



Instruction manual

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Power Management Control System (PMCS) software revision 7.00.

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PMCS

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PMCS

Glossary

Glossary

Baud rate	A measurement of a communication channel's signaling rate or information-carrying capacity. Communicating devices typically have configurable baud rates to provide compatibility with various speed communication networks. Higher baud rates generally provide faster data-refresh times.
CIMPLICITY HMI	An industry-standard supervisory control and data acquisition (SCADA) software package providing flexible, accurate, and easy-to-use graphics. CIMPLICITY HMI is based on client-server architecture, consisting of Servers and Viewer workstations. Servers are responsible for the collection and distribution of data. Viewer workstations connect into Servers and have full access to the collected data for viewing and control actions. Servers and Viewer workstations can be easily networked together to share data without the need to replicate your database from node to node.
CIMPLICITY HMI Server Development	Allows you to create new projects and can also function as a runtime system
CIMPLICITY HMI Server Runtime	Can be used as runtime systems only. They do not support project configuration.
CIMPLICITY HMI Viewer Runtime	Connects to Servers for viewing data and control actions
Communication network	A physical standard for wiring and interconnection of communicating devices. A communication network standard usually includes specifications of voltages, maximum cable-run lengths, shielding, termination, and cable requirements. RS485 and Ethernet are examples of communication-network standards.
Communication protocol	A language or convention used for reliable transmission and reception of binary data. A communication protocol is often independent of the physical method or network used for transmission. Modbus and TCP/IP are examples of communication protocol standards.
DDE	Dynamic data exchange. A Microsoft Windows standard for efficient sharing of data between applications on the same computer

DDE/OPC Server	A software application that typically runs in the background, gathering information from the network and providing the information in dynamic data exchange (DDE) and object linking and embedding for process control (OPC) format for use by one or more applications. The PMCS DDE/OPC Server is included in the PMCS Network & Device Configurator and comes in versions optimized for Ethernet TCP/IP or RS485 Modbus networks.
Ethernet	An industry-standard communication network commonly used for local-area networks (LANs) of computers. Ethernet-based PMCS systems provide high-speed, reliable communications at 10 megabits per second.
Ethernet gateway	The gateway increases performance of a PMCS system through multiple Modbus networks and reduces overall wiring costs through reuse of existing Ethernet LAN wiring
Event logger	A standard PMCS application that efficiently analyzes, sorts, and logs unusual system behavior, such as circuit breaker trips, undervoltages, and overcurrents. Extensive data-logging capabilities make it a useful tool for analyzing and predicting system maintenance patterns.
Host computer	The computer running the PMCS DDE Server. All other computers running PMCS client programs are referred to as Remote Viewers, viewer workstations, or networked computers.
IED	Intelligent electronic device
Interface Toolkit	An optional PMCS tool used to quickly generate accurate and friendly graphical user interfaces. The Interface Toolkit provides dozens of wizards to efficiently create intelligent one-line diagrams and tabular displays.
Modbus RTU	An industry-standard, nonproprietary communications protocol typically used in medium-speed networks (up to 38.4 kpbs) on RS485
Multinet	An Ethernet communications module that allows connection for up to 32 Modbus devices, providing Modbus TCP/IP communications for these devices over Ethernet. This allows connection to fiberoptic LAN and WAN systems for remote access to data.
NetBEUI	A network protocol usually used in small, department-size local-area networks of 1 to 200 clients
NetDDE	A version of dynamic data exchange (DDE) that allows communications between applications running on different computers over network connections
ODBC	Open database connectivity. An inter-application communication protocol required for certain PMCS client applications to share data. Automatically installed and configured as part of the PMCS installation.
PMCS	Power Management Control System. GE's high-performance power-management system for Windows, including open network protocols, waveform capture and analysis, and event logging.
PLC	Programmable logic controller
RELT	Reduced energy let-through instantaneous protection. A measurement displayed in PMCS for GTU devices.
RS485	An industry-standard communication network supporting up to 32 networked devices. RS485 provides medium-speed, reliable communication transport through shielding, balanced transmission voltages, and termination.
RTD	Resistive temperature device. This function varies resistance based on temperature.

RTU	Remote terminal unit. A microprocessor based device, such as a relay.
SCADA	Supervisory control and data acquisition. A category of systems that primarily acquires data for logging and analysis, as well as providing supervisory control in applications without time-critical requirements. Power-management systems are a direct application of SCADA technology.
TCP/IP	Transmission control protocol / Internet protocol. An industry-standard protocol typically used on Ethernet or token-ring LANs.
Waveform capture	A standard PMCS application that provides a window into power-quality data in an electrical system. Waveform capture is used to view snapshots of voltage and current waveforms from various points in an electrical system to analyze harmonics and unusual system behavior.

PMCS

Chapter 1: Introduction

Overview

The Power Management Control System (PMCS) accesses GE Multilin™ and third-party devices in a substation and provides graphical representations of status and energy trends, remote control, and automated responses. By optimizing methods used to control both processes and equipment, energy efficiency is realized.

PMCS is intended for installation with CIMPLICITY® HMI. The wizards contained in the PMCS software allow you to quickly build accurate and friendly user interfaces with CIMPLICITY. Installation of PMCS adds PMCS and EnerVista™ Integrator™ functionality to CIMPLICITY, where EnerVista Integrator integrates the comprehensive line of POWER LEADER™ devices, as well as many new Modbus remote terminal unit (RTU) devices and systems.

PMCS supports Ethernet and baud rates of up to 38.4 kbps on a Modbus-based network and 10 Mbps on an Ethernet TCP/IP network. This results in near real-time screen viewing and immediate access to critical event and alarm data.

This document provides an introduction to PMCS and outlines how to configure CIMPLICITY for PMCS and how to view information for devices. For information on devices supported, installation, and starting the software, see the PMCS Quickstart Guide.

Features

PMCS includes the following features that make the system powerful and easy to use:

- Compatible with industry-standard third-party supervisory control and data acquisition (SCADA) platforms
- Built-in Modbus RTU network compatibility for an open network architecture and high-speed communications
- Built-in Ethernet TCP/IP network compatibility for high-speed communication and reduced wiring costs
- 3D virtual-device interaction with accurately reproduced device look and feel
- Improved waveform capture, including extensive analysis tools
- Comprehensive alarm and event reporting for immediate diagnosis of electrical system problems

HMI application size

- 20,000 points/tags in human machine interface (HMI) database (30,000 maximum)
- 600 HMI alarms configured maximum
- 600 trended points (eight maximum per device)
- HMI I/O rates, alarm rates, and logging rates not to exceed 750 pts/sec
- 17 device types supported with two wizard types (Basic and Advanced) that can be configured using PowerBuilder
- 10% of tags connected to enterprise solution
- Web-enabled only via CIMPLICITY WebView; no waveform or event viewers

Special application issues

- No redundancy

Performance

Response times:

- One second or less to open an HMI screen
- One second update time to populate a screen per device per serial port (except for UR-series and ELVS400 devices)
- 4 to 7 second time delay to display event in PMCS Event Viewer
- One second response time to make device change (settings/command coil) not including device feedback
- 1000 device events/sec burst support

Configuration:

- Maximum 15 devices per serial port
- Device baud rates set to maximum
- CIMPLICITY HMI points set for on-demand
- Devices supporting 125 register block reads
- Average CPU utilization <35%
- 99% system uptime

OPC client data items size

- Up to 65,000 points/tags in OPC clients
- 10% of tags connected to enterprise solution

Devices supported

PMCS supports GE Multilin and third-party devices, including Modbus-based devices. The table outlines the devices supported. The numbered products 239, 339, and so on, are also referred to as SR239, SR339, and so on. Firmware revisions other than those listed may not be compatible. When in doubt, contact your GE Sales Representative or GE Digital Energy as outlined in the [For further assistance](#) section.

Table 1: Devices supported by PMCSDevices

Device family	Device	Firmware
ATS	MX150	5.4x, 6.0x
	MX250	5.4x, 6.0x
	MX350	1.2x
UPS	UPS, UPS LP, UPS SG	1.0
Trip Units/Switchgear	Spectra MicroVersa Trip	5.1x
	Enhanced MicroVersa Trip C	4.1x
	Enhanced MicroVersa Trip D	4.1x
	GTU (EntelliGuard TU Trip Unit)	7.0x
	ELVS (Entellisys)	4.5x
	MET	12.02.02
Meters/Switches	PQM	3.3x to 3.6x
	PQMII	1.0x to 2.2x
	EPM1000	3.8x
	EPM2000	1.0x
	EPM2200	1.0x
	EPM4000	3.8x
	EPM5000P	2.4x
	EPM5300P	2.4x
	EPM5350P	2.4x
	EPM6000	1.0x
	EPM9450Q	2.1x
	EPM9650Q	2.1x
	EPM9800	6.1x
	ML2400	3.0x
	Distribution Feeder	350
F35		2.6x to 5.9x
F60		2.6x to 5.9x
F650		1.6x to 5.4x
MIF 2		4.0
735/737		1.5x
750/760		3.6x to 7.4x
G30		4.4x to 5.9x
G60		2.6x to 5.9x
Generator		489
	D30	5.0x to 5.9x
	D60	2.6x to 5.9x
	D90 ^{Plus}	1.8x

Device family	Device	Firmware
Line Current Differential Protection	L30	5.6x to 5.9x
	L60	2.6x to 5.9x
	L90	2.6x to 5.9x
Transformer	745	2.4x to 5.2x
	T35	2.6x to 5.9x
	T60	2.6x to 5.9x
	345	1.3x to 1.4x
Motor	239	2.3x to 2.7x
	269+	6.0x
	339	1.3x to 1.4x
	369	1.6x to 3.4x
	469	2.5x to 5.1x
	MM200	1.0x to 1.2x
	MM300	1.2x to 1.5x
	MMII	4.0x to 5.2x
	MMIII	1.0 to 1.2x
	RRTD	1.4x, 1.5x
	SPM	2.0x, 2.1x
	M60	2.6x to 5.9x
Network	N60	3.4x to 5.9x
Bus	B30	2.6x to 5.9x
	B90	4.8x to 5.9x
Specialized	C30	2.6x to 5.9x
	C60	2.6x to 5.9x
	C90 ^{Plus}	1.6x to 1.8x
Miscellaneous	MRPO	1.0
	FIRETRACER	1.0
	VERSAMAX	1.0

PMCS includes a set of customized wizard screens for the devices listed in the following table.

Table 2: Customized wizard screens

Device family	Device
Trip Units/Switchgear	Spectra MicroVersa Trip
	Enhanced MicroVersa Trip C
	Enhanced MicroVersa Trip D
	GTU (EntelliGuard TU Trip Unit)
	ELVS (Entellisys)
Meters	PQM
	PQMII
	EPM9450Q
	EPM9650Q
Distribution Feeder	735/737
	750/760

Device family	Device
Generator	489
Transformer	745
Motor	469
Universal Relays	UR

For further assistance

For product support, contact the information and call center as follows. Have your software key(s) ready.

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Comments about new features or modifications for specific requirements are welcome.

PMCS

Chapter 2: Configure CIMPLICITY

To use PMCS in CIMPLICITY, the latter needs to be configured for it. This chapter outlines how to add a project for PMCS in CIMPLICITY.

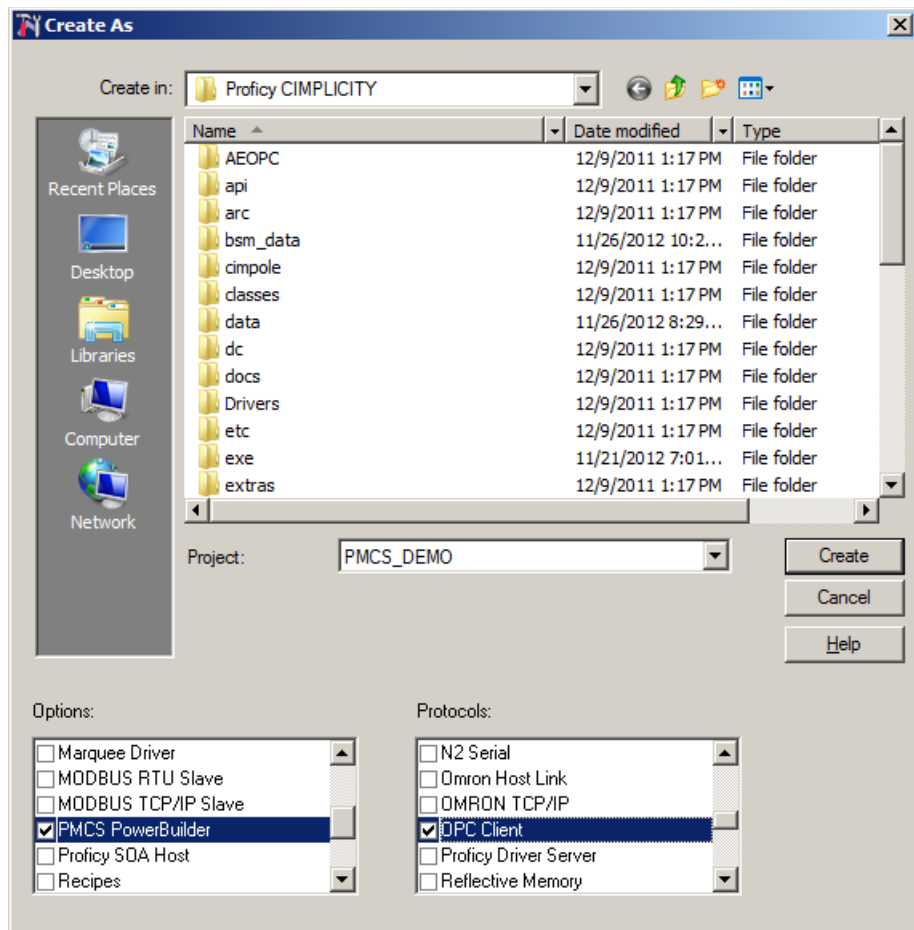
Add PMCS project in CIMPLICITY

This section outlines how to place and configure a PMCS wizard in CIMPLICITY HMI. You do this by adding a project in CIMPLICITY for PMCS.

To add a PMCS project in CIMPLICITY:

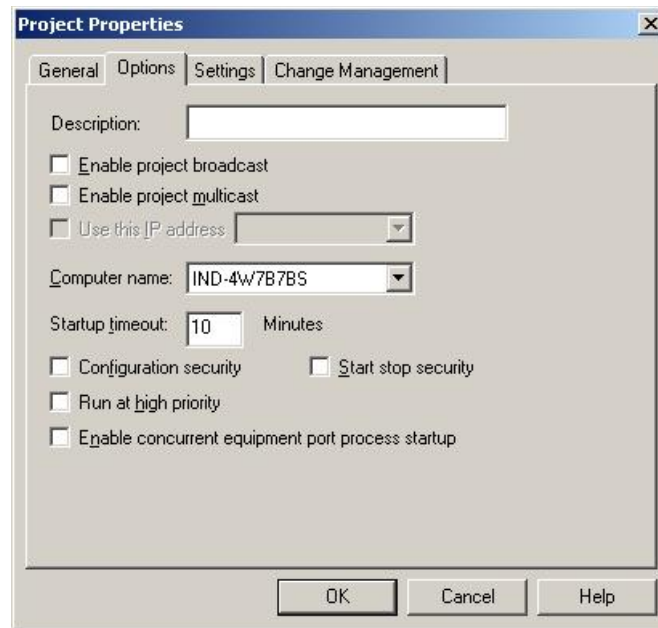
1. In CIMPLICITY HMI, create a new project by clicking the **New Project** button or selecting **File > New Project**. A window opens.
2. Enter a **Project Name** and select a folder in which to store the project (usually in the `cimplicity\hmi\projects\` folder). Under **Options**, select **PMCS PowerBuilder** and under **Protocols**, select **OPC Client**. Click the **Create** button to write the project file to disk and open the Project Properties window. See the following figure.

Figure 1: Creating a new project in CIMPLICITY



3. In the Project Properties window, click the **Options** tab, and select the **Enable project broadcast** checkbox if you want to use CIMPLICITY HMI remote view nodes. Ensure that the **Computer name** field matches the name of the host machine. Disregard the **Startup timeout** field and the **General** tab. Click **OK** to open the CIMPLICITY HMI Project Wizard.

Figure 2: Project Properties window



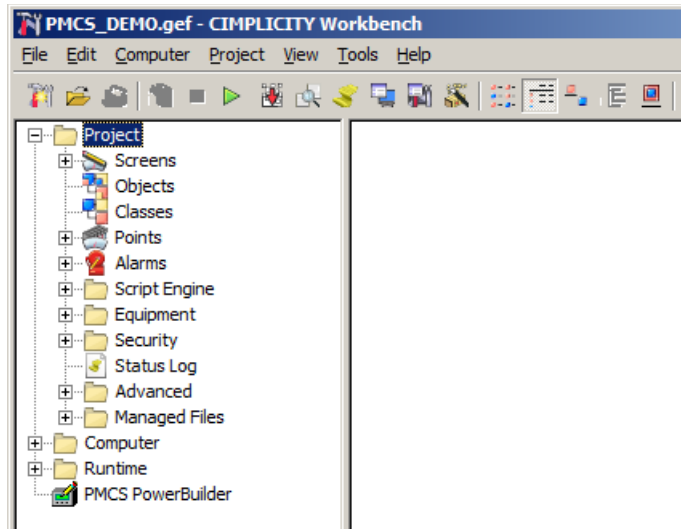
4. Complete the CIMPLICITY Project Wizard. At the end, click **Finish** to complete the setup.

Figure 3: CIMPLICITY Project Wizard



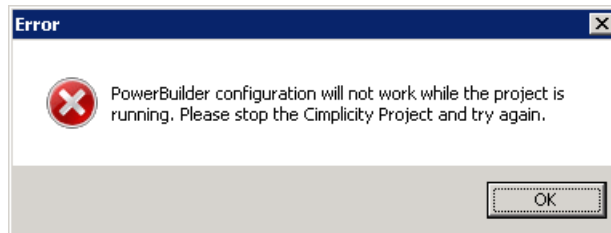
5. Access the CIMPLICITY Workbench view for the project.

Figure 4: CIMPLICITY Workbench window



6. With CIMPLICITY Project no longer running, double-click the **PMCS PowerBuilder** item. When CIMPLICITY Project is still running, the following error message displays; close the project window. Once PMCS PowerBuilder has launched, you can view device data as outlined in the next chapter.

Figure 5: Error message when CIMPLICITY still running



With successful launch of PMCS PowerBuilder, any supported devices configured in the PMCS configurator display in a list. If this configuration has not been done, do so now using the Quickstart Guide, then run PowerBuilder after device configuration is complete.

On first run, PowerBuilder reads the device configuration details from the server topic files (TOPIC.CFG). It populate the list with configured devices in the default one-line options, as shown in the following figure.

On next run, PowerBuilder loads the device details from the topic files and sets the one-line preferences of already configured devices as per previous configuration. The **Created** check box is enabled for these devices.

The next chapter explains how to use the main PowerBuilder window and the information available for various devices.

Figure 6: Devices listed in PMCS PowerBuilder

PMCSPowerBuilder - C:\Manoj_work\Work\PMCS 7\Test Cim Projects\PowerBuilderTestProj\POWERBUILDERTESTPROJ.gef

Select Devices to be Configured in Cimplicity Project

Device Name	Device Type	Server	Wizard	Created	OPC Port
EM_ELVS400	ELVS400	GE32MTCP	Basic	<input checked="" type="checkbox"/>	OPC_0
EM_EMVTC	EMVTC	GE32MTCP	Basic	<input checked="" type="checkbox"/>	OPC_0
EM_EMVTD	EMVTD	GE32MTCP	Basic	<input checked="" type="checkbox"/>	OPC_0
EM_GTU	GTU	GE32MODB	Basic	<input checked="" type="checkbox"/>	OPC_0
EM_MLPQMII	MLPQMII	GE32MTCP	Basic	<input checked="" type="checkbox"/>	OPC_0
LAB_ML489	ML489	GE32MTCP	Basic	<input type="checkbox"/>	OPC_0
LAB_ML745	ML745	GE32MTCP	Basic	<input type="checkbox"/>	OPC_0
LAB_ML750	ML750	GE32MTCP	Basic	<input type="checkbox"/>	OPC_0
LAB_ML760	ML760	GE32MTCP	Basic	<input type="checkbox"/>	OPC_0
LAB_MLPQM	MLPQM	GE32MTCP	Basic	<input type="checkbox"/>	OPC_0

PMCS

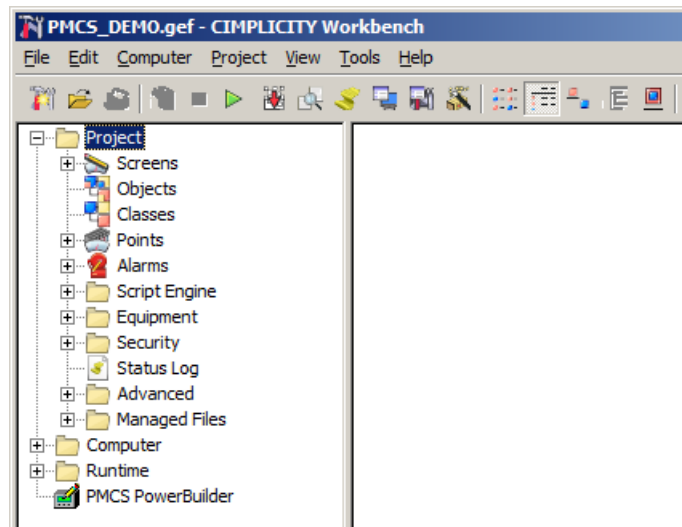
Chapter 3: PowerBuilder window

The main window PMCS PowerBuilder allows access to device information. This chapter explains the window. The information displayed was entered during installation of PMCS; to add devices, see the PMCS Quickstart Guide.

PowerBuilder window explained

To launch PowerBuilder, double-click the **PMCS PowerBuilder** menu item as outlined at the end of the previous chapter.

Figure 7: CIMPLICITY Workbench window



The following figure shows an example of the main PMCS PowerBuilder window. Devices with an ML prefix refer to GE Multilin products. Such products are referred to elsewhere in this document without the prefix, for example 369 instead of ML369.

Figure 8: Devices listed in PMCS PowerBuilder

Device Name	Device Type	Server	Wizard	Created	OPC Port	Faceplate	Symbol	Data Table
EM_ELV5400	ELVS400	GE32MTCP	Basic	<input checked="" type="checkbox"/>	OPC_0	Style 1	Style 3	4 Lines
EM_EMVTC	EMVTC	GE32MTCP	Basic	<input checked="" type="checkbox"/>	OPC_0	None	Style 3	2 Lines
EM_EMVTD	EMVTD	GE32MTCP	Basic	<input checked="" type="checkbox"/>	OPC_0	Style 1	Style 1	2 Lines
EM_GTU	GTU	GE32MODB	Basic	<input checked="" type="checkbox"/>	OPC_0	Style 1	Style 1	3 Lines
EM_MLPQMII	MLPQMII	GE32MTCP	Basic	<input checked="" type="checkbox"/>	OPC_0	Style 1	None	None
LAB_ML489	ML489	GE32MTCP	Basic	<input type="checkbox"/>	OPC_0	Style 1	None	None
LAB_ML745	ML745	GE32MTCP	Basic	<input type="checkbox"/>	OPC_0	Style 2	None	3 Lines
LAB_ML750	ML750	GE32MTCP	Basic	<input type="checkbox"/>	OPC_0	Style 1	Style 2	3 Lines
LAB_ML760	ML760	GE32MTCP	Basic	<input type="checkbox"/>	OPC_0	Style 1	Style 2	4 Lines
LAB_MLPQM	MLPQM	GE32MTCP	Basic	<input type="checkbox"/>	OPC_0	Style 1	None	2 Lines

Settings

The following settings are available in the PowerBuilder window.

Device Name

This is a read-only field populated from the device name topic file. An example is Mill_Relay.

Device Type

This is a read-only field populated from the device type topic file. An example is EMVTC.

Server

This is a read-only field populated from the device name and based on the Server (GE32MTCP/GE32MODB) topic file.

Wizard

Two types of wizards are available: basic and advanced. This field indicates the available wizard. By default, basic is selected. The basic wizard contains a single **Overview** tab, which consists metering data and device front panel LED status. The advanced wizard contains multiple tabs, including the **Overview**, **Settings**, **Commands**, **IO**, and **Analysis** tabs.

Created

When a checkbox is already selected, it means that the device has already been configured in CIMPLICITY Project. To configure any additional devices, enable the appropriate checkbox.

Normally, after first installation, you ensure that all checkboxes are selected so that all devices are configured. Then when you later add devices, you select the checkboxes here, then click the **Generate** button to proceed with configuration. The **Generate** button is explained later in this chapter.

OPC Port

The object linking and embedding for process control (OPC) port. The default is OPC_0. This setting controls how CIMPLICITY manages devices. Giving several devices the same OPC Port, such as OPC_0, means that there is a collection of devices in a virtual port, similar to a group devices.

Faceplate


















The faceplate style available. The default value is taken from the preference option for that device type:

- None
- Style 1
- Style 2

This setting is not for setting the faceplates displayed in the windows for each device (as shown in the next chapter).

Table 3: Faceplate styles

Device name	Style 1 - 2D small faceplate	Style 2 - 3D small faceplate
GTU		
MVT		
EMVT		
469		
489		
















Device name	Style 1 - 2D small faceplate	Style 2 - 3D small faceplate
735/737		
745		
750/760		
PQM		
PQMII		
UR		
EPM9450		
EPM9650		
ELVS400		

Symbol

The list of available symbol options. The default value is taken from the preference option for that device type:

- None
- Style 1
- Style 2
- Style 3

Table 4: Symbols

Style	No communication	Breaker open	Breaker closed	Breaker trip	Breaker racked out
None					
Style 1					
Style 2					
Style 3					

Data Table

The available data display options. The default value is taken from the preference option for that device type.

