS STD TD SD PD
		09	Amps Phase A	HS STD TD SD PD
		0A	Amps Phase B	HS STD TD SD PD
		0B	Amps Phase C	HS STD TD SD PD
		0C	Amps Neutral	HS STD TD SD PD
		0D	Reserved	
		0E	Volts Imbalance (0-100)	HS STD TD SD PD
		0F	Amps Imbalance (0-100)	STD TD SD PD

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	**Sub-class**	**Instance**	**Meaning**	
		10	kW Total	HS STD TD SD PD HRS
		11	kW Phase A	HS STD TD SD PD
		12	kW Phase B	HS STD TD SD PD
		13	kW Phase C	HS STD TD SD PD
		14	kVAR Total	STD TD SD PD HRS
		15	kVAR Phase A	STD TD SD PD
		16	kVAR Phase B	STD TD SD PD
		17	kVAR Phase C	STD TD SD PD
		18	kVA Total	HS STD TD SD PD HRS
		19	kVA Phase A	HS STD TD SD PD
		1A	kVA Phase B	HS STD TD SD PD
		1B	kVA Phase C	HS STD TD SD PD
		1C	PF Total	STD TD SD PD
		1D	PF Phase A	STD TD SD PD
		1E	PF Phase B	STD TD SD PD
		1F	PF Phase C	STD TD SD PD
		20	Frequency	HS STD TD SD PD
		21-23	Reserved	
		24	Phase Reversal (0 or 1)	HS STD
		25-27	Reserved	
		28	VAUX	STD TD SD PD
		29-2F	Reserved	
		30	I2T Avg. (0 = Off, 1= On)	HS
		31	I2T Phase A (0=Off, 1=On)	HS
		32	I2T Phase B (0=Off, 1=On)	HS
		33	I2T Phase C (0=Off, 1=On)	HS
		34-67	Reserved	
		68	V1 HD - K-Factor	STD TD SD PD
		69	V2 HD - K-Factor	STD TD SD PD
		6A	V3 HD - K-Factor	STD TD SD PD
		6B	VAUX HD - K-Factor	STD TD SD PD
		6C	I1 HD - K-Factor	STD TD SD PD
		6D	I2 HD - K-Factor	STD TD SD PD
		6E	I3 HD - K-Factor	STD TD SD PD
		6F	I4 HD - K-Factor	STD TD SD PD
		70	V1 HD - Total Odd	STD TD SD PD
		71	V2 HD - Total Odd	STD TD SD PD
		72	V3 HD - Total Odd	STD TD SD PD
		73	VAUX HD - Total Odd	STD TD SD PD
		74	I1 HD - Total Odd	STD TD SD PD

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	**Sub-class**	**Instance**	**Meaning**	
		75	I2 HD - Total Odd	STD TD SD PD
		76	I3 HD - Total Odd	STD TD SD PD
		77	I4 HD - Total Odd	STD TD SD PD
		78	V1 HD - Total Even	STD TD SD PD
		79	V2 HD - Total Even	STD TD SD PD
		7A	V3 HD - Total Even	STD TD SD PD
		7B	VAUX HD - Total Even	STD TD SD PD
		7C	I1 HD - Total Even	STD TD SD PD
		7D	I2 HD - Total Even	STD TD SD PD
		7E	I3 HD - Total Even	STD TD SD PD
		7F	I4 HD - Total Even	STD TD SD PD
		80	V1 HD - Total	STD TD SD PD
		81	V2 HD - Total	STD TD SD PD
		82	V3 HD - Total	STD TD SD PD
		83	VAUX HD - Total	STD TD SD PD
		84	I1 HD - Total	STD TD SD PD
		85	I2 HD - Total	STD TD SD PD
		86	I3 HD - Total	STD TD SD PD
		87	I4 HD - Total	STD TD SD PD
		88	V1 HD - Harmonic #1	STD TD SD PD
		89	V2 HD - Harmonic #1	STD TD SD PD
		8A	V3 HD - Harmonic #1	STD TD SD PD
		8B	VAUX HD - Harmonic #1	STD TD SD PD
		8C	I1 HD - Harmonic #1	STD TD SD PD
		8D	I2 HD - Harmonic #1	STD TD SD PD
		8E	I3 HD - Harmonic #1	STD TD SD PD
		8F	I4 HD - Harmonic #1	STD TD SD PD
		90	V1 HD - Harmonic #2	STD TD SD PD
		91	V2 HD - Harmonic #2	STD TD SD PD
		92	V3 HD - Harmonic #2	STD TD SD PD
		93	VAUX HD - Harmonic #2	STD TD SD PD
		94	I1 HD - Harmonic #2	STD TD SD PD
		95	I2 HD - Harmonic #2	STD TD SD PD
		96	I3 HD - Harmonic #2	STD TD SD PD
		97	I4 HD - Harmonic #2	STD TD SD PD
		98	V1 HD - Harmonic #3	STD TD SD PD
		99	V2 HD - Harmonic #3	STD TD SD PD
		9A	V3 HD - Harmonic #3	STD TD SD PD
		9B	VAUX HD - Harmonic #3	STD TD SD PD
		9C	I1 HD - Harmonic #3	STD TD SD PD

