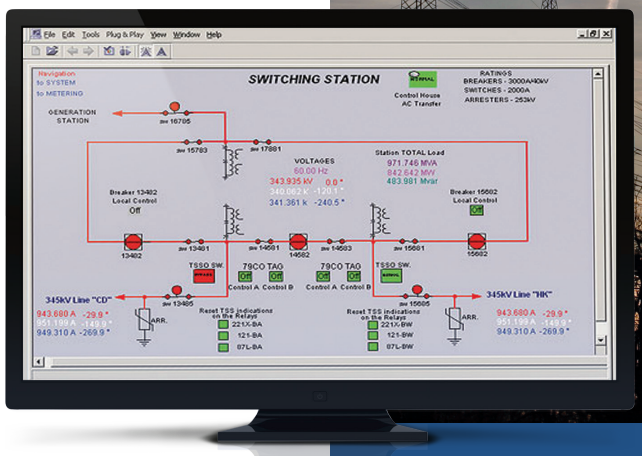
GE
Grid Solutions



EnerVista Viewpoint Monitoring

Easy to Use Monitoring and Data Recording Software

EnerVista™ Viewpoint Monitoring is an easy to setup, powerful and simple to use data monitoring and recording software application for electrical systems. With minimal configuration required to communicate with field devices directly, Viewpoint Monitoring provides an overall view of the entire power system and collects critical real-time and historical disturbance data to assist with analyzing past or impending power system events.

Key Benefits

- Easy start up and configuration saves time and cost by integrating devices using pre-programmed memory maps
- Automatically generated, user friendly monitoring screens provide remote equipment visibility
- Reduced integration time through automatic detection and configuration of UR devices
- Reduced fault analysis effort by centralizing critical fault data digitally
- Records and trends power equipment load levels for load analysis
- Remote viewing of Viewpoint Monitoring system using ViewNodes or Terminal Services in Microsoft® Windows Server 2012

Key Features

- Monitor up to 1000 devices (20000 data points) or 5000 devices (65000 data points)
- User friendly drag-and-drop construction of single-line monitoring screens
- Pre-configured memory maps of GE's Multilin™ devices
- Single-line monitoring and control
- Trending of up to 5000 power system data points with 1 minute resolution
- Communicate with third-party Modbus compliant field devices
- Plug-and-Play analysis of power system equipment
- Automatic collection of events and waveforms from GE's Multilin devices
- Annunciator alarming with visual, audio and email notification
- Diagnose waveform fault data recorded in power system devices

imagination at work

Plug-and-Play Monitoring

View Device and Asset Monitoring Screens

EnerVista Viewpoint Monitoring's Plug-and-Play screens are a series of pre-configured modules for analyzing the health and status of your power system equipment. Viewpoint Monitoring will detect the devices you are using and automatically generate monitoring screens that are tailored to your devices as well as wiring configurations. This saves hours of engineering effort and enables quick setup to monitor protection devices.

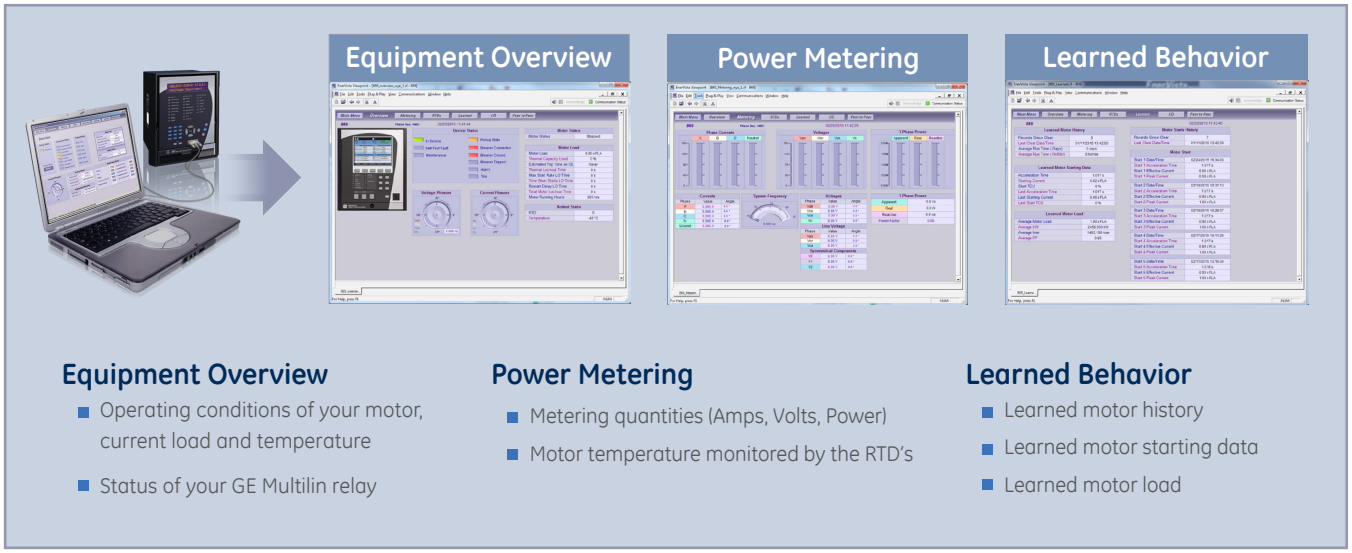
Auto-Discovery of Devices

Viewpoint Monitoring reduces integration time and decreases errors when configuring devices by automatically detecting and configuring UR devices.