Table 5: Data Table

Data Table option	Data displayed
None	
2 Lines	Line 1, 2
3 Lines	Line 1, 2, 3
4 Lines	Line 1, 2, 3, 4
5 Lines	Line 1, 2, 3, 4, 5

Table 6: Data Table lines

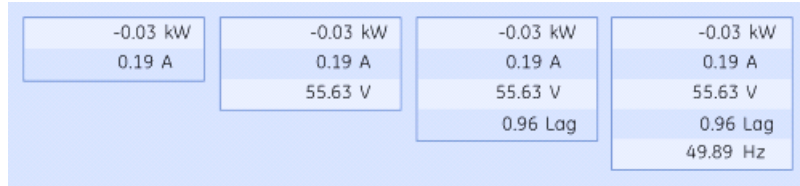
Device	Line 1	Line 2	Line 3	Line 4	Line 5
ELVS	Real Power	Avg Current	Avg Voltage	% LOAD	FREQ
EMVTC	Real Power	Avg Current	Avg Voltage	% LOAD	Avg PF
EMVTD	Real Power	Avg Current	Avg Voltage	% LOAD	Avg PF
MVT	Real Power	Avg Current	Avg Voltage	% LOAD	Avg PF
GTU	Real Power	Avg Current	Avg Voltage	% LOAD	Avg PF
PQM	Real Power	Avg Current	Avg Voltage	FREQ	Avg PF
PQMII	Real Power	Avg Current	Avg Voltage	FREQ	Avg PF
EPM9650/9450	Real Power	Avg Current	Avg Voltage	FREQ	Avg PF
469	Real Power	Avg Current	Avg Voltage	RPM	Thermal Capacity
489	Generator Load	Avg Current	Avg Voltage	RPM	GEN LOAD
735/737	Average Current	Ground Current	--	--	--
745	W1 Real Power	W1 Avg Current	W2 Real Power	W2 Avg Current	FREQ
750/760	Real Power	Avg Current	Avg Voltage	% LOAD	FREQ
UR	Src1 Real Power	Src1 Avg Current	Src1 Avg Voltage	AvgPF	FREQ

The figure shows the formats for the two to five-line options, followed by an example.

Figure 9: Two to five-line formats



Figure 10: Two to five-line examples



The 735 and 737 have two lines of data available, these being average and ground current.

Figure 11: Display for 735/737

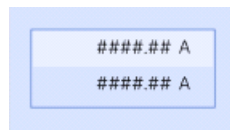
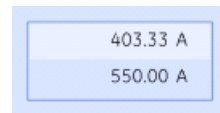


Figure 12: Example for 735/737



Buttons

The following buttons are available in the PowerBuilder window.

Select All Devices

Sets the **Created** checkboxes for all the devices to the checked state.

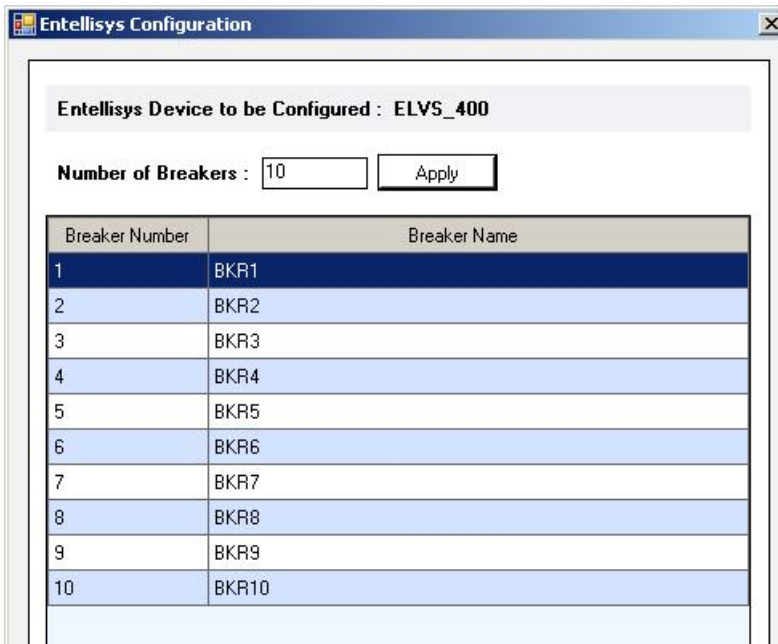
Clear All Devices

Sets the **Created** checkboxes for all the devices to the unchecked state.

ELVS Device Name

ELVS devices have a button beside the device name. Click the button to show the Entellisis breaker configuration window, where you specify the number of breakers and a name for each. The default name for each breaker is in the form BKR1, BKR2, and so on. To change the name, type in the field. The information is used in class object creation and passed on to the respective CIMPLICITY screens. When the number of breakers specified is greater than the actual number, blank rows appear at the end. When the number of breakers specified is less than the actual number, rows are removed from the end.

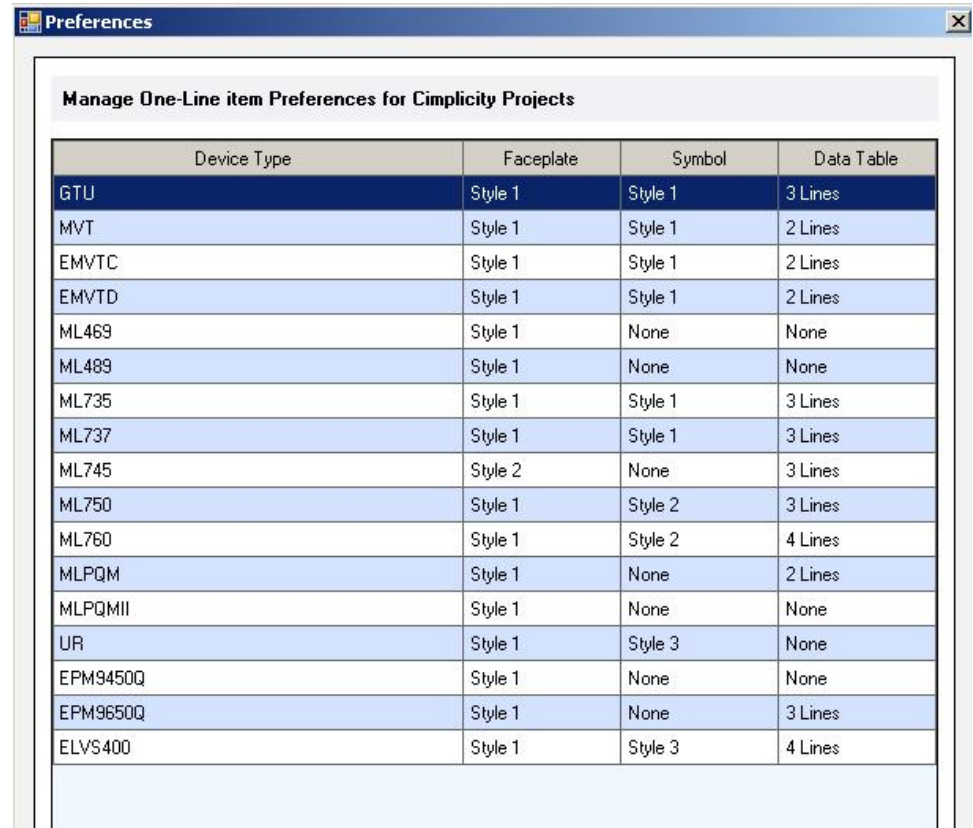
Figure 13: Entellics breaker configuration window



Preferences

Opens the Preferences window to configure the default one-line options for each device type supported in PMCS. To change a value, type in the field.

Figure 14: Set default values in Preferences window



Help

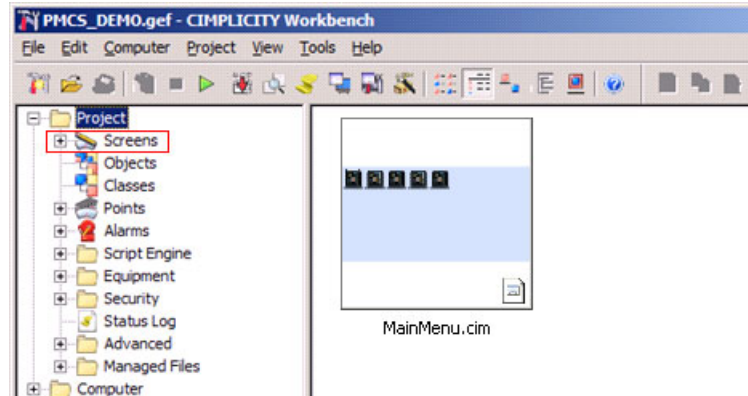
Opens the PMCS online help window.

Generate

Initiates CIMPLICITY project creation and includes all the devices that have the **Created** checkbox enabled. It also removes any devices that were configured in the project and have the **Created** checkbox unselected. See the previous chapter for instruction on creating a project.

Once the **Generate** button is clicked, it generates a MainMenu.cim file, which can be viewed by clicking the **Screens** menu item.

Figure 15: Viewing the MainMenu.cim file



For devices with the Created checkbox enabled, based on the default options set, such as Faceplate, Symbol, and Data Table, the options generate as objects in the MainMenu.cim file and are overlaid on one another.

Figure 16: Objects in the MainMenu.cim file



Cancel

Discards any changes done in the configuration options and closes the PowerBuilder window.

PMCS

Chapter 4: Device information

This chapter explains the information displayed for several devices. The windows vary with device. Content can include the following:

- Tabs with data
- Event log button, including the ability to clear the logs
- Trend data button
- Waveform button

The buttons are inactive when not applicable, for example when no trend window was specified in the Objects Properties window or when waveform capture is not supported by a device.

Content also varies with security level. When security is enabled in your application, the user 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 information on how to use security features.

469

This section explains the information displayed in PMCS for 469 motor management relays, which are also referred to as ML469 and SR469.

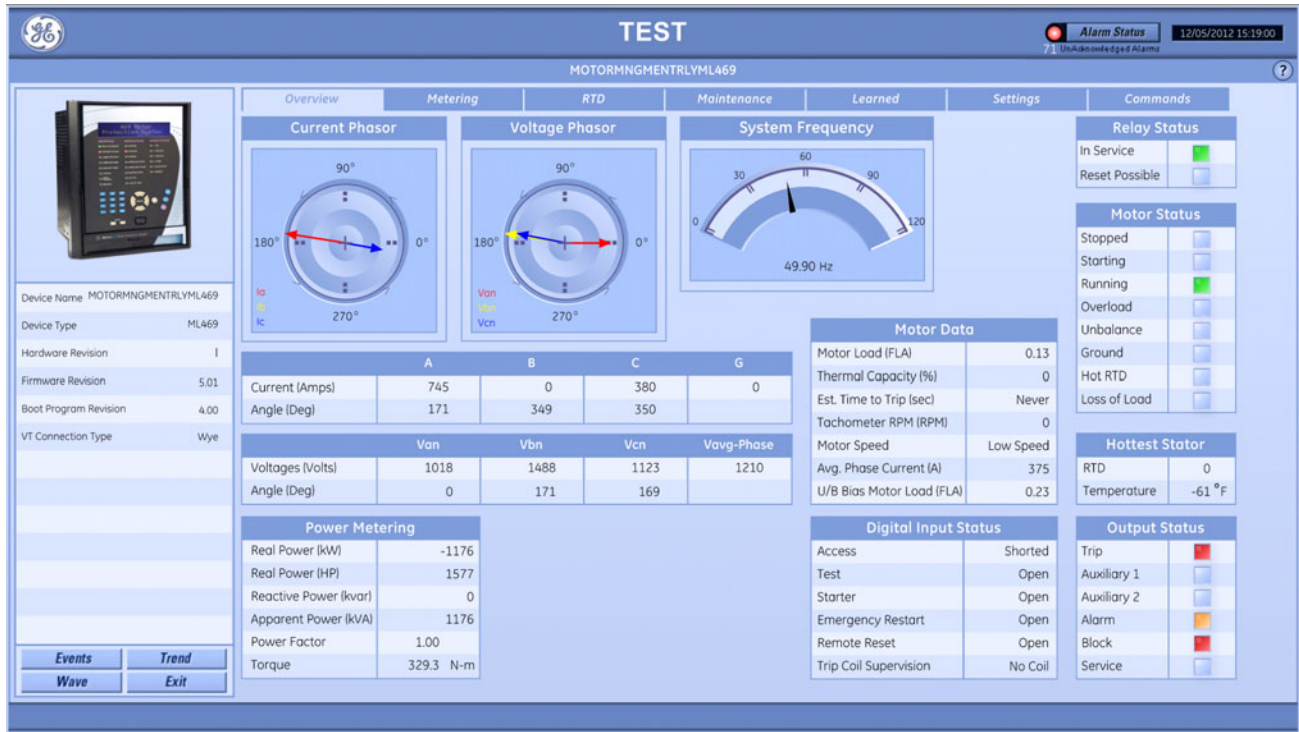
Overview tab

This tab displays

- Current
- Voltage
- Power
- System frequency
- Motor data
- Digital input status
- Relay status
- Motor status

- Hottest stator
- Output status

Figure 17: 469 Overview tab



Metering tab

This tab displays

- Differential currents
- Demand metering
- Energy consumption of the 469

Figure 18: 469 Metering tab

The screenshot shows the GE TEST web interface for a ML469 meter. The top navigation bar includes 'Overview', 'Metering' (selected), 'RTD', 'Maintenance', 'Learned', 'Settings', and 'Commands'. The 'Alarm Status' indicator shows '71 UnAcknowledge Alarm' at '12/05/2012 15:19:13'. The device name is 'MOTORMNGMENTRLVML469'.

Differential Currents

	Ia	Ib	Ic
Current (Amps)	0	0	0

Demand Metering

	Demand	Peak
Current (Amps)	743	755
Real (kW)	0	0
Reactive (kvar)	0	176
Apparent (kVA)	1189	1509

Energy

Positive Watthours (MWh)	0.000
Positive Varhours (Mvarh)	1.274
Negative Varhours (Mvarh)	0.000

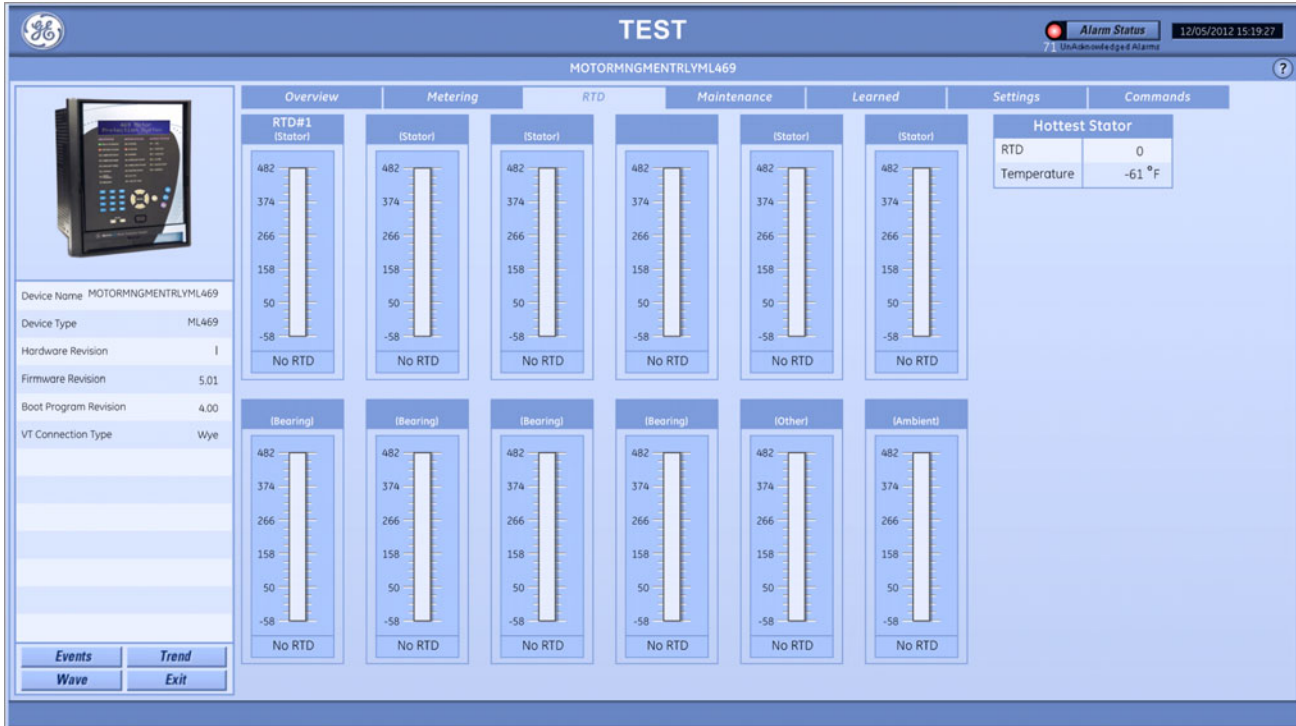
On the left side, a sidebar lists device details: Device Name (MOTORMNGMENTRLVML469), Device Type (ML469), Hardware Revision (I), Firmware Revision (5.01), Boot Program Revision (4.00), and VT Connection Type (Wye). At the bottom left, there are buttons for 'Events', 'Trend', 'Wave', and 'Exit'.

RTD tab

This tab displays

- Resistive temperature device (RTD) information

Figure 19: 469 RTD tab



Maintenance tab

This tab displays

- Trip data
- General timers and counters

Figure 20: 469 Maintenance tab

The screenshot shows the GE TEST web interface for a motor management device. The main title is "TEST" and the device ID is "MOTORMNGMENTRL469". The "Maintenance" tab is selected in the navigation menu. The interface displays the following data:

Trip Data	
Total Number of Trips	2
Cause of Last Trip	Volt. Frequency Trip
Date and Time of Last Trip	12/01/2012 18:19:25

General Counters	
Number of Motor Starts	3
Number of Emergency Restarts	0
Number of Starter Operations	2

Timers	
Motor Running Hours	309
Time Between Starts Timer	11

Device Information (from sidebar):

- Device Name: MOTORMNGMENTRL469
- Device Type: ML469
- Hardware Revision: 1
- Firmware Revision: 5.01
- Boot Program Revision: 4.00
- VT Connection Type: Wye

Navigation buttons: Events, Trend, Wave, Exit.

Learned tab

This tab displays

- Learned motor starting data
- Learned motor load
- Learned analog input data
- Learned resistive temperature device (RTD) data

Figure 21: 469 Learned tab

The screenshot shows the 'TEST' interface for a GE motor management device. The device name is MOTORMNGMENTRLV469. The 'Learned' tab is active, displaying the following data:

Learned Motor Starting Data	
Acceleration Time (s)	1.3
Starting Current (A)	179
Starting Capacity (%)	0
Last Acceleration Time (s)	1.3
Last Starting Current (A)	375
Last Starting Capacity (%)	0

Learned Motor Load	
Average Motor Load	0.13 FLA

Learned Analog Input Data		
	Minimum	Maximum
Analog Input 1	-50000	2000
Analog Input 2	-50000	200
Analog Input 3	N/A	N/A
Analog Input 4	N/A	N/A

Learned RTD Data °F	
RTD 1	No RTD
RTD 2	No RTD
RTD 3	No RTD
RTD 4	No RTD
RTD 5	No RTD
RTD 6	No RTD
RTD 7	No RTD
RTD 8	No RTD
RTD 9	No RTD
RTD 10	No RTD
RTD 11	No RTD
RTD 12	No RTD

Additional interface elements include a device image, a metadata table, and navigation buttons:

Device Name	MOTORMNGMENTRLV469
Device Type	ML469
Hardware Revision	I
Firmware Revision	5.01
Boot Program Revision	4.00
VT Connection Type	Wye

Buttons: Events, Trend, Wave, Exit

Settings tab

This tab displays

- System setup
- Thermal model

Figure 22: 469 Settings tab

The screenshot shows the 'TEST' interface for a GE motor device. The top bar displays 'TEST' and 'Alarm Status' with a timestamp of 12/05/2012 15:20:04. The device name is MOTORMNGMENTRLV469. The 'Settings' tab is active, showing two tables:

System Setup	
Phase CT Primary (Amps)	2500
Motor Full Load Amps (Amps)	2770
Ground CT Type	50/0.025 CT
Ground CT Primary (Amps)	100
Phase Diff. CT Type	1 A Secondary
Phase Differential CT Primary (Amps)	10
Enable Two Speed Motor Option	On
Speed Two Phase CT Primary (Amps)	100
Speed Two Motor Full Load (Amps)	1
VT Connection Type	Wye
One VT Connection	Off
Voltage Transformer Ratio	35.00
Motor Nameplate Voltage (Volts)	100
Nominal Frequency	50 Hz
System Phase Sequence	ABC
Serial Communication Control	On

Thermal Model	
Curve Style	Standard
Overload Pickup Level (FLA)	1.25
Unbalance k Factor	2
Cool Time Constant Running (min)	1
Cool Time Constant Stopped (min)	1
Hot/Cold Safe Stall Ratio	1.00
RTD Biasing	On
RTD Bias Minimum (°C)	40
RTD Bias Center Point (°C)	130
RTD Bias Maximum (°C)	155
Thermal Capacity Alarm	Off
Thermal Capacity Alarm Relays	Alarm
Thermal Capacity Level (% used)	100
Thermal Capacity Events	Off
Overload Trip Relays	Trip

On the left side, there is a device image and a list of device information:

- Device Name: MOTORMNGMENTRLV469
- Device Type: ML469
- Hardware Revision: 1
- Firmware Revision: 5.01
- Boot Program Revision: 4.00
- VT Connection Type: Wye

At the bottom left, there are buttons for 'Events', 'Trend', 'Wave', and 'Exit'.

Commands tab

The following functions are available.

Table 7: 469 commands available

Button	Function
Reset Device	Issues a reset command to the 469
Motor Start	Issues Motor Start command
Motor Stop	Issues Motor Stop command
Reset MWh & Mvarh	Clears these values from the 469 memory
Clear Peak Demand	Clears this data from memory
Clear Analog Input Min/Max	Clears this data from memory
Clear RTD Maximums	Resets the RTD maximums data
Clear Trip Counters	Clears the trip count data from memory
Clear Last Trip Data	Clears this data from memory
Reset Starter Information	Clears motor start information from memory

Figure 23: 469 Commands tab

The screenshot shows the GE 469 device web interface. The top navigation bar includes the GE logo, the word "TEST", an "Alarm Status" indicator, and the date/time "12/05/2012 15:20:23". Below this is a navigation menu with tabs for "Overview", "Metering", "RTD", "Maintenance", "Learned", "Settings", and "Commands". The "Commands" tab is selected, displaying a table of commands with corresponding buttons:

Commands	
Reset Device	Reset
Motor Start	Start
Motor Stop	Stop
Reset MWh & Mvarh	Reset
Clear Peak Demand	Reset
Clear Analog Input Min/Max	Reset
Clear RTD Maximums	Reset
Clear Trip Counters	Reset
Clear Last Trip Data	Reset
Reset Starter Information	Reset

On the left side of the interface, there is a sidebar with a device image and the following details:

- Device Name: MOTORMNGMENTRLYL469
- Device Type: ML469
- Hardware Revision: I
- Firmware Revision: 5.01
- Boot Program Revision: 4.00
- VT Connection Type: Wye

At the bottom left of the sidebar, there are four buttons: "Events", "Trend", "Wave", and "Exit".

489

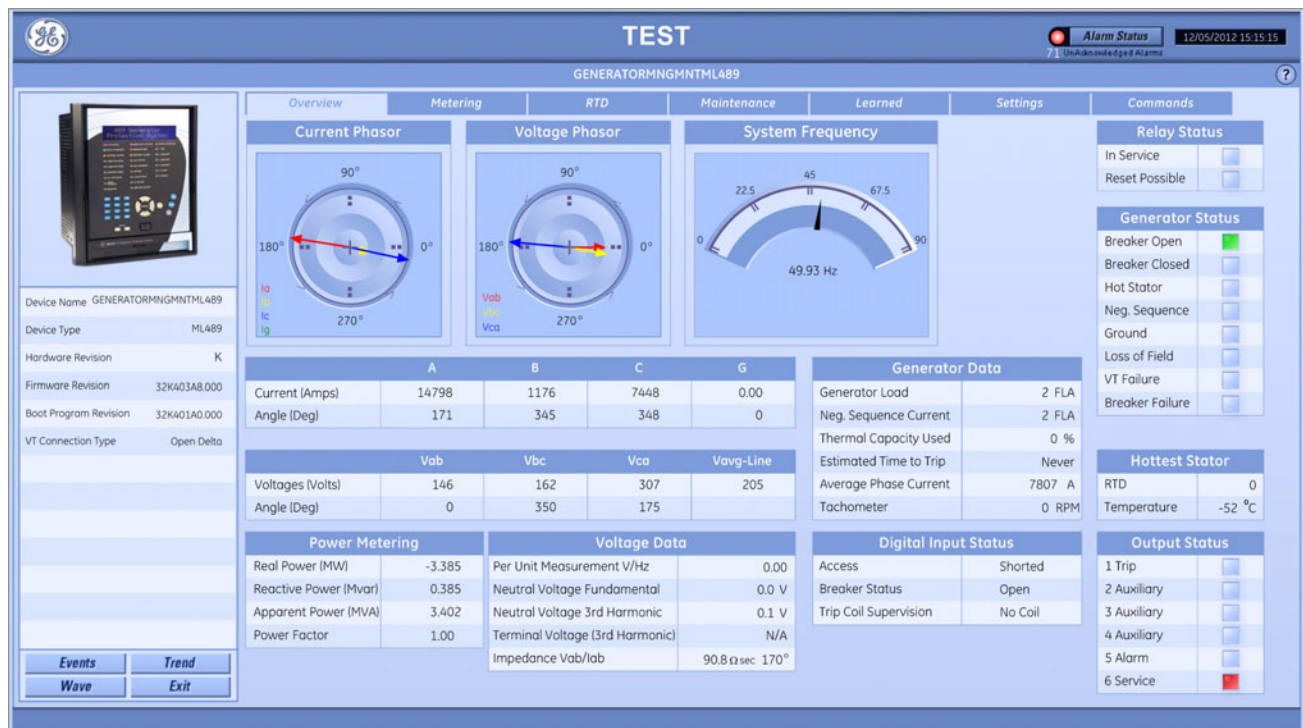
This section explains the information displayed in PMCS for 489 generator management relays, which are also referred to as ML489 and SR489.

