



MULTILIN™

*PMCS 6.15 for
CIMPLICITY® HMI
Interface Toolkit*

**User's Guide
DEH-210**

GE Power Management Control System 6.15

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Spectra MicroVersaTrip	SR469 Motor Management Relay	EPM 7300 Electronic Power Meter
EPM 7600 Electronic Power Meter	EPM 7500 Electronic Power Meter	EPM 7330 Electronic Power Meter
Enhanced MicroVersaTrip-C	SR489 Generator Management Relay	EPM 7700 Electronic Power Meter
Enhanced MicroVersaTrip-D	565 Feeder Management Relay	EPM 3710 Electronic Power Meter
MDP Overcurrent Relay	735 Feeder Relay	EPM 3720 Electronic Power Meter
SR750/SR760 Feeder Management Relay	SR745 Transformer Management Relay	Spectra Electronic Control Module
Universal Relay	EPM7430D/EPM7450D (Futura)	Motor Manager II (MMII)
GE-Zenith MX200 (Microprocessor Controller)	GE-Zenith Generator PLC (Series 90-70)	EPM5300P/EPM5200P
EPM5350P (DMMS350)	EPM5000P (DMWH300)	EPM9450Q (Nexus1250)
EPM9650Q (Nexus1252)	MLPQMII (PQMII)	F650 Bay Controller
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Back to Main Page

Contents

- INTRODUCTION 1**
- WELCOME 1
- HOW SHOULD I USE THIS MANUAL? 2
- CONVENTIONS 3
- ABOUT THE INTERFACE TOOLKIT 3
- INSTALLATION 4
- CONFIGURING AND USING PMCS WIZARDS 5**
- ABOUT THE WIZARDS 5
- CONFIGURING A SIMPLICITY PROJECT FOR PMCS 6
- PMCS POWERBUILDER - CONFIGURING ADVANCED WIZARDS 9
 - Manually Configuring Wizards without using PMCS Power Builder* 16
 - Manually Configuring the EPM 7700 Wizard* 18
- USING A PMCS WIZARD 21
 - Sample Application* 22
- SMALL FACEPLATE WIZARDS 24
 - Usage* 24
 - Small Faceplate Configuration* 25
- LARGE FACEPLATE/TABULAR WIZARDS 27
 - Usage* 27
 - Special Considerations* 27
 - Configuration* 28
- ONE-LINE WIZARDS 34
 - Usage* 34
 - Configuration* 35
 - Circuit Breaker One-Line Wizards* 40
- ELEVATION WIZARDS 41
 - Usage* 41
 - Configuration* 41
- FLOOR PLAN WIZARDS 42
 - Usage* 42
 - Configuration* 42
- ANNUNCIATOR PANEL WIZARD 43
 - Usage* 43
 - Configuration* 47
- CREATING FLOOR PLANS, ELEVATION VIEWS, AND ONE-LINE DIAGRAMS 49**

INTRODUCTION.....	49
ELEVATION VIEWS	49
FLOOR PLANS.....	51
ELECTRICAL ONE-LINE DIAGRAMS	52
SAMPLE APPLICATION.....	59
CREATING A BASIC INTERFACE.....	59
FEATURES OF GE LARGE FACEPLATE WIZARDS	63
ABOUT THE LARGE FACEPLATE WIZARDS	63
POWER LEADER EPM	64
SPECTRA MICROVERSA TRIP® TRIP UNIT	67
ENHANCED MICROVERSA TRIP PM-C TRIP UNIT	68
ENHANCED MICROVERSA TRIP PM-D TRIP UNIT.....	70
POWER LEADER™ METER	72
SPECTRA ECM	74
EPM 3710 METER	76
EPM 3720 METER	78
EPM 7700 METER	80
269 PLUS MOTOR MANAGEMENT RELAY.....	82
565 FEEDER MANAGEMENT RELAY	87
FEATURES OF TABULAR DATA SCREEN WIZARDS.....	94
INTRODUCTION.....	94
FEATURES OF TABULAR DATA SCREENS	94
POWER LEADER EPM.....	96
SPECTRA MICROVERSA TRIP	97
ENHANCED MICROVERSA TRIP-C TRIP UNIT	98
ENHANCED MICROVERSA TRIP-D TRIP UNIT	99
POWER LEADER METER	100
SPECTRA ECM	101
MDP DIGITAL OVERCURRENT RELAY	102
<i>Monitoring Tab</i>	102
<i>Command Tab</i>	103
<i>Setup Tab</i>	104
PQM (POWER QUALITY METER)	105
<i>Metering Tab</i>	105
<i>Status Tab</i>	106
<i>Demand Tab</i>	107
<i>IV Range Tab</i>	108
<i>P Range Tab</i>	109
<i>Analysis Tab</i>	110
<i>IO Tab</i>	111
<i>Setpoints Tab</i>	112
POWER QUALITY METER II (EPM8000).....	113
<i>Metering Tab</i>	113
<i>Status Tab</i>	114
<i>Demand Tab</i>	115
<i>IV Range Tab</i>	116
<i>P Range Tab</i>	117
<i>Analysis Tab</i>	118
<i>IO Tab</i>	119
<i>Setpoints Tab</i>	120
MOTOR MANAGER II (MMII)	120
EPM 3710 METER	122
EPM 3720 METER	123

EPM 7300 METER	124
<i>Metering Tab</i>	125
<i>Min/Max Tab</i>	126
<i>Setup Tab</i>	127
EPM 7330 METER	128
<i>Metering Tab</i>	129
<i>Min/Max Tab</i>	130
<i>Setup Tab</i>	131
EPM 7500/7600 METER	132
<i>Metering Tab</i>	132
<i>Min/Max Tab</i>	134
<i>Power Quality Tab</i>	135
<i>Demand Tab</i>	136
<i>Inputs Tab</i>	137
<i>Setup 1 Tab</i>	138
<i>Setup 2 Tab</i>	140
EPM 7700 METER	142
<i>Metering Tab</i>	142
<i>Min/Max Tab</i>	144
<i>Power Quality Tab</i>	145
<i>Demand Tab</i>	146
<i>Inputs Tab</i>	147
<i>Setup 1 Tab</i>	148
<i>Setup 2 Tab</i>	150
UNIVERSAL RELAY	152
<i>Metering Tab</i>	153
<i>Power Quality Tab</i>	154
<i>Protection Control Tab</i>	155
<i>Power System Configuration Tab</i>	156
<i>Transformer Tab</i>	158
<i>Elements Tab</i>	159
<i>Digital Counter Tab</i>	160
<i>Virtual Inputs Tab</i>	161
<i>Virtual Outputs Tab</i>	162
<i>Contact Inputs Tab</i>	163
<i>Contact Output Tab</i>	164
<i>DCMA Tab</i>	165
<i>Source Tabs</i>	166
<i>Demand Tab</i>	167
<i>Line Tab</i>	168
<i>Breaker Tab</i>	169
<i>Contact Output Current States Tab</i>	170
<i>Remote Temperature Detection Tab</i>	171
<i>Bus Tab</i>	172
239 MOTOR PROTECTION RELAY	173
<i>Metering tab</i>	173
<i>Status Tab</i>	174
<i>Trip Data</i>	175
<i>Setpoints Tab</i>	176
269 PLUS MOTOR MANAGEMENT RELAY	177
369 MOTOR MANAGEMENT RELAY	178
<i>Metering Tab</i>	178
<i>Alarms Tab</i>	180
<i>Trip Data Tab</i>	181
<i>Trip Counter Tab</i>	182
<i>Demand Tab</i>	183

<i>Local RTD Tab</i>	184
<i>Remote RTD Tab</i>	185
<i>Control Tab</i>	186
<i>Setup Tab</i>	187
SR469 MOTOR MANAGEMENT RELAY	188
<i>Metering Tab</i>	189
<i>Status Tab</i>	190
<i>Alarms Tab</i>	191
<i>Trip Tab</i>	192
<i>IO Tab</i>	193
<i>Maintenance Tab</i>	194
<i>Analog Tab</i>	195
<i>RTD HI Tab</i>	196
<i>Setpoints Tab</i>	197
SR489 GENERATOR MANAGEMENT RELAY	198
<i>Metering Tab</i>	198
<i>Pickup Tab</i>	199
<i>Alarms Tab</i>	200
<i>Trip Data Tab</i>	201
<i>IO Tab</i>	202
<i>Maintenance Tab</i>	203
<i>Setpoints Tab</i>	204
565 FEEDER MANAGEMENT RELAY	205
SR735 FEEDER RELAY	207
<i>Metering Tab</i>	207
<i>Trip Data Tab</i>	208
<i>Setpoints Tab</i>	209
SR745 TRANSFORMER MANAGEMENT RELAY	210
<i>Metering Tab</i>	210
<i>Flags Tab</i>	211
<i>IO Tab</i>	212
<i>Demand Tab</i>	213
<i>Harmonic Tab</i>	214
<i>Setpoints Tab</i>	215
<i>Power Tab</i>	216
SR750/SR760 FEEDER MANAGEMENT RELAY	217
<i>Metering Tab</i>	218
<i>Status Tab</i>	219
<i>Fault Tab</i>	219
<i>Trip Tab</i>	220
<i>Demand Tab</i>	221
<i>Logic Tab</i>	222
<i>IO Tab</i>	223
<i>Setpoints Tab</i>	224
FANUC 90/30	225
FANUC 90/70	225
MX200	226
<i>Metering Tab</i>	226
<i>Setup Tab</i>	228
MX250/MX150	231
<i>Metering Tab</i>	231
<i>Setup Tab</i>	233
GEN PLC	236
<i>Master Tab</i>	236
<i>Generator Tab</i>	237
<i>PSG</i>	238

EPM5300P.....	240
<i>Metering Tab</i>	240
<i>Setup One Tab</i>	241
<i>Setup Two Tab</i>	243
EPM5200P.....	245
<i>Metering Tab</i>	245
<i>Setup One Tab</i>	246
EPM5350P.....	249
<i>Metering</i>	249
<i>Setup One</i>	250
<i>Setup Two</i>	251
EPM5000P.....	253
<i>Metering</i>	253
<i>Setup</i>	254
EPM9450Q.....	255
<i>Metering</i>	255
<i>Min/Max</i>	256
<i>Demand</i>	257
<i>Thermal Average</i>	258
<i>Digital Inputs</i>	259
<i>Setup</i>	260
EPM9650Q.....	261
<i>Metering</i>	261
<i>Min/Max</i>	262
<i>Demand</i>	263
<i>Thermal Average</i>	264
<i>Digital Inputs</i>	265
<i>Setup</i>	266
<i>Flicker</i>	267
EPM7430D	268
EPM7450D	268
<i>Metering</i>	268
<i>Min/Max</i>	269
<i>Limits</i>	270
<i>Setup</i>	271
ENTELLISYS LVS	272
<i>Configuration</i>	272
<i>System Health</i>	274

..... 274

Metering 274

User Setting 277

Relay Protection 278

..... 280

Preventive Maintenance 280

Breaker Setting 281

Contact Input/Output 281

Virtual Input/Output 282

TROUBLESHOOTING 284

EPM 3710/EPM 3720 – NO DATA OR INCORRECT DATA DISPLAYED	284
EPM 3720 – KVAH IMPORT VALUES INCORRECT	284
LONG UPDATE WHEN CHANGING SETPOINTS	284
PLEPM – WRONG METERING TAB DISPLAYED	285
APPENDIX A: EPM 3720 SLIDING WINDOW DEMAND KEYS	286
DOWNLOADING SLIDING DEMAND WINDOW KEYS TO THE EPM 3720	286
APPENDIX B: AUTOMATIC WAVEFORM CAPTURE AND WAVEFORM RETRIEVAL ON EPM 3720 ...	292
USING A SETPOINT TO TRIGGER WAVEFORM CAPTURE OR RECORD ON THE EPM 3720	292
INDEX	307

Introduction

Welcome

The PMCS Interface Toolkit is a MULTILIN 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 CIMPPLICITY. 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 CIMPPLICITY HMI? What are "Wizards"?	Refer to the documentation that came with your CIMPPLICITY HMI package. Start with the introduction and tutorial sections, which will teach you about CIMPPLICITY 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 CIMPPLICITY 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 CIMPPLICITY 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 CIMPPLICITY HMI development environment and a special set of wizards developed for use with the power management devices supported by PMCS *6.15*.

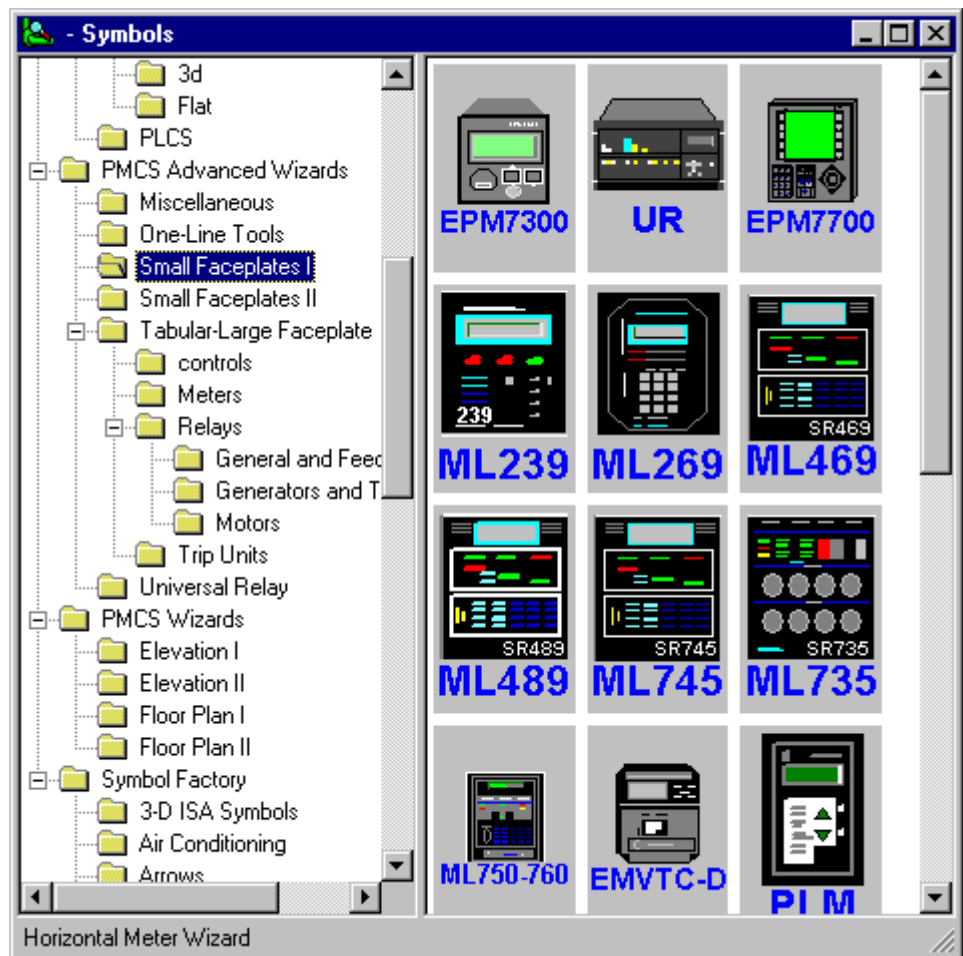
Installation

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 6.1, 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

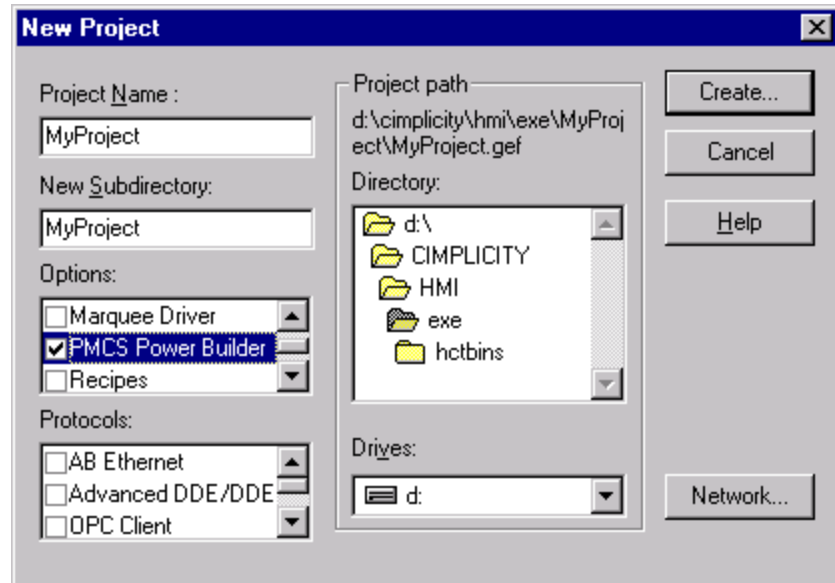
The wizards contained in the PMCS Interface Toolkit allow you to quickly build accurate and friendly user interfaces with CIMPPLICITY HMI. In addition to the various wizards standard with CIMPPLICITY HMI development systems, the User Screen Configurator provides five types of powerful GE wizards:

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

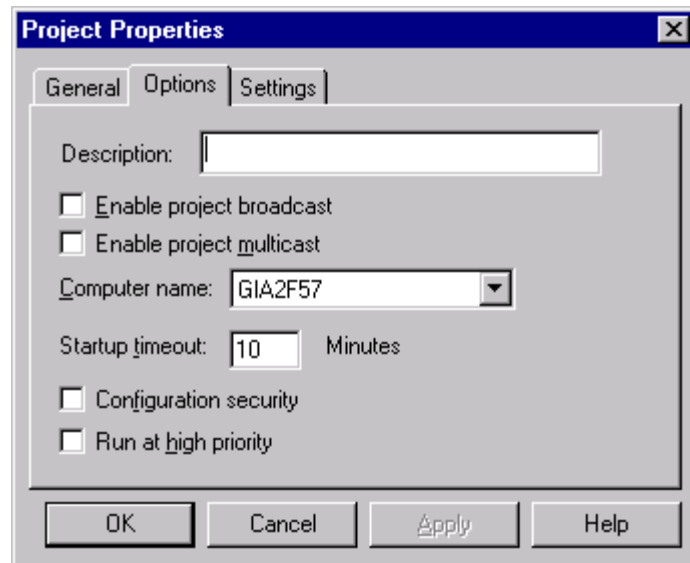
Configuring a CIMPLICITY Project for PMCS

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 `simplicity\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:

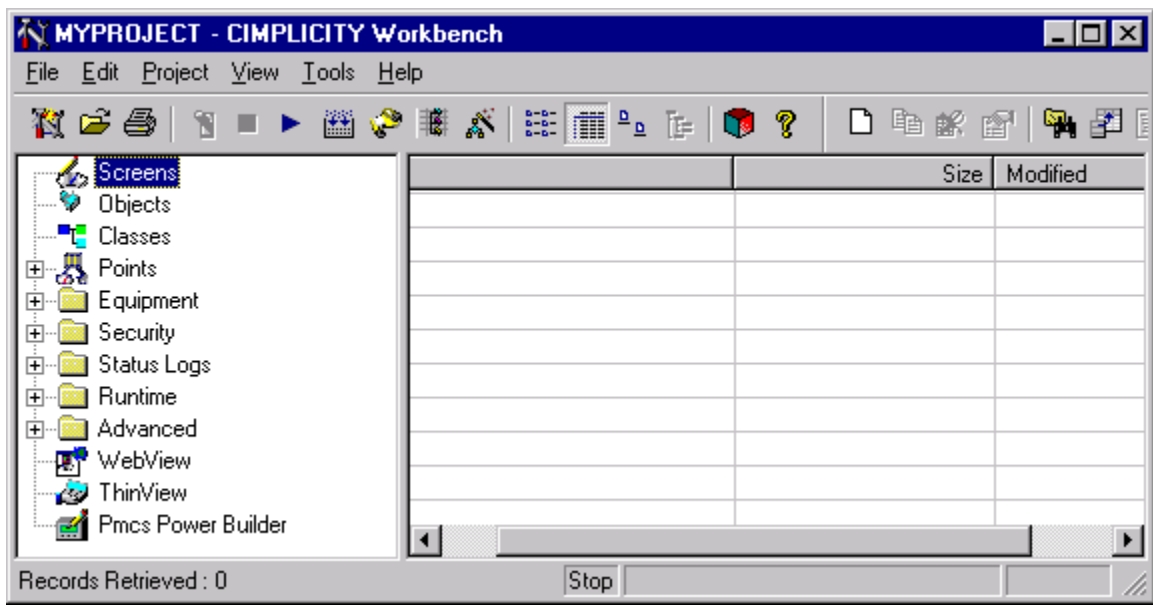


3. In the Project Properties window (Options tab), select the Enable project broadcast checkbox if you will be using CIMPLICITY HMI view nodes. Make sure the Computer name field matches the name of the host machine.

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:

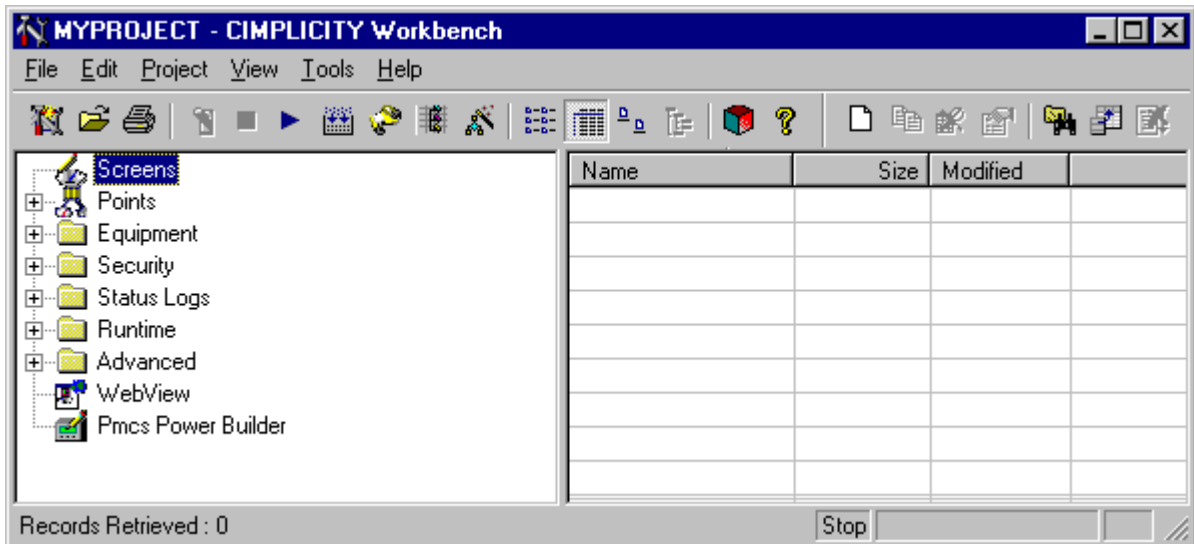


Double-click PMCS Power Builder to begin adding devices, and refer to *PMCS PowerBuilder - Configuring Advanced Wizards* in the following section for details on placing a PMCS Advanced Wizard in a CIMPLICITY project.

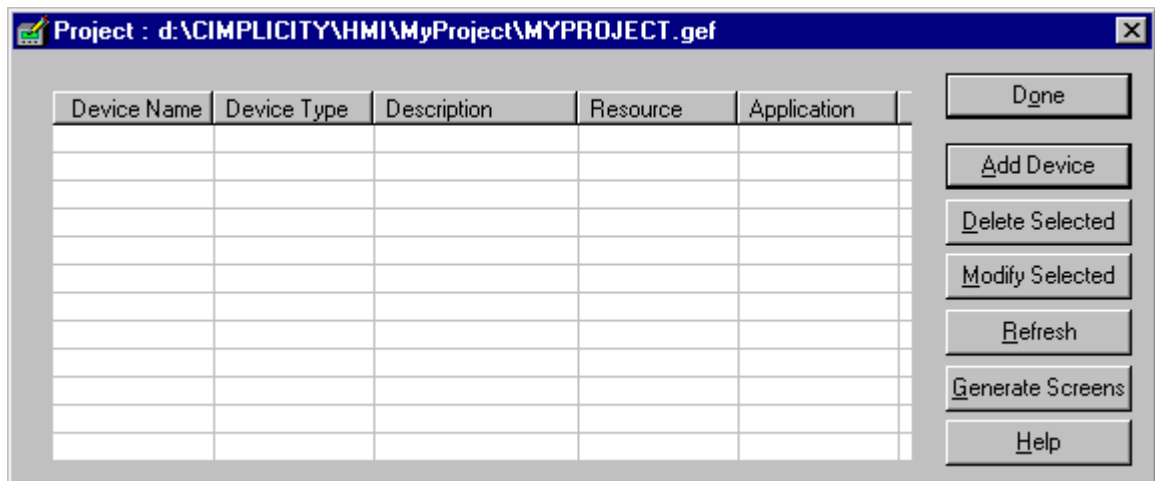
PMCS PowerBuilder - Configuring Advanced Wizards

PMCS Power Builder is a powerful tool to drastically 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 6.1. 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.

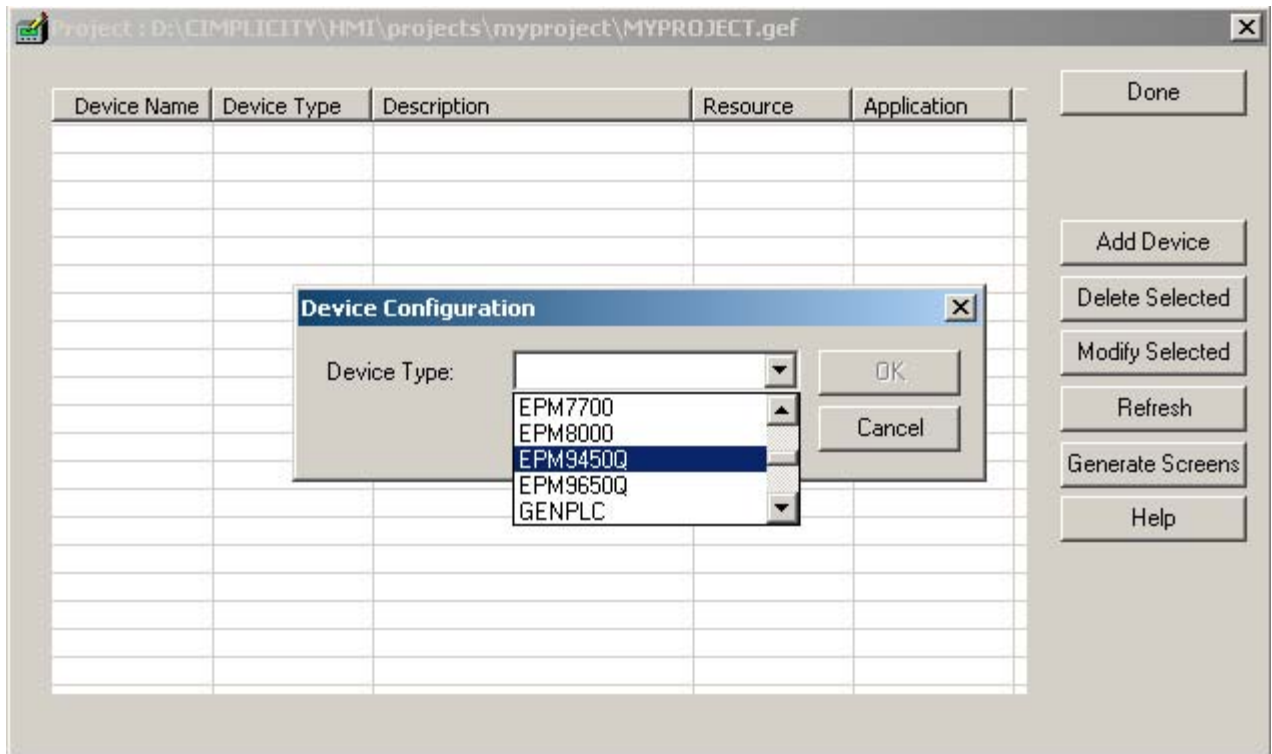
Modify Selected – use this button to change the Description, Resource, and application information for an existing (selected) device. You can also modify a device's configuration by double-clicking a listed device, or by right-clicking an existing device and selecting "Modify Selected" from the drop 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.

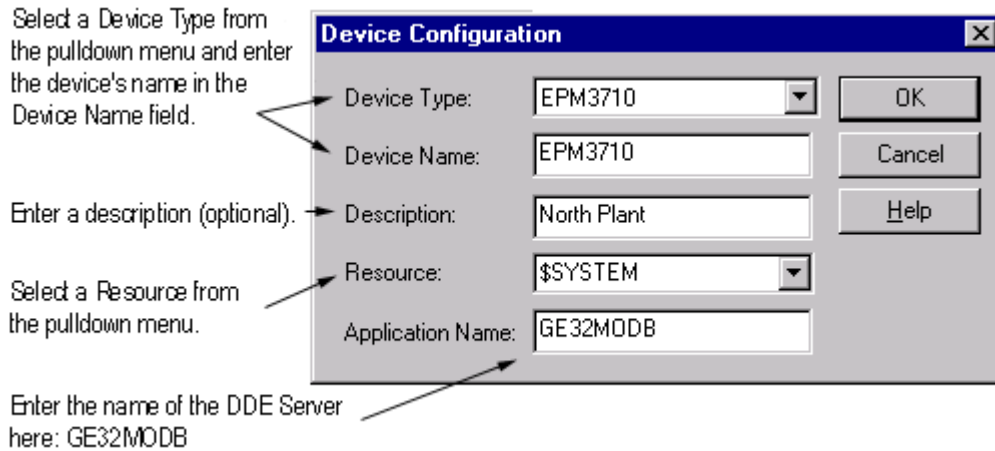
Help – use this button to access PMCS Power Builder help information.

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:

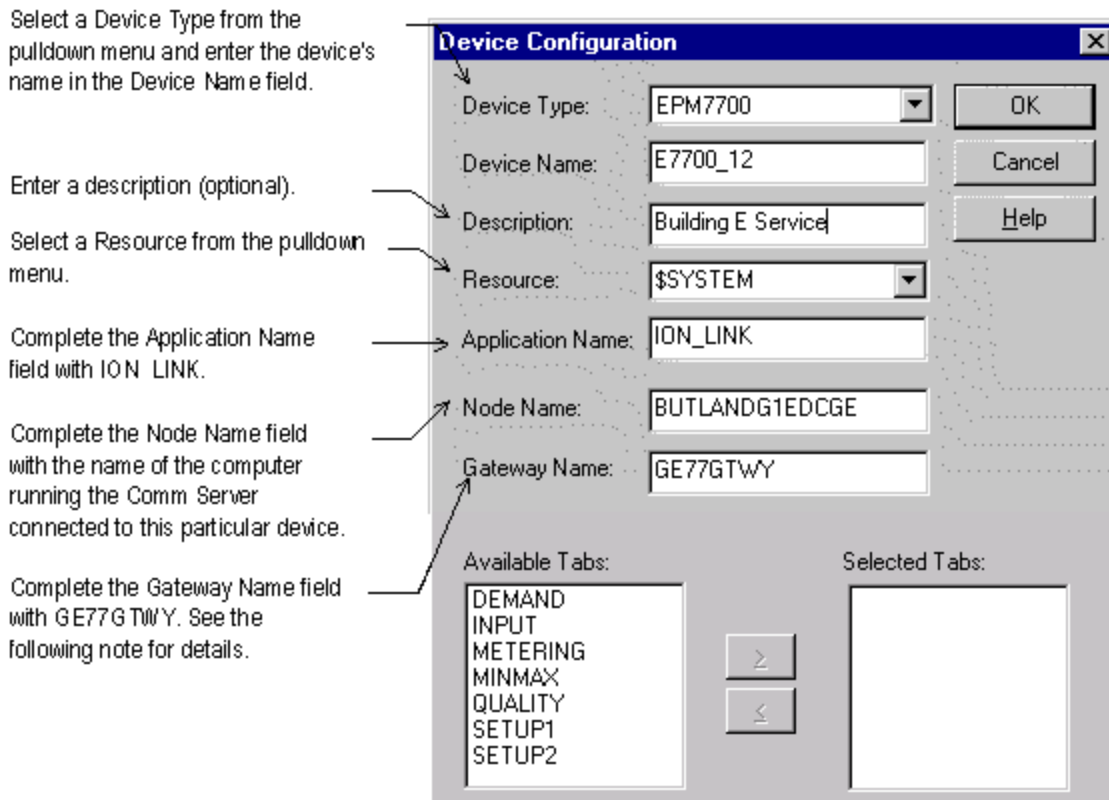


Select the device type to add, and the Device Configuration dialog dynamically expands to display the device-specific configuration parameters. For example, while most devices require only five parameters (Type, Name, Description, Resource, and the Server's Application name), some more complex device 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 MDP, EPM7300, EPM7330, EPM 7500, EPM 7600, EPM 7700, Multilin PQM, EPM8000, Multilin 369, Multilin 469, Multilin 489, Multilin 750, Multilin 760, Multilin 735, Multilin 745, MX 200, MX 250, GENPLC, EPM5000P, EPM5200P, EPM5300P, EPM5350P, EPM9450Q, EPM9650Q, EPM7430-7450D and Universal Relay require some additional configuration information, and these examples are shown separately.

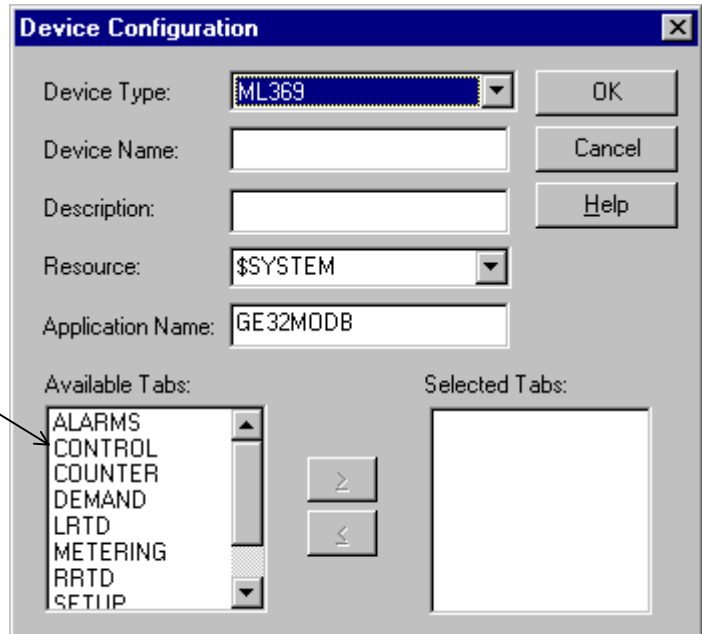


Device Configuration Dialog - most PMCS Advanced Wizards



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.

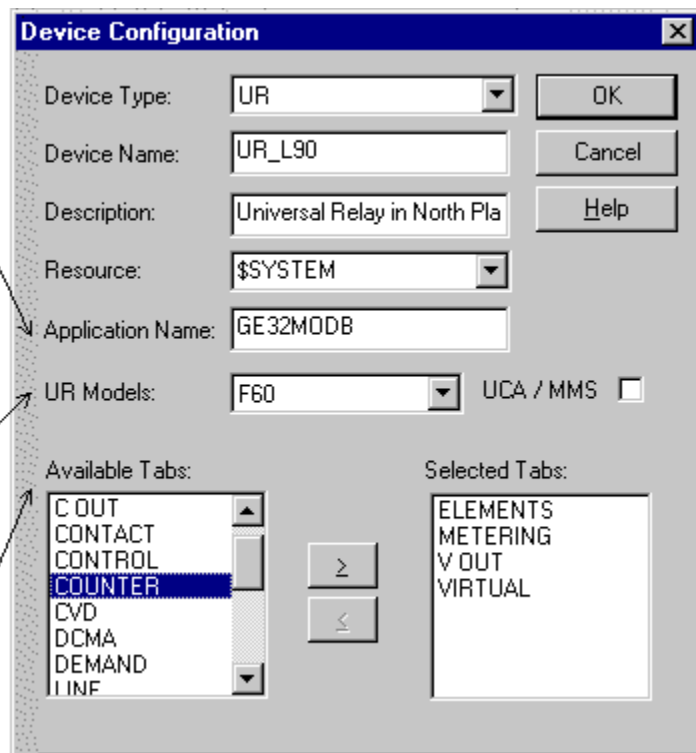


Device Configuration Dialog - 369

Complete the Application Name field; typically GE32MODB, but UCA/MMS is **NOT supported in this release.**

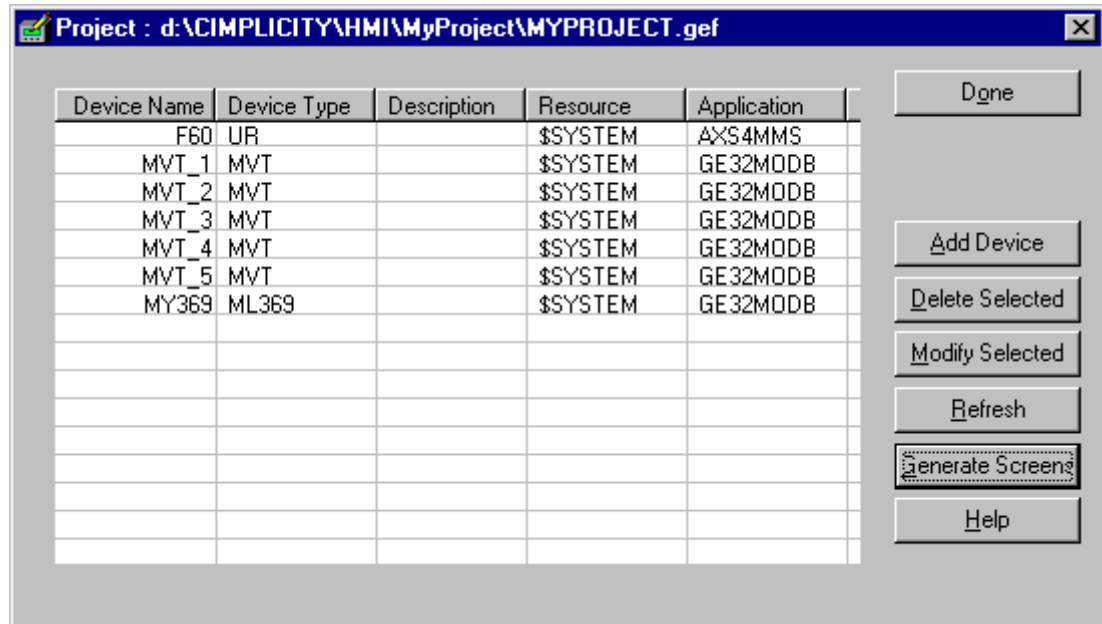
Select the Model of UR which you are configuring. This determines the contents of the Available Tabs list.

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

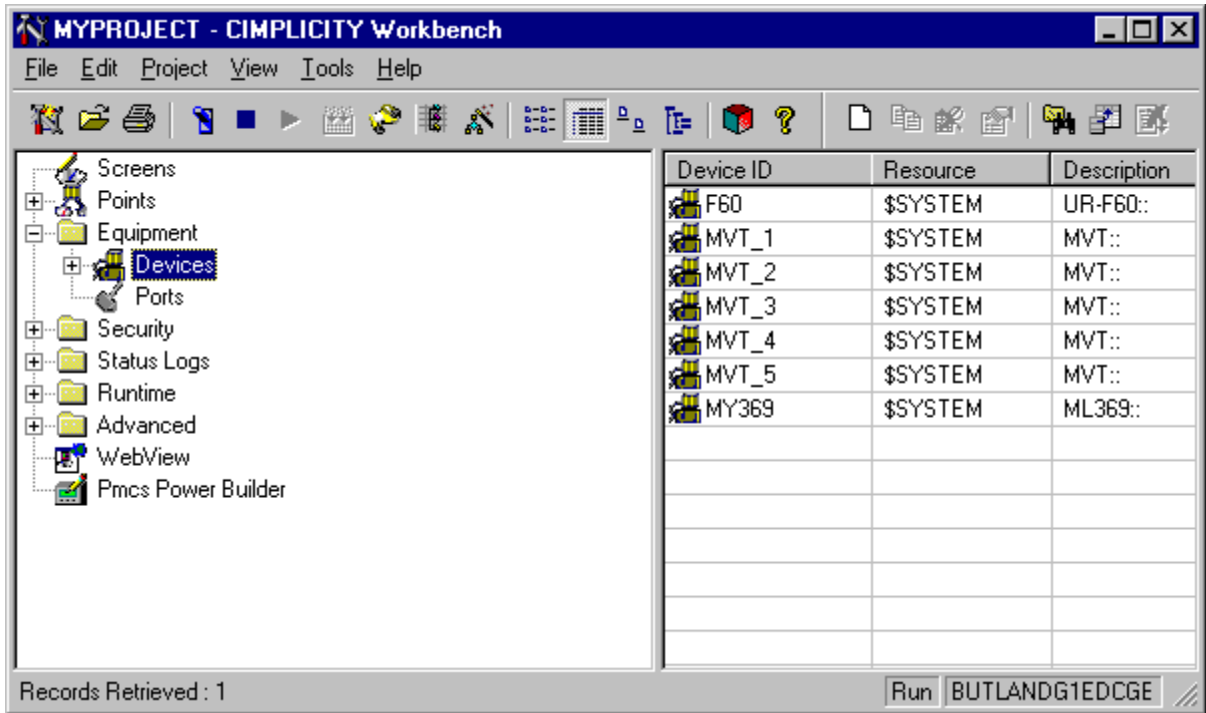
When you have completed the Device Configuration dialog for the selected device, click OK to add the device to the list displayed in the PMCS Power Builder window. In the example below, an F60 model UR, an ML 369, and five MicroVersaTrip devices have been added.



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 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 EPM 7700 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 (For all Tabular Wizards that are of Tab selection model)* 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 18, which details this wizard's special requirements.

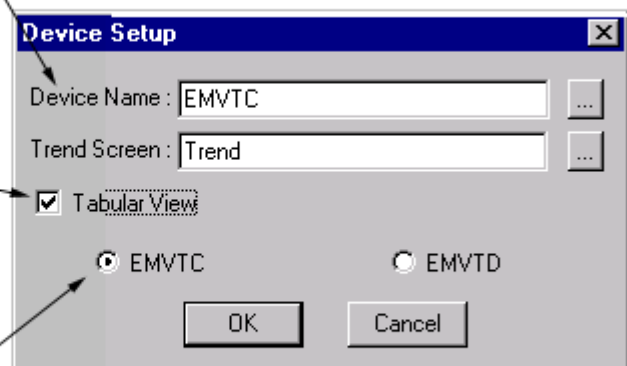
To configure the device graphics for a PMCS Advanced Wizard:

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.

Complete the Device Name and (optionally) the Trend Screen fields by selecting and trend screen using the ellipsis buttons to the right of the fields.

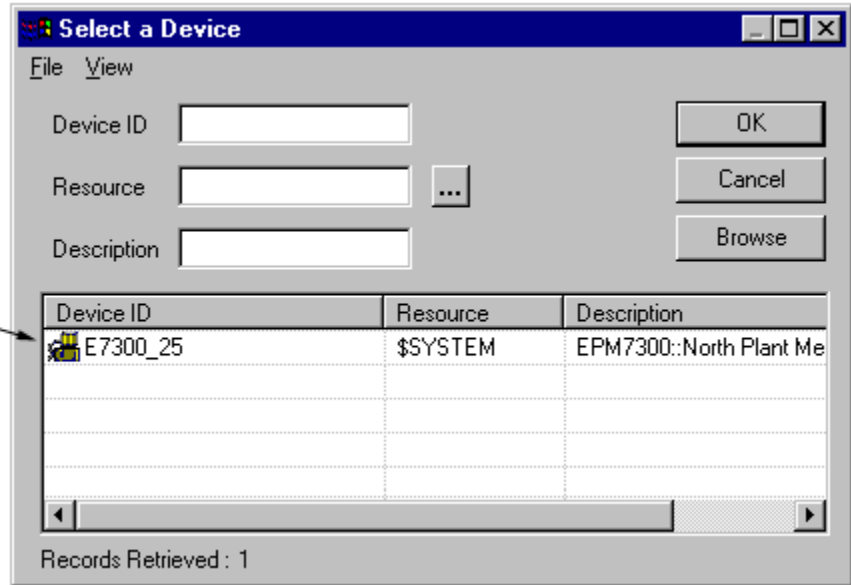
To open the Tabular view by default, select this checkbox.

EMVT-C and EMVT-D Only: Identify the wizard as an EMVT-C, or EMVT-D by selecting one of these radio buttons.



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.

The available devices are listed here for selection. Note that only devices of the type currently being configured will be listed.



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

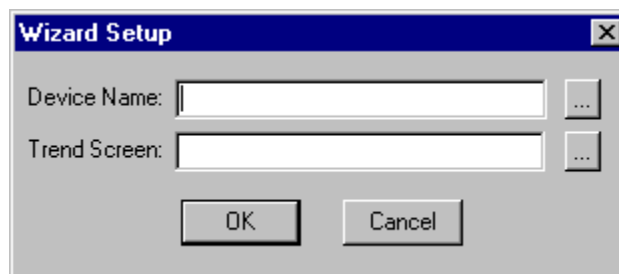
The EPM 7700 device type is more complex than the other PMCS Advanced Wizards, and its wizard reflects this. Dropping the EPM 7700 wizard into a project creates eight separate screens, each linked to the others. Another unique property of the EPM 7700 wizard is that the wizard itself is disposable. It 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.

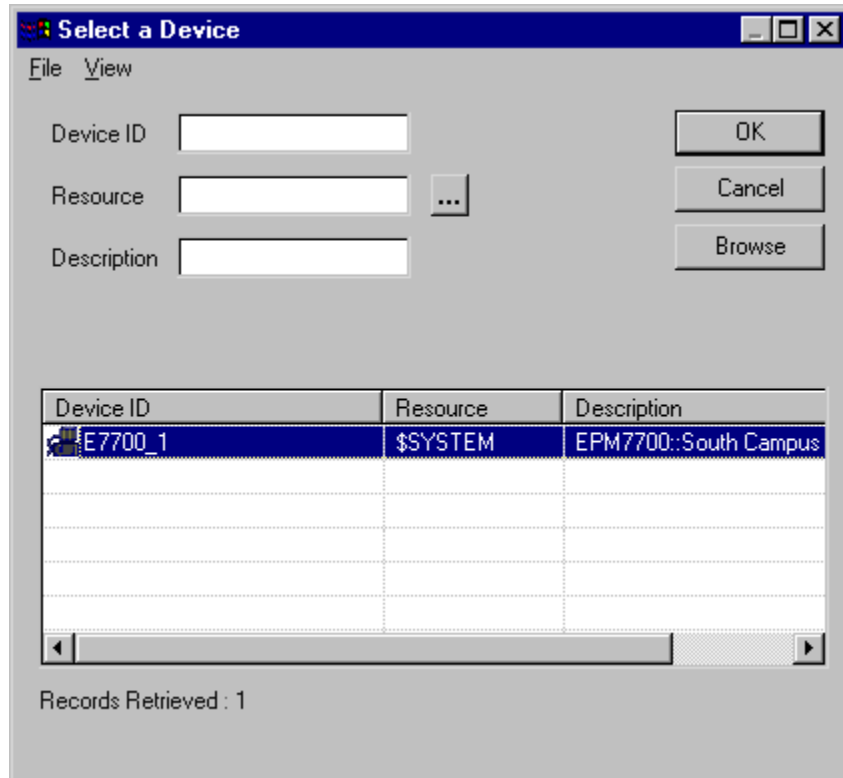
1. Open a new CimEdit screen, using the Screens>New command.

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

	<u>Import</u>	<u>Export</u>	<u>Total</u>	<u>Net</u>
kWh:	##### ##	##### ##	##### ##	##### ##
kVARh:	##### ##	##### ##	##### ##	##### ##
kVAh:			##### ##	

Reset Energy

	<u>Sliding Window Demand</u>	<u>Predicted Demand</u>	<u>Thermal Demand</u>
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	Trend	Help
Logger	Wave	Exit

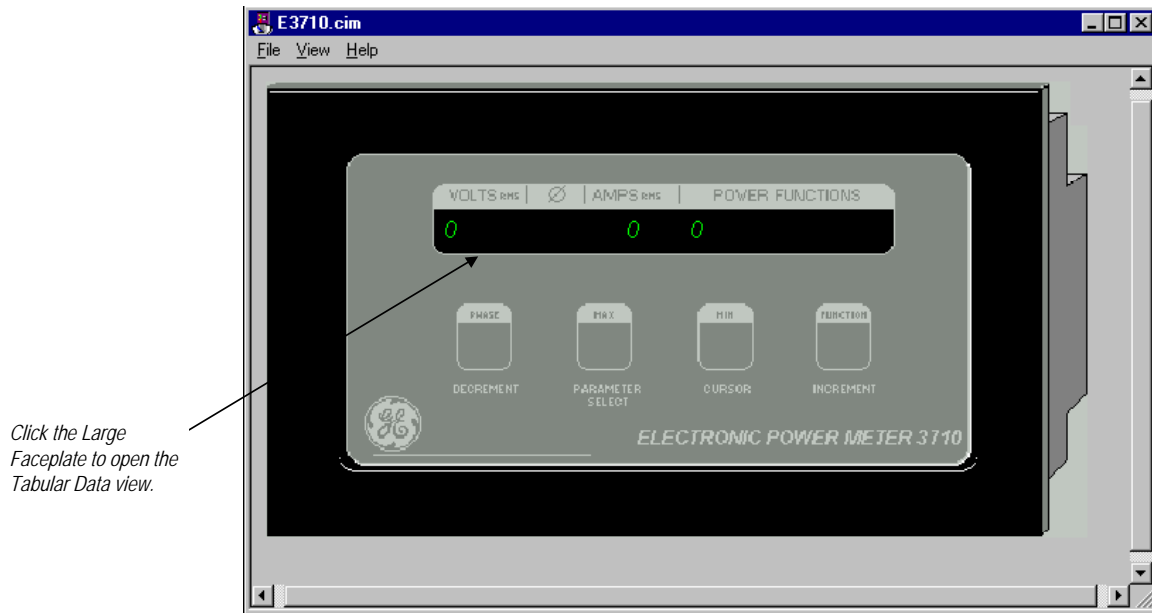
Metering MINMAX Quality Demand Input Setup 1 Setup 2

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

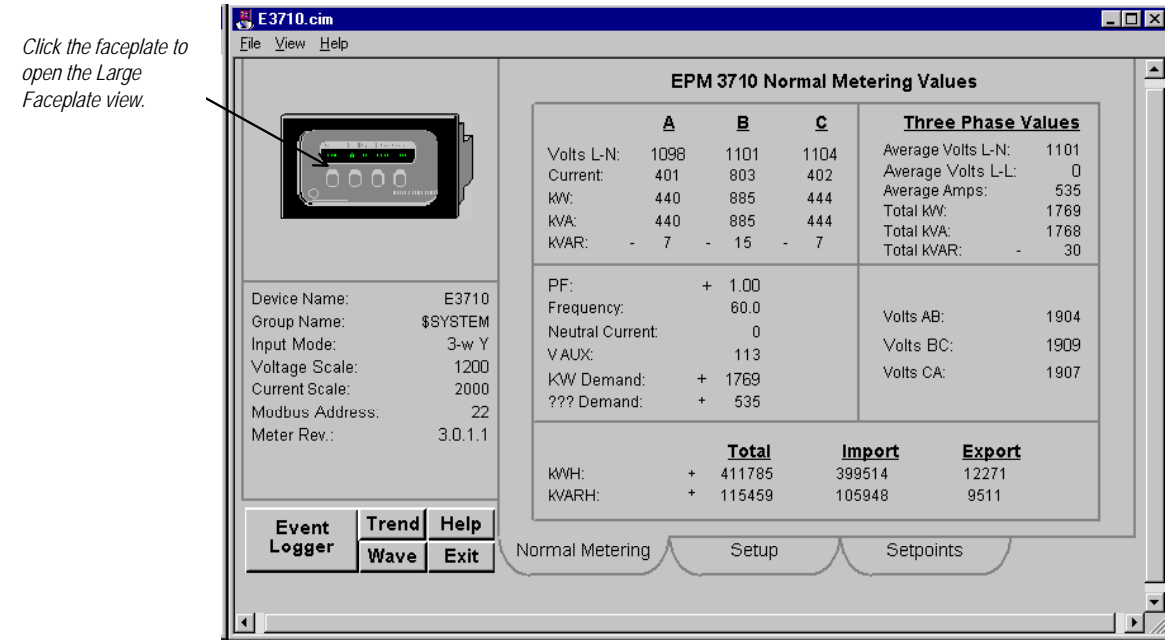
Using a PMCS Wizard

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.



Sample Application

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

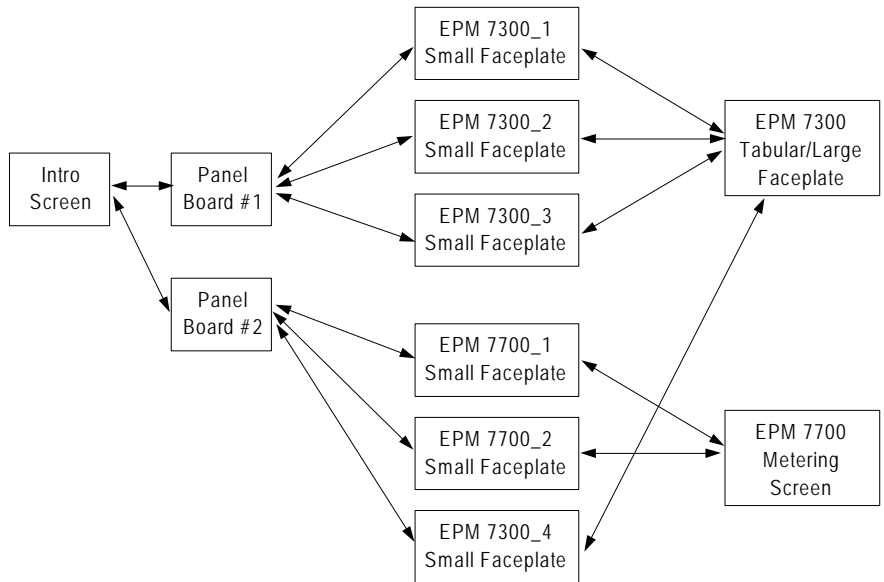
The Small Faceplate wizards are often used to create visually accurate representations of physical equipment line-up. Each Small Faceplate has a one-to-one relationship with not only the physical device, but also the Large Faceplate/Tabular wizard for that device. Clicking the Small Faceplate wizard 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 25.

Small Faceplate Wizards



Usage

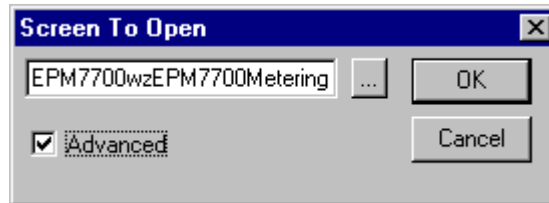
The Small Faceplate wizards are icon-sized graphics typically used to create accurate elevation views and one-line diagrams. These wizards are provided with logic to open another window, typically either a Large Faceplate/Tabular Data Screen wizard. There are several directories of Small Faceplate wizards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

Small Faceplate Configuration

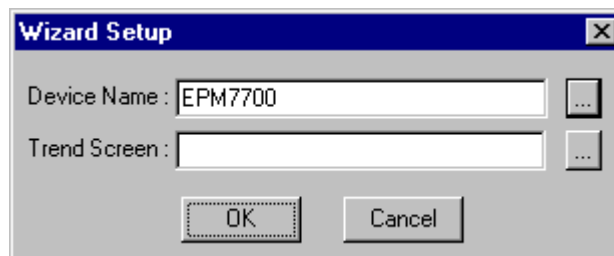
The Small Faceplate wizard for the PMCS Advanced Wizards offers additional functions beyond simply opening a designated window. If you so choose, you may configure a single Large Faceplate/Tabular wizard for each device type, regardless of how many actual devices of that type are installed, and use multiple 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.

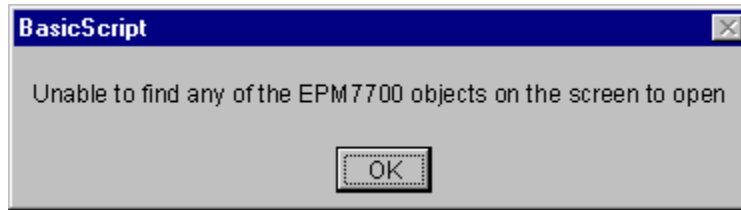
If you choose to use this many-to-one technique, select the Advanced checkbox in the Wizard Configuration dialog, as shown in the following figure. If the Advanced checkbox is not selected, the Small Faceplate wizard functions like any other Small Faceplate wizard, simply opening the selected screen.



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.

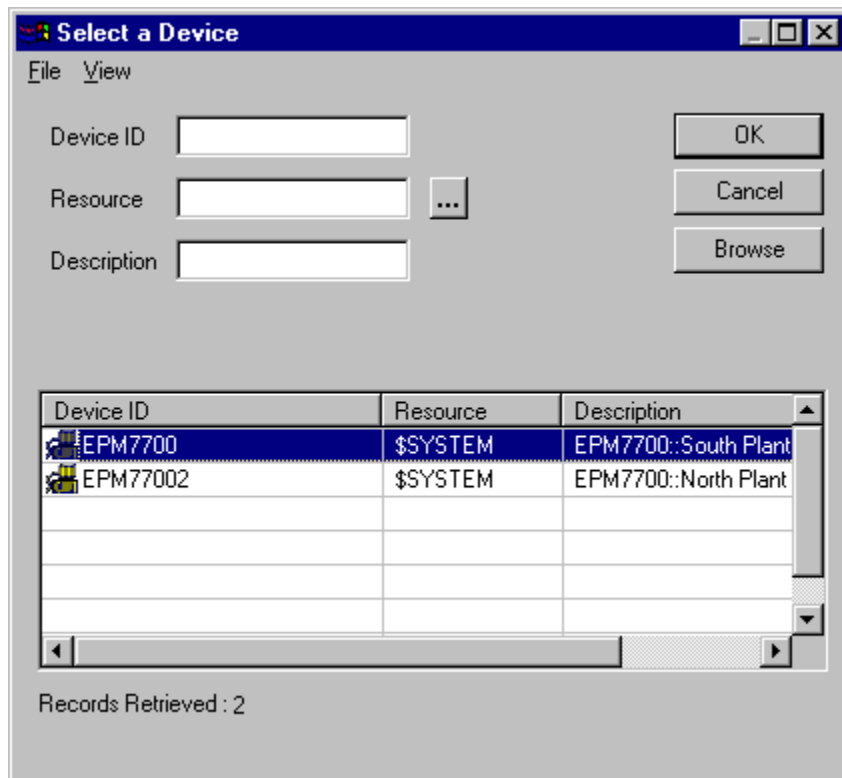


NOTE: If an advanced small faceplate wizard is configured to open a screen that does not contain a graphics wizard of the correct device type, a message similar to the one below will appear and the screen will not be opened.