Viewpoint Monitoring Advantage

Viewpoint Monitoring Reduces Commissioning Effort Saving Time and Cost

The following is an example of connecting and communicating with a 869 Motor Protection Relay to monitor relay and motor data:



Equipment Overview

- Operating conditions of your motor, current load and temperature
- Status of your GE Multilin relay

Power Metering

- Metering quantities (Amps, Volts, Power)
- Motor temperature monitored by the RTD's

Learned Behavior

- Learned motor history
- Learned motor starting data
- Learned motor load

With other HMIs

1 Hour	+	10 Hours	+	1 Hour	+	10 Hours	+	3 Minutes	+	8 Hours
Select data points for use in your system	→	Type in all required mnemonics	→	Scale the values	→	Test memory map to ensure loaded accurately	→	Type in IP address of your device	→	Create your monitoring screens

= 33 Hours per Relay
x 10 Relays
= 330 Hours

With Viewpoint Monitoring

3 Minutes
Type in IP address of your device

Viewpoint Monitoring automatically creates memory maps and monitoring screens

= 3 Minutes per Relay
x 10 Relays
= 30 Minutes

Plug-and-Play Motor Monitoring

Use Viewpoint Monitoring to Monitor Motor Protection Equipment

Automatically created overview screens provide insight on motor operating conditions and the status of Multilin relays. There are additional available monitoring screens that show the value of metering quantities, the motor temperature monitored by the RTDs and alarms that have been detected by the relay. Vital information and insight such as the cause of the last motor trip, operating information the relay has learned about the motor and maintenance issues that may need addressing can be determined using historical data shown on available screens.

Monitor critical information such as:

- Number of motor starts
- Learned motor starting current
- Motor running hours
- History of motor trips
- Real time power quantities (amps, motor load)
- Motor temperature

Supported Devices:

- M60 Motor Protection System
- 869 Motor Protection System
- 469 Motor Protection System
- 369 Motor Protection System
- 269 Motor Protection System
- 239 Motor Protection System
- MM200/MM300 Motor Management System
- MM2/MM3 Intelligent MCC Controller
- SPM Synchronous Motor Protection System
- RRTD Remote RTD Module

View motor status using digital inputs, analog inputs and RTD inputs.

Plug-and-Play Transformer Monitoring

Use Viewpoint Monitoring to Monitor Transformer Protection Equipment

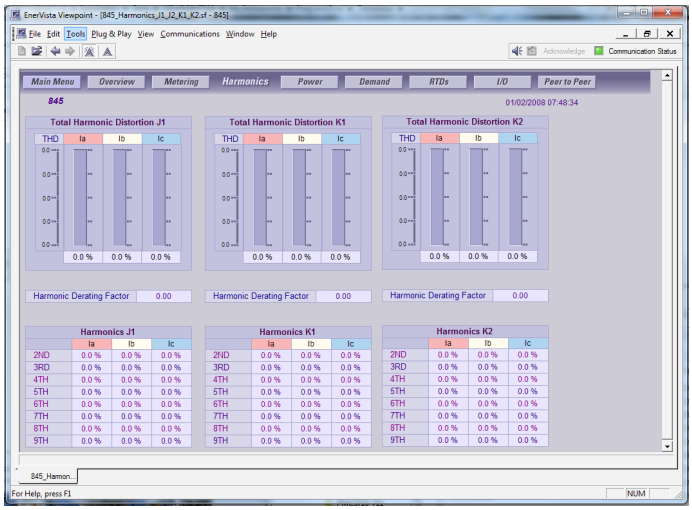
The operating condition of the transformer and the status of the GE Multilin relay are shown through automatically created overview screens. Additional monitoring screens allow further analysis of transformer status by viewing the metering, power, demand, energy and harmonic data that is being measured by the associated relay.

Monitor critical information such as:

- Transformer energization status
- Real time power quantities (amps, transformer loading, demand)
- Current harmonic analysis
- Accumulated loss of life
- Tap changer position
- Hottest transformer winding temperature

Supported Devices:

- T60 Transformer Protection System
- T35 Transformer Protection System
- 845 Transformer Protection System
- 745 Transformer Protection System



Monitor total harmonic content in each phase for all windings.

Plug-and-Play Generator Monitoring

Use Viewpoint Monitoring to Monitor Generator Protection Equipment

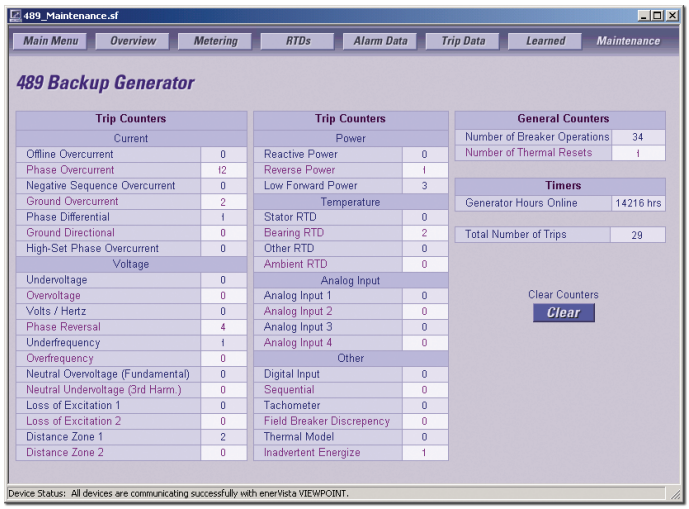
Automatically created overview screens provide insight on generator operating conditions and the status of GE Multilin relays. Further generator analysis can be performed with additional monitoring screens that monitor the value of metered quantities, the generator temperature monitored by RTD's and alarms that have been detected by the relay. Additional screens also provide historical information indicating cause of the last generator trip, operating information the relay has learned about the generator and maintenance issues that may need addressing.