Overview tab

This tab displays

- Current
- Voltage
- Power
- Voltage data
- System frequency
- Generator data
- Digital input status
- Relay status
- Generator status
- Hottest stator
- Output status

Figure 24: 489 Overview tab



Metering tab

This tab displays

- Differential currents
- Demand metering
- Energy

Figure 25: 489 Metering tab

The screenshot shows the GE TEST interface for device GENERATORMNGMNTML489. The interface includes a navigation menu with tabs for Overview, Metering (selected), RTD, Maintenance, Learned, Settings, and Commands. The main content area displays three data tables:

Differential Currents			
	Ia	Ib	Ic
Current (Amps)	14896	1176	7546
Angle (Deg)	0	0	0

Demand Metering		
	Demand	Peak
Current (Amps)	14862	15075
Real (MW)	0.000	0.000
Reactive (Mvar)	0.395	0.506
Apparent (MVA)	3.389	4.116

Energy	
Positive Watthours (MWh)	0.000
Positive Varhours (Mvarh)	344.424
Negative Varhours (Mvarh)	0.596

On the left side, there is a sidebar with a device image and a list of specifications:

- Device Name: GENERATORMNGMNTML489
- Device Type: ML489
- Hardware Revision: K
- Firmware Revision: 32K403A8.000
- Boot Program Revision: 32K401A0.000
- VT Connection Type: Open Delta

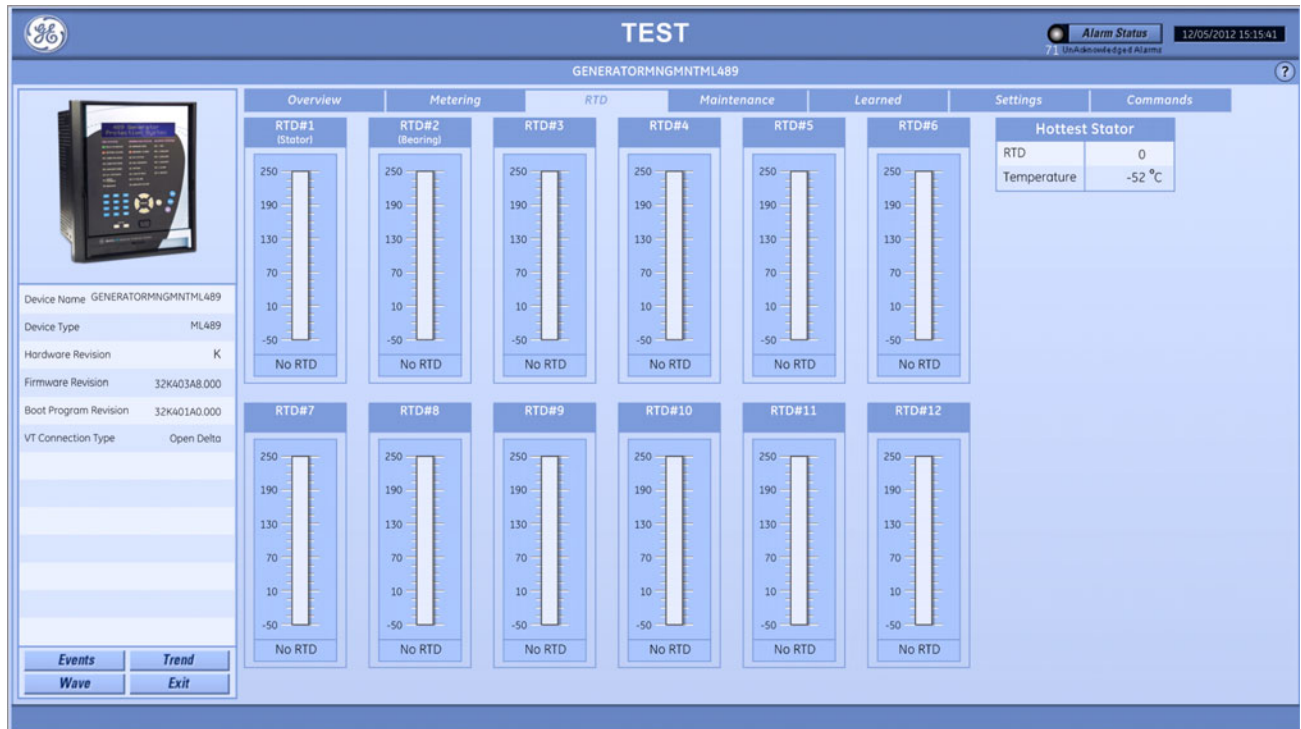
At the bottom left of the sidebar, there are four buttons: Events, Trend, Wave, and Exit.

RTD tab

This tab displays

- Resistive temperature device (RTD) information, where this function varies resistance based on temperature

Figure 26: 489 RTD tab



Maintenance tab

This tab displays

- Trip data
- General timers and counters

Figure 27: 489 Maintenance tab

The screenshot shows the GE TEST web interface for a generator. The main title is "TEST" and the device ID is "GENERATORMNGMNTML489". The "Maintenance" tab is selected, showing the following data:

Trip Data	
Total Number of Trips	0
Cause of Last Trip	No Event
Date and Time of Last Trip	01/01/2000 09:00:00

General Counters	
Number of Breaker Operations	0
Number of Thermal Resets	0

Timers	
Generator Hours Online	0 hrs

On the left side, there is a sidebar with a device image and the following information:

- Device Name: GENERATORMNGMNTML489
- Device Type: ML489
- Hardware Revision: K
- Firmware Revision: 32K403A8.000
- Boot Program Revision: 32K401A0.000
- VT Connection Type: Open Delta

At the bottom left of the sidebar are buttons for "Events", "Trend", "Wave", and "Exit".

Learned tab

This tab displays

- Learned parameter averages
- Learned analog input data
- Learned resistive temperature device (RTD) data

Figure 28: 489 Learned tab

The screenshot shows the 'TEST' interface for a GE generator management system. The main title is 'TEST' and the device name is 'GENERATORMNGMNTML489'. The interface includes a navigation menu with tabs: Overview, Metering, RTD, Maintenance, Learned (selected), Settings, and Commands. On the left, there is a device image and a list of device details: Device Name (GENERATORMNGMNTML489), Device Type (ML489), Hardware Revision (K), Firmware Revision (32K403A8.000), Boot Program Revision (32K401A0.000), and VT Connection Type (Open Delta). At the bottom left are buttons for Events, Trend, Wave, and Exit. The main content area is divided into three sections: 'Learned Parameter Averages', 'Learned Analog Input Data', and 'Learned RTD Data'. The 'Learned Parameter Averages' table shows Generator Load (2 % FLA), Negative Sequence Current (2 % FLA), and Phase to Phase Voltage (N/A). The 'Learned Analog Input Data' table shows four inputs with minimum and maximum values (0 or N/A). The 'Learned RTD Data' table shows 12 RTD locations, all with 'No RTD' status.

Learned Parameter Averages	
Generator Load	2 % FLA
Negative Sequence Current	2 % FLA
Phase to Phase Voltage	N/A

Learned Analog Input Data		
	Minimum	Maximum
Analog Input 1	N/A	N/A
Analog Input 2	0	0
Analog Input 3	0	0
Analog Input 4	0	0

Learned RTD Data °C	
RTD 1	No RTD
RTD 2	No RTD
RTD 3	No RTD
RTD 4	No RTD
RTD 5	No RTD
RTD 6	No RTD
RTD 7	No RTD
RTD 8	No RTD
RTD 9	No RTD
RTD 10	No RTD
RTD 11	No RTD
RTD 12	No RTD

Settings tab

This tab displays

- System setpoints
- Thermal model

Figure 29: 489 Settings tab

The screenshot shows the GE TEST interface for device GENERATORMNGMNTML489. The interface includes a top navigation bar with 'TEST' and 'Alarm Status' (Unacknowledge All Alarms), and a date/time display (12/05/2012 15:16:11). Below the navigation bar are tabs for Overview, Metering, RTD, Maintenance, Learned, Settings, and Commands. The Settings tab is active, displaying two tables: System Setpoints and Thermal Model. On the left, there is a device image and a list of device information including Device Name, Device Type, Hardware Revision, Firmware Revision, Boot Program Revision, and VT Connection Type. At the bottom left, there are buttons for Events, Trend, Wave, and Exit.

System Setpoints	
Phase CT Primary (Amps)	N/A
Ground CT Type	1 A Secondary
Ground CT Ratio	100 :1
VT Connection Type	Open Delta
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 (MVA)	50.000
Generator Rated PF	0.99
Generator Voltage Phase-Phase (Volts)	100
Generator Nominal Frequency (Hz)	60 Hz
Generator Phase Sequence	ABC
Step Up Transformer Setup	None
Pulse Width	200

Thermal Model	
Curve Style	Standard
Overload Pickup Level (FLA)	1.01
Unbalance Bias K Factor	0
Cool Time Constant Online (min)	15
Cool Time Constant Offline (min)	30
Hot/Cold Safe Stall Ratio	1.00
RTD Biasing	On
RTD Bias Minimum (°C)	40
RTD Bias Center Point (°C)	130
RTD Bias Maximum (°C)	155
Thermal Model Alarm	Latched
Thermal Model Alarm Relays	Relay 5
Thermal Alarm Level (% used)	75
Thermal Model Alarm Events	On
Thermal Model Trip	Latched
Thermal Model Trip Relays	Relay 1

Commands tab

The following functions are available.

Table 8: 489 commands available

Button	Function
Reset Device	Issues a reset command to the 489
Reset Breaker Information	Clears the breaker data from memory
Reset Generator Information	Clears the generator data from memory
Clear RTD Maximums	Clears the maximum RTD data from memory
Reset MWh & Mvarh Data	Clears the MWh and Mvarh data from memory
Clear Peak Demand Data	Clears the peak demand data from memory
Clear Analog Input Min/Max	Clears the analog input minimum/maximum data from memory
Clear Trip Counters	Clears the trip counter data from memory
Clear Last Trip Data	Clears the last trip data from memory

Figure 30: 489 Commands tab

The screenshot shows the GE 489 device web interface. The main header displays 'TEST' and 'GENERATORMNGMNTML489'. The navigation menu includes 'Overview', 'Metering', 'RTD', 'Maintenance', 'Learned', 'Settings', and 'Commands'. The 'Commands' tab is selected, showing a table of commands with 'Reset' buttons:

Commands	
Reset Device	Reset
Reset Breaker Information	Reset
Reset Generator Information	Reset
Clear RTD Maximums	Reset
Reset MWh & Mvarh Data	Reset
Clear Peak Demand Data	Reset
Clear Analog Input Min/Max	Reset
Clear Trip Counters	Reset
Clear Last Trip Data	Reset

On the left sidebar, the device information is displayed:

- Device Name: GENERATORMNGMNTML489
- Device Type: ML489
- Hardware Revision: K
- Firmware Revision: 32K403A8.000
- Boot Program Revision: 32K401A0.000
- VT Connection Type: Open Delta

At the bottom left of the sidebar, there are buttons for 'Events', 'Trend', 'Wave', and 'Exit'. The top right corner shows 'Alarm Status' with a red indicator and '71 UnAcknowledged Alarms' at '12/05/2012 15:16:25'.

735/737

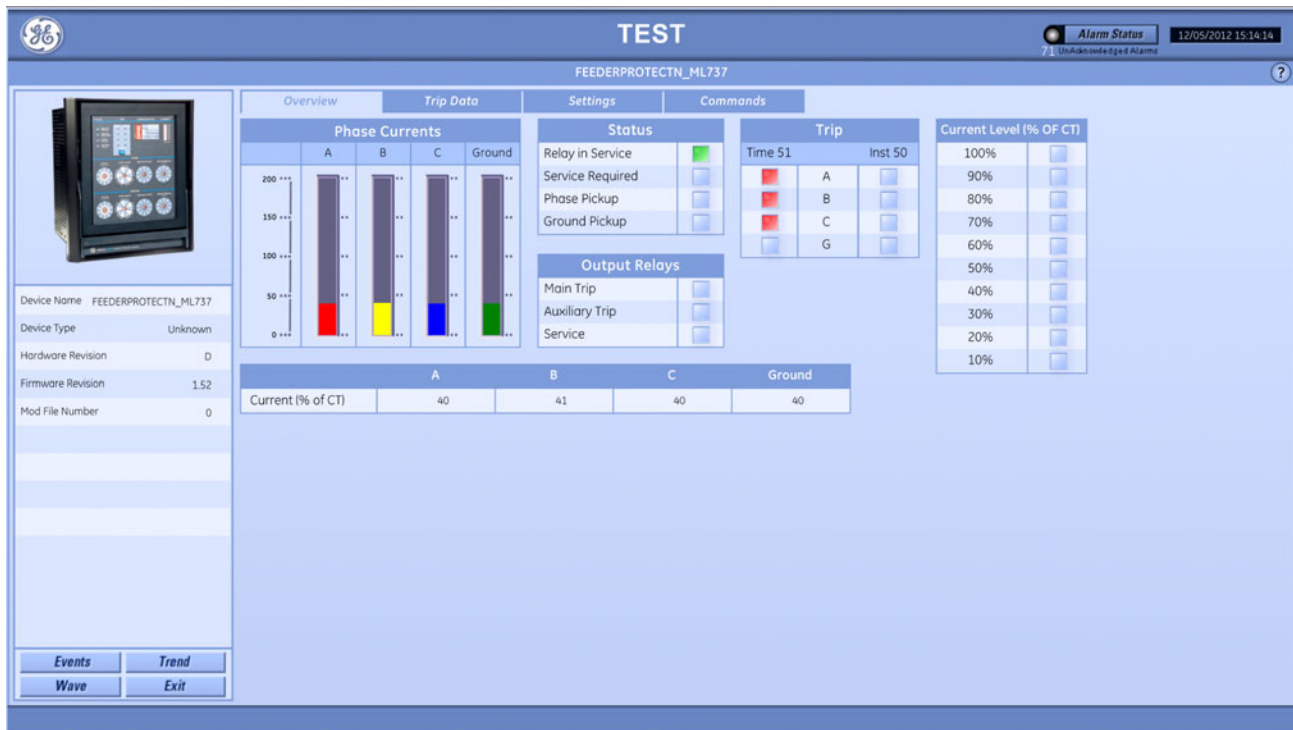
This section explains the information displayed in PMCS for 735 and 737 products, which are also referred to as ML735/ML737 and SR735/SR737.

Overview tab

This tab displays

- Phase currents
- Status
- Output relays
- Trip
- Current level

Figure 31: 737 Overview tab



Trip Data tab

This tab displays

- Pre-trip current
- Trip cause

Figure 32: 737 Trip Data tab

The screenshot displays the 'Trip Data' tab for a GE FEEDERPROTECTN_ML737 device. The interface includes a GE logo, a 'TEST' title, and an 'Alarm Status' indicator. The main content area is divided into two tables: 'Pre-Trip Current' and 'Trip Cause'. The 'Pre-Trip Current' table shows values for Phase A, B, C, and Ground. The 'Trip Cause' table shows details for the last five trips, all caused by 'Time OC trip: Phase A,B,C'.

Pre-Trip Current	
Phase A (% of CT)	40
Phase B (% of CT)	41
Phase C (% of CT)	40
Ground (% of CT)	40

Trip Cause	
Cause of Last Trip	Time OC trip: Phase A,B,C
Last OC Trip Time	98 milliseconds
Cause of 2nd Last Trip	Time OC trip: Phase A,B,C
Cause of 3rd Last Trip	Time OC trip: Phase A,B,C
Cause of 4th Last Trip	Time OC trip: Phase A,B,C
Cause of 5th Last Trip	Time OC trip: Phase A,B,C

Device Name: FEEDERPROTECTN_ML737
 Device Type: Unknown
 Hardware Revision: D
 Firmware Revision: 1.52
 Mod File Number: 0

Buttons: Events, Trend, Wave, Exit

Settings tab

This tab displays

- Dial settings
- Option switches

Figure 33: 737 Settings tab

The screenshot shows the 'Settings' tab for the FEEDERPROTECTN_ML737 device. The interface includes a navigation menu on the left with buttons for 'Events', 'Trend', 'Wave', and 'Exit'. The main content area is divided into two sections: 'Dial Settings' and 'Option Switches'.

Dial Settings	
Phase Pickup (% of CT)	30
Phase Curve Shape	Definite time (low)
Phase Time Multiplier	1
Phase Instantaneous (x CT)	4
Ground Pickup (% of CT)	15
Ground Curve Shape	Definite 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

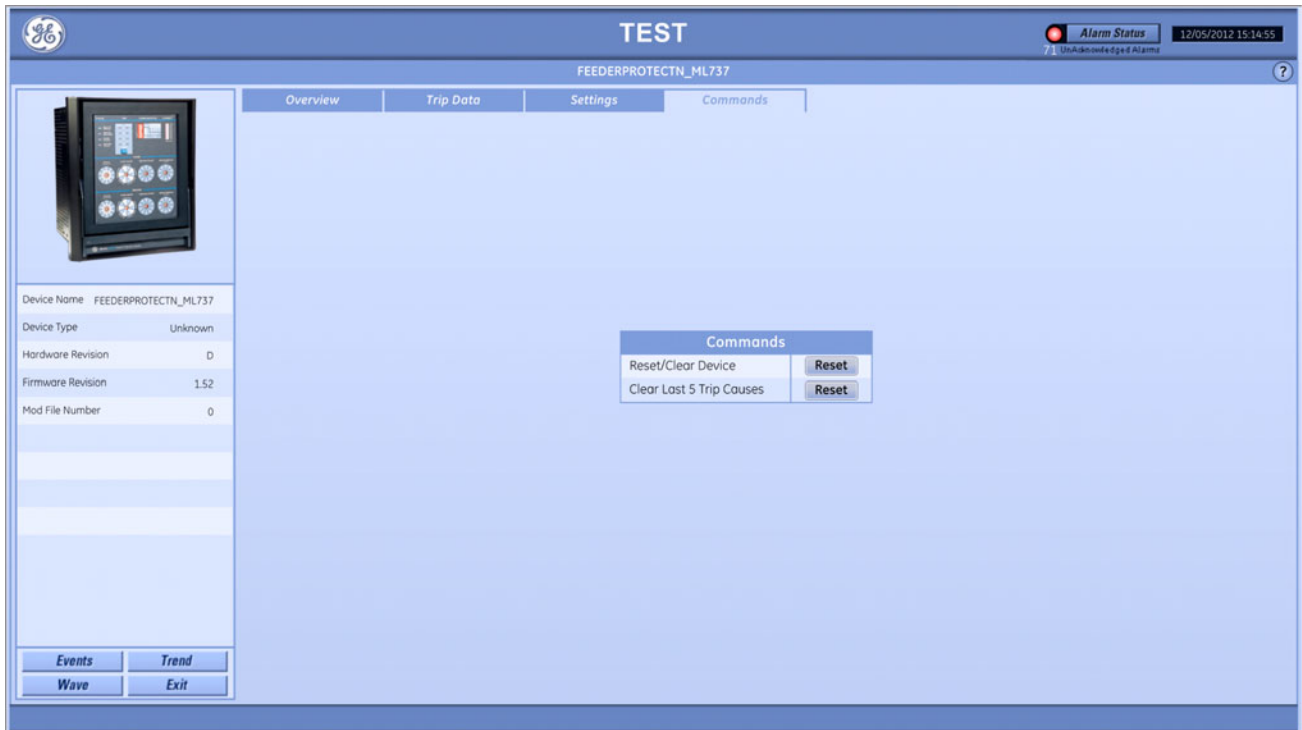
Commands tab

The following functions are available.

Table 9: 735/737 commands available

Button	Function
Reset/Clear Device	Issues a reset command to the device.
Clear Last 5 Trip Causes	Clears the last five trip causes from the device

Figure 34: 737 Commands tab



745

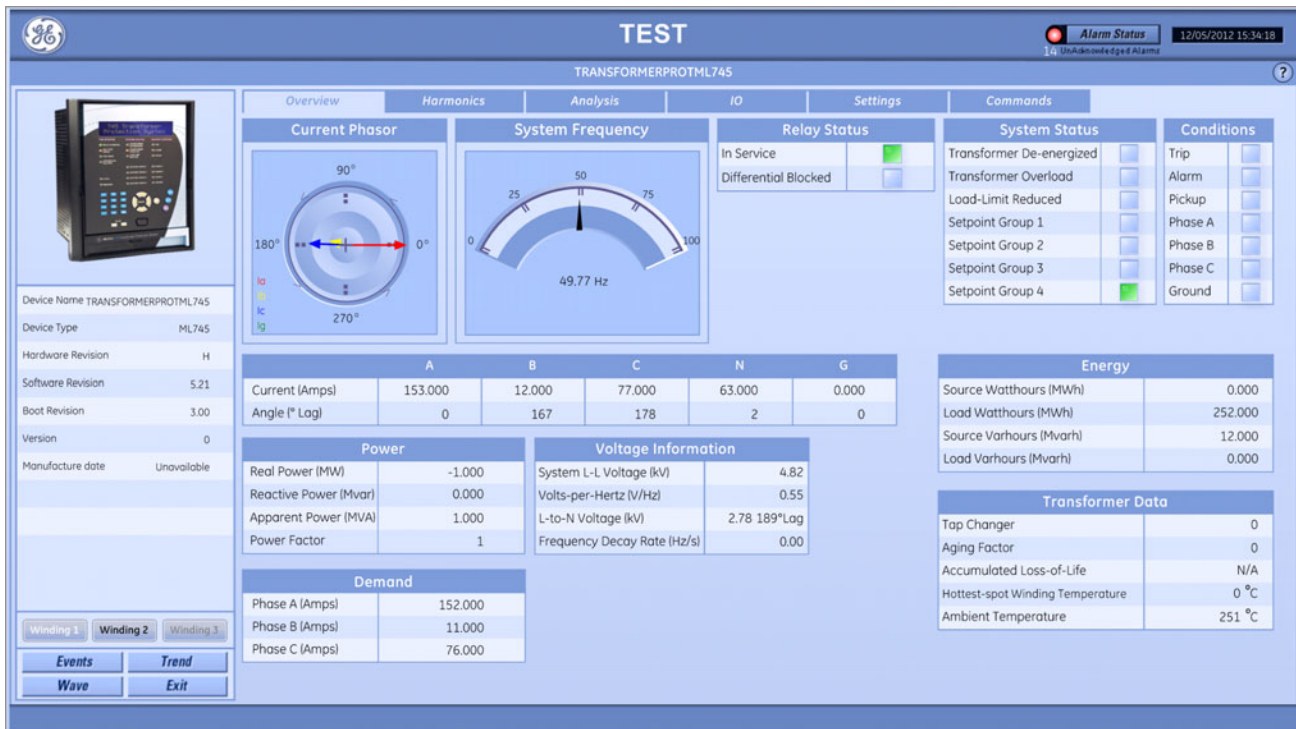
This section explains the information displayed in PMCS for 745 transformer management relays, which are also referred to as ML745 and SR745.

Overview tab

This tab displays

- Current
- Power
- Demand
- Energy
- Voltage information
- System frequency
- Relay status
- System status
- Conditions
- Transformer data

Figure 35: 745 Overview tab

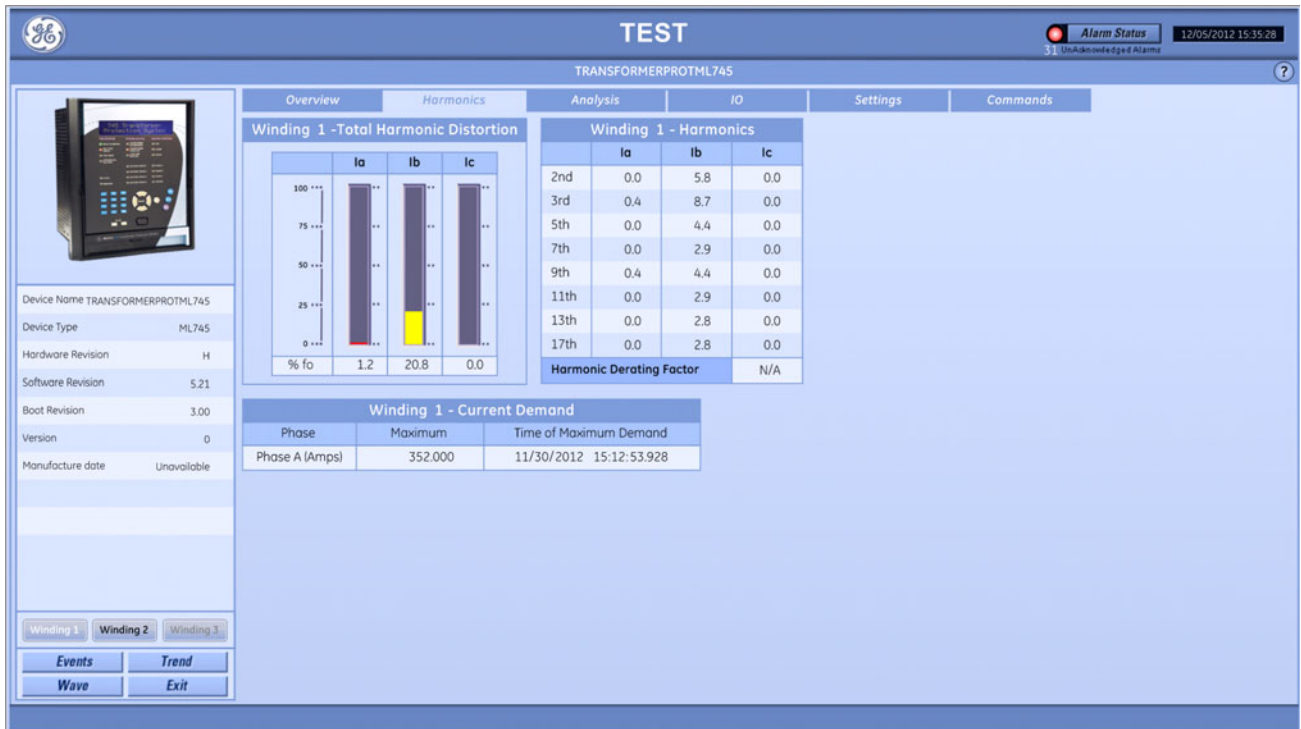


Harmonics tab

This tab displays

- Winding 1 - Total harmonic distortion (THD)
- Winding 1 - Harmonics
- Winding 1 - Current demand