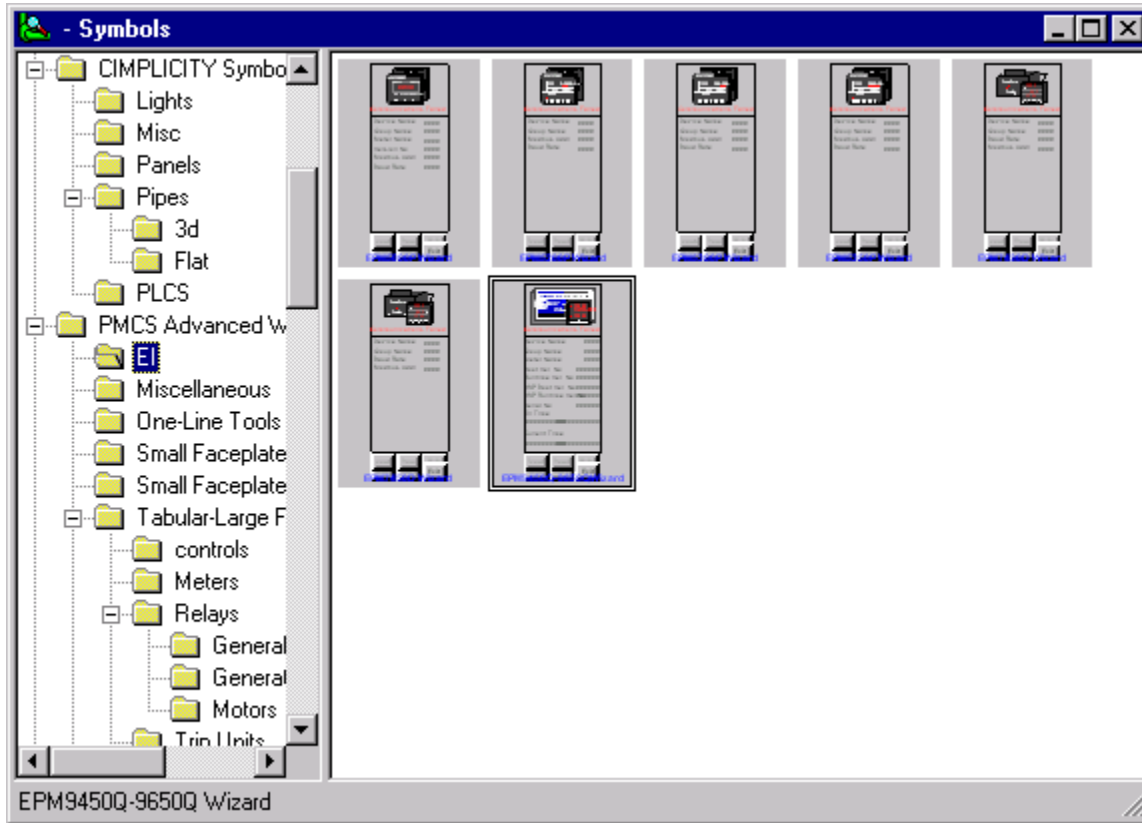


The displayed graphic resulted when an EPM7300 small faceplate was configured to open a screen containing only an EPM 7700 device graphic wizard.

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

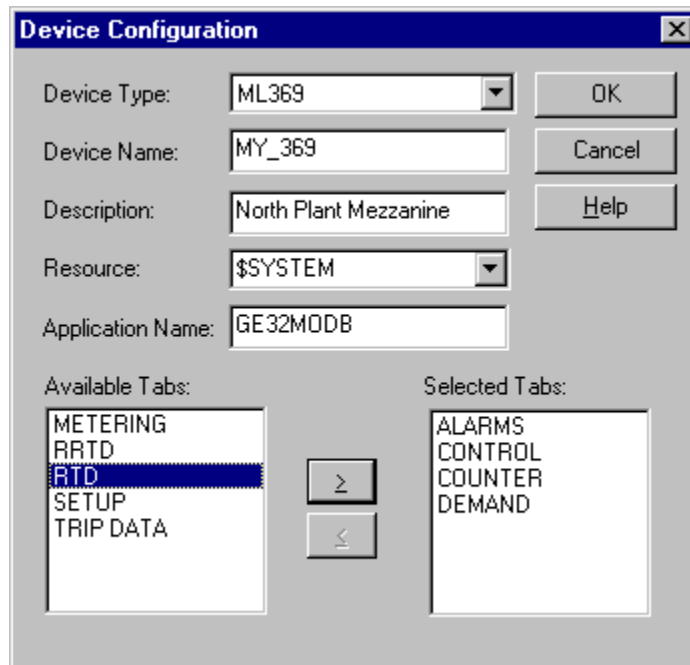
The PMCS Advanced Wizard device types require special configuration for their Large Faceplate/Tabular wizards. See the instructions provided in *Configuring PMCS Advanceds Wizards*, earlier in this chapter, and refer also to the *Sample Application* section, which provides an example of Advanced Wizards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

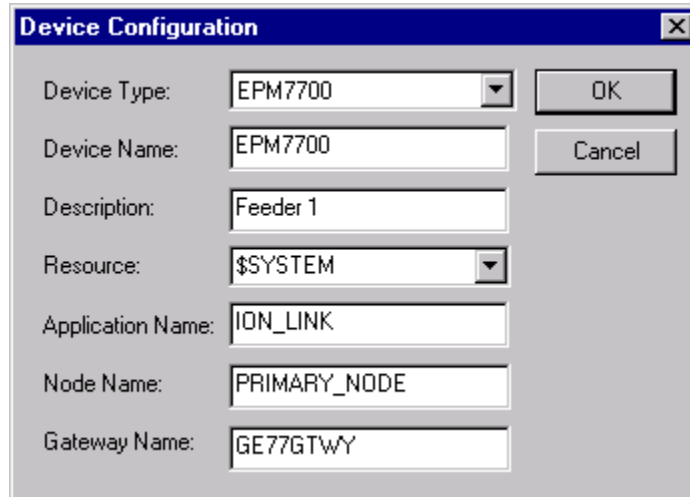
369 Motor Management Relay

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.

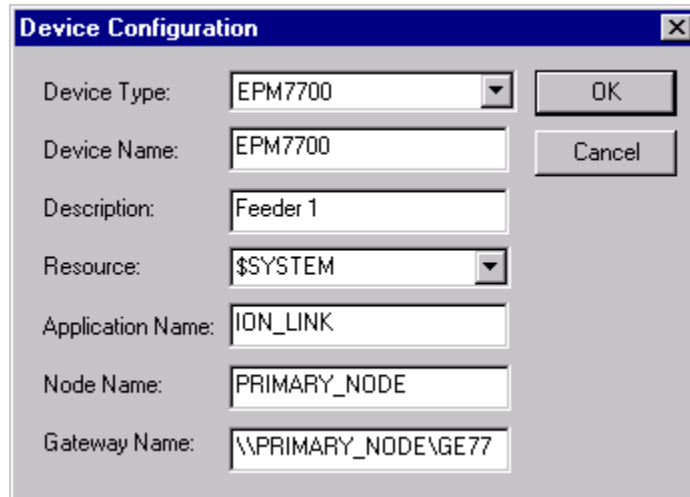


The *Node Name* field requires that you enter the name of the computer running the Communications Server that connects to this particular device. Depending on the configuration of the EPM 7700 network, this can be either the Primary node computer, or a computer setup as a “Full Station” Secondary node. 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.

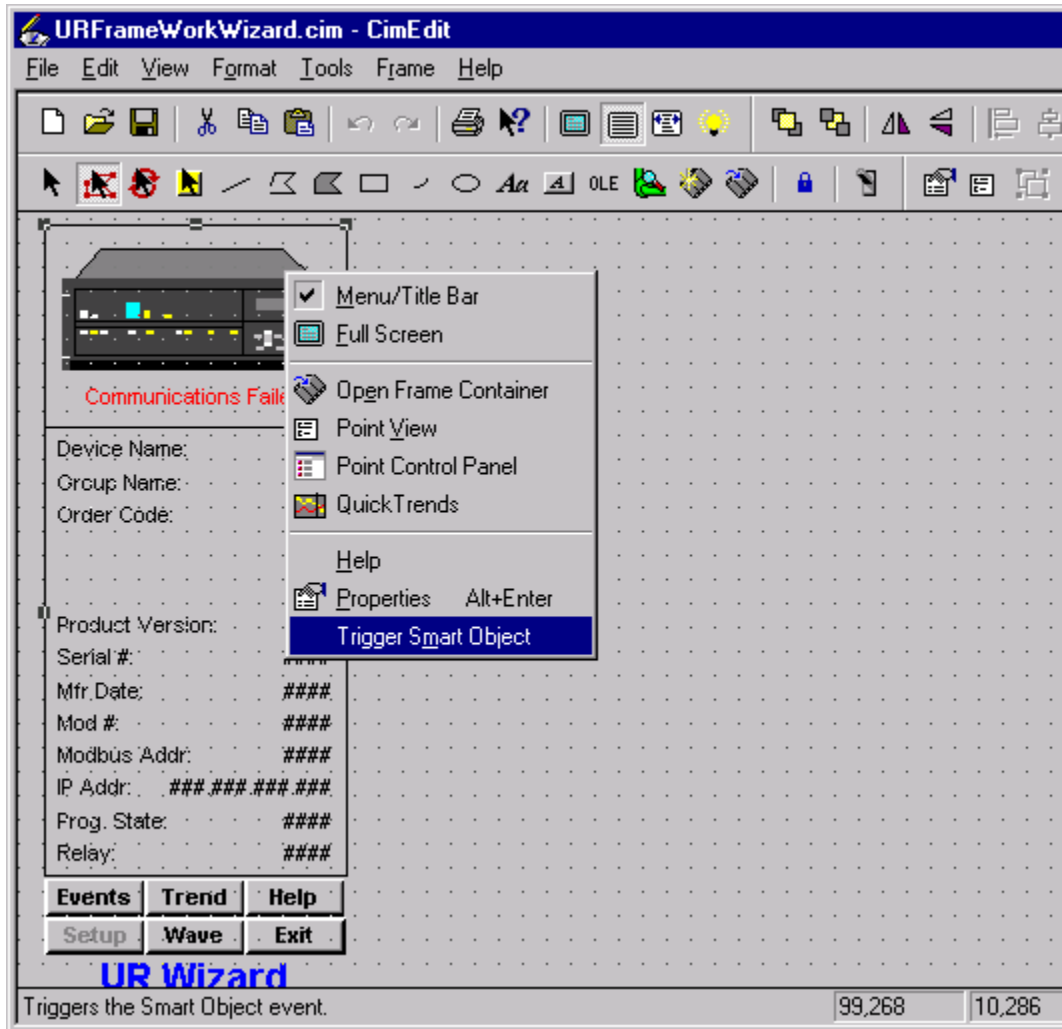


Refer to DEH-40035 for information on the Communications Server and 7700 Gateway Server.

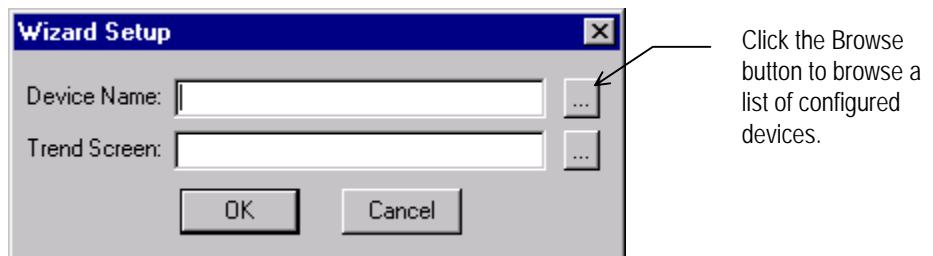
Disabling Dynamic Redraw (For all Tabular Wizards that are of Tab selection model)

As described earlier, UR and 369 type devices are highly flexible, and are typically redrawn on-the-fly by CIMPPLICITY, 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.

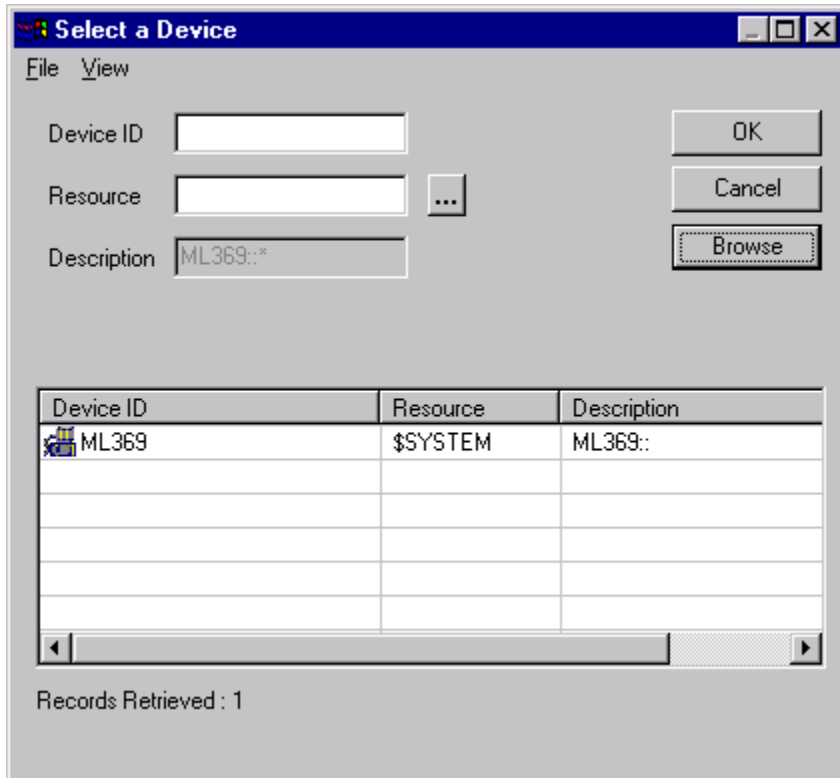
If for some reason you do not want to have the screen redraw itself, simply reconfigure the blank framework wizard. In CimEdit, open the framework wizard screen for the UR or 369 device. Right-click on the wizard graphic, and from the contextual menu displayed, choose "Trigger Smart Object," as shown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



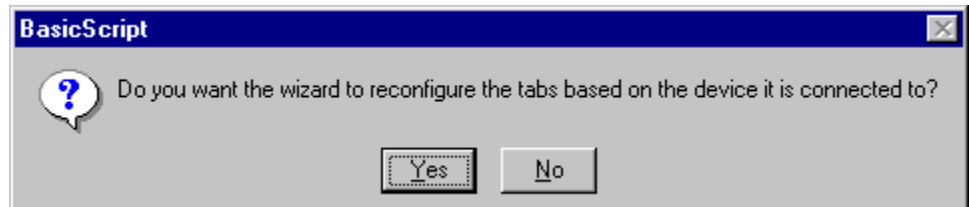
The Wizard Setup dialog appears, prompting you to select a device:



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:



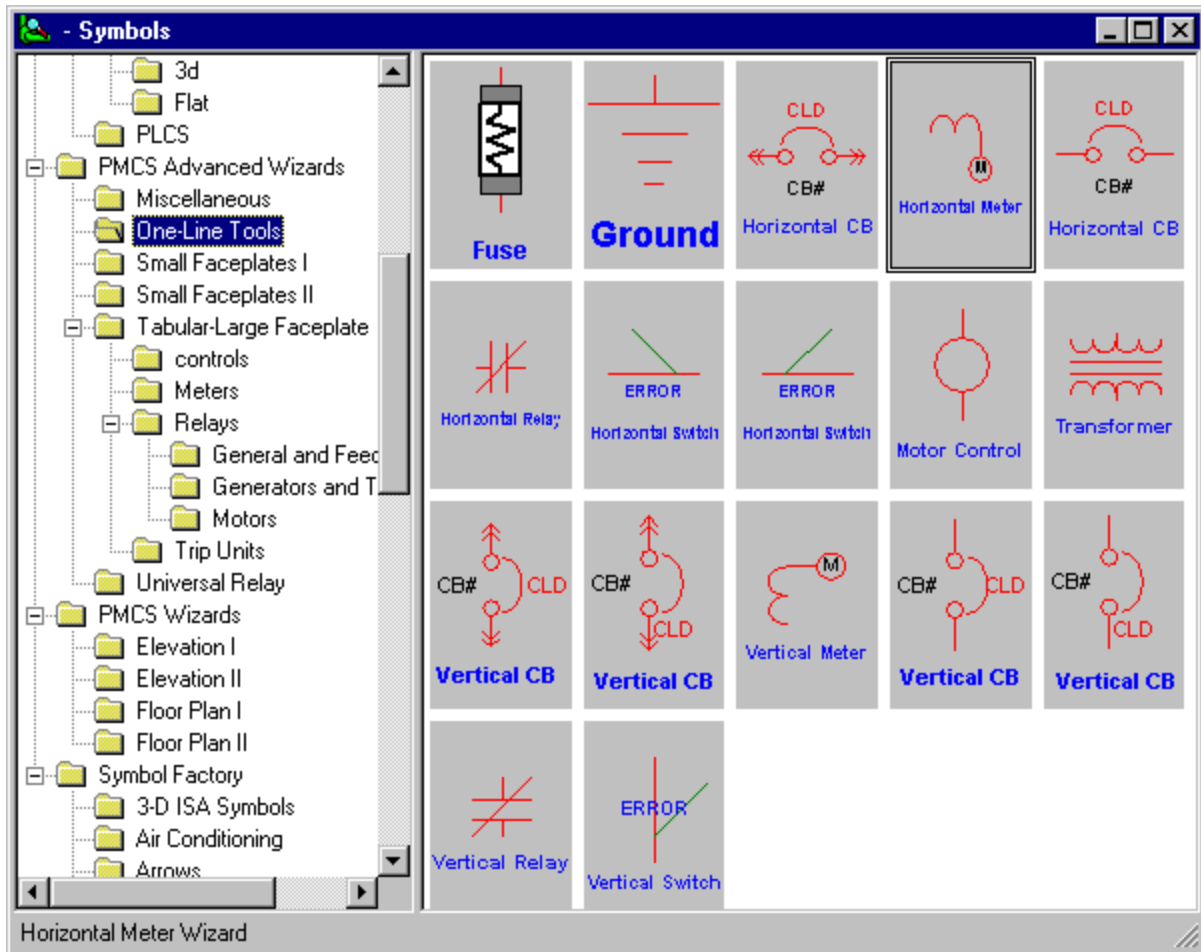
Choosing NO will cause the wizard to be redrawn once with the tabs specified for the selected device. The wizard's configuration is then fixed – it will function like a conventional wizard, displaying the configured tabs as soon as the window opens, without redrawing them. This way you can place one 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).

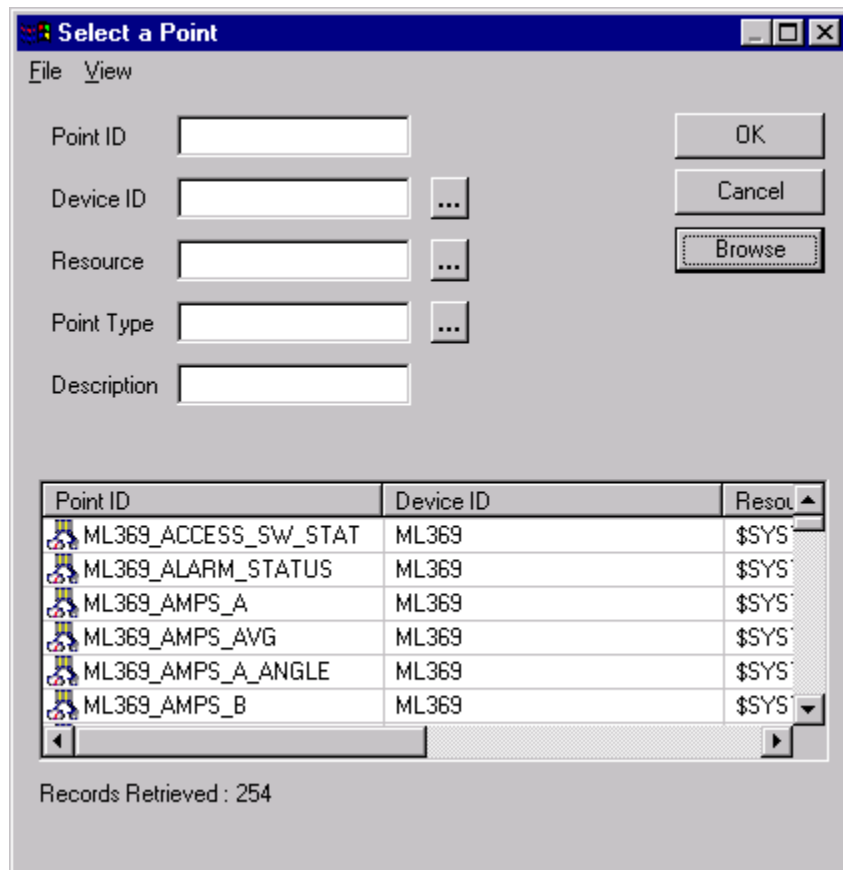
Configuration

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:

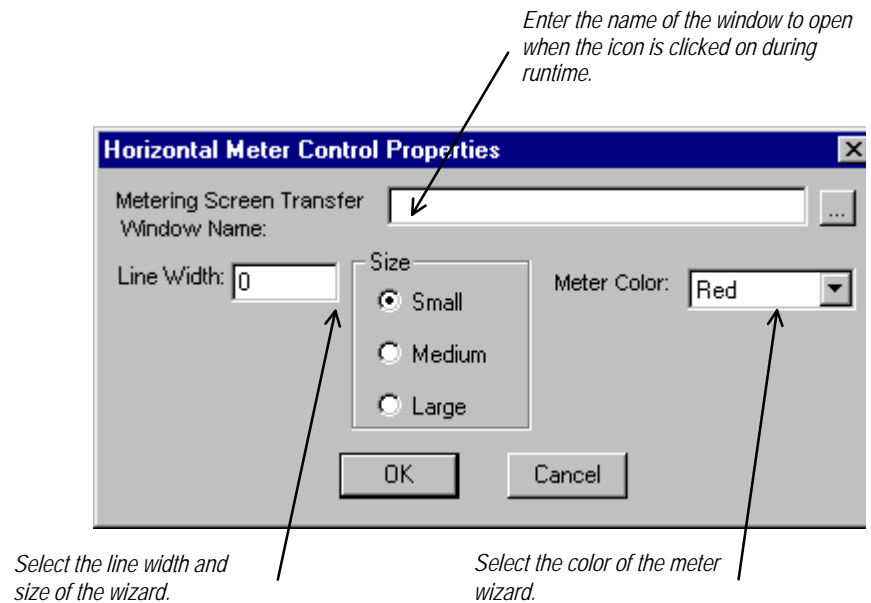


Use the snap-to-grid feature in CIMPLICITY to quickly align One-Line wizards.

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

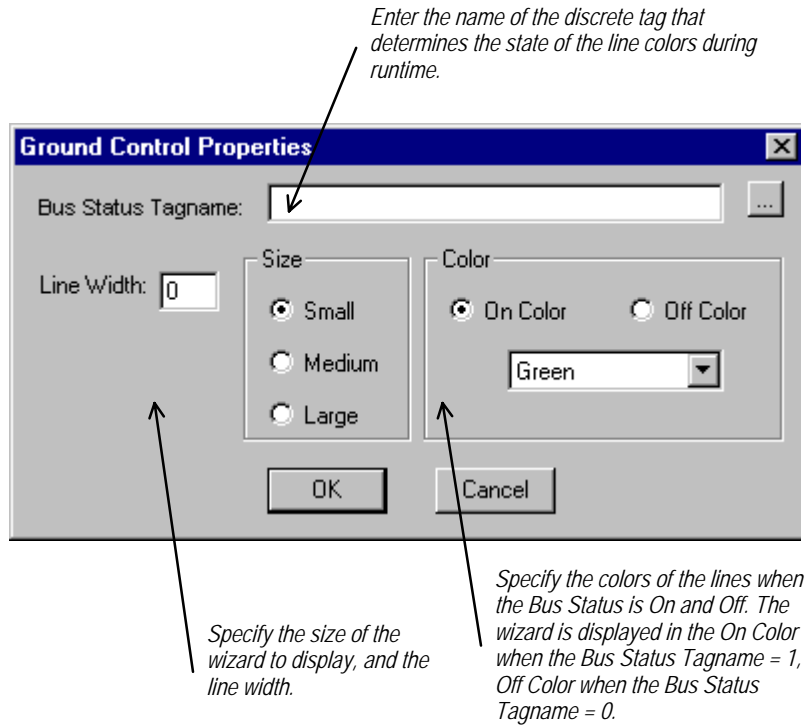
Meter One-Line Wizards

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.

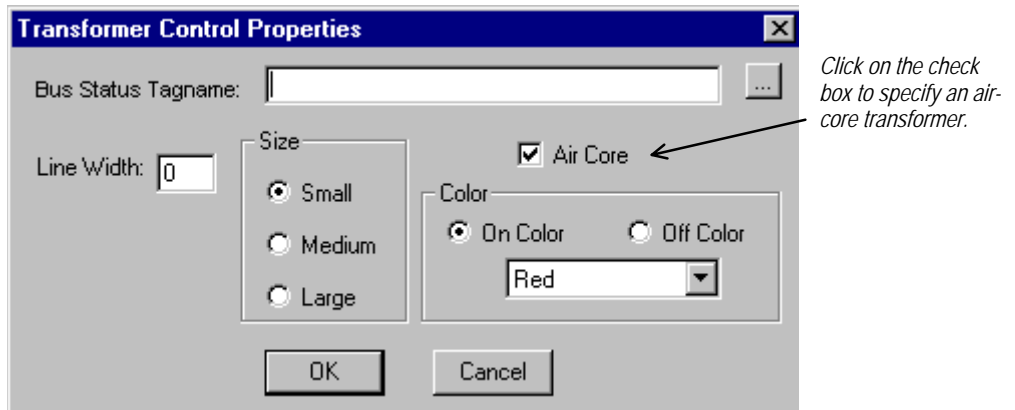


Transformer, Fuse, Ground, and Motor One-Line Wizards

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.

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

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

Click the check box to display a slash through the contacts (normally closed contact).

Horizontal Relay Control Properties

Left Connection Tagname: ...

Right Connection Tagname: ...

Contact Status Tagname: ...

Line Width:

Size

Small

Medium

Large

Color

On Color

Off Color

Diagonal

OK

Cancel

Enter the name of the discrete tag that determines the color of the relay symbol during runtime.

Specify the colors of the wizard elements when the contact status and connection discrete tags are On or Off.

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:

<u>SwOpen</u>	<u>SwClosed</u>	<u>Color</u>
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.

Enter text to display next to the breaker graphic during runtime (optional).

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

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

Enter the name of the analog tag that determines the color of the circuit breaker symbol, the state of the breaker, and the status text displayed next to the breaker icon during runtime.

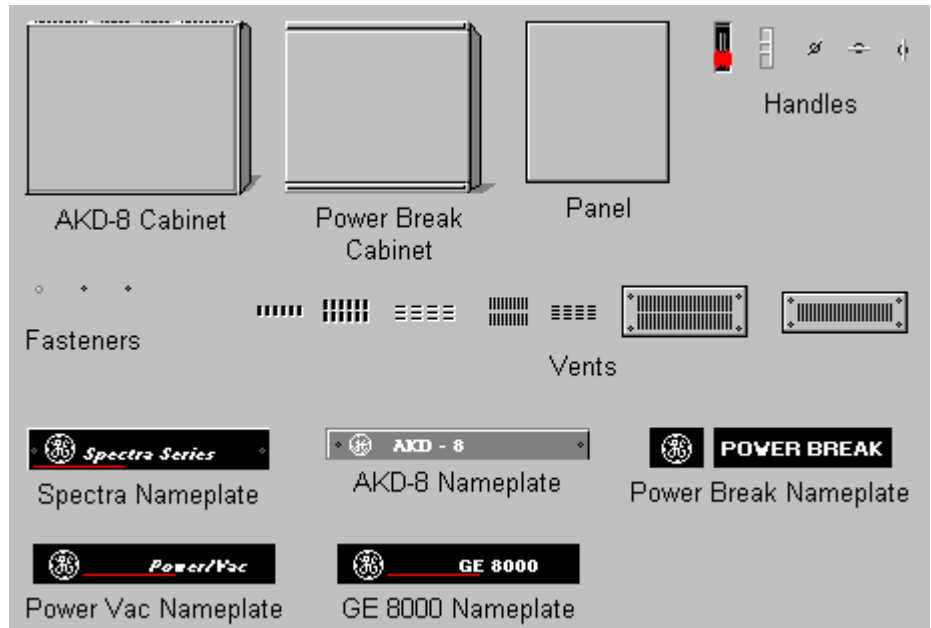
Specify the colors of the wizard elements and status text for the breaker states during runtime. See the table below for default status/color mappings.

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



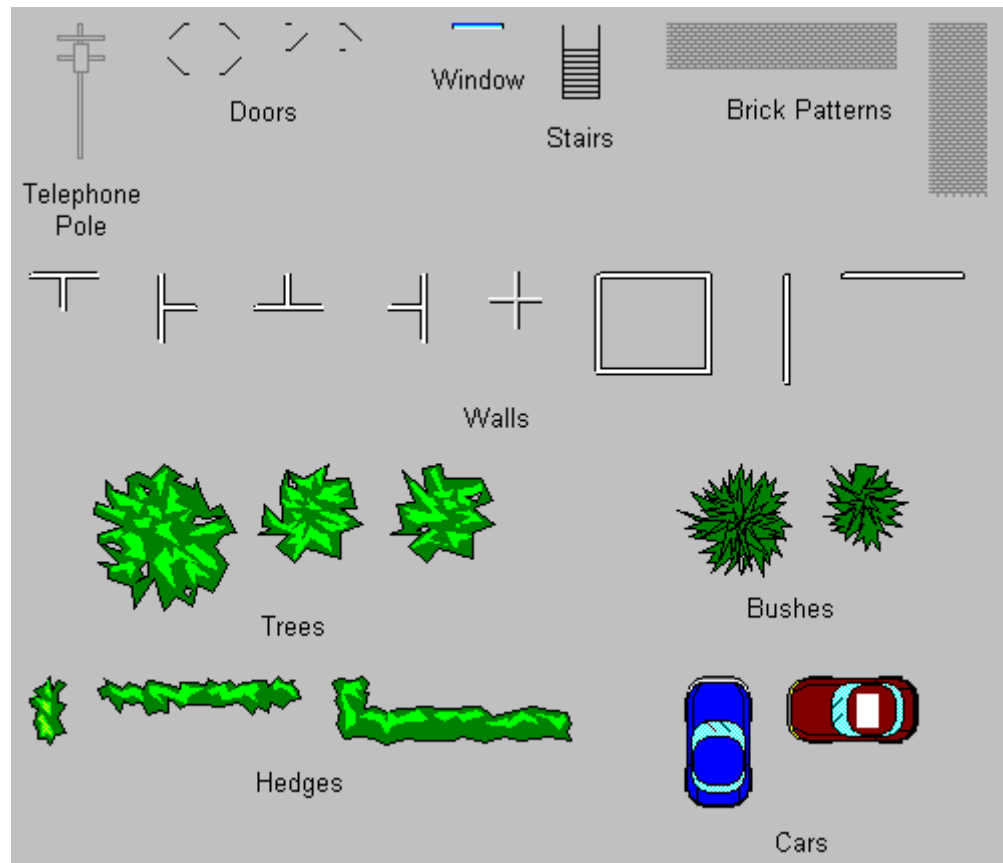
Usage

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



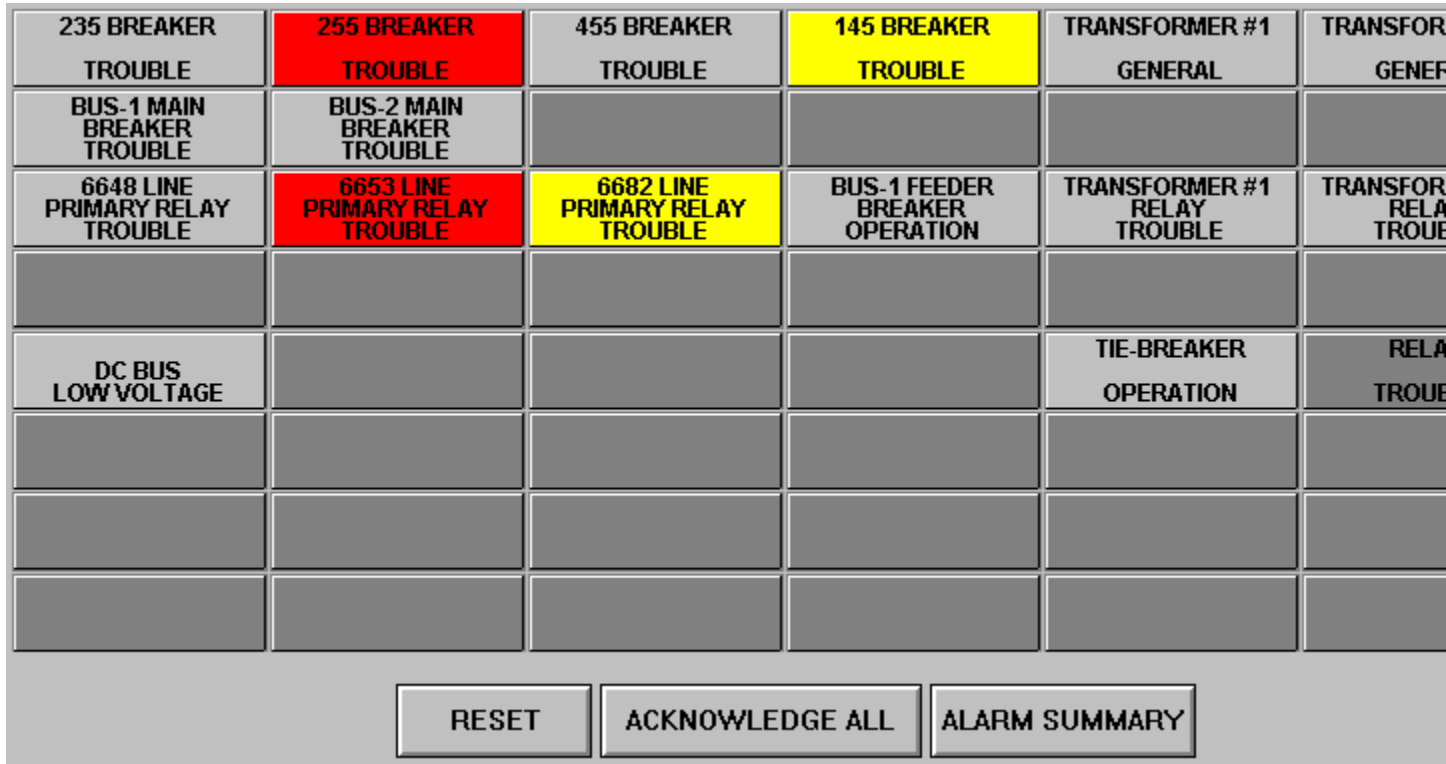
Usage

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

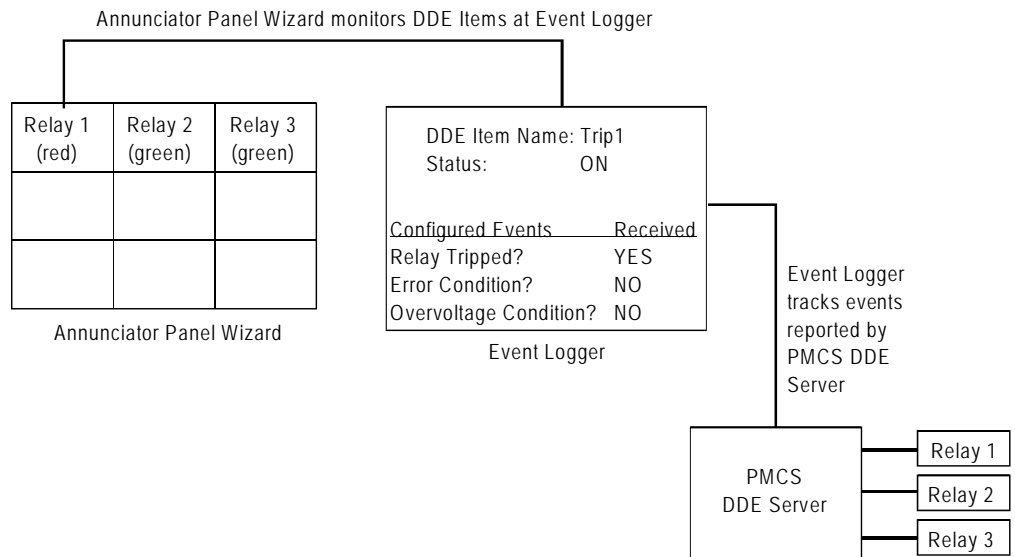
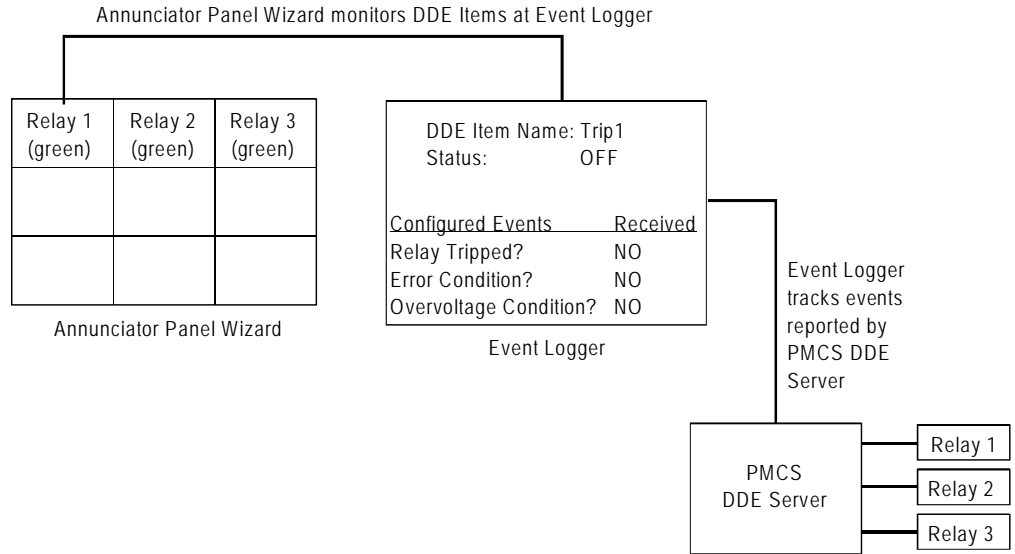
The Annunciator Panel wizard provides a screen full of indicator tiles, each relating to a particular device, event, or group of events. These tiles are displayed in different colors to indicate different alarm conditions. The Annunciator Panel wizard monitors selected DDE items in the Event Logger and 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)

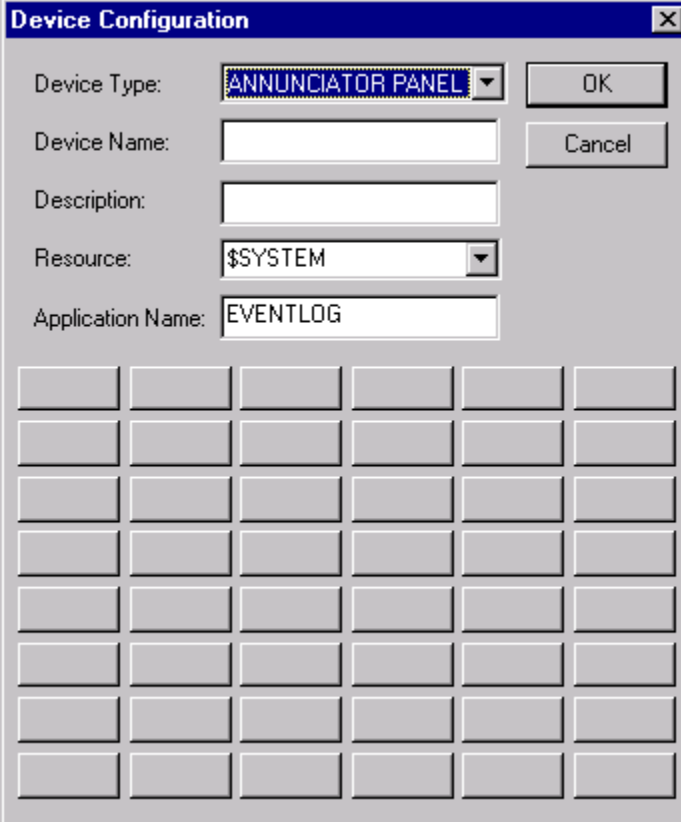
30 -> 39: Red

>= 40: Yellow

Configuration

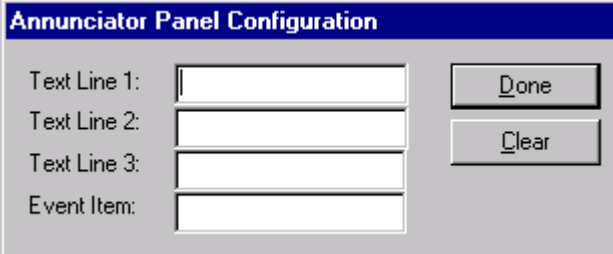
Note: Prior to configuring an Annunciator Panel Wizard, you should have completed configuration of the Annunciator Panel Items at the PMCS Event Logger. Refer to GEH-6512, *PMCS Event Logger Users Guide*, for details.

Using PMCS Power Builder, add an Annunciator Panel device to your CIMPPLICITY 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:



The screenshot shows the "Device Configuration" dialog box. The "Device Type" dropdown is set to "ANNUNCIATOR PANEL". The "Device Name" field is empty. The "Description" field is empty. The "Resource" dropdown is set to "\$SYSTEM". The "Application Name" field contains "EVENTLOG". Below these fields is a grid of 48 indicator buttons arranged in 8 rows and 6 columns.

Complete the Device Name, Description, and Application Name fields as desired, then configure the indicators of the Annunciator 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:



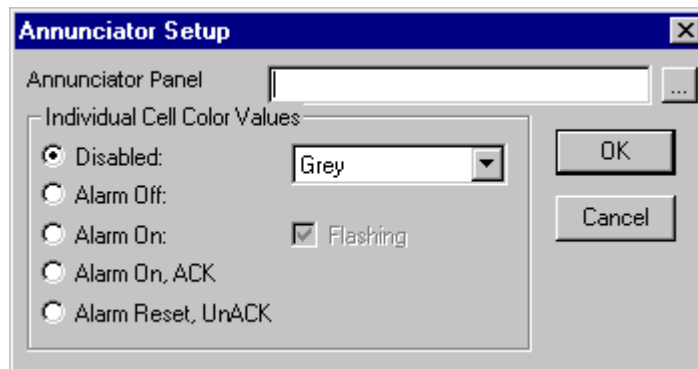
The screenshot shows the "Annunciator Panel Configuration" dialog box. It has four text input fields: "Text Line 1:", "Text Line 2:", "Text Line 3:", and "Event Item:". To the right of these fields are two buttons: "Done" and "Clear".

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

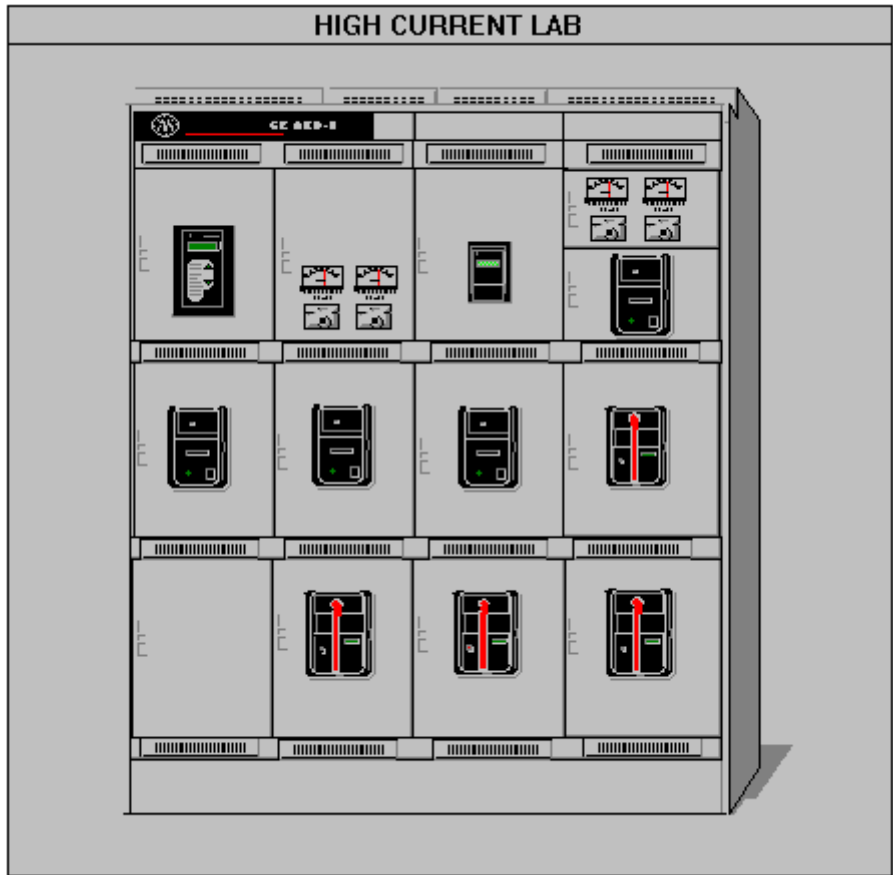
This section illustrates how to use the GE wizards described earlier to create animated displays of the facility floor plan, switchgear elevations, and system one-line diagrams. These examples are typical, but are not intended to display the limits of creative system design.

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:

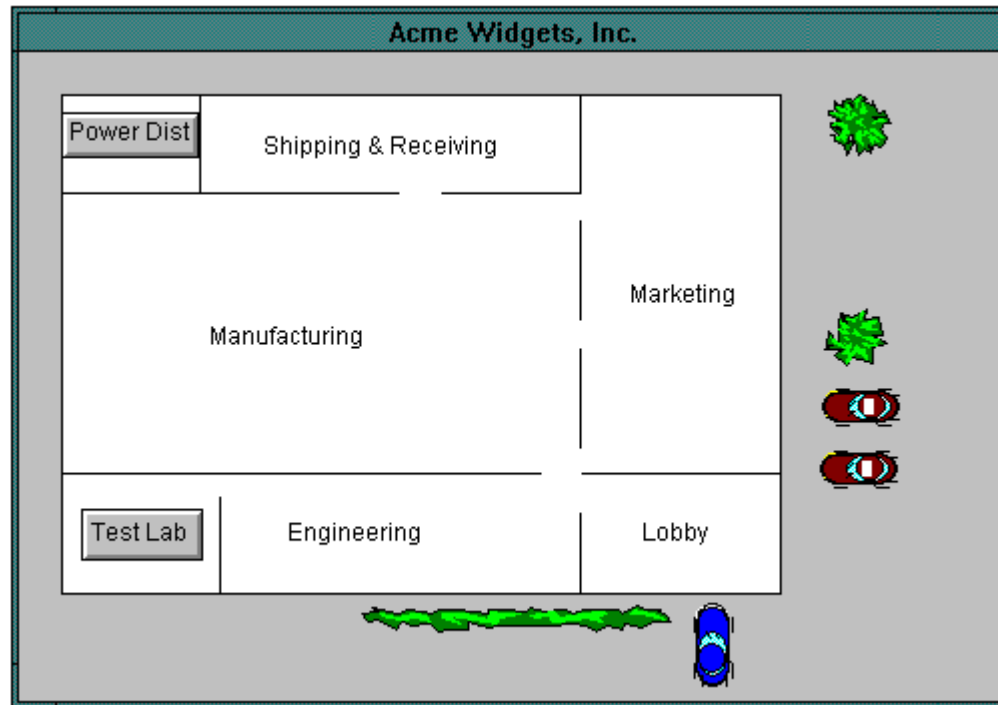
1. Place the appropriate cabinet.
2. Place panels onto the cabinet.
3. Add nameplates, louvers, handles, and fasteners to create the desired level of detail.
4. Place GE Small Faceplate wizards representing the components installed in the equipment on top of the elevation wizards, as shown in the figure 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

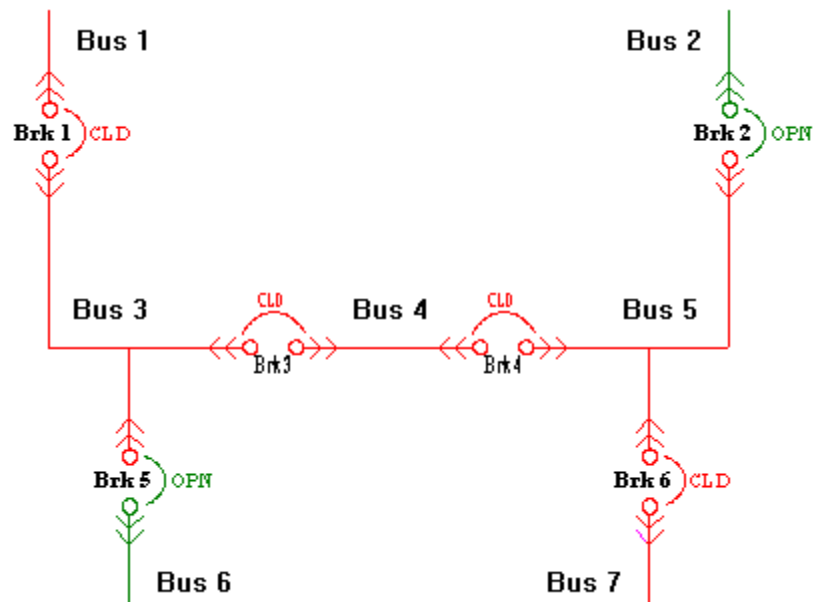
One-line diagrams are built by placing and linking circuit elements using the One-Line wizards, then creating scripts to provide animation for those wizards whose status can be determined or controlled, such as breakers and switches.

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.)

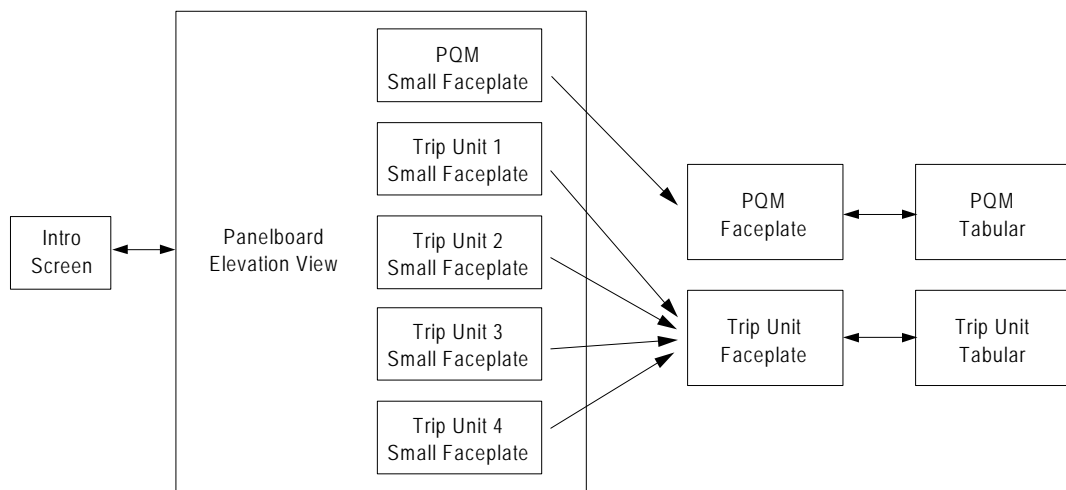
Sample Application

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.

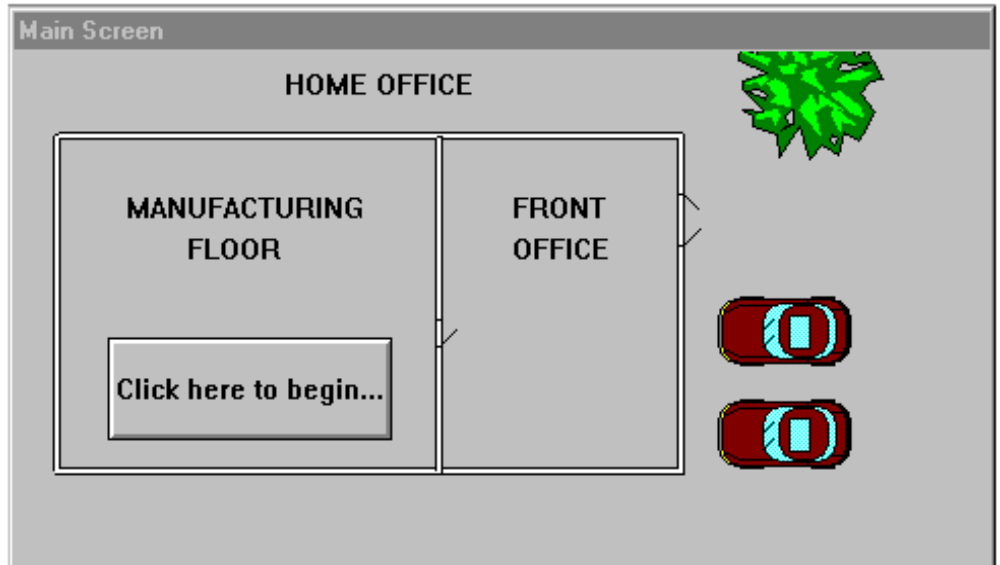
Launch CIMPLICITY and create a new project file as described in Chapter 2. Use the PMCS PowerBuilder to create 5 new devices in your project:

- 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:

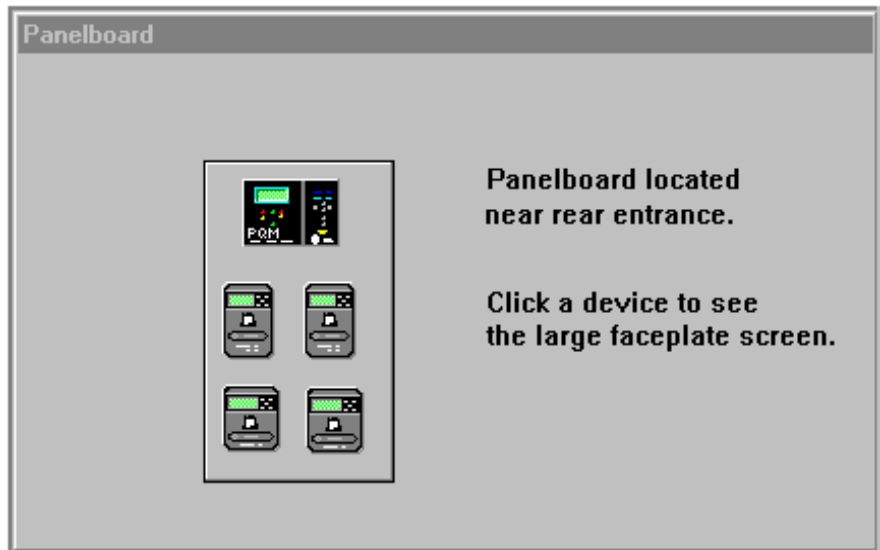
- MainMenu.cim – contains all the small faceplates for the project
- wzEMVTC-D.cim – Trip Unit Faceplate/Tabular wizard
- wzMLPQM.cim – PQM Faceplate/Tabular wizard

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:



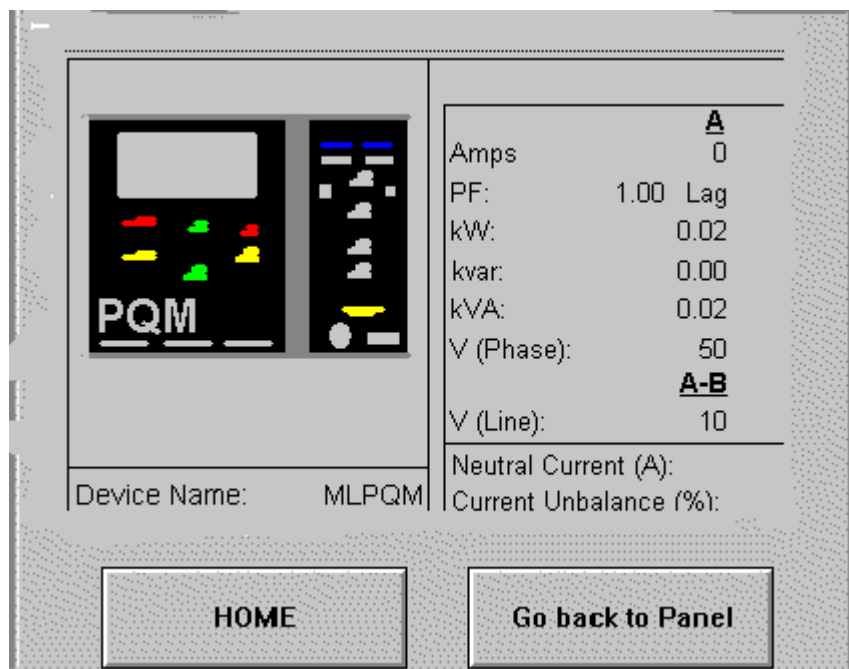
In the Manufacturing Floor area, create a button labeled "Click here to begin...", and give it an animation link to the screen named Panelboard.

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 "MLPQMFrameworkwizard.cim" screen as "PQM". Then open the Panelboard screen and reconfigure the PQM small faceplate to open the new "PQM" screen instead of the "MLPQMFrameworkwizard.cim" screen. Finally, delete the "MLPQMFrameworkwizard.cim" 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.

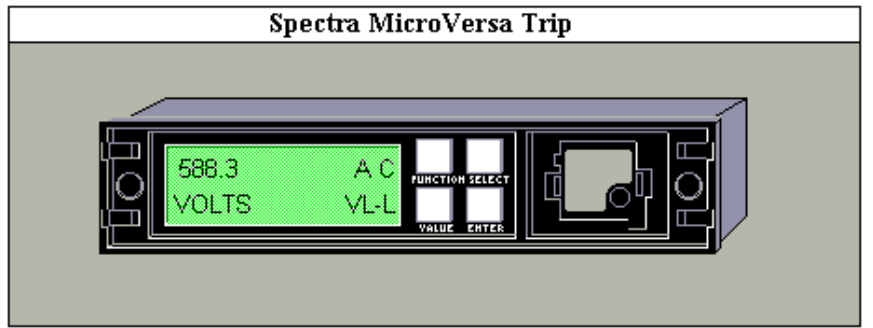
The electrical parameters and status information displayed by the EPM are listed in the following tables for both the normal and alternate scrolls. Note that the displayed

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:

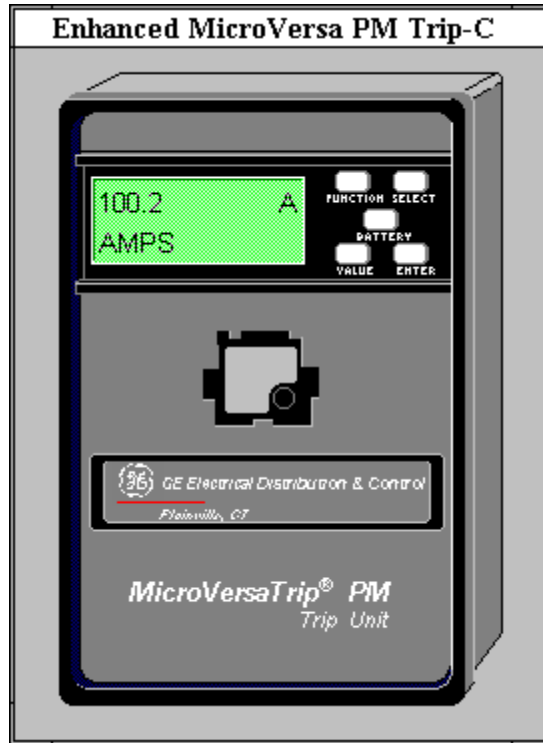
Click on...	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Normal Monitoring page.
FUNCTION Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
ENTER Button	Opens the tabular 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:

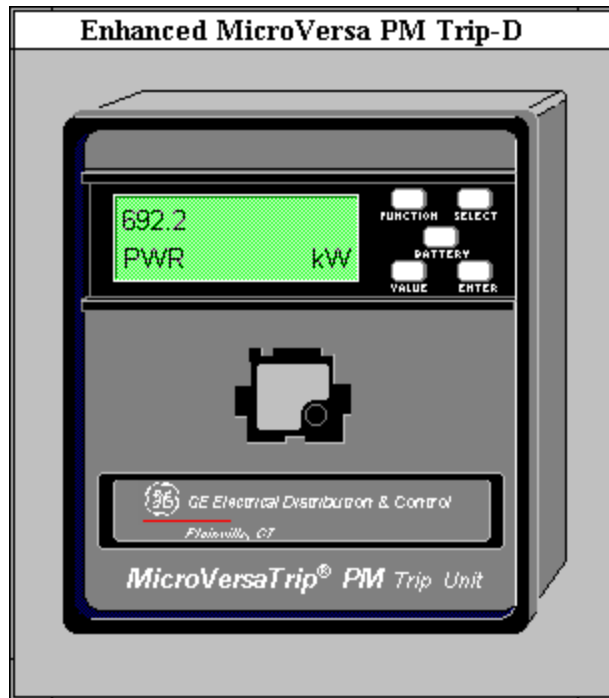
Click on ...	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Monitoring page.
FUNCTION Button	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
ENTER Button	Opens the tabular data 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:

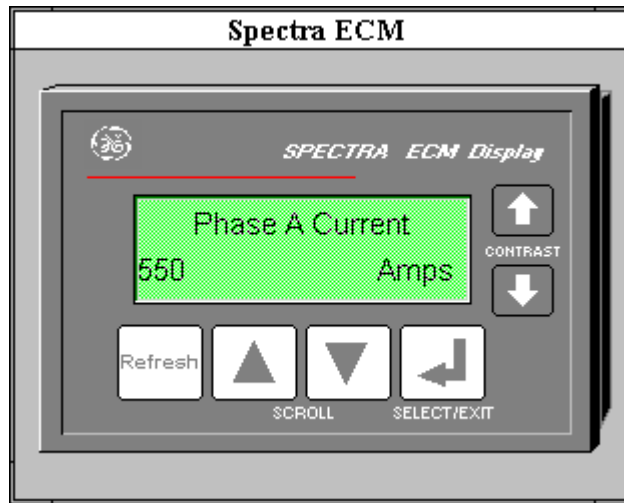
Feature	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Monitoring page.
GE Logo	Opens the tabular data window specified during wizard configuration and sets the view to the Setup page.
RESET/ENTER Button	Opens the tabular data window 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:

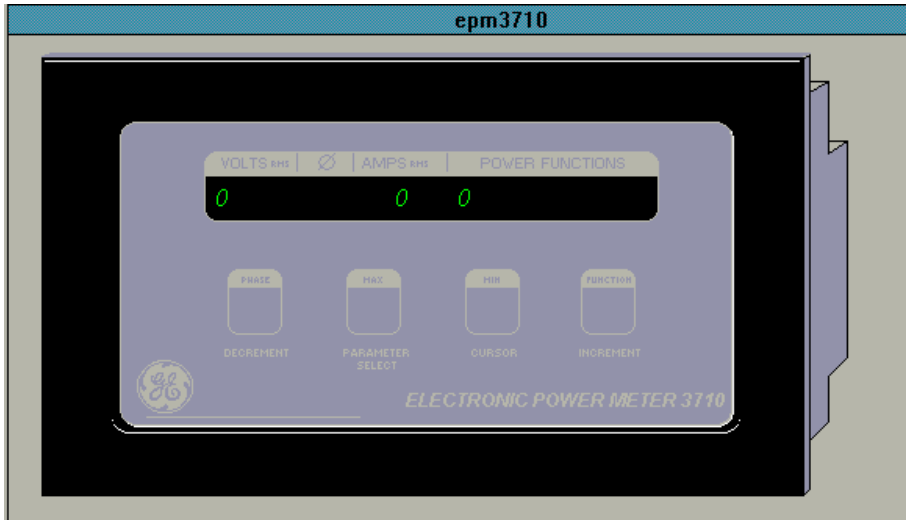
Feature	Function
Display Window	Opens the tabular data window specified during wizard configuration and sets the view to the Monitoring page.
CONTRAST Buttons	Open the tabular data window specified during wizard configuration and sets the view to the Setup page.
Refresh Button	Updates the display to 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

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 7. EPM 3710 Faceplate animated functions.