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	**Sub-class**	**Instance**	**Meaning**	
		9D	I2 HD - Harmonic #3	STD TD SD PD
		9E	I3 HD - Harmonic #3	STD TD SD PD
		9F	I4 HD - Harmonic #3	STD TD SD PD
		A0	V1 HD - Harmonic #4	STD TD SD PD
		A1	V2 HD - Harmonic #4	STD TD SD PD
		A2	V3 HD - Harmonic #4	STD TD SD PD
		A3	VAUX HD - Harmonic #4	STD TD SD PD
		A4	I1 HD - Harmonic #4	STD TD SD PD
		A5	I2 HD - Harmonic #4	STD TD SD PD
		A6	I3 HD - Harmonic #4	STD TD SD PD
		A7	I4 HD - Harmonic #4	STD TD SD PD
		A8	V1 HD - Harmonic #5	STD TD SD PD
		A9	V2 HD - Harmonic #5	STD TD SD PD
		AA	V3 HD - Harmonic #5	STD TD SD PD
		AB	VAUX HD - Harmonic #5	STD TD SD PD
		AC	I1 HD - Harmonic #5	STD TD SD PD
		AD	I2 HD - Harmonic #5	STD TD SD PD
		AE	I3 HD - Harmonic #5	STD TD SD PD
		AF	I4 HD - Harmonic #5	STD TD SD PD
		B0	V1 HD - Harmonic #6	STD TD SD PD
		B1	V2 HD - Harmonic #6	STD TD SD PD
		B2	V3 HD - Harmonic #6	STD TD SD PD
		B3	VAUX HD - Harmonic #6	STD TD SD PD
		B4	I1 HD - Harmonic #6	STD TD SD PD
		B5	I2 HD - Harmonic #6	STD TD SD PD
		B6	I3 HD - Harmonic #6	STD TD SD PD
		B7	I4 HD - Harmonic #6	STD TD SD PD
		B8	V1 HD - Harmonic #7	STD TD SD PD
		B9	V2 HD - Harmonic #7	STD TD SD PD
		BA	V3 HD - Harmonic #7	STD TD SD PD
		BB	VAUX HD - Harmonic #7	STD TD SD PD
		BC	I1 HD - Harmonic #7	STD TD SD PD
		BD	I2 HD - Harmonic #7	STD TD SD PD
		BE	I3 HD - Harmonic #7	STD TD SD PD
		BF	I4 HD - Harmonic #7	STD TD SD PD
		C0	V1 HD - Harmonic #8	STD TD SD PD
		C1	V2 HD - Harmonic #8	STD TD SD PD
		C2	V3 HD - Harmonic #8	STD TD SD PD
		C3	VAUX HD - Harmonic #8	STD TD SD PD
		C4	I1 HD - Harmonic #8	STD TD SD PD