Monitor critical information such as:

- Generator loading
- Real time power quantities (amps, volts)
- Cause of trip data
- Generator running hours
- History of generator trips
- Generator temperature

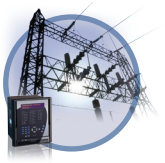
Supported Devices:

- G60 Generator Protection System
- G30 Generator Protection System
- 889 Generator Protection System
- 489 Generator Protection System



Improve maintenance efficiency by analyzing trip operations.

Plug-and-Play Feeder Monitoring



Use Viewpoint Monitoring to Monitor Feeder Protection Equipment

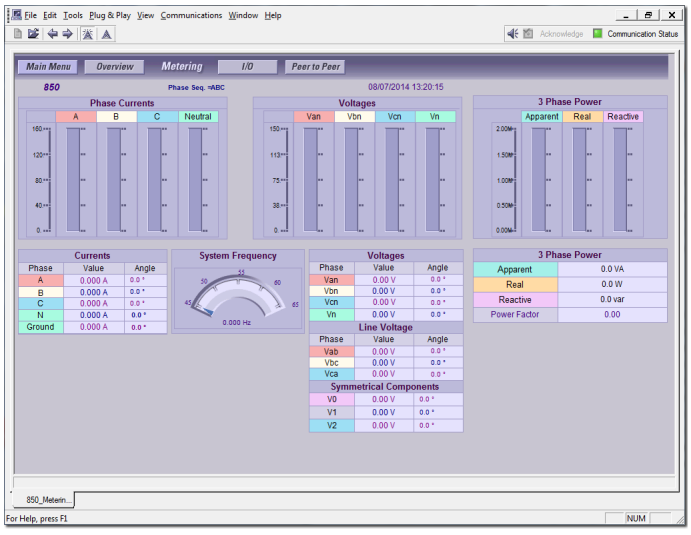
Automatically created overview screens provide insight on feeder operating conditions and the status of GE Multilin relays. Additional monitoring screens are available for analyzing metering quantities, along with the power, demand and energy values that may be measured by the relay. If supported by the relay, synchronism screens will also be available for helping to determine if it is safe to close the breaker and energize the feeder.

Monitor critical information such as:

- Breaker status
- Accumulated breaker arcing current
- Real time power quantities (amps, volts, demand, energy)
- Synchronism data

Supported Devices:

- 850 Feeder Protection System
- F60 Feeder Protection System
- F35 Multiple Feeder Protection System
- 750/760 Feeder Protection System
- F650 Feeder Protection System
- 735/737 Feeder Protection System
- MIFII Feeder Protection with Recloser
- 350 Feeder Protection System



Easily monitor synchronism levels needed for reclosing of circuit breakers.

Plug-and-Play Breaker Monitoring

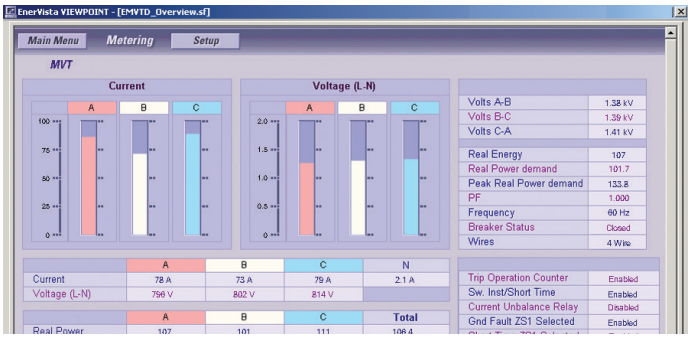
Use Viewpoint Monitoring to Monitor Breaker Equipment

Predefined screens allow quick setup and viewing of critical breaker information such as:

- Breaker status
- Number of breaker trip operations
- Real time current, voltage and power levels

Supported Devices:

- MVT MicroVersa Trip Unit
- EMVT Enhanced Microversa Trip unit
- GTU EntelliGuard TU Trip Unit
- Entellisys Low-Voltage Switchgear



Monitor breaker equipment with predefined screens.