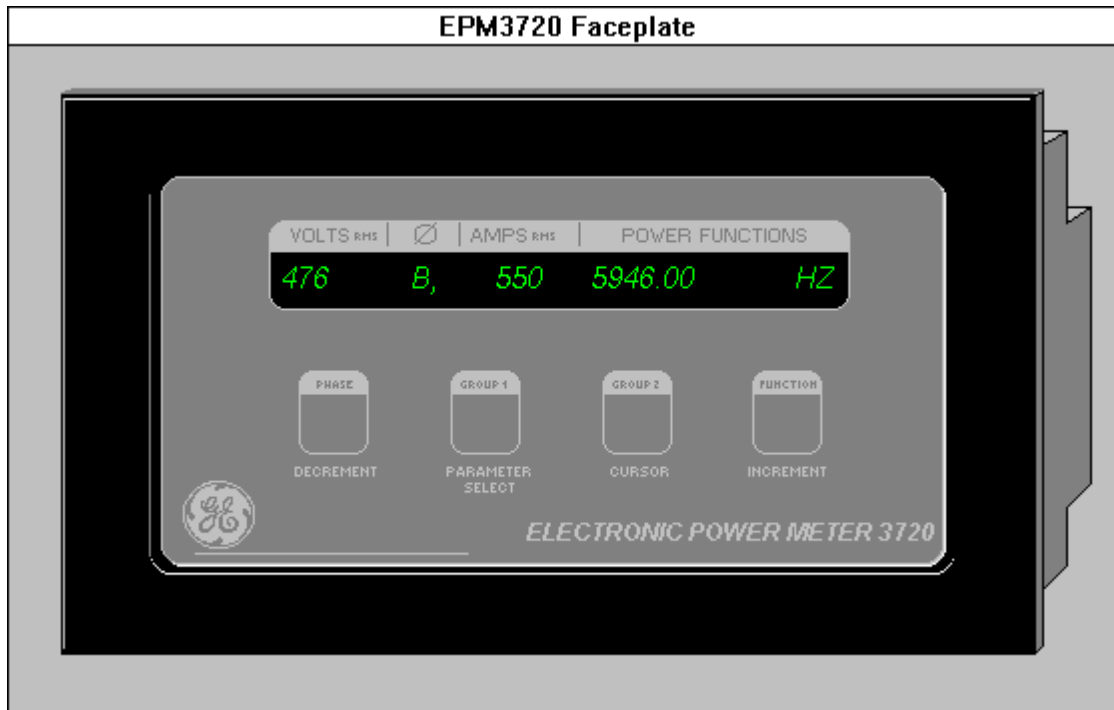
The parameters displayed by the PHASE button are listed in the following table.

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 8. 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 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 9. 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	<ul style="list-style-type: none"> • KW Total • KVAR Total • KVA Total • PF Signed Total
2 - Three-Phase Measurements	<ul style="list-style-type: none"> • 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 • VII ab • VII bc; VII ca; VII avg: n/a when Voltage Mode is SINGLE • Ia, Ib, Ic, Iavg • Ic: n/a when Voltage Mode is SINGLE • V unbal • I unbal • Line Frequency
3 - Per-Phase Power	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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.

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 10. 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.

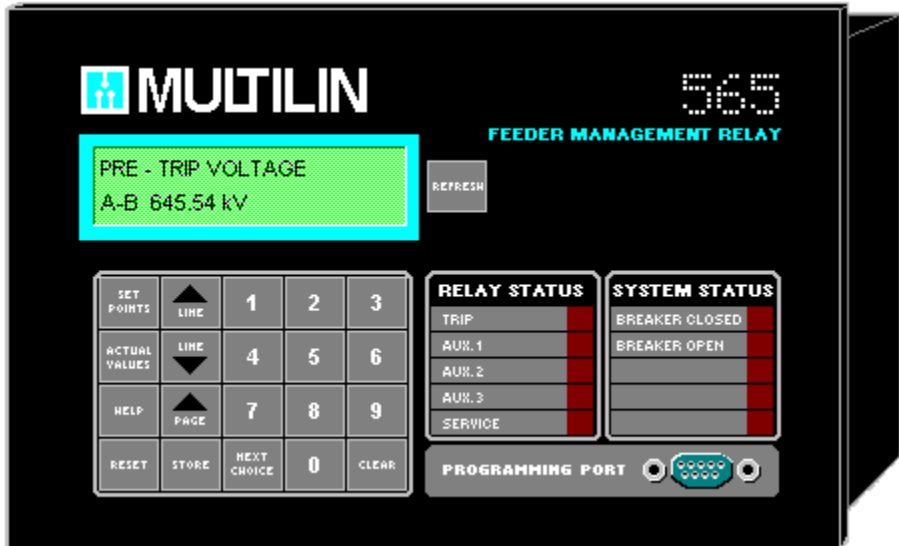
Page	Value	Text Displayed	Description
1	1	PAGE 1: ACTUAL VALUES PHASE CURRENT DATA	Page header
	2	I1=xxx I2=xxx I3=xxx (AMPS)---	Phase current in amps; --- or RUN based on motor status
	3	I(3 Ph avg.)=xxx AMPS Max Stator RTD=xxx C	Average phase current Hottest stator temperature
	4	UNBALANCE RATIO (In/Ip) 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
3	1	PAGE 3: ACTUAL VALUES MOTOR CAPACITY DATA	Page header
	2	ESTIMATED TIME TO TRIP = xxx SECONDS	
	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
4	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
	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
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 (I/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
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 KVAR 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

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 11. 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
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

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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

PLEPM Normal Metering Values (Delta)

	A-B	C-B	Total	Three Phase Values	
kW:	1.42	1.46	4.32	kWh Total:	2.00
kVar:	1.40	1.45	4.31	kVarh Lag Total:	2.00
kVA:	2.00	2.06	6.10	kVarh Lead Total:	2.00
PF:	0.71	0.71	2.12	kVAh Total:	2.00
				kQh Total:	7.47

Current A:	44.55				
Current B:	44.91				
Current C:	45.36				
Current Demand A:	44.55 Peak:	0.00			
Current Demand C:	45.36 Peak:	0.00			
Frequency:	60.00				
Voltage A-B:	77.72				
Voltage B-C:	78.74				
Voltage C-A:	78.59				

Device Name: EPM
 Group Name: GROUP 1
 Primary Voltage: 0.00
 Primary Current: 0
 Commnet Address: 0
 Modbus Address: 0
 Serial Number: 0
 Meter Rev.: 0.00
 Comm Card Rev.: 0.00

Event Logger | Trend Wave | Help | Exit

Normal Metering | Alternate Metering | Setup

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 12. 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

Spectra MicroVersa Trip Monitoring Screen

	<u>A</u>	<u>B</u>	<u>C</u>	<u>Total</u>
Amps:	45.10	44.83	45.41	
Volts L-N:	45.08	44.93	45.23	
kW:	1.45	1.44	1.46	4.34
kVAR:	1.43	1.41	1.45	4.29
kVA:	2.03	2.01	2.05	6.10
kWh:		2	Volts A-B:	78.07
kW demand:		2	Volts B-C:	77.82
Peak kW demand:		2	Volts A-C:	78.35
PF:		0.71		
Frequency:		60.3		
Breaker Status:		Open		

Device Name: MVT
 Group Name: \$System
 Connection: Delta
 Frame Size: G Frame
 Current Sensor: 0
 Rating Plug: 0
 PT Rating: 0
 Commnet Address: 0
 Modbus Address: 0
 Software Rev: 0.00
 Product Rev: 0.00

Event Logger | Trend Wave | Help Exit

Normal Monitoring | Setup Screen

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 13. 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

Enhanced MicroVersa Trip-C Monitoring Screen

	<u>A</u>	<u>B</u>	<u>C</u>	<u>N</u>
Amps:	44.82	44.57	44.91	45.07
Volts L-N:	45.26	45.08	45.15	Total
kW:	1.43	1.42	1.43	4.28
kVAR:	1.44	1.42	1.44	4.30
kVA:	2.03	2.01	2.03	6.07
kW demand:	903.00		Volts A-B:	78.40
Peak kW demand:	903.00		Volts B-C:	78.08
kWh:	903.00		Volts C-A:	78.20
PF:	2.11		Trip Operations Counter:	Disabled
Frequency:	59.9		Sw. Inst./Short Time:	Disabled
Breaker Status:	Open		Current Unbalance Relay:	Disabled
Wires:	3 wire		Gnd Fault ZSI Selected:	Disabled
			Short Time ZSI Selected:	Disabled

Device Name: EMVTC
 Group Name: \$System
 Connection: Delta
 Frame Size: 0
 Rating Plug: 0
 PT Rating: 0
 Commnet Address: 0
 Modbus Address: 0
 Software Rev: 0.00
 Product Rev: Unknown

Event Trend Help
 Logger Wave Exit

Normal Monitoring Setup Screen

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 14. EMVT-C Tabular data screen commands.

Enhanced MicroVersaTrip-D Trip Unit

Enhanced MicroVersa Trip-D Monitoring Screen

	A	B	C	N
Amps:	90.41	90.45	90.15	89.51
Volts L-N:	90.16	90.46	89.51	Total
kW:	0.06	0.06	0.03	0.03
kVAR:	8.15	8.18	8.07	24.40
kVA:	8.15	8.18	8.07	24.40
kW demand:	1293.00		Volts A-B:	156.17
Peak kW demand:	1293.00		Volts B-C:	156.69
kWh:	1293.00		Volts A-C:	155.03
PF:	1.00		Trip Operations Counter:	Disabled
Frequency:	59.7		Sw. Inst/Short Time:	Disabled
Breaker Status:	Open		Current Unbalance Relay:	Disabled
Wires:	3 wire		Gnd Fault ZS1 Selected:	Disabled
			Short Time ZS1 Selected:	Disabled

Device Name: EMVTD
 Group Name: \$System
 Connection: Delta
 Frame Size: 0
 Rating Plug: 0
 PT Rating: 0
 Commnet Address: 0
 Modbus Address: 0
 Software Rev: 0.00
 Product Rev: Unknown

Event Logger Trend Wave Help Exit

Normal Monitoring Setup Screen

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 15. EMVT-D Tabular data screen commands.

POWER LEADER Meter

PLM Monitoring Screen

	A	B	C	Total
RMS Amps:	45.10	44.83	45.41	
Peak Amps:	90.41	90.45	90.15	
Amp Demand:	45.10	44.83	45.41	
RMS Volts L-N:	45.08	44.93	45.23	
KW:	1.45	1.44	1.46	
KVAR:	1.43	1.41	1.45	
KVA:	2.03	2.01	2.05	6.10

	A-B	B-C	C-A
RMS Volts:	78.07	77.82	78.35
KWh:	641.00		
KW demand:	1.45	Peak kW demand:	1.45
KVARh:	236.00		
PF:	2.13		
Frequency:	60.74 hz		
Harmonic Distortion:	0 %		

Waveform Status
Waveform Captured: Unavailable Phase:

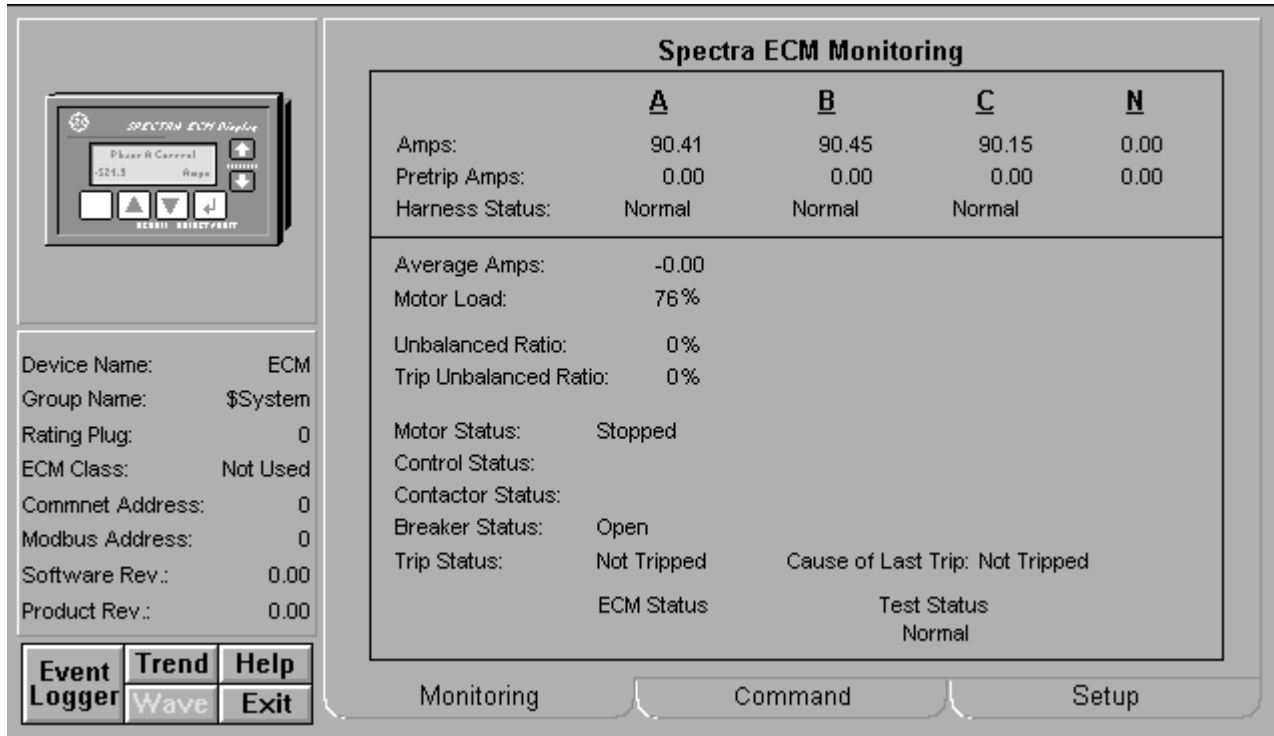
Monitoring Command Setup

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 16. 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	Contactors 1 Start	Closes contactor 1
	Contactors 2 Fast Start	Initiates a fast start of contactor 2
	Contactors 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 17. 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 18. 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.

Monitoring Tab

The screenshot displays the MDP Monitoring Screen with the following data:

	<u>A</u>	<u>B</u>	<u>C</u>	<u>N</u>
RMS Current:	0.00	0.00	0.00	0.00
RMS Trip Current:	1.09	2.08	2.12	0.03
Phase Trip Status:	ON	ON	ON	OFF

Trip Time: 6.95

<u>Status</u>		<u>External Inputs</u>	
Ready	YES	Block Ground;	NO
Time Overcurrent:	YES	Block IOC:	NO
Inst. Overcurrent:	NO	Front Panel Settings:	NO
Pickup:	NO		
Relay:	Relay OK		
Breaker:	OPEN		

Device Name: MDP_1
 Group Name: \$SYSTEM
 CT Ratio: 1
 Model: 5 Amp
 Commnet Address: 337
 Modbus Address: 70
 MDP Software Rev.: 2.58
 COC Software Rev.: 1.00
 COC Product Rev.: 1.00

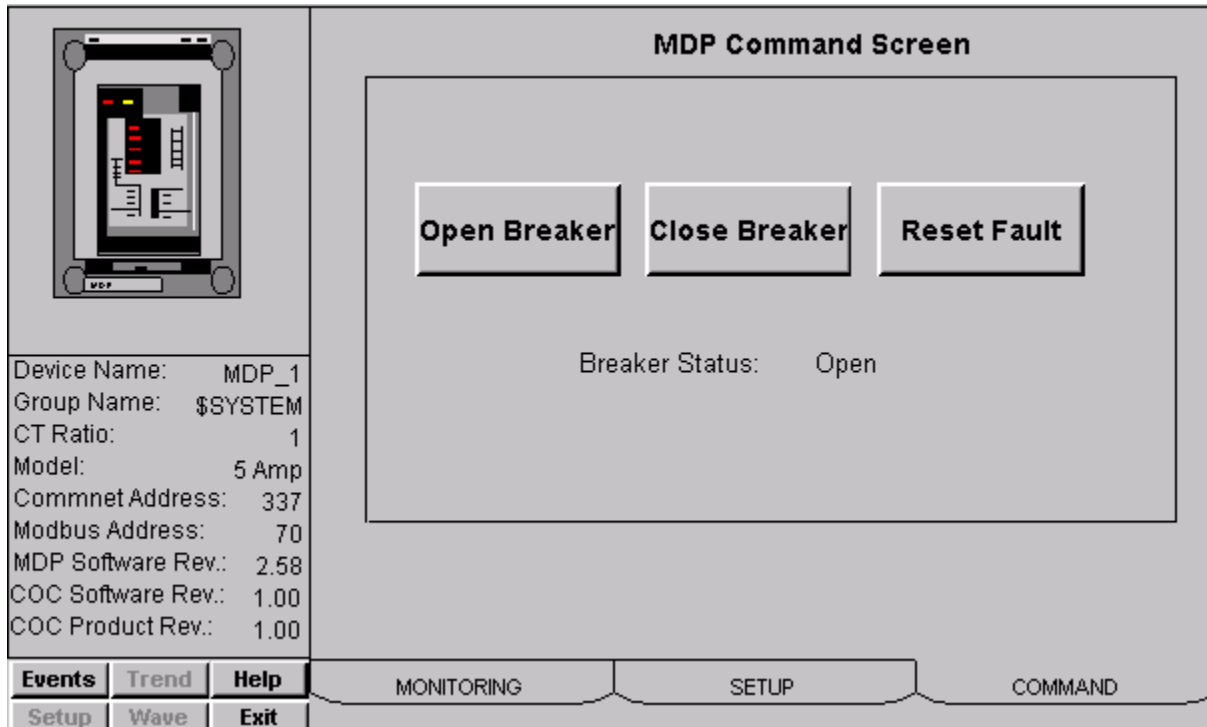
Navigation buttons: Events, Trend, Help, Setup, Wave, Exit. Tab labels: MONITORING, SETUP, COMMAND.

The MDP Monitoring Screen shows the following:

- Metering values of RMS Current, RMS Trip Current and Phase Trip Status
- Trip Time
- Status
- External Inputs

The message “CT Ratios has not been entered!” will appear when no CT Ratio entered on the Setup tab. Click on Setup Screen Tab to enter the CT Ratio.

Command Tab



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 19. MDP Tabular data screen commands.

The MDP Command Screen shows 3 buttons:

- **Open Breaker:** Opens the Breaker
- **Close Breaker:** Closes the Breaker
- **Reset Fault:** Clears the Event Table in the MDP

The screen also shows the Breaker Status, for example OPEN.

Setup Tab

The screenshot displays the MDP Setup Screen. On the left, there is a small image of the device and a list of device parameters. The main area is divided into two columns for configuration: Phase Setting Configuration and Ground Setting Configuration. Below these is a section for CT Ratio, Output Selection, and Ground Settings. At the bottom, there are navigation buttons for Events, Trend, Help, Setup, Wave, Exit, MONITORING, SETUP, and COMMAND.

Phase Setting Configuration		Ground Setting Configuration	
Phase Curve:	Inverse	Ground Curve:	Extremely Inverse
Definite Time:	OFF	Definite Time:	OFF
Time Dial:	1.00	Time Dial:	1.00
IOC Delay (Sec):	0.05	IOC Delay (Sec):	0.05
Pickup IOC (TOC x):	3.75	Pickup IOC (TOC x):	2.00
Pickup TOC:	1.875	Pickup TOC:	0.500

CT Ratio:	1.000000
Output Selection:	A
Ground Settings:	Nominal

Events	Trend	Help	MONITORING	SETUP	COMMAND
Setup	Wave	Exit			

The MDP Setup Screen shows:

- Phase Settings Configuration
- Ground Settings Configuration

You must enter CT Ratio in the relevant field.

PQM (Power Quality Meter)

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

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 20. 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.

Metering Tab

The screenshot displays the 'Multilin PQM Metering' screen. On the left, there is a 'PQM' logo and a small display area. Below it, a list of device information is shown: Device Name: MLPQM, Group Name: \$SYSTEM, Device Type: PQM, Hardware Rev.: C, Main Program Rev.: 3.41, Boot Program Rev.: 1.10, Supervisor Rev.: 1.02, and Mod File Numbers: 1 2 3 4 5, 000 000 000 000 000. The main display area shows a table of electrical parameters for three phases (A, B, C) and a 3-phase average. Parameters include Amps, PF (1.00 Lag), kW (0.02, 0.03, 0.13, 0.18), kvar (0.00, 0.00, 0.00, 0.00), kVA (0.02, 0.03, 0.13, 0.18), V (Phase) (50, 60, 90, 67 Average), and V (Line) (10, 30, 40, 27 Average). Below this, it shows Neutral Current (A): 0, Voltage Unbalance (%): 35.0, Current Unbalance (%): 25.0, and Frequency (Hz): 60.00. The 'Energy' section shows Positive kWh: 0, Negative kWh: 0, Positive kvarh: 0, Negative kvarh: 0, kVAh: 0, kWh last 24 hrs: 0, Real Energy Cost (\$): 0.00, and Real Energy Cost/day (\$): 0.00. The 'Output Relays' section shows Last Energy Reset: 11:09:52 12/20/2001, with checkboxes for Alarm, Aux 1, Aux 2, and Aux 3. At the bottom, there are two buttons: 'Clear Energy' and 'Reset Device'. The screen also features a navigation bar with buttons for Events, Trend, Help, Setup, Wave, and Exit, and a status bar with buttons for METERING, STATUS, DEMAND, IVRANGE, PRANGE, ANALYSIS, IO, and SETPOINTS.

The Multilin PQM Metering tab shows:

- **Metering values:** For A, B, C and 3 Phase
- **Energy:** In various values
- **Output Relays:** Alarm, Aux 1, Aux 2 and Aux 3

The **Clear Energy** button, when clicked, will clear all energy values. The **Reset Device** button, when clicked, will reset the Device.

Status Tab

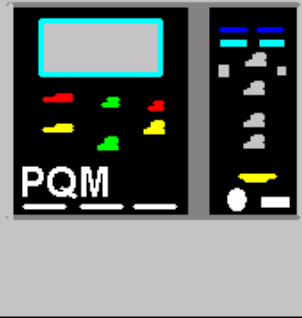
Multilin PQM Alarm, Aux1, Aux2, Aux3 Relay Status					
<input type="checkbox"/>	Phase Undercurrent	<input type="checkbox"/>	Underfrequency	<input type="checkbox"/>	Clock Not Set
<input type="checkbox"/>	Phase Overcurrent	<input type="checkbox"/>	Overfrequency	<input type="checkbox"/>	Param. Not Set
<input type="checkbox"/>	Neutral Overcurrent	<input type="checkbox"/>	Apparent Power Dmnd	<input type="checkbox"/>	Pulse Input 1
<input type="checkbox"/>	Undervoltage	<input type="checkbox"/>	Phase A Current Dmnd	<input type="checkbox"/>	Current THD
<input type="checkbox"/>	Overvoltage	<input type="checkbox"/>	Phase B Current Dmnd	<input type="checkbox"/>	Voltage THD
<input type="checkbox"/>	Current Unbalance	<input type="checkbox"/>	Phase C Current Dmnd	<input type="checkbox"/>	Main Analog I/F
<input type="checkbox"/>	Voltage Unbalance	<input type="checkbox"/>	Neutral Current Dmnd	<input type="checkbox"/>	Alt Analog I/P
<input type="checkbox"/>	Phase Reversal	<input type="checkbox"/>	Switch Input A	<input type="checkbox"/>	Data Log 1
<input type="checkbox"/>	Power Factor Lead 1	<input type="checkbox"/>	Switch Input B	<input type="checkbox"/>	Data Log 2
<input type="checkbox"/>	Power Factor Lead 2	<input type="checkbox"/>	Switch Input C	<input type="checkbox"/>	COM1 Failure
<input type="checkbox"/>	Power Factor Lag 1	<input type="checkbox"/>	Switch Input D	<input type="checkbox"/>	COM2 Failure
<input type="checkbox"/>	Power Factor Lag 2	<input type="checkbox"/>	Internal Fault	<input type="checkbox"/>	Pulse Input 2
<input type="checkbox"/>	Positive Real Power	<input type="checkbox"/>	Pos. Real Power Dmnd	<input type="checkbox"/>	Pulse Input 3
<input type="checkbox"/>	Negative Real Power	<input type="checkbox"/>	Neg. Real Power Dmnd	<input type="checkbox"/>	Pulse Input 4
<input type="checkbox"/>	Pos. Reactive Power	<input type="checkbox"/>	Pos. Reactive Pwr Dmnd	<input type="checkbox"/>	Total Pulse Inp.
<input type="checkbox"/>	Neg. Reactive Power	<input type="checkbox"/>	Neg. Reactive Pwr Dmnd	<input type="checkbox"/>	Time Alarm

Legend: ■ = Pickup ■ = Active

Events	Trend	Help	METERING	STATUS	DEMAND	IVRANGE
Setup	Wave	Exit	PRANGE	ANALYSIS	IO	SETPOINTS

The Multilin Status tab shows the status of Alarms, Aux1, Aux2, Aux3 Relays.

Demand Tab



PQM

Multilin PQM Metering Frequency & Demand Range

<u>Frequency</u>	<u>Min</u>	<u>Max</u>
Hz 60.00	60.00 11:09:37 12/20/2001	60.00 11:09:37 12/20/2001

<u>Demand Current & Power</u>	<u>Peak Demand</u>
Phase A Current Demand (Amps):	0 0 11:09:44 12/20/2001
Phase B Current Demand (Amps):	0 0 11:09:44 12/20/2001
Phase C Current Demand (Amps):	0 0 11:09:44 12/20/2001
Neutral Current Demand (Amps):	0 0 11:09:44 12/20/2001
Real Power Demand (kW):	0.10 0.10 11:09:46 12/20/2001
Reactive Power Demand (kvar):	0.00 0.00 11:09:44 12/20/2001
Apparent Power Demand (kVA):	0.10 0.10 11:09:46 12/20/2001

Clear Max Demand Values

Clear Frequency Values


Events	Trend	Help	METERING	STATUS	DEMAND	VRANGE
Setup	Wave	Exit	PRANGE	ANALYSIS	IO	SETPOINTS

The Multilin PQM Demand screen shows :

- Demand Current & Power
- Peak Demand
- Minimum and Maximum Frequency and their Time Stamps.

The Clear Max Demand Values button, when clicked, will clear all the maximum demand values. The Clear Frequency Values button, when clicked, will clear all the frequency values.

IV Range Tab



Device Name: MLPQM
 Group Name: \$SYSTEM
 Device Type: PQM
 Hardware Rev.: C
 Main Program Rev.: 3.41
 Boot Program Rev.: 1.10
 Supervisor Rev.: 1.02
 Mod File Numbers:
 1 2 3 4 5
 000 000 000 000 000

Multilin PQM Current, Voltage Min/Max Detected Values

<u>Current</u>	<u>Min</u>	<u>Max</u>
Amps A:	0 11:09:17 12/20/2001	0 11:09:17 12/20/2001
Amps B:	0 11:09:17 12/20/2001	0 11:09:17 12/20/2001
Amps C:	1 11:09:17 12/20/2001	2 11:29:58 12/20/2001
Amps N:	0 11:09:17 12/20/2001	0 11:09:17 12/20/2001
Amps Unbal. (%):	0.0 11:09:17 12/20/2001	100.0 11:29:58 12/20/2001
<u>Voltage</u>		
Volts AB:	9 11:09:26 12/20/2001	10 11:09:38 12/20/2001
Volts BC:	29 11:23:59 12/20/2001	30 11:09:26 12/20/2001
Volts CA:	39 11:24:58 12/20/2001	40 11:09:26 12/20/2001
Volts An:	50 11:09:26 12/20/2001	50 11:09:26 12/20/2001
Volts Bn:	59 11:19:51 12/20/2001	60 11:09:26 12/20/2001
Volts Cn:	90 11:09:26 12/20/2001	90 11:09:26 12/20/2001
Volts Unbal. (%):	35.0 11:09:26 12/20/2001	35.7 11:28:03 12/20/2001

Clear Current Min/Max

Clear Voltage Min/Max

Events	Trend	Help
Setup	Wave	Exit

METERING	STATUS	DEMAND	IVRANGE
PRANGE	ANALYSIS	IO	SETPOINTS

The Multilin PQM IV Range tab shows the Minimum and Maximum Current, Voltage Values.


The **Clear Current Min/Max** button, when clicked, will clear all the minimum and maximum values of the current.

The **Clear Voltage Min/Max** button, when clicked, will clear all the minimum and maximum values of voltage.

108 • Features of Tabular Data Screen Wizards

PMCS Interface Toolkit

P Range Tab

 <p>Device Name: MLPQM Group Name: \$SYSTEM Device Type: PQM Hardware Rev.: C Main Program Rev.: 3.41 Boot Program Rev.: 1.10 Supervisor Rev.: 1.02 Mod File Numbers: 1 2 3 4 5 000 000 000 000 000</p>	Multilin PQM Power		Min		Max		
	3 Ph. kW:	0.18	11:10:05	12/20/2001	0.18	11:10:05	12/20/2001
	Ph. A kW:	0.02	11:10:05	12/20/2001	0.02	11:10:05	12/20/2001
	Ph. B kW:	0.03	11:10:06	12/20/2001	0.03	11:10:06	12/20/2001
	Ph. C kW:	0.13	11:10:06	12/20/2001	0.13	11:10:06	12/20/2001
	3 Ph. kvar:	0.00	11:10:05	12/20/2001	0.00	11:10:05	12/20/2001
	Ph. A kvar:	0.00	11:10:05	12/20/2001	0.00	11:10:05	12/20/2001
	Ph. B kvar:	0.00	11:10:06	12/20/2001	0.00	11:10:06	12/20/2001
	Ph. C kvar:	0.00	11:10:06	12/20/2001	0.00	11:10:06	12/20/2001
	3 Ph. kVA:	0.18	11:10:05	12/20/2001	0.18	11:10:05	12/20/2001
Ph. A kVA:	0.02	11:10:06	12/20/2001	0.02	11:10:06	12/20/2001	
Ph. B kVA:	0.03	11:10:06	12/20/2001	0.03	11:10:06	12/20/2001	
Ph. C kVA:	0.13	11:10:06	12/20/2001	0.13	11:10:06	12/20/2001	
3 Ph. PF:	1.00 Lag	11:10:05	12/20/2001	1.00 Lag	11:10:05	12/20/2001	
Ph. A PF:	1.00 Lag	11:10:06	12/20/2001	1.00 Lag	11:10:06	12/20/2001	
Ph. B PF:	1.00 Lag	11:10:06	12/20/2001	1.00 Lag	11:10:06	12/20/2001	
Ph. C PF:	1.00 Lag	11:10:06	12/20/2001	1.00 Lag	11:10:06	12/20/2001	
Clear Power Min/Max							
Events	Trend	Help	PRANGE	ANALYSIS	IO	SETPOINTS	
Setup	Wave	Exit	METERING	STATUS	DEMAND	IVRANGE	

The Multilin PQM Power Range screen shows the Power minimum and maximum values.

The **Clear Power Min/Max** button, when clicked, will clear all the minimum and maximum values of the power.

Analysis Tab

Multilin PQM Power Analysis

<u>Power Quality Values</u>			
Ia Crest Factor:	1.414	Ia Transformer Harmonic Derating Factor:	0.999
Ib Crest Factor:	1.412	Ib Transformer Harmonic Derating Factor:	1.001
Ic Crest Factor:	1.416	Ic Transformer Harmonic Derating Factor:	0.998

<u>Total Harmonic Distortion</u>		<u>THD Max</u>	
Phase A Current THD (%):	0.7	0.7	11:52:39 12/20/2001
Phase B Current THD (%):	0.7	0.7	11:52:39 12/20/2001
Phase C Current THD (%):	1.0	1.7	12:07:35 12/20/2001
Neutral Current THD (%):	0.0	0.0	11:52:39 12/20/2001
Voltage An THD (%):	0.9	0.9	11:52:47 12/20/2001
Voltage Bn THD (%):	0.9	1.0	11:53:06 12/20/2001
Voltage Cn THD (%):	0.7	0.9	11:52:54 12/20/2001
Voltage AB THD (%):	0.0	0.0	11:52:39 12/20/2001
Voltage BC THD (%):	0.0	0.0	11:52:39 12/20/2001

Clear Max THD Values

Device Name: MLPQM
 Group Name: \$SYSTEM
 Device Type: PQM
 Hardware Rev.: C
 Main Program Rev.: 3.41
 Boot Program Rev.: 1.10
 Supervisor Rev.: 1.02
 Mod File Numbers:
 1 2 3 4 5
 000 000 000 000 000

Events Trend Help
 Setup Wave Exit
 PRANGE ANALYSIS IO SETPOINTS
 METERING STATUS DEMAND IVRANGE

The Multilin PQM Power Analysis screen shows:

- Power Quality Values
- Total Harmonic Distortion
- THD Max

The **Clear Max THD Values** button, when clicked, will clear all maximum THD values.

IO Tab

Multilin PQM Inputs and Outputs

Digital Input Switches		Output Relays	
SWITCH INPUT A	Not Active	Alarm:	De-Energized
SWITCH INPUT B	Not Active	Auxillary 1:	De-Energized
SWITCH INPUT C	Not Active	Auxillary 2:	De-Energized
SWITCH INPUT D	Not Active	Auxillary 3:	De-Energized

Analog Input

Main/Alt Analog Input: 0

Switch Input Pulse Counters			
Pulse Count 1:	0	Units	Pulse Input 1 Value: 1
Pulse Count 2:	0		Pulse Input 2 Value: 1
Pulse Count 3:	0		Pulse Input 3 Value: 1
Pulse Count 4:	0		Pulse Input 4 Value: 1
Totalized Pulse Input:	0		Pulse Input Total: 1+2+3+4

Reset Pulse Counter

Device Name: MLPQM
 Group Name: \$SYSTEM
 Device Type: PQM
 Hardware Rev.: C
 Main Program Rev.: 3.41
 Boot Program Rev.: 1.10
 Supervisor Rev.: 1.02
 Mod File Numbers:
 1 2 3 4 5
 000 000 000 000 000

Events Trend Help
 Setup Wave Exit

PRANGE ANALYSIS IO SETPOINTS
 METERING STATUS DEMAND IVRANGE

The Multilin PQM Inputs and Outputs screen shows:

- Digital Input Switches
- Output Relays
- Analog Input
- Switch Input Pulse Counters

The **Reset Pulse Counter** button, when clicked, will reset all the pulse counter values.

Setpoints Tab

Multilin PQM System Setpoints	
Current Demand Type: Thermal Exponential	Analog Input Select: Off
Current Demand Time Interval (m): 30	Analog Input Main Relay: Off
Power Demand Type: Thermal Exponential	Analog Input Alt. Relay: Off
Power Demand Time Interval (m): 30	Analog Out 1 Main: Avg. Phase Current
Energy Cost Per kWh (cents): 10.00	Analog Out 1 Alt.: Phase A Current
Phase CT Primary (A): 5	Analog Out 2 Main: 3 Phase kW
Neutral Current Sensing: Separated CT	Analog Out 2 Alt.: Not Used
Neutral CT Primary (A): 100	Analog Out 3 Main: 3 Phase kvar
CT Wiring: Phase A, B, and C	Analog Out 3 Alt.: Not Used
Voltage Transformer Ratio: 1.0 :1	Analog Out 4 Main: 3 Phase PF
VT Wiring: 4 Wire Wye/3 VTs	Analog Out 4 Alt.: Not Used
VT Nominal Secondary Voltage (V): 100	Switch A Function: Not Used
Nominal Direct Input Voltage (V): 600	Switch B Function: Aux. 3 Relay
Nominal System Frequency (Hz): 60	Switch C Function: Not Used
Modbus Address: 21	Switch D Function: Not Used

Device Name: MLPQM	Group Name: \$SYSTEM	Device Type: PQM	Hardware Rev.: C	Main Program Rev.: 3.41	Boot Program Rev.: 1.10	Supervisor Rev.: 1.02	Mod File Numbers: 1 2 3 4 5 000 000 000 000 000
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Events	Trend	Help	PRANGE	ANALYSIS	IO	SETPOINTS
Setup	Wave	Exit	METERING	STATUS	DEMAND	IVRANGE

The Multilin PQM System Setpoints screen shows:

- Current Demand Type
- Current Demand Time Interval (m)
- Power Demand Type
- Power Demand Time Interval (m)
- Energy Cost Per kWh (cents)
- Neutral Current Sensing
- Analog Input Main Relay
- Analog Input Alt Relay
- Switch A Function
- Switch B Function
- Switch C Function
- Switch D Function

Power Quality Meter II (EPM8000)

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

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

Tab	Button	Function
Metering	Clear Energy	Clears the PQMII's energy counters
	Reset Device	Issues a RESET command to the PQMII
Demand	Clear Max Demand Values	Clears the PQMII's Max Demand values from memory
	Clear Frequency Values	Clears the PQMII's Max Frequency values from memory
I, V Range	Clear Current Min/Max	Clears the PQMII's Current Min/Max values from memory
	Clear Voltage Min/Max	Clears the EPM8000's Voltage Min/Max values from memory
P Range	Clear Power Min/Max	Clears the PQMII's Power Min/Max values from memory
Analysis	Clear Max THD Values	Clears the PQMII's Max THD values from memory
I/O	Reset Pulse Counter	Resets the PQMII's pulse counter

Table 21. PQMII Tabular data screen commands.

See the PQMII 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.

Metering Tab

EPM8000 Metering

	<u>A</u>	<u>B</u>	<u>C</u>	<u>3 Phase</u>
Amps	1005	1007	1004	1005 (Average)
PF:	1.00 Lag	1.00 Lag	1.00 Lag	1.00 Lag
kW:	50.31	50.40	50.36	151.07
kvar:	-0.30	-0.43	-0.46	-1.20
kVA:	50.41	50.48	50.45	151.07
V (Phase):	50	50	50	50 (Average)
V (Line):	<u>A-B</u> 86	<u>B-C</u> 86	<u>C-A</u> 86	86 (Average)
Neutral Current (A):	0		Voltage Unbalance (%):	0.0
Current Unbalance (%):	0.0		Frequency (Hz):	60.00
Energy			kVAh:	1912854
Positive kWh:	1094156		kWh last 24 hrs:	3627
Negative kWh:	16184		Real Energy Cost (\$):	109415.60
Positive kvarh:	372338		Real Energy Cost/day (\$):	262.37
Negative kvarh:	484394		Output Relays	
Last Energy Reset: 19:05:51 11/07/2001			<input checked="" type="checkbox"/> Alarm	<input type="checkbox"/> Aux 2
Clear Energy			<input type="checkbox"/> Aux 1	<input type="checkbox"/> Aux 3
Reset Device				

Events **Trend** **Help**
Setup **Wave** **Exit**

METERING STATUS DEMAND IVRANGE
 PRANGE ANALYSIS IO SETPOINTS

The Multilin EPM8000 Metering tab shows:

- **Metering values:** For A, B, C and 3 Phase
- **Energy:** In various values
- **Output Relays:** Alarm, Aux 1, Aux 2 and Aux 3

The **Clear Energy** button, when clicked, will clear all energy values. The **Reset Device** button, when clicked, will reset the Device.

Status Tab

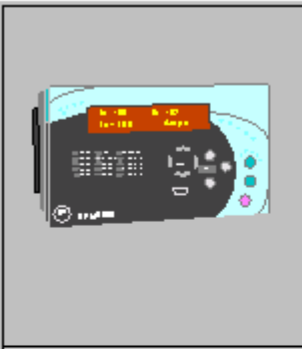
EPM8000 Alarm, Aux1, Aux2, Aux3 Relay Status	
<input type="checkbox"/> Phase Undercurrent	<input type="checkbox"/> Underfrequency
<input type="checkbox"/> Phase Overcurrent	<input type="checkbox"/> Overfrequency
<input type="checkbox"/> Neutral Overcurrent	<input type="checkbox"/> Apparent Power Dmnd
<input checked="" type="checkbox"/> Undervoltage	<input type="checkbox"/> Phase A Current Dmnd
<input type="checkbox"/> Overvoltage	<input type="checkbox"/> Phase B Current Dmnd
<input type="checkbox"/> Current Unbalance	<input type="checkbox"/> Phase C Current Dmnd
<input type="checkbox"/> Voltage Unbalance	<input type="checkbox"/> Neutral Current Dmnd
<input type="checkbox"/> Phase Reversal	<input type="checkbox"/> Switch Input A
<input type="checkbox"/> Power Factor Lead 1	<input type="checkbox"/> Switch Input B
<input type="checkbox"/> Power Factor Lead 2	<input type="checkbox"/> Switch Input C
<input type="checkbox"/> Power Factor Lag 1	<input type="checkbox"/> Switch Input D
<input type="checkbox"/> Power Factor Lag 2	<input type="checkbox"/> Internal Fault
<input type="checkbox"/> Positive Real Power	<input type="checkbox"/> Pos. Real Power Dmnd
<input type="checkbox"/> Negative Real Power	<input type="checkbox"/> Neg. Real Power Dmnd
<input type="checkbox"/> Pos. Reactive Power	<input type="checkbox"/> Pos. Reactive Pwr Dmnd
<input type="checkbox"/> Neg. Reactive Power	<input type="checkbox"/> Neg. Reactive Pwr Dmnd
<input type="checkbox"/> Clock Not Set	<input type="checkbox"/> Param. Not Set
<input type="checkbox"/> Pulse Input 1	<input type="checkbox"/> Current THD
<input type="checkbox"/> Current THD	<input type="checkbox"/> Voltage THD
<input type="checkbox"/> Voltage THD	<input type="checkbox"/> Main Analog I/P
<input type="checkbox"/> Main Analog I/P	<input type="checkbox"/> Alt Analog I/P
<input type="checkbox"/> Alt Analog I/P	<input type="checkbox"/> Data Log 1
<input type="checkbox"/> Data Log 1	<input type="checkbox"/> Data Log 2
<input type="checkbox"/> Data Log 2	<input type="checkbox"/> COM1 Failure
<input type="checkbox"/> COM1 Failure	<input type="checkbox"/> COM2 Failure
<input type="checkbox"/> COM2 Failure	<input type="checkbox"/> Pulse Input 2
<input type="checkbox"/> Pulse Input 2	<input type="checkbox"/> Pulse Input 3
<input type="checkbox"/> Pulse Input 3	<input type="checkbox"/> Pulse Input 4
<input type="checkbox"/> Pulse Input 4	<input type="checkbox"/> Total Pulse Inp.
<input type="checkbox"/> Total Pulse Inp.	<input type="checkbox"/> Time Alarm
<input type="checkbox"/> Time Alarm	

Legend: ■ = Pickup ■ = Active

Events	Trend	Help	METERING	STATUS	DEMAND	IVRANGE
Setup	Wave	Exit	PRANGE	ANALYSIS	IO	SETPOINTS

The Multilin Status tab shows the status of Alarms, Aux1, Aux2, Aux3 Relays.

Demand Tab



Device Name: PGM2
 Group Name: \$SYSTEM
 Device Type: PGM
 Hardware Rev.: C
 Main Program Rev.: 3.62
 Boot Program Rev.: 1.10
 Supervisor Rev.: 1.02
 Mod File Numbers:
 1 2 3 4 5
 000 000 000 000 000

EPM8000 Metering Frequency & Demand Range

<u>Frequency</u>	<u>Min</u>	<u>Max</u>
Hz 60.00	0.00 19:14:55 11/07/2001	123.01 06:32:44 11/27/2003

<u>Demand Current & Power</u>	<u>Peak Demand</u>
Phase A Current Demand (Amps): 999	6199 23:51:46 12/18/2003
Phase B Current Demand (Amps): 1000	6333 13:51:22 12/13/2001
Phase C Current Demand (Amps): 996	7198 20:11:32 12/10/2001
Neutral Current Demand (Amps): 0	503 00:52:01 12/14/2001
Real Power Demand (kW): 151.18	240737.20 20:54:29 12/10/2003
Reactive Power Demand (kvar): -1.05	34137.39 09:44:34 12/14/2001
Apparent Power Demand (kVA): 151.09	241017.82 20:54:29 12/10/2003

Clear Max Demand Values

Clear Frequency Values

Events	Trend	Help
Setup	Wave	Exit

METERING	STATUS	DEMAND	IVRANGE
PRANGE	ANALYSIS	IO	SETPOINTS

The Multilin PQMII Demand screen shows :


- Demand Current & Power
- Peak Demand
- Minimum and Maximum Frequency and their Time Stamps.

The Clear Max Demand Values button, when clicked, will clear all the maximum demand values. The Clear Frequency Values button, when clicked, will clear all the frequency values.

PMCS Interface Toolkit

Features of Tabular Data Screen Wizards • 115

IV Range Tab



Device Name: PGM2
 Group Name: \$SYSTEM
 Device Type: PGM
 Hardware Rev.: C
 Main Program Rev.: 3.62
 Boot Program Rev.: 1.10
 Supervisor Rev.: 1.02
 Mod File Numbers:
 1 2 3 4 5
 000 000 000 000 000

EPM8000 Current, Voltage Min/Max Detected Values

<u>Current</u>	<u>Min</u>	<u>Max</u>
Amps A:	0 19:17:00 11/07/2001	10000 23:36:32 12/18/2003
Amps B:	0 19:17:00 11/07/2001	6357 14:01:41 12/13/2001
Amps C:	0 19:17:00 11/07/2001	7206 20:14:03 12/10/2001
Amps N:	0 19:17:00 11/07/2001	507 20:18:56 12/13/2001
Amps Unbal. (%):	0.0 19:17:00 11/07/2001	100.0 19:27:59 11/15/2001
<u>Voltage</u>		
Volts AB:	0 19:15:47 11/07/2001	205603 02:12:14 12/07/2003
Volts BC:	0 11:27:23 11/08/2001	296649 09:20:39 12/14/2001
Volts CA:	0 11:27:23 11/08/2001	205671 00:48:55 12/07/2003
Volts An:	0 19:15:47 11/07/2001	116507 04:56:26 12/07/2003
Volts Bn:	0 19:15:47 11/07/2001	145954 09:20:39 12/14/2001
Volts Cn:	0 11:27:23 11/08/2001	150996 09:28:01 12/14/2001
Volts Unbal. (%):	0.0 11:22:26 11/08/2001	100.0 19:15:47 11/07/2001

Clear Current Min/Max

Clear Voltage Min/Max

Events	Trend	Help
Setup	Wave	Exit

METERING	STATUS	DEMAND	IVRANGE
PRANGE	ANALYSIS	IO	SETPOINTS

The Multilin PQMII IV Range tab shows the Minimum and Maximum Current, Voltage Values.


The **Clear Current Min/Max** button, when clicked, will clear all the minimum and maximum values of the current.

The **Clear Voltage Min/Max** button, when clicked, will clear all the minimum and maximum values of voltage.

116 • Features of Tabular Data Screen Wizards

PMCS Interface Toolkit

P Range Tab



EPM8000 Power		<u>Min</u>			<u>Max</u>		
3 Ph. kW:	0.00	19:12:39	11/07/2001	350000.00	23:36:32	12/18/2003	
Ph. A kW:	0.00	19:12:39	11/07/2001	350000.00	23:36:32	12/18/2003	
Ph. B kW:	0.00	19:12:39	11/07/2001	111691.23	20:54:32	12/10/2003	
Ph. C kW:	0.00	19:12:39	11/07/2001	112182.06	20:54:32	12/10/2003	
3 Ph. kvar:	0.00	19:12:39	11/07/2001	146335.72	20:21:23	12/10/2003	
Ph. A kvar:	0.00	19:12:39	11/07/2001	37530.82	11:47:50	12/11/2003	
Ph. B kvar:	0.00	19:12:39	11/07/2001	-110077.80	00:30:24	12/11/2003	
Ph. C kvar:	0.00	19:12:39	11/07/2001	97354.77	03:12:50	12/11/2003	
3 Ph. kVA:	0.00	19:12:39	11/07/2001	350000.00	23:36:32	12/18/2003	
Ph. A kVA:	0.00	19:12:39	11/07/2001	350000.00	23:36:32	12/18/2003	
Ph. B kVA:	0.00	19:12:39	11/07/2001	110677.72	07:32:05	12/12/2003	
Ph. C kVA:	0.00	19:12:39	11/07/2001	111648.83	23:17:56	12/11/2003	
3 Ph. PF:	0.00 Lag	17:22:30	11/08/2001	1.00 Lag	19:12:39	11/07/2001	
Ph. A PF:	0.00 Lag	13:31:59	11/17/2001	1.00 Lag	19:12:39	11/07/2001	
Ph. B PF:	0.00 Lag	20:17:41	11/19/2001	1.00 Lag	19:12:39	11/07/2001	
Ph. C PF:	0.00 Lag	15:38:41	11/09/2001	1.00 Lag	19:12:39	11/07/2001	


Device Name:	PQM2			
Group Name:	\$SYSTEM			
Device Type:	PQM			
Hardware Rev.:	C			
Main Program Rev.:	3.62			
Boot Program Rev.:	1.10			
Supervisor Rev.:	1.02			
Mod File Numbers:				
1	2	3	4	5
000	000	000	000	000

Events	Trend	Help	PRANGE	ANALYSIS	IO	SETPOINTS
Setup	Wave	Exit	METERING	STATUS	DEMAND	IVRANGE

The Multilin PQMII Power Range screen shows the Power minimum and maximum values.

The **Clear Power Min/Max** button, when clicked, will clear all the minimum and maximum values of the power.

Analysis Tab

	EPM8000 Power Analysis																	
	Power Quality Values Ia Crest Factor: 1.414 Ib Crest Factor: 1.420 Ic Crest Factor: 1.415		Ia Transformer Harmonic Derating Factor: 1.000 Ib Transformer Harmonic Derating Factor: 0.995 Ic Transformer Harmonic Derating Factor: 0.998															
Device Name: PQM2 Group Name: \$SYSTEM Device Type: PQM Hardware Rev.: C Main Program Rev.: 3.62 Boot Program Rev.: 1.10 Supervisor Rev.: 1.02 Mod File Numbers: 1 2 3 4 5 000 000 000 000 000	Total Harmonic Distortion Phase A Current THD (%): 0.6 Phase B Current THD (%): 0.6 Phase C Current THD (%): 0.7 Neutral Current THD (%): 0.0		THD Max 6368.5 20:36:28 11/19/2001 6308.8 20:20:51 11/19/2001 6549.2 15:15:55 03/23/2003 0.0 19:14:10 11/07/2001 193.1 12:55:47 12/10/2002 212.6 15:59:47 01/25/2002 184.0 12:29:17 11/20/2001 1.2 15:06:15 12/13/2001 100.7 15:06:15 12/13/2001															
			<input type="button" value="Clear Max THD Values"/>															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Events</td> <td style="padding: 2px;">Trend</td> <td style="padding: 2px;">Help</td> </tr> <tr> <td style="padding: 2px;">Setup</td> <td style="padding: 2px;">Wave</td> <td style="padding: 2px;">Exit</td> </tr> </table>	Events	Trend	Help	Setup	Wave	Exit	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">PRANGE</td> <td style="padding: 2px;">ANALYSIS</td> <td style="padding: 2px;">IO</td> <td style="padding: 2px;">SETPOINTS</td> </tr> <tr> <td style="padding: 2px;">METERING</td> <td style="padding: 2px;">STATUS</td> <td style="padding: 2px;">DEMAND</td> <td style="padding: 2px;">IVRANGE</td> </tr> </table>	PRANGE	ANALYSIS	IO	SETPOINTS	METERING	STATUS	DEMAND	IVRANGE			
Events	Trend	Help																
Setup	Wave	Exit																
PRANGE	ANALYSIS	IO	SETPOINTS															
METERING	STATUS	DEMAND	IVRANGE															

The Multilin PQMII Power Analysis screen shows:

- Power Quality Values
- Total Harmonic Distortion
- THD Max

The **Clear Max THD Values** button, when clicked, will clear all maximum THD values.

IO Tab

EPM8000 Inputs and Outputs

Digital Input Switches

SWITCH INPUT A	Not Active
SWITCH INPUT B	Not Active
SWITCH INPUT C	Not Active
SWITCH INPUT D	Not Active

Output Relays

Alarm:	Energized
Auxillary 1:	De-Energized
Auxillary 2:	De-Energized
Auxillary 3:	De-Energized

Analog Input

Main/Alt Analog Input:	0
------------------------	---

Switch Input Pulse Counters

Pulse Count 1:	0	Units	Pulse Input 1 Value:	1
Pulse Count 2:	0		Pulse Input 2 Value:	1
Pulse Count 3:	0		Pulse Input 3 Value:	1
Pulse Count 4:	0		Pulse Input 4 Value:	1
Totalized Pulse Input:	0		Pulse Input Total:	1+2+3+4

Reset Pulse Counter

Device Name: PQM2
 Group Name: \$SYSTEM
 Device Type: PQM
 Hardware Rev.: C
 Main Program Rev.: 3.62
 Boot Program Rev.: 1.10
 Supervisor Rev.: 1.02
 Mod File Numbers:
 1 2 3 4 5
 000 000 000 000 000


Events Trend Help
 Setup Wave Exit
 PRANGE ANALYSIS IO SETPOINTS
 METERING STATUS DEMAND IVRANGE

The Multilin PQMII Inputs and Outputs screen shows:

- Digital Input Switches
- Output Relays
- Analog Input
- Switch Input Pulse Counters

The **Reset Pulse Counter** button, when clicked, will reset all the pulse counter values.

Setpoints Tab



EPM8000 System Setpoints

Current Demand Type: Thermal Exponential	Analog Input Select: Off
Current Demand Time Interval (m): 30	Analog Input Main Relay: Off
Power Demand Type: Thermal Exponential	Analog Input Alt. Relay: Off
Power Demand Time Interval (m): 30	Analog Out 1 Main: Avg. Phase Current
Energy Cost Per kWh (cents): 10.00	Analog Out 1 Alt.: Not Used
Phase CT Primary (A): 10000	Analog Out 2 Main: 3 Phase kW
Neutral Current Sensing: Separated CT	Analog Out 2 Alt.: Not Used
Neutral CT Primary (A): 100	Analog Out 3 Main: 3 Phase kvar
CT Wiring: Phase A, B, and C	Analog Out 3 Alt.: Not Used
Voltage Transformer Ratio: 1.0 :1	Analog Out 4 Main: 3 Phase PF
VT Wiring: 4 Wire Wye/3 VTs	Analog Out 4 Alt.: Not Used
VT Nominal Secondary Voltage (V): 100	Switch A Function: Alarm Relay
Nominal Direct Input Voltage (V): 600	Switch B Function: Not Used
Nominal System Frequency (Hz): 60	Switch C Function: Not Used
Modbus Address: 1	Switch D Function: Not Used

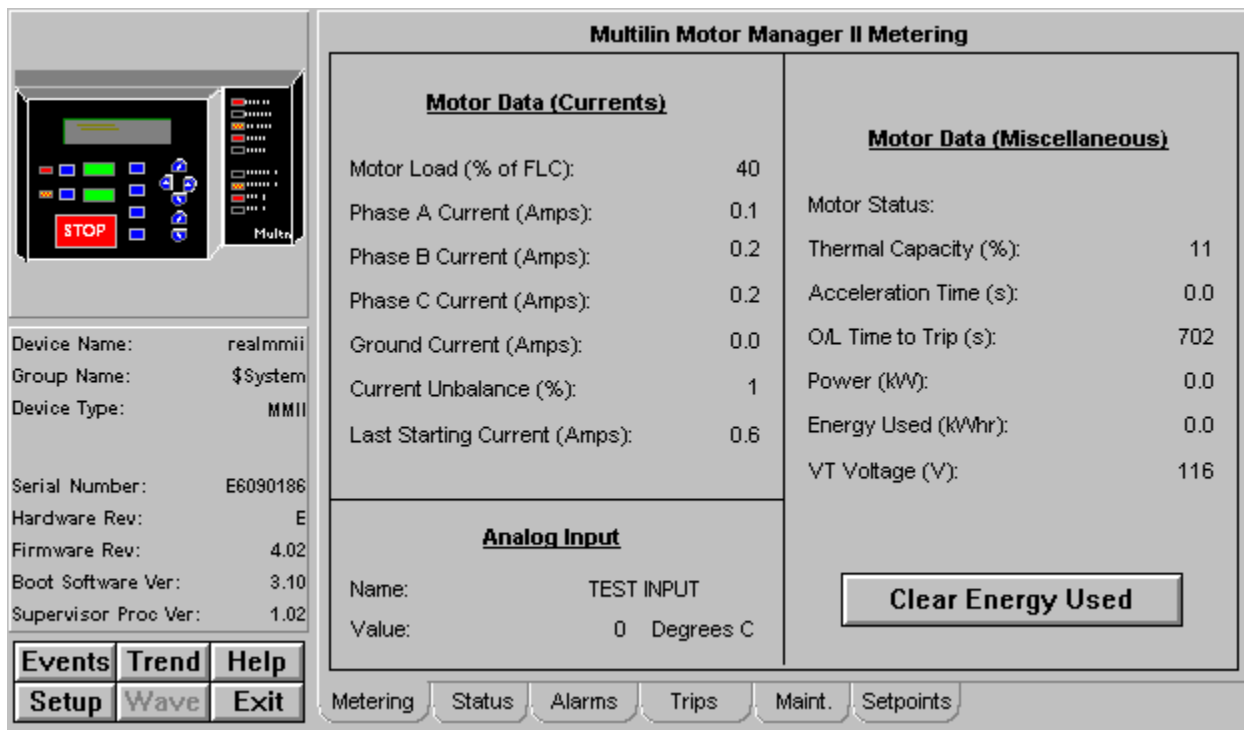
Device Name: PQM2	Group Name: \$SYSTEM	Device Type: PQM	Hardware Rev.: C
Main Program Rev.: 3.62	Boot Program Rev.: 1.10	Supervisor Rev.: 1.02	Mod File Numbers:
1 000	2 000	3 000	4 000
5 000			

Events	Trend	Help	SETPOINTS
Setup	Wave	Exit	IVRANGE

The Multilin PQMII System Setpoints screen shows:

- Current Demand Type
- Current Demand Time Interval (m)
- Power Demand Type
- Power Demand Time Interval (m)
- Energy Cost Per kWh (cents)
- Neutral Current Sensing
- Analog Input Main Relay
- Analog Input Alt Relay
- Switch A Function
- Switch B Function
- Switch C Function
- Switch D Function

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 22. 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

	<u>A</u>	<u>B</u>	<u>C</u>	<u>Three Phase Values</u>	
Volts L-N:	78	78	78	Average Volts L-N:	78
Current:	78	77	78	Average Volts L-L:	135
KW:	0	0	0	Average Amps:	78
kVA:	24	0	0	Total KW:	0
kVAR:	8	8	8	Total kVA:	0
				Total kVAR:	24
PF:	+ 0.08			Volts AB:	136
Frequency:	601.1			Volts BC:	135
Neutral Current:	90			Volts CA:	136
V AUX:	0				
KW Demand:	+ 0				
??? Demand	+ 0				
		<u>Total</u>	<u>Import</u>	<u>Export</u>	
KWH:	+ 875	0	0		
KVARH:	+ 875	0	0		

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

	<u>A</u>	<u>B</u>	<u>C</u>	<u>Three Phase Values</u>	
Voltage L-N:	45	45	45	Avg. Voltage L-N:	45
Current:	45	45	45	Avg. Voltage L-L:	78
kW:	1	1	1	Avg. Current:	45
kVA:	6	0	0	Total kW:	4
kVAR:	1	1	1	Total kVA:	0
PF (%):	+ 0	+ 0	+ 0	Total kVAR:	4
				Total PF (%):	+ 0
V AUX:			0	Volts AB:	78
Neutral Current:			45	Volts BC:	77
Frequency:			60.28	Volts CA:	78
Voltage Unbalance (%):			0		
Current Unbalance (%):			0		
	<u>Total</u>	<u>Import</u>	<u>Export</u>	<u>Net</u>	
kWH:	860	860	0	0	
kVARH:	860	860	0	0	
kVAH:	0	0	0	0	

Device Name: EPM3720
 Group Name: \$System
 Voltage Scale: 0
 Current Scale: 0
 Modbus Address: 0
 Meter Rev.: 0.0.0.0

Event Logger | Trend Wave | Help Exit

Metering | Thermal Dmnd | Sliding Dmnd | Setup 1 | Setup 2 | Setpoints

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 23. EPM 7300 Tabular data screen commands.