Figure 36: 745 Harmonics tab

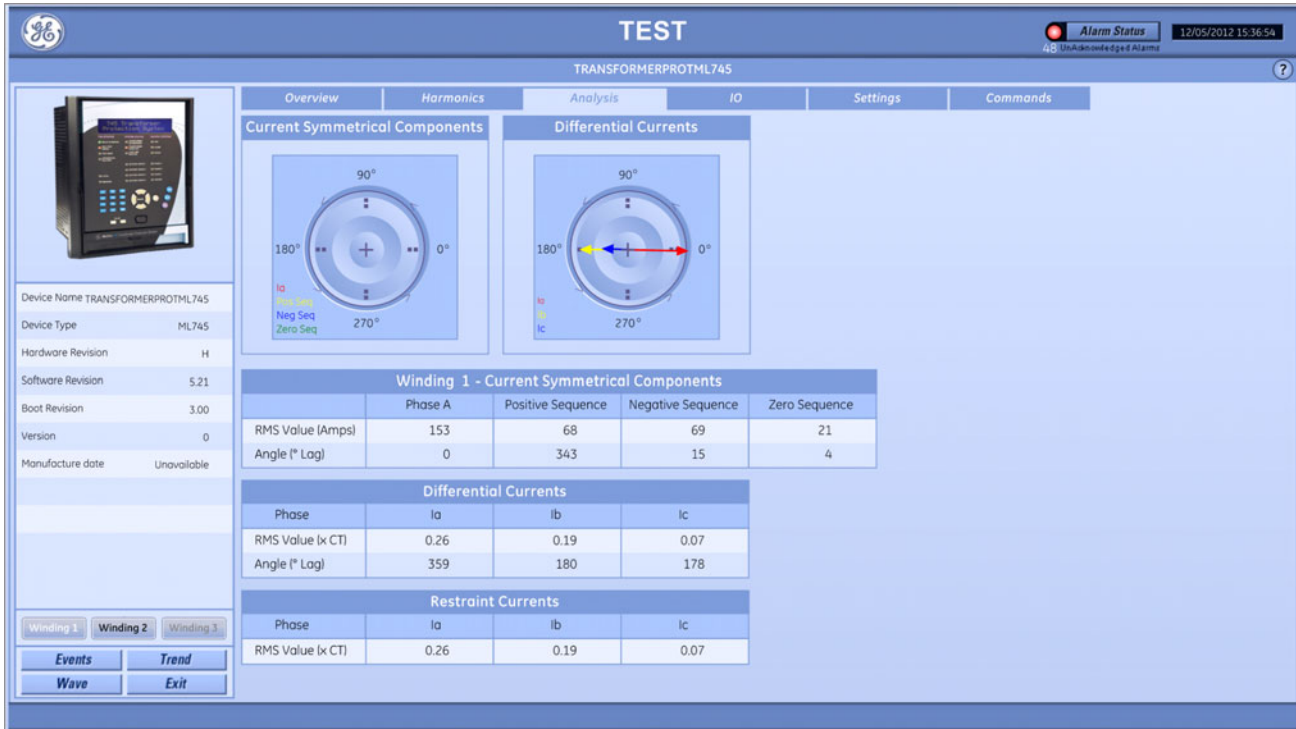


Analysis tab

This tab displays

- Winding 1 - Current symmetrical components
- Differential currents
- Restraint currents

Figure 37: 745 Analysis tab

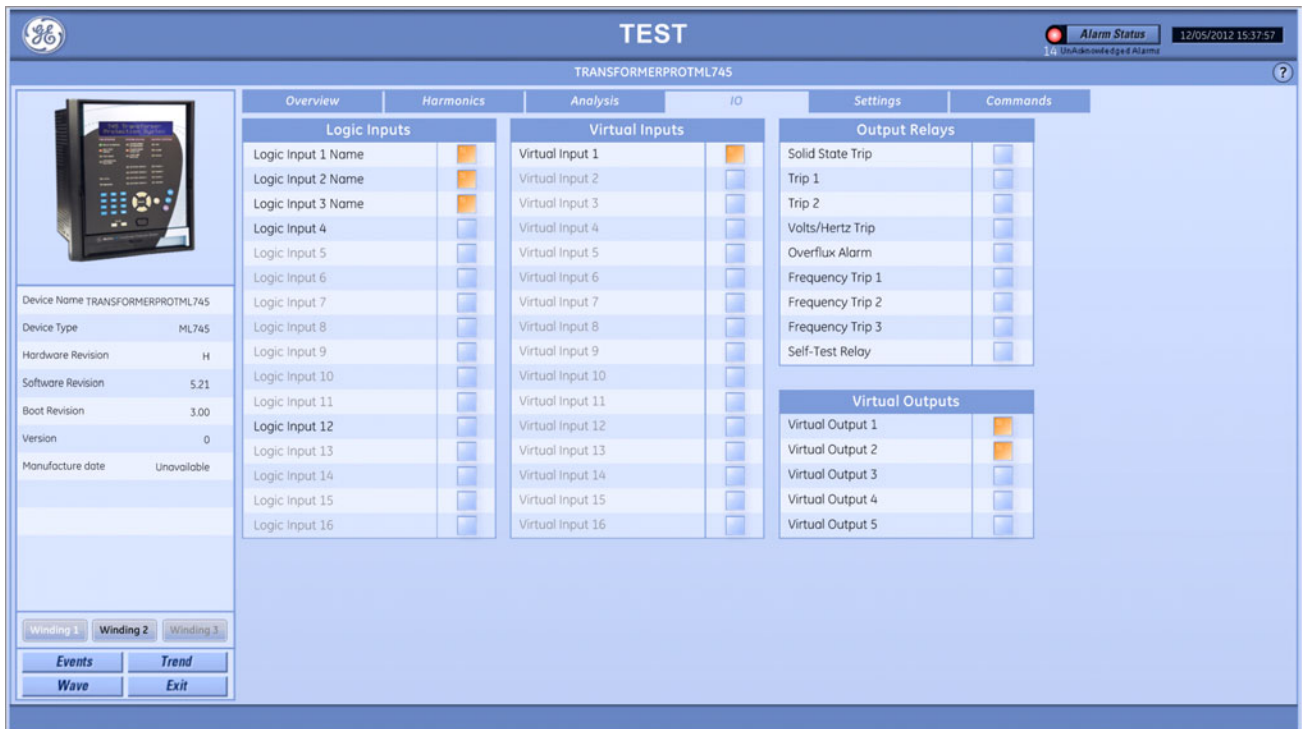


IO tab

This tab displays

- Logic inputs
- Virtual inputs
- Output relays
- Virtual outputs

Figure 38: 745 IO tab



Settings tab

This tab displays

- System setup
- Analog outputs

Figure 39: 745 Settings tab

The screenshot shows the GE TEST interface for a TRANSFORMERPROTML745 device. The interface includes a GE logo, an Alarm Status indicator, and a timestamp of 12/05/2012 19:43:06. The main content area is divided into several tabs: Overview, Harmonics, Analysis, IO, Settings, and Commands. The Settings tab is active, displaying two tables: System Setup and Analog Outputs. On the left side, there is a device image and a list of device details. At the bottom, there are buttons for Winding 1, Winding 2, Winding 3, Events, Trend, Wave, and Exit.

System Setup		Analog Outputs	
Nominal Phase to Phase Voltage (kV)	220.0	Analog Output 1	W1 ϕ A Current
Rated Load (MVA)	100.0	Analog Output 2	W1 ϕ A Current
Series 3 Phase Resistance (Ohms)	10.700	Analog Output 3	W1 ϕ A Current
Transformer Type	Y/d30°	Analog Output 4	W1 ϕ A Current
Phase Sequence	ABC	Analog Output 5	W1 ϕ A Current
Nominal Frequency (Hz)	60	Analog Output 6	W1 ϕ A Current
Voltage Sensing	Enabled	Analog Output 7	W1 ϕ A Current
Nominal VT Secondary Volts	120.0		
VT Ratio	100:1		
Winding with Tap Changer	Winding 1		
# of Tap Positions	50		
Active Setpoints Group	4		

Commands tab

The following functions are available.

Table 10: 745 commands available

Button	Function
Reset Relay	Issues a reset command to the device
Reset Peak Demand	Clears the maximum demand data from the 745 memory
Reset Energy	Resets the energy counters to zero
Reset Loss of Life	Clears loss-of-life data from the 745 memory

Figure 40: 745 Commands tab



750/760

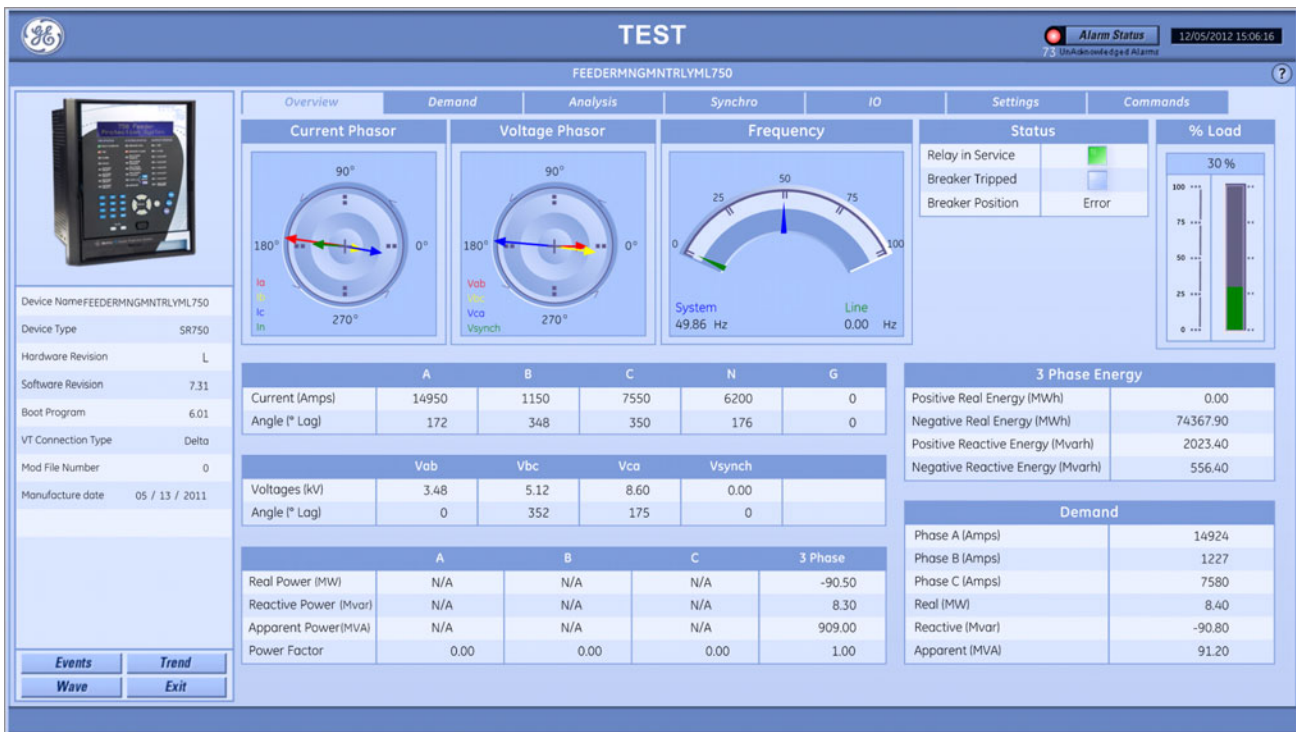
This section explains the information displayed in PMCS for 750 and 760 feeder management relays, which are also referred to as ML750/ML760 and SR750/SR760.

Overview tab

This tab displays

- Current
- Energy
- Voltage
- Power

Figure 41: 750 Overview tab



Demand tab

This tab displays

- Current demand
- Three-phase power demand

Figure 42: 750 Demand tab

The screenshot shows the GE TEST interface for device FEEDERMNGMNTRL750. The 'Demand' tab is selected, displaying two tables of data. The left sidebar shows device details, and the top navigation bar includes 'Overview', 'Demand', 'Analysis', 'Synchro', 'IO', 'Settings', and 'Commands'.

Current Demand			
	Present	Maximum	Time of Maximum
Phase A (Amps)	14924	17670	09/28/2012 09:18:37.341
Phase B (Amps)	1227	10996	11/07/2012 12:35:28.313
Phase C (Amps)	7580	16998	09/13/2012 19:50:17.208

3 Phase Power Demand			
	Present	Maximum	Time of Maximum
Real (MW)	-90.80	-367.30	11/20/2012 23:20:00.410
Reactive (Mvar)	8.40	17.30	10/09/2012 16:20:00.269
Apparent (MVA)	91.20	367.40	11/20/2012 23:20:00.410

Device Information Panel:

- Device Name: FEEDERMNGMNTRL750
- Device Type: SR750
- Hardware Revision: L
- Software Revision: 7.31
- Boot Program: 6.01
- VT Connection Type: Delta
- Mod File Number: 0
- Manufacture date: 05 / 13 / 2011

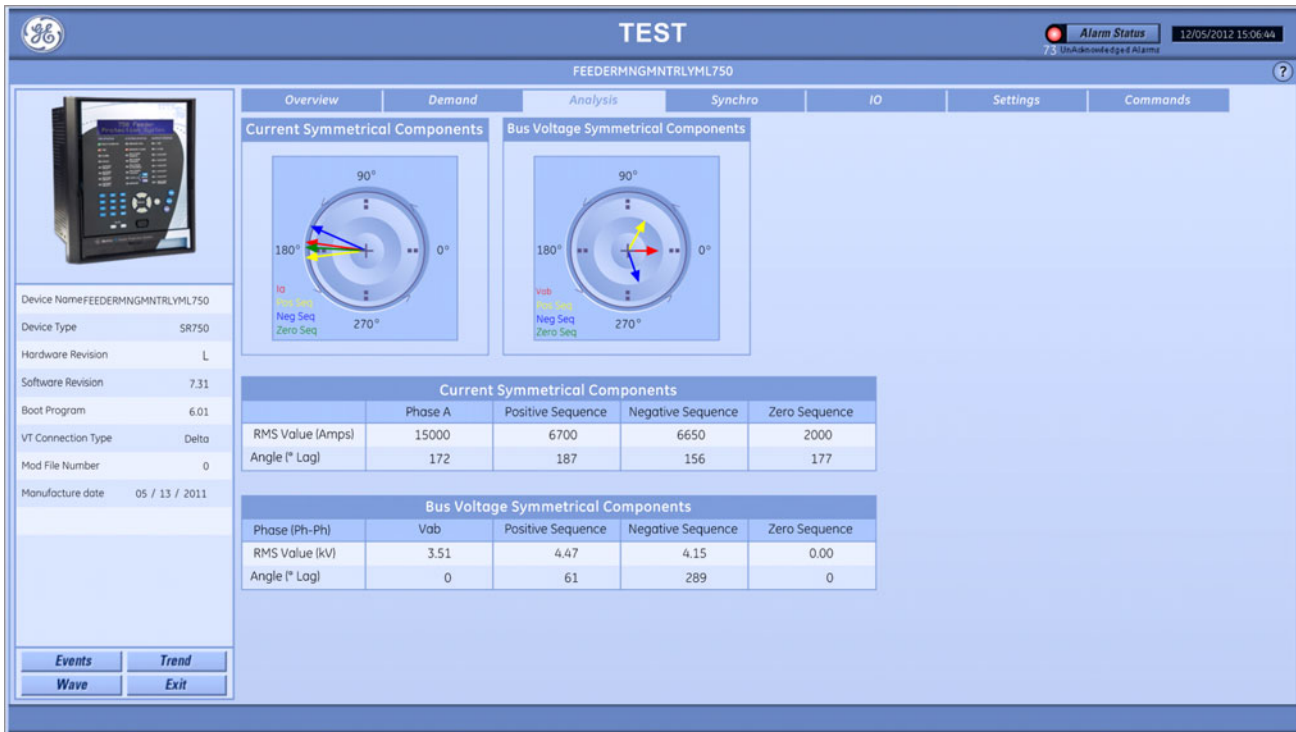
Navigation Buttons: Events, Trend, Wave, Exit

Analysis tab

This tab displays

- Current symmetrical components
- Bus voltage symmetrical components

Figure 43: 750 Analysis tab

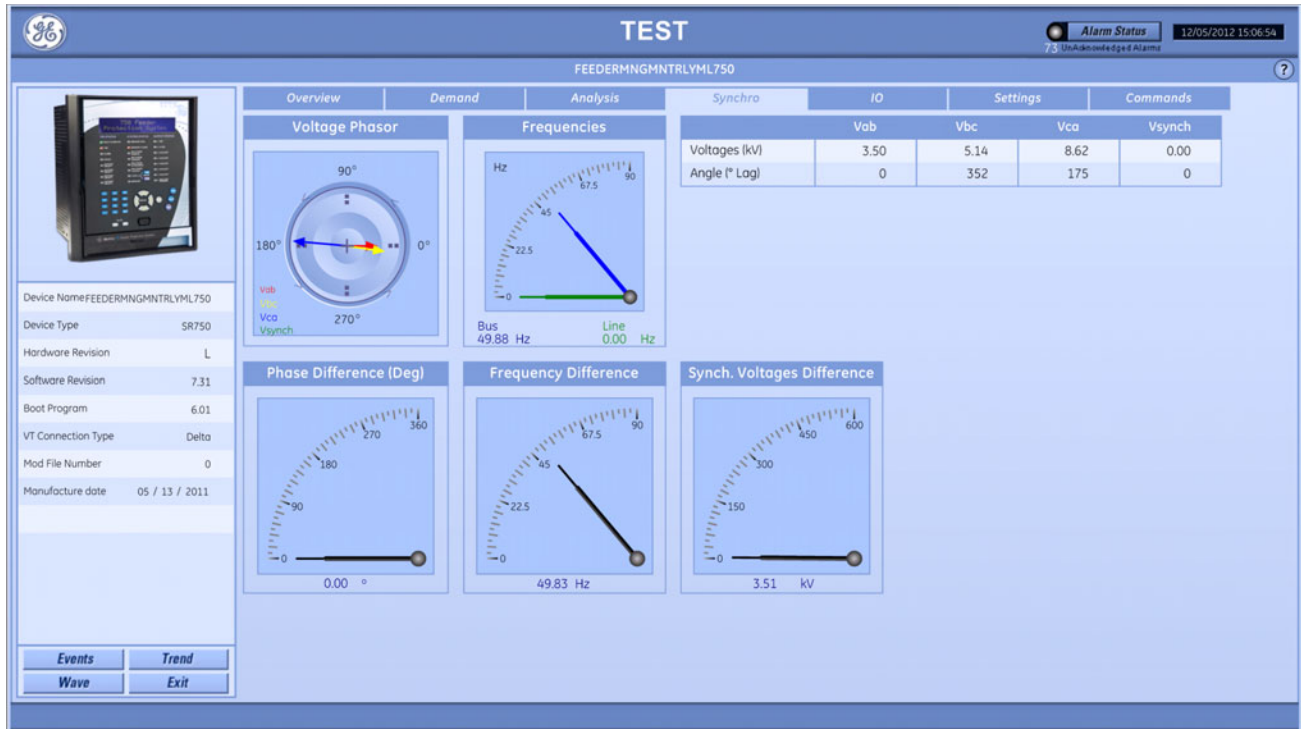


Synchro tab

This tab displays

- Voltage phasor
- Frequencies
- Phase difference
- Frequency difference
- Synchronous voltages difference

Figure 44: 750 Synchro tab



IO tab

This tab displays

- Contact inputs
- Contact outputs
- Virtual inputs

Figure 45: 750 IO tab

The screenshot shows the 'TEST' interface for a GE 750 device. The top navigation bar includes 'Overview', 'Demand', 'Analysis', 'Synchro', 'IO', 'Settings', and 'Commands'. The 'IO' tab is selected, displaying three main sections: Contact Inputs, Contact Outputs, and Virtual Inputs. Each section contains a table of inputs/outputs with status indicators.

Device Information:

- Device Name: FEEDERMNGMNTRL750
- Device Type: SR750
- Hardware Revision: L
- Software Revision: 7.31
- Boot Program: 6.01
- VT Connection Type: Delta
- Mod File Number: 0
- Manufacture date: 05 / 13 / 2011

Contact Inputs:

Contact Input 1	<input type="checkbox"/>	Contact Input 8	<input type="checkbox"/>
Contact Input 2	<input type="checkbox"/>	Contact Input 9	<input type="checkbox"/>
Contact Input 3	<input type="checkbox"/>	Contact Input 10	<input type="checkbox"/>
Contact Input 4	<input type="checkbox"/>	Contact Input 11	<input type="checkbox"/>
Contact Input 5	<input type="checkbox"/>	Contact Input 12	<input type="checkbox"/>
Contact Input 6	<input type="checkbox"/>	Contact Input 13	<input type="checkbox"/>
Contact Input 7	<input type="checkbox"/>	Contact Input 14	<input type="checkbox"/>

Contact Outputs:

Trip	<input type="checkbox"/>
Close	<input type="checkbox"/>
AUXILIARY	<input type="checkbox"/>
AUXILIARY	<input type="checkbox"/>
AUXILIARY	<input type="checkbox"/>
AUXILIARY	<input type="checkbox"/>
AUXILIARY	<input type="checkbox"/>
Self Test Warning	<input checked="" type="checkbox"/>

Virtual Inputs:

Virtual Input 1	<input type="checkbox"/>	Virtual Input 11	<input type="checkbox"/>
Virtual Input 2	<input type="checkbox"/>	Virtual Input 12	<input type="checkbox"/>
Virtual Input 3	<input type="checkbox"/>	Virtual Input 13	<input type="checkbox"/>
Virtual Input 4	<input type="checkbox"/>	Virtual Input 14	<input type="checkbox"/>
Virtual Input 5	<input type="checkbox"/>	Virtual Input 15	<input type="checkbox"/>
Virtual Input 6	<input type="checkbox"/>	Virtual Input 16	<input type="checkbox"/>
Virtual Input 7	<input type="checkbox"/>	Virtual Input 17	<input type="checkbox"/>
Virtual Input 8	<input type="checkbox"/>	Virtual Input 18	<input type="checkbox"/>
Virtual Input 9	<input type="checkbox"/>	Virtual Input 19	<input type="checkbox"/>
Virtual Input 10	<input type="checkbox"/>	Virtual Input 20	<input type="checkbox"/>

Navigation Buttons: Events, Trend, Wave, Exit.

Settings tab

This tab displays

- System setup

Figure 46: 750 Settings tab

The screenshot shows the GE TEST 750 Settings tab. The interface includes a top navigation bar with the GE logo, the word 'TEST', an 'Alarm Status' indicator, and a timestamp '12/05/2012 15:07:23'. Below this is a sub-header 'FEEDERMNGMNTRL750' and a navigation menu with tabs: Overview, Demand, Analysis, Synchro, IO, Settings, and Commands. The 'Settings' tab is selected, showing a 'System Setup' table with the following data:

System Setup	
Phase CT Primary (Amps)	50000
Ground CT Primary (Amps)	50
VT Connection Type	Delta
Nominal VT Secondary Voltage (Volts)	120.9
Voltage Transformer Ratio	120.0
Nominal Frequency (Hz)	60
Line VT Connection	Vab
Line Nominal VT Secondary Voltage (Volts)	120.9
Line VT Ratio	120.0
Phase Sequence	ACB
Sensitive Gnd. CT Primary (Amps)	1000

On the left side of the interface, there is a sidebar with a device image and the following information:

- Device Name: FEEDERMNGMNTRL750
- Device Type: SR750
- Hardware Revision: L
- Software Revision: 7.31
- Boot Program: 6.01
- VT Connection Type: Delta
- Mod File Number: 0
- Manufacture date: 05 / 13 / 2011

At the bottom left of the sidebar, there are four buttons: Events, Trend, Wave, and Exit.

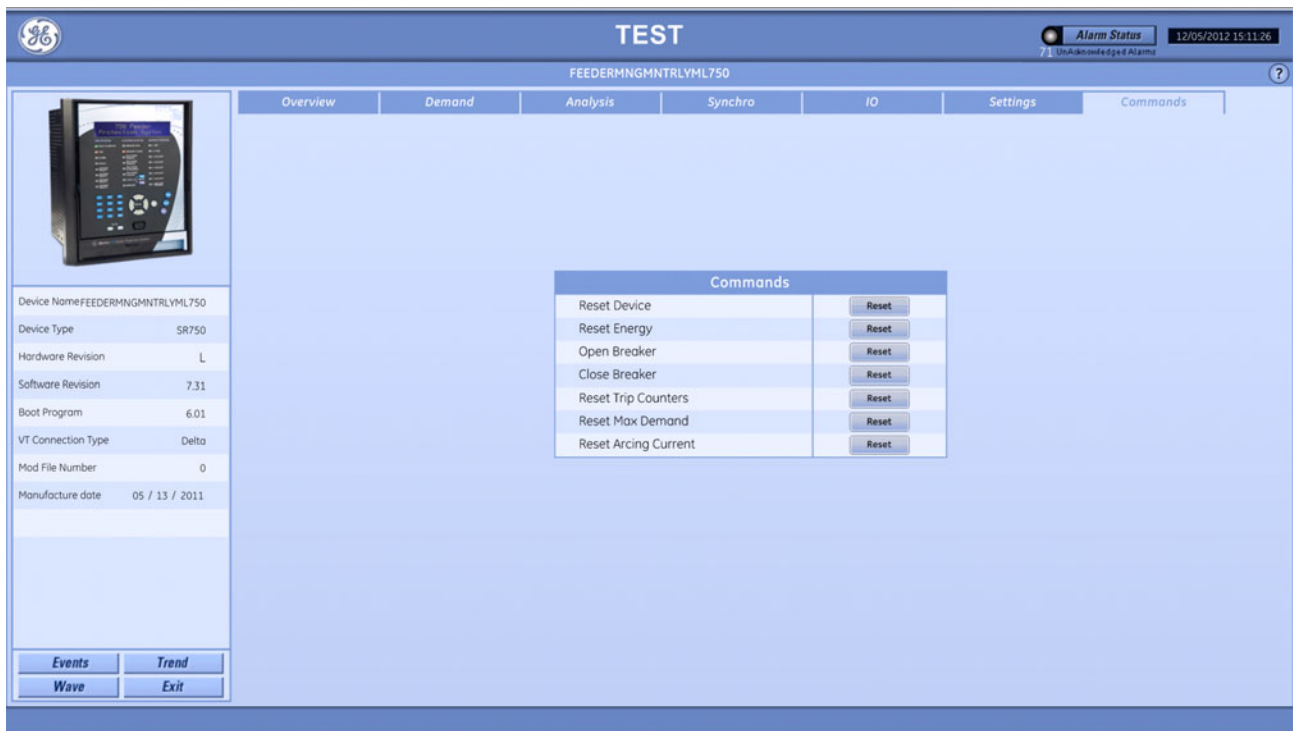
Commands tab

The following functions are available.