Plug-and-Play Power Quality Monitoring

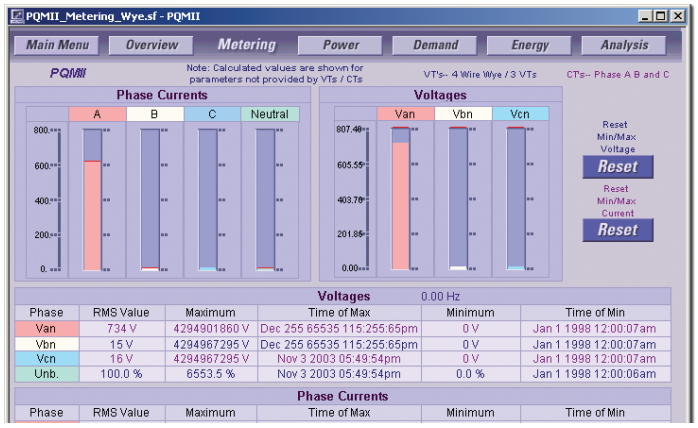
Use Viewpoint Monitoring to Monitor Power Quality Equipment and Measure Usage

Monitor critical information such as:

- Power quality and equipment status
- Load unbalances using real time and maximum and minimum values
- Consumption and cost of energy using inputs from revenue meters
- Amount of total harmonic distortion on the power system

Supported Devices:

- PQM / PQM II Power Quality Meter
- EPM 2000/2200 Electronic Power Meter
- EPM 4600 Electronic Power meter
- EPM 5200/5300/5350 Electronic Power Meter
- EPM 6000/6100 Electronic Power Meter
- EPM 7000/7100 Electronic Power Meter
- EPM 9450/9650 Electronic Power Meter
- EPM 9800 Electronic Power Meter
- EPM 9900 Electronic Power Meter



View the power quality status for critical devices.

Plug-and-Play Backup Power Monitoring

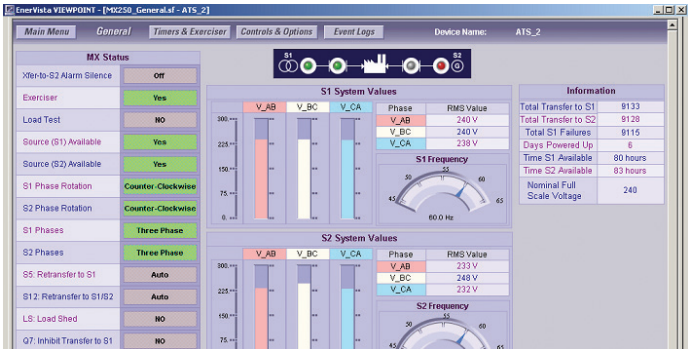
Use Viewpoint Monitoring to Monitor Critical Backup Assets

Monitor critical information such as:

- Availability of normal and emergency power sources
- Status of power source connections
- Real time voltages and frequency
- Switch status, timer settings and control switch position
- Stored events and exerciser schedules

Supported Devices:

- MX150 Controller
- MX250 Controller
- MX350 Controller
- Lan Pro UPS
- SG-Series UPS



Monitor the status of critical backup assets.

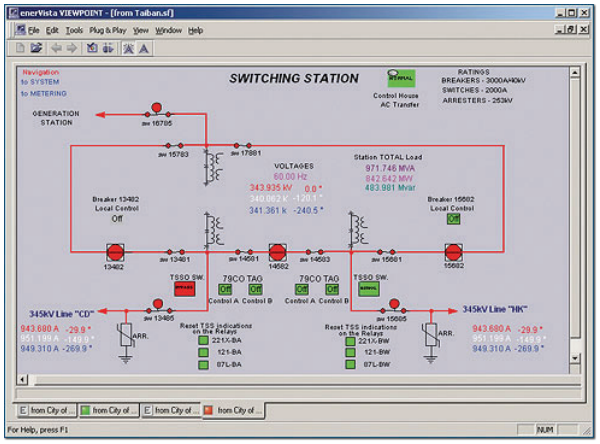
Single-Line Monitoring and Control

View the Power System Status on Customizable Single-Line Diagrams

Viewpoint Monitoring provides the tools to easily create customized single-line diagrams providing monitoring and control. This powerful tool will communicate with supported devices and put the facility's energy system at your fingertips from either a local or a remote location.

Easily Create Customized Single-Line Monitoring Screens

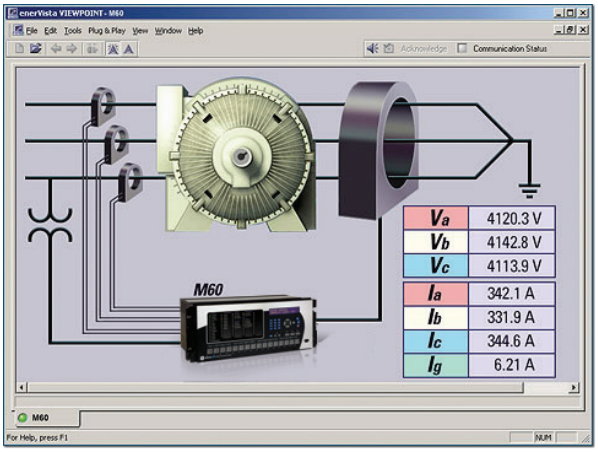
- Create single-line diagrams using user-friendly, drag-and-drop tools with standardized symbols and components representing power system assets (transformers, breakers, CT's and PT's)
- Import graphics (bmp, jpg, png) to customize single-line diagrams more quickly
- Display power system values and status with minimal configuration through pre-loaded memory maps
- Create customized or "virtual" monitoring points using the powerful Formula Editor



Easily create customized screens to monitor the power system state.