Metering Tab



Device Name: E7330
Group Name: \$SYSTEM
Device Type: EPM7300
Modbus Address: 18

EPM7300 Normal Metering Values

	A	B	C	Three Phase Values	
Voltage L-N:	N/A	N/A	N/A	Avg. Voltage L-N:	N/A
Current (A):	120	119	120	Avg. Voltage L-L:	33
kW:	N/A	N/A	N/A	Avg. Current (A):	120
kVA:	N/A	N/A	N/A	Total kW:	-6
kVAR:	N/A	N/A	N/A	Total kVA:	6
PF (%):	N/A	N/A	N/A	Total kVAR:	0
Voltage THD (%):	329.30	0.00	0.00	Total PF (%):	-99.99
Current THD (%):	0.00	0.31	0.33		
K Factor:	1.00	1.00	1.00		

Voltage Unbalance (%):	100.00	Volts AB:	0
Current Unbalance (%):	0.12	Volts BC:	50
Frequency (Hz):	N/A	Volts CA:	50
Phase Reversal:	ON		

	Import	Export	Total	Net
kWh:	11	97	108	-86
kVARh:	1	1	2	0
kVAh:			108	

[Reset Energy](#)

Events

Trend

Help

METERING

SETUP

MINMAX

Setup

Wave

Exit

The 7300 ION Normal Metering Values screen shows the metering values:

- A, B and C
- Three Phase Values
- Voltage Imbalance
- Current Imbalance
- Frequency (Hz)
- Phase Reversal
- Energy

The **Reset Energy** button will reset the energy.

Min/Max Tab

EPM7300 MIN/MAX/Demand Values

	MIN	MAX
Avg. Voltage L-N:	N/A	N/A
Avg. Current:	0	292
Frequency (Hz):	0	60
kW Total:		39
kVAR Total:		8
kVA Total:		39

	Digital Outputs	Status
D01	<input type="text" value="Digital Output 1"/> Force ON Force OFF	<input type="button" value="OFF"/>
D02	<input type="text" value="Digital Output 2"/> Force ON Force OFF	<input type="button" value="OFF"/>
D03	<input type="text" value="Digital Output 3"/> Force ON Force OFF	<input type="button" value="OFF"/>

	Sliding Window Demand	Predicted Demand
kW	-6	-6
kVA	6	6
kVAR	0	0

Reset Sliding Demand **Reset Min/Max**

Events Trend Help
Setup Wave Exit

METERING SETUP MINMAX


The 7300 ION Min/Max/Demand Values screen shows:

- Minimum and maximum metering values
- Digital Outputs
 1. By clicking on the Text box provided, a popup box will be appeared where text can be entered.
 2. By clicking on Force ON and Force OFF the status can be seen as ON or OFF respectively.
- Sliding Window Demand and Predicted Windows Demand

The Reset Sliding Demand button, when clicked, will reset all Sliding Demand values in the device.

The Reset Min/Max button, when clicked, will reset all Min/Max values in the device.

Setup Tab

		EPM7300 Setup				
	Device Name:	E7330		PT Secondary:	120	
	Group Name:	SYSTEM		CT Secondary:	5	
	Device Type:	EPM7300		Dig. Out 1 Polarity:	Inverting	
	Modbus Address:	18		Dig. Out 2 Polarity:	Inverting	
		Volts Mode:	Delta		Dig. Out 3 Polarity:	Inverting
		Va Polarity:	Inverted		KYZ Polarity:	Non-Inverting
		Vb Polarity:	Inverted		Com 1 Baud Rate:	19200
		Vc Polarity:	Inverted		Com 1 Unit ID:	18
		Phase Order:	ABC			
		Ia Polarity:	Inverted			
	Ib Polarity:	Inverted				
	Ic Polarity:	Inverted				
		kw Sliding Demand:	900 sec.	SD Sub Interval	SD #Sub Interval	SD Predicted Response
		kVAR Sliding Demand:	900 sec.	1	1	70
		kVA Sliding Demand:	900 sec.	1	1	70
		Download		Refresh		
Events	Trend	Help	METERING		SETUP	MINMAX
Setup	Wave	Exit				

The 7300 ION Setup screen shows various setup values of the device such as Volts Mode, Phase Order, PT Secondary and CT Secondary.

The **Download** button, when clicked, will download all relevant values in the device.

The **Refresh** button, when clicked, will refresh all the values coming from the device.

EPM 7330 Meter

The EPM 7330 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 7330 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 24. EPM 7330 Tabular data screen commands.

Metering Tab



Device Name: E7330
Group Name: \$SYSTEM
Device Type: EPM7330
Modbus Address: 18

EPM7330 Normal Metering Values

	A	B	C	Three Phase Values	
Voltage L-N:	N/A	N/A	N/A	Avg. Voltage L-N:	N/A
Current (A):	120	119	120	Avg. Voltage L-L:	33
kW:	N/A	N/A	N/A	Avg. Current (A):	120
kVA:	N/A	N/A	N/A	Total kW:	-6
kVAR:	N/A	N/A	N/A	Total kVA:	6
PF (%):	N/A	N/A	N/A	Total kVAR:	0
Voltage THD (%):	305.99	0.00	0.00	Total PF (%):	99.99
Current THD (%):	0.47	0.00	0.34		
K Factor:	1.00	1.00	1.00		

Voltage Unbalance (%):	100.00	Volts AB:	0
Current Unbalance (%):	0.14	Volts BC:	50
Frequency (Hz):	N/A	Volts CA:	50
Phase Reversal:	<input type="checkbox"/> OFF		

	Import	Export	Total	Net
kWh:	11	103	114	-92
kVARh:	1	1	2	0
kVAh:			114	

Reset Energy

Events Trend Help

METERING SETUP MINMAX

Setup Wave Exit

The 7330 ION Normal Metering Values screen shows the metering values:

- A, B and C
- Three Phase Values
- Voltage Imbalance
- Current Imbalance
- Frequency (Hz)
- Phase Reversal
- Energy

The **Reset Energy** button will reset the energy.

Min/Max Tab

EPM7330 MIN/MAX/Demand Values

	MIN	MAX
Avg. Voltage L-N:	N/A	N/A
Avg. Current:	0	292
Frequency (Hz):	0	60
kW Total:		39
kVAR Total:		8
kVA Total:		39

	Digital Outputs	Status
D01	<input type="text" value="Digital Output 1"/> Force ON Force OFF	<input type="button" value="OFF"/>
D02	<input type="text" value="Digital Output 2"/> Force ON Force OFF	<input type="button" value="OFF"/>
D03	<input type="text" value="Digital Output 3"/> Force ON Force OFF	<input type="button" value="OFF"/>

	Sliding Window Demand	Predicted Demand
kW	-6	-6
kVA	6	6
kVAR	0	0

Reset Sliding Demand **Reset Min/Max**

Events Trend Help
Setup Wave Exit

METERING SETUP MINMAX


The 7330 ION Min/Max/Demand Values screen shows:

- Minimum and maximum metering values
- Digital Outputs
 3. By clicking on the Text box provided, a popup box will be appeared where text can be entered.
 4. By clicking on Force ON and Force OFF the status can be seen as ON or OFF respectively.
- Sliding Window Demand and Predicted Windows Demand

The Reset Sliding Demand button, when clicked, will reset all Sliding Demand values in the device.

The Reset Min/Max button, when clicked, will reset all Min/Max values in the device.

Setup Tab

EPM7330 Setup																					
	Volts Mode: <input type="text" value="Delta"/> ▾	PT Secondary: <input type="text" value="120"/>																			
	Va Polarity: <input type="text" value="Normal"/> ▾	CT Secondary: <input type="text" value="5"/>																			
	Vb Polarity: <input type="text" value="Inverted"/> ▾	Dig. Out 1 Polarity: <input type="text" value="Inverting"/> ▾																			
	Vc Polarity: <input type="text" value="Inverted"/> ▾	Dig. Out 2 Polarity: <input type="text" value="Inverting"/> ▾																			
	Phase Order: <input type="text" value="ABC"/> ▾	Dig. Out 3 Polarity: <input type="text" value="Inverting"/> ▾																			
	Ia Polarity: <input type="text" value="Normal"/> ▾	KYZ Polarity: <input type="text" value="Non-Inverting"/> ▾																			
	Ib Polarity: <input type="text" value="Inverted"/> ▾	Com 1 Baud Rate: <input type="text" value="19200"/> ▾																			
	Ic Polarity: <input type="text" value="Inverted"/> ▾	Com 1 Unit ID: <input type="text" value="18"/>																			
	Device Name: E7330																				
	Group Name: \$SYSTEM																				
Device Type: EPM7330																					
Modbus Address: 18																					
<table border="1"> <thead> <tr> <th></th> <th>SD Sub Interval</th> <th></th> <th>SD #Sub Interval</th> <th>SD Predicted Response</th> </tr> </thead> <tbody> <tr> <td>kw Sliding Demand:</td> <td><input type="text" value="900"/></td> <td>sec.</td> <td><input type="text" value="1"/></td> <td><input type="text" value="70"/></td> </tr> <tr> <td>kVAR Sliding Demand:</td> <td><input type="text" value="900"/></td> <td>sec.</td> <td><input type="text" value="1"/></td> <td><input type="text" value="70"/></td> </tr> <tr> <td>kVA Sliding Demand:</td> <td><input type="text" value="900"/></td> <td>sec.</td> <td><input type="text" value="1"/></td> <td><input type="text" value="70"/></td> </tr> </tbody> </table>			SD Sub Interval		SD #Sub Interval	SD Predicted Response	kw Sliding Demand:	<input type="text" value="900"/>	sec.	<input type="text" value="1"/>	<input type="text" value="70"/>	kVAR Sliding Demand:	<input type="text" value="900"/>	sec.	<input type="text" value="1"/>	<input type="text" value="70"/>	kVA Sliding Demand:	<input type="text" value="900"/>	sec.	<input type="text" value="1"/>	<input type="text" value="70"/>
	SD Sub Interval		SD #Sub Interval	SD Predicted Response																	
kw Sliding Demand:	<input type="text" value="900"/>	sec.	<input type="text" value="1"/>	<input type="text" value="70"/>																	
kVAR Sliding Demand:	<input type="text" value="900"/>	sec.	<input type="text" value="1"/>	<input type="text" value="70"/>																	
kVA Sliding Demand:	<input type="text" value="900"/>	sec.	<input type="text" value="1"/>	<input type="text" value="70"/>																	
<input type="button" value="Download"/> <input type="button" value="Refresh"/>																					
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Events	Trend	Help																			
Setup	Wave	Exit																			
METERING	SETUP	MINMAX																			

The 7330 ION Setup screen shows various setup values of the device such as Volts Mode, Phase Order, PT Secondary and CT Secondary.

The **Download** button, when clicked, will download all relevant values in the device.

The **Refresh** button, when clicked, will refresh all the values coming from the device.


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

		EPM7500 Normal Metering Values							
		Phase A	Phase B	Phase C	Neutral	Average			
	Voltage L-N (V):	131.37	122.56	20.13	----	91.35			
	Current (A):	798.76	797.14	798.54	0.00	798.15			
		Total							
	kW:	104.01	-71.14	-16.07	----	16.80			
	kVA:	104.93	97.69	16.07	----	79.79			
	kVAR:	-13.88	-64.12	0.00	----	-78.00			
	PF Lead (%):	99.12	n/a	100.00	----	21.05			
	PF Lag (%):	n/a	72.82	n/a	----	n/a			
	PF (%):	99.12	-72.82	100.00	----	21.05			
	Voltage THD (%):	0.00	0.00	0.00	----	----			
Current THD (%):	0.31	0.47	0.75	0.00	----				
K Factor (%):	1.00	1.00	1.04	0.00	----				
		Three Phase Values							
Device Name: EPM7500		Volts AB:		227.54	Frequency (Hz): 60.00				
Group Name: \$SYSTEM		Volts BC:		212.27	Phase Reversal: <input type="checkbox"/>				
Device Type: EPM7500		Volts CA:		34.86	Voltage Unbalance (%): 77.97				
Serial ID: PK-0001A006-01		Voltage L-L (V):		158.23	Current Unbalance (%): 0.13				
Firmware Rev.: 7500V201									
Voltage Mode: 3W-WYE									
Events	Trend	Help	METERING	MINMAX	QUALITY	DEMAND	INPUT	SETUP1	SETUP2
Setup	Wave	Exit							

EPM 7500/7600 Meter - Metering Data Screen

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

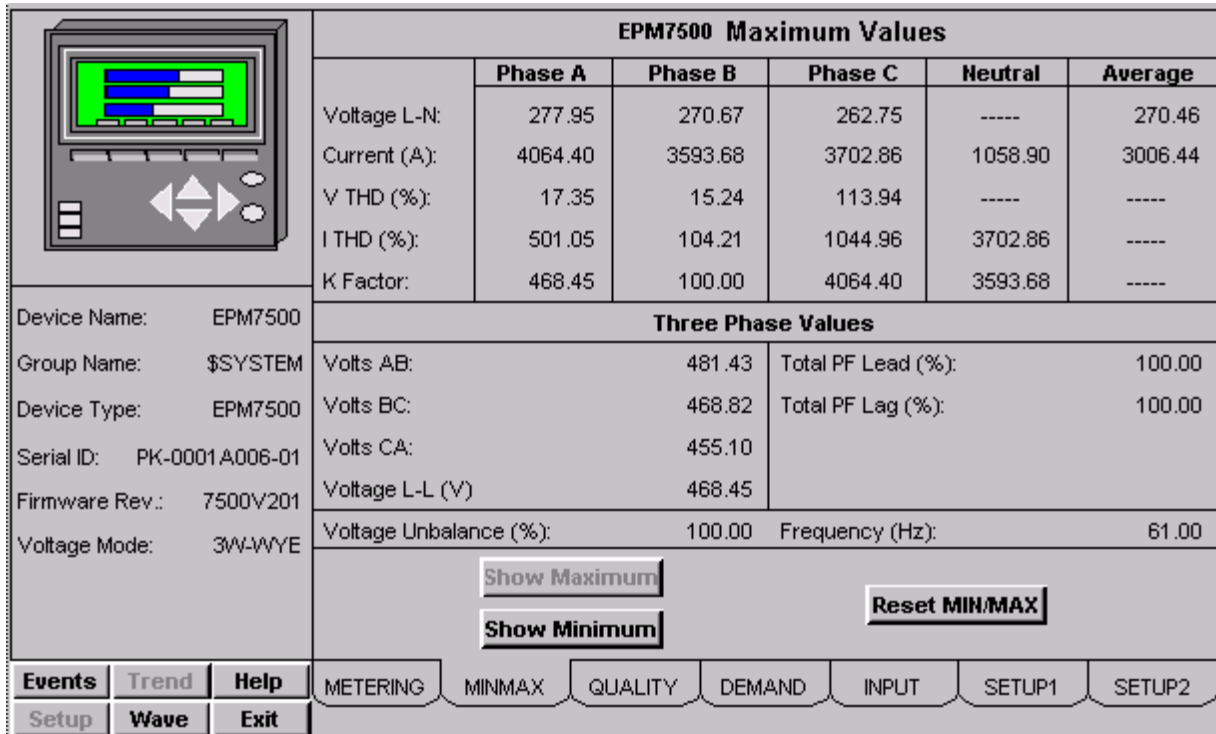
- Vln A, B: n/a when Voltage Mode is DELTA
- Vln C: n/a when Voltage Mode is DELTA or SINGLE
- Vln Avg: n/a when Voltage Mode is DELTA
- VII AB
- VII BC, CA, and Avg: n/a when Voltage Mode is SINGLE
- I A, B, Neutral, and Avg

- 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



EPM7500 Maximum Values					
	Phase A	Phase B	Phase C	Neutral	Average
Voltage L-N:	277.95	270.67	262.75	-----	270.46
Current (A):	4064.40	3593.68	3702.86	1058.90	3006.44
V THD (%):	17.35	15.24	113.94	-----	-----
I THD (%):	501.05	104.21	1044.96	3702.86	-----
K Factor:	468.45	100.00	4064.40	3593.68	-----

Three Phase Values			
Volts AB:	481.43	Total PF Lead (%):	100.00
Volts BC:	468.82	Total PF Lag (%):	100.00
Volts CA:	455.10		
Voltage L-L (V)	468.45		
Voltage Unbalance (%):	100.00	Frequency (Hz):	61.00

Events **Trend** **Help** **Setup** **Wave** **Exit**

METERING MINMAX QUALITY DEMAND INPUT SETUP1 SETUP2

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

- VIn A, B: n/a when Voltage Mode is DELTA
- VIn C: n/a when Voltage Mode is DELTA or SINGLE
- VIn 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

	EPM7500 Power Quality								
	Symmetric Components								
	Current Zero Seq:	0.0	/	0.00 ^o	Voltage Zero Seq:	n/a / n/a ^o			
	Current Positive Seq:	0.0	/	0.00 ^o	Voltage Positive Seq:	n/a / n/a ^o			
	Current Negative Seq:	0.0	/	0.00 ^o	Voltage Negative Seq:	n/a / n/a ^o			
	Disturbance Counts								
	Sag Swell Counter:	<input checked="" type="checkbox"/>	8	Enable Sag Swell	Disable Sag Swell				
	Reset Disturbance Counts								
	Relative Setpoints								
	Over KW SWD:	<input checked="" type="checkbox"/>	UNDER	Enable Over KW SWD	Disable Over KW SWD				
Over Ia:	<input checked="" type="checkbox"/>	OVER	Enable Over Current	Disable Over Current					
Over Ib:	<input checked="" type="checkbox"/>	OVER	Enable Over Current	Disable Over Current					
Over Ic:	<input checked="" type="checkbox"/>	OVER	Enable Over Current	Disable Over Current					
Over Vunbal:	<input checked="" type="checkbox"/>	OVER	Enable Over Vunbal	Disable Over Vunbal					
Legend: Disabled <input type="checkbox"/> Enabled <input checked="" type="checkbox"/>									
Events	Trend	Help	METERING	MINMAX	QUALITY	DEMAND	INPUT	SETUP1	SETUP2
Setup	Wave	Exit							

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

		EPM7500 Demand						
		Energy						
		Import	Export	Total	Net			
kWh		8085.213	267.K	347.K	-18.K			
kVARh		36.648	416.K	416.K	-41.K			
kVAh		----	----	563.K	Reset Energy			
		Demand						
		SWD	Predicted	Thermal	Reset SWD			
kW		-36.44	14.73	19.77				
kVAR		-125.68	-50.82	-55.38	Reset Thermal			
kVA		131.69	57.69	71.01				
I Avg		1363.16	545.82	635.77				
		Maximum Demand						
		SWD	Total	TD	Show Maximum			
kW		53.19	614.84	481.43	Show Minimum			
kVA		53.37	1597.28	99.30				
kVAR		53.33	104.25	503.94	Reset Peak Dmd			
Events		METERING	MINMAX	QUALITY	DEMAND	INPUT	SETUP1	SETUP2
Trend								
Help								
Setup								
Wave								
Exit								

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

The screenshot displays the 'EPM7500 Inputs' tab. On the left, there is a device information panel with the following details:

- Device Name: EPM7500
- Group Name: \$SYSTEM
- Device Type: EPM7500
- Serial ID: PK-0001A006-01
- Firmware Rev.: 7500V201
- Voltage Mode: 3W-WYE

The main area shows a table of digital inputs:

Digital Inputs	Status	Counter
SI1: <input type="text" value="Status Input 1"/>	<input checked="" type="checkbox" value="ON"/>	7
SI2: <input type="text" value="Status Input 2"/>	<input checked="" type="checkbox" value="ON"/>	7
SI3: <input type="text" value="Status Input 3"/>	<input checked="" type="checkbox" value="ON"/>	7
SI4: <input type="text" value="Status Input 4"/>	<input checked="" type="checkbox" value="ON"/>	7
SI5: <input type="text" value="Status Input 5"/>	<input checked="" type="checkbox" value="ON"/>	7
SI6: <input type="text" value="Status Input 6"/>	<input checked="" type="checkbox" value="ON"/>	7
SI7: <input type="text" value="Status Input 7"/>	<input checked="" type="checkbox" value="ON"/>	7
SI8: <input type="text" value="Status Input 8"/>	<input checked="" type="checkbox" value="ON"/>	7

Below the table is a 'Reset Counters' button. At the bottom, a navigation bar includes buttons for 'Events', 'Trend', 'Help', 'Setup', 'Wave', 'Exit', 'METERING', 'MINMAX', 'QUALITY', 'DEMAND', 'INPUT', 'SETUP1', and 'SETUP2'.

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

EPM7500 Setup 1																								
 <p>Device Name: EPM7500 Group Name: \$SYSTEM Device Type: EPM7500 Serial ID: PK-0001A006-01 Firmware Rev.: 7500V201 Voltage Mode: 3W-WYE</p>	<table border="1"> <thead> <tr> <th>Power</th> <th>Transformer Ratios</th> </tr> </thead> <tbody> <tr> <td>Volts Mode: <input type="text" value="3W-WYE"/></td> <td>PT Primary: <input type="text" value="120"/></td> </tr> <tr> <td>Va Polarity: <input type="text" value="Inverted"/></td> <td>CT Primary: <input type="text" value="5000"/></td> </tr> <tr> <td>Vb Polarity: <input type="text" value="Normal"/></td> <td>PT Secondary: <input type="text" value="120"/></td> </tr> <tr> <td>Vc Polarity: <input type="text" value="Normal"/></td> <td>CT Secondary: <input type="text" value="5"/></td> </tr> <tr> <td>Phase Order: <input type="text" value="ABC"/></td> <td>I4 CT Primary: <input type="text" value="5"/></td> </tr> <tr> <td>Ia Polarity: <input type="text" value="Inverted"/></td> <td>I4 CT Secondary: <input type="text" value="5"/></td> </tr> <tr> <td>Ib Polarity: <input type="text" value="Inverted"/></td> <td></td> </tr> <tr> <td>Ic Polarity: <input type="text" value="Normal"/></td> <td></td> </tr> <tr> <td>I4 Polarity: <input type="text" value="Normal"/></td> <td></td> </tr> </tbody> </table>	Power	Transformer Ratios	Volts Mode: <input type="text" value="3W-WYE"/>	PT Primary: <input type="text" value="120"/>	Va Polarity: <input type="text" value="Inverted"/>	CT Primary: <input type="text" value="5000"/>	Vb Polarity: <input type="text" value="Normal"/>	PT Secondary: <input type="text" value="120"/>	Vc Polarity: <input type="text" value="Normal"/>	CT Secondary: <input type="text" value="5"/>	Phase Order: <input type="text" value="ABC"/>	I4 CT Primary: <input type="text" value="5"/>	Ia Polarity: <input type="text" value="Inverted"/>	I4 CT Secondary: <input type="text" value="5"/>	Ib Polarity: <input type="text" value="Inverted"/>		Ic Polarity: <input type="text" value="Normal"/>		I4 Polarity: <input type="text" value="Normal"/>				
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<p style="text-align: center;"><input type="button" value="Download"/> <input type="button" value="Refresh"/></p>																								
<table border="1"> <thead> <tr> <th colspan="4">Communications</th> </tr> </thead> <tbody> <tr> <td colspan="4">Comm Mode: RS485</td> </tr> <tr> <th>Port</th> <th>Baud Rate</th> <th>Unit ID</th> <th>Protocol</th> </tr> <tr> <td>Com 1</td> <td>9600</td> <td>13</td> <td>MODBUS RTL</td> </tr> <tr> <td>Com 2</td> <td>19200</td> <td>13</td> <td>MODBUS RTL</td> </tr> <tr> <td>Com 3</td> <td>9600</td> <td>13</td> <td>ION</td> </tr> </tbody> </table>	Communications				Comm Mode: RS485				Port	Baud Rate	Unit ID	Protocol	Com 1	9600	13	MODBUS RTL	Com 2	19200	13	MODBUS RTL	Com 3	9600	13	ION
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Com 2	19200	13	MODBUS RTL																					
Com 3	9600	13	ION																					
<p>Ethernet IP Address: 3.209.16.55 Subnet Mask: 255.255.252.0 Default Gateway: 3.209.16.1</p>																								
<p><input type="button" value="Events"/> <input type="button" value="Trend"/> <input type="button" value="Help"/></p>																								
<p><input type="button" value="Setup"/> <input type="button" value="Wave"/> <input type="button" value="Exit"/></p>																								
<p>METERING MINMAX QUALITY DEMAND INPUT SETUP1 SETUP2</p>																								

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

EPM7500 Setup 2							
		SD Sub Interval		SD #Sub Intervals		SD Predicted Response	
	kW Sliding Demand:	<input type="text" value="900"/>	sec.	<input type="text" value="1"/>		<input type="text" value="70"/>	
	kVAR Sliding Demand:	<input type="text" value="900"/>	sec.	<input type="text" value="1"/>		<input type="text" value="70"/>	
	kVA Sliding Demand:	<input type="text" value="900"/>	sec.	<input type="text" value="1"/>		<input type="text" value="70"/>	
	lavg Sliding Demand:	<input type="text" value="900"/>	sec.	<input type="text" value="1"/>		<input type="text" value="70"/>	
Waveform Recorder				Sag / Swell			
Depth: <input type="text" value="128x14"/>				Nominal (V): <input type="text" value="120.00"/>			
				Sag Limit (%): <input type="text" value="88.00"/>			
				Swell Limit (%): <input type="text" value="106.00"/>			
				Change Criteria (%): <input type="text" value="10.00"/>			
Setpoints		DropOut		Pickup		Time Limits	
	Nominal	Under	Over	Under	Over	On (s)	Off (s)
Over kW SWD:	<input type="text" value="0.00"/>	<input type="text" value="200.00"/>	<input type="text" value="0.00"/>	<input type="text" value="200.00"/>	<input type="text" value="0.00"/>	<input type="text" value="30"/>	<input type="text" value="30"/>
Over Ia:	<input type="text" value="0.00"/>	<input type="text" value="200.00"/>	<input type="text" value="0.00"/>	<input type="text" value="200.00"/>	<input type="text" value="0.00"/>	<input type="text" value="30"/>	<input type="text" value="30"/>
Over Ib:	<input type="text" value="0.00"/>	<input type="text" value="200.00"/>	<input type="text" value="0.00"/>	<input type="text" value="200.00"/>	<input type="text" value="0.00"/>	<input type="text" value="30"/>	<input type="text" value="30"/>
Over Ic:	<input type="text" value="0.00"/>	<input type="text" value="200.00"/>	<input type="text" value="0.00"/>	<input type="text" value="200.00"/>	<input type="text" value="0.00"/>	<input type="text" value="30"/>	<input type="text" value="30"/>
Over Vunbal:	<input type="text" value="0.00"/>	<input type="text" value="200.00"/>	<input type="text" value="0.00"/>	<input type="text" value="200.00"/>	<input type="text" value="0.00"/>	<input type="text" value="30"/>	<input type="text" value="30"/>
<input type="button" value="Download"/>				<input type="button" value="Refresh"/>			
Events	Trend	Help	METERING	MINMAX	QUALITY	DEMAND	INPUT
Setup	Wave	Exit				SETUP1	SETUP2

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

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

		EPM7700 Normal Metering Values							
		Phase A	Phase B	Phase C	Neutral	Average			
 <p>Device Name: EPM7700 Group Name: \$SYSTEM Device Type: EPM7700 Serial ID: PM-9706B006-05 Firmware Rev.: 7700V200 Voltage Mode: 3W-WYE</p>	Voltage L-N (V):	131.40	75.70	20.00	----	75.70			
	Current (A):	23.95	2.38	15.97	0.00	14.10			
		Total							
	kW:	3.12	-0.16	-0.32	----	2.64			
	kVA:	3.15	0.18	0.32	----	2.69			
	kVAR:	-0.42	-0.09	-0.00	----	-0.51			
	PF Lead (%):	99.11	n/a	n/a	----	98.21			
	PF Lag (%):	n/a	87.86	100.00	----	n/a			
	PF (%):	99.11	-87.86	-100.00	----	98.21			
	Voltage THD (%):	0.00	0.00	0.00	----	----			
Current THD (%):	0.00	5.57	0.82	0.00	----				
K Factor (%):	1.00	3.96	1.00	4.03	----				
		Three Phase Values							
	Volts AB:	227.59		Frequency (Hz):	60.00				
	Volts BC:	131.12		Phase Reversal:	ON				
	Volts CA:	34.64		Voltage Unbalance (%):	73.58				
	Voltage L-L (V):	131.12		Current Unbalance (%):	83.13				
Events	Trend	Help	METERING	MINMAX	QUALITY	DEMAND	INPUT	SETUP1	SETUP2
Setup	Wave	Exit							

EPM 7700 ION Meter - Metering Data Screen

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

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

- VII 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

		EPM7700 Maximum Values							
		Phase A	Phase B	Phase C	Neutral	Average			
Voltage L-N:		218.28	210.31	208.54	----	204.27			
Current (A):		5934.10	7396.06	7916.47	0.00	5104.91			
V THD (%):		654.02	654.22	653.83	----	----			
I THD (%):		650.00	653.83	655.35	0.00	----			
K Factor:		274.01	762.82	177514.63	4.03	----			
Device Name: EPM7700		Three Phase Values							
Group Name: \$SYSTEM		Volts AB:		354.51	Total PF Lead (%): 100.00				
Device Type: EPM7700		Volts BC:		352.52	Total PF Lag (%): 100.00				
Serial ID: PM-9706B006-05		Volts CA:		350.53					
Firmware Rev.: 7700V200		Voltage L-L (V)		352.52					
Voltage Mode: 3W-WYE		Voltage Unbalance (%):		200.00	Frequency (Hz): 61.26				
		<input type="button" value="Show Maximum"/>		<input type="button" value="Reset MIN/MAX"/>					
		<input type="button" value="Show Minimum"/>							
<input type="button" value="Events"/>	<input type="button" value="Trend"/>	<input type="button" value="Help"/>	<input type="button" value="METERING"/>	<input type="button" value="MINMAX"/>	<input type="button" value="QUALITY"/>	<input type="button" value="DEMAND"/>	<input type="button" value="INPUT"/>	<input type="button" value="SETUP1"/>	<input type="button" value="SETUP2"/>
<input type="button" value="Setup"/>	<input type="button" value="Wave"/>	<input type="button" value="Exit"/>							





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
- VII AB
- VII 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

	EPM7700 Power Quality								
	Symmetric Components								
	Current Zero Seq:	0.0	$\angle -20.57^\circ$	Voltage Zero Seq:	n/a	$\angle n/a^\circ$			
	Current Positive Seq:	3.0	$\angle 30.49^\circ$	Voltage Positive Seq:	n/a	$\angle n/a^\circ$			
	Current Negative Seq:	0.0	$\angle -83.20^\circ$	Voltage Negative Seq:	n/a	$\angle n/a^\circ$			
	Disturbance Counts								
	Sag Swell Counter:		433	Enable Sag Swell	Disable Sag Swell				
	Transient Counter:		2.09646e+006	Enable Transient	Disable Transient				
	Reset Disturbance Counts								
	Relative Setpoints								
Over KW SWD:	<input type="checkbox"/>	OFF	Enable Over KW SWD	Disable Over KW SWD					
Over Ia:	<input type="checkbox"/>	OFF	Enable Over Current	Disable Over Current					
Over Ib:	<input type="checkbox"/>	OFF	Enable Over Vunbal	Disable Over Vunbal					
Over Ic:	<input type="checkbox"/>	OFF							
Over Vunbal:	<input type="checkbox"/>	OFF							
Legend: Disabled <input type="checkbox"/> Enabled 									
Events	Trend	Help	METERING	MINMAX	QUALITY	DEMAND	INPUT	SETUP1	SETUP2
Setup	Wave	Exit							

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

EPM7700 Demand									
Energy									
		Import	Export	Total	Net				
kWh		359.K	383.K	397.K	320.K				
kVARh		314.K	7509.266	390.K	239.K				
kVAh		----	----	413.K		Reset Energy			
Demand									
		SWD	Predicted	Thermal					
kW		-0.15	0.43	1.08	Reset SWD				
kVAR		-1.35	-0.92	-0.67					
kVA		1.38	1.26	1.50	Reset Thermal				
I Avg		28.58	19.41	14.81					
Maximum Demand									
		SWD	Total	TD					
kW		450.62	749.25	450.55	Show Maximum				
kVA		649.47	994.35	663.10	Show Minimum				
kVAR		168.88	424.80	168.88	Reset Peak Dmd				
Events	Trend	Help	METERING	MINMAX	QUALITY	DEMAND	INPUT	SETUP1	SETUP2
Setup	Wave	Exit							

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

	EPM7700 Inputs								
	Digital Inputs	Status	Counter						
	SI1: <input type="text" value="Status Input 1"/>	<input type="checkbox" value="OFF"/>	0						
	SI2: <input type="text" value="Status Input 2"/>	<input type="checkbox" value="OFF"/>	0						
	SI3: <input type="text" value="Status Input 3"/>	<input type="checkbox" value="OFF"/>	0						
	SI4: <input type="text" value="Status Input 4"/>	<input type="checkbox" value="OFF"/>	0						
	SI5: <input type="text" value="Status Input 5"/>	<input type="checkbox" value="OFF"/>	0						
	SI6: <input type="text" value="Status Input 6"/>	<input type="checkbox" value="OFF"/>	0						
	SI7: <input type="text" value="Status Input 7"/>	<input type="checkbox" value="OFF"/>	0						
	SI8: <input type="text" value="Status Input 8"/>	<input type="checkbox" value="OFF"/>	0						
Reset Counters									
Analog Inputs	Zero Scale	Full Scale	Scaled Value						
A1: <input type="text" value="n/a"/>	n/a	n/a	n/a						
A2: <input type="text" value="n/a"/>	n/a	n/a	n/a						
A3: <input type="text" value="n/a"/>	n/a	n/a	n/a						
A4: <input type="text" value="n/a"/>	n/a	n/a	n/a						
Events	Trend	Help	METERING	MINMAX	QUALITY	DEMAND	INPUT	SETUP1	SETUP2
Setup	Wave	Exit							

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 SII-8.

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

Digital Input Names for SII-8.

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

Setup 1 Tab

EPM7700 Setup 1											
 Device Name: EPM7700 Group Name: \$SYSTEM Device Type: EPM7700 Serial ID: PM-9808B047-05 Firmware Rev.: 7700V202 Voltage Mode: 4W-WYE			Power				Transformer Ratios				
			Volts Mode: 4W-WYE				PT Primary: 120				
			Va Polarity: Normal				CT Primary: 5000				
			Vb Polarity: Normal				PT Secondary: 120				
			Vc Polarity: Normal				CT Secondary: 5				
			Phase Order: ABC				I4 CT Primary: 5				
			Ia Polarity: Normal				I4 CT Secondary: 5				
			Ib Polarity: Normal								
			Ic Polarity: Normal								
			I4 Polarity: Normal								
Download					Refresh						
Communications											
Comm Mode: RS485				Ethernet Protocol: ION							
Port	Baud Rate	Unit ID	Protocol	Ethernet IP Address: 3.46.9.217							
Com 1	9600	8047	ION	Subnet Mask: 255.255.240.0							
Com 2	9600	101	ETHER GATE	Default Gateway: 3.46.0.1							
Com 3	9600	102	ETHER GATE								
Events	Trend	Help	METERING	MINMAX	QUALITY	DEMAND	INPUT	SETUP1	SETUP2		
Setup	Wave	Exit									

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

EPM7700 Setup 2									
		SD Sub Interval	SD #Sub Intervals	SD Predicted Response					
	kW Sliding Demand:	900	sec.	2	70				
	kVAR Sliding Demand:	900	sec.	2	70				
	kVA Sliding Demand:	900	sec.	2	70				
	lavg Sliding Demand:	900	sec.	2	70				
Waveform Recorder				Sag / Swell / Transient					
Depth: 128x14				Nominal (V): 600.00					
				Sag Limit (%): 88.00					
				Swell Limit (%): 106.00					
				Change Criteria (%): 10.00					
				Transient Threshold (%): 125.00					
Setpoints		DropOut		Pickup		Time Limits			
Nominal		Under	Over	Under	Over	On (s)	Off (s)		
Over kW SWD:	0.00	200.00%	0.00%	200.00%	0.00%	30	30		
Over Ia:	0.00	200.00%	0.00%	200.00%	0.00%	30	30		
Over Ib:	0.00	200.00%	0.00%	200.00%	0.00%	30	30		
Over Ic:	0.00	200.00%	0.00%	200.00%	0.00%	30	30		
Over Vunbal:	0.00	200.00%	0.00%	200.00%	0.00%	30	30		
Download				Refresh					
Events	Trend	Help	METERING	MINMAX	QUALITY	DEMAND	INPUT	SETUP1	SETUP2
Setup	Wave	Exit							

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 Twenty Three screens available, depending on the type of UR device connected. For example, the C30 device does not support any metering functions, so the metering and 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.

Special Note: UCA/MMS support for PMCS 6.15 is removed. **Do not** check this checkbox.

In PMCS 6.15 , two more Device Types are added to supported - UR480 & UR490 . Now UR supports FW ver 2.6- 4.6 . UR480 supports FW 4.8 & UR490 supports FW ver 4.90 and 5.00 .

Also support for D30, G30 ,N60, T35 & B90 devices are added in new Device types – UR480 & UR490.

Note: If Cimplicity Project is running when the Power Builder dialog is called up, a message appears warning that any changes made to the UR wizard configuration will not take effect until the Project 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 Project is restarted.

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

Metering Tab

Metering Tab										
Phase	Current			Phase	Voltage					
	RMS (Amps)	Magnitude (Amps)	Angle (Deg)		RMS (kV)	Magnitude (kV)	Angle (Deg)			
A	59.98	59.99	∠-104.90	AG	0.00	0.00	∠ 0.00			
B	59.80	59.76	∠-104.90	BG	0.00	0.00	∠ 0.00			
C	59.88	59.89	∠-104.80	CG	0.00	0.00	∠ 0.00			
Ground	0.00	0.00	∠ 0.00	AB	0.00	0.00	∠ 0.00			
Neutral	179.63	179.64	∠-104.90	BC	0.00	0.00	∠ 0.00			
				CA	0.00	0.00	∠ 0.00			
				Auxiliary	0.00	0.00	∠ 0.00			
Power										
Phase	Real		Reactive	Apparent		p.f.				
A	0.00 kW		0.00 kVAR	0.00 kVA		1.00				
B	0.00 kW		0.00 kVAR	0.00 kVA		1.00				
C	0.00 kW		0.00 kVAR	0.00 kVA		1.00				
3-Phase	0.00 kW		0.00 kVAR	0.00 kVA		1.00				
Frequency: N/A Hz										
Events	Trend	Help		METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL	CONTACT	COUNTER
Setup	Wave	Exit		POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5	SOURCE6	XFORM
				V OUT	C OUT	CVD	BREAKER	DCMA	DEMAND	RTD

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. For UR480 & UR490, Metering tab is supported for B30, C60, D30, D60, F35, F60, G30, G60, L60, L90, M60, N60, T35 & T60.

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.

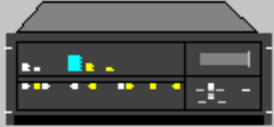
Power Factor values derived from a source wired in a delta configuration are displayed as "N/A".

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

 Device Name: T60 Group Name: \$SYSTEM Order Code: T60-D00-HCH-F8C-H6K-M8A -P5F-U6H-W6G Product Version: 2.83 Serial #: MBHC00000079 Mfr Date: 09/23/2000 Mod #: 0 Modbus Addr: 19 IP Addr: 3 . 209 . 16 . 60 Prog. State: Programmed Relay: Relay-1		Power Quality Tab							
		Source Tab 1	Current		Voltage				
			Magnitude (Amps)	Angle (Deg)	Magnitude (kV)	Angle (Deg)			
Zero Sequence	59.89	∕ -193.20	0.00	∕ 0.00					
Positive Sequence	0.00	∕ 0.00	0.00	∕ 0.00					
Negative Sequence	0.00	∕ 0.00	0.00	∕ 0.00					
Source Tab 1 <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px 10px;">S1</div> <div style="border: 1px solid black; padding: 2px 10px;">S2</div> <div style="border: 1px solid black; padding: 2px 10px;">S3</div> <div style="border: 1px solid black; padding: 2px 10px;">S4</div> <div style="border: 1px solid black; padding: 2px 10px;">S5</div> <div style="border: 1px solid black; padding: 2px 10px;">S6</div> </div>									
Events	Trend	Help	METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL	CONTACT	COUNTER
Setup	Wave	Exit	POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5	SOURCE6	XFORM
			V OUT	C OUT	CVD	BREAKER	DCMA	DEMAND	RTD

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. For UR480 & UR490 , Power Quality is displayed for B30, C30, C60, D30,

D60, F35, F60, G30, G60, L60, L90, M60, N60, T35 & 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

The screenshot displays the 'Protection Control Tab' for a Universal Relay. On the left, a device icon is shown above a metadata section containing: Device Name: T60, Group Name: \$SYSTEM, Order Code: T60-D00-HCH-F8C-H6K-M8A-P5F-U6H-W6G, Product Version: 2.83, Serial #: MBHC00000079, Mfr Date: 09/23/2000, Mod #: 0, Modbus Addr: 19, IP Addr: 3 . 209 . 16 . 60, Prog. State: Programmed, and Relay: Relay-1. The main area is titled 'Protection Control Tab' and features a 'Select Settings Group' dropdown set to '2'. Below this are eight groups of settings, each with a row of checkboxes and a 'Gnd.', 'Ph.', or 'Neu.' button. The settings include: Gnd. TOC (1-6), Gnd. IOC (1-6), Gnd. IOC (5-12), Ph. Dir1-2, Neu. Dir OC1-2, Neg. Seq. Dir1-2, Cold Load Pkp. 1-2, Under Frequency, DD Function, Synchrocheck 1-2, Neg. Seq. TOC1-2, Neg. Seq. IOC1-2, Phase UV1-2, Ph. OV1, Line Pickup, Inst. Diff. Prot., and Rst. Gnd. Fit. 1-6. A bottom navigation bar includes 'Events', 'Trend', 'Help', 'Setup', 'Wave', and 'Exit' buttons, and a grid of protection elements: METERING, QUALITY, CONTROL, ELEMENTS, VIRTUAL, CONTACT, COUNTER, POWER, SOURCE2, SOURCE3, SOURCE4, SOURCE5, SOURCE6, XFORM, V OUT, C OUT, CVD, BREAKER, DCMA, DEMAND, and RTD.

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. For UR480 & UR490, Protection Control is displayed for B30, C30, C60, D30, D60, F35, F60, G30, G60, L60, L90, M60, N60, T35 & 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:

Button to enable or disable the indicated function.

Status indicator: gray = disabled, amber = enabled.

The label color indicates the function's availability on the connected device: gray = not available, black = available.

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

Power System Configuration									
Current Transformer					Voltage Transformer				
No.	Phase		Ground		Phase				
	Primary (Amps)	Sec.	Primary (Amps)	Sec.	No.	Connection Type	Secondary (Volts)	Ratio (:1)	
1	100.00	5A	1.00	1A	1	Wye	120.00	100.00	
2	100	5A	1.00	1A	2	N/A	N/A	N/A	
3	1.00	1A	1.00	1A	3	N/A	N/A	N/A	
					Auxiliary				
4	N/A	N/A	N/A	N/A	1	Delta	66.40	1.00	
5	N/A	N/A	N/A	N/A	2	N/A	N/A	N/A	
6	N/A	N/A	N/A	N/A	3	N/A	N/A	N/A	
			Voltage		Frequency		Phase		
Synchrocheck 1 Delta			N/A		N/A		N/A		
Synchrocheck 2 Delta			N/A		N/A		N/A		
IRIG-B Signal Type				None					
Normal Frequency(Hz)				60					
Phase Rotation				ABC					
Frequency Tracking Reference				0					
					<input type="button" value="Enable"/> <input type="checkbox"/> Hi-Z Function				
					Legend: <input type="checkbox"/> Disabled <input type="checkbox"/> Enabled				
Events	Trend	Help	POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5	SOURCE6	XFORM
Setup	Wave	Exit	METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL	CONTACT	COUNTER
			V OUT	C OUT	CVD	BREAKER	DCMA	DEMAND	RTD

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. For UR480 & UR490, Power System Configuration Tab will be supported for B30, C60, D30, D60, F35, F60, G30, G60, L60, L90, M60, N60, T35 & T60. 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.

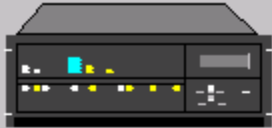
Frequency Tracking Reference

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

Transformer Tab									
 <p>Device Name: T60 Group Name: \$SYSTEM Order Code: T60-D00-HCH-F8C-H6K-M8A-P5F-U6H-VV6G Product Version: 2.83 Serial #: MBHC00000079 Mfr Date: 09/23/2000 Mod #: 0 Modbus Addr: 19 IP Addr: 3 . 209 . 16 . 60 Prog. State: Programmed Relay: Relay-1</p>				lad	lbd	lcd			
	Differential Phasor Magnitude(p.u.)			1.20	1.20	1.20			
	Differential Phasor Angle(Degs)			/-347.00	/-347.00	/-346.90			
	Differential 2nd Harm Magnitude(%fo)			0.00	0.00	0.00			
	Differential 2nd Harm Angle(Degs)			/-0.00	/-0.00	/-0.10			
	Differential 5th Harm Magnitude(%fo)			0.10	0.10	0.00			
	Differential 5th Harm Angle(Degs)			/-58.60	/-46.60	/-49.00			
				lar	lbr	lcr			
	Restraint Phasor Magnitude(p.u.)			0.60	0.60	0.60			
	Restraint Phasor Angle(Degs)			/-347.00	/-347.00	/-347.00			
T/F Wdg.	Tap Position	Ph. Position	Transformer Ref. Winding(1-6) 1						
1	N/A	N/A	<input type="checkbox"/> % Differential Function						
2	N/A	N/A	<input type="checkbox"/> 5th Harm. Overex. Inhibit Func.						
3	N/A	N/A	<input type="checkbox"/> 2nd Harm. Inrush Inhibit Func.						
4	N/A	N/A	Legend: <input type="checkbox"/> Disabled <input type="checkbox"/> Enabled						
5	N/A	N/A							
6	N/A	N/A							
Events	Trend	Help	POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5	SOURCE6	XFORM
Setup	Wave	Exit	METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL	CONTACT	COUNTER
			V OUT	C OUT	CVD	BREAKER	DCMA	DEMAND	RTD

Universal Relay - Transformer Tab

The T60 device alone supports a Transformer Tab on its wizard. This tab is unique to the T60 device type. For UR480 & UR490 , Transformer Tab is displayed for N60, T35 & T60.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

		Digital Element							
		Module	Digital Element		Digital Element Name				
		Function	Status						
Device Name: T60 Group Name: \$SYSTEM Order Code: T60-D00-HCH-F8C-H6K-M8A-P5F-U6H-W6G Product Version: 2.83 Serial #: MBHC00000079 Mfr Date: 09/23/2000 Mod #: 0 Modbus Addr: 19 IP Addr: 3 . 209 . 16 . 60 Prog. State: Programmed Relay: Relay-1		1	Enable	<input type="checkbox"/>	Dig Element 1				
		2	Enable	<input type="checkbox"/>	Dig Element 2				
		3	Enable	<input type="checkbox"/>	Dig Element 3				
		4	Enable	<input type="checkbox"/>	Dig Element 4				
		5	Enable	<input type="checkbox"/>	Dig Element 5				
		6	Enable	<input type="checkbox"/>	Dig Element 6				
		7	Enable	<input type="checkbox"/>	Dig Element 7				
		8	Enable	<input type="checkbox"/>	Dig Element 8				
		9	Enable	<input type="checkbox"/>	Dig Element 9				
		10	Enable	<input type="checkbox"/>	Dig Element 10				
		11	Enable	<input type="checkbox"/>	Dig Element 11				
		12	Enable	<input type="checkbox"/>	Dig Element 12				
		13	Enable	<input type="checkbox"/>	Dig Element 13				
		14	Enable	<input type="checkbox"/>	Dig Element 14				
		15	Enable	<input type="checkbox"/>	Dig Element 15				
		16	Enable	<input type="checkbox"/>	Dig Element 16				
Events	Trend	Help	METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL	CONTACT	COUNTER
Setup	Wave	Exit	POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5	SOURCE6	XFORM
			V OUT	C OUT	CVD	BREAKER	DCMA	DEMAND	RTD

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. For UR480 & UR490 , Elements Tab is supported for B30, C30, C60, D30, D60, F35, F60, G30, G60, L60, L90, M60, N60, T35 & T60 .

Digital Counter Tab

		Digital Counter Tab					
#	Status	Enable/Disable	Name	Frozen Value	Time Stamp (Seconds)		
1	<input type="checkbox"/>	Enable	Counter 1	0	01/01/1970 00:00:00 . 000000		
2	<input type="checkbox"/>	Enable	Counter 2	0	01/01/1970 00:00:00 . 000000		
3	<input type="checkbox"/>	Enable	Counter 3	-2147418112	01/10/2004 13:37:04 . 107374		
4	<input type="checkbox"/>	Enable	Counter 4	0	02/16/1972 17:21:04 . 131072		
5	<input type="checkbox"/>	Enable	Counter 5	0	01/01/1970 00:00:00 . 065280		
6	<input type="checkbox"/>	Enable	Counter 6	8192	01/01/1970 00:00:00 . 062464		
7	<input type="checkbox"/>	Enable	Counter 7	0	01/01/1970 18:12:20 . 000000		
8	<input type="checkbox"/>	Enable	Counter 8	268435456	01/01/1970 00:00:00 . 027648		

Device Name: T60	Group Name: \$SYSTEM	Order Code: T60-D00-HCH-F8C-H6K-M8A-P5F-U6H-W6G	Product Version: 2.83	Serial #: MBHC00000079	Mfr Date: 09/23/2000	Mod #: 0	Modbus Addr: 19	IP Addr: 3 . 209 . 16 . 60	Prog. State: Programmed	Relay: Relay-1
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Events	Trend	Help	METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL	CONTACT	COUNTER
Setup	Wave	Exit	POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5	SOURCE6	XFORM
			V OUT	C OUT	CVD	BREAKER	DCMA	DEMAND	RTD

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. In UR480 & UR490 , Digital Counter Tab is displayed for m B30, C30, C60, D30, D60, F35, F60, G30, G60, L60, L90, M60, N60, T35 & T60.

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

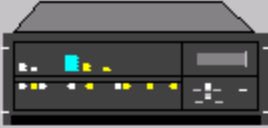
Enable/Disable – this button gives the user the ability to enable or disable the specified counter.

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

 <p>Device Name: T60 Group Name: \$SYSTEM Order Code: T60-D00-HCH-F8C-H6K-M8A-P5F-U6H-VV6G Product Version: 2.83 Serial #: MBHC00000079 Mfr Date: 09/23/2000 Mod #: 0 Modbus Addr: 19 IP Addr: 3 . 209 . 16 . 60 Prog. State: Programmed Relay: Relay-1</p>	Virtual Input						Page <>		
	Virtual Input Settings Status Enable / Disable Name			Status Enable / Disable Name			<input type="button" value="←"/> <input type="button" value="→"/> 1 of 2		
	1	<input type="checkbox"/>	Enable	Virt Ip 1	9	<input type="checkbox"/>	Enable	Virt Ip 9	
	2	<input type="checkbox"/>	Enable	Virt Ip 2	10	<input type="checkbox"/>	Enable	Virt Ip 10	
	3	<input type="checkbox"/>	Enable	Virt Ip 3	11	<input type="checkbox"/>	Enable	Virt Ip 11	
	4	<input type="checkbox"/>	Enable	Virt Ip 4	12	<input type="checkbox"/>	Enable	Virt Ip 12	
	5	<input type="checkbox"/>	Enable	Virt Ip 5	13	<input type="checkbox"/>	Enable	Virt Ip 13	
	6	<input type="checkbox"/>	Enable	Virt Ip 6	14	<input type="checkbox"/>	Enable	Virt Ip 14	
	7	<input type="checkbox"/>	Enable	Virt Ip 7	15	<input type="checkbox"/>	Enable	Virt Ip 15	
	8	<input type="checkbox"/>	Enable	Virt Ip 8	16	<input type="checkbox"/>	Enable	Virt Ip 16	
	Virtual Input Control 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 ON/OFF <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>								
Events	Trend	Help	METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL	CONTACT	COUNTER
Setup	Wave	Exit	POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5	SOURCE6	XFORM
			V OUT	C OUT	CVD	BREAKER	DCMA	DEMAND	RTD

Universal Relay - Virtual Inputs Tab

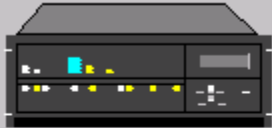
The Virtual Inputs (VInputs) tab allows the user to enable/disable all configured virtual inputs in the connected device and provides indication of their status. The 32 virtual inputs can be manually operated with the pushbuttons provided at the bottom of the screen. This tab supports the B30, C30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 devices. . . For UR480 & UR490 , 64 Virtual Inputs are available this tab is displayed for B30, C30, C60, D30, D60, F35, F60, G30, G60, L60, L90, M60, N60, T35 & T60.

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

 <p>Device Name: T60 Group Name: \$SYSTEM Order Code: T60-D00-HCH-F8C-H6K-M8A-P5F-U6H-VV6G Product Version: 2.83 Serial #: MBHC00000079 Mfr Date: 09/23/2000 Mod #: 0 Modbus Addr: 19 IP Addr: 3.209.16.60 Prog. State: Programmed Relay: Relay-1</p>	Virtual Output						Page <input type="button" value="←"/> <input type="button" value="→"/>	
	No.	State	Name	No.	State	Name		Legend <input type="checkbox"/> DeEnergized <input checked="" type="checkbox"/> Energized
1	<input type="checkbox"/>	Virtual Output Name	9	<input type="checkbox"/>	Virtual Output Name			
2	<input type="checkbox"/>	Virtual Output Name	10	<input type="checkbox"/>	Virtual Output Name			
3	<input type="checkbox"/>	Virtual Output Name	11	<input type="checkbox"/>	Virtual Output Name			
4	<input type="checkbox"/>	Virtual Output Name	12	<input type="checkbox"/>	Virtual Output Name			
5	<input type="checkbox"/>	Virtual Output Name	13	<input type="checkbox"/>	Virtual Output Name			
6	<input type="checkbox"/>	Virtual Output Name	14	<input type="checkbox"/>	Virtual Output Name			
7	<input type="checkbox"/>	Virtual Output Name	15	<input type="checkbox"/>	Virtual Output Name			
8	<input type="checkbox"/>	Virtual Output Name	16	<input type="checkbox"/>	Virtual Output Name			
<input type="button" value="Events"/> <input type="button" value="Trend"/> <input type="button" value="Help"/> <input type="button" value="Setup"/> <input type="button" value="Wave"/> <input type="button" value="Exit"/>		V OUT	C OUT	CVD	BREAKER	DCMA	DEMAND	RTD
		METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL	CONTACT	COUNTER
		POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5	SOURCE6	XFORM

Universal Relay - Virtual Outputs Tab

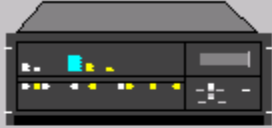
The Virtual Outputs (VOutput) tab allows the user to view the status (energized/de-energized) of all available virtual outputs on the device. The user can also assign a textual name to each of the outputs. Up to 64 virtual outputs can be displayed. This tab supports the B30, C30, C60, D60, F30, F35, F60, G60, L60, L90, M60 and T60 devices. For UR480 & UR490, 96 virtual outputs are available and this tab is displayed for B30, C30, C60, D30, D60, F35, F60, G30, G60, L60, L90, M60, N60, T35 & T60.

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

		Contact Input							
		State	Name	State	Name	State	Name	State	Name
 Device Name: T60 Group Name: \$SYSTEM Order Code: T60-D00-HCH-F8C-H6K-M8A-P5F-U6H-W6G Product Version: 2.83 Serial #: MBHC00000079 Mfr Date: 09/23/2000 Mod #: 0 Modbus Addr: 19 IP Addr: 3 . 209 . 16 . 60 Prog. State: Programmed Relay: Relay-1	1	<input type="checkbox"/> Cont Ip 1	9	<input type="checkbox"/> Cont Ip 9	17	<input type="checkbox"/> N/A	25	<input type="checkbox"/> N/A	
	2	<input type="checkbox"/> Cont Ip 2	10	<input type="checkbox"/> Cont Ip 10	18	<input type="checkbox"/> N/A	26	<input type="checkbox"/> N/A	
	3	<input type="checkbox"/> Cont Ip 3	11	<input type="checkbox"/> Cont Ip 11	19	<input type="checkbox"/> N/A	27	<input type="checkbox"/> N/A	
	4	<input type="checkbox"/> Cont Ip 4	12	<input type="checkbox"/> Cont Ip 12	20	<input type="checkbox"/> N/A	28	<input type="checkbox"/> N/A	
	5	<input type="checkbox"/> Cont Ip 5	13	<input type="checkbox"/> N/A	21	<input type="checkbox"/> N/A	29	<input type="checkbox"/> N/A	
	6	<input type="checkbox"/> Cont Ip 6	14	<input type="checkbox"/> N/A	22	<input type="checkbox"/> N/A	30	<input type="checkbox"/> N/A	
	7	<input type="checkbox"/> Cont Ip 7	15	<input type="checkbox"/> N/A	23	<input type="checkbox"/> N/A	31	<input type="checkbox"/> N/A	
	8	<input type="checkbox"/> Cont Ip 8	16	<input type="checkbox"/> N/A	24	<input type="checkbox"/> N/A	32	<input type="checkbox"/> N/A	
		<input type="checkbox"/> Energized <input type="checkbox"/> De-Energized		<input type="button" value="←"/> <input type="button" value="→"/>		1 of 3			
Events Trend Help Setup Wave Exit		METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL	CONTACT	COUNTER	
		POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5	SOURCE6	XFORM	
		V OUT	C OUT	CVD	BREAKER	DCMA	DEMAND	RTD	

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. . For UR480 & UR490 , Contact Input Tab is displayed for B30, C30, C60, D30, D60, F35, F60, G30, G60, L60, L90, M60, N60, T35 & T60.