Table 11: 750/760 commands available

Button	Function
Reset Device	Issues a reset command to the 750/760
Reset Energy	Resets the energy counters to zero
Open Breaker	Issues Open Breaker command
Close Breaker	Issues Close Breaker command
Reset Trip Counters	Resets the 750/760 trip counters to zero
Reset Max Demand	Clears the maximum demand data from the 750/760 memory
Reset Arcing Current	Resets the arcing current data

Figure 47: 750 Commands tab



ELVS

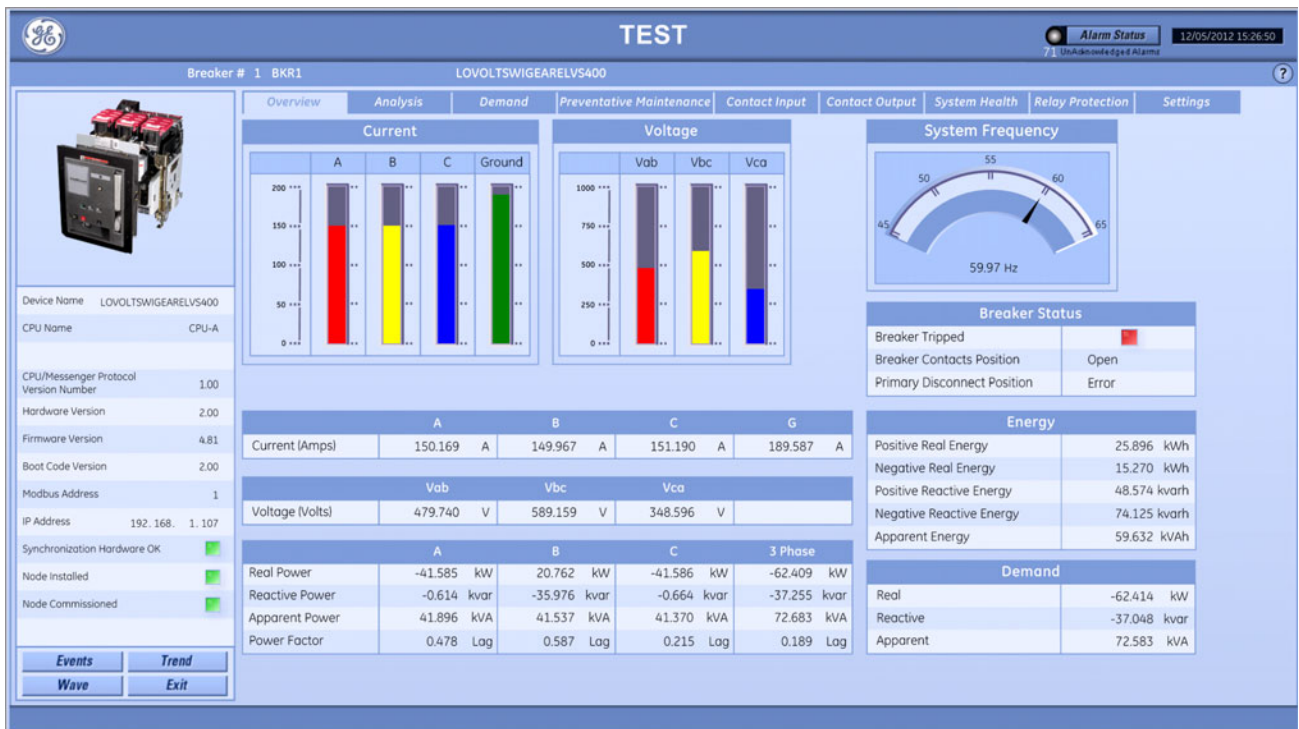
This section explains the information displayed in PMCS for EntellisysLVS (ELVS) products.

Overview tab

This tab displays

- Current
- Voltage
- System frequency
- Breaker status
- Energy
- Demand

Figure 48: ELVS Overview tab

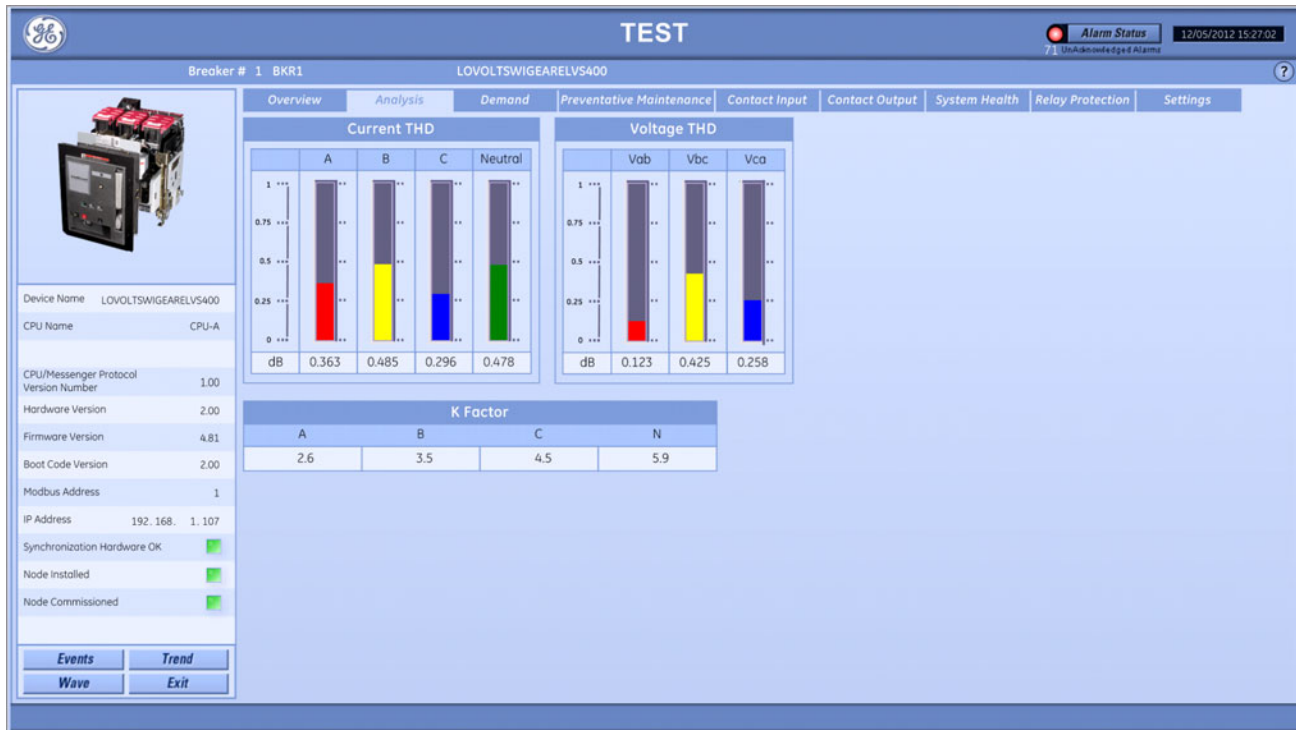


Analysis tab

This tab displays

- Current total harmonic distortion (THD)
- Voltage THD
- K factor

Figure 49: ELVS Analysis tab



Demand tab

This tab displays

- Demand
- Power factor
- Energy

Figure 50: ELVS Demand tab

The screenshot displays the 'Demand' tab for a GE LovoltsWigearELVS400 breaker. The interface includes a navigation menu, a device information sidebar, and three main data tables: Demand, Power Factor, and Energy. The 'Demand' table shows real, reactive, and apparent power over previous and maximum intervals. The 'Power Factor' table shows present and maximum values for each phase. The 'Energy' table shows positive and negative real and reactive energy for each phase and 3-phase totals.

Demand			
	Previous Interval	Maximum	Time of Maximum
Real Power	-62.414 kW	-62.415 kW	04/14/2014 06:51:03
Reactive Power	-37.048 kvar	-37.084 kvar	05/19/2032 07:11:11
Apparent Power	72.583 kVA	72.601 kVA	07/25/2026 05:12:30

Power Factor			
	Present	Maximum	Time of Maximum
Phase A	0.478 Lag	0.567 Lag	09/15/2026 07:10:38
Phase B	0.587 Lag	0.890 Lag	10/10/2028 00:59:29
Phase C	0.215 Lag	0.234 Lag	02/11/2015 12:48:55
3 Phase	0.189 Lag	0.345 Lag	02/13/2009 23:31:30

Energy				
	A	B	C	3 Phase
Positive Real Energy	14.590 kWh	54.870 kWh	48.962 kWh	25.896 kWh
Negative Real Energy	29.756 kWh	36.949 kWh	78.954 kWh	15.270 kWh
Positive Reactive Energy	14.287 kvarh	26.789 kvarh	35.964 kvarh	48.574 kvarh
Negative Reactive Energy	48.596 kvarh	63.524 kvarh	96.385 kvarh	74.125 kvarh
Apparent Energy	45.896 kVAh	58.963 kVAh	85.422 kVAh	59.632 kVAh

Preventative Maintenance tab

This tab displays

- Operation and preventative maintenance information
- Line up options
- Per breaker options

Figure 51: Preventative Maintenance tab

The screenshot shows the 'TEST' interface for a GE breaker. The main content area is titled 'Preventative Maintenance' and contains the following data:

Preventative Maintenance	
Total Operations As per ANSI/IEEE C37.13 & C37.16	39
Total No-Load Operations As per ANSI/IEEE C37.13 & C37.16	31
Total Load Operations As per ANSI/IEEE C37.13 & C37.16	8
Total Fault Operations As per ANSI/IEEE C37.13 & C37.16	6
Breaker Percent Load Life As per ANSI C37.50	7.99
Percent Mechanical Life As per ANSI C37.50	0.31
Date of Initial Energization	11/10/2009 10:40:30
Hours of Operations	58963
Date of Last Operation	08/17/2012 14:50:00

Line Up Options	
Synch Check Relay	<input checked="" type="checkbox"/>
Bus Differential Relay	<input checked="" type="checkbox"/>
Multi Source Ground Fault	<input checked="" type="checkbox"/>
ZSI	<input checked="" type="checkbox"/>
High Resistance Ground Fault	<input checked="" type="checkbox"/>
Waveform Capture	<input checked="" type="checkbox"/>

Per Breaker Options	
Expanded Metering Count	9
Demand Metering Count	9
Advanced Metering Count	9
Voltage Relay Count	9
High Current Relay Count	9
Frequency & Reverse power Relay Count	9

Additional interface elements include a left sidebar with device details (Device Name: LOVOLTSWIGARELVS400, CPU Name: CPU-A, etc.), a top navigation menu (Overview, Analysis, Demand, Preventative Maintenance, Contact Input, etc.), and a bottom control panel with buttons for Events, Trend, Wave, and Exit.

Contact Input tab

This tab displays

- Contact inputs

Figure 52: ELVS Contact Input tab

Breaker # 1 BKR1 LOVOLTSGEARELVS400

Alarm Status 12/05/2012 15:27:58

71 UnAcknowledge Alarm

Overview Analysis Demand Preventative Maintenance **Contact Input** Contact Output System Health Relay Protection Settings

Contact Inputs Prev Next 1 of 4

	Name	State		Name	State
1	Entellisys Contact Input 000001	<input type="checkbox"/>	17	Entellisys Contact Input 000017	<input type="checkbox"/>
2	Entellisys Contact Input 000002	<input type="checkbox"/>	18	Entellisys Contact Input 000018	<input type="checkbox"/>
3	Entellisys Contact Input 000003	<input type="checkbox"/>	19	Entellisys Contact Input 000019	<input type="checkbox"/>
4	Entellisys Contact Input 000004	<input type="checkbox"/>	20	Entellisys Contact Input 000020	<input type="checkbox"/>
5	Entellisys Contact Input 000005	<input type="checkbox"/>	21	Entellisys Contact Input 000021	<input type="checkbox"/>
6	Entellisys Contact Input 000006	<input type="checkbox"/>	22	Entellisys Contact Input 000022	<input type="checkbox"/>
7	Entellisys Contact Input 000007	<input type="checkbox"/>	23	Entellisys Contact Input 000023	<input type="checkbox"/>
8	Entellisys Contact Input 000008	<input type="checkbox"/>	24	Entellisys Contact Input 000024	<input type="checkbox"/>
9	Entellisys Contact Input 000009	<input type="checkbox"/>	25	Entellisys Contact Input 000025	<input type="checkbox"/>
10	Entellisys Contact Input 000010	<input type="checkbox"/>	26	Entellisys Contact Input 000026	<input type="checkbox"/>
11	Entellisys Contact Input 000011	<input type="checkbox"/>	27	Entellisys Contact Input 000027	<input type="checkbox"/>
12	Entellisys Contact Input 000012	<input type="checkbox"/>	28	Entellisys Contact Input 000028	<input type="checkbox"/>
13	Entellisys Contact Input 000013	<input type="checkbox"/>	29	Entellisys Contact Input 000029	<input type="checkbox"/>
14	Entellisys Contact Input 000014	<input type="checkbox"/>	30	Entellisys Contact Input 000030	<input type="checkbox"/>
15	Entellisys Contact Input 000015	<input type="checkbox"/>	31	Entellisys Contact Input 000031	<input type="checkbox"/>
16	Entellisys Contact Input 000016	<input type="checkbox"/>	32	Entellisys Contact Input 000032	<input type="checkbox"/>

Device Name: LOVOLTSGEARELVS400
 CPU Name: CPU-A
 CPU/Messenger Protocol Version Number: 1.00
 Hardware Version: 2.00
 Firmware Version: 4.81
 Boot Code Version: 2.00
 Modbus Address: 1
 IP Address: 192. 168. 1. 107
 Synchronization Hardware OK:
 Node Installed:
 Node Commissioned:

Events Trend
 Wave Exit

Contact Output tab

This tab displays

- Contact outputs

Figure 53: ELVS Contact Output tab

The screenshot shows the 'TEST' interface for a GE device. The top navigation bar includes tabs for Overview, Analysis, Demand, Preventative Maintenance, Contact Input, Contact Output (selected), System Health, Relay Protection, and Settings. The main content area is titled 'Contact Outputs' and displays a table of 32 outputs. Each output is listed with a number, name, and state indicator.

	Name	State		Name	State
1	Entellisis Contact Output 00001	<input type="checkbox"/>	17	Entellisis Contact Output 00017	<input type="checkbox"/>
2	Entellisis Contact Output 00002	<input type="checkbox"/>	18	Entellisis Contact Output 00018	<input type="checkbox"/>
3	Entellisis Contact Output 00003	<input type="checkbox"/>	19	Entellisis Contact Output 00019	<input type="checkbox"/>
4	Entellisis Contact Output 00004	<input type="checkbox"/>	20	Entellisis Contact Output 00020	<input type="checkbox"/>
5	Entellisis Contact Output 00005	<input type="checkbox"/>	21	Entellisis Contact Output 00021	<input type="checkbox"/>
6	Entellisis Contact Output 00006	<input type="checkbox"/>	22	Entellisis Contact Output 00022	<input type="checkbox"/>
7	Entellisis Contact Output 00007	<input type="checkbox"/>	23	Entellisis Contact Output 00023	<input type="checkbox"/>
8	Entellisis Contact Output 00008	<input type="checkbox"/>	24	Entellisis Contact Output 00024	<input type="checkbox"/>
9	Entellisis Contact Output 00009	<input type="checkbox"/>	25	Entellisis Contact Output 00025	<input type="checkbox"/>
10	Entellisis Contact Output 00010	<input type="checkbox"/>	26	Entellisis Contact Output 00026	<input type="checkbox"/>
11	Entellisis Contact Output 00011	<input type="checkbox"/>	27	Entellisis Contact Output 00027	<input type="checkbox"/>
12	Entellisis Contact Output 00012	<input type="checkbox"/>	28	Entellisis Contact Output 00028	<input type="checkbox"/>
13	Entellisis Contact Output 00013	<input type="checkbox"/>	29	Entellisis Contact Output 00029	<input type="checkbox"/>
14	Entellisis Contact Output 00014	<input type="checkbox"/>	30	Entellisis Contact Output 00030	<input type="checkbox"/>
15	Entellisis Contact Output 00015	<input type="checkbox"/>	31	Entellisis Contact Output 00031	<input type="checkbox"/>
16	Entellisis Contact Output 00016	<input type="checkbox"/>	32	Entellisis Contact Output 00032	<input type="checkbox"/>

On the left sidebar, the following device information is displayed:

- Device Name: LOVOLTSWIGARELVS400
- CPU Name: CPU-A
- CPU/Messenger Protocol Version Number: 1.00
- Hardware Version: 2.00
- Firmware Version: 4.81
- Boot Code Version: 2.00
- Modbus Address: 1
- IP Address: 192.168.1.107
- Synchronization Hardware OK:
- Node Installed:
- Node Commissioned:

At the bottom of the sidebar are buttons for Events, Trend, Wave, and Exit. The main interface also includes a 'Prev Next' navigation bar and a '1 of 4' indicator.

System Health tab

This tab displays

- Messenger hardware health
- Messenger settings validation
- Messenger communication status
- Messenger control power

Figure 54: ELVS System Health tab

The screenshot displays the 'System Health' tab for a GE LOVOLTSGEARELVS400 device. The interface includes a top navigation bar with tabs for Overview, Analysis, Demand, Preventative Maintenance, Contact Input, Contact Output, System Health (selected), Relay Protection, and Settings. The main content area is organized into four sections, each with a title and a list of items with status indicators (green squares):

- Messenger Hardware Health:**
 - Self Test Check
 - Configuration
 - Firmware
 - Hardware
 - Compartment ID Button
- Messenger Settings Validation:**
 - Protection Settings in Range
- Messenger Communication Status:**
 - CPU Communication
 - Communication Wiring
- Messenger Control Power:**
 - Primary Control Power
 - Secondary Control Power

The left sidebar provides detailed device information:

- Device Name: LOVOLTSGEARELVS400
- CPU Name: CPU-A
- CPU/Messenger Protocol Version Number: 1.00
- Hardware Version: 2.00
- Firmware Version: 4.81
- Boot Code Version: 2.00
- Modbus Address: 1
- IP Address: 192.168.1.107
- Synchronization Hardware OK:
- Node Installed:
- Node Commissioned:

Navigation buttons at the bottom left include Events, Trend, Wave, and Exit.

Relay Protection tab

This tab displays


- Over voltage
- Over frequency
- Under voltage
- Under frequency
- Reverse power
- Phase loss
- High current
- High resistance ground fault

Figure 55: ELVS Relay Protection tab

TEST Alarm Status 12/05/2012 15:28:37
71 UnAcknowledged Alarms

Breaker # 1 BKR1 LOVOLTSWIGARELVS400

Overview Analysis Demand Preventative Maintenance Contact Input Contact Output System Health **Relay Protection** Settings



Device Name LOVOLTSWIGARELVS400
CPU Name CPU-A
CPU/Messenger Protocol Version Number 1.00
Hardware Version 2.00
Firmware Version 4.81
Boot Code Version 2.00
Modbus Address 1
IP Address 192.168.1.107
Synchronization Hardware OK
Node Installed
Node Commissioned

Events Trend
Wave Exit

Alarm			Trip		
Pickup Setting (%)	110.0		120.0		
Time Delay (Seconds)	10.0		10.0		
Phase Requirement	1 Phase Violates Threshold		1 Phase Violates Threshold		
Open/Trip			Trip & Activate Lockout		

Alarm			Trip		
Pickup Setting (Hz)	62.0		65.0		
Time Delay (Seconds)	10.0		10.0		
Blocking Voltage Sett. (%)	10		10		
Open/Trip			Open & Don't Activate Lockout		

Alarm			Trip		
Pickup Setting (Hz)	58.0		55.6		
Time Delay (Seconds)	10.0		10.0		
Blocking Voltage Sett. (%)	10		10		
Open/Trip			Open & Don't Activate Lockout		

Alarm			Trip		
Pickup Setting (kW)	100.0		200.0		
Time Delay (Seconds)	10.0		10.0		
Open/Trip			Open & Don't Activate Lockout		

Alarm			Trip		
Pickup Setting (% LT Pk)	200.0				
Time Delay (Seconds)	15.0				

Alarm			Trip		
Pickup Setting (Hz)	58.0		55.6		
Time Delay (Seconds)	10.0		10.0		
Blocking Voltage Sett. (%)	10		10		
Open/Trip			Open & Don't Activate Lockout		

Alarm			Trip		
Pickup Setting (Hz)	8.0		12.0		
Time Delay (Seconds)	10.0		20.0		
Blocking Voltage Sett. (%)	5.0		5.0		
Open/Trip			Open & Don't Activate Lockout		

Alarm			Trip		
Pickup Setting (Amps)	2.0				
Time Delay (Seconds)	0.5				
Ground Resistance (Ohms)	5				
Ground CT Rating (Amps)	10				

Settings tab

This tab displays

- Breaker configuration
- Long time protection
- Ground fault alarm protection
- Short time protection
- Ground fault trip protection
- Instantaneous protection

Figure 56: ELVS Settings tab

Breaker # 1 BKR1 **LOVOLT5WIGEARELVS400**

Overview Analysis Demand Preventative Maintenance Contact Input Contact Output System Health Relay Protection Settings

Breaker Configuration	
Frame Rating	900
Sensor Rating	200
PT Rating	600 V Delta
Breaker Type	ANSI
Hardware Version	1.00
Firmware Version	5.01
Message Protocol Version	1.00
Serial Number	MF0A04000216
Breaker Topology	1

Long Time Protection	
Rating (Amps)	80
LT Setting	1.00
Current Setting (Amps)	80.00
Delay Band	BAND 4

Short Time Protection	
Short Time	Enabled
Pickup Setting (x LT Pickup)	1.5
Curve I2T	Disabled
Delay Band	BAND 1

Instantaneous Protection	
Instantaneous Overcurrent	Disabled
Pickup (x Rating)	6.0

Ground Fault Alarm Protection	
Alarm Enabled	Enabled
Pickup Setting (x CT)	0.20
Curve I2T	Disabled
Delay Band	BAND 1

Ground Fault Trip Protection	
Pickup Setting (x CT)	0.20
Curve I2T	Disabled
Delay Band	BAND 1

Device Name: LOVOLT5WIGEARELVS400
 CPU Name: CPU-A
 CPU/Messenger Protocol Version Number: 1.00
 Hardware Version: 2.00
 Firmware Version: 4.81
 Boot Code Version: 2.00
 Modbus Address: 1
 IP Address: 192.168.1.107
 Synchronization Hardware OK:
 Node Installed:
 Node Commissioned:

Events Trend
 Wave Exit

EMVTC

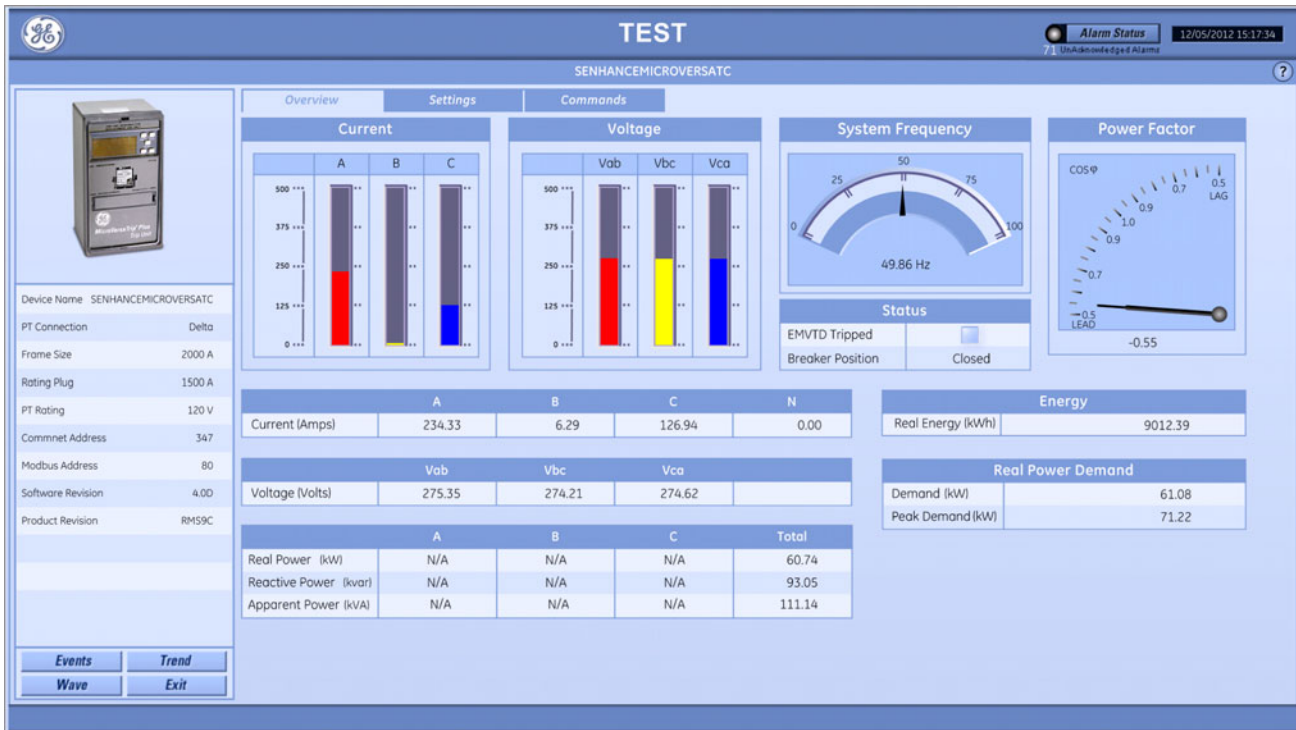
This section explains the information displayed in PMCS for Enhanced MicroVersa Trip C (EMVTC) products.

Overview tab

This tab displays

- Current
- Voltage
- System frequency
- Status
- Power factor
- Energy
- Real power demand

Figure 57: EMVTC Overview tab



Settings tab

This tab displays

- Breaker configuration
- Long time protection
- Short time protection
- Instantaneous protection
- Protective relays
- Ground fault protection

Figure 58: EMVTC Settings tab

The screenshot displays the 'Settings' tab for a GE device. The interface includes a top navigation bar with 'Overview', 'Settings', and 'Commands' tabs. The 'Settings' tab is active, showing various protection parameters in table format. A left sidebar provides device details and navigation options.

Breaker Configuration	
Current Sensor Rating	1500
Targets	Enabled
Power Flow Direction	Line to Load
Neutral Protection Factor	Off
Wire Mode	3 Wire
Demand Interval	15 Min.
Trip Operation Counter	Enabled
Sw. Inst/Short Time	Disabled
Current Unbalance Relay	Disabled
Gnd Fault ZS1 Selected	Disabled
Short Time ZS1 Selected	Disabled

Long Time Protection	
Pickup	0.65
Delay	3
Overcurrent	Enabled

Short Time Protection	
Short Time	Disabled
Pickup	7.00
Pickup Config	Long Time
Delay	1, OUT

Instantaneous Protection	
Instantaneous Overcurrent	Enabled
Pickup	2.5

Protective Relays			
	Protection	Setpoint	Delay
Undervoltage	Disabled	50 %	0 Sec.
Overvoltage	Disabled	150 %	0 Sec.
Volts Unbalance	Disabled	50 %	0 Sec.
Amps Unbalance	Disabled	50 %	0 Sec.
Power Reversal	Disabled	300 kW	0 Sec.