Monitor Power System Devices

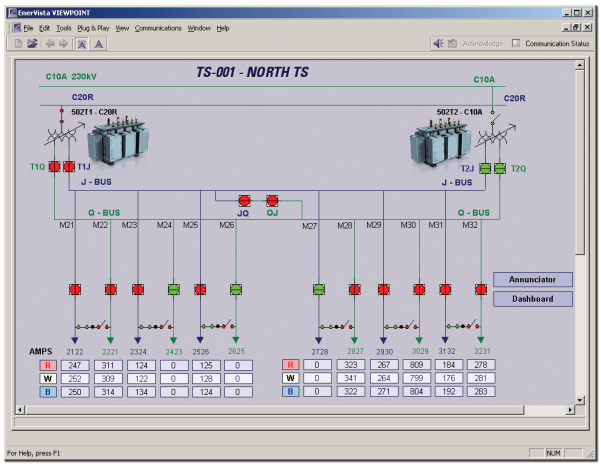
- Provide a system-wide view of the power system on one single-line monitoring screen
- Analyze the magnitude of critical power quantities measured by devices
- Generate alarm warnings when measured values exceed configurable critical levels
- Create links to multiple monitoring screens to analyze power system equipment with greater detail



Monitor the motors status and loading throughout the facility from a centralized location locally or remotely.

Control Power System Equipment

- Send commands to devices to control and change the status of power system equipment (breakers, switches, isolators)
- Enforces required two-step verification process to the operator sending the command
- Validates user's permissions by requiring passwords to be sent to protection relays or other devices before operation occurs



Monitor the status of the entire power system and control components from one screen.

Automatic Event and Waveform Retrieval

Automated archiving of event and waveform data from GE Multilin devices ensures availability of detailed information for diagnosing power system events.

Event Logging

The event records from GE Multilin devices can be automatically downloaded from each device and stored in a centralized, system-wide, sequence of event record. Viewpoint Monitoring will continually poll each GE Multilin device to see if any new events have been added to that device's event record. Once a new event has been detected, the event record will be downloaded and the new events will be stored in the system-wide sequence of events record.

Waveform Archiving

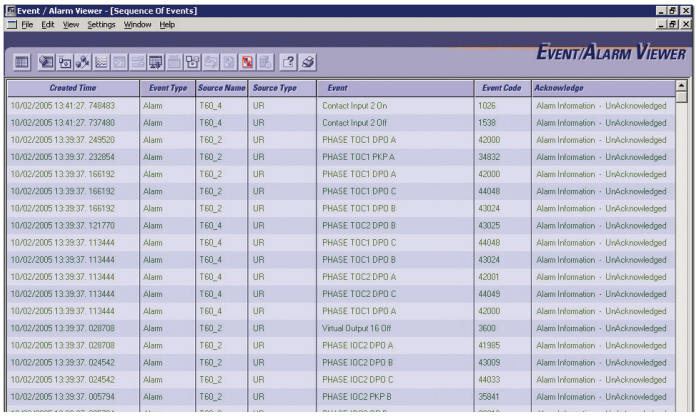
The waveform (oscillography) files from GE Multilin devices can be automatically downloaded from each device and stored on your hard drive. Similar to Event Logging, Viewpoint Monitoring will continually poll each GE Multilin device to see if any new waveform files have been created. Once a new waveform has been detected, the file will be downloaded by Viewpoint Monitoring to the centralized data repository.

Event Viewing

The Event Viewer centrally stores and displays information about preset and configured systems events. Each event in the record contains the following information:

- Event Time
- Event Type
- Source Name
- Source Type
- Event Cause

This data can be sorted by any of the fields indicated above.

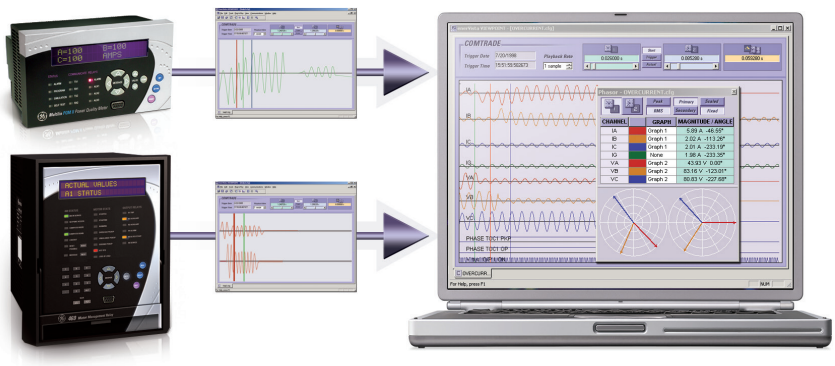


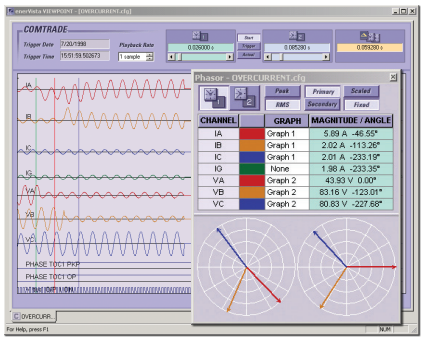
Create comprehensive, centralized, system-wide sequence of event records for analysis of power system faults.