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

	Contact Output Current States						Page < > <input type="button" value="←"/> <input type="button" value="→"/> 1 of 4						
	Device Name: T60 Group Name: \$SYSTEM Order Code: T60-D00-HCH-F8C-H6K-M8A-P5F-U6H-W6G Product Version: 2.83 Serial #: MBHC00000079 Mfr Date: 09/23/2000 Mod #: 0 Modbus Addr: 19 IP Addr: 3 . 209 . 16 . 60 Prog. State: Programmed Relay: Relay-1	No.	State	Name	No.	State	Name						
	1	<input type="checkbox"/>	Contact Output	9	<input type="checkbox"/>	Contact Output							
	2	<input type="checkbox"/>	Contact Output	10	<input type="checkbox"/>	Contact Output							
	3	<input type="checkbox"/>	Contact Output	11	<input type="checkbox"/>	Contact Output							
	4	<input type="checkbox"/>	Contact Output	12	<input type="checkbox"/>	Contact Output							
	5	<input type="checkbox"/>	Contact Output	13	<input type="checkbox"/>	Contact Output							
	6	<input type="checkbox"/>	Contact Output	14	<input type="checkbox"/>	Contact Output							
	7	<input type="checkbox"/>	Contact Output	15	<input type="checkbox"/>	Contact Output							
	8	<input type="checkbox"/>	Contact Output	16	<input type="checkbox"/>	Contact Output							
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 12.5%; text-align: center;">Events</td> <td style="width: 12.5%; text-align: center;">Trend</td> <td style="width: 12.5%; text-align: center;">Help</td> </tr> <tr> <td style="text-align: center;">Setup</td> <td style="text-align: center;">Wave</td> <td style="text-align: center;">Exit</td> </tr> </table>	Events	Trend	Help	Setup	Wave	Exit	V OUT	C OUT	CVD	BREAKER	DCMA	DEMAND	RTD
Events	Trend	Help											
Setup	Wave	Exit											
METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL	CONTACT	COUNTER							
POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5	SOURCE6	XFORM							


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. For UR480 & UR490, contact output tab is displayed for B30, C30, C60, D30, D60, F35, F60, G30, G60, L60, L90, M60, N60, T35 & T60.

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

 <p>Device Name: T60 Group Name: \$SYSTEM Order Code: T60-D00-HCH-F8C-H6K-M8A-P5F-U6H-W6G Product Version: 2.83 Serial #: MBHC00000079 Mfr Date: 09/23/2000 Mod #: 0 Modbus Addr: 19 IP Addr: 3 . 209 . 16 . 60 Prog. State: Programmed Relay: Relay-1</p>	DCMA Inputs								
	No.	State	ID	Value	Units				
	1	<input type="checkbox"/> Enabled	DCMA Ip 1	0.00	mA	Page <input type="button" value="←"/> <input type="button" value="→"/> Legend <input type="checkbox"/> Disabled <input type="checkbox"/> Enabled			
	2	<input type="checkbox"/> Enabled	DCMA Ip 2	0.00	mA				
	3	<input type="checkbox"/> Enabled	DCMA Ip 3	0.00	mA				
	4	<input type="checkbox"/> Enabled	DCMA Ip 4	0.00	mA				
	5	<input type="checkbox"/> Enabled	DCMA Ip 5	0.00	mA				
	6	<input type="checkbox"/> Enabled	DCMA Ip 6	0.00	mA				
	7	<input type="checkbox"/> Enabled	DCMA Ip 7	0.00	mA				
	8	<input type="checkbox"/> Enabled	DCMA Ip 8	0.00	mA				
	9	<input type="checkbox"/> Enable	N/A	N/A	N/A				
	10	<input type="checkbox"/> Enable	N/A	N/A	N/A				
11	<input type="checkbox"/> Enable	N/A	N/A	N/A					
12	<input type="checkbox"/> Enable	N/A	N/A	N/A					
Events	Trend	Help	V OUT	C OUT	CVD	BREAKER	DCMA	DEMAND	RTD
Setup	Wave	Exit	METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL	CONTACT	COUNTER
			POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5	SOURCE6	XFORM

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. For UR480 & UR490, DCMA tab is displayed for B30, C30, C60, D30, D60, F60, G30, G60, L60, L90, M60, N60, T35 & T60.


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			Phase	Voltage			
		RMS (Amps)	Magnitude (Amps)	Angle (Deg)		RMS (kV)	Magnitude (kV)	Angle (Deg)	
	A	59.97	59.98	/-224.90	AG	0.00	0.00	/ 0.00	
	B	59.81	59.78	/-224.90	BG	0.00	0.00	/ 0.00	
	C	59.87	59.85	/-224.80	CG	0.00	0.00	/ 0.00	
	Ground	0.00	0.00	/ 0.00	AB	0.00	0.00	/ 0.00	
	Neutral	179.61	179.62	/-224.90	BC	0.00	0.00	/ 0.00	
					CA	0.00	0.00	/ 0.00	
					Auxiliary	0.00	0.00	/ 0.00	
Power									
Phase	Real		Reactive		Apparent		p.f.		
A	0.00 kW		0.00 kVAR		0.00 kVA		1.00		
B	0.00 kW		0.00 kVAR		0.00 kVA		1.00		
C	0.00 kW		0.00 kVAR		0.00 kVA		1.00		
3-Phase	0.00 kW		0.00 kVAR		0.00 kVA		1.00		
Frequency: 0.00 Hz									
Events	Trend	Help	POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5	SOURCE6	XFORM
Setup	Wave	Exit	METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL	CONTACT	COUNTER
			V OUT	C OUT	CVD	BREAKER	DCMA	DEMAND	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. In UR480 & UR490, B30, C30, C60, D30, D60, F35, F60, G30, G60, L60, L90, M60, N60, T35 & T60 device types are supported.

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

Demand Tab

	Demand								
	Data Logger Channel Count	0	Oldest available samples					01/14/2002 01:16:00	
	Data Logger Duration	0	Newest available samples					01/14/2002 01:16:00	
	Data Logger Rate	1 Min	Demand Current Method		N/A				
Clear Data Logger		Demand Power Method		N/A					
Demand Interval		N/A							
Source 1 Energy									
Positive Watthour	0.00	Positive Varhour			0.00				
Negative Watthour	0.00	Negative Varhour			0.00				
Source 1	Demand	Peak Demand		Peak Demand Date					
Ia	N/A	N/A		N/A					
Ib	N/A	N/A		N/A					
Ic	N/A	N/A		N/A					
Watt	N/A	N/A		N/A					
Var	N/A	N/A		N/A					
Va	N/A	N/A		N/A					
S1		S2		S3		S4			
S5		S6		Clear Demand					
Events	Trend	Help	V OUT	C OUT	CVD	BREAKER	DCMA	DEMAND	RTD
Setup	Wave	Exit	METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL	CONTACT	COUNTER
			POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5	SOURCE6	XFORM

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. In UR480 & UR490, Demand tab is displayed for B30, C30, C60, D30, D60, F35, F60, G30, G60, L60, L90, M60, N60, T35 & T60.

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).

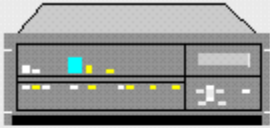
Source (x) Energy

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

	Demand					
	Data Logger Channel Count	0	Oldest available samples	09/29/2000 17:09:00		
Data Logger Duration	0	Newest available samples	09/29/2000 17:09:00			
Data Logger Rate	1 Min	Demand Current Method	N/A			
Clear Data Logger		Demand Power Method	N/A			
		Demand Interval	N/A			
Device Name: UR_51	Source 1 Energy					
Group Name: \$SYSTEM	Positive Watthour	N/A	Positive Varhour	N/A		
Order Code: L90-D00-HCH-F8A-H6E-M5F-P5E-VW6H	Negative Watthour	N/A	Negative Varhour	N/A		
Product Version: 240	Source 1	Demand	Peak Demand	Peak Demand Date		
Serial #: MBHC99000002	Ia	N/A	N/A	N/A		
Mfr Date: 06/16/1999	Ib	N/A	N/A	N/A		
Mod #: 0	Ic	N/A	N/A	N/A		
Modbus Addr: 51	Watt	N/A	N/A	N/A		
IP Addr: 3 . 46 . 9 . 234	Var	N/A	N/A	N/A		
Prog. State: Programmed	Va	N/A	N/A	N/A		
Relay60Tranformer URRELA	S1		S2		S3	
	S4		S5		S6	
	Clear Demand					
Events	Trend	Help	CVD	BREAKER	DCMA	
Setup	Wave	Exit	METERING	QUALITY	CONTROL	
			COUNTER	POWER	SOURCE2	
			DEMAND	LINE	RTD	
			ELEMENTS	VIRTUAL	CONTACT	
			SOURCE3	V OUT	C OUT	

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

BreakerTab							
Arcing							
Breaker	Amp (kA ² -cyc)			Clear Current Arcing			
	Phase A	Phase B	Phase C	Breaker 1		Breaker 2	
1	N/A	N/A	N/A				
2	N/A	N/A	N/A				
Breaker Status							
1	<input type="checkbox"/>	<input type="checkbox"/>	N/A	<input type="checkbox"/> <input type="checkbox"/> Brkr. 1 Arcing Amp Function			
2	<input type="checkbox"/>	<input type="checkbox"/>	N/A	<input type="checkbox"/> <input type="checkbox"/> Brkr. 2 Arcing Amp Function			
Select Settings Group			↓	↑	2		
			<input type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	3	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	4	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	5	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	6	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	7	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	8	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	Brkr. 1 Failure Function		
			<input type="checkbox"/>	<input type="checkbox"/>	Brkr. 2 Failure Function		
Auto Reclose							
Function		Count		Function		Count	
1	<input type="checkbox"/>	<input type="checkbox"/>	N/A	4	<input type="checkbox"/>	<input type="checkbox"/>	N/A
2	<input type="checkbox"/>	<input type="checkbox"/>	N/A	5	<input type="checkbox"/>	<input type="checkbox"/>	N/A
3	<input type="checkbox"/>	<input type="checkbox"/>	N/A	6	<input type="checkbox"/>	<input type="checkbox"/>	N/A
Legend: <input type="checkbox"/> Disabled <input checked="" type="checkbox"/> Enabled							
Events	Trend	Help	V OUT	C OUT	CVD	BREAKER	DCMA
Setup	Wave	Exit	METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL
			POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5
							SOURCE6
							XFORM

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. In UR480 & UR490 is supported for B30, C30, C60, D30, D60, F35, F60, G30, G60, L60, L90, M60, N60, T35 & T60 .

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

Contact Output Current States							
No.	State	Name	No.	State	Name	Page < >	
1	<input type="checkbox"/>	Contact Output	9	<input type="checkbox"/>	Contact Output	Page < > <input type="button" value="←"/> <input type="button" value="→"/> 1 of 4 <input type="button" value="Current"/> <input type="button" value="Voltage"/> <input type="button" value="Detect"/> Legend <input type="checkbox"/> De-Energized <input type="checkbox"/> Energized	
2	<input type="checkbox"/>	Contact Output	10	<input type="checkbox"/>	Contact Output		
3	<input type="checkbox"/>	Contact Output	11	<input type="checkbox"/>	Contact Output		
4	<input type="checkbox"/>	Contact Output	12	<input type="checkbox"/>	Contact Output		
5	<input type="checkbox"/>	Contact Output	13	<input type="checkbox"/>	Contact Output		
6	<input type="checkbox"/>	Contact Output	14	<input type="checkbox"/>	Contact Output		
7	<input type="checkbox"/>	Contact Output	15	<input type="checkbox"/>	Contact Output		
8	<input type="checkbox"/>	Contact Output	16	<input type="checkbox"/>	Contact Output		
		CVD			BREAKER		DCMA
		METERING			QUALITY		CONTROL
		COUNTER			POWER		SOURCE2
					DEMAND		LINE
					ELEMENTS		VIRTUAL
					SOURCE3		V OUT
							RTD
							CONTACT
						C OUT	

Events

Trend

Help

Setup

Wave

Exit

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. In UR480 & UR490, Contact Output tab is displayed for B30, C30, C60, D30, D60, F35, F60, G30, G60, L60, L90, M60, N60, T35 & T60.


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

		RTD Tab								
		No.	Status	Function ID	Temp.	No.	Status	Function ID	Temp.	
	Device Name:	T60	1	<input type="checkbox"/>	N/A	N/A	13	<input type="checkbox"/>	N/A	N/A
	Group Name:	\$SYSTEM	2	<input type="checkbox"/>	N/A	N/A	14	<input type="checkbox"/>	N/A	N/A
	Order Code:	T60-D00-HCH-F8C-H6K-M8A -P5F-U6H-W6G	3	<input type="checkbox"/>	N/A	N/A	15	<input type="checkbox"/>	N/A	N/A
	Product Version:	2.83	4	<input type="checkbox"/>	N/A	N/A	16	<input type="checkbox"/>	N/A	N/A
	Serial #:	MBHC00000079	5	<input type="checkbox"/>	N/A	N/A	17	<input type="checkbox"/>	N/A	N/A
	Mfr Date:	09/23/2000	6	<input type="checkbox"/>	N/A	N/A	18	<input type="checkbox"/>	N/A	N/A
	Mod #:	0	7	<input type="checkbox"/>	N/A	N/A	19	<input type="checkbox"/>	N/A	N/A
	Modbus Addr:	19	8	<input type="checkbox"/>	N/A	N/A	20	<input type="checkbox"/>	N/A	N/A
	IP Addr:	3 . 209 . 16 . 60	9	<input type="checkbox"/>	N/A	N/A	21	<input type="checkbox"/>	N/A	N/A
	Prog. State:	Programmed	10	<input type="checkbox"/>	N/A	N/A	22	<input type="checkbox"/>	N/A	N/A
	Relay:	Relay-1	11	<input type="checkbox"/>	N/A	N/A	23	<input type="checkbox"/>	N/A	N/A
			12	<input type="checkbox"/>	N/A	N/A	24	<input type="checkbox"/>	N/A	N/A
		Legend <input type="checkbox"/> Disabled <input type="checkbox"/> Enabled						Page <input type="button" value="←"/> <input type="button" value="→"/>		
Events	Trend	Help	V OUT	C OUT	CVD	BREAKER	DCMA	DEMAND	RTD	
Setup	Wave	Exit	METERING	QUALITY	CONTROL	ELEMENTS	VIRTUAL	CONTACT	COUNTER	
			POWER	SOURCE2	SOURCE3	SOURCE4	SOURCE5	SOURCE6	XFORM	

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. In UR480 & UR490, RTD Tab is supported for B30, C30, C60, D30, D60, F60, G30, G60, L60, L90, M60, N60, T35 & T60.

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

	BUS Tab								
	Ph.	BUS 1				BUS 2			
		Diff Mag. (k Amps)	Diff Angle (Deg.)	Diff Rest Mag. (k Amps)	Diff Rest Angle (Deg.)	Diff Mag. (k Amps)	Diff Angle (Deg.)	Diff Rest Mag. (k Amps)	Diff Rest Angle (Deg.)
	Device Name: UR_51 Group Name: \$SYSTEM Order Code: B30-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 Relay: Relay-1	Ia	0.60	-329.20	0.10	-329.00	N/A	N/A	N/A
Ib	0.60	-208.90	0.10	-208.90	N/A	N/A	N/A	N/A	
Ic	0.60	-89.50	0.10	-89.10	N/A	N/A	N/A	N/A	
Direction		Bus 1 (Deg.)	Bus 2 (Deg.)		<input type="checkbox"/> Enable <input type="checkbox"/> Bus 1 Zone Function <input type="checkbox"/> Enable <input type="checkbox"/> Bus 2 Zone Function				
A		0.00	N/A						
B		0.00	N/A						
C		0.00	N/A						
Legend <input type="checkbox"/> Disabled <input checked="" type="checkbox"/> Energized									
BREAKER				BUS					
Events	Trend	Help							
Setup	Wave	Exit							

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 25. 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.

Metering tab

The screenshot displays the 'Multilin 239 Metering' screen. On the left is a small image of the physical device. The main area is divided into several sections:

- Device Information:** Device Name: ML239, Group Name: \$SYSTEM, Device Type: ML239, Hardware Rev: D, Program Rev: Mod Files.
- Current (Amps):** Phase A: 0, Phase B: 0, Phase C: 0, Ground: 0.0, Unbalance(%): 0, Motor Max. Starting Cur.: 6553.5.
- Temperature (°C):** RTD 1: (Stator) - No RTD, RTD 2: (Bearing) - No RTD, RTD 3: (Bearing) - No RTD, Thermistor: Not Connected.
- Status:** Trip Cause: Parameters Not Set, Calc. Trip Time (seconds): 0.0.
- Motor Status:** Stopped, Motor Load (% FLC): 0, Thermal Cap. Used (%): 0, Motor Running Time(hr): 144284057.50, Main Ph. Cur. Scal. Factor: 10, Time to Over Load Reset (Min.): 0.
- Switches:** Switch 1 Access: Closed, Switch 2 Emergency Restart: Open, Switch 3 External Reset: Open, OPTION SWITCH 1 (Off), OPTION SWITCH 2 (Off).
- Output Relays:** Trip (red), Alarm, Auxiliary, Service, PickUp, Selected Setpoint Group: Main Group.

At the bottom, there are buttons for 'Reset Device' and 'Emergency Restart', and a navigation bar with tabs for 'METERING', 'SETPOINTS', 'TRIP', and 'STATUS'.

The Multilin 239 Metering screen shows:

- Current
- RTD Status and Temperature
- Motor Status
- Switches
- Output Relays

The **Reset Device** button, when clicked, will issue a RESET command to the 239.

The **Emergency Restart** button, when clicked, will issue a RESTART command to the 239.

Status Tab

Multilin 239 Status

Device Name: ML239
 Group Name: \$SYSTEM
 Device Type: ML239
 Hardware Rev: D

Program Rev	Mod Files
Main: 2.51	1: 000
Boot: 2.00	2: 000
Super: 1.02	3: 000
Calib: 09/06/2000	4: 000
Manf: 09/06/2000	5: 000

Alarm Status Flags	Trip Status Flags	Aux. Status Flags
<input type="checkbox"/> Immediate Overload	<input type="checkbox"/> Ground	<input type="checkbox"/> Undercurrent
<input type="checkbox"/> Undercurrent	<input type="checkbox"/> Overload	<input type="checkbox"/> Option Sw.1
<input type="checkbox"/> Unbalance	<input type="checkbox"/> Unbalance	<input type="checkbox"/> Option Sw.2
<input type="checkbox"/> Ground Fault	<input type="checkbox"/> Thermistor	<input type="checkbox"/> Alarms
<input type="checkbox"/> Thermistor	<input type="checkbox"/> Mechanical Jam	<input type="checkbox"/> Trips
<input type="checkbox"/> Thermistor Open	<input type="checkbox"/> Short Circuit	<input type="checkbox"/> Short Circuit
<input type="checkbox"/> Stator RTD	<input type="checkbox"/> Stator RTD	<input type="checkbox"/> Ground
<input type="checkbox"/> Bearing RTD	<input type="checkbox"/> Bearing RTD	<input type="checkbox"/> Thermistor
<input type="checkbox"/> RTD Failure	<input checked="" type="checkbox"/> Parameters Not Set	<input type="checkbox"/> Breaker Failure
<input type="checkbox"/> Comm. Failure	<input type="checkbox"/> Option Switch 1	<input type="checkbox"/> Mechanical Jam
<input checked="" type="checkbox"/> Internal Fault	<input type="checkbox"/> Option Switch 2	
<input type="checkbox"/> Thermal Capacity	<input type="checkbox"/> Computer Command	
<input type="checkbox"/> Option Switch 1	<input type="checkbox"/> Undercurrent	
<input type="checkbox"/> Option Switch 2		
<input type="checkbox"/> Breaker Failure		
<input type="checkbox"/> Mechanical Jam		

Legend:
 = Pickup
 = Active

Events Trend Help
 Setup Wave Exit

METERING SETPOINTS TRIP STATUS

- The Status tab displays Alarm, Trip, Auxiliary Status Pickup is shown in Amber color and Active Alarm shown in Red, along with a text string for each alarm condition.
- 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.

Trip Data

Multilin 239 Last Trip Data

Cause of Last Trip: Parameters Not Set
(Amps)

Phase A	0	Pre-Trip RTD 1 :	0 °C
Phase B	0	Pre-Trip RTD 2 :	0
Phase C	0	Pre-Trip RTD 3 :	0
Ground	0.0		
Unbalance (%)	0		

Trip Record

Cause of 2nd Last Trip:	Parameters Not Set
Cause of 3rd Last Trip:	Parameters Not Set
Cause of 4th Last Trip:	Parameters Not Set
Cause of 5th Last Trip:	Parameters Not Set

Clear Trip Data

Device Name: ML239
Group Name: \$SYSTEM
Device Type: ML239
Hardware Rev: D
Program Rev: Mod Files
Main: 2.51 1: 000
Boot: 2.00 2: 000
Super: 1.02 3: 000
Calib: 09/06/2000 4: 000
Manf: 09/06/2000 5: 000

Events Trend Help
Setup Wave Exit


METERING SETPOINTS TRIP STATUS

The Multilin 239 Last Trip Data screen shows:

- Cause of Last Trip and their corresponding currents and RTD Temperatures at the time of trip.
- Trip Record

The **Clear Trip Data** button, when clicked, will clear all the trip data.

Setpoints Tab

		Multilin 239 System Setpoints			
		Device Name: ML239 Group Name: \$SYSTEM Device Type: ML239 Hardware Rev: D <u>Program Rev</u> <u>Mod Files</u> Main: 2.51 1: 000 Boot: 2.00 2: 000 Super: 1.02 3: 000 Calib: 09/06/2000 4: 000 Manf: 09/06/2000 5: 000		CT Inputs Phase CT Primary (A): OFF Ground Sensing: OFF Ground CT Primary (A): N/A Nominal Frequency (Hz): 60	
		Phase Current Overload Overload Curve Number: 4 O/L Level for Trip Time (x FLC): 2.00 Calc. Time to O/L Trip (sec.): 0.00 Overload Lockout Time (min): 30		Breaker Failure: Alarm Breaker Failure Pickup: 0.5 Breaker Failure Pickup Delay: 0.0 ms Breaker Failure Dropout Delay: 0.0 ms	
		Immediate Overload Inhibit Sensing On Start For (s): UnLimited		Mechanical Jam Inhibit Sensing On Start For (s): UnLimited	
Events Trend Help Setup Wave Exit		METERING SETPOINTS TRIP STATUS			

The Multilin 239 System Setpoints screen shows:

- CT Inputs
- Motor Data
- Phase Current Overload
- Breaker Failure
- Immediate Overload
- Mechanical Jam

269 Plus Motor Management Relay

Device Name:	ML269
Group Name:	\$System
Device Type:	Unknown: 0x0
Hardware Rev.:	N/A
Firmware Rev.:	0.0
Firmware Mod.:	None

Amps A:	45	Volts AB:	0
Amps B:	44	Volts BC:	78
Amps C:	45	Volts CA:	77
Average Amps:	45	kW:	78
Unbalance Ratio:	0	kVAR:	4
Ground Fault Amps:	0.0	PF:	0.04
Motor Status:	Stopped	Frequency:	56.0
Starts/Hour Timer 1 (Min.):	0	Est. Time to Trip (Sec.):	0
Starts/Hour Timer 2 (Min.):	0	Motor Load (%):	0
Starts/Hour Timer 3 (Min.):	0	Ther. Cap. Used (%):	0
Starts/Hour Timer 4 (Min.):	0		
Starts/Hour Timer 5 (Min.):	0		

Istart Avg. (Amps):	0	Stopped Cool Time (Min.):	0
Last Istart (Amps):	0	Acceleration Time (Sec.):	0.0
K Factor:	0.0	Start Capacity (%):	0
Running Cool Time (Min.):	0		

Event	Trend	Help
Logger	Wave	Exit

Metering Statistics Alarms Setup 1 Setup 2 Setup 3 Setup 4 Setup 5 Setup 6

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 26. 269+ Tabular data screen commands.

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

369 Motor Management Relay

Metering Tab

	Metering				
	Current	Magnitude	Angle	Power	
	Phase A	101 Amps	∠ 0	Real	65462 kW
	Phase B	101 Amps	∠ 0	Reactive	65498 kvar
	Phase C	104 Amps	∠ 0	Apparent	84 kVA
	Avg.	102 Amps		Power Factor	0.89 Lag
	Ground	0 Amps		Timer Functions	
	Motor Load	0.20 x FLA		Overload Lockout	0 Min
	Ther. Cap. Used	6 %		Time Between Starts	4 Min
	Est. Time to Trip	0 Sec		Restart Block	0 Sec
Unbalance Ratio	0 %		Back Spin	0 Sec	
	Voltage	Magnitude	Angle	Start Inhibit	0 Min
Device Name: ML369	Vab	477 Volts		Motor Running Hours	0 Hrs
Group Name: \$SYSTEM	Vbc	481 Volts		Start 1	59 Min
Order Code: 369-HI -R-B-F -0	Vca	478 Volts		Start 2	0 Min
Device Type: ML369	Avg. Phase Volt	479 Volts		Start 3	0 Min
Hardware Rev.: B	Van	279 Volts	∠ 0	Start 4	0 Min
Firmware Rev.: 1.20	Vbn	275 Volts	∠ 0	Start 5	0 Min
Modification No: None	Vcn	274 Volts	∠ 0		
Serial Number: M53B99000081	Avg. Line Volt	277 Volts			
Slave Address: 104	Motor Status	Running		Learned Values	
Events	Trend	Help	METERING	COUNTER	CONTROL
Setup	Wave	Exit	RTD	RRTD	SETUP
					ALARMS
					DEMAND
					TRIP DATA

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


	Alarm Status																	
Device Name: ML369 Group Name: \$SYSTEM Order Code: 369-HI -R-B-F-0 Device Type: ML369 Hardware Rev.: B Firmware Rev.: 1.20 Modification No: None Serial Number: M53B99000081 Slave Address: 104	Spare Switch <input type="checkbox"/> Emergency Restart Switch <input type="checkbox"/> Differential Switch <input type="checkbox"/> Speed Switch <input type="checkbox"/> ResetSwitch <input type="checkbox"/> Thermal Capacity <input type="checkbox"/> Overload <input type="checkbox"/> Mechanical Jam <input type="checkbox"/> Undercurrent <input type="checkbox"/> Current Underbalance <input type="checkbox"/> Ground Fault <input type="checkbox"/> Undervoltage <input type="checkbox"/> Overvoltage <input type="checkbox"/> Underfrequency <input type="checkbox"/> Overfrequency <input type="checkbox"/>	Lead Power Factor <input type="checkbox"/> Lag Power Factor <input checked="" type="checkbox"/> Positive kvar <input type="checkbox"/> Negative kvar <input type="checkbox"/> Underpower <input type="checkbox"/> Reverse Power <input type="checkbox"/> Lost Remote RTD Comm. <input type="checkbox"/> Trip Counter <input type="checkbox"/> Starter Failure <input type="checkbox"/> Self Test <input type="checkbox"/> Broken / Open RTD <input checked="" type="checkbox"/> Short / Low Temp. <input type="checkbox"/>	Legend <input checked="" type="checkbox"/> Timing Out <input checked="" type="checkbox"/> Latched <input type="checkbox"/> Not Active <input checked="" type="checkbox"/> Active (Blinking)															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Events</td> <td style="width: 25%;">Trend</td> <td style="width: 25%;">Help</td> </tr> <tr> <td style="text-align: center;">Setup</td> <td style="text-align: center;">Wave</td> <td style="text-align: center;">Exit</td> </tr> </table>	Events	Trend	Help	Setup	Wave	Exit	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">METERING</td> <td style="width: 25%;">COUNTER</td> <td style="width: 25%;">CONTROL</td> <td style="width: 25%;">ALARMS</td> </tr> <tr> <td style="text-align: center;">RTD</td> <td style="text-align: center;">RRTD</td> <td style="text-align: center;">SETUP</td> <td style="text-align: center;">TRIP DATA</td> </tr> </table>	METERING	COUNTER	CONTROL	ALARMS	RTD	RRTD	SETUP	TRIP DATA	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">DEMAND</td> </tr> <tr> <td style="text-align: center;">TRIP DATA</td> </tr> </table>	DEMAND	TRIP DATA
Events	Trend	Help																
Setup	Wave	Exit																
METERING	COUNTER	CONTROL	ALARMS															
RTD	RRTD	SETUP	TRIP DATA															
DEMAND																		
TRIP DATA																		

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

	Trip Data				
	Pre - Trip Current			Pre - Trip Power	
Device Name: ML369 Group Name: \$SYSTEM Order Code: 369-HI -R-B-F -0 Device Type: ML369 Hardware Rev.: B Firmware Rev.: 1.20 Modification No: None Serial Number: M53B99000081 Slave Address: 104	Phase A	795	Amps	Real	65291 kW
	Phase B	102	Amps	Apparent	278 kVA
	Phase C	106	Amps	Reactive	65404 kvar
	Ground	0	Amps	Other Pre - Trip Data	
	Pre - Trip Voltage			Motor Load	0.67 xFLA
	Vab	478	Volts	System Freq.	60.00 Hz
	Vbc	479	Volts	Power Factor	0.88 Lag
	Vca	480	Volts	Current Unbalance	92 %
	Van	281	Volts	Cause of Last Trip	Mechanical Jam
	Vbn	274	Volts	Time of Last Trip	16:31:43
Vcn	275	Volts	Date of Last Trip	2/22/2000	
			Hottest St. RTD during Trip	0	
			Temp. of Hottest St. RTD	65494 DegC	
Events	Trend	Help	RTD	RRTD	SETUP
Setup	Wave	Exit	METERING	COUNTER	CONTROL
			ALARMS	TRIP DATA	
			DEMAND		

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


			Trip Counter				
Device Name: ML369 Group Name: \$SYSTEM Order Code: 369-HI -R-B-F -0 Device Type: ML369 Hardware Rev.: B Firmware Rev.: 1.20 Modification No: None Serial Number: M53B99000081 Slave Address: 104	Total No. of Trips 37 Switch 0 Overload 0 Short Circuit 0 Mechanical Jam 37 Undercurrent 0 Current Unbalance 0 Single Phase 0 Ground Fault 0 Acceleration 0 Undervoltage 0 Overvoltage 0 Phase Reversal 0 Underfrequency 0 Overfrequency 0	Lead Power Factor 0 Lag Power Factor 0 Positive Reactive Power 0 Negative Reactive Power 0 Underpower 0 Reverse Power 0 Stator RTD 0 Bearing RTD 0 Other RTD 0 Ambient RTD 0 Incomplete Sequence 0 Trip Counters Last Cleared 2/17/2000 No. of Motor Starts 2 No. of Emergency Restarts 0 Digital Counter 0					
Events	Trend	Help	METERING	COUNTER	CONTROL	ALARMS	DEMAND
Setup	Wave	Exit	RTD	RRTD	SETUP	TRIP DATA	

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

	Demand Tab							
	Positive Watt Hours	0 MWh						
	Positive Varhours	0 kvarh						
	Negative Varhours	0 kvarh						
Device Name: ML369 Group Name: \$SYSTEM Order Code: 369-HI -R-B-F-0 Device Type: ML369 Hardware Rev.: B Firmware Rev.: 1.20 Modification No: None Serial Number: M53B99000081 Slave Address: 104	Demand		Peak Demand		Alarm			
	Current	0 Amps	0 Amps	<input type="checkbox"/>				
	Real Power	0 kW	0 kW	<input type="checkbox"/>				
	Reactive Power	0 kvar	0 kvar	<input type="checkbox"/>				
	Apparent Power	0 kVA	0 kVA	<input type="checkbox"/>				
	Legend:							
	<input type="checkbox"/> Not Active		<input type="checkbox"/> Active (Blinking)					
	<input type="checkbox"/> Timing Out		<input type="checkbox"/> Latched					
Events	Trend	Help		METERING	COUNTER	CONTROL	ALARMS	DEMAND
Setup	Wave	Exit		RTD	RRTD	SETUP	TRIP DATA	

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

		Local RTD Tab				
		RTD No.	Alarm / High Alarm	Temp. (Deg C)	Max. Temp. (Deg C)	Application
<div style="text-align: center; margin-bottom: 10px;">  </div> <div style="font-size: small;"> Device Name: ML369 Group Name: \$SYSTEM Order Code: 369-HI -R-B-F -0 Device Type: ML369 Hardware Rev.: B Firmware Rev.: 1.20 Modification No: None Serial Number: M53B99000081 Slave Address: 104 </div>	1	<input type="checkbox"/>	N/A	N/A	None	N/A
	2	<input type="checkbox"/>	-43	-43	Stator	RTD 2
	3	<input type="checkbox"/>	-43	-43	Bearing	RTD 3
	4	<input type="checkbox"/>	-43	-43	Ambient	RTD 4
	5	<input type="checkbox"/>	-43	-43	Other	RTD 5
	6	<input type="checkbox"/>	-43	-43	Stator	RTD 6
	7	<input type="checkbox"/>	-43	-43	Stator	RTD 7
	8	<input type="checkbox"/>	-43	-43	Stator	RTD 8
	9	<input type="checkbox"/>	-43	-43	Bearing	RTD 9
	10	<input type="checkbox"/>	-43	-43	Stator	RTD 10
	11	<input type="checkbox"/>	-43	-43	Stator	RTD 11
	12	<input type="checkbox"/>	-43	-43	Ambient	RTD 12
Legend: Hottest Stator Temperature Highlighted in red <div style="display: flex; justify-content: space-around; font-size: x-small;"> <div><input type="checkbox"/> Not Active</div> <div><input type="checkbox"/> Alarm Latched</div> <div><input type="checkbox"/> Hi. Alarm Latched</div> </div> <div style="display: flex; justify-content: space-around; font-size: x-small;"> <div><input type="checkbox"/> Timing Out</div> <div><input type="checkbox"/> Alarm Active (Blinking)</div> <div><input type="checkbox"/> Hi. Alarm Act. (Blinking)</div> </div>						
Events	Trend	Help				
RTD	RRTD		SETUP	TRIP DATA		
Setup	Wave	Exit	METERING	COUNTER	CONTROL	ALARMS
			DEMAND			

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

		Remote RTD								
		RRTD 1	RTD No.	RTD Alarm	Temp. (Deg.)	Max Temp. (Deg.)	Appl.	Name		
Device Name: ML369 Group Name: \$SYSTEM Order Code: 369-HI -R-B-F -0 Device Type: ML369 Hardware Rev.: B Firmware Rev.: 1.20 Modification No: None Serial Number: M53B99000081 Slave Address: 104		Status	1	<input type="checkbox"/>	N/A	N/A	None	N/A		
		Trip <input type="checkbox"/>	2	<input type="checkbox"/>	N/A	N/A	None	N/A		
		Alarm <input type="checkbox"/>	3	<input type="checkbox"/>	N/A	N/A	None	N/A		
		Aux 1 <input type="checkbox"/>	4	<input type="checkbox"/>	N/A	N/A	None	N/A		
		Aux 2 <input type="checkbox"/>	5	<input type="checkbox"/>	N/A	N/A	None	N/A		
		RTD Failure <input type="checkbox"/>	6	<input type="checkbox"/>	N/A	N/A	None	N/A		
		Comm Failure <input type="checkbox"/>	7	<input type="checkbox"/>	N/A	N/A	None	N/A		
		Legend:	8	<input type="checkbox"/>	N/A	N/A	None	N/A		
		De-energized <input type="checkbox"/>	9	<input type="checkbox"/>	N/A	N/A	None	N/A		
		Energized <input type="checkbox"/>	10	<input type="checkbox"/>	N/A	N/A	None	N/A		
			11	<input type="checkbox"/>	N/A	N/A	None	N/A		
			12	<input type="checkbox"/>	N/A	N/A	None	N/A		
		RRTD Selection <input type="button" value="1"/> <input type="button" value="2"/> <input type="button" value="3"/> <input type="button" value="4"/>		RTD Alarms legend: Hottest Temp. Stator is Highlighted in red Not Active <input type="checkbox"/> Alarm Active (Blinking) <input type="checkbox"/> Timing Out <input type="checkbox"/> Hi Alarm Latched <input type="checkbox"/> Alarm Latched <input type="checkbox"/> Hi Alarm Active (Blinking) <input type="checkbox"/>						
Events	Trend	Help	RTD		RRTD		SETUP		TRIP DATA	
Setup	Wave	Exit	METERING		COUNTER		CONTROL		ALARMS	

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

Control Tab		
Status	Preset Values	
Trip <input type="checkbox"/>	Digital Counter	3 <input type="button" value="Set"/>
Alarm <input type="checkbox"/>	MWh	3 <input type="button" value="Set"/>
Aux. 1 <input type="checkbox"/>	Positive kvarh	0 <input type="button" value="Set"/>
Aux. 2 <input type="checkbox"/>	Negative kvarh	0 <input type="button" value="Set"/>
Spare <input type="checkbox"/>	Control	
Speed <input type="checkbox"/>	<input type="button" value="Reset 369"/>	
Differential <input type="checkbox"/>	<input type="button" value="Start Motor"/>	
Reset <input type="checkbox"/>	<input type="button" value="Stop Motor"/>	
Emergency <input type="checkbox"/>	Clear Data	
Access <input type="checkbox"/>	<input type="button" value="All Data"/>	
Legend		
Energized <input checked="" type="checkbox"/>	<input type="button" value="Motor Status"/> Stopped	
Deenergized <input type="checkbox"/>	<input type="button" value="Motor Data"/>	
<input type="button" value="Trip Counter"/>		
<input type="button" value="Event Records"/>		
<input type="button" value="Peak Demand Data"/>		
<input type="button" value="Last Trip Data"/>		
<input type="button" value="RTD Maximums"/>		
Events	Trend	Help
METERING	COUNTER	CONTROL
Setup	Wave	Exit
RTD	RRTD	ALARMS
SETUP		DEMAND
TRIP DATA		

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

Setup Tab																								
 Device Name: ML369 Group Name: \$SYSTEM Order Code: 369-HI -R-B-F -0 Device Type: ML369 Hardware Rev.: B Firmware Rev.: 1.20 Modification No: None Serial Number: M53B99000081 Slave Address: 104	System Settings		Motor Settings																					
	VT Connection Type	Wye	Full Load Amps(FLA)	500 Amps																				
	VT Ratio	2.31 : 1	Rated Voltage	480 Volts																				
	Single VT Operation	Off	Cooling Time Constant:																					
	Ground CT Type	5 A Secondary	Running	20 Min.																				
	Ground CT Primary	100	Stopped	30 Min.																				
	Phase CT Primary	1000	Hot/Cold Safe Stall Ratio	0.10																				
	Nominal Frequency	60	RTD Settings																					
	Phase Sequence	ABC	Biasing	On																				
	Communications																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Channel</th> <th style="width: 15%;">Parity</th> <th style="width: 15%;">Baud</th> <th style="width: 20%;">Application</th> <th style="width: 35%;">Connection</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>None</td> <td>19200 baud</td> <td>-----</td> <td>-----</td> </tr> <tr> <td>2</td> <td>None</td> <td>19200 baud</td> <td>-----</td> <td>-----</td> </tr> <tr> <td>3</td> <td>None</td> <td>19200 baud</td> <td>MODBUS</td> <td>RS 485</td> </tr> </tbody> </table>					Channel	Parity	Baud	Application	Connection	1	None	19200 baud	-----	-----	2	None	19200 baud	-----	-----	3	None	19200 baud	MODBUS	RS 485
Channel	Parity	Baud	Application	Connection																				
1	None	19200 baud	-----	-----																				
2	None	19200 baud	-----	-----																				
3	None	19200 baud	MODBUS	RS 485																				
Events	Trend	Help	RTD RRTD SETUP TRIP DATA																					
Setup	Wave	Exit	METERING COUNTER CONTROL ALARMS DEMAND																					

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.

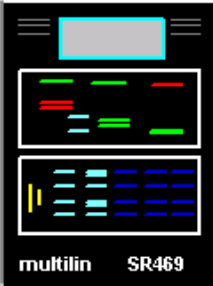
The SR469 Tabular Data Screen wizard has nine command buttons, described below.

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 27. 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.

Metering Tab

		Multilin SR469 Metering Values					
		Metering Values		RTDs °C			
Device Name:	ML469	Amps A:	0 / 0	Volts AB:	0	Hottest Stator:	
Group Name:	\$SYSTEM	Amps B:	1 / 121	Volts BC:	0	1:	- No RTD -
Device Type:	ML469	Amps C:	0 / 313	Volts CA:	0	2:	- No RTD -
Hardware Rev.:	E	Average Amps:	0	Avg Line Voltage:	0	3:	- No RTD -
Firmware Rev.:	30E280A8.000	Current Unbalance (%):	0	Volts An:	- N/A -	4:	- No RTD -
Boot Program Rev.:	30E210A0.000	Ground Amps:	0.00	Volts Bn:	- N/A -	5:	- No RTD -
		Motor Load (FLA):	0.00	Volts Cn:	- N/A -	6:	- No RTD -
		U/B Bias Motor Load:	0.00	Avg Phase Voltage:	- N/A -	7:	- No RTD -
		Differential Amps A:	- N/A -	Frequency (Hz):	0.00	8:	- No RTD -
		Differential Amps B:	- N/A -	Tachometer RPM:	- N/A -	9:	- No RTD -
		Differential Amps C:	- N/A -	Demand (Amps):	1	10:	- No RTD -
		Demand (kW):	0	Demand (kW):	0	11:	- No RTD -
		Demand (kVAR):	0	Demand (kVAR):	0	12:	- No RTD -
		Peak Demand (Amps):	3	HP:	0	Torque Metering: Disabled	
		Peak Demand (kW):	0	kVAR:	0	Torque: Disabled	
		Peak Demand (kVAR):	0	+ MWh hours:	0.000		
		Peak Demand (kVA):	0	+ Mvar hours:	0.000		
				- Mvar hours:	0.000		
		<input type="button" value="Clear Peak Demand"/>		<input type="button" value="Clear MWh & Mvarh"/>		<input type="button" value="RESET Device"/>	
<input type="button" value="Events"/> <input type="button" value="Trend"/> <input type="button" value="Help"/>		<input type="button" value="METERING"/> <input type="button" value="STATUS"/> <input type="button" value="ALARMS"/> <input type="button" value="TRIP"/> <input type="button" value="IO"/>					
<input type="button" value="Setup"/> <input type="button" value="Wave"/> <input type="button" value="Exit"/>		<input type="button" value="MAINT"/> <input type="button" value="SETPOINTS"/> <input type="button" value="ANALOG"/> <input type="button" value="RTDHI"/>					

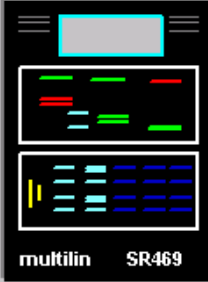
The Multilin SR469 Metering Values screen shows the metering values, for example, Amps A, Amps B and Amps C; and Volts AB, Volts BC and Volts CA. Also shows Power, Energy, Motor Data and RTD information.

The **Clear Peak Demand** button will clear all Peak Demand data

The **Clear MWh & Mvarh** button will clear all MWh and Mvarh values.

The **RESET Device** button will issue a RESET command to the SR469.

Status Tab

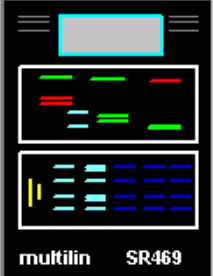
 <p>multilin SR469</p>	Multilin SR469 Status				
	Learned Acceleration Time (s): 200.0 Learned Starting Amps: 3329 Learned Starting Capacity (%): 3 Learned Average Motor Load: 0.00 Last Starting Current: 1 Last Starting Capacity: 3	Real Time Clock Date: 1/ 1/2002 Time: 11:29:00			
Device Name: ML469 Group Name: \$SYSTEM Device Type: ML469 Hardware Rev.: E Firmware Rev.: 30E280A8.000 Boot Program Rev.: 30E210A0.000	Start Blocks SR469 Programmed: Yes Overload Lockout (m): N/A Start Inhibit Block (m): N/A Starts/Hour Block Lockout Time (m): N/A Time Between Starts Lockout Time (m): N/A Restart Block (s): N/A		RTD Maximums °C 1: - No RTD - 2: - No RTD - 3: - No RTD - 4: - No RTD - 5: - No RTD - 6: - No RTD - 7: - No RTD - 8: - No RTD - 9: - No RTD - 10: - No RTD - 11: - No RTD - 12: - No RTD -		
	Motor Status Motor Status: - Running - Motor Thermal Capacity Used (%): 0 Estimated Time to Trip (s): Never Motor Speed: - Low Speed -		<input type="button" value="Motor Start"/> <input type="button" value="Motor Stop"/> <input type="button" value="Clear RTD Maximums"/>		
<input type="button" value="Events"/> <input type="button" value="Trend"/> <input type="button" value="Help"/>	METERING	STATUS	ALARMS	TRIP	IO
<input type="button" value="Setup"/> <input type="button" value="Wave"/> <input type="button" value="Exit"/>	MAINT	SETPOINTS	ANALOG	RTDHI	

The Multilin SR469 Status screen shows:

- Start Blocks
- Motor Status
- Real Time Clock
- RTD Maximums


The **Clear RTD Maximums** button will clear all maximum RTD values.

Alarms Tab

	Multilin SR469 Alarm Status																		
Device Name: ML469 Group Name: \$SYSTEM Device Type: ML469 Hardware Rev.: E Firmware Rev.: 30E280A8.000 Boot Program Rev.: 30E210A0.000	Remote Alarm: Off Pressure Switch Alarm: Off Vibration Switch Alarm: Off Digital Counter Alarm: Off Tachometer Alarm: Off Thermal Capacity Alarm: Off Overload Alarm: Not Active Undercurrent Alarm: Active Current Unbalance Alarm: Not Active Ground Fault Alarm: Not Active Undervoltage Alarm: Not Active Overvoltage Alarm: Not Active System Frequency Alarm: Not Active Power Factor Alarm: Off Reactive Power Alarm: Off Underpower Alarm: Active Trip Counter Alarm: Off Starter Failure Alarm: Off Current Demand Alarm: Off kW Demand Alarm: Off kVAR Demand Alarm: Off kVA Demand Alarm: Off Reverse Power Alarm: Not Active	Open RTD Sensor Alarm: Off Sensor / Low Temp Alarm: Off RTD #1 Alarm: Off RTD #2 Alarm: Off RTD #3 Alarm: Off RTD #4 Alarm: Off RTD #5 Alarm: Off RTD #6 Alarm: Off RTD #7 Alarm: Off RTD #8 Alarm: Off RTD #9 Alarm: Off RTD #10 Alarm: Off RTD #11 Alarm: Off RTD #12 Alarm: Off Analog Input 1 Alarm: Off Analog Input 2 Alarm: Off Analog Input 3 Alarm: Off Analog Input 4 Alarm: Off General Switch A Alarm: Off General Switch B Alarm: Off General Switch C Alarm: Off General Switch D Alarm: Off																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Events</td> <td style="padding: 2px;">Trend</td> <td style="padding: 2px;">Help</td> </tr> <tr> <td style="padding: 2px;">Setup</td> <td style="padding: 2px;">Wave</td> <td style="padding: 2px;">Exit</td> </tr> </table>	Events	Trend	Help	Setup	Wave	Exit	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">METERING</td> <td style="padding: 2px;">STATUS</td> <td style="padding: 2px;">ALARMS</td> <td style="padding: 2px;">TRIP</td> <td style="padding: 2px;">IO</td> </tr> <tr> <td style="padding: 2px;">MAINT</td> <td style="padding: 2px;">SETPOINTS</td> <td style="padding: 2px;">ANALOG</td> <td colspan="2" style="padding: 2px;">RTDHI</td> </tr> </table>	METERING	STATUS	ALARMS	TRIP	IO	MAINT	SETPOINTS	ANALOG	RTDHI			
Events	Trend	Help																	
Setup	Wave	Exit																	
METERING	STATUS	ALARMS	TRIP	IO															
MAINT	SETPOINTS	ANALOG	RTDHI																

The Multilin SR469 Alarm Status screen shows the status of various alarms such as Overload Alarm and Underpower Alarm.

Trip Tab



multilin SR469

Multilin SR469 Last Trip Data

Cause of Trip: No Event / No Trip To Date	Trip Time: 09:00:00
Motor Speed During Trip: - Low Speed -	Trip Date: 01/01/1995
Pre-Trip Amps A: 0	Pre-Trip Tachometer RPM: - N/A -
Pre-Trip Amps B: 0	Pre-Trip Volts AB: 0
Pre-Trip Amps C: 0	Pre-Trip Volts BC: 0
Pre-Trip Motor Load (FLA): 0.00	Pre-Trip Volts CA: 0
Pre-Trip Current Unbalance (%): 0	Pre-Trip Volts An: - N/A -
Pre-Trip Ground Amps: 0.00	Pre-Trip Volts Bn: - N/A -
Pre-Trip Differential Amps A: - N/A -	Pre-Trip Volts Cn: - N/A -
Pre-Trip Differential Amps B: - N/A -	Pre-Trip Frequency (Hz): 0.00
Pre-Trip Differential Amps C: - N/A -	Pre-Trip kW: 0
	Pre-Trip kVAR: 0
	Pre-Trip kVA: 0
	Pre-Trip PF: 0.00 Lag
Pre-Trip Hottest Stator RTD # 0	Pre-Trip Analog Input 1: - N/A -
Pre-Trip Hottest Bearing RTD # 0	Pre-Trip Analog Input 2: - N/A -
Pre-Trip Hottest Other RTD # 0	Pre-Trip Analog Input 3: - N/A -
Pre-Trip Hottest Amb. RTD # 0	Pre-Trip Analog Input 4: - N/A -


Clear Last Trip Data

Events	Trend	Help
Setup	Wave	Exit

METERING	STATUS	ALARMS	TRIP	IO
MAINT	SETPOINTS	ANALOG	RTDHI	

The Multilin SR469 Trip screen shows the values of last trip data.
 The **Clear Last Trip Data** button will clear all values of the last trip data.

IO Tab



multilin SR469

Multilin SR469 Inputs & Outputs

Output Relays

<input type="checkbox"/> R1 TRIP	<input type="checkbox"/> R3 AUXILIARY	<input type="checkbox"/> R5 BLOCK START
<input type="checkbox"/> R2 AUXILIARY	<input checked="" type="checkbox"/> R4 ALARM	<input type="checkbox"/> R6 SERVICE

Digital Input Switches

Access Switch:	- Shorted -	Assignable Input 1:	- Open -
Test Switch:	- Open -	Assignable Input 2:	- Open -
Starter Switch:	- Open -	Assignable Input 3:	- Open -
Emer. Restart Switch:	- Open -	Assignable Input 4:	- Open -
Remote Reset Switch:	- Open -	Trip Coil Supervision:	- No Coil -

Analog Inputs

	<u>Min</u>	<u>Max</u>
Analog I/P 1	- N/A -	- N/A -
Analog I/P 2	- N/A -	- N/A -
Analog I/P 3	- N/A -	- N/A -
Analog I/P 4	- N/A -	- N/A -
Analog Input Diff 1-2	0	100
Analog Input Diff 3-4	0	100

Clear Analog I/P Min/Max

Events	Trend	Help	METERING	STATUS	ALARMS	TRIP	IO
Setup	Wave	Exit	MAINT	SETPOINTS	ANALOG		RTDHI

Device Name: ML469

Group Name: \$SYSTEM

Device Type: ML469

Hardware Rev.: E

Firmware Rev.: 30E280A8.000


Boot Program Rev.: 30E210A0.000

The Multilin SR469 Inputs & Outputs screen shows values related to:

- Output Relays
- Digital Input Switches
- Analog Inputs

The **Clear Analog I/P Min/Max** button will clear all minimum and maximum values of Analog I/P.

Maintenance Tab

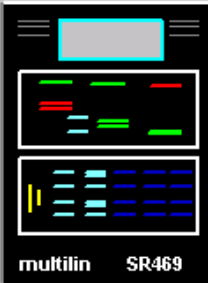
Multilin SR469 Maintenance		
	Trip Counters	
	Total Number of Trips:	0
	Reverse Power Trips:	0
	Incomplete Sequence Trips:	0
	Input Switch Trips:	0
	Tachometer Trips:	0
	Overload Trips:	0
	Short Circuit Trips:	0
	Mechanical Jam Trips:	0
	Undercurrent Trips:	0
Current Unbalance Trips:	0	
Ground Fault Trips:	0	
Phase Differential Trips:	0	
Acceleration Timer Trips:	0	
Stator RTD Trips:	0	
Bearing RTD Trips:	0	
Other RTD Trips:	0	
Ambient RTD Trips:	0	
Analog Input #1 Trips:	0	
Analog Input #2 Trips:	0	
Analog Input #3 Trips:	0	
		Timers
Motor Running Hours:	328	
Time Between Starts (min):	0	
Start Timer 1 (min):	0	
Start Timer 2 (min):	0	
Start Timer 3 (min):	0	
Start Timer 4 (min):	0	
Start Timer 5 (min):	0	
		General Counters
No. Motor Starts:	1920	
No. Emergency Restarts:	0	
No. Starter Operations:	1906	
Digital Counter: - N/A -	Units	
<input type="button" value="Clear Trip Counters"/> <input type="button" value="Preset Digital Ctr"/>		
Device Name:	ML469	
Group Name:	\$SYSTEM	
Device Type:	ML469	
Hardware Rev.:	E	
Firmware Rev.:	30E280A8.000	
Boot Program Rev.:	30E210A0.000	
Events	Trend	Help
Setup	Wave	Exit
MAINT		SETPOINTS
METERING	STATUS	ALARMS
ANALOG		RTDHI
TRIP		IO

The Multilin SR469 Maintenance screen shows values related to:

- Trip Counters
- Timers
- General Counters

The **Clear Trip Counters** button will clear all values of trip counters and the **Preset Digital Ctr** will preset trip counters.

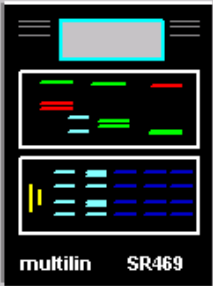
Analog Tab

	Multilin SR469 Analog Input Differential																																							
	<p>Analog Input Diff 1-2</p> <table border="0"> <tr> <td>Alarm:</td> <td>Off</td> <td>Comparison:</td> <td>% Difference</td> </tr> <tr> <td>Alarm Relays:</td> <td>Alarm</td> <td>Logic:</td> <td>1 <> 2</td> </tr> <tr> <td>Percent Alarm:</td> <td>10%</td> <td>Active When:</td> <td>Always</td> </tr> <tr> <td>Absolute Alarm:</td> <td>10</td> <td>Block from Start:</td> <td>0s</td> </tr> <tr> <td>Alarm Delay:</td> <td>1.0s</td> <td>Trip:</td> <td>Off</td> </tr> <tr> <td>Alarm Events:</td> <td>OFF</td> <td>Trip Relays:</td> <td>Trip</td> </tr> <tr> <td></td> <td></td> <td>Percent Trip:</td> <td>10%</td> </tr> <tr> <td></td> <td></td> <td>Absolute Trip:</td> <td>10</td> </tr> <tr> <td></td> <td></td> <td>Trip Delay:</td> <td>1.0s</td> </tr> </table>				Alarm:	Off	Comparison:	% Difference	Alarm Relays:	Alarm	Logic:	1 <> 2	Percent Alarm:	10%	Active When:	Always	Absolute Alarm:	10	Block from Start:	0s	Alarm Delay:	1.0s	Trip:	Off	Alarm Events:	OFF	Trip Relays:	Trip			Percent Trip:	10%			Absolute Trip:	10			Trip Delay:	1.0s
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Device Name: ML469 Group Name: \$SYSTEM Device Type: ML469 Hardware Rev.: E Firmware Rev.: 30E280A8.000 Boot Program Rev.: 30E210A0.000	<p>Analog Input Diff 3-4</p> <table border="0"> <tr> <td>Alarm:</td> <td>Off</td> <td>Comparison:</td> <td>% Difference</td> </tr> <tr> <td>Alarm Relays:</td> <td>Alarm</td> <td>Logic:</td> <td>1 <> 2</td> </tr> <tr> <td>Percent Alarm:</td> <td>10%</td> <td>Active When:</td> <td>Always</td> </tr> <tr> <td>Absolute Alarm:</td> <td>10</td> <td>Block from Start:</td> <td>0s</td> </tr> <tr> <td>Alarm Delay:</td> <td>1.0s</td> <td>Trip:</td> <td>Off</td> </tr> <tr> <td>Alarm Events:</td> <td>OFF</td> <td>Trip Relays:</td> <td>Trip</td> </tr> <tr> <td></td> <td></td> <td>Percent Trip:</td> <td>10%</td> </tr> <tr> <td></td> <td></td> <td>Absolute Trip:</td> <td>10</td> </tr> <tr> <td></td> <td></td> <td>Trip Delay:</td> <td>1.0s</td> </tr> </table>				Alarm:	Off	Comparison:	% Difference	Alarm Relays:	Alarm	Logic:	1 <> 2	Percent Alarm:	10%	Active When:	Always	Absolute Alarm:	10	Block from Start:	0s	Alarm Delay:	1.0s	Trip:	Off	Alarm Events:	OFF	Trip Relays:	Trip			Percent Trip:	10%			Absolute Trip:	10			Trip Delay:	1.0s
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Events	Trend	Help																																						
Setup	Wave	Exit																																						
MAINT	SETPOINTS	ANALOG	RTDHI																																					
METERING	STATUS	ALARMS	TRIP																																					
			IO																																					

The Multilin SR469 Analog Input Differential screen shows:

- Analog Input Diff 1-2
- Analog Input Diff 3-4

RTD HI Tab



multilin SR469

Multilin SR469 HI Alarm Status

RTD #1 HI Alarm:	Off	RTD #1 HI Alarm:	Off
RTD #1 HI Alarm Level:	130	RTD #1 HI Alarm Relays:	Alarm
RTD #2 HI Alarm:	Off	RTD #2 HI Alarm:	Off
RTD #2 HI Alarm Level:	130	RTD #2 HI Alarm Relays:	Alarm
RTD #3 HI Alarm:	Off	RTD #3 HI Alarm:	Off
RTD #3 HI Alarm Level:	130	RTD #3 HI Alarm Relays:	Alarm
RTD #4 HI Alarm:	Off	RTD #4 HI Alarm:	Off
RTD #4 HI Alarm Level:	130	RTD #4 HI Alarm Relays:	Alarm
RTD #5 HI Alarm:	Off	RTD #5 HI Alarm:	Off
RTD #5 HI Alarm Level:	130	RTD #5 HI Alarm Relays:	Alarm
RTD #6 HI Alarm:	Off	RTD #6 HI Alarm:	Off
RTD #6 HI Alarm Level:	130	RTD #6 HI Alarm Relays:	Alarm
RTD #7 HI Alarm:	Off	RTD #7 HI Alarm:	Off
RTD #7 HI Alarm Level:	80	RTD #7 HI Alarm Relays:	Alarm
RTD #8 HI Alarm:	Off	RTD #8 HI Alarm:	Off
RTD #8 HI Alarm Level:	80	RTD #8 HI Alarm Relays:	Alarm
RTD #9 HI Alarm:	Off	RTD #9 HI Alarm:	Off
RTD #9 HI Alarm Level:	80	RTD #9 HI Alarm Relays:	Alarm
RTD #10 HI Alarm:	Unknown	RTD #10 HI Alarm:	Off
RTD #10 HI Alarm Level:	80	RTD #10 HI Alarm Relays:	Alarm
RTD #11 HI Alarm:	Off	RTD #11 HI Alarm:	Off
RTD #11 HI Alarm Level:	80	RTD #11 HI Alarm Relays:	Alarm
RTD #12 HI Alarm:	Off	RTD #12 HI Alarm:	Off
RTD #12 HI Alarm Level:	60	RTD #12 HI Alarm Relays:	Alarm

Device Name: ML469

Group Name: \$SYSTEM

Device Type: ML469

Hardware Rev.: E


Firmware Rev.: 30E280A8.000

Boot Program Rev.: 30E210A0.000

Events	Trend	Help	MAINT	SETPOINTS	ANALOG	RTDHI
Setup	Wave	Exit	METERING	STATUS	ALARMS	TRIP

The Multilin SR469 HI Alarm Status screen shows various RTD values.