Ground Fault Protection	
Ground Fault	Disabled
Curve	Normal
Switchable GF	No
Pickup	0.2
Delay	1, IN

Device Information:

- Device Name: SENHANCEMICROVERSATC
- PT Connection: Delta
- Frame Size: 2000 A
- Rating Plug: 1500 A
- PT Rating: 120 V
- Commnet Address: 347
- Modbus Address: 80
- Software Revision: 4.00
- Product Revision: RM59C

Navigation Buttons: Events, Trend, Wave, Exit

Commands tab

The following functions are available.

Table 12: EMVTC commands available

Button	Function
Reset Energy	Clears energy data in the device
Reset Peak Demand	Clears peak demand data in the device
Reset Instantaneous Trip Counter	Clears instantaneous trip counters from the device
Reset Short Time Trip Counter	Clears short time trip counters from the device
Reset Long Time Trip Counter	Clears long time trip counters from the device
Reset Ground Fault Trip Counter	Clears ground fault trip counters from the device

Figure 59: EMVTC Commands tab



EMVTD

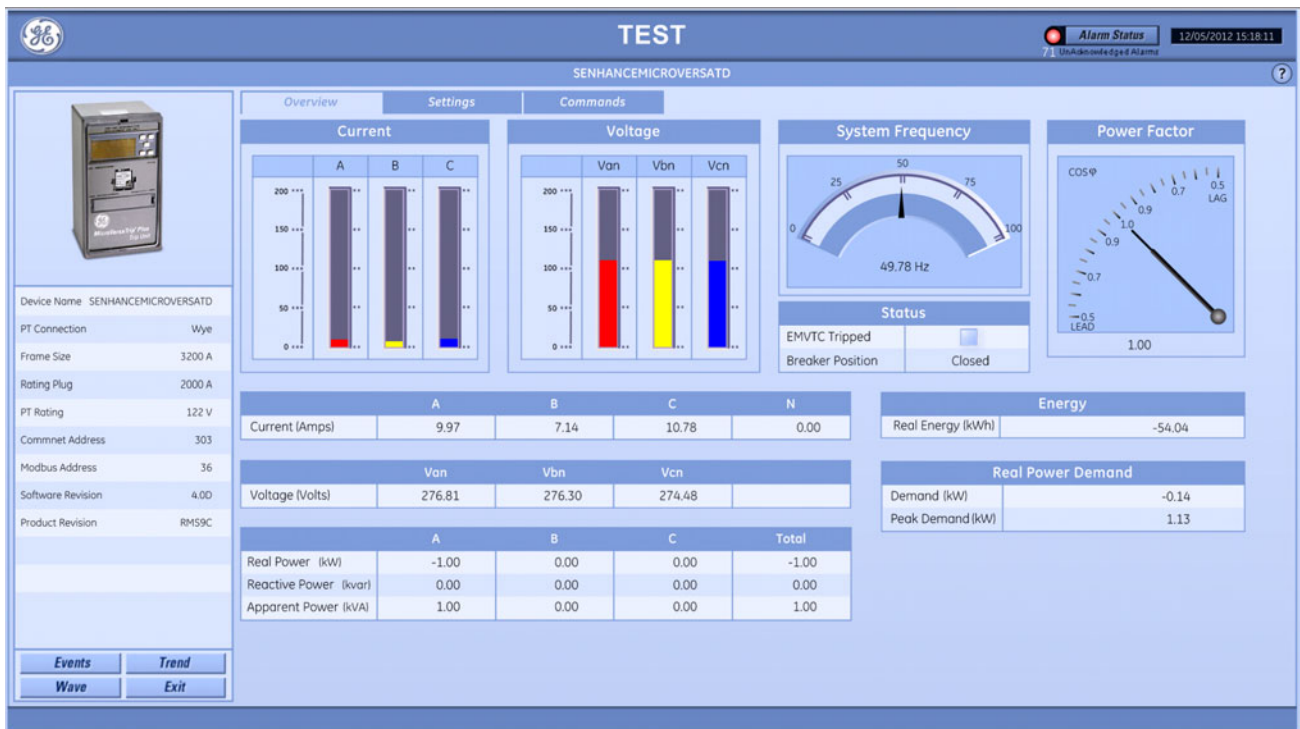
This section explains the information displayed in PMCS for the Enhanced MicroVersa Trip D (EMVTD) products.

Overview tab

This tab displays

- Current
- Voltage
- System frequency
- Status
- Power factor
- Energy
- Real power demand

Figure 60: EMVTD Overview tab



Settings tab

This tab displays

- Breaker configuration
- Long time protection
- Short time protection
- Instantaneous protection
- Protective relays
- Ground fault protection

Figure 61: EMVTD Settings tab

The screenshot shows the 'Settings' tab for a GE breaker. The interface includes a device image, a parameter list, and several configuration tables for protection settings.

Device Information:

- Device Name: SENHANCIMICROVERSATD
- PT Connection: Wye
- Frame Size: 3200 A
- Rating Plug: 2000 A
- PT Rating: 122 V
- Commet Address: 303
- Modbus Address: 36
- Software Revision: 4.00
- Product Revision: RMS9C

Breaker Configuration:

Current Sensor Rating	2000
Targets	Enabled
Power Flow Direction	Line to Load
Neutral Protection Factor	Off
Wire Mode	3 Wire
Demand Interval	20 Min.
Trip Operation Counter	Enabled
Sw. Inst/Short Time	Disabled
Current Unbalance Relay	Disabled
Gnd Fault ZS1 Selected	Disabled
Short Time ZS1 Selected	Disabled

Long Time Protection:

Pickup	0.90
Delay	2
Overcurrent	Enabled

Short Time Protection:

Short Time	Enabled
Pickup	9.00
Pickup Config	Long Time
Delay	3 , IN

Instantaneous Protection:

Instantaneous Overcurrent	Disabled
Pickup	0.0

Ground Fault Protection:

Ground Fault	Enabled
Curve	Normal
Switchable GF	No
Pickup	0.3
Delay	3 , IN

Protective Relays:

	Protection	Setpoint	Delay
Undervoltage	Disabled	50 %	0 Sec.
Overvoltage	Disabled	150 %	0 Sec.
Volts Unbalance	Disabled	50 %	0 Sec.
Amps Unbalance	Disabled	50 %	0 Sec.
Power Reversal	Disabled	300 kW	0 Sec.

Commands tab

The following functions are available.

Table 13: EMVTD commands available

Button	Function
Reset Energy	Clears energy data in the device
Reset Peak Demand	Clears peak demand data in the device
Reset Instantaneous Trip Counter	Clears instantaneous trip counters from the device
Reset Short Time Trip Counter	Clears short time trip counters from the device
Reset Long Time Trip Counter	Clears long time trip counters from the device
Reset Ground Fault Trip Counter	Clears ground fault trip counters from the device

Figure 62: EMVTD Commands tab

The screenshot shows the EMVTD web interface. At the top, there is a GE logo, the word 'TEST' in the center, and an 'Alarm Status' indicator on the right showing '12/05/2012 15:19:31'. Below the header, the device name 'SENHANCEMICROVERSATD' is displayed. The interface has three tabs: 'Overview', 'Settings', and 'Commands', with 'Commands' being the active tab. On the left side, there is a sidebar with a device image and a list of parameters: Device Name (SENHANCEMICROVERSATD), PT Connection (Wye), Frame Size (3200 A), Rating Plug (2000 A), PT Rating (122 V), Commet Address (303), Modbus Address (36), Software Revision (4.00), and Product Revision (RM59C). At the bottom of the sidebar are buttons for 'Events', 'Trend', 'Wave', and 'Exit'. The main content area shows a table of commands with 'Reset' buttons next to each:

Commands	
Reset Energy	Reset
Reset Peak Demand	Reset
Reset Instantaneous Trip Counter	Reset
Reset Short Time Trip Counter	Reset
Reset Long Time Trip Counter	Reset
Reset Ground Fault Trip Counter	Reset

EPM9650/EPM9450

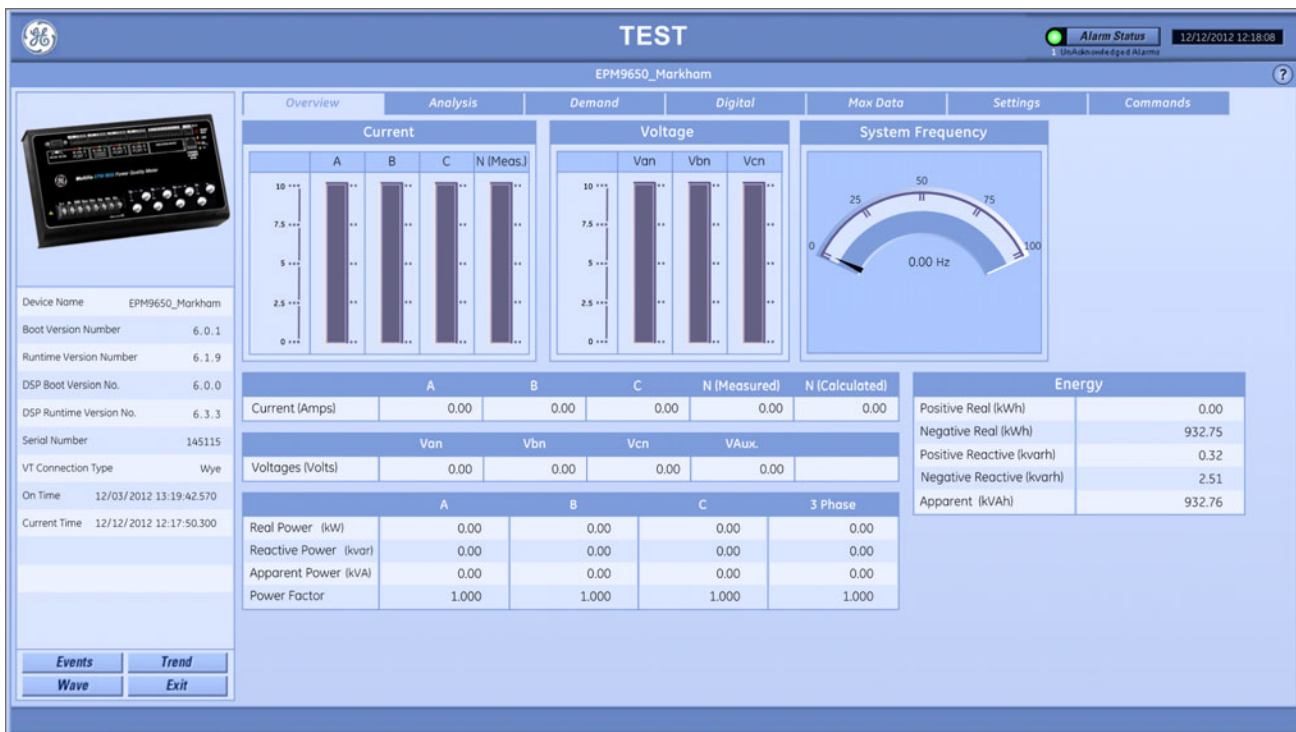
This section explains the information displayed in PMCS for EPM9650 and EPM9450 meters.

Overview tab

This tab displays

- Currents
- Voltages
- Energy
- Power
- System frequency

Figure 63: EPM9650 Overview tab



Analysis tab

This tab displays present, maximum, and timestamp of maximum of

- Currents - Total harmonic distortion (THD)
- Phase Voltage - THD
- K-factor currents

Figure 64: EPM9650 Analysis tab

The screenshot shows the 'TEST' interface for the EPM9650 device. The 'Analysis' tab is selected, displaying three data tables: Currents - Total Harmonic Distortion (THD), Voltages - Total Harmonic Distortion (THD), and K-Factor Currents. A left sidebar contains device metadata and navigation buttons.

Device Information	
Device Name	EPM9650_Markham
Boot Version Number	6.0.1
Runtime Version Number	6.1.9
DSP Boot Version No.	6.0.0
DSP Runtime Version No.	6.3.3
Serial Number	145115
VT Connection Type	Wye
On Time	12/03/2012 13:19:42.570
Current Time	12/12/2012 12:19:08.180

Currents - Total Harmonic Distortion (THD)				
Phase	Present	Maximum	Time of Maximum	
A (%)	0.00	6.25	10/30/2012	11:37:41.05
B (%)	0.00	6.25	10/30/2012	11:37:41.05
C (%)	0.00	6.25	10/30/2012	11:37:41.05

Voltages - Total Harmonic Distortion (THD)				
Phase	Present	Maximum	Time of Maximum	
Van (%)	0.00	4.68	02/28/2007	15:01:19.06
Vbn (%)	0.00	4.68	02/28/2007	15:01:19.06
Vcn (%)	0.00	4.68	02/28/2007	15:01:19.06

K-Factor Currents				
Phase	Present	Maximum	Time of Maximum	
A (%)	0.00	12.76	10/30/2012	11:37:41.05
B (%)	0.00	15.02	10/30/2012	11:37:41.05
C (%)	0.00	12.76	10/30/2012	11:37:41.05

Demand tab

This tab displays

- Fixed window power
- Predictive sliding window

Figure 65: EPM9650 Demand tab

The screenshot shows the 'TEST' interface for the EPM9650 device. The top navigation bar includes 'Overview', 'Analysis', 'Demand' (selected), 'Digital', 'Max Data', 'Settings', and 'Commands'. The 'Demand' tab is active, displaying two tables: 'Block (Fixed) Window' and 'Rolling (Sliding) Window'. Both tables show power metrics (Positive Real, Negative Real, Positive Reactive, Negative Reactive, and Apparent) with columns for Instantaneous, Maximum, and Time of Maximum values.

Block (Fixed) Window				
	Instantaneous	Maximum	Time of Maximum	
Positive Real (kW)	0.00	0.00	09/26/2012	09:14:59.06
Negative Real (kW)	N/A	-3.77	11/08/2012	02:59:59.06
Positive Reactive (kvar)	0.00	0.01	11/01/2012	05:29:59.06
Negative Reactive (kvar)	N/A	-0.01	11/11/2012	00:14:59.06
Apparent (kVA)	0.00	3.77	11/08/2012	02:59:59.06

Rolling (Sliding) Window				
	Instantaneous	Maximum	Time of Maximum	
Positive Real (kW)	0.00	0.00	09/26/2012	09:19:59.06
Negative Real (kW)	N/A	-3.77	11/08/2012	03:09:59.05
Positive Reactive (kvar)	0.00	0.01	11/01/2012	05:24:59.05
Negative Reactive (kvar)	N/A	-0.01	11/08/2012	10:09:59.05
Apparent (kVA)	0.00	3.77	11/08/2012	03:09:59.05

On the left side, there is a device information panel for 'EPM9650_Markham' with fields for Boot Version Number (6.0.1), Runtime Version Number (6.1.9), DSP Boot Version No. (6.0.0), DSP Runtime Version No. (6.3.3), Serial Number (145115), VT Connection Type (Wye), On Time (12/03/2012 13:19:42.570), and Current Time (12/12/2012 12:19:23.640). Below this panel are buttons for 'Events', 'Trend', 'Wave', and 'Exit'.

Digital tab

This tab displays

- Digital inputs

Figure 66: EPM9650 Digital tab

The screenshot shows the 'TEST' interface for the EPM9650 device. The 'Digital' tab is selected, displaying a table of digital inputs. The table has columns for Name, Open/Close Label, a status indicator (green square), and Pulse Counter. The pulse counter for all inputs is 0.

Digital Inputs			
	Name	Open/Close Label	Pulse Counter
1	HSI Input 1	Open_1	0
2	HSI Input 2	Open_2	0
3	HSI Input 3	Open_3	0
4	HSI Input 4	Open_4	0
5	HSI Input 5	Open_5	0
6	HSI Input 6	Open_6	0
7	HSI Input 7	Open_7	0
8	HSI Input 8	Open_8	0

Device Name: EPM9650_Markham
 Boot Version Number: 6.0.1
 Runtime Version Number: 6.1.9
 DSP Boot Version No.: 6.0.0
 DSP Runtime Version No.: 6.3.3
 Serial Number: 145115
 VT Connection Type: Wye
 On Time: 12/03/2012 13:19:42.570
 Current Time: 12/12/2012 12:19:38.040

Buttons: Events, Trend, Wave, Exit

Max Data tab

This tab displays the maximum and its time stamp of

- Currents
- Voltages
- Positive real power
- Negative real power
- Positive reactive power
- Negative reactive power
- Apparent power

Figure 67: EPM9650 Max Data tab

The screenshot displays the 'Max Data' tab for the EPM9650 device. The interface is titled 'TEST' and shows the device name 'EPM9650_Markham'. The 'Max Data' section is active, showing several data tables:

- Current:**

	Maximum	Time of Maximum
A (Amps)	42.26	11/08/2012 03:22:44.06
B (Amps)	42.26	11/08/2012 03:22:44.06
C (Amps)	42.28	11/08/2012 03:22:44.06
N (Amps)	0.00	02/28/2007 15:01:14.06
N (calcl)	126.94	11/08/2012 03:22:45.04
- Voltage:**

	Maximum	Time of Maximum
Van (Volts)	116.51	02/28/2007 15:02:01.05
Vbn (Volts)	116.51	02/28/2007 15:02:01.05
Vcn (Volts)	116.51	02/28/2007 15:02:01.05
Vaux	0.00	02/28/2007 15:01:14.06
- Positive Real Power (kW):**

	Maximum	Time of Maximum
Phase A	0.00	02/28/2007 15:01:14.07
Phase B	0.00	02/28/2007 15:01:14.07
Phase C	0.00	02/28/2007 15:01:14.07
3 Phase	0.00	02/28/2007 15:01:14.07
- Positive Reactive Power (kvar):**

	Maximum	Time of Maximum
Phase A	0.00	11/05/2012 02:50:09.03
Phase B	0.00	10/30/2012 11:38:43.04
Phase C	0.01	10/30/2012 23:15:54.03
3 Phase	0.01	11/01/2012 05:41:01.10
- Apparent Power (kVA):**

	Maximum	Time of Maximum
Phase A	1.26	11/08/2012 03:22:45.04
Phase B	1.26	11/08/2012 03:22:45.04
Phase C	1.26	11/08/2012 03:22:45.05
3 Phase	3.77	11/08/2012 03:22:45.05
- Negative Real Power (kW):**

	Maximum	Time of Maximum
Phase A	-1.26	11/08/2012 03:22:45.05
Phase B	-1.26	11/08/2012 03:22:45.05
Phase C	-1.26	11/08/2012 03:22:45.05
3 Phase	-3.77	11/08/2012 03:22:45.05
- Negative Reactive Power (kvar):**

	Maximum	Time of Maximum
Phase A	-0.01	11/11/2012 03:36:15.06
Phase B	-0.01	11/09/2012 16:53:05.05
Phase C	-0.01	11/11/2012 00:11:48.05
3 Phase	-0.01	11/09/2012 03:43:34.05

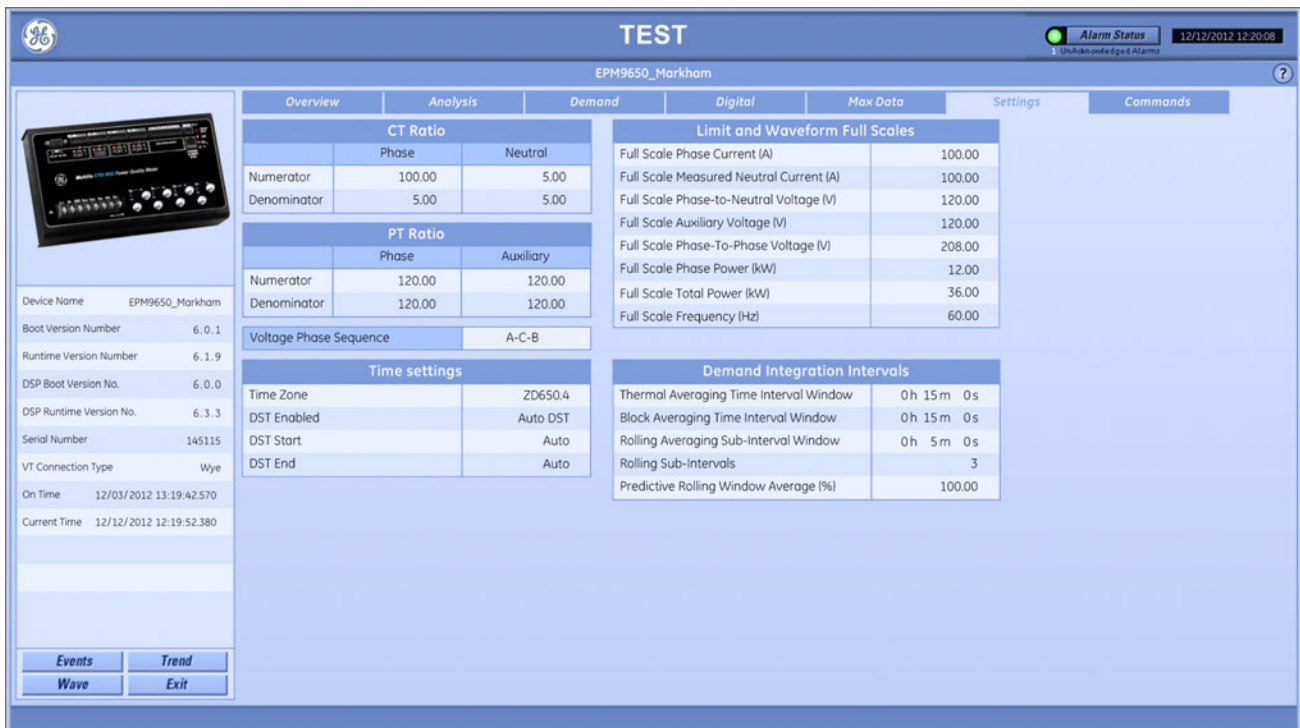
Additional interface elements include a device image, version information (Boot: 6.0.1, Runtime: 6.1.9, DSP Boot: 6.0.0, DSP Runtime: 6.3.3, Serial: 145115, VT Connection: Wye, On Time: 12/03/2012 13:19:42.570, Current Time: 12/12/2012 12:19:52.380), and navigation buttons (Events, Trend, Wave, Exit). The top right shows 'Alarm Status' as '1 Unacknowledged Alarm' at '12/12/2012 12:19:57'.

Settings tab

This tab displays

- Current setpoints
- Voltage setpoints
- Voltage phase sequence
- CT ratio
- PT ratio
- Time settings, including time zone

Figure 68: EPM9650 Settings tab



The screenshot shows the Settings tab for the EPM9650 device. The interface includes a GE logo, a 'TEST' header, and an 'Alarm Status' indicator. The main content area is divided into several sections: Overview, Analysis, Demand, Digital, Max Data, Settings, and Commands. The Settings section is active and displays various configuration parameters in tables.

Device Information:

- Device Name: EPM9650_Markham
- Boot Version Number: 6.0.1
- Runtime Version Number: 6.1.9
- DSP Boot Version No.: 6.0.0
- DSP Runtime Version No.: 6.3.3
- Serial Number: 145115
- VT Connection Type: Wye
- On Time: 12/03/2012 13:19:42.570
- Current Time: 12/12/2012 12:19:52.380

CT Ratio:

	Phase	Neutral
Numerator	100.00	5.00
Denominator	5.00	5.00

PT Ratio:

	Phase	Auxiliary
Numerator	120.00	120.00
Denominator	120.00	120.00

Voltage Phase Sequence: A-C-B

Time settings:

Time Zone	ZD650.4
DST Enabled	Auto DST
DST Start	Auto
DST End	Auto

Limit and Waveform Full Scales:

Full Scale Phase Current (A)	100.00
Full Scale Measured Neutral Current (A)	100.00
Full Scale Phase-to-Neutral Voltage (V)	120.00
Full Scale Auxiliary Voltage (V)	120.00
Full Scale Phase-To-Phase Voltage (V)	208.00
Full Scale Phase Power (kW)	12.00
Full Scale Total Power (kW)	36.00
Full Scale Frequency (Hz)	60.00

Demand Integration Intervals:

Thermal Averaging Time Interval Window	0h 15m 0s
Block Averaging Time Interval Window	0h 15m 0s
Rolling Averaging Sub-Interval Window	0h 5m 0s
Rolling Sub-Intervals	3
Predictive Rolling Window Average (%)	100.00

Buttons: Events, Trend, Wave, Exit

Commands tab

The following functions are available.

Table 14: EPM9650 commands available

Button	Function
Reset Energy	Clears the energy counters
Reset Maximums	Clears the maximum values from memory
Reset Minimums	Clears the minimum values from memory

Figure 69: EPM9650 Commands tab



GTU

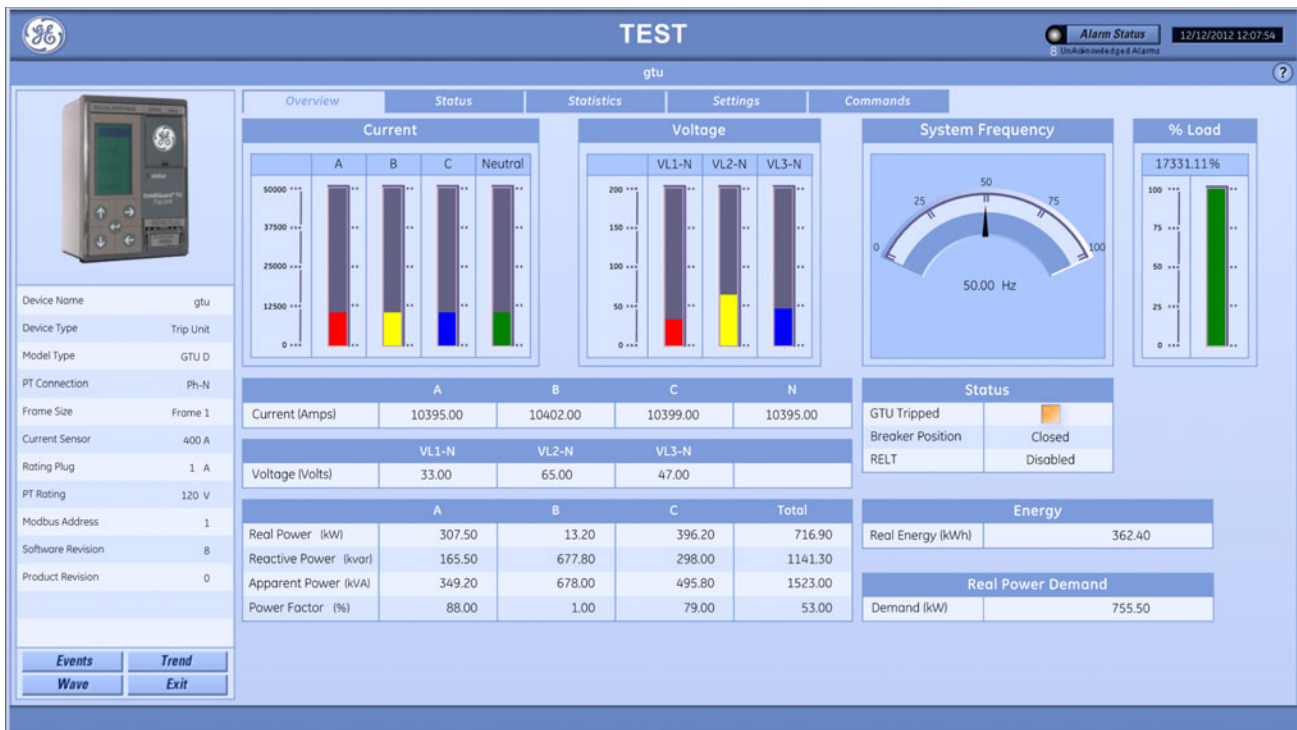
This section explains the information displayed in PMCS for Entellguard Trip Unit (GTU) products.