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	**Sub-class**	**Instance**	**Meaning**	
		C5	I2 HD - Harmonic #8	STD TD SD PD
		C6	I3 HD - Harmonic #8	STD TD SD PD
		C7	I4 HD - Harmonic #8	STD TD SD PD
		C8	V1 HD - Harmonic #9	STD TD SD PD
		C9	V2 HD - Harmonic #9	STD TD SD PD
		CA	V3 HD - Harmonic #9	STD TD SD PD
		CB	VAUX HD - Harmonic #9	STD TD SD PD
		CC	I1 HD - Harmonic #9	STD TD SD PD
		CD	I2 HD - Harmonic #9	STD TD SD PD
		CE	I3 HD - Harmonic #9	STD TD SD PD
		CF	I4 HD - Harmonic #9	STD TD SD PD
		D0	V1 HD - Harmonic #10	STD TD SD PD
		D1	V2 HD - Harmonic #10	STD TD SD PD
		D2	V3 HD - Harmonic #10	STD TD SD PD
		D3	VAUX HD - Harmonic #10	STD TD SD PD
		D4	I1 HD - Harmonic #10	STD TD SD PD
		D5	I2 HD - Harmonic #10	STD TD SD PD
		D6	I3 HD - Harmonic #10	STD TD SD PD
		D7	I4 HD - Harmonic #10	STD TD SD PD
		D8	V1 HD - Harmonic #11	STD TD SD PD
		D9	V2 HD - Harmonic #11	STD TD SD PD
		DA	V3 HD - Harmonic #11	STD TD SD PD
		DB	VAUX HD - Harmonic #11	STD TD SD PD
		DC	I1 HD - Harmonic #11	STD TD SD PD
		DD	I2 HD - Harmonic #11	STD TD SD PD
		DE	I3 HD - Harmonic #11	STD TD SD PD
		DF	I4 HD - Harmonic #11	STD TD SD PD
		E0	V1 HD - Harmonic #12	STD TD SD PD
		E1	V2 HD - Harmonic #12	STD TD SD PD
		E2	V3 HD - Harmonic #12	STD TD SD PD
		E3	VAUX HD - Harmonic #12	STD TD SD PD
		E4	I1 HD - Harmonic #12	STD TD SD PD
		E5	I2 HD - Harmonic #12	STD TD SD PD
		E6	I3 HD - Harmonic #12	STD TD SD PD
		E7	I4 HD - Harmonic #12	STD TD SD PD
		E8	V1 HD - Harmonic #13	STD TD SD PD
		E9	V2 HD - Harmonic #13	STD TD SD PD
		EA	V3 HD - Harmonic #13	STD TD SD PD
		EB	VAUX HD - Harmonic #13	STD TD SD PD
		EC	I1 HD - Harmonic #13	STD TD SD PD

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	Sub-class	Instance	Meaning	
		ED	I2 HD - Harmonic #13	STD TD SD PD
		EE	I3 HD - Harmonic #13	STD TD SD PD
		EF	I4 HD - Harmonic #13	STD TD SD PD
		F0	V1 HD - Harmonic #14	STD TD SD PD
		F1	V2 HD - Harmonic #14	STD TD SD PD
		F2	V3 HD - Harmonic #14	STD TD SD PD
		F3	VAUX HD - Harmonic #14	STD TD SD PD
		F4	I1 HD - Harmonic #14	STD TD SD PD
		F5	I2 HD - Harmonic #14	STD TD SD PD
		F6	I3 HD - Harmonic #14	STD TD SD PD
		F7	I4 HD - Harmonic #14	STD TD SD PD
		F8	V1 HD - Harmonic #15	STD TD SD PD
		F9	V2 HD - Harmonic #15	STD TD SD PD
		FA	V3 HD - Harmonic #15	STD TD SD PD
		FB	VAUX HD - Harmonic #15	STD TD SD PD
		FC	I1 HD - Harmonic #15	STD TD SD PD
		FD	I2 HD - Harmonic #15	STD TD SD PD
		FE	I3 HD - Harmonic #15	STD TD SD PD
		FF	I4 HD - Harmonic #15	STD TD SD PD

The action keys specify the instance number for an object to perform an action on. The following action keys are possible:

Action Key	Setpoint Supported	Meaning
0	-	No action
1000-1004	STD HS	Clear digital input counter 0-3 (Status input counter 1-4), 4=ALL
1100-1102	STD HS	Operate Relay #1 to 3
1C00-1C04	STD HS	same as 1000-1004
A400-A407	STD HS	Waveform Capture channels #1 to 8
A500	STD HS	Waveform Recorder

Action keys marked with STD are supported by Standard Setpoints (1–11), action keys marked with HS are supported by High Speed Setpoints (1–6).

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