Setpoints Tab

 <p>multilin SR469</p>	Multilin SR469 System Setpoints																				
Device Name: ML469 Group Name: \$SYSTEM Device Type: ML469 Hardware Rev.: E Firmware Rev.: 30E280A8.000 Boot Program Rev.: 30E210A0.000	Thermal Model Curve Style: Standard Overload Pickup Level (FLA): 1.01 Unbalance k Factor: 0 Cool Time Constant Running (min): 15 Cool Time Constant Stopped (min): 30 Hot/Cold Safe Stall Ratio: 1.00 RTD Biasing: Off RTD Bias Minimum (°C): 40 RTD Bias Center Point (°C): 130 RTD Bias Maximum (°C): 155 Thermal Capacity Alarm: Off T. C. Alarm Relays: Alarm Thermal Capacity Level (% used): 75 Thermal Capacity Events: Off Overload Trip Relays: Trip Serial Communication Control: Off	Current Sensing Phase CT Primary: 1 Motor Full Load Amps: 1 Ground CT Type: Multilin 50:0.025 Ground CT Primary: 100 Phase Diff. CT Type: None Phase Differential CT Primary: 100 Enable Two Speed Motor Option: On Speed Two Phase CT Primary: 100 Speed Two Motor Full Load: 1	Voltage Sensing One VT Connection: AN (Wye) AB (Delta) VT Connection Type: Open Delta Voltage Transformer Ratio: 1.00 Motor Nameplate Voltage: 100	Power System Nominal Frequency: 60 Hz System Phase Sequence: ABC																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Events</td> <td style="width: 25%;">Trend</td> <td style="width: 25%;">Help</td> <td style="width: 25%;"></td> </tr> <tr> <td>Setup</td> <td>Wave</td> <td>Exit</td> <td></td> </tr> </table>	Events	Trend	Help		Setup	Wave	Exit		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">MAINT</td> <td style="width: 25%;">SETPOINTS</td> <td style="width: 25%;">ANALOG</td> <td style="width: 25%;">RTDHI</td> </tr> <tr> <td>METERING</td> <td>STATUS</td> <td>ALARMS</td> <td>TRIP</td> </tr> <tr> <td></td> <td></td> <td></td> <td>IO</td> </tr> </table>	MAINT	SETPOINTS	ANALOG	RTDHI	METERING	STATUS	ALARMS	TRIP				IO
Events	Trend	Help																			
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MAINT	SETPOINTS	ANALOG	RTDHI																		
METERING	STATUS	ALARMS	TRIP																		
			IO																		

The Multilin SR469 System Setpoints screen shows values of Thermal Model, Current, Voltage Sensing, Power System

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 28. 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.

Metering Tab



SR489

Metering

Current		A	B	C	Average Amps: 2
Amps	2/ 0	4/121	0/ 0	0/ 0	Neg. Seq. (% FLA): 0
Neutral Amps	0/ 0	0/ 0	0/ 0	0/ 0	Ground Amps: 0.00
Diff. Amps	2/ 0	4/ 0	0/ 0	0/ 0	Vab / lab: 401/139
Voltage		Volts An: 0/ 0		Speed (RPM): - N/A -	
Volts AB:	501/181	Volts Bn:	501/ 1	RTD Temp °C (Max)	
Volts BC:	0/ 0	Volts Cn:	502/ 1	Hottest Stator: No RTD	
Volts CA:	502/ 1	Avg Phase:	334	1:	No RTD No RTD
Avg Line:	334	Neut. Volts Fund:	0.0	2:	No RTD No RTD
Per Unit V/Hz:	5.00	Neut. 3rd Harm.:	0.1	3:	No RTD No RTD
Freq. (Hz):	60.00	Term. 3rd Harm.:	0.5	4:	No RTD No RTD
Generator Status:	OnLine	Gen. Load (% FLA):	0	5:	No RTD No RTD
Est. O/L Trip Time (s):	Never	Therm. Cap. Used(%):	0	6:	No RTD No RTD
Demand (Amps):	4	Power		7:	No RTD No RTD
Demand (MW):	0.000	Power Factor:	-00.49 Lag	8:	No RTD No RTD
Demand (MVAR):	0.001	MW:	0.000	9:	No RTD No RTD
Demand (MVA):	0.001	MVAR:	0.001	10:	No RTD No RTD
Pk Dmnd (Amps):	6	MVA:	0.001	11:	No RTD No RTD
Pk Dmnd (MW):	8.000	+ MW hours:	0.314	12:	No RTD No RTD
Pk Dmnd (MVAR):	0.001	+ Mvar hours:	0.018	Clear Max RTD Data	
Pk Dmnd (MVA):	0.008	- Mvar hours:	0.042	Clear Peak Demand Clear MWh & Mvarh RESET Device	

Events

Trend

Help

METERING

PICKUP

ALARMS

IO

MAINTEN

LASTTRIP

SETUP

Setup

Wave

Exit

The Multilin SR489 Metering Values screen shows various metering values:

- Current
- Voltage
- Demand
- Power
- RTD Information
- Motor Data


The **Clear Peak Demand** button clears all peak demand values.

The **Clear MWh & Mvarh** button clears all MWh and Mvarh data

The **Clear Max RTD Data** button clears the maximum RTD data and

The **RESET Device** button will issue a RESET command to the device.

Pickup Tab

		Multilin SR489 Pickups					
		Input	RTD	Phase	State		
Device Name:	ML489	Input A:	Not Enabled	RTD #1	Not Enabled	Phase Differential Trip:	Active
Group Name:	\$SYSTEM	Input B:	Not Enabled	RTD #2	Not Enabled	Undervoltage Trip:	Inactive
Device Type:	ML489	Input C:	Not Enabled	RTD #3	Not Enabled	Oversvoltage Trip:	Active
Hardware Rev.:	G	Input D:	Not Enabled	RTD #4	Not Enabled	Volts/Hertz Trip:	Active
Firmware Rev.:	32G141A8.000	Input E:	Not Enabled	RTD #5	Not Enabled	Phase Reversal Trip:	Inactive
Boot Program Rev.:	32G200A0.000	Input F:	Not Enabled	RTD #6	Not Enabled	Underfrequency Trip:	Not Enabled
		Input G:	Not Enabled	RTD #7	Not Enabled	Overfrequency Trip:	Inactive
		Analog I/P 1:	Inactive	RTD #8	Not Enabled	Neutral O/V (Fund) Trip:	Inactive
		Analog I/P 2:	Inactive	RTD #9	Not Enabled	Neutral U/V (3rd) Trip:	Inactive
		Analog I/P 3:	Inactive	RTD #10	Not Enabled	Reactive Power Trip:	Not Enabled
		Analog I/P 4:	Inactive	RTD #11	Not Enabled	Reverse Power Trip:	Not Enabled
				RTD #12	Not Enabled	Low Forward Power Trip:	Not Enabled
						Thermal Model Trip:	Not Enabled
						Loss of Excitation 1:	Inactive
						Loss of Excitation 2:	Inactive
						Ground Directional:	Inactive
						High-Set Phase Overcurrent:	Inactive
						Distance Zone 1:	Inactive
						Distance Zone 2:	Inactive


Events	Trend	Help	METERING	PICKUP	ALARMS	IO	MAINTEN	LASTTRIP	SETUP
Setup	Wave	Exit							

The Multilin SR489 Pickups screen shows:

- Phase Differential Trip
- Overvoltage Trip
- Volts/Hertz Trip


CLICK MORE BUTTON TO SEE MORE PICKUPS

Alarms Tab

 <p>SR489</p>	Multilin SR489 Alarm Pickups													
<p>Device Name: ML489</p> <p>Group Name: \$SYSTEM</p> <p>Device Type: ML489</p> <p>Hardware Rev.: G</p> <p>Firmware Rev.: 32G141A8.000</p> <p>Boot Program Rev.: 32G200A0.000</p>	<p>Input A: Not Enabled</p> <p>Input B: Not Enabled</p> <p>Input C: Not Enabled</p> <p>Input D: Not Enabled</p> <p>Input E: Not Enabled</p> <p>Input F: Not Enabled</p> <p>Input G: Not Enabled</p>	<p>Analog I/P 1: Inactive</p> <p>Analog I/P 2: Inactive</p> <p>Analog I/P 3: Inactive</p> <p>Analog I/P 4: Inactive</p>	<p>RTD #1: Not Enabled</p> <p>RTD #2: Not Enabled</p> <p>RTD #3: Not Enabled</p> <p>RTD #4: Not Enabled</p>	<p>RTD #5: Not Enabled</p> <p>RTD #6: Not Enabled</p> <p>RTD #7: Not Enabled</p> <p>RTD #8: Not Enabled</p> <p>RTD #9: Not Enabled</p> <p>RTD #10: Not Enabled</p> <p>RTD #11: Not Enabled</p> <p>RTD #12: Not Enabled</p>	<p>Tachometer Alarm: Not Enabled</p> <p>Overcurrent Alarm: Inactive</p> <p>Neg. Sequence Alarm: Inactive</p> <p>Ground Overcurrent Alarm: Inactive</p> <p>Undervoltage Alarm: Inactive</p> <p>Overvoltage Alarm: Active</p> <p>Volts/Hertz Alarm: Active</p> <p>Underfrequency Alarm: Inactive</p> <p>Overfrequency Alarm: Inactive</p> <p>Neutral O/V (Fund) Alarm: Inactive</p> <p>Neutral U/V (3rd) Alarm: Inactive</p> <p>Reactive Power Alarm: Not Enabled</p> <p>Reverse Power Alarm: Not Enabled</p> <p>Low Forward Power Alarm: Not Enabled</p> <p>Open Sensor Alarm: Not Enabled</p>			<p>Short/Low Temp Alarm: Not Enabled</p> <p>Thermal Model Alarm: Not Enabled</p> <p>Trip Counter Alarm: Not Enabled</p> <p>Breaker Failure Alarm: Not Enabled</p> <p>Trip Coil Monitor Alarm: Not Enabled</p> <p>VT Fuse Failure Alarm: Not Enabled</p> <p>Current Demand Alarm: Not Enabled</p> <p>MW Demand Alarm: Not Enabled</p> <p>Mvar Demand Alarm: Not Enabled</p> <p>MVA Demand Alarm: Not Enabled</p> <p>Not Programmed Alarm: Inactive</p> <p>Simulation Mode Alarm: Not Enabled</p> <p>Output Relays Forced Alarm: Not Enabled</p> <p>Analog Output Forced Alarm: Not Enabled</p> <p>Test Switch Shorted Alarm: Not Enabled</p>						
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Events</td> <td style="padding: 2px;">Trend</td> <td style="padding: 2px;">Help</td> </tr> <tr> <td style="padding: 2px;">Setup</td> <td style="padding: 2px;">Wave</td> <td style="padding: 2px;">Exit</td> </tr> </table>	Events	Trend	Help	Setup	Wave	Exit	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">METERING</td> <td style="padding: 2px;">PICKUP</td> <td style="padding: 2px;">ALARMS</td> <td style="padding: 2px;">IO</td> <td style="padding: 2px;">MAINTEN</td> <td style="padding: 2px;">LASTTRIP</td> <td style="padding: 2px;">SETUP</td> </tr> </table>	METERING	PICKUP	ALARMS	IO	MAINTEN	LASTTRIP	SETUP
Events	Trend	Help												
Setup	Wave	Exit												
METERING	PICKUP	ALARMS	IO	MAINTEN	LASTTRIP	SETUP								

The Multilin SR489 Alarm Pickups screen shows all the Alarms.

Trip Data Tab



SR489

Multilin SR489 Last Trip Data

Cause of Trip: Differential Trip	Trip Time: 16:27:07	Trip Date: 12/31/2001
----------------------------------	---------------------	-----------------------

Pre-Trip Data				
	<u>A</u>	<u>B</u>	<u>C</u>	
Current (Amps)	1	2	0	
Diff. Current (Amps)	1	2	0	
Ground Current (Amps):	0.00			Tachometer (RPM): - N/A -
Neg. Seq. Current (% FLA):	0			Volts AB: 106
Analog I/P 1	0 Units			Volts BC: 0
Analog I/P 2	0 Units			Volts CA: 106
Analog I/P 3	0 Units			Vab/lab (ohms): 0.0
Analog I/P 4	0 Units			Vab/lab Angle: 0°
	⁰ C			Neutral Volt Fund: 0.0
Hottest Stator RTD #0	No RTD			Neutral Volt 3rd Harmonic: 0.1
Hottest Bearing RTD #0	No RTD			Frequency (Hz): 0.00
Hottest Other RTD #0	No RTD			Real Power (MW): 0.000
Hottest Amb. RTD #0	No RTD			Reactive Power (MVAR): 0.000
				Apparent Power (MVA): 0.000


Events	Trend	Help
Setup	Wave	Exit

METERING	PICKUP	ALARMS	IO	MAINTEN	LASTTRIP	SETUP
----------	--------	--------	----	---------	----------	-------

The Multilin SR489 Last Trip Data screen shows the values of last trip data and the corresponding values at the time of trip.

The **Clear Last Trip Data** button clears all values of the last trip data.

IO Tab



Device Name: ML489
Group Name: \$SYSTEM
Device Type: ML489
Hardware Rev.: G
Firmware Rev.: 32G141A8.000
Boot Program Rev.: 32G200A0.000

Multilin SR489 Inputs & Outputs

Digital Input Switches		Output Relays	
Access Switch:	-Shorted-	■	R1 TRIP
Breaker Status Switch:	-Open-	<input type="checkbox"/>	R2 AUXILIARY
Assignable Input 1:	-Open-	<input type="checkbox"/>	R3 AUXILIARY
Assignable Input 2:	-Open-	<input type="checkbox"/>	R4 AUXILIARY
Assignable Input 3:	-Open-	<input type="checkbox"/>	R5 ALARM
Assignable Input 4:	-Open-	<input type="checkbox"/>	R6 SERVICE
Assignable Input 5:	-Open-		
Assignable Input 6:	-Open-		
Assignable Input 7:	-Open-		
Trip Coil Supervision:	-No Coil-		
Digital Input Supervision:	Yes		
Enable Voltage Supervision:	No		

Analog Inputs		Min	Max
Analog I/P 1	0 Units	0	0
Analog I/P 2	0 Units	0	0
Analog I/P 3	0 Units	0	0
Analog I/P 4	0 Units	0	0

Clear Analog I/P Min/Max

Learned Data Values

Avg Generator Load (%FLA): 0
Avg Neg Seq Current(%FLA): 0
Avg Phase-Phase Volts: 334

Events Trend Help

METERING PICKUP ALARMS IO MAINTEN LASTTRIP SETUP


Setup Wave Exit

The Multilin SR489 Inputs & Outputs screen shows:

- Digital Input Switches
- Analog Inputs
- Output Relays
- Learned Data Values

The Clear Analog I/P Min/Max button clears all the minimum and maximum analog I/P.

Maintenance Tab

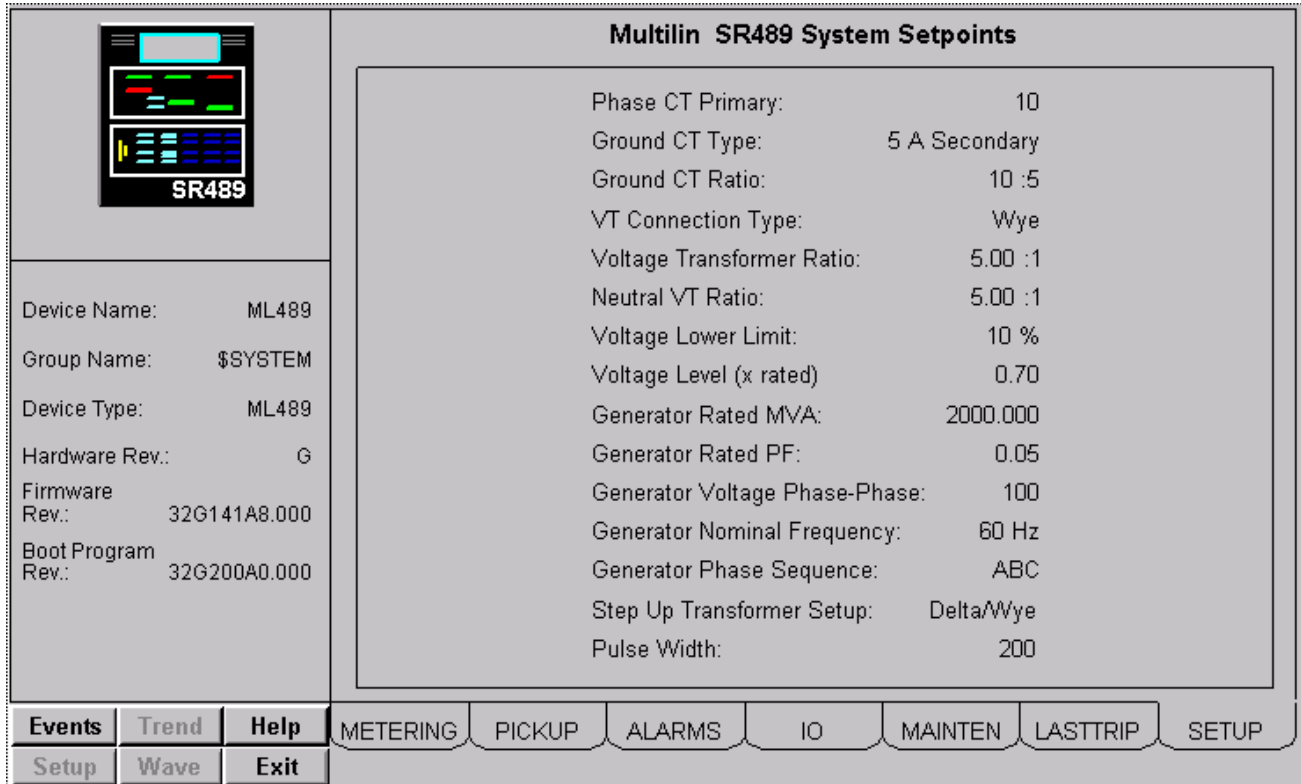
	Multilin SR489 Maintenance	
	General Timers & Counters Generator Hours Online: 160	# of Breaker Operations: 0 # of Thermal Resets: 0
Device Name: ML489 Group Name: \$SYSTEM Device Type: ML489 Hardware Rev.: G Firmware Rev.: 32G141A8.000 Boot Program Rev.: 32G200A0.000	Trip Counters Total Number of Trips: 38 Digital Input Trips: 0 Sequential Trips: 0 Field-Bkr Discrep. Trips: 0 Tachometer Trips: 0 Offline O/C Trips: 0 Phase O/C Trips: 0 Neg. Sequence O/C Trips: 0 Ground O/C Trips: 0 Phase Differential Trips: 8 Undervoltage Trips: 1 Overvoltage Trips: 26 Volts/Hertz Trips: 3 Phase Reversal Trips: 0 Underfrequency Trips: 0 Overfrequency Trips: 0 High-Set Phase O/C Trips: 0 Ground Directional Trips: 0	Neutral O/V Fund Trips: 0 Neutral U/V 3rd Trips: 0 Reactive Power Trips: 0 Reverse Power Trips: 0 Low Forward Power Trips: 0 Stator RTD Trips: 0 Bearing RTD Trips: 0 Other RTD Trips: 0 Ambient RTD Trips: 0 Thermal Model Trips: 0 Inadvertent Energy Trips: 0 Analog Input #1 Trips: 0 Analog Input #2 Trips: 0 Analog Input #3 Trips: 0 Analog Input #4 Trips: 0 Distance Zone 1 Trips: 0 Distance Zone 2 Trips: 0 Loss of Excitation 1 Trips: 0 Loss of Excitation 2 Trips: 0 Trip Counters Last Cleared: 12/25/2001
	<input type="button" value="Clear Trip Counters"/> <input type="button" value="Clear Generator Info"/> <input type="button" value="Clear Breaker Info"/>	
	<input type="button" value="Events"/> <input type="button" value="Trend"/> <input type="button" value="Help"/>	<input type="button" value="METERING"/> <input type="button" value="PICKUP"/> <input type="button" value="ALARMS"/> <input type="button" value="IO"/> <input type="button" value="MAINTEN"/> <input type="button" value="LASTTRIP"/> <input type="button" value="SETUP"/>
	<input type="button" value="Setup"/> <input type="button" value="Wave"/> <input type="button" value="Exit"/>	

The Multilin SR489 Maintenance screen shows:

- General Timers & Counters
- Trip Counters

The Clear Trip Counters button will clear all values of trip counters; the Clear General Info button will clear all general information; and the Clear Breaker Info button will clear all breaker information from the memory.

Setpoints Tab



Multilin SR489 System Setpoints

Phase CT Primary:	10
Ground CT Type:	5 A Secondary
Ground CT Ratio:	10 :5
VT Connection Type:	Wye
Voltage Transformer Ratio:	5.00 :1
Neutral VT Ratio:	5.00 :1
Voltage Lower Limit:	10 %
Voltage Level (x rated)	0.70
Generator Rated MVA:	2000.000
Generator Rated PF:	0.05
Generator Voltage Phase-Phase:	100
Generator Nominal Frequency:	60 Hz
Generator Phase Sequence:	ABC
Step Up Transformer Setup:	Delta/Wye
Pulse Width:	200

Device Information:

- Device Name: ML489
- Group Name: \$SYSTEM
- Device Type: ML489
- Hardware Rev.: G
- Firmware Rev.: 32G141A8.000
- Boot Program Rev.: 32G200A0.000

Navigation Bar:

- Events
- Trend
- Help
- METERING
- PICKUP
- ALARMS
- IO
- MAINTEN
- LASTTRIP
- SETUP
- Setup
- Wave
- Exit

The Multilin SR489 System Setpoints screen shows various values related to the setpoints such as Phase CT Primary, Ground CT Type, VT Connection Type, Voltage Transformer Ratio etc.

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 29. 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

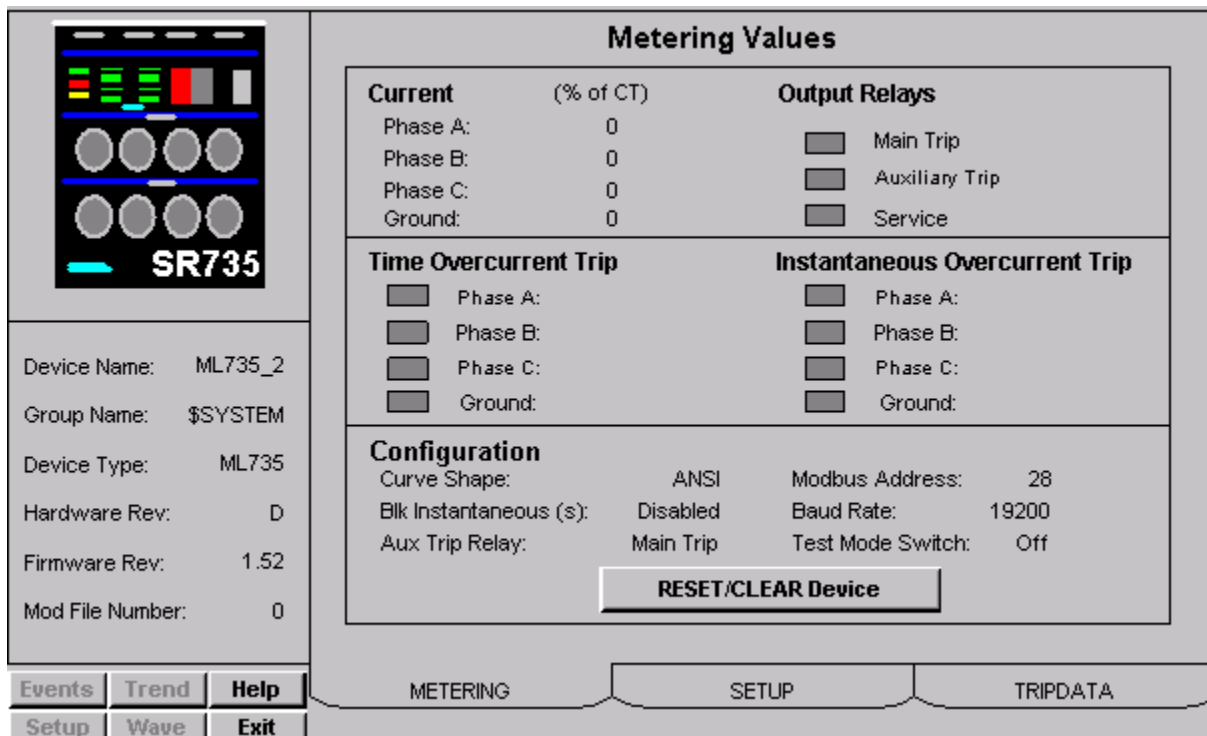
The Events and Wave function buttons below the Info box are disabled since the SR735 does not support Waveform Capture or Event generation.

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 30. 735 Tabular data screen commands.

Metering Tab



The 735 Metering screen shows:

- Current and Output Relays
- Time Overcurrent Trip and Instantaneous Overcurrent Trip
- Configuration

The RESET/CLEAR Device button will issue a RESET command to 735.

Trip Data Tab

The screenshot displays the 'Trip Data' screen for an SR735 device. On the left, there is a panel with a status indicator (SR735) and a list of device details:

Device Name:	ML735_2
Group Name:	\$SYSTEM
Device Type:	ML735
Hardware Rev:	D
Firmware Rev:	1.52
Mod File Number:	0

The main area is titled 'Trip Data' and contains two sections:

Last Trip Data

Cause Of Last Trip:	None
Phase A Pretrip (% CT):	0
Phase B Pretrip (% CT):	0
Phase C Pretrip (% CT):	0
Ground Pretrip (% CT):	0
Last O/C Trip Time (mS):	Time not available

Trip Record

Cause Of 2nd Last Trip:	None
Cause Of 3rd Last Trip:	None
Cause Of 4th Last Trip:	None
Cause Of 5th Last Trip:	None

Below the Trip Record section is a button labeled 'Clear Last 5 Trip Causes'.

At the bottom, there is a navigation bar with three tabs: 'METERING', 'SETUP', and 'TRIPDATA'. The 'TRIPDATA' tab is currently selected. To the left of this bar are three buttons: 'Events', 'Trend', and 'Help' in the top row, and 'Setup', 'Wave', and 'Exit' in the bottom row.

The 735 Trip Data screen shows trip data information such as:

- Last Trip Data
- Trip Record

The Clear Last 5 Trip Causes button will clear values of last 5 trip causes.

Setpoints Tab

System Setpoints

Dial Settings

Phase Pickup (% of CT):	OFF
Phase Curve Shape:	Def. time (low)
Phase Time Multiplier:	1
Phase Instantaneous (x CT):	OFF
Ground Pickup (% of CT):	OFF
Ground Curve Shape:	Def. time (low)
Ground Time Multiplier:	1
Ground Instantaneous (x CT):	OFF

Option Switches

Phase Time Overcurrent Shift Multiplier:	1.0
Ground Time Overcurrent Shift Multiplier:	1.0
System Frequency (Hz):	60
Custom Scheme:	Disabled

Device Name: ML735_2
Group Name: \$SYSTEM
Device Type: ML735
Hardware Rev: D
Firmware Rev: 1.52
Mod File Number: 0

Events Trend Help
Setup Wave Exit

METERING SETUP TRIPDATA

The 735 System Setpoints screen shows setpoints information such as:

- Dial Settings
- Option Switches

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 31. 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.

Metering Tab

Multilin SR745 Metering Values									
Current	A	B	C	N	Gnd	Avg			
W1 (Amps):	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
W1 Angle (*lag):	0	0	0	0	0	0	0		
W2 (Amps):	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
W2 Angle (*lag):	0	0	0	0	0	0	0		
Differential (x CT):	0.00	0.00	0.00						
Diff. Angle (*lag):	0	0	0						
Restr. (x CT):	0.00	0.00	0.00						
	+ Seq Cur	- Seq Cur	0 Seq Cur	Loading	Gnd Diff CT				
	Amps °lag	Amps °lag	Amps °lag						
W1:	0.000 0	0.000 0	0.000 0	999 %	0.000				
W2:	0.000 0	0.000 0	0.000 0	999 %	0.000				
Status Flags	State			Phases					
Any Element: Percent Differential: Instantaneous Diff.:									
RESET Device									
Events	Trend	Help	Metering	Flags	IO	Demand	Harmonics	Power	Setpoints
Setup	Wave	Exit							

The Multilin SR745 Metering Values screen shows:

- Current
- Sequence Current

- Status Flags

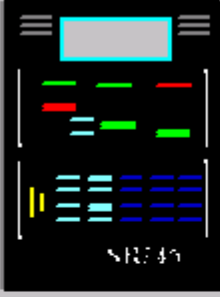
The **RESET Device** button will issue a RESET command to the device.

Flags Tab

		Multilin SR745 Element Flags	
		State	Phases
Device Name: ML745 Group Name: \$SYSTEM Device Type: ML745 Hardware Rev: D Software Rev: 2.50 Boot Rev: 1.20 Version: 0 Manuf. Date: 08/31/2000		Any W1 O/C Flag: Any W2 O/C Flag: Any W3 O/C Flag: Underfrequency 1: Underfrequency 2: Freq Decay Rate 1: Freq Decay Rate 2: Freq Decay Rate 3: Freq Decay Rate 4: Overfrequency: 5th Harmonic Level: Volts/Hz 1: Volts/Hz 2: Winding 1 THD Level: Winding 2 THD Level: Winding 3 THD Level: W1 Harmonic Derating: W2 Harmonic Derating: W3 Harmonic Derating: Hottest-Spot Temp Limit: Loss-of-Life Limit: Transformer Overload: <input type="button" value="Prev"/> <input type="button" value="Next"/>	
<input type="button" value="Events"/>	<input type="button" value="Trend"/>	<input type="button" value="Help"/>	
<input type="button" value="Setup"/>	<input type="button" value="Wave"/>	<input type="button" value="Exit"/>	
		<input type="button" value="Metering"/>	<input type="button" value="Flags"/>
		<input type="button" value="IO"/>	<input type="button" value="Demand"/>
		<input type="button" value="Harmonics"/>	<input type="button" value="Power"/>
		<input type="button" value="Setpoints"/>	

The Multilin SR745 Element Flags screen shows the state and phases of various elements.

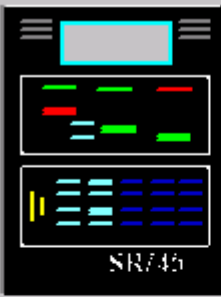
IO Tab

Multilin SR745 Inputs & Outputs																																
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; vertical-align: top;"> Logic Inputs <input type="checkbox"/> Logic Input 1 <input type="checkbox"/> Logic Input 2 <input type="checkbox"/> Logic Input 3 <input type="checkbox"/> Logic Input 4 <input type="checkbox"/> Logic Input 5 <input type="checkbox"/> Logic Input 6 <input type="checkbox"/> Logic Input 7 <input type="checkbox"/> Logic Input 8 <input type="checkbox"/> Logic Input 9 <input type="checkbox"/> Logic Input 10 <input type="checkbox"/> Logic Input 11 <input type="checkbox"/> Logic Input 12 <input type="checkbox"/> Logic Input 13 <input type="checkbox"/> Logic Input 14 <input type="checkbox"/> Logic Input 15 <input type="checkbox"/> Logic Input 16 </td> <td style="width: 33%; vertical-align: top;"> Virtual Inputs <input type="checkbox"/> Virtual Input 1 <input type="checkbox"/> Virtual Input 2 <input type="checkbox"/> Virtual Input 3 <input type="checkbox"/> Virtual Input 4 <input type="checkbox"/> Virtual Input 5 <input type="checkbox"/> Virtual Input 6 <input type="checkbox"/> Virtual Input 7 <input type="checkbox"/> Virtual Input 8 <input type="checkbox"/> Virtual Input 9 <input type="checkbox"/> Virtual Input 10 <input type="checkbox"/> Virtual Input 11 <input type="checkbox"/> Virtual Input 12 <input type="checkbox"/> Virtual Input 13 <input type="checkbox"/> Virtual Input 14 <input type="checkbox"/> Virtual Input 15 <input type="checkbox"/> Virtual Input 16 </td> <td style="width: 33%; vertical-align: top;"> Output Relays Solid State Trip <input type="checkbox"/> Trip 1 <input type="checkbox"/> Trip 2 <input type="checkbox"/> Volts/Hertz Trip <input type="checkbox"/> Overflux Alarm <input type="checkbox"/> Frequency Trip 1 <input type="checkbox"/> Frequency Trip 2 <input type="checkbox"/> Frequency Trip 3 <input type="checkbox"/> Self-Test Relay <input checked="" type="checkbox"/> </td> </tr> <tr> <td style="vertical-align: top;"> Device Name: ML745 Group Name: \$SYSTEM Device Type: ML745 Hardware Rev: D Software Rev: 2.50 Boot Rev: 1.20 Version: 0 Manuf. Date: 08/31/2000 </td> <td style="vertical-align: top;"> Virtual Outputs Virtual Output 1: <input type="checkbox"/> Virtual Output 2: <input type="checkbox"/> Virtual Output 3: <input type="checkbox"/> Virtual Output 4: <input type="checkbox"/> Virtual Output 5: <input type="checkbox"/> </td> </tr> <tr> <td colspan="2" style="text-align: center;"> Legend: <input checked="" type="checkbox"/> Asserted <input checked="" type="checkbox"/> Energized <input type="checkbox"/> Not Asserted <input type="checkbox"/> Not Energized </td> </tr> <tr> <td colspan="2" style="text-align: right;"> Analog Input μA ANALOG INPUT 0 </td> </tr> <tr> <td colspan="2" style="text-align: center;"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Events</td> <td style="padding: 2px;">Trend</td> <td style="padding: 2px;">Help</td> <td style="padding: 2px;">Metering</td> <td style="padding: 2px;">Flags</td> <td style="padding: 2px;">IO</td> <td style="padding: 2px;">Demand</td> <td style="padding: 2px;">Harmonics</td> <td style="padding: 2px;">Power</td> <td style="padding: 2px;">Setpoints</td> </tr> <tr> <td style="padding: 2px;">Setup</td> <td style="padding: 2px;">Wave</td> <td style="padding: 2px;">Exit</td> <td colspan="7"></td> </tr> </table> </td> </tr> </table>	Logic Inputs <input type="checkbox"/> Logic Input 1 <input type="checkbox"/> Logic Input 2 <input type="checkbox"/> Logic Input 3 <input type="checkbox"/> Logic Input 4 <input type="checkbox"/> Logic Input 5 <input type="checkbox"/> Logic Input 6 <input type="checkbox"/> Logic Input 7 <input type="checkbox"/> Logic Input 8 <input type="checkbox"/> Logic Input 9 <input type="checkbox"/> Logic Input 10 <input type="checkbox"/> Logic Input 11 <input type="checkbox"/> Logic Input 12 <input type="checkbox"/> Logic Input 13 <input type="checkbox"/> Logic Input 14 <input type="checkbox"/> Logic Input 15 <input type="checkbox"/> Logic Input 16	Virtual Inputs <input type="checkbox"/> Virtual Input 1 <input type="checkbox"/> Virtual Input 2 <input type="checkbox"/> Virtual Input 3 <input type="checkbox"/> Virtual Input 4 <input type="checkbox"/> Virtual Input 5 <input type="checkbox"/> Virtual Input 6 <input type="checkbox"/> Virtual Input 7 <input type="checkbox"/> Virtual Input 8 <input type="checkbox"/> Virtual Input 9 <input type="checkbox"/> Virtual Input 10 <input type="checkbox"/> Virtual Input 11 <input type="checkbox"/> Virtual Input 12 <input type="checkbox"/> Virtual Input 13 <input type="checkbox"/> Virtual Input 14 <input type="checkbox"/> Virtual Input 15 <input type="checkbox"/> Virtual Input 16	Output Relays Solid State Trip <input type="checkbox"/> Trip 1 <input type="checkbox"/> Trip 2 <input type="checkbox"/> Volts/Hertz Trip <input type="checkbox"/> Overflux Alarm <input type="checkbox"/> Frequency Trip 1 <input type="checkbox"/> Frequency Trip 2 <input type="checkbox"/> Frequency Trip 3 <input type="checkbox"/> Self-Test Relay <input checked="" type="checkbox"/>	Device Name: ML745 Group Name: \$SYSTEM Device Type: ML745 Hardware Rev: D Software Rev: 2.50 Boot Rev: 1.20 Version: 0 Manuf. 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Legend: <input checked="" type="checkbox"/> Asserted <input checked="" type="checkbox"/> Energized <input type="checkbox"/> Not Asserted <input type="checkbox"/> Not Energized																																
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Events</td> <td style="padding: 2px;">Trend</td> <td style="padding: 2px;">Help</td> <td style="padding: 2px;">Metering</td> <td style="padding: 2px;">Flags</td> <td style="padding: 2px;">IO</td> <td style="padding: 2px;">Demand</td> <td style="padding: 2px;">Harmonics</td> <td style="padding: 2px;">Power</td> <td style="padding: 2px;">Setpoints</td> </tr> <tr> <td style="padding: 2px;">Setup</td> <td style="padding: 2px;">Wave</td> <td style="padding: 2px;">Exit</td> <td colspan="7"></td> </tr> </table>		Events	Trend	Help	Metering	Flags	IO	Demand	Harmonics	Power	Setpoints	Setup	Wave	Exit																		
Events	Trend	Help	Metering	Flags	IO	Demand	Harmonics	Power	Setpoints																							
Setup	Wave	Exit																														

The Multilin SR745 Inputs & Outputs screen shows:

- Logic Inputs
- Virtual Inputs
- Output Relays
- Virtual Outputs
- Analog Input

Demand Tab



Device Name: ML745
 Group Name: \$SYSTEM
 Device Type: ML745

 Hardware Rev: D
 Software Rev: 2.50
 Boot Rev: 1.20
 Version: 0
 Manuf. Date: 08/31/2000

Multilin SR745 Demand Data

Configuration

Current Demand Meter Type: Thermal
 Thermal 90% Response Time (min.): 15

Present Values	A	B	C
Winding 1 (Amps):	0.000	0.000	0.000
Winding 2 (Amps):	0.000	0.000	0.000

Maximums	Phase	Amps	Date	Time
Winding 1:	A	0.000	12/07/2001	08:51:222.251
Winding 2:	A	0.000	12/07/2001	08:51:222.251

Clear Max Demand Data Demand Last Reset: 12/07/2001 08:51:222.251

Events	Trend	Help
Setup	Wave	Exit

Metering	Flags	IO	Demand	Harmonics	Power	Setpoints
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The Multilin SR745 Demand Data screen shows:

- Configuration
- Present Values
- Maximums

The **Clear Max Demand Data** button will clear all maximum values of the demand data.

Harmonic Tab

Multilin SR745 Harmonic & Misc. Data			
Harmonic Data	Winding 1	Winding 2	
Phase A THD %:	0.0	0.0	
Phase B THD %:	0.0	0.0	
Phase C THD %:	0.0	0.0	
THD Minimum Harmonic Number	0		
THD Maximum Harmonic Number	19 th		
Misc.			
System Voltage (kV):	0.00	Frequency (Hz):	0.00
Volts per Hertz:	0.00	Freq. Decay Rate (Hz/s):	0.00
Ambient Temp. (°C):	N/A	Hottest Spot Winding (°C):	0
Tap Changer Position:	0	Total Loss of Life (%):	0.0
Reset Loss of Life			

Device Name:	ML745	System Voltage (kV):	0.00	Frequency (Hz):	0.00
Group Name:	\$SYSTEM	Volts per Hertz:	0.00	Freq. Decay Rate (Hz/s):	0.00
Device Type:	ML745	Ambient Temp. (°C):	N/A	Hottest Spot Winding (°C):	0
Hardware Rev:	D	Tap Changer Position:	0	Total Loss of Life (%):	0.0
Software Rev:	2.50	Reset Loss of Life			
Boot Rev:	1.20				
Version:	0				
Manuf. Date:	08/31/2000				


Events	Trend	Help	Metering	Flags	IO	Demand	Harmonics	Power	Setpoints
Setup	Wave	Exit							

The Multilin SR745 Harmonic & Misc Data screen shows:

- Harmonic Data
- Misc


The **Reset Loss of Life** button will clear loss-of-life data from the SR745's memory.

Setpoints Tab

 SR745		Multilin SR745 System Setpoints							
			W1	W2					
Device Name: ML745		Nominal Phase to Phase Voltage (kV):	100.0	100.0					
Group Name: \$SYSTEM		Rated Load (MVA):	0.1	0.1					
Device Type: ML745		Series 3 Phase Resistance (Ohms):	10.700	2.100					
Hardware Rev: D		Transformer Type: Y/d30°	Analog Outputs Analog Output 1: W1 aA Current Analog Output 2: W1 aB Current Analog Output 3: W1 aC Current Analog Output 4: W1 Loading Analog Output 5: Voltage Analog Output 6: Frequency Analog Output 7: Tap Position						
Software Rev: 2.50		Phase Sequence: ABC							
Boot Rev: 1.20		Nominal Frequency (Hz): 60							
Version: 0		Voltage Sensing: Enabled							
Manuf. Date: 08/31/2000		Nominal VT Secondary Volts: 100.0							
		VT Ratio: 1:1							
		Winding with Tap Changer: None							
		# of Tap Positions: 33							
		Active Setpoints Group: 1							
Events	Trend	Help	Metering	Flags	IO	Demand	Harmonics	Power	Setpoints
Setup	Wave	Exit							

The Multilin SR745 System Setpoints screen shows information such as Nominal Phase to Phase Voltage, Rated Load (MVA), Transformer Type and Analog Outputs.

Power Tab

Multilin SR745 Power & Energy			
	Power		Winding 1
	Real (MW)		0.000
	Reactive (MVar)		0.000
	Apparent (MVA)		0.000
	Power Factor		0.00
			Winding 2
	Source Watthours (MVh)		0.000
	Load Watthours (MVh)		0.000
	Source Varhours (Mvarh)		0.000
	Load Varhours (Mvarh)		0.000
Aging Factor		Tap Changer	
Device Name:	ML745	Aging Factor:	0.0
Group Name:	\$SYSTEM	Limit Pickup:	2.0
Device Type:	ML745	Limit Function:	Disabled
Hardware Rev:	D	Limit Target:	Self-Reset
Software Rev:	2.50	Limit Delay:	10 Min.
Boot Rev:	1.20	Limit Block:	Disabled
Version:	0	Fail Function:	Disabled
Manuf. Date:	08/31/2000	Fail Target:	Self-Reset
		Fail Delay:	500 Sec.
		Fail Block:	Disabled
Events	Trend	Help	Metering
Setup	Wave	Exit	Flags
			IO
			Demand
			Harmonics
			Power
			Setpoints

The Multilin SR745 Power & Energy screen shows:

- Power
- Energy
- Aging Factor
- Tap Changer

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:

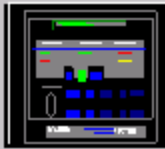
Tab	Button	Function
Metering	Clear Energy	Resets the energy counters to zero.
	Reset Device	Issues a RESET command to the SR750/760.
Demand	Reset Max Demand	Clears the Max Demand data from the SR750/SR760's memory.
Trip	Reset Trip Counters	Resets the SR750/760's trip counters to zero.
I/O	Open Breaker	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 32. 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.

Metering Tab


	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center; background-color: #f2f2f2;">Metering Values</th> </tr> </thead> <tbody> <tr> <td style="width: 25%;">Current</td> <td style="width: 25%;">(Amps)</td> <td style="width: 25%;">(Degrees)</td> <td style="width: 25%;"></td> </tr> <tr> <td>Phase A:</td> <td>0</td> <td>0 Lag</td> <td></td> </tr> <tr> <td>Phase B:</td> <td>0</td> <td>0 Lag</td> <td></td> </tr> <tr> <td>Phase C:</td> <td>0</td> <td>0 Lag</td> <td></td> </tr> <tr> <td>Average:</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>Neutral:</td> <td>0</td> <td>0 Lag</td> <td></td> </tr> <tr> <td>Ground:</td> <td>0</td> <td>0 Lag</td> <td></td> </tr> <tr> <td>Sen. Gnd:</td> <td>0.00</td> <td>0 Lag</td> <td></td> </tr> <tr> <td>Pos. Seq:</td> <td>0</td> <td>0 Lag</td> <td></td> </tr> <tr> <td>Neg. Seq:</td> <td>0</td> <td>0 Lag</td> <td></td> </tr> <tr> <td>Zero Seq:</td> <td>0</td> <td>0 Lag</td> <td></td> </tr> <tr> <td>Percent of Load-to-Trip:</td> <td colspan="3">414 %</td> </tr> <tr> <td colspan="4">Energy</td> </tr> <tr> <td>Positive (kWh):</td> <td colspan="3">0</td> </tr> <tr> <td>Pos. MWh Cost (\$):</td> <td colspan="3">0</td> </tr> <tr> <td>Negative (kWh):</td> <td colspan="3">0</td> </tr> <tr> <td>Neg. MWh Cost (\$):</td> <td colspan="3">0</td> </tr> <tr> <td>Positive (Kvarh):</td> <td colspan="3">0</td> </tr> <tr> <td>Negative (Kvarh):</td> <td colspan="3">0</td> </tr> <tr> <td>Last Energy Reset:</td> <td colspan="3">11/22/2001</td> </tr> <tr> <td colspan="2">Voltage</td> <td>(kVolts)</td> <td>(Degrees)</td> </tr> <tr> <td>Phase An:</td> <td>0.02</td> <td>0</td> <td>Lag</td> </tr> <tr> <td>Phase Bn:</td> <td>0.02</td> <td>120</td> <td>Lag</td> </tr> <tr> <td>Phase Cn:</td> <td>0.01</td> <td>240</td> <td>Lag</td> </tr> <tr> <td>Line AB:</td> <td>0.03</td> <td>330</td> <td>Lag</td> </tr> <tr> <td>Line BC:</td> <td>0.03</td> <td>90</td> <td>Lag</td> </tr> <tr> <td>Line CA:</td> <td>0.03</td> <td>210</td> <td>Lag</td> </tr> <tr> <td>Neutral:</td> <td>0.00</td> <td>0</td> <td>Lag</td> </tr> <tr> <td>Synchronizing:</td> <td>0.00</td> <td>0</td> <td>Lag</td> </tr> <tr> <td>Synchro. Delta:</td> <td>0.01</td> <td>120</td> <td></td> </tr> <tr> <td>Positive Sequence:</td> <td>0.01</td> <td>1</td> <td>Lag</td> </tr> <tr> <td>Negative Sequence:</td> <td>0.00</td> <td>0</td> <td>Lag</td> </tr> <tr> <td>Zero Sequence:</td> <td>0.00</td> <td>0</td> <td>Lag</td> </tr> <tr> <td>Avg. Phase (kV):</td> <td>0.01</td> <td>Average Line (kV):</td> <td>0.03</td> </tr> <tr> <td>Sync. Freq. (Hz):</td> <td>0.00</td> <td>Sync. Freq. Diff. (Hz):</td> <td>60.00</td> </tr> <tr> <td colspan="2">Power</td> <td>(kW)</td> <td>(kvar)</td> </tr> <tr> <td>3 Phase:</td> <td>0</td> <td>0</td> <td>0 1.00 Lag</td> </tr> <tr> <td>Phase A:</td> <td>0</td> <td>0</td> <td>0 1.00 Lag</td> </tr> <tr> <td>Phase B:</td> <td>0</td> <td>0</td> <td>0 1.00 Lag</td> </tr> <tr> <td>Phase C:</td> <td>0</td> <td>0</td> <td>0 1.00 Lag</td> </tr> <tr> <td colspan="2" style="text-align: center;"> <input type="button" value="Clear Energy Data"/> <input type="button" value="Reset Device"/> </td> <td colspan="2" style="text-align: right;">System Frequency (Hz): 60.00</td> </tr> </tbody> </table>	Metering Values				Current	(Amps)	(Degrees)		Phase A:	0	0 Lag		Phase B:	0	0 Lag		Phase C:	0	0 Lag		Average:	0			Neutral:	0	0 Lag		Ground:	0	0 Lag		Sen. Gnd:	0.00	0 Lag		Pos. Seq:	0	0 Lag		Neg. Seq:	0	0 Lag		Zero Seq:	0	0 Lag		Percent of Load-to-Trip:	414 %			Energy				Positive (kWh):	0			Pos. MWh Cost (\$):	0			Negative (kWh):	0			Neg. MWh Cost (\$):	0			Positive (Kvarh):	0			Negative (Kvarh):	0			Last Energy Reset:	11/22/2001			Voltage		(kVolts)	(Degrees)	Phase An:	0.02	0	Lag	Phase Bn:	0.02	120	Lag	Phase Cn:	0.01	240	Lag	Line AB:	0.03	330	Lag	Line BC:	0.03	90	Lag	Line CA:	0.03	210	Lag	Neutral:	0.00	0	Lag	Synchronizing:	0.00	0	Lag	Synchro. Delta:	0.01	120		Positive Sequence:	0.01	1	Lag	Negative Sequence:	0.00	0	Lag	Zero Sequence:	0.00	0	Lag	Avg. Phase (kV):	0.01	Average Line (kV):	0.03	Sync. Freq. (Hz):	0.00	Sync. Freq. Diff. (Hz):	60.00	Power		(kW)	(kvar)	3 Phase:	0	0	0 1.00 Lag	Phase A:	0	0	0 1.00 Lag	Phase B:	0	0	0 1.00 Lag	Phase C:	0	0	0 1.00 Lag	<input type="button" value="Clear Energy Data"/> <input type="button" value="Reset Device"/>		System Frequency (Hz): 60.00	
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The SR750/760 Metering screen shows:

- Current
- Energy
- Voltage
- Power

The **Clear Energy Data** button will clear all values of energy data. The **RESET Device** button will issue a RESET command to the device.

Status Tab



Status

Active Conditions

General	Transfer Not Ready
Alarm	Out Of Synchronization
Alarm	Trip Coil Failure
Alarm	Neg. Seq. Overvoltage
Alarm	Unknown: 0x203F

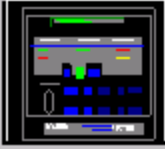
Device Name:	ML750
Group Name:	\$SYSTEM
Device Type:	SR750
Hardware Rev:	H
Software Rev:	4.01
Boot Program:	3.00
Mod File Number:	0
Manuf. Date:	09/21/2000

Events	Trend	Help
Setup	Wave	Exit

DEMAND	SETPOINTS	STATUS	TRIP
METERING	FAULT	IO	LOGIC

The SR750/760 Status screen shows Active Conditions.

Fault Tab



Fault & Maintenance Data

Device Name:	ML750
Group Name:	\$SYSTEM
Device Type:	SR750
Hardware Rev:	H
Software Rev:	4.01
Boot Program:	3.00
Mod File Number:	0
Manuf. Date:	09/21/2000

#	Date	Time	Distance (km)	Z-pos (Ω)	Type of Fault
0	11/22/2001	15:50:12.366	321.01	32.10	B to C
1	11/22/2001	15:49:48.917	321.01	32.10	B to C
2	11/22/2001	15:49:16.201	327.66	32.77	B to C
3	11/22/2001	15:48:53.851	298.01	29.80	B to C
4	11/22/2001	15:48:19.669	327.66	32.77	B to C
5	11/22/2001	15:47:16.320	327.66	32.77	B to C
6	11/22/2001	15:46:56.371	327.66	32.77	B to C
7	11/22/2001	15:46:35.122	285.74	28.57	B to C
8	11/22/2001	15:46:12.039	327.66	32.77	B to C
9	11/22/2001	15:45:45.655	307.82	30.78	B to C

Total Arcing Current (kA² cyc)

Phase A Total:	0		Last Arcing Current Reset: 11/22/2001
Phase B Total:	0		
Phase C Total:	0		

Events	Trend	Help
Setup	Wave	Exit

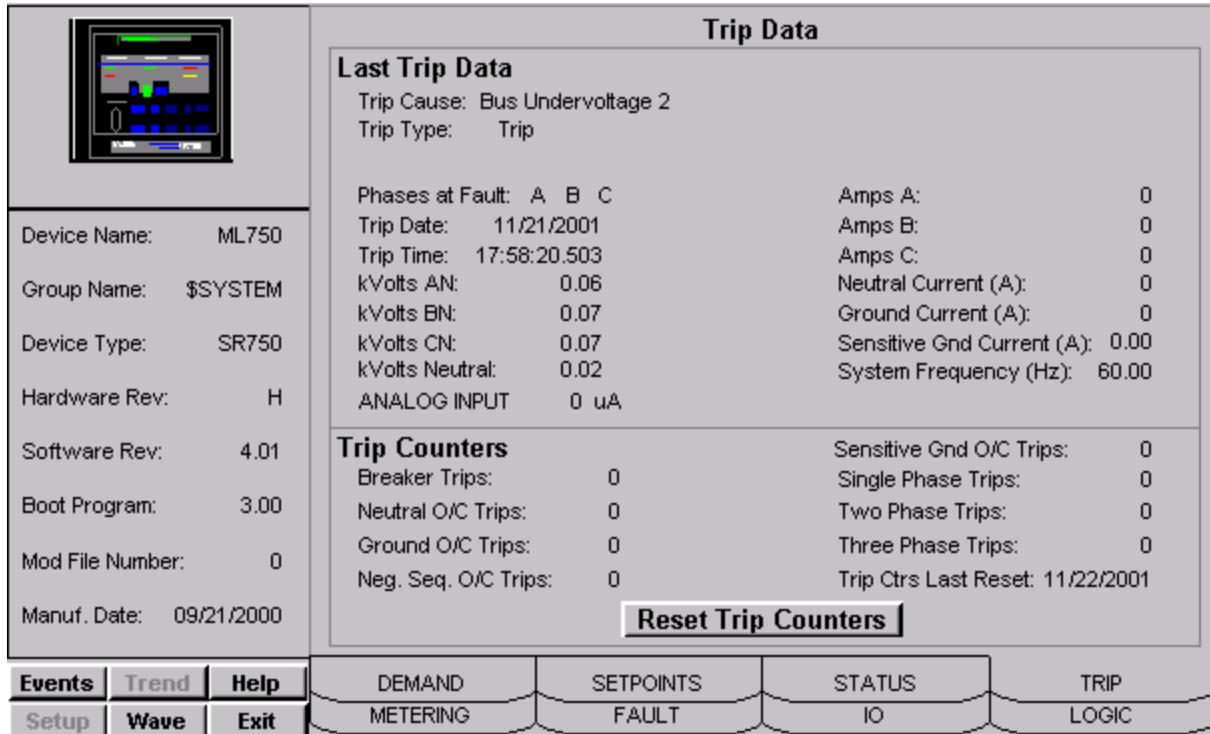
METERING	FAULT	IO	LOGIC
DEMAND	SETPOINTS	STATUS	TRIP

The SR750/760 Fault & Maintenance Data screen shows:

- Fault Locations
- Total Arcing Current

The **Reset Arcing Current** button will reset all values of the arcing current.

Trip Tab



The screenshot displays the 'Trip Data' screen for a device. It is divided into several sections:

- Device Information:**
 - Device Name: ML750
 - Group Name: \$SYSTEM
 - Device Type: SR750
 - Hardware Rev: H
 - Software Rev: 4.01
 - Boot Program: 3.00
 - Mod File Number: 0
 - Manuf. Date: 09/21/2000
- Last Trip Data:**
 - Trip Cause: Bus Undervoltage 2
 - Trip Type: Trip
 - Phases at Fault: A B C
 - Trip Date: 11/21/2001
 - Trip Time: 17:58:20.503
 - kVolts AN: 0.06
 - kVolts BN: 0.07
 - kVolts CN: 0.07
 - kVolts Neutral: 0.02
 - ANALOG INPUT: 0 uA
 - Amps A: 0
 - Amps B: 0
 - Amps C: 0
 - Neutral Current (A): 0
 - Ground Current (A): 0
 - Sensitive Gnd Current (A): 0.00
 - System Frequency (Hz): 60.00
- Trip Counters:**
 - Breaker Trips: 0
 - Neutral O/C Trips: 0
 - Ground O/C Trips: 0
 - Neg. Seq. O/C Trips: 0
 - Sensitive Gnd O/C Trips: 0
 - Single Phase Trips: 0
 - Two Phase Trips: 0
 - Three Phase Trips: 0
 - Trip Ctrs Last Reset: 11/22/2001

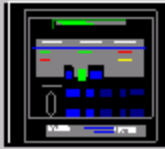
At the bottom of the screen, there is a navigation bar with the following tabs: **Events**, **Trend**, **Help**, **Setup**, **Wave**, **Exit**, **DEMAND**, **METERING**, **SETPOINTS**, **FAULT**, **STATUS**, **IO**, and **TRIP**, **LOGIC**. A **Reset Trip Counters** button is also visible within the Trip Counters section.

The SR750/760 Trip Data screen shows:

- Last Trip Data
- Trip Counters

The **Reset Trip Counters** button will reset all values of the trip counters.

Demand Tab



Demand

Configuration	Function	Meas. Type	Relays	Pickup Threshold	Time (min.)
Current:	Alarm	Thermal Exp	3, 4, 5, 6, 7	1000 Amps	15
Real Power:	Alarm	Block Interval	3, 4, 5, 6, 7	100.00 kW	20
Reactive Power:	Alarm	Block Interval	None	100.00 kvar	20
Apparent Power:	Control	Block Interval	3, 4, 5, 6, 7	100.00 kVA	20

Values	Present	Max	Date	Time
Phase A (Amps):	0	0	11/22/2001	13:15:54.021
Phase B (Amps):	0	0	11/22/2001	13:15:54.021
Phase C (Amps):	0	0	11/22/2001	13:15:54.021
Real Power (kW):	0.00	0.00	11/22/2001	13:15:54.021
React Power(kvar):	0.00	0.00	11/22/2001	13:15:54.021
Appar. Power(kVA):	0.00	0.00	11/22/2001	13:15:54.021

Reset Max Demand
Demand Last Reset: 11/22/2001

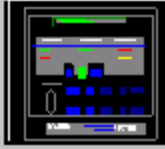
Events	Trend	Help	DEMAND	SETPOINTS	STATUS	TRIP
Setup	Wave	Exit	METERING	FAULT	IO	LOGIC

The SR750/760 Demand screen shows details of:

- Configuration
- Values

The **Reset Max Demand** button will reset all maximum values of demand.