Overview tab

This tab displays

- Currents
- Voltages
- System frequency
- Status
- Energy
- Real power demand

Figure 70: GTU Overview tab



Status tab

This tab displays

- Trip status
- Breaker status
- Alarm status
- Primary protection
- Waveform capture data
- Relays
- Inputs
- Shunts
- Undervoltage release (UVR)

Figure 71: GTU Status tab

The screenshot shows the 'TEST' interface for a GE GTU device. The main title is 'TEST' with a GE logo on the left and 'Alarm Status' and '12/12/2012 12:08:10' on the right. Below the title is a navigation bar with tabs: Overview, Status, Statistics, Settings, and Commands. The 'Status' tab is active.

On the left side, there is a device image and a list of device parameters:

- Device Name: gtu
- Device Type: Trip Unit
- Model Type: GTU D
- PT Connection: Ph-N
- Frame Size: Frame 1
- Current Sensor: 400 A
- Rating Plug: 1 A
- PT Rating: 120 V
- Modbus Address: 1
- Software Revision: 8
- Product Revision: 0

At the bottom left, there are buttons for 'Events', 'Trend', 'Wave', and 'Exit'.

The main content area is divided into several sections:

- Trip Status:** GTU Tripped (indicated by an orange square).
- Relays:** Relay 1, 2, 3, and 4, each with a status indicator.
- Inputs:** Input 1, 2, 3, and 4, each with a status indicator.
- Shunts:** Shunt 1 and Shunt 2, each with a status indicator.
- UVRs:** UVR 1 and UVR 2, each with a status indicator.
- Breaker Status:** Breaker Position, Breaker Ready to Close, Spring Charge, Fan Status, and Remote Close, each with a status indicator.
- Primary Protection:** Long Time Pickup and Short Time Pickup, each with a status indicator.
- Waveform Capture Data:** Waveform Capture Data Available (indicated by a blue square).
- Alarm Status:** A table with columns for 'Pickup' and 'Active'.

Alarm	Pickup	Active
Voltage Unbalance	Orange	Grey
Under Voltage	Orange	Grey
Over Voltage	Blue	Grey
Current Unbalance	Blue	Grey
Power Reversal	Orange	Grey
Ground Fault Sum	Orange	Orange
Current Alarm 1	Blue	Orange
Current Alarm 2	Blue	Orange
Bell Alarm Actuation	Blue	Blue
Bell Alarm/Lockout Actuation	Blue	Blue

A legend at the bottom right indicates that a grey square represents 'Not Available'.

Statistics tab

This tab displays

- Trip counts

Figure 72: GTU Statistics tab

The screenshot shows the GE TEST web interface for a GTU device. The main navigation bar includes 'Overview', 'Status', 'Statistics', 'Settings', and 'Commands'. The 'Statistics' tab is selected, displaying a table of trip counts. On the left side, there is a device image and a list of device parameters. At the bottom left, there are buttons for 'Events', 'Trend', 'Wave', and 'Exit'.

Trip Counts	
Long Time Trips	0
Short Time Trips	5
Instantaneous Trips	8
Ground Fault Sum Trips	0
Power Reversal Trips	7
Current Unbalance Trips	0
Voltage Unbalance Trips	0
Over Voltage Trips	3
Under Voltage Trips	0
Under Voltage Release 1 Trips	N/A
Under Voltage Release 2 Trips	N/A
Shunt 1 Trips	N/A
Shunt 2 Trips	N/A

Device Name: gtu
 Device Type: Trip Unit
 Model Type: GTU D
 PT Connection: Ph-N
 Frame Size: Frame 1
 Current Sensor: 400 A
 Rating Plug: 1 A
 PT Rating: 120 V
 Modbus Address: 1
 Software Revision: 8
 Product Revision: 0

Buttons: Events, Trend, Wave, Exit

Settings tab

This tab displays

- Breaker configuration
- Long time protection configuration
- Short time protection configuration
- Instantaneous protection configuration
- Reduced energy let-through (RELT) instantaneous protection configuration
- Protective relays
- Ground fault protection configuration

Figure 73: GTU Settings tab

The screenshot displays the GE GTU Settings tab interface. At the top, there is a navigation bar with the GE logo, the word 'TEST', and an 'Alarm Status' indicator showing 'Unknown Edge Alarm' at '12/12/2012 12:08:31'. Below the navigation bar are tabs for 'Overview', 'Status', 'Statistics', 'Settings', and 'Commands'. The main content area is divided into several configuration sections:

- Breaker Configuration:**

Power Flow Direction	Line to Load
Neutral Protection	N/A
Demand Interval	25 Min.
Under Voltage Zero-Volt Trip	Enabled
- Long Time Protection Configuration:**

Pickup	0.60 A
Delay	C2
Overcurrent	Enabled
- Short Time Protection Configuration:**

Short Time	Enabled
Pickup	0.90 A
Pickup Config	Long Time
Delay	Band4
Curve	2
- Instantaneous Protection Configuration:**

Pickup	2.00 A
Instantaneous Overcurrent	Enabled
- RELT Configuration:**

Pickup	2.00 A
RELT	Disabled
- Protective Relays:**

	Status	Setpoint	Delay
Undervoltage	Enabled	50 %	1 Sec.
Overvoltage	Enabled	110 %	1 Sec.
Volts Unbalance	Enabled	10 %	1 Sec.
Amps Unbalance	Enabled	10 %	1 Sec.
Power Reversal	Enabled	10 kW	1 Sec.
- Ground Fault Protection Configuration:**

	Ground Fault	Curve	Switchable GF	Pickup	Delay
GF CT Trip	Enabled	0	Yes	80.00 A	Band4
GF CT Alarm	Enabled	0	Yes	80.00 A	Band4
GF Sum Trip	Enabled	0	Yes	80.00 A	Band4
GF Sum Alarm	Enabled	0	Yes	80.00 A	Band4

A left sidebar contains device information:

- Device Name: gtu
- Device Type: Trip Unit
- Model Type: GTU D
- PT Connection: Ph-N
- Frame Size: Frame 1
- Current Sensor: 400 A
- Rating Plug: 1 A
- PT Rating: 120 V
- Modbus Address: 1
- Software Revision: 8
- Product Revision: 0

At the bottom of the sidebar are navigation buttons: 'Events', 'Trend', 'Wave', and 'Exit'.

Commands tab

The following functions are available.

Table 15: GTU commands available

Button	Function
Reset Instantaneous Trip Counter	Clears Instantaneous trip counter data
Reset Short Time Trip Counter	Clears short time trip counter data
Reset Long Time Trip Counter	Clears long time trip counter data
Reset Ground Fault Trip Counter	Clears ground fault trip counter data
Reset RELT	Resets RELT
Reset Total Energy	Clears total energy

Figure 74: GTU Commands tab

The screenshot shows the GE GTU web interface. At the top, there is a 'TEST' header and an 'Alarm Status' indicator. The main navigation menu includes 'Overview', 'Status', 'Statistics', 'Settings', and 'Commands'. The 'Commands' tab is selected, displaying a table with the following commands and their corresponding 'Reset' buttons:

Commands	
Reset Instantaneous Trip Counter	Reset
Reset Short Time Trip Counter	Reset
Reset Long Time Trip Counter	Reset
Reset Ground Fault Trip Counter	Reset
Reset RELT	Reset
Reset Total Energy	Reset

On the left side of the interface, there is a device image and a table of device parameters:

Device Name	gtu
Device Type	Trip Unit
Model Type	GTU D
PT Connection	Ph-N
Frame Size	Frame 1
Current Sensor	400 A
Rating Plug	1 A
PT Rating	120 V
Modbus Address	1
Software Revision	8
Product Revision	0

At the bottom left, there are buttons for 'Events', 'Trend', 'Wave', and 'Exit'.

MVT

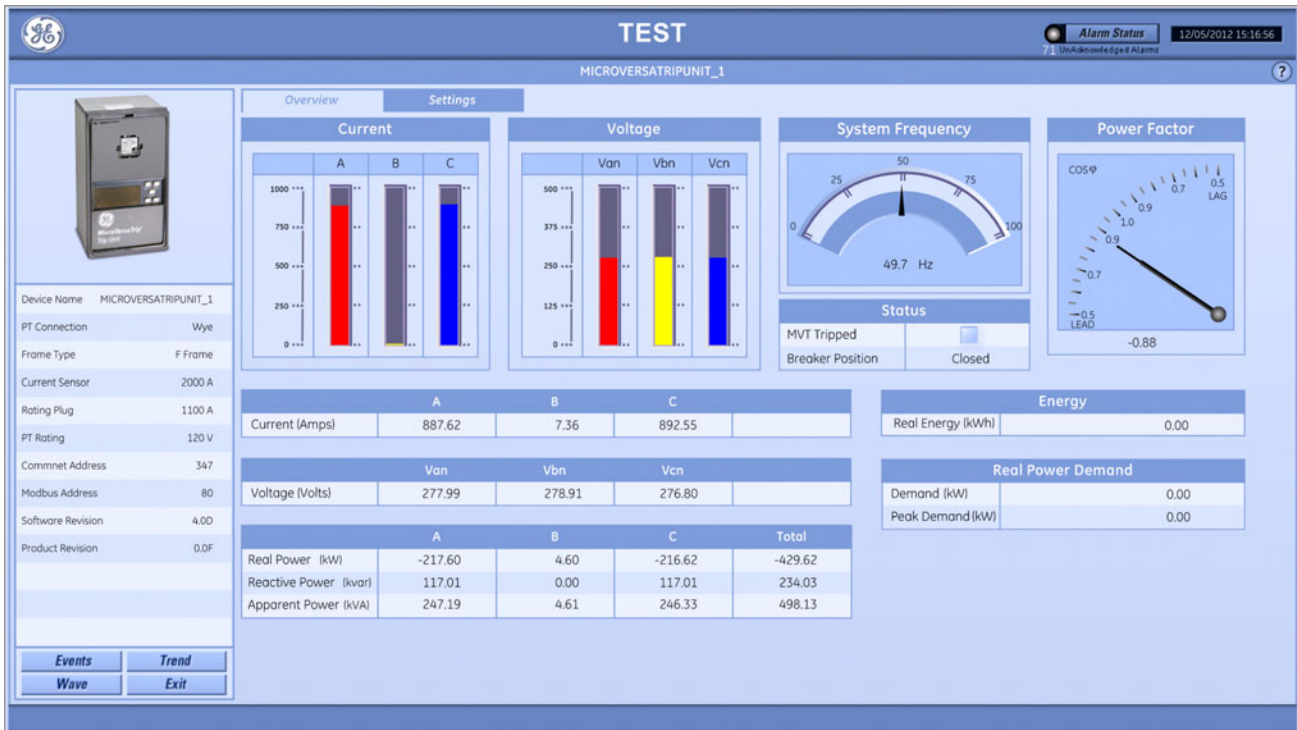
This section explains the information displayed in PMCS for MicroVersa Trip (MVT) products, excluding EMVTC and EMVTD.

Overview tab

This tab displays

- Current
- Voltage
- System frequency
- Status
- Power factor
- Energy
- Real power demand

Figure 75: MVT Overview tab



Settings tab

This tab displays

- Breaker configuration
- Long time protection
- Short time protection
- Instantaneous protection
- Protective relays
- Ground fault protection

Figure 76: MVT Settings tab

The screenshot displays the 'Settings' tab for a GE Microversatrip Unit. The interface is titled 'TEST' and shows the device name 'MICROVERSATRI PUNIT_1'. The 'Alarm Status' is '71 UnAcknowledge of Alarm' and the timestamp is '12/05/2012 15:17:08'. The 'Settings' tab is active, showing several configuration tables:

Breaker Configuration	
Current Sensor Rating	5000 Amps
Targets	Enabled
Power Flow Direction	Load to line
Relay Option	Wye

Long Time Protection	
Fixed Pickup	Disabled
Fixed Delay	Disabled
Overcurrent	Enabled

Ground Fault Protection	
Ground Fault	Disabled
Pickup	0.20
Delay	1, IN

Short Time Protection	
Short Time	Disabled
Pickup	7.0
Delay	1, OUT

Instantaneous Protection	
Instantaneous Function	Enabled
Instantaneous Limited	Disabled
Pickup	10.0

Protective Relays		
	Setpoint	Delay
Undervoltage	50 %	OFF secs
Overvoltage	150 %	OFF secs
Volts Unbalance	50 %	OFF secs
Amps Unbalance	50 %	OFF secs
Power Reversal	1368 kW	OFF secs

On the left side, there is a device image and a table of device details:

Device Name	MICROVERSATRI PUNIT_1
PT Connection	Wye
Frame Type	F Frame
Current Sensor	2000 A
Rating Plug	1100 A
PT Rating	120 V
Commnet Address	347
Modbus Address	80
Software Revision	4.00
Product Revision	0.0F

At the bottom left, there are navigation buttons: Events, Trend, Wave, and Exit.

PQM/PQMII

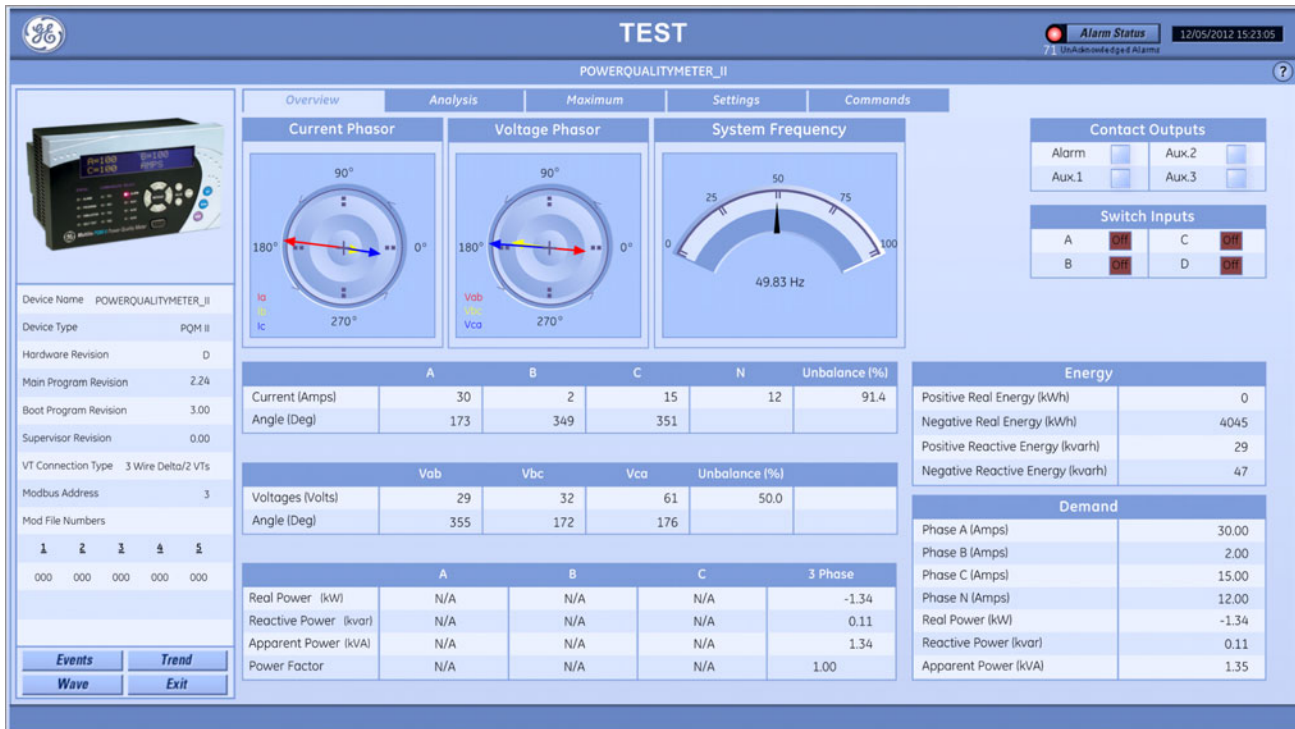
This section explains the information displayed in PMCS for power quality meter (PQM) and PQMII products.

Overview tab

This tab displays

- Current
- Voltage
- Power
- Energy
- Demand
- Contact outputs
- Switch inputs

Figure 77: PQMII Overview tab

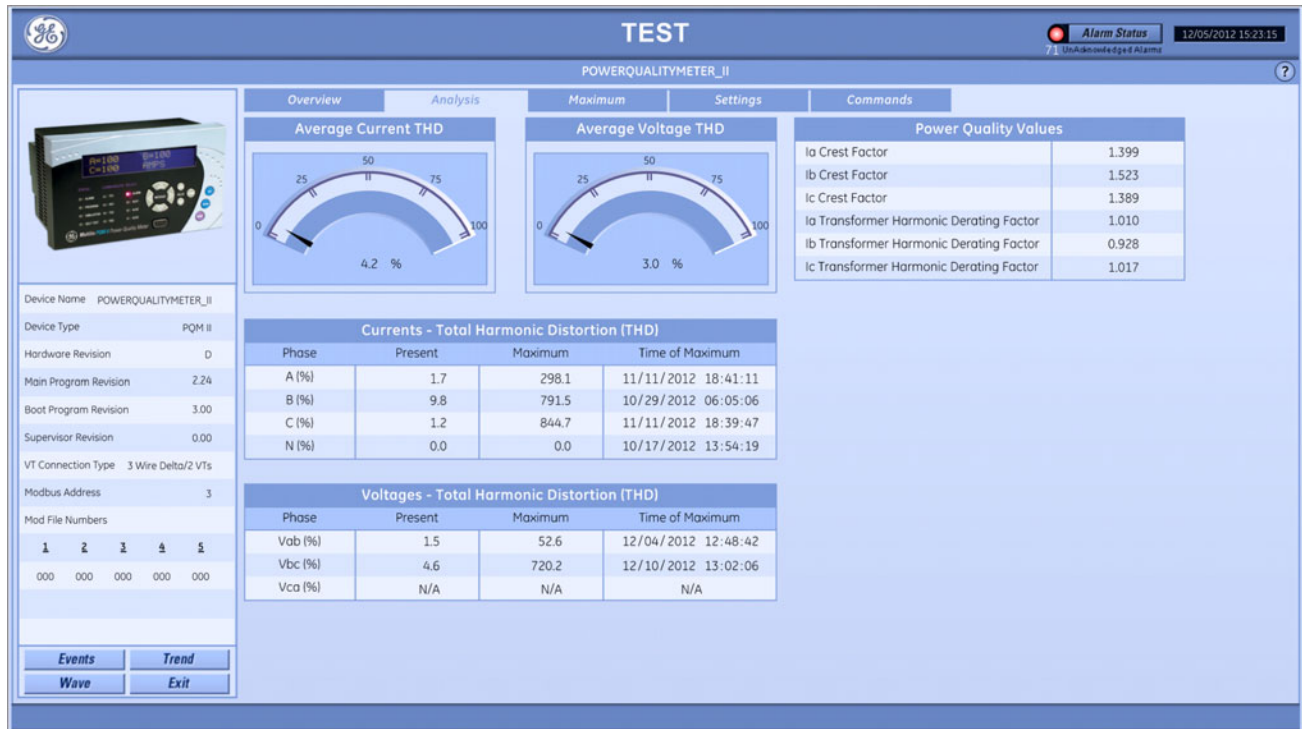


Analysis tab

This tab displays

- Currents - Total harmonic distortion (THD) (present and maximum values)
- Phase voltages - THD (present and maximum values)
- Power quality values

Figure 78: PQMII Analysis tab



Maximum tab

This tab displays

- Current (present value, maximum value, and time stamp of maximum value)
- Voltage (present value, maximum value, and time stamp of maximum value)
- Three-phase power (present value, maximum value, and time stamp of maximum value)
- Current demand (present value, maximum value, and time stamp of maximum value)
- Three-phase power demand (present value, maximum value, and time stamp of maximum value)

Figure 79: PQMII Maximum tab

The screenshot shows the 'TEST' interface for a POWERQUALITYMETER_II. The 'Maximum' tab is selected, displaying the following data:

Current			
	Present	Maximum	Time of Maximum
A (Amps)	30	1069	09/14/2012 11:05:28
B (Amps)	2	1068	09/14/2012 11:05:28
C (Amps)	15	1068	09/14/2012 11:05:29
N (Amps)	12	40	11/21/2012 11:39:14

Current Demand			
	Present	Maximum	Time of Maximum
A (Amps)	30	1056	09/28/2012 09:02:47
B (Amps)	2	1055	09/28/2012 09:11:48
C (Amps)	15	1055	09/28/2012 09:11:48
N (Amps)	12	36	11/21/2012 12:28:06

Voltage			
	Present	Maximum	Time of Maximum
Vab (Volts)	29	151	09/14/2012 01:40:40
Vbc (Volts)	32	77	10/05/2012 14:51:49
Vca (Volts)	61	151	09/13/2012 14:59:58
Unb (%)	50.0	100.0	09/14/2012 15:12:11

3 Phase Power			
	Present	Maximum	Time of Maximum
Real (kW)	-1.34	-155.15	09/28/2012 09:06:32
Reactive (kvar)	0.12	41.78	10/03/2012 09:40:47
Apparent (kVA)	1.34	155.21	09/28/2012 09:06:32

3 Phase Power Demand			
	Present	Maximum	Time of Maximum
Real (kW)	-1.34	-387.91	09/28/2012 09:33:49
Reactive (kvar)	0.11	-23.47	09/28/2012 09:39:50
Apparent (kVA)	1.35	390.85	09/28/2012 09:34:49

Device Information:
 Device Name: POWERQUALITYMETER_II
 Device Type: PQM II
 Hardware Revision: 0
 Main Program Revision: 2.24
 Boot Program Revision: 3.00
 Supervisor Revision: 0.00
 VT Connection Type: 3 Wire Delta/2 VTs
 Modbus Address: 3
 Mod File Numbers: 000 000 000 000 000

Navigation: Events, Trend, Wave, Exit

Settings tab

This tab displays

- System setup

Figure 80: PQMII Settings tab

The screenshot shows the 'Settings' tab for a GE Power Quality Meter II. The main content area is titled 'System Setup' and contains the following table:

Parameter	Value
Current Demand Type	Rolling Interval
Current Demand Time Interval (min)	60
Power Demand Type	Rolling Interval
Power Demand Time Interval (min)	60
CT Wiring	Phase A, B, and C
Phase CT Primary (A)	100
Neutral Current Sensing	Calculated
Neutral CT Primary (A)	100
VT Wiring	3 Wire Delta/2 VTs
Voltage Transformer Ratio	1.0
VT Nominal Secondary Voltage (V)	120
Nominal Direct Input Voltage (V)	600
Nominal System Frequency (Hz)	60

The sidebar on the left provides device details:

- Device Name: POWERQUALITYMETER_II
- Device Type: PQM II
- Hardware Revision: D
- Main Program Revision: 2.24
- Boot Program Revision: 3.00
- Supervisor Revision: 0.00
- VT Connection Type: 3 Wire Delta/2 VTs
- Modbus Address: 3
- Mod File Numbers: 1 2 3 4 5 (000 000 000 000 000)

Navigation buttons at the bottom left include 'Events', 'Trend', 'Wave', and 'Exit'. The top right corner shows 'Alarm Status' (Unacknowledged Alarms) and the date/time '12/05/2012 15:23:41'.

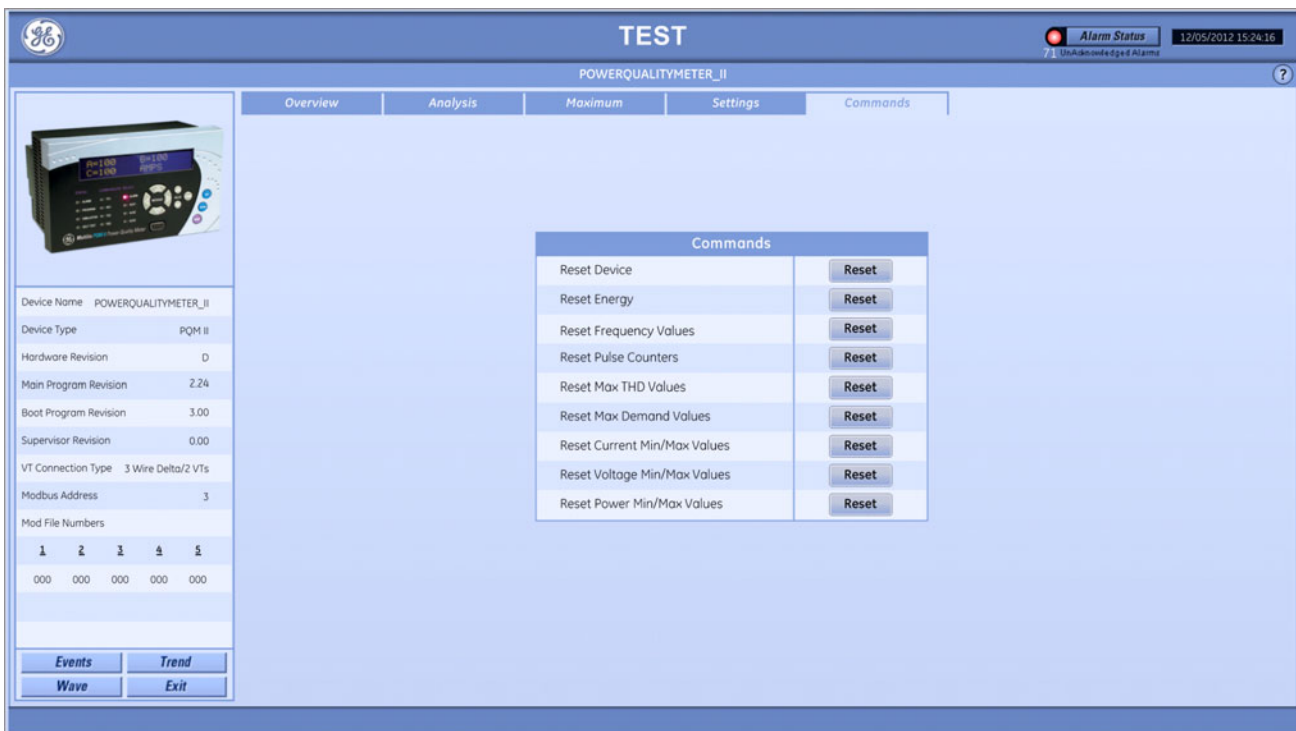
Commands tab

The following functions are available.