Waveform Viewing

View and analyze waveform fault data that has been recorded from a power system device in a time-based, phasor quantity or tabular view. This Waveform View utility provides functionality to:

- Merge and overlay waveforms that were recorded from multiple devices
- Identify the harmonic content in the monitored parameters





View and analyze waveform fault data retrieved from devices.

Trending Reports

Create a Historical Archive of Monitored Data from Multiple Devices

Data Logging

- Log and trend the value of monitored analog or digital points
- Data values are stored in a Microsoft SQL Server Express database
- View logged data for a pre-configured, customized recorded time period

Reports

- Create up to 100 customized records
- Store up to 50 points per record for 5000 points logged in total

Chart

- View logged data in a pre-configured, customized date range for trending analysis

Archiving Data

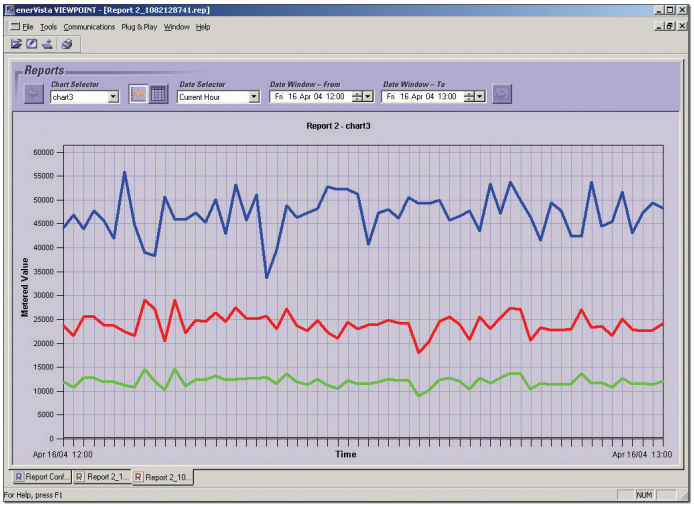
- Manually archive recorded data for storage onto network data repositories to reduce risk of data loss and decrease data storage requirements on local workstations

Exporting and Printing Data

- Export data into an Excel format for easy data manipulation and analysis
- Print data that is logged in trending reports

Historical Record of Monitored Data

- Trend up to 5000 data points
- Record data with 1 minute resolution
- View data in time based graphical or tabular format



Log power level data from multiple devices at one time.

Third-Party Device Support

Viewpoint Monitoring supports communication with third-party (non-GE) devices that utilize Modbus RTU or Modbus TCP/IP, providing a simple way to simple way to integrate these devices.

Viewpoint Monitoring provides support for third-party devices as follows:

Single-Line Diagrams

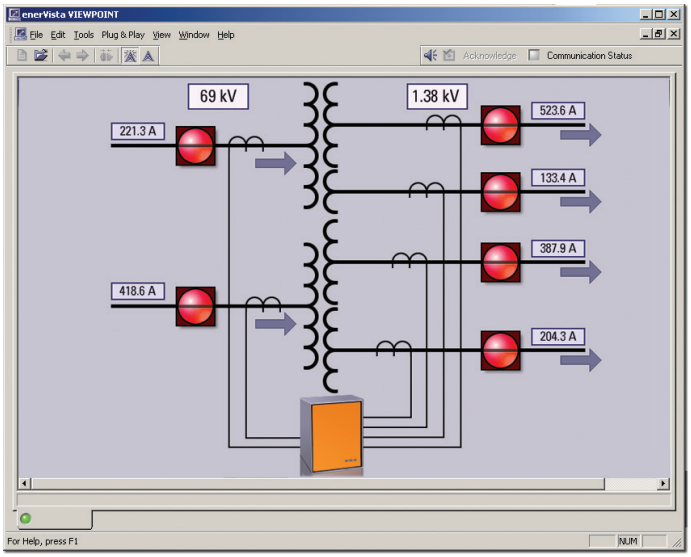
- Read the status of digital point
- Read the value of analog data
- Send commands to control power system equipment

Annunciator Panel

- Present an alarm when analog value surpasses a preset level or condition
- Present an alarm when a digital point(s) change state

Trending Reports

- Log the value of analog points over prolonged time periods
- Log the status of digital points on a device



Easily integrate third-party devices into single-line diagrams, annunciator alarms, and trending reports.

Annunciator Alarming

Receive Reliable Notification of System Alarms from Devices on the Network

Viewpoint Monitoring Annunciator Alarming actively monitors measured values and generates alarms. Alarms can be configured to be activated whenever a digital status changes state, or an analog value changes beyond any programmed threshold. Alarms can be delivered through multiple visual, audio, or e-mail notification channels. Furthermore, the Monitoring and Alarm Sentry ensures annunciators and alarms are always active.