Logic Tab

	Contact Inputs <input type="checkbox"/> Contact 1 <input type="checkbox"/> Contact 2 <input type="checkbox"/> Contact 3 <input type="checkbox"/> Contact 4 <input type="checkbox"/> Contact 5 <input type="checkbox"/> Contact 6 <input type="checkbox"/> Contact 7 <input type="checkbox"/> Contact 8 <input type="checkbox"/> Contact 9 <input type="checkbox"/> Contact 10 <input type="checkbox"/> Contact 11 <input type="checkbox"/> Contact 12 <input type="checkbox"/> Contact 13 <input type="checkbox"/> Contact 14	Virtual Inputs <input type="checkbox"/> Virtual Input 1 <input type="checkbox"/> Virtual Input 2 <input type="checkbox"/> Virtual Input 3 <input type="checkbox"/> Virtual Input 4 <input type="checkbox"/> Virtual Input 5 <input type="checkbox"/> Virtual Input 6 <input type="checkbox"/> Virtual Input 7 <input type="checkbox"/> Virtual Input 8 <input type="checkbox"/> Virtual Input 9 <input type="checkbox"/> Virtual Input 10 <input type="checkbox"/> Virtual Input 11 <input type="checkbox"/> Virtual Input 12 <input type="checkbox"/> Virtual Input 13 <input type="checkbox"/> Virtual Input 14 <input type="checkbox"/> Virtual Input 15 <input type="checkbox"/> Virtual Input 16 <input type="checkbox"/> Virtual Input 17 <input type="checkbox"/> Virtual Input 18 <input type="checkbox"/> Virtual Input 19 <input type="checkbox"/> Virtual Input 20	→	Logic Input States <input type="checkbox"/> Logic Input 1 <input type="checkbox"/> Logic Input 2 <input type="checkbox"/> Logic Input 3 <input type="checkbox"/> Logic Input 4 <input type="checkbox"/> Logic Input 5 <input type="checkbox"/> Logic Input 6 <input type="checkbox"/> Logic Input 7 <input type="checkbox"/> Logic Input 8 <input type="checkbox"/> Logic Input 9 <input type="checkbox"/> Logic Input 10 <input type="checkbox"/> Logic Input 11 <input type="checkbox"/> Logic Input 12 <input type="checkbox"/> Logic Input 13 <input type="checkbox"/> Logic Input 14 <input type="checkbox"/> Logic Input 15 <input type="checkbox"/> Logic Input 16 <input type="checkbox"/> Logic Input 17 <input type="checkbox"/> Logic Input 18 <input type="checkbox"/> Logic Input 19 <input type="checkbox"/> Logic Input 20														
Device Name: ML750 Group Name: \$SYSTEM Device Type: SR750 Hardware Rev: H Software Rev: 4.01 Boot Program: 3.00 Mod File Number: 0 Manuf. Date: 09/21/2000	Legend: <input type="checkbox"/> Open / Not Asserted <input style="background-color: green; width: 15px; height: 10px; display: inline-block; vertical-align: middle;"/> Closed / Asserted																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Events</td> <td style="padding: 2px;">Trend</td> <td style="padding: 2px;">Help</td> </tr> <tr> <td style="padding: 2px;">Setup</td> <td style="padding: 2px;">Wave</td> <td style="padding: 2px;">Exit</td> </tr> </table>	Events	Trend	Help	Setup	Wave	Exit	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">METERING</td> <td style="padding: 2px;">FAULT</td> <td style="padding: 2px;">IO</td> <td style="padding: 2px;">LOGIC</td> </tr> <tr> <td style="padding: 2px;">DEMAND</td> <td style="padding: 2px;">SETPOINTS</td> <td style="padding: 2px;">STATUS</td> <td style="padding: 2px;">TRIP</td> </tr> </table>	METERING	FAULT	IO	LOGIC	DEMAND	SETPOINTS	STATUS	TRIP			
Events	Trend	Help																
Setup	Wave	Exit																
METERING	FAULT	IO	LOGIC															
DEMAND	SETPOINTS	STATUS	TRIP															

The SR750/760 Logic screen shows:

- Contact Inputs
- Virtual Inputs
- Logic Input States

IO Tab

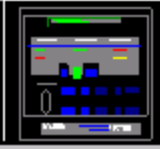
	Inputs & Outputs					
	Output Relays					
	<input type="checkbox"/> R1 TRIP	<input checked="" type="checkbox"/> R3 AUXILIARY	<input checked="" type="checkbox"/> R5 AUXILIARY	<input checked="" type="checkbox"/> R7 AUXILIARY		
	<input type="checkbox"/> R2 CLOSE	<input checked="" type="checkbox"/> R4 AUXILIARY	<input checked="" type="checkbox"/> R6 AUXILIARY	<input type="checkbox"/> R8 SERVICE		
	Analog Input		Hardware Input Coils			
	ANALOG INPUT	uA	0	Trip Coil Circuit: Open		
	A.I. Change Rate per minute:	0.0		Close Coil Circuit: Open		
	A.I. Change Rate per hour:	0.0				
Open Breaker						
Close Breaker						
Breaker Operation						
<input type="checkbox"/> Breaker Open						
<input type="checkbox"/> Breaker Closed						
<input type="checkbox"/> Local Mode						
Events	Trend	Help	METERING	FAULT	IO	LOGIC
Setup	Wave	Exit	DEMAND	SETPOINTS	STATUS	TRIP

The SR750/760 Inputs & Outputs screen shows:

- Output Relays
- Analog Input
- Hardware Input Coils
- Breaker Operation

The **Open Breaker** button will issue an Open Breaker command. The **Close Breaker** button will issue a Close Breaker command.

Setpoints Tab

	System Setpoints														
Device Name: ML750 Group Name: \$SYSTEM Device Type: SR750 Hardware Rev: H Software Rev: 4.01 Boot Program: 3.00 Mod File Number: 0 Manuf. Date: 09/21/2000	System Setup Phase CT Primary (Amps): 1 Ground CT Primary (Amps): 1 Sensitive Gnd. CT Primary (Amps): 1 VT Connection Type: Wye Nominal VT Secondary Volts: 120.00 Voltage Transformer Ratio: 1.0:1 Nominal Frequency (Hz): 60 Cost of Energy (cents/kWh): 5.0 Line VT Connection: Vbn Line Nominal VT Secondary Volts: 120.0 Line VT Ratio: 1.0:1 Phase Sequence: ABC Active Setpoints Group: 1	Analog Output Configuration A/O 1: Phase A Current A/O 2: Phase B Current A/O 3: Phase C Current A/O 4: Avg Phase Current A/O 5: % of Load Trip A/O 6: Neutral Current A/O 7: Phase A-N Voltage A/O 8: Phase A Current													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; font-weight: bold;">Events</td> <td style="width: 25%; font-weight: bold;">Trend</td> <td style="width: 25%; font-weight: bold;">Help</td> </tr> <tr> <td style="font-weight: bold;">Setup</td> <td style="font-weight: bold;">Wave</td> <td style="font-weight: bold;">Exit</td> </tr> </table>	Events	Trend	Help	Setup	Wave	Exit	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">DEMAND</td> <td style="width: 25%;">SETPOINTS</td> <td style="width: 25%;">STATUS</td> <td style="width: 25%;">TRIP</td> </tr> <tr> <td>METERING</td> <td>FAULT</td> <td>IO</td> <td>LOGIC</td> </tr> </table>	DEMAND	SETPOINTS	STATUS	TRIP	METERING	FAULT	IO	LOGIC
Events	Trend	Help													
Setup	Wave	Exit													
DEMAND	SETPOINTS	STATUS	TRIP												
METERING	FAULT	IO	LOGIC												

The SR750/760 System Setpoints screen shows:

- System Setup
- Analog Output Configuration

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.

MX200

The MX 200 device is an Automatic Transfer Switch. The 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. Clicking on the displayed value changes some, while clicking on the box changes others. 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 MX 200 Meter's Tabular Data Screen Wizards' tabs will be displayed and detailed.

Metering Tab

The screenshot displays the 'metering tab' interface for an MX200 device. It includes a small device display icon, a metadata section, a main data table, a legend, and navigation buttons.

metering tab			
Voltage (Volts)	Normal	Emergency	Communications
Ph1-Ph2	209	0	MX200 - Mod Card-
Ph2-Ph3	208	0	Communication Status
Ph3-Ph1	206	0	Comm. OK
Frequency (Hz)	59.9	0	Status
No of Phases	Three	Three	Q3 Input
Source	█	█	Auxiliary 2 Input
Position Status	█	█	Auxiliary 1 Input
Phase Rotation	█	█	Automatic Transfer Relay
Timer Function	P Timer		SN limit switch
Timer Active	Timer Running		SE limit switch
Timer Countdown Value	76		SNO limit switch
Time On Emergency	0		SEO limit switch
No. of Transfers	3		S5 Selector
Nominal FS Vol. Value	208		S12 Selector
ATS Not in Auto Mode	Not in Auto		Load Shed Input
Fault Present	YES		Q7 Input
Exerciser Enabled	Enabled		
Load Test Running	Running		
Load status	Running		
Legend	Source: Avail. █ Not Avail. █	Ph. Rotation: ON █ OFF █	
	Posi. Status: Normal █ Emergency █	Status: ON █ OFF █	

Navigation buttons: Events, Trend, Help, Setup, Wave, Exit. The interface is divided into 'METERING' and 'SETUP' sections.

The Metering tab displays the following metered values from the MX 200 device.

Voltages

Normal and Emergency Voltage values for all the phases.

Timer Functions

- Timer Active
- Timer Countdown Value
- Time on Emergency
- No. of Transfers
- Nominal FS Vol. Value
- ATS Mode
- Fault Present
- Exerciser Enabled
- Load Test Running
- Load, No Load, Fast Load Status

Communications

- MX-200 – Modcard – Communication Status

Displays communication status, for example, Comm OK

Status

- Q3 Input
- Auxiliary 2 Input
- Auxiliary 1 Input
- Automatic Transfer Relay
- SN Limit Switch
- SE Limit Switch
- SNO Limit Switch
- SEO Limit Switch
- S5 Selector
- S12 Selector
- Load Shed Input
- Q7 Input

The status is either ON or OFF. If the relay is ON, the status is displayed in green and if relay is OFF, it is displayed in red.

Others

The tab shows frequency and number of phases on source:

- Position Status
- Phase Rotation

The status for Source is displayed as Available (displayed in green) or Not Available (displayed in red). The Position Status is displayed as Normal (displayed in green) or Emergency (displayed in red). The Phase Rotation is displayed as ON (displayed in green) or OFF (displayed in red).

Setup Tab

SetupTab					
Control	Status	Option	Value	Voltage (Volts)	
YE	<input checked="" type="checkbox"/>	T3 Timer Bypass	Not Configured	Normal Pickup 216	
YN	<input checked="" type="checkbox"/>	T3 Timer	Configured	Normal Dropout 90	
No Load Test	<input type="checkbox"/>	W3 Timer Bypass	Not Configured	Emer. Pickup 100	
Load Test	<input checked="" type="checkbox"/>	W3 Timer	Configured	Emer. Dropout 123	
Fast Load Test	<input type="checkbox"/>	T Timer Bypass	Configured	Frequency (Hz)	
S5	<input type="checkbox"/>	W Timer Bypass	Configured	Normal Pickup 123	
S12	<input type="checkbox"/>	In Ph. Mon./Closed Trans.	Configured	Emer. Pickup 100	
LS	<input type="checkbox"/>	ATS Type	Std. ATS	Time (Seconds)	
Q7	<input checked="" type="checkbox"/>	S12 Auto/Manual	Not Configured	P Time 10	
Q3	<input type="checkbox"/>	S5 Auto/Manual Bypass	Not Configured	W Time 300	
AUX 2	<input type="checkbox"/>	Phase Sequence Check	Not Configured	W3 Time 12	
AUX 1	<input checked="" type="checkbox"/>	Emg Over Frequency	Not Configured	DW Time 600	
Legend		Emg Over Voltage	Configured	T Time 3600	
<input checked="" type="checkbox"/>	ON	Norm Over Frequency	Configured	T3 Time 60	
<input type="checkbox"/>	OFF	Norm Under Frequency	Configured	DT Time 600	
		Norm Over Voltage	Configured	U Time 3600	

Events Trend Help METERING SETUP
 Setup Wave Exit

The Setup tab displays the following demand values from MX 200 device.

Control

- YE
- YN
- No Load Test
- Load Test
- Fast Load Test

- S5
- S12
- LS
- Q7
- Q3
- Aux2
- Aux1

The legend is ON and OFF. If ON, it is indicated by amber and if OFF by gray color.

Options

- T3 Timer Bypass
- T3 Timer
- W3 Timer Bypass
- W3 Timer
- T Timer Bypass
- W Timer Bypass
- In Ph. Mon/Closed Trans
- ATS Type
- S12 Auto/Manual
- S5 Auto/Manual Bypass
- Phase Sequence Check
- Emg Over Frequency
- Emg Over Voltage
- Normal Over Frequency
- Normal Under Frequency
- Normal Over Voltage

The value against each option is displayed as either as Confirmed or Not Confirmed.

Voltage (Volts)

- Normal Pickup
- Normal Dropout
- Emer Pickup
- Emer Dropout

The user can enter values against each parameter.

Frequency (Hz)

- Normal Pickup
- Emer Pickup

The user can enter values against each parameter.

Time (Seconds)

- P Time
- W Time
- W3 Time
- DW Time
- T Time
- T3 Time
- DT Time
- U Time

The Setup 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

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 MX 200, as the latest settings may not be displayed.

MX250/MX150

The MX 250/MX150 devices are Automatic Transfer Switches. The 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. Clicking on the displayed value changes some, while clicking on the box changes others. 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 MX 250/MX150 Meter's Tabular Data Screen Wizards' tabs will be displayed and detailed.

Metering Tab

		Metering Tab									
		Voltage (Volts)	Normal	Emergency	Communications						
	Ph1-Ph2	114	0	MX200 - Mod Card- Communication Status	Comm. OK						
	Ph2-Ph3	0	0	Status							
	Ph3-Ph1	0	0								
	Frequency (Hz)	60	0	Q3 Input	<input checked="" type="checkbox"/>						
	No of Phases	Single	Single	TMS Control	<input checked="" type="checkbox"/>						
	Source	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	SN limit switch	<input checked="" type="checkbox"/>						
	Position Status	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	SE limit switch	<input checked="" type="checkbox"/>						
	Phase Rotation	CW	CW	SNO limit switch	<input checked="" type="checkbox"/>						
	Timer Function	Not Invoked		SEO limit switch	<input checked="" type="checkbox"/>						
	Timer Active	Timer Stopped		S5 Selector	<input checked="" type="checkbox"/>						
Timer Countdown Value (P, DW, DT, U)	0		S12 Selector	<input checked="" type="checkbox"/>							
TW Timer Countdown Value	0		Load Shed Input	<input checked="" type="checkbox"/>							
T3/W3 Timer Countdown Value	0		Q7 Input	<input checked="" type="checkbox"/>							
No. of Transfers	9		Load Test Running	Stopped							
Nominal FS Vol. Value	120		Load status	Stopped							
ATS Mode	Not in Auto										
Fault Present	NO										
Exerciser Enabled	Enabled										
Legend	Source: Avail. <input checked="" type="checkbox"/> Not Avail. <input checked="" type="checkbox"/>	Status: ON <input checked="" type="checkbox"/> OFF <input checked="" type="checkbox"/>									
	Posi. Status: Normal <input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/>										
<table border="1"> <tr> <td>Events</td> <td>Trend</td> <td>Help</td> </tr> <tr> <td>Setup</td> <td>Wave</td> <td>Exit</td> </tr> </table>		Events	Trend	Help	Setup	Wave	Exit	METERING		SETUP	
Events	Trend	Help									
Setup	Wave	Exit									

The Metering tab displays the following metered values from the MX 250 device.

Voltages

Normal and Emergency Voltage values for all the phases.

Timer Functions

- Timer Active
- Timer Countdown Value of P Timer, DW Timer, DT Timer and U Timer
- T/W Timer Countdown Value
- T3/W3 Timer Countdown Value
- No. of Transfers
- Nominal FS Vol. Value
- ATS Mode
- Fault Present
- Exerciser Enabled
- Load Test Running
- Load, No Load, Fast Load Status

Communications

- MX250/MX150 – Modcard – Communication Status
- Displays communication status, for example, Comm OK

Status

- Q3 Input
- TMS Control
- SN Limit Switch
- SE Limit Switch
- SNO Limit Switch
- SEO Limit Switch
- S5 Selector
- S12 Selector
- Load Shed Input
- Q7 Input

The status is either ON or OFF. If the relay is ON, the status is displayed in green and if relay is OFF, it is displayed in red.

Others


The tab shows frequency and number of phases on source:

- Position Status

- Phase Rotation

The status for Source is displayed as Available (displayed in green) or Not Available (displayed in red). The Position Status is displayed as Normal (displayed in green) or Emergency (displayed in red). The Phase Rotation is displayed as ON (displayed in green) or OFF (displayed in red).

Setup Tab

	SetupTab			
	Control	Status	Option	Value
Device Name: MX250	<input checked="" type="checkbox"/>	In Ph. Mon./Closed Trans.	Configured	Normal Pickup <input type="text" value="90"/>
Group Name: \$SYSTEM	<input checked="" type="checkbox"/>	ATS Type	Std. ATS	Normal Dropout <input type="text" value="80"/>
Serial Number: 1400000	<input checked="" type="checkbox"/>	S12 Auto/Manual	Not Configured	Emer. Pickup <input type="text" value="90"/>
	<input checked="" type="checkbox"/>	S5 Auto/Manual Bypass	Configured	Emer. Dropout <input type="text" value="80"/>
	<input type="checkbox"/>	Phase Sequence Check	Not Configured	Under Frequency (Hz)
	<input type="checkbox"/>	Emg Over Frequency	Not Configured	Normal Pickup <input type="text" value="0"/>
	<input type="checkbox"/>	Emg Over Voltage	Not Configured	Emer. Pickup <input type="text" value="95"/>
	<input type="checkbox"/>	Norm Over Frequency	Not Configured	Time (Seconds)
	<input type="checkbox"/>	Norm Under Frequency	Not Configured	P Time <input type="text" value="0"/>
	<input type="checkbox"/>	Norm Over Voltage	Not Configured	W Time <input type="text" value="3"/>
	<input type="checkbox"/>			W3 Time <input type="text" value="10"/>
	<input type="checkbox"/>			DW Time <input type="text" value="0"/>
	<input type="checkbox"/>			T Time <input type="text" value="3600"/>
	<input type="checkbox"/>			T3 Time <input type="text" value="10"/>
	<input type="checkbox"/>			DT Time <input type="text" value="0"/>
	<input type="checkbox"/>			U Time <input type="text" value="200"/>
	Legend			
	<input checked="" type="checkbox"/>	ON		
	<input type="checkbox"/>	OFF		
Events	Trend	Help	METERING	
Setup	Wave	Exit	SETUP	

The Setup tab displays the following demand values from MX 250 device.

Control

- YE
- YN
- No Load Test
- Load Test
- Fast Load Test
- S5
- S12

- LS
- Q7
- Q3
- TMS Control

The legend is ON and OFF. If ON, it is indicated by amber and if OFF by gray color.

Options

- Closed Transition
- In Phase Monitor
- ATS Type
- S12 Auto/Manual
- S5 Auto/Manual Bypass
- Phase Sequence Check
- Emg Over Frequency
- Emg Over Voltage
- Normal Over Frequency
- Normal Under Frequency
- Normal Over Voltage

The value against each option is displayed as either as Configured or Not Configured.

Voltage (Volts)

- Normal Pickup
- Normal Dropout
- Emer Pickup
- Emer Dropout

The user can enter values against each parameter.

Frequency (Hz)

- Normal Pickup
- Emer Pickup

The user can enter values against each parameter.

Time (Seconds)

- P Time
- W Time

- W3 / T3 Time
- DW Time
- T Time
- DT Time
- U Time

The Setup 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

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 MX 250, as the latest settings may not be displayed.

GEN PLC

The Generator Programmable Logic Controller (PLC) is a specially programmed PLC with specific number of I/O modules, controlled by a Master PLC program up to maximum number of 16 Generators.

GEN PLC Tabular wizard mainly have 3 tabs as described below.

Master Tab

Master PLC							
Gen.	Run / Stop	Alarm	Shutdown	Runtime (hrs)	Lead Value	Parameters	
1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0	3	Cool Down Time	32768 Sec
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1	Engine Crank Time	5 Sec
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	3	No. Of Cranks	5
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1		
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1		
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1		
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1		
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1		
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1		
10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1		
11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	3		
12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1		
13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1		
14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1		
15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1		
16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1		
						Legend :	
						<input type="checkbox"/>	Generator Stopped
						<input checked="" type="checkbox"/>	Generator Running
						<input checked="" type="checkbox"/>	Alarm
						<input checked="" type="checkbox"/>	Shutdown

Events Trend Help
MASTER
GENERATOR
PSG

Setup Wave Exit

The Master PLC lists 16 generators displaying status for each generator separately. The status types are:

- Run/Stop
- Alarm
- Shutdown
- Runtime (in hours)
- Lead Value

If a particular generator is stopped, it is displayed in gray color; if a generator is running, in green; if there is an alarm, in amber; and shutdown of a generator in red.

The parameters of generators are:

- Engine Crank Time (In seconds)
- No. of Cranks
- Cool Down Time (In seconds)

Generator Tab

The screenshot shows the 'Generator Tab' interface. On the left, there is a 'GEN' status indicator with a green bar and a 'GP' device name. Below it, the 'Group Name' is '\$SYSTEM' and the 'No. of Generators' is '2'. The main area is titled '# 1 - Generator Parameters' and is divided into three columns: 'Status', 'Alarm', and 'Shutdown'. Each column contains a list of parameters with corresponding checkboxes. A 'Generators' section at the bottom features buttons for G1 through G16. A 'Legend' section below the generators shows color-coded boxes for Status Stop (green), Not in Auto (red), Alarm (orange), and Shutdown (red). At the bottom, there are buttons for 'Events', 'Trend', 'Help', 'Setup', 'Wave', and 'Exit', along with labels for 'MASTER', 'GENERATOR', and 'PSG'.

# 1 - Generator Parameters		
Status	Alarm	Shutdown
Gen. Brkr. Aux. Contact <input type="checkbox"/>	Undervoltage <input type="checkbox"/>	Overcrank <input type="checkbox"/>
Breaker Close Ready <input type="checkbox"/>	Hi Water Temp. Warn. <input type="checkbox"/>	Overspeed <input type="checkbox"/>
Not in Auto <input type="checkbox"/>	Battery Charger Failure <input type="checkbox"/>	High Water Temp. <input type="checkbox"/>
CPU Running <input type="checkbox"/>	Low Fuel Day Tank <input type="checkbox"/>	Oil Pressure <input type="checkbox"/>
Engine in Cooldown <input type="checkbox"/>	Oil Pressure Warning <input type="checkbox"/>	Overvoltage <input type="checkbox"/>
Engine Run Contact <input type="checkbox"/>	Low Water Temp. <input type="checkbox"/>	Reverse Power <input type="checkbox"/>
	Low Water Level <input type="checkbox"/>	Breaker Locked Out <input type="checkbox"/>
	Day Tank Critically - Low Fuel Level <input type="checkbox"/>	Fail to Synchronize <input type="checkbox"/>
	Day Tank Hi Fuel Level <input type="checkbox"/>	Gen. Failure <input type="checkbox"/>
	Day Tank Fuel Leak <input type="checkbox"/>	Emergency Stop <input type="checkbox"/>
	Summary Alarm <input type="checkbox"/>	EMCP Diagnostic Failure <input type="checkbox"/>
		Gen. Set Breaker <input type="checkbox"/>
		Air Damper Switch <input type="checkbox"/>
		Lock Out 489 Relay <input type="checkbox"/>
		Fail Safe 489 Relay <input type="checkbox"/>

Generators

G1 G2 G3 G4 G5 G6 G7 G8
G9 G10 G11 G12 G13 G14 G15 G16

Legend : ■ Status Stop ■ Not in Auto ■ Alarm ■ Shutdown

Events Trend Help
Setup Wave Exit

MASTER GENERATOR PSG

This tab displays generator parameters for 16 generators represented as G1 to G16 (buttons). When a button is clicked, the parameters of that generator are displayed on the screen. The parameters are:

Status

- Gen Brkr Aux Contact
- Breaker Close Ready
- Not in Auto
- CPU Running
- Engine in Cooldown
- Engine Run Contact

If a generator is running, the status is displayed in gray and if it is Status Stop, it is displayed as green. The status Not In Auto is displayed in red.

Alarm

- Undervoltage
- Hi Water Temp Warn
- Battery Charger Failure
- Low Fuel Day Tank
- Oil Pressure Warning
- Low Water Temp
- Low Water Level
- Day Tank Critically – Low Fuel Level
- Day Tank Hi Fuel Level
- Day Tank Fuel Leak

- Summary Alarm


Any alarm in generator's status is displayed in amber. Otherwise the status is displayed in gray.

Shutdown

- Overcrank
- Overspeed
- High Water Temp
- Oil Pressure
- Overvoltage
- Reverse Power
- Breaker Locked Out
- Fail to Synchronize
- General Failure
- Emergency Stop
- EMCP Diagnostic Failure
- Gen Set Breaker
- Air Damper Switch
- Lock Out 489 Relay
- Fail Safe 489 Relay

Note: Any kind of shutdown is displayed in red.

PSG

		Paralleling Switch Gear Status		
	Latched Under Frequency	<input type="checkbox"/>	System Not in Auto	<input type="checkbox"/>
	Latched Over Frequency	<input type="checkbox"/>	System Under Test	<input type="checkbox"/>
	Communication Failure	<input type="checkbox"/>	Remote Start Signal Received	<input type="checkbox"/>
	Main Tank Low Fuel Level	<input type="checkbox"/>	System in Load Demand Mode	<input type="checkbox"/>
	Main Tank Critical Low Fuel Level	<input type="checkbox"/>	System Test with Load Bank	<input type="checkbox"/>
	Main Tank High Fuel Level	<input type="checkbox"/>	Remote Peak Shave Signal Received	<input type="checkbox"/>
	Main Tank Fuel Leaked	<input type="checkbox"/>	Load Add Priority	<input type="checkbox"/>
	Load Bank Breaker Bell Alarm	<input type="checkbox"/>	Load Add Priority 3	<input type="checkbox"/>
			Load Add Priority 4	<input type="checkbox"/>
			Load Shed Priority 2	<input type="checkbox"/>
		Load Shed Priority 3	<input type="checkbox"/>	
		Load Shed Priority 4	<input type="checkbox"/>	
Legend : ■ Alarm ■ Normal				
Events Trend Help		MASTER GENERATOR PSG		
Setup Wave Exit				

The screen shows Paralleling SwitchGear Status of generators.

Status

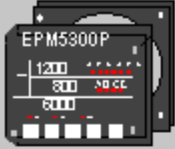
- Latched Under Frequency
- Latched Over Frequency
- Communication Failure
- Main Tank Low Fuel Level
- Main Tank Critical Low Fuel Level
- Main Tank High Fuel Level
- Main Tank Fuel Leaked
- Load Bank Breaker Bell Alarm
- System Not in Auto
- System Under Test
- Remote Start Signal Received
- System in Load Demand Mode
- System Test With Load Bank
- Remote Peak Shave Signal Received
- Load Add Priority
- Load Add Priority 3
- Load Add Priority 4
- Load Shed Priority 2
- Load Shed Priority 3
- Load Shed Priority 4

Note: Any alarm is displayed in amber, otherwise normal status is shown in gray color.

EPM5300P

This device belongs to Electro Industries family, which is tightly integrated device in to PMCS product. This device contains the following tabs.

Metering Tab

 <p>Device Name: DMS Group Name: \$SYSTEM Modbus Addr: 1 Baud Rate: 9600</p>	Metering Tab							
	Current(Amps)			Voltage(Volts)		Phase	THD Current	THD Voltage
	Phase	Inst.	Max.	Phase	Inst.		Inst. (Amps)	Inst. (Volts)
	A	397.00	0.00	AN	119.50	A	31.00	7.00
	B	400.00	0.00	BN	119.90	B	35.00	5.00
	C	401.00	0.00	CN	119.90	C	29.00	7.00
	Neut.	32.00	0.00	AB	206.30	Freq.(Hz)		60.00
				BC	207.20	Ph. Imbalance		1.7
				CA	207.60	Ph. Reversal		A-B-C
	Energy							
KW Hour		1974288.10	KVA Hour		5090713.30	KVAR Hour		9481.00
Power								
Ph.	Real (KW)		Reactive (KVAR)		Apparent (KVA)		P.F.	
	Inst.	Max.	Inst.	Max.	Inst.	Max.	Inst.	
A	-16.30	16.38	-16.25	0.00	16.29	16.38	0.9	
B	16.29	16.38	-16.25	0.00	16.37	16.38	-0.9	
C	0.57	16.38	16.25	16.38	16.25	16.38	0.0	
3 Ph	0.82	16.38	0.64	0.51	16.15	16.38	0.6	
Events	Trend	Help	METERING		SETUPONE		SETUPTWO	
Setup	Wave	Exit						

The screen explains various parameters of the device:

Current (Amps)

- Phase (A, B, C and Neutral)
- Inst
- Max

Voltage (Volts)

- Phase (AN, BN, CN, AB, BC and CA)
- Inst
- THD Current
- THD Voltage


Energy

- WATT Hour
- VA Hour
- VAR Hour

Power

- Real (WATT)
- Reactive (VAR)
- Apparent (VA)
- PF

Setup One Tab

 <p>Device Name: DMMS300 Group Name: \$SYSTEM Modbus Addr: 55 Baud Rate: 9600</p>	Setup One			
	Configuration		Relay 1	Relay 2
	Kilo Volt Inputs	<input type="checkbox"/>	Phase Reversal	<input type="checkbox"/>
	Kilo Amp Input	<input type="checkbox"/>	Phase Imbalance	<input type="checkbox"/>
	Mega Watt Input	<input type="checkbox"/>	Delay On (Sec.)	0 0
	Phase Reverse Limits	<input type="checkbox"/>	Delay Off (Sec.)	0 0
	Meter Setup	Non Open Delta		
	Limits Set By	Average		
	Decimal Placement		Reset	
	Volts Decimal Placement	0	Watt Hour	<input type="checkbox"/>
Amps Decimal Placement	1	VAR Hour	<input type="checkbox"/>	
Watt Decimal Placement	0	VA Hour	<input type="checkbox"/>	
VOLTS Full Scale (Volts)	1000.00			
AMPS Full Scale (Amps)	100.00			
Lim.Threshold for lmb(%)	99.99			
Legend : <input type="checkbox"/> Not Configured <input type="checkbox"/> Not Enabled <input type="checkbox"/> Not Reset <input checked="" type="checkbox"/> Configured <input checked="" type="checkbox"/> Enabled <input checked="" type="checkbox"/> Reset				
Events	Trend	Help		
Setup	Wave	Exit		
METERING		SETUPONE		
SETUPTWO				

The screen explains various parameters in relation with Relay 1 and Relay 2 such as:

Configuration

- Kilo Volt Inputs
- Kilo Amp Input
- Mega Watt Input
- Phase Reverse Limits
- Meter Setup
- Limits Set By

Relay 1 / Relay 2

- Phase Reversal
- Phase Imbalance
- Delay On
- Delay Off

Decimal Placement

- Volts Decimal Placement
- Amps Decimal Placement
- WATT Decimal Placement
- VOLTS Full Scale
- AMPS Full Scale
- Lim. Threshold for lmb (%)

Reset

- WATT Hour
- VAR Hour
- VA Hour

If it is kilo volt inputs, the decimal placement is 2 (as shown in the screen); if kilo amp input the decimal placement is 3 and if mega watt input, it is 1.

Note: Configured is displayed in green, Enabled in red and Reset in Amber.

Setup Two Tab

		Setup Two									
		Limit 1	Trigger		Limit 2	Trigger		Exceeded		Set Above/Below	
			Rly. 1	Rly. 2		Rly. 1	Rly. 2	Limit 1	Limit 2	Limit 1	Limit 2
Current											
Ia(Amp)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ib(Amp)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ic(Amp)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In(Amp)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Voltage											
Van(Volt)	12.000	<input type="checkbox"/>	<input type="checkbox"/>	1.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vbn(Volt)	12.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vcn(kV)	12.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vab(Volt)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vbc(Volt)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vca(Volt)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power											
kVA	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
kVAR	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
kWatt	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P.F.	0.00	<input type="checkbox"/>	<input type="checkbox"/>	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Freq.	0.0	<input type="checkbox"/>	<input type="checkbox"/>	0.0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Legend :		<input type="checkbox"/> No Trigger		<input type="checkbox"/> Not Exceeded		<input type="checkbox"/> Below		<input type="checkbox"/> Exceeded		<input type="checkbox"/> Above	
		<input type="checkbox"/> Trigger		<input type="checkbox"/> Exceeded		<input type="checkbox"/> Above					
Events		Trend		Help		METERING		SETUPONE		SETUPTWO	
Setup		Wave		Exit							

The screen explains various parameters related to Limits and Triggers:
Brief explanation of each of the columns is described below

Column	Description
Limit 1	Limit 1 value for the Associated quantity (For example: Phase A Amps)
Trigger - Relay 1	LED display in Amber color : Limit 1 of the associated value will trigger Relay 1. LED display in Gray color: Limit 1 of the associated value will not trigger Relay 1.
Trigger - Relay 2	LED display in Amber color : Limit 1 of the associated value will trigger Relay 2. LED display in Gray color: Limit 1 of the associated value will not trigger Relay 2.
Limit 2	Limit 2 value for the Associated quantity (For example: Phase A Amps)
Trigger - Relay 1	LED display in Amber color : Limit 2 of the associated value will trigger Relay 1. LED display in Gray color: Limit 2 of the associated value will not trigger Relay 1.
Trigger - Relay 2	LED display in Amber color : Limit 2 of the associated value will trigger Relay 2. LED display in Gray color: Limit 2 of the associated value will not trigger Relay 2.
Set Above/Below Limit 1	LED display in RED color : Limit 1 of the associated value is Set for Above. LED display in Gray color: Limit 1 of the associated value is Set for Below.
Set Above/Below Limit 2	LED display in RED color : Limit 2 of the associated value is Set for Above. LED display in Gray color: Limit 2 of the associated value is Set for Below.
Exceeded Limit 1	LED display in GREEN color : The associated quantity is exceeded the Limit 1 value. LED display in Gray color: The associated quantity is NOT exceeded the Limit 1 value.
Exceeded Limit 2	LED display in GREEN color : The associated quantity is exceeded the Limit 2 value. LED display in Gray color: The associated quantity is NOT exceeded the Limit 2 value.

Example 1	Example 2
Limit 1 is Set for Above	Limit 2 is Set for Below
Limit 1 is 100 Amps	Limit 2 is 80 Amps
The associated Quantity is Phase A Instantaneous value is 397 Amps	The associated Quantity is Phase A Instantaneous value is 50 Amps

Exceeded Limit 1 will show in GREEN color as 397>100	Exceeded Limit 1 will show in GREEN color as 50<80
--	--

Current

- Phase A
- Phase B
- Phase C
- Neutral

Voltage

- AN
- BN
- CN
- AB
- BC
- CA

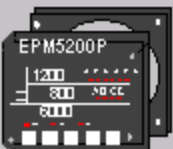
Power

- VA
- VAR
- WATT
- PF
- Frequency

EPM5200P

This device belongs to Electro Industries family, which is tightly integrated device in to PMCS product. This device contains the following tabs.

Metering Tab

	Metering Tab								
	Current(kAmps)			Voltage(kV)		Phase	THD Current	THD Voltage	
	Phase	Inst.	Max.	Phase	Inst.		Inst. (Amps)	Inst. (Volts)	
	A	1.97	2.99	AN	0.00	A	N/A	N/A	
	B	1.99	2.04	BN	0.00	B	N/A	N/A	
	C	1.98	1.99	CN	0.00	C	N/A	N/A	
	Neut.	0.00	5.91	AB	0.00	Freq.(Hz)		0.00	
				BC	0.00	Ph. Imbalance		0.0	
				CA	0.00	Ph. Sequence		A-B-C	
	Device Name: DMMS425 Group Name: \$SYSTEM Modbus Addr: 54 Baud Rate: 9600	Energy							
	KW Hour		1743	KVA Hour		N/A	KVAR Hour		N/A
Power									
Ph.	Real (kW)		Reactive (KVAR)		Apparent (KVA)		P.F.		
	Inst.	Max.	Inst.	Max.	Inst.	Max.	Inst.		
A	0.00	N/A	0.00	N/A	0.00	N/A	1.00		
B	0.00	N/A	0.00	N/A	0.00	N/A	1.00		
C	0.00	N/A	0.00	N/A	0.00	N/A	1.00		
3 Ph	0.00	N/A	0.00	N/A	0.00	N/A	1.00		
Events	Trend	Help	METERING				SETUPONE		
Setup	Wave	Exit							

The screen explains various parameters of the device:

Current (Amps)

- Phase (A, B, C, Neutral)
- Inst
- Max

Voltage (Volts)

- Phase (AN, BN, CN, AB, BC, CA)
- Inst

THD Current/THD Voltage

Displays Phase A, Phase B and Phase C THD Current and Voltage values.


Energy

- WATT Hour
- VA Hour
- VAR Hour

Power

- Real (WATT)
- Reactive (VAR)
- Apparent (VA)
- PF

Setup One Tab

 <p>Device Name: DMMS425 Group Name: \$SYSTEM Modbus Addr: 54 Baud Rate: 9600</p>	Setup One				
	Configuration		Relay 1 Relay 2		
	Kilo Volt Inputs	<input checked="" type="checkbox"/>	Phase Reversal	N/A	N/A
	Kilo Amp Input	<input checked="" type="checkbox"/>	Phase Imbalance	N/A	N/A
	Mega Watt Input	<input type="checkbox"/>	Delay On (Sec.)	N/A	N/A
	Phase Reverse Limits	<input checked="" type="checkbox"/>	Delay Off (Sec.)	N/A	N/A
	Meter Setup	Non Open Delta			
	Limits Set By	Instantaneous			
	Decimal Placement		Reset		
	Volts Decimal Placement	1	<input type="button" value="Watt Hour"/>	<input type="checkbox"/>	
Amps Decimal Placement	2	<input type="button" value="VAR Hour"/>	<input type="checkbox"/>		
Watt Decimal Placement	0	<input type="button" value="VA Hour"/>	<input type="checkbox"/>		
VOLTS Full Scale (kV)	138.00				
AMPS Full Scale (kAmps)	5.00				
Legend : <input type="checkbox"/> Not Configured <input type="checkbox"/> Not Enabled <input type="checkbox"/> Not Reset <input checked="" type="checkbox"/> Configured <input checked="" type="checkbox"/> Enabled <input checked="" type="checkbox"/> Reset					
<input type="button" value="Events"/>	<input type="button" value="Trend"/>	<input type="button" value="Help"/>	METERING		
<input type="button" value="Setup"/>	<input type="button" value="Wave"/>	<input type="button" value="Exit"/>	SETUPONE		

The screen explains various parameters in relation with Relay 1 and Relay 2 such as:

Configuration

- Kilo Volt Inputs
- Kilo Amp Input
- Mega Watt Input
- Phase Reverse Limits
- Meter Setup
- Limits Set By

Relay 1 / Relay 2

- Phase Reversal
- Phase Imbalance
- Delay On
- Delay Off

Decimal Placement

- Volts Decimal Placement
This value decides the precision. User can change the values from 1 to 4.

- Amps Decimal Placement
This value decides the precision. User can change the values from 1 to 4.
- WATT Decimal Placement
- VOLTS Full Scale

If kilo volt inputs value is set then Voltage full-scale value is divided by 1000, showing the value in Kilo Volts.

- AMPS Full Scale

If kilo Amp inputs value is set then Amps full-scale value is divided by 1000, showing the value in Kilo Amps.

Reset

- WATT Hour
- VAR Hour
- VA Hour

Note: Configured is displayed in green, Enabled in red and Reset in Amber.


EPM5350P

This device belongs to the Electro Industries family, which is a tightly integrated device in to the PMCS product.

Special Note : This device supports server [GE32MTCP Server ONLY](#).

The device contains the following tabs:

Metering

 <p>Device Name: DMMS350 Group Name: \$SYSTEM Modbus Addr: 1 Baud Rate: 9600</p>	Metering Tab								
	Current(Amps)			Voltage(Volts)		Phase	THD Current		THD Voltage
	Phase	Inst.	Max.	Phase	Inst.		Inst. (Amps)	Inst. (Volts)	
	A	553.00	2030.00	AN	119.60	A	33.40	0.20	
	B	545.00	2012.00	BN	119.90	B	34.60	0.30	
	C	570.00	2001.00	CN	119.50	C	31.90	0.40	
	Neut.	54.00	4083.00	AB	206.50	Freq.(Hz)		60.00	
				BC	207.00	Ph. Imbalance		1.7	
				CA	207.20	Ph. Sequence		A-B-C	
	Energy								
	KW Hour		1864	KVA Hour		51801	KVAR Hour		187
	Power								
	Ph.	Real (KW)		Reactive (KVAR)		Apparent (KVA)		P.F.	
		Inst.	Max.	Inst.	Max.	Inst.	Max.	Inst.	
	A	15.00	251.00	61.00	71.00	63.00	251.00	0.25	
B	-59.00	246.00	-18.00	76.00	61.00	249.00	0.95		
C	49.00	250.00	-42.00	41.00	64.00	250.00	-0.76		
3 Ph	6.00	740.00	0.00	8.00	190.00	751.00	0.65		
METERING			SETUPONE			SETUPTWO			
Events	Trend	Help							
Setup	Wave	Exit							

The screen explains various parameters of the device:

Current (Amps): Phase (A, B, C and Neutral), Inst and Max.


Voltage (Volts): Phase (AN, BN, CN, AB, BC and CA), Inst, THD Current and THD Voltage.

Energy: WATT Hour, VA Hour and VAR Hour.

Power: Real (WATT), Reactive (VAR), Apparent (VA) and PF.

The wizard also displays the parameters Frequency, Phase imbalance and Phase Reversal.

Setup One

		Setup One			
		Configuration		Relay 1	Relay 2
Device Name: DMMS300		Kilo Volt Inputs <input type="checkbox"/>	Phase Reversal <input type="checkbox"/>	<input type="checkbox"/>	
Group Name: \$SYSTEM		Kilo Amp Input <input type="checkbox"/>	Phase Imbalance <input type="checkbox"/>	<input type="checkbox"/>	
Modbus Addr: 55		Mega Watt Input <input type="checkbox"/>	Delay On (Sec.)	0	0
Baud Rate: 9600		Phase Reverse Limits <input type="checkbox"/>	Delay Off (Sec.)	0	0
		Meter Setup Non Open Delta			
		Limits Set By Average			
		Decimal Placement		Reset	
		Volts Decimal Placement	0	Watt Hour <input type="checkbox"/>	<input type="checkbox"/>
		Amps Decimal Placement	1	VAR Hour <input type="checkbox"/>	<input type="checkbox"/>
		Watt Decimal Placement	0	VA Hour <input type="checkbox"/>	<input type="checkbox"/>
		VOLTS Full Scale (Volts)	1000.00		
		AMPS Full Scale (Amps)	100.00		
		Lim.Threshold for lmb(%)	99.99		
		Legend : <input type="checkbox"/> Not Configured <input type="checkbox"/> Not Enabled <input type="checkbox"/> Not Reset <input type="checkbox"/> Configured <input type="checkbox"/> Enabled <input type="checkbox"/> Reset			
Events	Trend	Help	METERING		SETUPONE
Setup	Wave	Exit			SETUPTWO

The screen explains various parameters in relation with Relay 1 and Relay 2 such as:


Configuration: Kilo Volt Inputs, Kilo Amp Input, Mega Watt Input, Phase Reverse Limits, Meter Setup and Limits Set By. The Legend applicable for these parameters is if any of the above parameters are configured the LED shows Green otherwise LED shows Gray in color.

Relay 1 / Relay 2: Phase Reversal, Phase Imbalance, Delay On and Delay Off. The Legend applicable for these parameters is if any of the above parameters are Enabled the LED shows RED otherwise LED shows Gray in color.

Decimal Placement: Volts Decimal Placement, Amps Decimal Placement, WATT Decimal Placement, VOLTS Full Scale, AMPS Full Scale and Lim. Threshold for lmb (%).

Reset: WATT Hour, VAR Hour and VA Hour. The Legend applicable for this parameter is if any of the above parameters are RESET the LED shows Amber in color otherwise LED shows Gray in color.

Setup Two

Setup Two										
	Limit 1	Trigger		Limit 2	Trigger		Exceeded		Set Above/Below	
		Rly. 1	Rly. 2		Rly. 1	Rly. 2	Limit 1	Limit 2	Limit 1	Limit 2
										
Device Name: DMMS350										
Group Name: \$SYSTEM										
Modbus Addr: 1										
Baud Rate: 9600										
Current										
Ia(Amp)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ib(Amp)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ic(Amp)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In(Amp)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Voltage										
Van(Volt)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vbn(Volt)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vcn(Volt)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vab(Volt)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vbc(Volt)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vca(Volt)	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power										
kVA	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
kVAR	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
kWatt	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P.F.	0.00	<input type="checkbox"/>	<input type="checkbox"/>	0.00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Freq.	0.0	<input type="checkbox"/>	<input type="checkbox"/>	0.0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Legend :	<input type="checkbox"/> No Trigger		<input type="checkbox"/> Not Exceeded		<input type="checkbox"/> Below		<input type="checkbox"/> Exceeded		<input type="checkbox"/> Above	
	<input type="checkbox"/> Trigger		<input type="checkbox"/> Exceeded		<input type="checkbox"/> Above					
Events	Trend	Help		METERING		SETUPONE		SETUPTWO		
Setup	Wave	Exit								

The screen explains various parameters related to Limits and Triggers of the following parameters

Current: Phase A, Phase B, Phase C and Neutral.

Voltage: AN, BN, CN, AB, BC and CA.

Power: VA, VAR, WATT, PF and Frequency.

The screen explains various parameters related to Limits and Triggers:

Brief explanation of each of the columns is described below

Column	Description
Limit 1	Limit 1 value for the Associated quantity (For example: Phase A Amps)
Trigger - Relay 1	LED display in Amber color : Limit 1 of the associated value will trigger Relay 1. LED display in Gray color: Limit 1 of the associated value will not trigger Relay 1.
Trigger - Relay 2	LED display in Amber color : Limit 1 of the associated value will trigger Relay 2. LED display in Gray color: Limit 1 of the associated value will not trigger Relay 2.
Limit 2	Limit 2 value for the Associated quantity (For example: Phase A Amps)
Trigger - Relay 1	LED display in Amber color : Limit 2 of the associated value will trigger Relay 1. LED display in Gray color: Limit 2 of the associated value will not trigger Relay 1.
Trigger - Relay 2	LED display in Amber color : Limit 2 of the associated value will trigger Relay 2. LED display in Gray color: Limit 2 of the associated value will not trigger Relay 2.
Set Above/Below Limit 1	LED display in RED color : Limit 1 of the associated value is Set for Above. LED display in Gray color: Limit 1 of the associated value is Set for Below.
Set Above/Below Limit 2	LED display in RED color : Limit 2 of the associated value is Set for Above. LED display in Gray color: Limit 2 of the associated value is Set for Below.
Exceeded Limit 1	LED display in GREEN color : The associated quantity is exceeded the Limit 1 value. LED display in Gray color: The associated quantity is NOT exceeded the Limit 1 value.
Exceeded Limit 2	LED display in GREEN color : The associated quantity is exceeded the Limit 2 value. LED display in Gray color: The associated quantity is NOT exceeded the Limit 2 value.

Example 1	Example 2
Limit1 is Set for Above	Limit 2 is Set for Below
Limit 1 is 100 Amps	Limit 2 is 80 Amps
The associated Quantity is Phase A Instantaneous value is 397 Amps	The associated Quantity is Phase A Instantaneous value is 50 Amps
Exceeded Limit 1 will show in GREEN color as 397>100	Exceeded Limit 1 will show in GREEN color as 50<80

Setup

Setup Tab			
Configuration			
Mega WATT	<input type="checkbox"/>	Protocol	MODBUS
Leading Zero	<input checked="" type="checkbox"/>	Relay 1	<input checked="" type="checkbox"/>
Reset Protection	<input type="checkbox"/>	Relay 2	<input type="checkbox"/>
Open Delta	<input type="checkbox"/>	Communications	<input checked="" type="checkbox"/>
KYZ Output for Positive WH	<input checked="" type="checkbox"/>	DC Output	<input checked="" type="checkbox"/>
KYZ Output for Negative WH	<input type="checkbox"/>		
		Status	Value
Positive WATT	Limit 1	Above <input type="button" value="v"/>	256 <input type="button" value="Set"/>
	Limit 2	Above <input type="button" value="v"/>	0 <input type="button" value="Set"/>
Negative WATT	Limit 1	Above <input type="button" value="v"/>	0 <input type="button" value="Set"/>
	Limit 2	Above <input type="button" value="v"/>	0 <input type="button" value="Set"/>
<input type="button" value="Reset Power"/>		<input type="button" value="Reset Energy"/>	
Legend : <input checked="" type="checkbox"/> Enabled <input type="checkbox"/> Disabled			
Events		Trend	
Setup		Wave	
Help		Exit	
METERING		SETUP	

The screen explains various parameters related to configuration and setup.

Configuration: Mega WATT, Leading Zero, Reset Protection, Open Delta, KYZ Output for positive WH, KYZ Output for negative WH.

Protocol: Relay 1, Relay 2, Communications and DC Output.

Status/Value: The user can set the values in the Status and Value fields. Under Positive WATT and Negative WATT, the status is shown as Above/Below for Limit 1 and Limit 2. The user can directly set the status to the device by clicking on the arrow buttons on respective fields to change the value from Above to Below or from Below to Above. The user can enter the set values by clicking on the field that contains the rectangular box that filled with White color on respective fields by entering the desired set values. Once the user enters the set value, by clicking on the Set button of the respective field, will set the value in to the device. Against these settings the wizard will prompt user for the conformation.

Legend: The Legend is applicable for Configuration parameters. Enabled status is displayed in red, Otherwise the status is displayed in gray.

EPM9450Q

This device belongs to the Electro Industries family, which is a tightly integrated device in to the PMCS product.

The device offers the following features:

- **Max/Min integration:** Offers Maximum and Minimum values for every measured reading.
- **8 Built-in Digital High-Speed Status Inputs:** The device offers 8 High speed digital inputs.
- **Demand:** Measures Fixed window, Sliding window, Predictive and Thermal demands.
- **4 Communication Ports:** There are 4 ports – Port 1, Port 2, Port 3 and Port 4.

The device contains the following tabs:

Metering

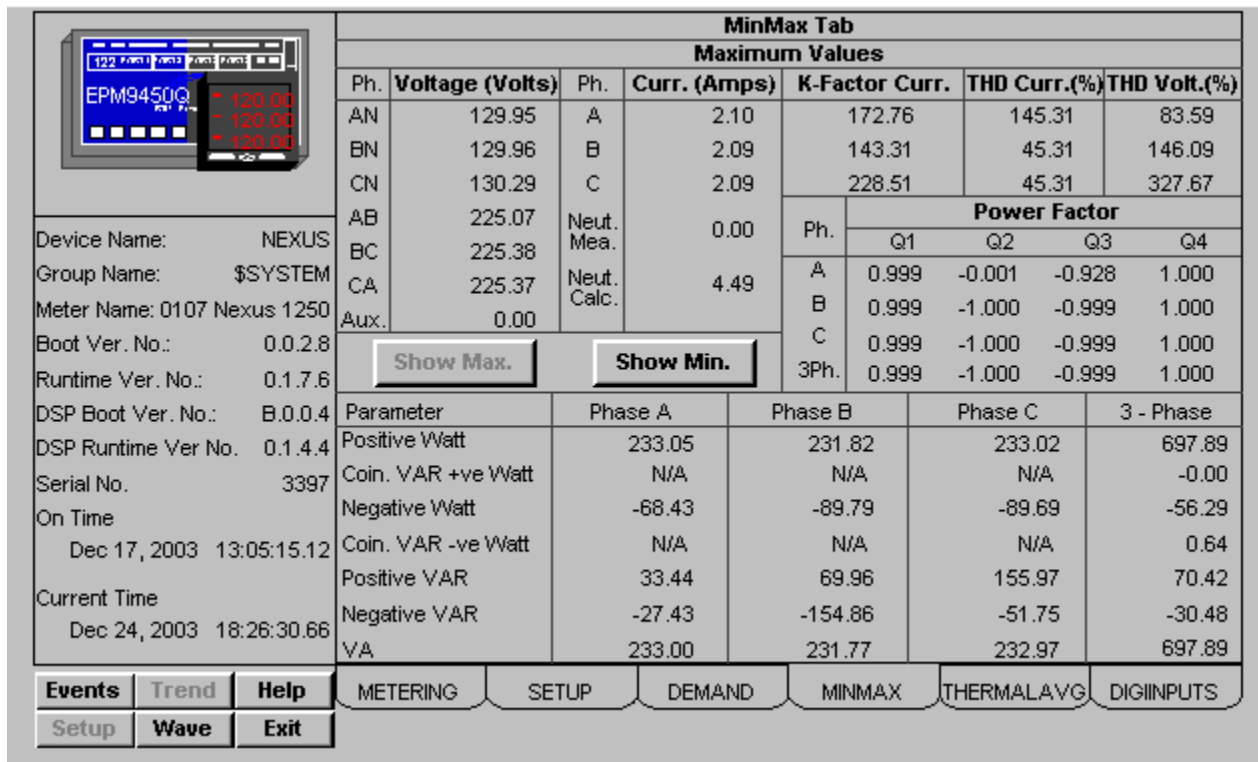
Metering Tab						
Normal Values				THD Vol. (%)	THD Curr. (%)	K-Factor Curr. (%)
Ph	Vol. (Volts)	Ph	Curr. (Amps)			
AN	0.00	A	0.10	0.00	12.89	74.06
BN	0.00	B	0.10	0.00	12.50	90.87
CN	0.00	C	0.10	0.00	15.23	98.38
AB	0.00	Neut. Meas.	0.00	--	--	--
BC	0.00	Neut. Calc.	0.30	--	--	--
CA	0.00	Frequency (Hz)				0.000
Aux.	0.00			<input type="button" value="Show Normal"/>	<input type="button" value="Show High Speed"/>	
Power Normal Values						
Ph	Real (Watt)	Reactive (VAR)	Apparent (VA)	PF		
A	0.00	0.00	0.00	1.000		
B	0.00	0.00	0.00	1.000		
C	0.00	0.00	0.00	1.000		
3 Ph	0.00	0.00	0.00	1.000		

Events **Trend** **Help** **METERING** **SETUP** **DEMAND** **MINMAX** **THERMALAVG** **DIGIINPUTS**
Setup **Wave** **Exit**

The Metering tab shows following various parameters

- **Voltage Normal/ High Speed:** This tab displays the voltage values of AN, BN, CN, AB, BC, CA and Aux.
- **Current Normal/ High Speed:** Displays currents of Phase A, B, C, measured and calculated.
- **THD Normal/ High Speed:** Displays THD values of Phase A, B, C for Voltage and Current and K Factor.
- **Power:** Displays Phase A, B, C and 3 Phase Power Values for Real (Watt), Reactive (VAR), Apparent (VA) and PF.
- **Frequency Normal/ High Speed:** Displays Frequency in Hz.

Min/Max



The screenshot displays the 'MinMax Tab' interface. On the left, there is a small image of a device screen showing 'EPM9450Q' and three red numerical values: 120.00, 120.00, and 120.00. Below this, device information is listed: Device Name: NEXUS, Group Name: \$SYSTEM, Meter Name: 0107 Nexus 1250, Boot Ver. No.: 0.0.2.8, Runtime Ver. No.: 0.1.7.6, DSP Boot Ver. No.: B.0.0.4, DSP Runtime Ver No.: 0.1.4.4, Serial No.: 3397, On Time: Dec 17, 2003 13:05:15.12, Current Time: Dec 24, 2003 18:26:30.66.

The main data table is titled 'MinMax Tab' and 'Maximum Values'. It contains the following data:


Ph.	Voltage (Volts)	Ph.	Curr. (Amps)	K-Factor Curr.	THD Curr.(%)	THD Volt.(%)		
AN	129.95	A	2.10	172.76	145.31	83.59		
BN	129.96	B	2.09	143.31	45.31	146.09		
CN	130.29	C	2.09	228.51	45.31	327.67		
AB	225.07	Neut. Mea.	0.00	Power Factor				
BC	225.38	Neut. Calc.	4.49					
CA	225.37			Ph.	Q1	Q2	Q3	Q4
Aux.	0.00			A	0.999	-0.001	-0.928	1.000
				B	0.999	-1.000	-0.999	1.000
				C	0.999	-1.000	-0.999	1.000
				3Ph.	0.999	-1.000	-0.999	1.000

Below the table, there are two buttons: 'Show Max.' and 'Show Min.'. The bottom section of the interface includes a navigation bar with buttons for 'Events', 'Trend', 'Help', 'Setup', 'Wave', and 'Exit'. Below this is a menu bar with options: 'METERING', 'SETUP', 'DEMAND', 'MINMAX', 'THERMALAVG', and 'DIGIINPUTS'.

The tab displays Maximum and Minimum values of various parameters. The user can get maximum and minimum values by clicking on respective buttons labeled Show Max and Show Min.

- **Voltage:** This tab displays the voltage values of AN, BN, CN, AB, BC, CA and Aux.
- **Current:** Displays currents of Phase A, B, C, measured and calculated.
- **THD :** Displays THD values of Phase A, B, C for Voltage and Current and K Factor.
- **Power Factor :** Displays PF of Phase A, B, C and 3 Phase of 4 Quadrants namely Q1, Q2, Q3 and Q4.
- **Power:** Displays Phase A, B, C and 3 Phase Power Values for Positive Watt, Coincidence VAR for Positive Watt, Negative Watt, Coincidence VAR for Negative Watt, Positive VAR, Negative VAR and VA.

Demand


		Demand Tab		
		Sliding Window Demand		
		Instantaneous	Maximum	
 <p>Device Name: NEXUS Group Name: \$SYSTEM Meter Name: 0107 Nexus 1250 Boot Ver. No.: 0.0.2.8 Runtime Ver. No.: 0.1.7.6 DSP Boot Ver. No.: B.0.0.4 DSP Runtime Ver No. 0.1.4.4 Serial No. 3397 On Time Dec 17, 2003 13:05:15.12 Current Time Dec 24, 2003 18:26:05.31</p>	Positive Watt	0.00	461.83	
	Coin. VAR for Max. +ve Watt	N/A	-0.03	
	Negative Watt	N/A	-36.22	
	Coin. VAR for Max. -ve Watt	N/A	0.34	
	Positive VAR	0.00	25.27	
	Negative VAR	N/A	-16.95	
	VA	0.00	461.83	
			Sliding Window	Fixed Window
			Energy	Predictive Sliding Window
		Positive kWh	111.67	WATT 0.00
	Negative kWh	0.03	VAR 0.00	
	Positive kVARh	0.20	VA 0.00	
	Negative kVARh	0.30		
	kVAh	111.92		

Events	Trend	Help	METERING	SETUP	DEMAND	MINMAX	THERMALAVG	DIGIINPUTS
Setup	Wave	Exit						

The screen explains various parameters related to demand values:

- **Sliding Window Demand:** Displays Average and Maximum Sliding window demand for Positive Watt, Coincidence VAR for Maximum Postive Watt, Negative Watt, Coincedance VAR for Maximum Negative Watt, Positive VAR, Negative VAR and VA. User can click on Sliding Window button to see the Sliding window Demand.
- **Fixed Window Demand:** Displays Average and Maximum Sliding window demand for Positive Watt, Coincidence VAR for Maximum Postive Watt, Negative Watt, Coincedance VAR for Maximum Negative Watt, Positive VAR, Negative VAR and VA. User can click on Fixed Window button to see the Fixed window Demand.
- **Predictive Sliding Window Demand:** Displays Predictive Sliding Window demand for WATT, VAR and VA.
- **Energy:** Displays Energy values for the parameters namely Positve kWh, Negative kWh, Positve kVARh, Negative kVARh and kVAh.

Thermal Average



Thermal Average Tab						
Current (Amps)				Voltage (Volts)		Thermal Average Interval(Sec)
Phase	Mag.	Phase	Mag.			
A	0.10	AN	0.00	300		
B	0.10	BN	0.00			
C	0.10	CN	0.00			
Neut. Mea.	0.00	AB	0.00			
Neut. Calc.	0.30	BC	0.00			
		CA	0.00			
		Aux.	0.00			
Power						
Phase	Real (Watt)		Reactive (VAR)		Apparent (VA)	
A	0.00		0.00		0.00	
B	0.00		0.00		0.00	
C	0.00		0.00		0.00	
3 Ph	0.00		0.00		0.00	

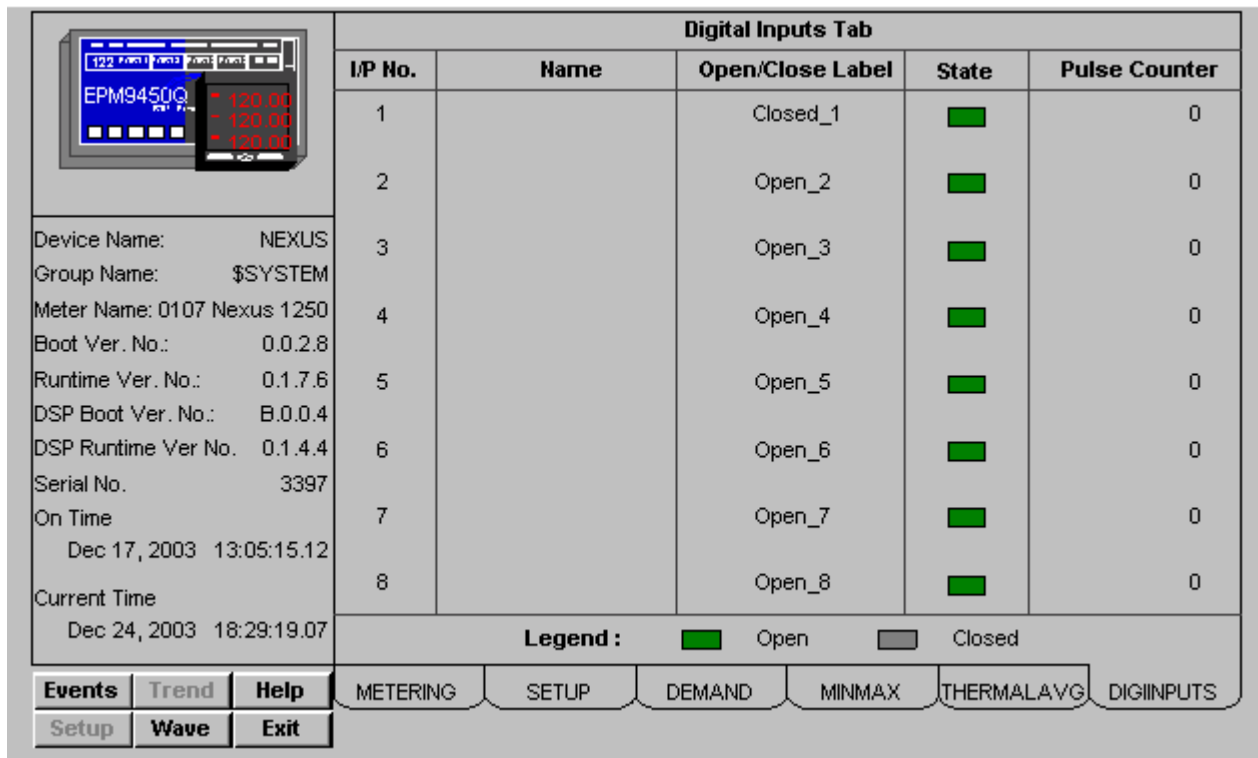
Device Name: NEXUS
 Group Name: \$SYSTEM
 Meter Name: 0107 Nexus 1250
 Boot Ver. No.: 0.0.2.8
 Runtime Ver. No.: 0.1.7.6
 DSP Boot Ver. No.: B.0.0.4
 DSP Runtime Ver No.: 0.1.4.4
 Serial No.: 3397
 On Time
 Dec 17, 2003 13:05:15.12
 Current Time
 Dec 24, 2003 18:28:57.83









Events	Trend	Help	METERING	SETUP	DEMAND	MINMAX	THERMALAVG	DIGIINPUTS
Setup	Wave	Exit						



The screen explains about various parameters related to thermal average:

- **Current (Amps):** Displays the current readings for the phases A, B, C, Mea. (measured) and Cal. (calculated).
- **Voltage (Volts):** Displays the Voltage readings for the phases AN, BN, CN, AB, BC, CA and Aux.
- **Power:** Displays Phase A, B, C and 3 Phase Power Values for Real (Watt), Reactive (VAR) and Apparent (VA).