Table 16: PQMII commands available

Button	Function
Reset Device	Issues a reset command to the PQM/PQMII
Reset Energy	Clears the PQM/PQMII energy counters
Reset Frequency Values	Clears the PQM/PQMII maximum frequency values from memory
Reset Pulse Counters	Resets the PQM/PQMII pulse counter
Reset Max THD Values	Clears the PQM/PQMII maximum total harmonic distortion values from memory
Reset Max Demand Values	Clears the PQM/PQMII maximum demand values from memory
Reset Current Min/Max Values	Clears the PQM/PQMII current minimum and maximum values from memory
Reset Voltage Min/Max Values	Clears the PQM/PQMII voltage minimum and maximum values from memory
Reset Power Min/Max Values	Clears the PQM/PQMII power minimum and maximum values from memory

Figure 81: PQMII Commands tab



UR

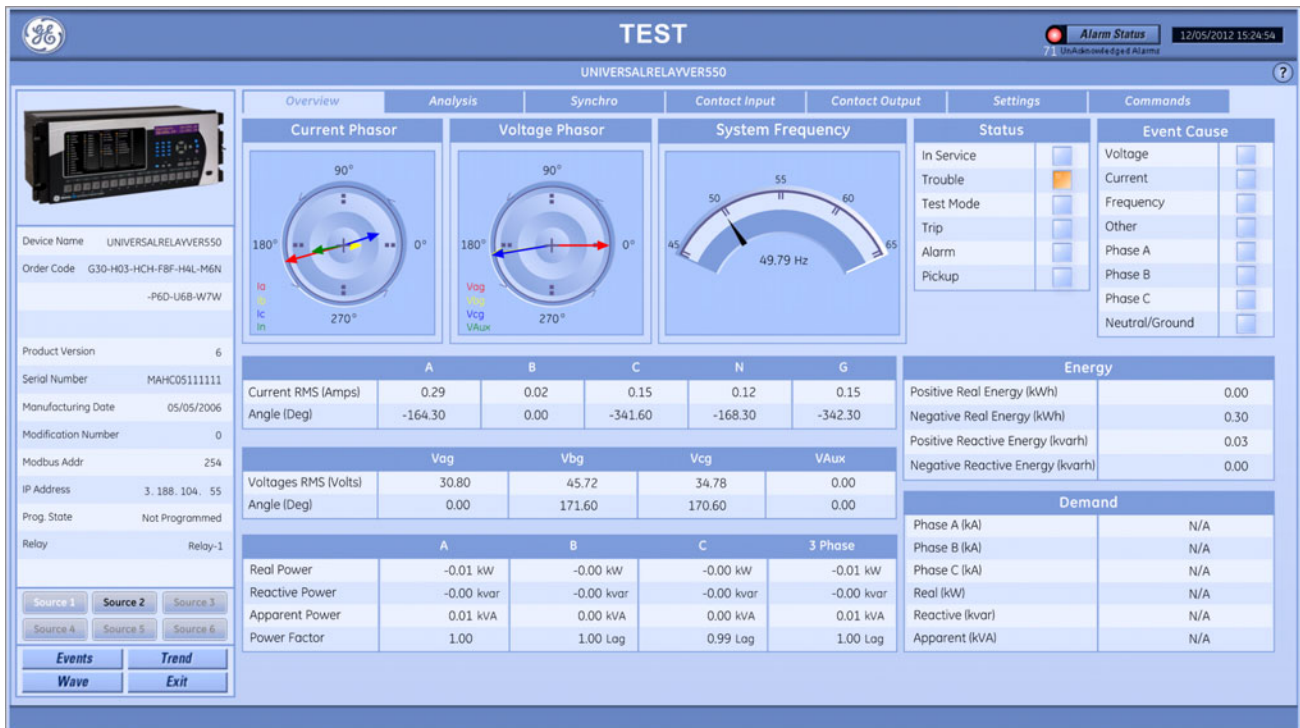
This section explains the information displayed in PMCS for the Universal Relay (UR) series, such as the B30, C30, C60, and D30. Due to the number of products available, a UR wizard can display between one and eight screens of data; the number of screens is determined by the user during wizard configuration. There are 23 tab variations possible in PMCS, depending on the type of UR device connected. For example, the C30 device does not support metering functions, so the metering and source tabs are not available for this device.

Overview tab

This tab displays

- Currents
- Voltages
- Energy
- Demand
- System frequency
- Status
- Event cause

Figure 82: UR Overview tab

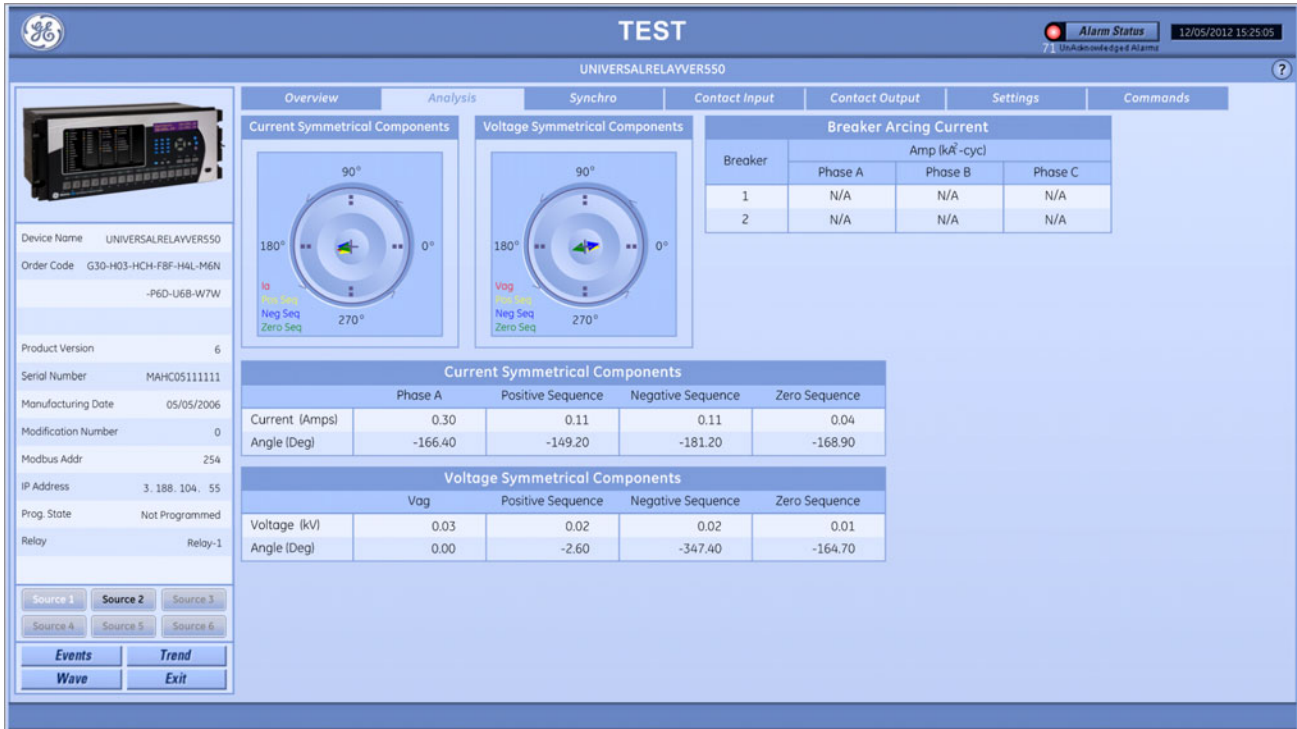


Analysis tab

This tab displays

- Current symmetrical components
- Voltage symmetrical components
- Breaker arcing current

Figure 83: UR Analysis tab

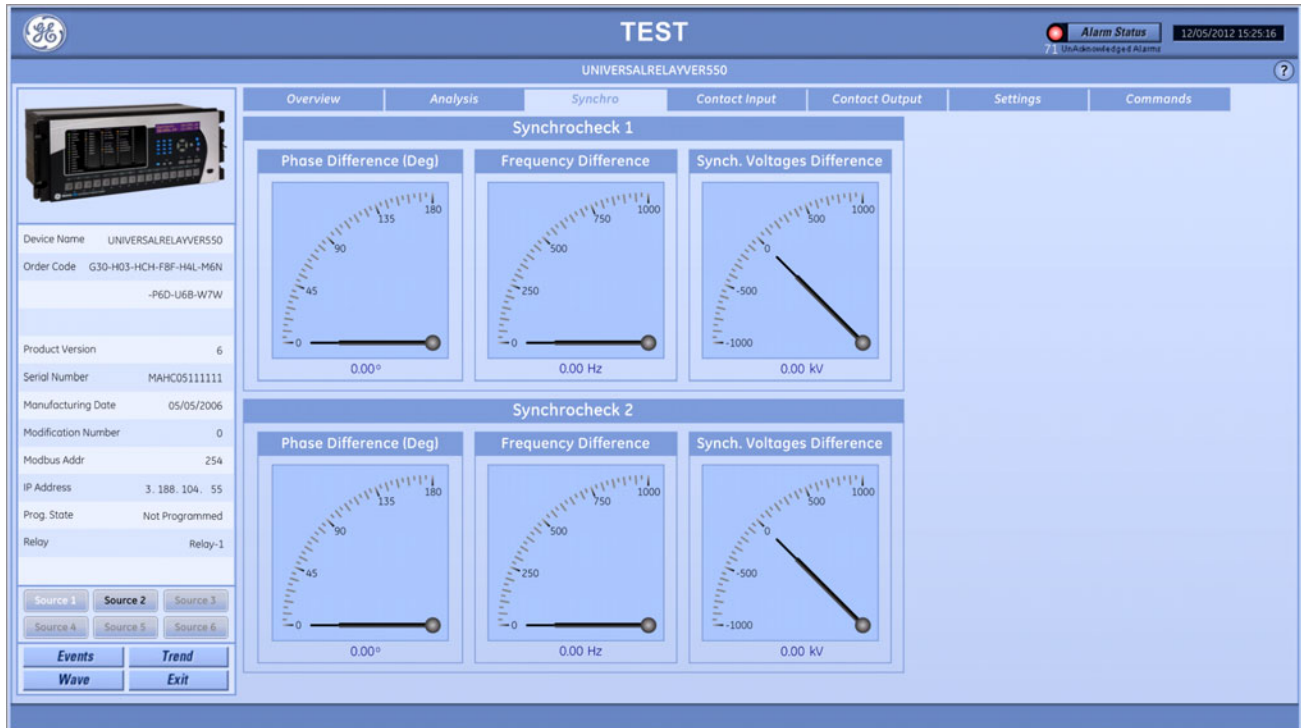


Synchro tab

This tab displays

- Synchrocheck 1
- Synchrocheck 2

Figure 84: UR Synchro tab



Contact Input tab

This tab displays

- Contact inputs

Figure 85: UR Contact Input tab

The screenshot shows the 'TEST' interface for a GE Universal Relay V550. The top navigation bar includes 'Overview', 'Analysis', 'Synchro', 'Contact Input' (selected), 'Contact Output', 'Settings', and 'Commands'. The 'Contact Input' tab displays a table of 32 contact inputs. The left sidebar shows device details and source selection buttons. The right sidebar shows 'Prev' and 'Next' buttons and a page indicator '1 of 3'.

Contact Inputs						
	Name	State		Name	State	
1	Cont Ip 1	<input type="checkbox"/>		17	Cont Ip 17	<input type="checkbox"/>
2	Cont Ip 2	<input type="checkbox"/>		18	Cont Ip 18	<input type="checkbox"/>
3	Cont Ip 3	<input type="checkbox"/>		19	Cont Ip 19	<input type="checkbox"/>
4	Cont Ip 4	<input type="checkbox"/>		20	Cont Ip 20	<input type="checkbox"/>
5	Cont Ip 5	<input type="checkbox"/>		21	Cont Ip 21	<input type="checkbox"/>
6	Cont Ip 6	<input type="checkbox"/>		22	Cont Ip 22	<input type="checkbox"/>
7	Cont Ip 7	<input type="checkbox"/>		23	Cont Ip 23	<input type="checkbox"/>
8	Cont Ip 8	<input type="checkbox"/>		24	Cont Ip 24	<input type="checkbox"/>
9	Cont Ip 9	<input type="checkbox"/>		25	Cont Ip 25	<input type="checkbox"/>
10	Cont Ip 10	<input type="checkbox"/>		26	Cont Ip 26	<input type="checkbox"/>
11	Cont Ip 11	<input type="checkbox"/>		27	Cont Ip 27	<input type="checkbox"/>
12	Cont Ip 12	<input type="checkbox"/>		28	Cont Ip 28	<input type="checkbox"/>
13	Cont Ip 13	<input type="checkbox"/>		29	Not Available	<input type="checkbox"/>
14	Cont Ip 14	<input type="checkbox"/>		30	Not Available	<input type="checkbox"/>
15	Cont Ip 15	<input type="checkbox"/>		31	Not Available	<input type="checkbox"/>
16	Cont Ip 16	<input type="checkbox"/>		32	Not Available	<input type="checkbox"/>

Contact Output tab

This tab displays

- Contact outputs

Figure 86: UR Contact Output tab

The screenshot shows the 'TEST' interface for a GE Universal Relay 550. The 'Contact Output' tab is selected, displaying a table of 32 contact outputs. The table is organized into two columns of 16 rows each. The first column lists outputs 1 through 16, and the second column lists outputs 17 through 32. The 'State' column shows the status of each output, with some (1, 2, 14) being active (orange) and others being 'Not Available' (blue). A '1 of 2' indicator is visible below the table, suggesting a multi-page view.

Name		State	Name		State
1	Cont Op 1	Active	17	Cont Op 17	Not Available
2	Cont Op 2	Active	18	Cont Op 18	Not Available
3	Cont Op 3	Not Available	19	Cont Op 19	Not Available
4	Cont Op 4	Not Available	20	Cont Op 20	Not Available
5	Cont Op 5	Not Available	21	Cont Op 21	Not Available
6	Cont Op 6	Not Available	22	Cont Op 22	Not Available
7	Cont Op 7	Not Available	23	Cont Op 23	Not Available
8	Cont Op 8	Not Available	24	Cont Op 24	Not Available
9	Cont Op 9	Not Available	25	Cont Op 25	Not Available
10	Cont Op 10	Not Available	26	Cont Op 26	Not Available
11	Cont Op 11	Not Available	27	Cont Op 27	Not Available
12	Cont Op 12	Not Available	28	Cont Op 28	Not Available
13	Cont Op 13	Not Available	29	Cont Op 29	Not Available
14	Cont Op 14	Active	30	Cont Op 30	Not Available
15	Cont Op 15	Not Available	31	Cont Op 31	Not Available
16	Cont Op 16	Not Available	32	Cont Op 32	Not Available

Device Name: UNIVERSALRELAYVER550
 Order Code: G30-H03-HCH-FBF-HAL-M6N -P6D-U6B-W7W
 Product Version: 6
 Serial Number: MAHC05111111
 Manufacturing Date: 05/05/2006
 Modification Number: 0
 Modbus Addr: 254
 IP Address: 3. 188. 104. 55
 Prog. State: Not Programmed
 Relay: Relay-1

Settings tab

This tab displays

- Current transformer settings
- Voltage transformer settings
- Power system settings

Figure 87: UR Settings tab

TEST Alarm Status 12/05/2012 15:25:53
71 Unknown/Unlabeled Alarms

UNIVERSALRELAYER550

Overview Analysis Synchro Contact Input Contact Output **Settings** Commands

Current Transformer Settings

	CT Bank 1	CT Bank 2	CT Bank 3	CT Bank 4	CT Bank 5	CT Bank 6
Phase CT Primary (A)	1.00	N/A	N/A	N/A	N/A	N/A
Phase CT Secondary	1A	N/A	N/A	N/A	N/A	N/A
Ground CT Primary (A)	1.00	N/A	N/A	N/A	N/A	N/A
Ground CT Secondary	1A	N/A	N/A	N/A	N/A	N/A

Voltage Transformer Settings

	VT Bank 1	VT Bank 2	VT Bank 3
Phase VT Connection	Wye	N/A	N/A
Phase VT Secondary(V)	66.40	N/A	N/A
Phase VT Ratio	1.00	N/A	N/A
Aux. VT Connection	Vag	N/A	N/A
Aux. VT Secondary (V)	66.40	N/A	N/A
Aux. VT Ratio	1.00	N/A	N/A

Power System Settings

IRIG-B Signal Type	None
Nominal Frequency (Hz)	60
Phase Rotation	ABC
Frequency Tracking Function	Enabled

Device Name UNIVERSALRELAYER550
Order Code G30-H03-HCH-FBF-H4L-M6N
-P6D-U6B-W7W
Product Version 6
Serial Number MAHC05111111
Manufacturing Date 05/05/2006
Modification Number 0
Modbus Addr 254
IP Address 3. 188. 104. 55
Prog. State Not Programmed
Relay Relay-1

Source 1 Source 2 Source 3
Source 4 Source 5 Source 6

Events Trend
Wave Exit

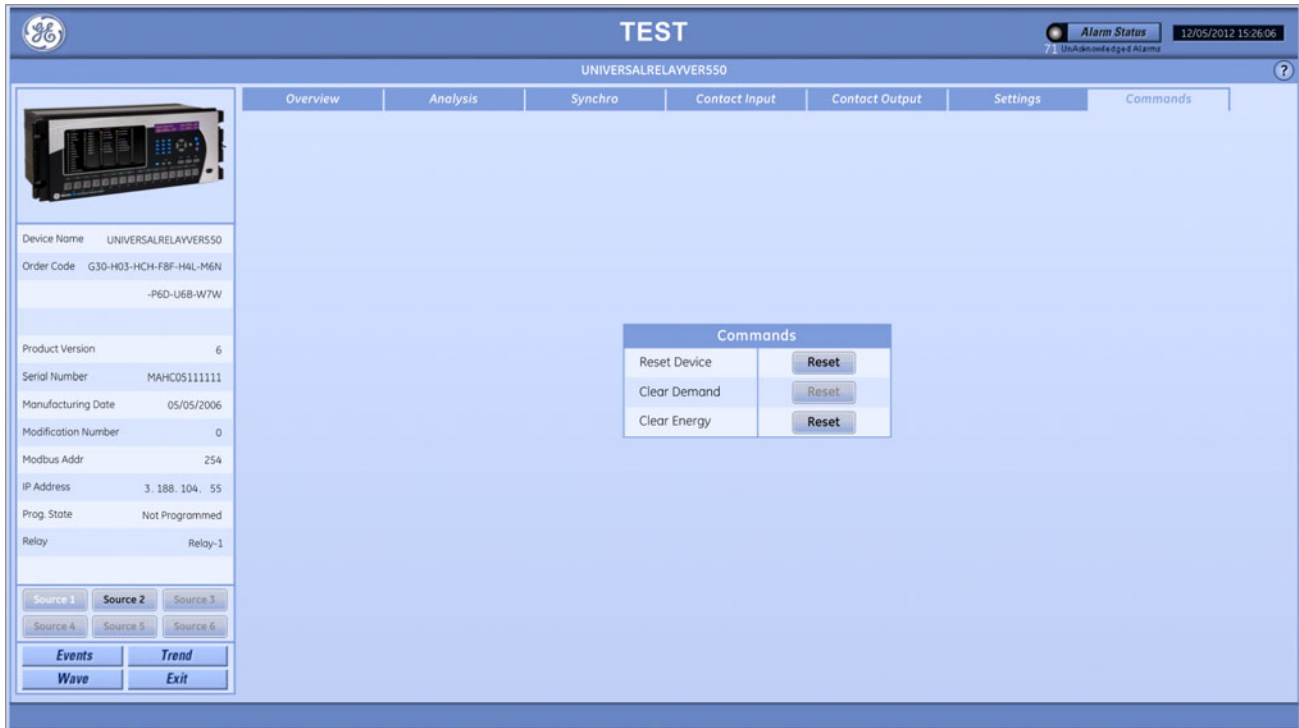
Commands tab

The following functions are available.

Table 17: UR commands available

Button	Function
Reset Device	Issues a reset command to the UR device
Clear Demand	Clears Demand data from the device
Clear Energy	Clears Energy data from the device

Figure 88: UR Commands tab



PMCS

Chapter 5: Software and license management

The following actions can be performed by the Administrator for software and license management:

- Manage activation code
- Transfer software license
- Update software
- Uninstall software

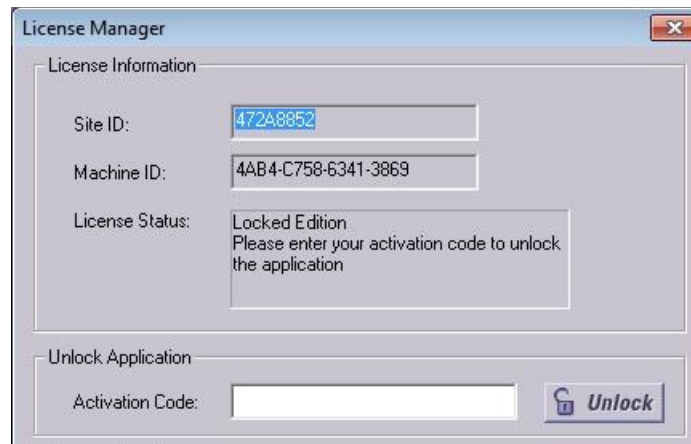
Manage activation code

The software license allows for installation on one computer. After installing PMCS on a computer, use the procedure here to generate an activation code and enter it. There is no prompt to do so; the software does not work unless the code is entered.

To unlock an installation:

1. Launch the Configurator application by clicking **Start > All Programs > EnerVista Integrator > EnerVista Configurator**.
2. Click **Help > License Manager**. The License Manager window opens, shown as follows.

Figure 89: Activating a PMCS software license



3. Obtain the **Site ID** and **Machine ID** from the window.
4. Generate an activation code as follows. Log in to <http://apps.gedigitalenergy.com/swmgr> using the following credentials:
 Order number: nnnnnnnn
 Password: nnnnnnnn
 Enter the **Site ID** and **Machine ID**, and generate the CD activation code. Record the number.
5. Enter the code in the **Activation Code** field, and click the **Unlock** button. This unlocks both PMCS and EnerVista Integrator.

Transfer software license

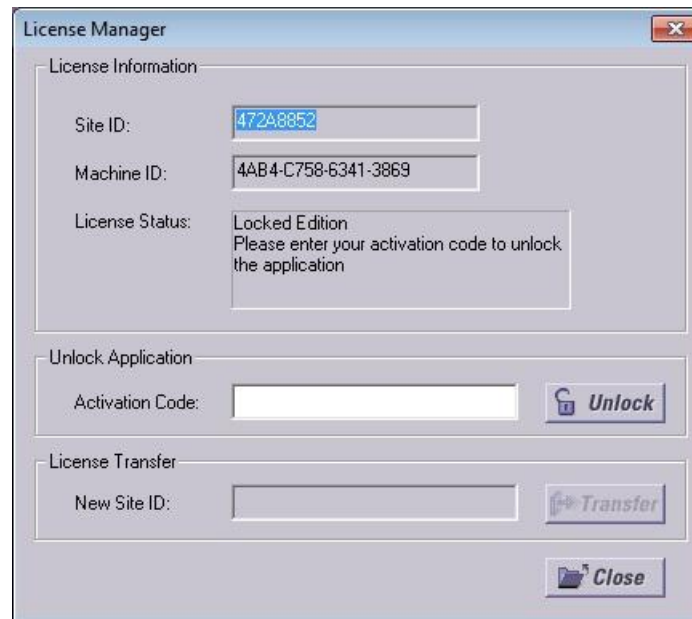
The license does not allow installation on more than one computer, but you can move the software license from one PMCS installation to another. You cannot move a complete installation with its database to another computer.

You look up the **Site ID** of the license being moved, then transfer it.

To view a Site ID:

1. At the computer on which the license is installed, launch the Configurator application.
2. Click **Help > License Manager**. The License Manager window opens, shown as follows.

Figure 90: Transferring a PMCS software license



3. Obtain the **Site ID** from the window.

To transfer the license:

1. At the computer on which you want to install the license, log in as Administrator.
2. Launch the Configurator application.
3. Click **Help > License Manager**. The License Manager window opens.
4. Enter the Site ID in the **New Site ID** field.
5. Click the **Transfer** button.

Update software

After initial activation, if PMCS license manager detects any license options still available for upgrade, the license upgrade section is enabled in the license management window. Updates are free for a year after purchase. Download them from the GE Multilin website at <http://gedigitalenergy.com/multilin> or ask for a new CD using the contact information contained in the [For further assistance](#) section.

Based on the license purchased, PMCS limits the number of installations. The license can be upgraded by entering a new activation code. See the [Manage activation code](#) section.

Uninstall software

If required, the PMCS software can be uninstalled.

Uninstalling the PMCS software deletes configuration information too. It does not delete some files, such as error logs, system logs, and configuration records, which are created after the PMCS installation is complete. Since these files are not part of the initial installation, they are not removed by the uninstaller, and must be deleted manually. The SQL Express database remains.

To uninstall PMCS software:

1. Click **Start > Control Panel**.
2. Click **Programs and Features**.
3. Click the PMCS application.
4. Click **Uninstall**, and confirm the deletion. The PMCS software is deleted as outlined.

PMCS

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