Audio Notification

- Separate sounds for alert status and alarm status
- Audio notification of alarms and alerts continue until the alarm state is acknowledged by an operator

Visual Notification

- Annunciator screen shows the status of the monitored point
- The alarmed point will flash in a color chosen by the user until the alarm is reset by the operator

Email Notification

- Alarming of any monitored point can automatically generate an email to notify users of the alarm
- A different email address can be entered for each monitored point

Monitoring and Alarm Sentry

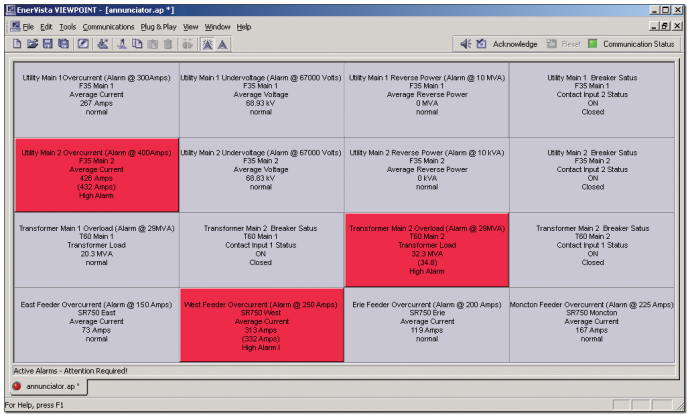
- Ensures annunciators and alarms are always active, even when the annunciator screens or the Viewpoint Monitoring software is closed in error

Reliable Alarm Notification

- Create alarms on monitored digital and/or analog data points
- Configured alarm warnings delivered through audio, visual or email notification channels

Rapid Alarm Notification

- Create alarms on any monitored analog or digital data point
- Receive alarm warnings through audio, visual or email notification



Reliable notification of system alarms in a single visual dashboard view.

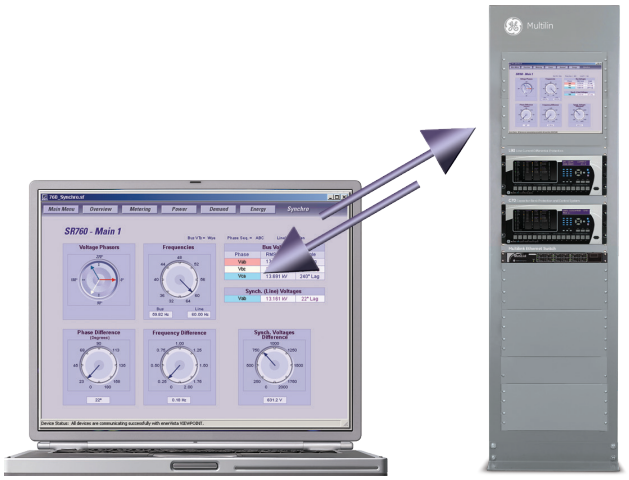
EnerVista Viewpoint Monitoring ViewNodes – Remote Monitoring

Remote Monitoring and Control

- Connect remotely to a Viewpoint Monitoring system over a network
  - Connect up to 10 ViewNodes to a single Viewpoint Monitoring system or
  - Connect up to 4 clients to a single Viewpoint Monitoring system using Terminal Services in Microsoft

Microsoft Windows Server 2012

- Implement security access through user accounts with configurable permissions
- Access
  - Plug and Play screens
  - One-Line diagrams
  - Annunciators panels/trending reports
  - Events
  - Waveforms

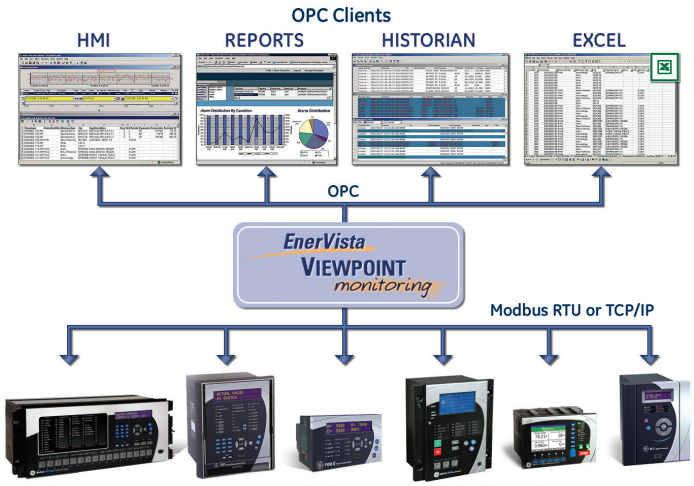


OPC Server Option

Viewpoint Monitoring can send the data that is being read from the relays and meters to any third-party OPC compliant automation or monitoring system. With Viewpoint Monitoring's pre-configured memory maps of GE Multilin devices the time, effort and cost required to import essential data into your monitoring, automation and control systems is significantly reduced.

Integrate the data retrieved by Viewpoint Monitoring into a larger monitoring or automation system.

- Send up to 65000 data points to an OPC Client
- Supports the entire library of devices that comes with Viewpoint Monitoring
- Provides the ability to send data from third-party devices added to the Viewpoint Monitoring database



Integrate the data retrieved by Viewpoint Monitoring into a larger monitoring or automation system.