Digital Inputs



Digital Inputs Tab					
I/P No.	Name	Open/Close Label	State	Pulse Counter	
1		Closed_1		0	
2		Open_2		0	
3		Open_3		0	
4		Open_4		0	
5		Open_5		0	
6		Open_6		0	
7		Open_7		0	
8		Open_8		0	

Legend :  Open  Closed

Events Trend Help METERING SETUP DEMAND MINMAX THERMALAVG DIGIINPUTS
 Setup Wave Exit

The Digital Inputs tab displays the following parameters of 8 digital inputs. They are

Name: Displays the name of the Digital Input. The maximum allowed is 16 Character string.

Open/Close Label: Based on the Digital input status, the corresponding label will be displayed. For example if the digital input status is OPEN then label for Open condition is displayed or if the digital input status is CLOSED then label for Closed condition is displayed.

Status: The status is displayed Open/Closed. Open status showed in green and Closed status in gray.

Counter: Displays the corresponding digital input counter value.

EPM9650Q

This device belongs to the Electro Industries family, which is a tightly integrated device in to the PMCS product. There is a Flicker option present in this device. The Customer who has opted for this option only will get the Flicker tab visible on the runtime wizards. This document still has the flicker tab description.

The device offers the following features:

- **Max/Min integration:** Offers Maximum and Minimum values for every measured reading.
- **8 Built-in Digital High-Speed Status Inputs:** The device offers 8 High speed digital inputs.
- **Demand:** Measures Fixed window, Sliding window, Predictive and Thermal demands.
- **4 Communication Ports:** There are 4 ports – Port 1, Port 2, Port 3 and Port 4.

The device contains the following tabs:

Metering

Metering Tab								
Normal Values				THD Vol. (%)	THD Curr. (%)	K-Factor Curr. (%)		
Ph	Vol. (Volts)	Ph	Curr. (Amps)					
AN	0.00	A	0.10	0.00	14.06	102.84		
BN	0.00	B	0.10	0.00	12.50	80.72		
CN	0.00	C	0.10	0.00	13.28	75.35		
AB	0.00	Neut. Meas.	0.00	--	--	--		
BC	0.00	Neut. Calc.	0.30	--	--	--		
CA	0.00	Frequency (Hz)					0.000	
Aux.	0.00			<input type="button" value="Show Normal"/> <input type="button" value="Show High Speed"/>				
Power Normal Values								
Ph	Real (Watt)	Reactive (VAR)	Apparent (VA)	PF				
A	0.00	0.00	0.00	1.000				
B	0.00	0.00	0.00	1.000				
C	0.00	0.00	0.00	1.000				
3 Ph	0.00	0.00	0.00	1.000				

Device Name: NEXUS
 Group Name: \$SYSTEM
 Meter Name: 0107 Nexus 1250
 Boot Ver. No.: 0.0.2.8
 Runtime Ver. No.: 0.1.7.6
 DSP Boot Ver. No.: B.0.0.4
 DSP Runtime Ver No. 0.1.4.4
 Serial No. 3397
 On Time Dec 17, 2003 13:05:15.12
 Current Time Dec 24, 2003 17:37:39.17

The Metering tab shows following various parameters

- **Voltage Normal/ High Speed:** This tab displays the voltage values of AN, BN, CN, AB, BC, CA and Aux.
- **Current Normal/ High Speed:** Displays currents of Phase A, B, C, measured and calculated.
- **THD Normal/ High Speed:** Displays THD values of Phase A, B, C for Voltage and Current and K Factor.

- **Power:** Displays Phase A, B, C and 3 Phase Power Values for Real (Watt), Reactive (VAR), Apparent (VA) and PF.
- **Frequency Normal/ High Speed:** Displays Frequency in Hz.

Min/Max

		MinMax Tab							
		Maximum Values							
Ph.	Voltage (Volts)	Ph.	Curr. (Amps)	K-Factor Curr.	THD Curr.(%)	THD Volt.(%)			
AN	129.95	A	2.10	172.76	145.31	83.59			
BN	129.96	B	2.09	143.31	45.31	146.09			
CN	130.29	C	2.09	228.51	45.31	327.67			
AB	225.07	Neut. Mea.	0.00	Power Factor					
BC	225.38			Ph.	Q1	Q2	Q3	Q4	
CA	225.37	Neut. Calc.	4.49	A	0.999	-0.001	-0.928	1.000	
Aux.	0.00			B	0.999	-1.000	-0.999	1.000	
				C	0.999	-1.000	-0.999	1.000	
				3Ph.	0.999	-1.000	-0.999	1.000	
		Show Max.	Show Min.						
Parameter		Phase A	Phase B	Phase C	3 - Phase				
Positive Watt		233.05	231.82	233.02	697.89				
Coin. VAR +ve Watt		N/A	N/A	N/A	-0.00				
Negative Watt		-66.43	-89.79	-89.69	-56.29				
Coin. VAR -ve Watt		N/A	N/A	N/A	0.64				
Positive VAR		33.44	69.96	155.97	70.42				
Negative VAR		-27.43	-154.86	-51.75	-30.48				
VA		233.00	231.77	232.97	697.89				
Events	Trend	Help	METERING	SETUP	DEMAND	MINMAX	THERMLAVG	DIGIINPUTS	FLICKERS
Setup	Wave	Exit							

The tab displays Maximum and Minimum values of various parameters. The user can get maximum and minimum values by clicking on respective buttons labeled Show Max and Show Min.

- **Voltage:** This tab displays the voltage values of AN, BN, CN, AB, BC, CA and Aux.
- **Current:** Displays currents of Phase A, B, C, measured and calculated.
- **THD :** Displays THD values of Phase A, B, C for Voltage and Current and K Factor.
- **Power Factor :** Displays PF of Phase A, B, C and 3 Phase of 4 Quadrants namely Q1, Q2, Q3 and Q4.
- **Power:** Displays Phase A, B, C and 3 Phase Power Values for Positive Watt, Coincidence VAR for Positive Watt, Negative Watt, Coincidence VAR for Negative Watt, Positive VAR, Negative VAR and VA.

Demand


		Demand Tab	
		Sliding Window Demand	
		Instantaneous	Maximum
Positive Watt		0.00	461.83
Coin. VAR for Max. +ve Watt		N/A	-0.03
Negative Watt		N/A	-36.22
Coin. VAR for Max. -ve Watt		N/A	0.34
Positive VAR		0.00	25.27
Negative VAR		N/A	-16.95
VA		0.00	461.83
		Sliding Window	Fixed Window
		Energy	Predictive Sliding Window
Positive kWh		111.67	WATT 0.00
Negative kWh		0.03	VAR 0.00
Positive kVARh		0.20	VA 0.00
Negative kVARh		0.30	
kVAh		111.92	

Events	Trend	Help	METERING	SETUP	DEMAND	MINMAX	THERMLAVG	DIGIINPUTS	FLICKERS
Setup	Wave	Exit							

The screen explains various parameters related to demand values:

- **Sliding Window Demand:** Displays Average and Maximum Sliding window demand for Positive Watt, Coincidence VAR for Maximum Positive Watt, Negative Watt, Coincidence VAR for Maximum Negative Watt, Positive VAR, Negative VAR and VA. User can click on Sliding Window button to see the Sliding window Demand.
- **Fixed Window Demand:** Displays Average and Maximum Sliding window demand for Positive Watt, Coincidence VAR for Maximum Positive Watt, Negative Watt, Coincidence VAR for Maximum Negative Watt, Positive VAR, Negative VAR and VA. User can click on Fixed Window button to see the Fixed window Demand.
- **Predictive Sliding Window Demand:** Displays Predictive Sliding Window demand for WATT, VAR and VA.
- **Energy:** Displays Energy values for the parameters namely Positive kWh, Negative kWh, Positive kVARh, Negative kVARh and kVAh.









Thermal Average



		Thermal Average Tab				
		Current (Amps)		Voltage (Volts)		Thermal Average Interval(Sec)
		Phase	Mag.	Phase	Mag.	300
Device Name:	NEXUS	A	0.10	AN	0.00	
Group Name:	\$SYSTEM	B	0.10	BN	0.00	
Meter Name:	0107 Nexus 1250	C	0.10	CN	0.00	
Boot Ver. No.:	0.0.2.8	Neut. Mea.	0.00	AB	0.00	
Runtime Ver. No.:	0.1.7.6	Neut. Calc.	0.30	BC	0.00	
DSP Boot Ver. No.:	B.0.0.4			CA	0.00	
DSP Runtime Ver No.	0.1.4.4			Aux.	0.00	
Serial No.	3397	Power				
On Time	Dec 17, 2003 13:05:15.12	Phase	Real (Watt)	Reactive (VAR)	Apparent (VA)	
Current Time	Dec 24, 2003 18:13:02.33	A	0.00	0.00	0.00	
		B	0.00	0.00	0.00	
		C	0.00	0.00	0.00	
		3 Ph	0.00	0.00	0.00	
Events	Trend	Help	METERING	SETUP	DEMAND	
Setup	Wave	Exit	MINMAX	THERMLAVG	DIGIINPUTS	
					FLICKERS	

The screen explains about various parameters related to thermal average:

- **Current (Amps):** Displays the current readings for the phases A, B, C, Mea. (measured) and Cal. (calculated).
- **Voltage (Volts):** Displays the Voltage readings for the phases AN, BN, CN, AB, BC, CA and Aux.
- **Power:** Displays Phase A, B, C and 3 Phase Power Values for Real (Watt), Reactive (VAR) and Apparent (VA).

Digital Inputs

Digital Inputs Tab					
I/P No.	Name	Open/Close Label	State	Pulse Counter	
1		Closed_1		0	
2		Open_2		0	
3		Open_3		0	
4		Open_4		0	
5		Open_5		0	
6		Open_6		0	
7		Open_7		0	
8		Open_8		0	

Legend :  Open  Closed

Device Name: NEXUS
Group Name: \$SYSTEM
Meter Name: 0107 Nexus 1250
Boot Ver. No.: 0.0.2.8
Runtime Ver. No.: 0.1.7.6
DSP Boot Ver. No.: B.0.0.4
DSP Runtime Ver No.: 0.1.4.4
Serial No.: 3397
On Time: Dec 17, 2003 13:05:15.12
Current Time: Dec 24, 2003 18:13:32.07

Events **Trend** **Help** **METERING** **SETUP** **DEMAND** **MINMAX** **THERMLAVG** **DIGIINPUTS** **FLICKERS**
Setup **Wave** **Exit**

The Digital Inputs tab displays the following parameters of 8 digital inputs. They are

Name: Displays the name of the Digital Input. The maximum allowed is 16 Character string.

Open/Close Label: Based on the Digital input status, the corresponding label will be displayed. For example if the digital input status is OPEN then label for Open condition is displayed or if the digital input status is CLOSED then label for Closed condition is displayed.

Status: The status is displayed Open/Closed. Open status showed in green and Closed status in gray.

Counter: Displays the corresponding digital input counter value.

Setup

Setup Tab									
Phase	Current Setpoints(%)		Phase	Voltage Setpoints(%)					
	Above	Below		Above	Below				
A	327.00	0.00	AN	110.00	80.00				
B	110.00	0.00	BN	110.00	80.00				
C	110.00	0.00	CN	110.00	80.00				
Mea.	10.00	0.00	AB	150.00	20.00				
Calc.	0.00	0.00	BC	150.00	20.00				
			CA	150.00	20.00				
			Aux.	0.00	0.00				
		PT Ratio		CT Ratio		Comm. Parameters			
		Phase	Aux.	Phase	Neut.	Port #	Address	Baud	
Numerator		1.00	1.00	1.00	5.00	1	41	19200	
Denominator		1.00	1.00	1.00	5.00	2	41	19200	
						3	1	9600	
						4	41	19200	
On Time Dec 17, 2003 13:05:15.12		Reset Minimum		Reset Log		Volt. Phase Seq. C-B-A			
Current Time Dec 24, 2003 17:38:20.20		Reset Maximum		Reset Energy					
Events	Trend	Help	METERING	SETUP	DEMAND	MINMAX	THERMLAVG	DIGIINPUTS	FLICKERS
Setup	Wave	Exit							

The screen explains various parameters related to setup.

Current Set Points: Above and Below Current Setpoints are shown for Phase A, B, C, Measured and Calculated.

Voltage Set Points: Above and Below Voltage Setpoints are shown AN, BN, CN, AB, BC, CA and Aux.

PT Ratio: Displays Phase and Auxiliary values for Numerator and Denominator.

CT Ratio: Displays Phase and Neutral values for Numerator and Denominator.

Communication Parameters: Displays Port Addresses and Baudrate for each of the 4 Ports.

Reset: This wizard allows user to reset the following Parameters.

- Energy
- Log
- Maximum and
- Minimum

Voltage Phase Sequence: Displays Phase sequence as either C-B-A or A-B-C, based on the register value.

Flicker

		FLICKERS		
Time		Short Term Flickers		
		PST	Time	
Start/Reset	00 0,000 00:00:00.00	Volts AN	0.00	00 0,000 00:00:00.00
Stop	00 0,000 00:00:00.00	Volts BN	0.00	00 0,000 00:00:00.00
Current	Dec 24, 2003 18:16:51.24	Volts CN	0.00	00 0,000 00:00:00.00
Next PST	0 Sec	Min Volts AN	0.00	00 0,000 00:00:00.00
Next PLT	0 Sec	Min Volts BN	0.00	00 0,000 00:00:00.00
Status		Min Volts CN	0.00	00 0,000 00:00:00.00
STOPPED		Max Volts AN	0.00	00 0,000 00:00:00.00
Frequency		Max Volts BN	0.00	00 0,000 00:00:00.00
Base	Hz	Max Volts CN	0.00	00 0,000 00:00:00.00
Current	0.00 Hz			
Base Voltage 230 Volts				
Flicker Monitoring				
Start Stop Reset		Instantaneous Short Term Long Term		

The screen explains various parameters related to setup.

Current Date Time: Current Date Time in the device

Start/Reset/Stop: The start and stop time stamp of flicker. Start and Reset timestamps are displayed at the same place.

Next PST: When is the next short-term flicker in seconds.

Next PLT: When is the next long-term flicker in seconds.

Status: Whether Flicker is running/active or stopped.

Frequency: This has information about base frequency, current frequency. And base voltage is displayed.

Instantaneous: Displays the P instantaneous and Voltage AN, BN and CN readings. No Min Volts AN, BN, CN present.

Short Term: Shows short term voltage for AN, BN, CN, Min and Max voltages along with their time stamps.

Long Term: Shows long term voltage for AN, BN, CN, Min and Max voltages along with their time stamps.

Flicker Monitoring: There are 3 buttons under this to enable the following:

Start: Start the flicker

Stop: Stop the Flicker

Reset: Stops and starts the flicker.

EPM7430D

EPM7450D

These devices belong to the Electro Industries family, which is a tightly integrated device in to the PMCS product. These devices communicate through EI Protocol (Electro Industries Protocol). The server used for these devices is **GE32EIND**.

The device comes with 2 versions – EPM7430D and EPM7450D. Both the devices does not support Waveform and events features. So these two buttons will be disabled.

Metering

Metering Tab						
Ph	Voltage(Volts)	Ph	Current (Amps)	THD Current (%)	THD Voltage (%)	
AN	9.70	A	0.00	0.00	2.30	
BN	9.70	B	0.00	0.00	3.20	
CN	9.70	C	0.00	0.00	2.80	
AB	0.00	Neut.	0.00	Frequency (Hz)		60.00
BC	0.00			Phase Imbalance (%)		0.00
CA	0.00			Phase Reversal		A-B-C
Energy						
Positive kWh			0.00	Positive kVARh		12.91
Negative kWh			2956.05	Negative kVARh		0.00
kVAh			2956.09			
Power						
Phase	kW	kVAR	kVA	PF		
A	0.00	0.00	0.00	1.00		
B	0.00	0.00	0.00	1.00		
C	0.00	0.00	0.00	1.00		
3 Ph	0.00	0.00	0.00	1.00		

EventsTrendHelp

SetupWaveExit

METERINGMINMAXSETUPLIMITS

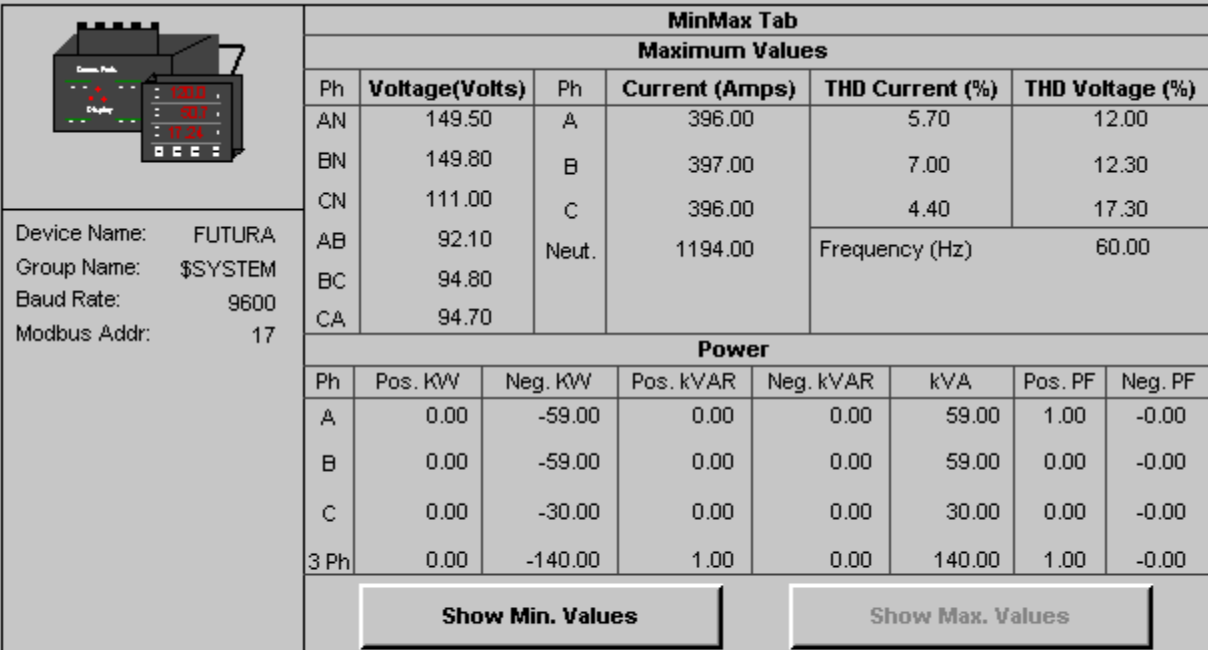
The Metering tab shows following various parameters:

- **Voltage:** This tab displays the voltage values of AN, BN, CN, AB, BC and CA.
- **Current:** Displays currents of Phase A, B, C and neutral.
- **THD Current/THD Voltage:** Displays THD values of Phase A, B and C for current and voltage.
- **Energy:** Displays values for Positive kWh, Negative kWh, Positive kVARh, Negative kVARh and kVAh,.

- **Power:** Displays Phase A, B, C and 3 Phase Power Values for Real (kW), Reactive (kVAR), Apparent (kVA) and PF.

The wizard also displays the parameters Frequency (Hz), Phase Imbalance (%) and Phase Reversal. If Phase Reversal is ON, the wizard shows CBA, if not then shows ABC.

Min/Max



The screenshot shows the 'MinMax Tab' interface. On the left, there is a device information panel with the following details:

- Device Name: FUTURA
- Group Name: \$SYSTEM
- Baud Rate: 9600
- Modbus Addr: 17

The main area contains two tables. The first table, titled 'Maximum Values', shows the following data:

Ph	Voltage(Volts)	Ph	Current (Amps)	THD Current (%)	THD Voltage (%)
AN	149.50	A	396.00	5.70	12.00
BN	149.80	B	397.00	7.00	12.30
CN	111.00	C	396.00	4.40	17.30
AB	92.10	Neut.	1194.00	Frequency (Hz) 60.00	
BC	94.80				
CA	94.70				

The second table, titled 'Power', shows the following data:

Ph	Pos. kW	Neg. kW	Pos. kVAR	Neg. kVAR	kVA	Pos. PF	Neg. PF
A	0.00	-59.00	0.00	0.00	59.00	1.00	-0.00
B	0.00	-59.00	0.00	0.00	59.00	0.00	-0.00
C	0.00	-30.00	0.00	0.00	30.00	0.00	-0.00
3 Ph	0.00	-140.00	1.00	0.00	140.00	1.00	-0.00

Below the tables are two buttons: 'Show Min. Values' and 'Show Max. Values'. At the bottom, there is a navigation bar with buttons for 'Events', 'Trend', 'Help', 'Setup', 'Wave', and 'Exit', and a menu with options 'METERING', 'MINMAX', 'SETUP', and 'LIMITS'.

The tab displays Maximum and Minimum values of various parameters. The user can get maximum and minimum values by clicking on respective buttons labeled Show Max. Values and Show Min. Values.

- **Voltage:** This tab displays the voltage values of AN, BN, CN, AB, BC and CA.
- **Current:** Displays currents of Phase A, B, C and Neutral.
- **THD :** Displays THD values of Phase A, B, C for Current and Voltage.
- **Power:** Displays Phase A, B, C and 3 Phase Power Values for Positive kW, Negative kW, Positive kVAR, Negative kVAR, kVA, Positive PF and Negative PF.
- **Frequency:** Displays frequency in Hz.

Limits

	Limits Tab									
	Limit 1	Limit1 Trigger			Limit 2	Limit2 Trigger			Set Above/Below	
		Rly. 1	Rly. 2	Rly. 3		Rly. 1	Rly. 2	Rly. 3	Lim. 1	Lim. 2
Current										
Phase A	400	Gray	Gray	Gray	200	Gray	Gray	Gray	Red	Gray
Phase B	400	Gray	Gray	Gray	200	Gray	Gray	Gray	Red	Gray
Phase C	400	Gray	Gray	Gray	200	Gray	Gray	Gray	Red	Gray
Neutral	40	Gray	Gray	Gray	10	Gray	Gray	Gray	Red	Gray
Voltage										
AN	100	Amber	Gray	Gray	20	Gray	Amber	Gray	Red	Gray
BN	100	Amber	Gray	Gray	20	Gray	Amber	Gray	Red	Gray
CN	100	Amber	Gray	Gray	20	Gray	Amber	Gray	Red	Gray
AB	10	Gray	Gray	Amber	10	Gray	Gray	Amber	Red	Gray
BC	10	Gray	Gray	Amber	10	Gray	Gray	Amber	Red	Gray
CA	10	Gray	Gray	Amber	10	Gray	Gray	Amber	Red	Gray
Power										
kVA	10	Gray	Gray	Gray	5	Gray	Gray	Gray	Red	Gray
kVAR	10	Gray	Gray	Gray	5	Gray	Gray	Gray	Red	Gray
kWatt	10	Gray	Gray	Gray	5	Gray	Gray	Gray	Red	Gray
Freq.	60	Gray	Gray	Gray	60	Gray	Gray	Gray	Red	Gray

Legend : Amber Triggered, Gray Not Triggered, Gray Below, Red Above

Events Trend Help
Setup Wave Exit

METERING MINMAX SETUP LIMITS

The screen explains various parameters related to Limits and Triggers:

Limit 1 Trigger/Limit 2 Trigger (Relay 1, Relay 2 and Relay 3)

Relay 1, Relay 2 and Relay 3 are triggered depending upon the Limit 1 and Limit 2 values. The screen also displays whether the Limit 1 and Limit 2 are set above or set below.

Relay 1, Relay 2 and Relay 3 of Limit 1 and Limit 2 are displayed either as Not Triggered or Triggered. If the relay is triggered, the LED fills with amber, if not then gray.

If Limit 1 or Limit 2 are set above, then the status is displayed in red, if not gray, meaning the Limits are set below,

The Limit 1 and Limit 2 Parameters that are shown on the tab are

Current: Phase A, Phase B, Phase C and Neutral.

Voltage: AN, BN, CN, AB, BC, CA

Power: VA, VAR, WATT, PF and Frequency

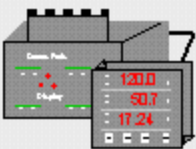
The screen explains various parameters related to Limits and Triggers:

Brief explanation of each of the columns is described below

Column	Description
Limit 1	Limit 1 value for the Associated quantity (For example: Phase A Amps)
Trigger - Relay 1	LED display in Amber color : Limit 1 of the associated value will trigger Relay 1. LED display in Gray color: Limit 1 of the associated value will not trigger Relay 1.
Trigger - Relay 2	LED display in Amber color : Limit 1 of the associated value will trigger Relay 2. LED display in Gray color: Limit 1 of the associated value will not trigger Relay 2.
Trigger - Relay 3	LED display in Amber color : Limit 1 of the associated value will trigger Relay 3.

	LED display in Gray color: Limit 1 of the associated value will not trigger Relay 3.
Limit 2	Limit 2 value for the Associated quantity (For example: Phase A Amps)
Trigger - Relay 1	LED display in Amber color : Limit 2 of the associated value will trigger Relay 1. LED display in Gray color: Limit 2 of the associated value will not trigger Relay 1.
Trigger - Relay 2	LED display in Amber color : Limit 2 of the associated value will trigger Relay 2. LED display in Gray color: Limit 2 of the associated value will not trigger Relay 2.
Trigger - Relay 3	LED display in Amber color : Limit 2 of the associated value will trigger Relay 3. LED display in Gray color: Limit 2 of the associated value will not trigger Relay 3.
Set Above/Below Limit 1	LED display in RED color : Limit 1 of the associated value is Set for Above. LED display in Gray color: Limit 1 of the associated value is Set for Below.
Set Above/Below Limit 2	LED display in RED color : Limit 2 of the associated value is Set for Above. LED display in Gray color: Limit 2 of the associated value is Set for Below.

Setup

		Setup Tab					
		Configuration		Relay 1	Relay 2	Relay 3	
 Device Name: FUTURA Group Name: \$SYSTEM Baud Rate: 9600 Modbus Addr: 17	Kilo Volt Inputs	<input type="checkbox"/>	Ph. Imbalance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Kilo Amp Input	<input type="checkbox"/>	Delay on	0	0	0	
	Mega Watt Input	<input type="checkbox"/>	Delay Off	0	0	0	
	Phase Reverse Limits	<input checked="" type="checkbox"/>	Interval			900	
	Meter Setup	Non Open Delta					
	Limits Set By	Instantaneous					
	Full Scale Values			Reset			
	Phase	Voltage	Phase	Current	<input type="text"/> <input type="text"/> <input type="text"/>		
	AN	120	A	2000			
	BN	120	B	2000			
CN	120	C	2000	<input type="text"/> <input type="text"/> <input type="text"/>			
Volts Decimal Placement		1		<input type="text"/>			
Amps Decimal Placement		0		<input type="text"/>			
Power Decimal Placement		0		<input type="text"/>			
Legend : <input checked="" type="checkbox"/> Configured <input type="checkbox"/> Enabled							
Events	Trend	Help	METERING	MINMAX	SETUP	LIMITS	
Setup	Wave	Exit					

The screen shows the following parameters in relation with Relay 1, Relay 2 and Relay 3 such as:

Configuration: The Parameters under configuration are Kilo Volt Inputs, Kilo Amp Input, Mega Watt Input, Phase Reverse Limits. If any of the above parameters are configured the LED shows Green otherwise LED shows Gray in color.

Meter Setup: If this parameter is set then text displayed as Open Delta, if not then shows Non Open Delta.

Limits Set By: If this parameter is set then text displayed as Average, if not then shows Instantaneous.

Relay 1 / Relay 2/ Relay 3: This section shows the parameters Phase Imbalance, Delay On and Delay Off of Realy 1, Relay 2 and Relay 3.

The Legend applicable Phase Imbalance is if any of the above parameters are Enabled the LED shows RED otherwise LED shows Gray in color.

Full Scale Values: Displays Full Scale Voltage values for phases AN, B and CN; and Full Scale current values for phases A, B and C. Also shows Decimal Placement values of Volts, Amps and Power.

Reset of WATT Hour, VAR Hour and VA Hour:

In resetting the above parameters 2 dialog boxes will prompt user to implement the functionality.

For example:

Dialog box 1: To reset Watt Hour, when the button is clicked, a dialog box will appear asking “Do you want to reset Watt Hour?”. The dialog box contains Ok and Cancel buttons. If the Ok button is clicked, then another dialog box prompts the user. If Cancel button is clicked the Dialog box 2 will not appear and no Reset will occur.

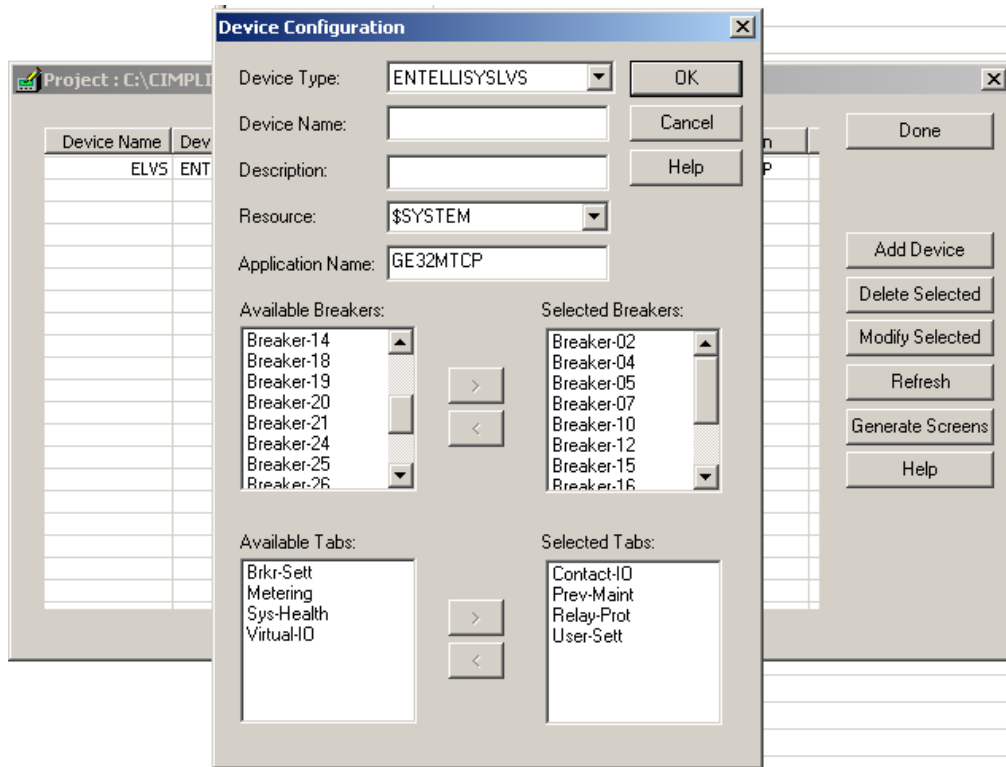
Dialog box 2: Asking “Confirm the reset within 10 seconds”. If the Ok button is clicked the parameter is reset. If Cancel button is clicked no Reset will occur.

Entellisys LVS

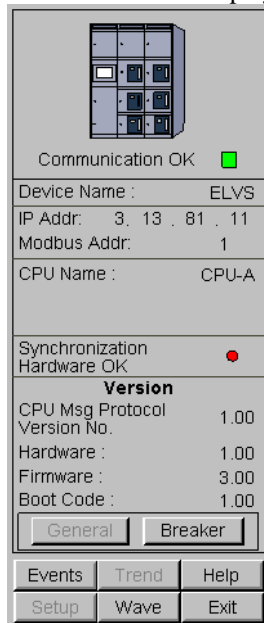
EntellisysLVS is an integrated switchgear control system using a single central processing unit (C/CPU) to perform all switchgear functions. It replaces all devices and the point-to-point wiring used today to perform protection, monitoring, metering, discrete I/O and control functions in GE low voltage distribution switchgear. The basic FBW system consists of a C/CPU (Power PC), a digital communications network, and device electronics (Nodes) at the breaker - all are located in the gear. Raw voltage/current samples and status are digitized by the Node and communicated via the digital network to the C/CPU. The C/CPU runs the software to perform all of the switchgear functions. When it is determined that a breaker operation is required, the C/CPU sends a command to the Node. The Node decodes the commands and controls the power to actuate the breaker. Additionally, the EntellisysLVS system performs discrete I/O and communicates externally to SCADA systems, web interfaces, and through email. The EntellisysLVS system is redundant to achieve higher reliability than current day systems. Local maximum breaker protection is provided at the Node.

Configuration

In PMCS Power builder, user need to select the breakers and tabs which he need to configure in the project. Depending upon the selection of Breakers and Tabs, points are imported into the project.



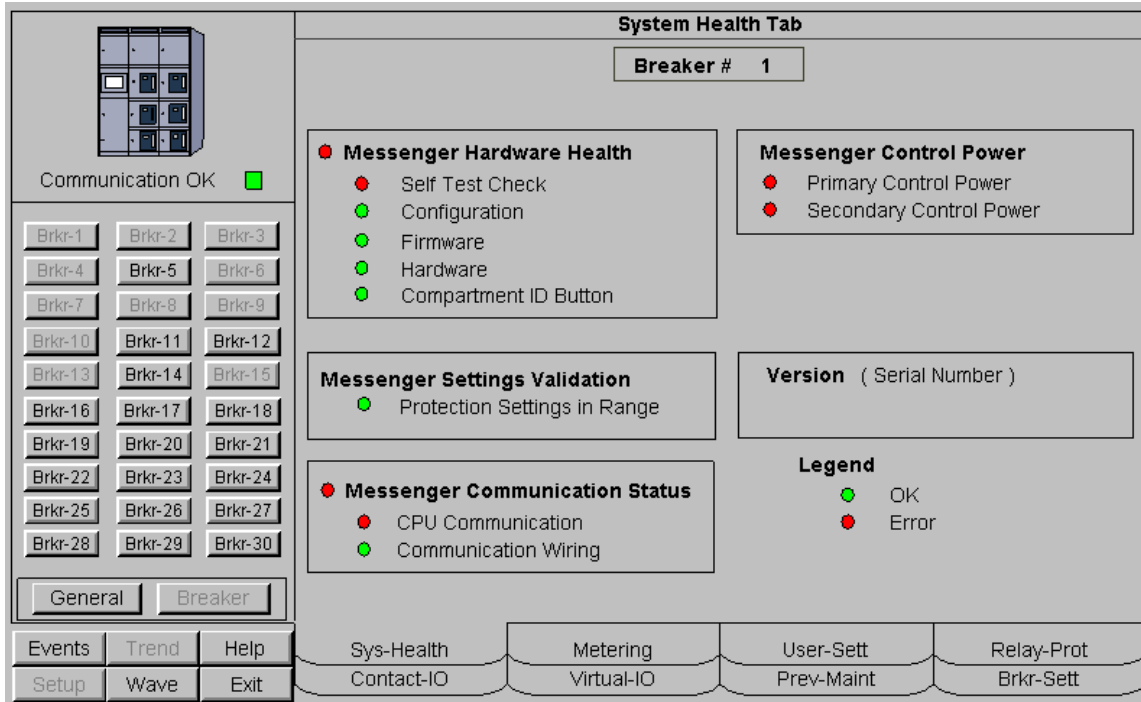
There are two buttons provided in Framework Wizard –General and Breaker. General button shows CPU health information while Breaker button displays set of all the 30 breaker buttons. By default General button is clicked



Depending upon the configured breakers respective Breaker buttons become enabled. Remaining all other breakers are disabled. When the user opens the tabular wizard by clicking small face plate, by default the first breaker out of configured breakers is selected.

System Health

The System Health window displays diagnostic and statistic information for up to 30 nodes and for both CPUs. Operators can quickly be alerted to any system maintenance or repairs that require attention, as well as troubleshoot startup issues.



Metering

Breaker Status

Breaker Status screen displays detailed information about the status of this breaker.

Metering Tab
Breaker # 1

Breaker Status | Demand | Detailed Metering | Harmonics

Breaker Status

Breaker Contacts Position	Open
Secondary Disconnect Position	Disconnected
Instantaneous Protection	Enabled
Short Time Protection	Disabled
Long Time Protection	Enabled
Ground Fault Protection	Disabled
Ground Fault Alarm Only	Alarm

Phase Currents	
Phase	RMS Value
A	2.999 kA
B	2.999 kA
C	4.323 kA
N	14.92 kA

Phase Voltage	
Phase	RMS Value
Van	0.00 V
Vbn	0.00 V
Vcn	0.00 V

Line Voltage	
Vab	820.35 V
Vbc	819.91 V
Vca	1.420 kV

Entellisys-Trip | Entellisys-Alarm

Oversvoltage	Enabled	Enabled
Undersvoltage	Disabled	Disabled
High Current		Disabled
Phase Loss	Disabled	Disabled
Reverse Power	Disabled	Disabled
High Resistance GF		Disabled
Under Frequency	Disabled	Disabled
Over Frequency	Disabled	Disabled

General | Breaker

Events | Trend | Help | Sys-Health | Metering | User-Sett | Relay-Prot
Setup | Wave | Exit | Contact-IO | Virtual-IO | Prev-Maint | Brkr-Sett

This screen provides the following information:

- Breaker contact position – open/tripped
- Secondary disconnect position – connected/disconnected
- Instantaneous, Short Time, Long Time, and Ground Fault protection – enabled/disabled
- Ground Fault Alarm – open/tripped
- Oversvoltage, Undersvoltage, High Current, Phase Loss, and Reverse Power – enabled/disabled for trip and alarm
- Phase Currents, Phase Voltages, and Line Voltages – RMS and voltage values

Demand Metering

Demand Metering window displays breaker load information about the selected breaker

Metering Tab
Breaker # 1

Breaker Status | Demand | Detailed Metering | Harmonics

Demand

	Real	Reactive	Apparent
Prev Interval	-3.426 MW	-2.603 MVAR	4.303 MVA
Maximum	-5.476 MW	-2.647 MVAR	5.476 MVA
Date of Max.	04/09/2005 17:54:00	04/10/2005 18:21:00	04/09/2005 17:54:00

Date of Last Demand Reset	04/09/2005 15:01:32
Quantity of 'Last Resets'	19
Date of Last Resets - All Breakers	04/09/2005 15:01:32
Quantity of 'Last Resets All'	9
Date of Last Log Clear	04/09/2005 15:02:04
Record since Last Clear	4542
Records Available	4542
Date of Last Clear - All Breakers	04/09/2005 15:02:00

Communication OK ■

Brkr-1 Brkr-2 Brkr-3
Brkr-4 Brkr-5 Brkr-6
Brkr-7 Brkr-8 Brkr-9
Brkr-10 Brkr-11 Brkr-12
Brkr-13 Brkr-14 Brkr-15
Brkr-16 Brkr-17 Brkr-18
Brkr-19 Brkr-20 Brkr-21
Brkr-22 Brkr-23 Brkr-24
Brkr-25 Brkr-26 Brkr-27
Brkr-28 Brkr-29 Brkr-30

General Breaker

Events Trend Help Sys-Health Metering User-Sett Relay-Prot
Setup Wave Exit Contact-IO Virtual-IO Prev-Maint Brkr-Sett

Detailed Metering

Detailed Metering window displays current, voltage, energy, and power data for the selected breaker.

Metering Tab
Breaker # 1

Breaker Status | Demand | Detailed Metering | Harmonics

Detailed Metering

	3 Phase	Phase A	Phase B	Phase C
Real	-3.426 MW	0.00 W	0.00 W	0.00 W
Reactive	-2.603 MVAR	0.00 VAR	0.00 VAR	0.00 VAR
Apparent	4.303 MVA	0.00 VA	0.00 VA	0.00 VA

	Present	Lag	Lead
Power Factor	0.796	0.000	0.000
Minimum	0.796	0.000	0.000
Date of Min	04/10/2005 17:21:41	01/01/1970 00:00:00	01/01/1970 00:00:00
Maximum	0.999	0.000	0.000
Date of Max	04/09/2005 15:07:11	01/01/1970 00:00:00	01/01/1970 00:00:00

	Wh	Wh	Wh	Wh
Energy	0.00	0.00	0.00	0.00
+ve Wh	0.00	0.00	0.00	0.00
-ve Wh	-311.283	0.00	0.00	0.00
+ve VARh	739.311	0.00	0.00	0.00
-ve VARh	-129.125	0.00	0.00	0.00
VAh	354.776	0.00	0.00	0.00

Date of Last Energy Clear	04/09/2005 15:07:08
Date of Last Energy Clear-All Breakers	04/09/2005 15:07:11

Communication OK ■

Brkr-1 Brkr-2 Brkr-3
Brkr-4 Brkr-5 Brkr-6
Brkr-7 Brkr-8 Brkr-9
Brkr-10 Brkr-11 Brkr-12
Brkr-13 Brkr-14 Brkr-15
Brkr-16 Brkr-17 Brkr-18
Brkr-19 Brkr-20 Brkr-21
Brkr-22 Brkr-23 Brkr-24
Brkr-25 Brkr-26 Brkr-27
Brkr-28 Brkr-29 Brkr-30

General Breaker

Events Trend Help Sys-Health Metering User-Sett Relay-Prot
Setup Wave Exit Contact-IO Virtual-IO Prev-Maint Brkr-Sett

Harmonics Metering

Harmonics Metering window displays K factor and harmonic distortion information about the selected breaker.

Metering Tab
Breaker # 1

Breaker Status | Demand | Detailed Metering | Harmonics

Harmonics

K Factor

Phase	K Factor
A	1.00
B	1.00
C	66.50
N	1.00

Total Harmonic Distortion

Phase	Current THD
A	0.000
B	0.000
C	10.422
N	0.000

Phase	Voltage THD
Van	0.030
Vbn	0.000
Vcn	0.017

Breaker Control Status

Breaker Name	Breaker # 1
Current Status	Open

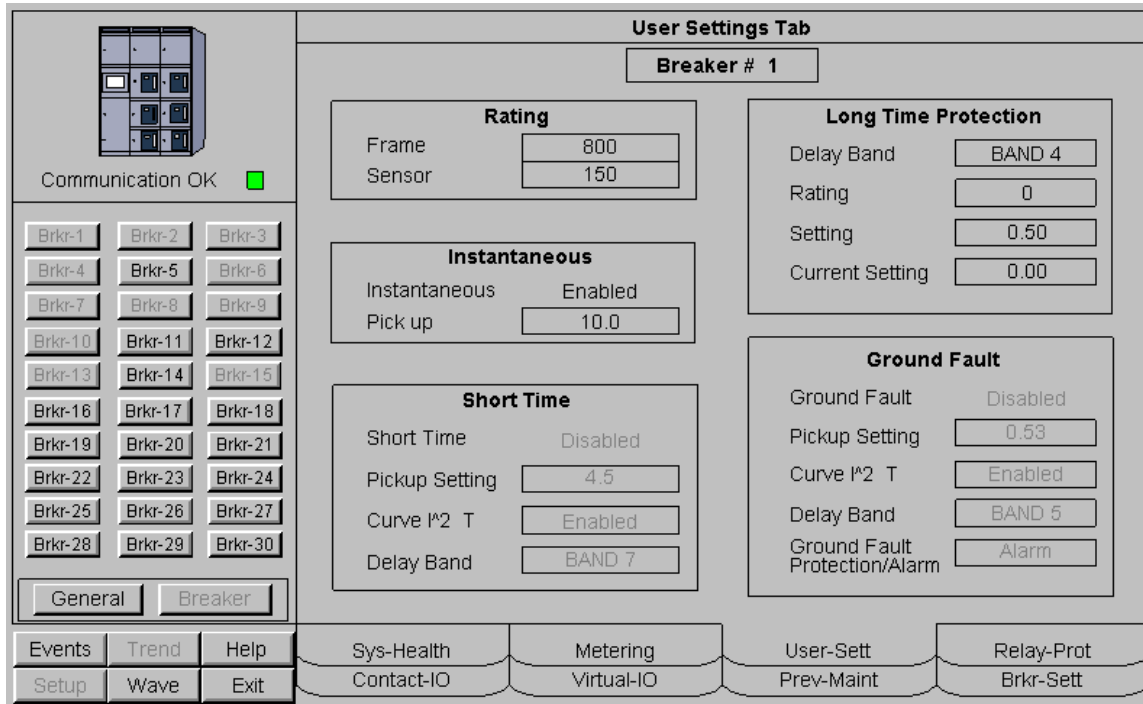
General | Breaker

Events | Trend | Help | Sys-Health | Metering | User-Sett | Relay-Prot
Setup | Wave | Exit | Contact-IO | Virtual-IO | Prev-Maint | Brkr-Sett

User Setting

Entellisys provides different kinds of protections: Long Time (LT), Short Time (ST), Instantaneous Overcurrent (IOC), and Ground Fault (GF). The system provides overcurrent protection for each breaker by monitoring the phase currents at each breaker. When an overcurrent condition is detected, the system opens the breaker.

Here User setting screen shows data related to Overcurrent Protection. This screen lets you see present Over current Protection, IOC/Short Time, Long Time, and Ground Fault settings.



Relay Protection

Entellsys provides single-point protection relay functions in three optioned packages.

The Voltage Relay package has the following functions:

- Undervoltage Protection Relay
- Overvoltage Protection Relay
- Phase Loss Protection Relay

The Frequency and Reverse Power Relay package has the following functions:

- Under Frequency Protection Relay
- Over Frequency Protection Relay
- Reverse Power Protection Relay

High Current Relay Package has the following function:

- High Current Protection Relay

Page1

Relay Protection Tab

Breaker # 1

Trip		Alarm	
Over Voltage		Over Voltage	
Pickup Setting	125.0	Pickup Threshold	105.0
Time Delay	0.5	Time Delay	599.5
Phase Requirement	1 Phase Violates Threshold	Phase Requirement	2 Phases Violate Threshold
Open Trip	Trip & Activate Lockout		
Under Voltage		Under Voltage	
Curve Type	Inverse Time Curve	Curve Type	Inverse Time Curve
Pickup Setting	51.0	Pickup Setting	51.0
Time Delay	31.0	Time Delay	1.0
Phase Requirement	1 Phase Violates Threshold	Phase Requirement	3 Phases Violate Threshold
Blocking Voltage Setting	6.0	Blocking Voltage Setting	6.0
Open Trip	Trip & Activate Lockout		
Reverse Power		Reverse Power	
Pickup Setting	10.0	Pickup Threshold	10.0
Time Delay	30.5	Time Delay	16.0
Open Trip	Open & Don't Activate Lockout		

General Breaker

Events Trend Help
Setup Wave Exit

Sys-Health Metering User-Sett Relay-Prot
Contact-IO Virtual-IO Prev-Maint Brkr-Sett

Page 2

Relay Protection Tab

Breaker # 1

Trip		Alarm	
Over Frequency		Over Frequency	
Pickup Setting	50.1	Pickup Setting	50.2
Time Delay	30.1	Time Delay	30.2
Blocking Voltage Setting	10	Blocking Voltage Setting	10
Open Trip	Open & Don't Activate Lockout		
Under Frequency		Under Frequency	
Pickup Setting	45.1	Pickup Setting	45.2
Time Delay	30.1	Time Delay	30.2
Blocking Voltage Setting	10	Blocking Voltage Setting	10
Open Trip	Open & Don't Activate Lockout		
Phase Loss		Phase Loss	
Pickup Setting	11.0	Pickup Setting	13.0
Time Delay	31.0	Time Delay	12.0
Blocking Voltage Setting	5.0	Blocking Voltage Setting	5.0
Open Trip	Trip & Activate Lockout		

General Breaker

Events Trend Help
Setup Wave Exit

Sys-Health Metering User-Sett Relay-Prot
Contact-IO Virtual-IO Prev-Maint Brkr-Sett

Page 3

Relay Protection Tab

Breaker # 1

Alarm

High Current

Pickup Setting	200.0
Time Delay	15.0

High Resistance GF

Pickup Setting	9.9
Time Delay	4.9
Ground Resistance	6
Ground CT Rating	10

Communication OK ■

Brkr-1 Brkr-2 Brkr-3
 Brkr-4 Brkr-5 Brkr-6
 Brkr-7 Brkr-8 Brkr-9
 Brkr-10 Brkr-11 Brkr-12
 Brkr-13 Brkr-14 Brkr-15
 Brkr-16 Brkr-17 Brkr-18
 Brkr-19 Brkr-20 Brkr-21
 Brkr-22 Brkr-23 Brkr-24
 Brkr-25 Brkr-26 Brkr-27
 Brkr-28 Brkr-29 Brkr-30

General Breaker

Events Trend Help
 Setup Wave Exit

Sys-Health Metering User-Sett Relay-Prot
 Contact-IO Virtual-IO Prev-Maint Brkr-Sett

Preventive Maintenance

Entellisys provides data to manage preventative maintenance items. Breaker transition counters, life calculations, run hours of operations, and last operation date stamping are all values that can aid in maintaining and servicing the Entellisys system. Transition counters can trigger alarms after a certain number of transitions have occurred. The *Preventative Maintenance* screen lets you specify general setup and alarm setup maintenance settings.

Preventive Maintenance Tab

Breaker # 1

Preventive Maintenance

	Actual Value
No. of Oper. As per ANSI/IEEE C37.13 & C37.16	54
No. of No-Load Oper. As per ANSI/IEEE C37.13 & C37.16	5
No. of Load Oper. As per ANSI/IEEE C37.13 & C37.16	2
No. of Fault Oper. As per ANSI/IEEE C37.13 & C37.16	5
Percentage of Total Load Life As per ANSI C37.50	25.12
Percentage of Mechanical Life As per ANSI C37.50	0.43
Date of Initial Energization	06/30/2005 00:00:00
Hours of Operations	1191169
Date of Last Operation	04/08/2005 11:03:01

Line Up Options

- Synch Check Relay
- Bus Differential Relay
- Multi Source Ground Fault
- ZSI
- High Resistance Ground Fault
- Waveform Capture

Per Breaker Options

Expanded Metering Count	30
Demand Metering Count	30
Advanced Metering Count	30
Voltage Relay Count	30
High Current Relay Count	30
Frequency & High Power Relay Count	30

Communication OK ■

Brkr-1 Brkr-2 Brkr-3
 Brkr-4 Brkr-5 Brkr-6
 Brkr-7 Brkr-8 Brkr-9
 Brkr-10 Brkr-11 Brkr-12
 Brkr-13 Brkr-14 Brkr-15
 Brkr-16 Brkr-17 Brkr-18
 Brkr-19 Brkr-20 Brkr-21
 Brkr-22 Brkr-23 Brkr-24
 Brkr-25 Brkr-26 Brkr-27
 Brkr-28 Brkr-29 Brkr-30

General Breaker

Events Trend Help
 Setup Wave Exit

Contact-IO Virtual-IO Prev-Maint Brkr-Sett
 Sys-Health Metering User-Sett Relay-Prot

Breaker Setting

This is part of factory configuration settings. It lets the user to see Breaker settings.

Breaker Setting Tab

Breaker Settings

Breaker # 1

Installed

Commissioned

PT Rating: 480 V Delta

Breaker Type: ANSI

Frame Rating: 800

Sensor Rating: 150

Hardware Version: 0.00

Firmware Version: 0.05

Message Protocol Version: 1.00

Long Time Rating: 0

Long Time Setting: 0.50

Long Time Current Setting: 0.00

General | Breaker

Events | Trend | Help | Setup | Wave | Exit

Contact-IO | Virtual-IO | Prev-Maint | Brkr-Sett
Sys-Health | Metering | User-Sett | Relay-Prot

Contact Input/Output

Contact Input

CI screen displays a list of all the contact inputs configured along with the input name and state – On or Off

Contact Inputs & Outputs Tab

Contact Input | Contact Output

Contact Inputs Contact Input Count :: 128

Contact Input	Name	State
17	Contact Input 17	Off
18	Contact Input 18	Off
19	Contact Input 19	Off
20	Contact Input 20	Off
21	Contact Input 21	Off
22	Contact Input 22	Off
23	Contact Input 23	Off
24	Contact Input 24	Off
25	Contact Input 25	Off
26	Contact Input 26	Off
27	Contact Input 27	Off
28	Contact Input 28	Off
29	Contact Input 29	Off
30	Contact Input 30	Off
31	Contact Input 31	Off
32	Contact Input 32	Off

On (Green square) | Off (Red square)

Device Name : ELVS

IP Addr: 3, 13, 81, 11

Modbus Addr: 1

CPU Name : CPU-A

Synchronization Hardware OK

Version

CPU Msg Protocol Version No. 1.00

Hardware : 1.00


Firmware : 3.00

Boot Code : 1.00

General | Breaker

Events | Trend | Help | Setup | Wave | Exit

Contact-IO | Virtual-IO | Prev-Maint | Brkr-Sett
Sys-Health | Metering | User-Sett | Relay-Prot



Communication OK ■

Device Name : ELVS
IP Addr: 3 . 13 . 81 . 11
Modbus Addr: 1
CPU Name : CPU-A

Synchronization Hardware OK ●

Version
CPU Msg Protocol Version No. 1.00
Hardware : 1.00
Firmware : 3.00
Boot Code : 1.00

General Breaker

Virtual Inputs & Outputs Tab

Virtual Inputs
Virtual Outputs

Virtual Input	Name	State
1	Virtual Input 1	■
2	Virtual Input 2	■
3	Virtual Input 3	■
4	Virtual Input 4	■
5	Virtual Input 5	■
6	Virtual Input 6	■
7	Virtual Input 7	■
8	Virtual Input 8	■
9	Virtual Input 9	■
10	Virtual Input 10	■
11	Virtual Input 11	■
12	Virtual Input 12	■
13	Virtual Input 13	■
14	Virtual Input 14	■
15	Virtual Input 15	■
16	Virtual Input 16	■

▲
▼

■ On
■ Off

Events Trend Help


Setup Wave Exit

Contact-IO Virtual-IO Prev-Maint Brkr-Sett

Sys-Health Metering User-Sett Relay-Prot

Virtual Output

It lets the user to view the state of Virtual Inputs . For each virtual input, Entellisys displays its name and current state.



Communication OK ■

Device Name : ELVS
IP Addr: 3 . 13 . 81 . 11
Modbus Addr: 1
CPU Name : CPU-A

Synchronization Hardware OK ●

Version
CPU Msg Protocol Version No. 1.00
Hardware : 1.00
Firmware : 3.00
Boot Code : 1.00

General Breaker

Virtual Inputs & Outputs Tab

Virtual Inputs
Virtual Outputs

Virtual Output	Name	State
17	Virtual Output 17	■
18	Virtual Output 18	■
19	Virtual Output 19	■
20	Virtual Output 20	■
21	Virtual Output 21	■
22	Virtual Output 22	■
23	Virtual Output 23	■
24	Virtual Output 24	■
25	Virtual Output 25	■
26	Virtual Output 26	■
27	Virtual Output 27	■
28	Virtual Output 28	■
29	Virtual Output 29	■
30	Virtual Output 30	■
31	Virtual Output 31	■
32	Virtual Output 32	■

▲
▼

■ On
■ Off

Events Trend Help

Setup Wave Exit

Contact-IO Virtual-IO Prev-Maint Brkr-Sett

Sys-Health Metering User-Sett Relay-Prot

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	

#1	#2	#3 & #4	Sliding Window Key Thumbwheel Settings	
Class	Sub-class	Instance	Measurement	Supported Modes
4	3	68	V1 HD - K-Factor	STD TD SD PD
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

#1	#2	#3 & #4	Sliding Window Key Thumbwheel Settings	
Class	Sub-class	Instance	Measurement	Supported Modes
4	3	95	I2 HD - Harmonic #2	STD TD SD PD
4	3	96	I3 HD - Harmonic #2	STD TD SD PD
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

#1	#2	#3 & #4	Sliding Window Key Thumbwheel Settings	
Class	Sub-class	Instance	Measurement	Supported Modes
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
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

#1	#2	#3 & #4	Sliding Window Key Thumbwheel Settings	
Class	Sub-class	Instance	Measurement	Supported Modes
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
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*.

1. In the EPM 3720 wizard's tabular data screen, click on the Setpoints tab.
2. 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.)
3. Based on the parameter that will be set in the Trigger Key, select the Setpoint Type.
4. 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.
5. Enter the High and Low Limits as well as any Time Delays to operate and release.
6. 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.

7. 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.
8. 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.
9. 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.
10. 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**.
11. View and save waveforms as desired.
12. 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

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	Sub-class	Instance	Meaning	
		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
		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

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	Sub-class	Instance	Meaning	
		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
		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

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	Sub-class	Instance	Meaning	
		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
		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

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	Sub-class	Instance	Meaning	
		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
		ED	I2 HD - Harmonic #13	STD TD SD PD
		EE	I3 HD - Harmonic #13	STD TD SD PD

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	Sub-class	Instance	Meaning	
		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
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

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	Sub-class	Instance	Meaning	
		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
		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

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	Sub-class	Instance	Meaning	
		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
		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

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	Sub-class	Instance	Meaning	
		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
		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

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	Sub-class	Instance	Meaning	
		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
		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

#1	#2	#3 & #4	Trigger Key Thumbwheel Setting	
Class	Sub-class	Instance	Meaning	
		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
		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).

Index

2

269 Plus Motor Management Relay, 82, 83, 178

5

565 Feeder Management Relay, 87, 206

7

735 Feeder Relay, 208

9

90/30, 226

90/70, 226

A

alarm, 83, 90

E

Elevation views, 1, 24, 41, 42, 50

Elevation Views, 49

Elevation wizards, 41, 49

EPM 3710 Meter, 76, 123

EPM 3720 Meter, 78, 124

EPM 7300 Meter, 125

EPM 7700 Meter, 80

event, 91, 94

F

Fanuc, 226

Floor Plans, 49

I

Interface Toolkit, 1, 3, 4

M

MDP Digital Overcurrent Relay, 102

MMII (Motor Manager II), 122

P

PMCS Interface Toolkit, 1

POWER LEADER EPM, 64, 96

POWER LEADER Meter, 72, 100

S

Spectra ECM, 74, 101

Spectra MVT trip unit, 67, 97

SR469 Motor Management Relay, 189

SR489 Generator Management Relay, 199

SR745 Transformer Management Relay, 211

SR750/SR760 Feeder Management Relay, 218

W

waveform capture, 94



GE Consumer & Industrial

*General Electric Company
41 Woodford Ave., Plainville, CT 06062*

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