Technical Specifications

System Requirements - EnerVista Viewpoint Monitoring v8.00

COMPONENT	REQUIREMENT
Supported Operating Systems	• Windows 7 (SP1) – 32 or 64 bit • Windows 8.1 – 32 or 64 bit • Windows 10 – 32 or 64 bit • Windows Server 2012 R2 (SP1)
Supported Databases	• SQL Server 2012 Express • SQL Server 2012
Computer and Processor	Recommended workstation: • Intel® Core™ i3 CPU or higher • Speakers (to support audible alarms)
Memory	4 GB of RAM (minimum)

Technical Specifications (Cont)

Supported Devices

DEVICE FAMILY	DEVICE	FIRMWARE
ATS	MX150	5.4x, 6.0x
	MX250	5.4x, 6.0x
	MX350	1.2x
Bay Protection/ Specialized	C30	2.6x to 7.3x
	C60	2.6x to 7.3x
	C90Plus	1.6x to 1.8x
	U90Plus	1.1
Bus	B30	2.6x to 7.3x
	B90	4.8x to 7.3x
Distribution Feeder	350	1.2x to 2.0x
	F35	2.6x to 7.3x
	F60	2.6x to 7.3x
	F650	1.6x to 7.1x
	MIF 2	4.0
	735/737	1.5x
	750/760	3.6x to 7.4x
	850	1.0x to 1.6x
Generator	G30	4.4x to 7.3x
	G60	2.6x to 7.3x
	489	1.3x to 4.03x
	889	1.6x
Line Protection	D30	3.0x to 7.3x
	D60	2.6x to 7.3x
	D90Plus	1.8x
	L30	5.6x to 7.3x
	L60	2.6x to 7.3x
	L90	2.6x to 7.3x
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
	EPM4600S	3.0x
	EPM4600T	3.0x
	EPM5000P	2.4x
	EPM5200P	2.4x
	EPM5300P	2.4x
	EPM5350P	2.4x
	EPM6000	1.0x
	EPM6000T	1.0x
	EPM6010	1.0x
	EPM6100	1.0x
	EPM7000	1.0x
	EPM7000T	1.0x
	EPM7100	1.0x
	EPM9450Q	2.1x
	EPM9650Q	2.1x
	EPM9800	6.1x
	EPM9900	1.0x
	ML2400	3.0x

DEVICE FAMILY	DEVICE	FIRMWARE
Miscellaneous	MRPO	1.0
	FIRETRACER	1.0
	VERSAMAX	1.0
Monitoring/Remote I/O	DGCM	4.0x
Motor	239	2.3x to 2.7x
	269+	6.0x
	339	1.3x to 1.7x
	369	1.6x to 3.6x
	469	2.5x to 5.2x
	869	1.3x to 1.60x
	MM200	1.0x to 1.2x
	MM300	1.2x to 1.70
	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 7.3x
Network	N60	3.4x to 7.3x
Transformer	745	2.4x to 5.2x
	T35	2.6x to 7.3x
	T60	2.6x to 7.3x
	345	1.3x to 1.5x
	845	1.40x to 1.6x
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)	40.x to 5.0x
	MET	12.02.02
UPS	UPS, UPS LP, UPS SG	1.0

EnerVista Viewpoint Monitoring v8.00 Software Selection Guide

EnerVista Viewpoint Monitoring

	VP	-	*	*	*	*	-	*	-	*	-	*	Description
Package		-	X	X	X	X							None
			0	0	5	0							50 Device / 3000 Points License, Version 7.20
			0	1	0	0							100 Devices / 5000 Points License, Version 7.20
			0	3	0	0							300 Devices / 30000 Points License, Version 7.20
			0	5	0	0							500 Devices / 65000 Points License, Version 7.20
			1	0	0	0							1000 Devices / 20000 Points License, Version 7.20
			U	0	0	1							Device/Point Upgrade 50 Devices / 3000 Points to 100 Devices / 5000 Points, Version 7.20
			U	1	0	3							Device/Point Upgrade 100 Devices / 5000 Points to 300 / 30000 Points, Version 7.20
			U	1	0	5							Device/Point Upgrade 100 Devices / 5000 Points to 500 / 65000 Points, Version 7.20
			U	1	1	0							Device/Point Upgrade 100 Devices / 5000 Points to 1000 / 20000 Points, Version 7.20
			U	3	0	5							Device/Point Upgrade 300 Devices / 30000 Points to 500 / 65000 Points, Version 7.20
			U	3	1	0							Device/Point Upgrade 300 Devices / 30000 Points to 1000 / 20000 Points, Version 7.20
			U	5	1	0							Device/Point Upgrade 500 Devices / 65000 Points to 1000 / 20000 Points, Version 7.20
Server Installation							-	X					None
								S					Windows Server Installation
OPC									-	X			None
										O			OPC Option
Version Upgrade											-	X	None
												U	1 Additional Year of Version Upgrades

EnerVista Viewpoint Monitoring ViewNodes

	VP	-	*	*	*	*	-	*	-	*	-	*	Description
ViewNodes			V	I	E	W	-	X	-	X	-	X	EnerVista Viewpoint Monitoring Version 7.20 ViewNode

EnerVista Viewpoint Monitoring 61850*

	VP	-	*	*	*	*	-	*	-	*	-	*	Description
61850		-	I	6	1	8	-	X					VP Monitoring 61850 - 50 Devices
OPC									-	X			None
										O			OPC Option
Version Upgrade											-	X	None
												U	1 Year Version Upgrades

**NOTE:*

- *EnerVista Viewpoint Monitoring 61850 is a separate application from EnerVista VP Monitoring and provides support for 61850 protocol edition 1 only.*
  - *OS Compatibility: Windows XP - 32 bit*
  - *Devices: Supports up to 50 devices; up to UR v5.5x. For complete details refer to EnerVista Viewpoint Monitoring 61850 release notes.*

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