## **Grid Solutions**



# 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 2019/2022 (Remote access requires Microsoft Windows Server Remote Desktop Services (User or Device) purchased separately)



## **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 Vernova'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 Vernova's Multilin devices
- Annunciator alarming with visual, audio and email notification
- Diagnose waveform fault data recorded in power system devices



## 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.

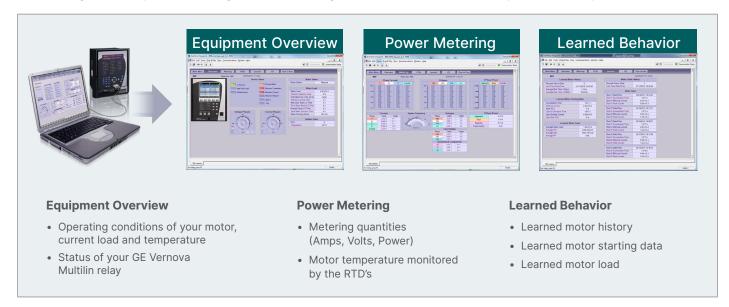
#### **Auto-Discovery of Devices**

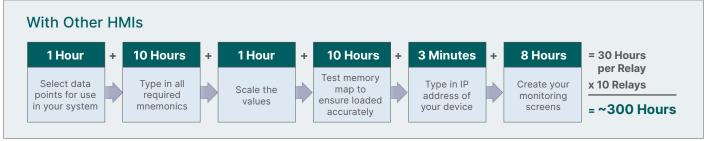
Viewpoint Monitoring reduces integration time and decreases errors when configuring devices by automatically detecting and configuring UR devices.

## 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:







## 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
- 859 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 Vernova 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.

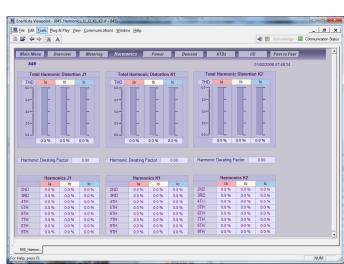


Monitor critical information such as:

- · 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 Vernova 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

- System

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

Trip Counters		Trip Counters		General Counters				
Current		Power	Power Number of Breaker Operations					
Offline Overcurrent	0	Reactive Power	0	Number of Thermal Resets				
Phase Overcurrent	12	Reverse Power	1					
Negative Sequence Overcurrent	0	Low Forward Power	3	Timers				
Ground Overcurrent	2	Temperature		Generator Hours Online	14216 h			
Phase Differential	1	Stator RTD	0					
Ground Directional	0	Bearing RTD	2	Total Number of Trips	29			
High-Set Phase Overcurrent	0	Other RTD	0					
Voltage		Ambient RTD	0					
Undervoltage	0	Analog Input						
Overvoltage	0	Analog Input 1	0	Clear Counters				
Volts / Hertz	0	Analog Input 2	0	Clear				
Phase Reversal	4	Analog Input 3	0					
Underfrequency	1	Analog Input 4	0					
Overfrequency	0	Other						
Neutral Overvoltage (Fundamental)	0	Digital Input	0					
Neutral Undervoltage (3rd Harm.)	0	Sequential	0					
Loss of Excitation 1	0	Tachometer	0					
Loss of Excitation 2	0	Field Breaker Discrepency	0					
Distance Zone 1	2	Thermal Model						
Distance Zone 2	0	Inadvertent Energize	1					

Improve maintenance efficiency by analyzing trip operations.

## Plug-and-Play Feeder Monitoring

#### **Use Viewpoint Monitoring to Monitor Feeder Protection Equipment**

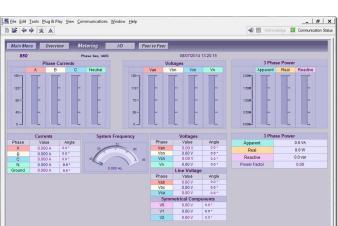
Automatically created overview screens provide insight on feeder operating conditions and the status of GE Vernova Multilin relays. Additional monitoring screens are available for analyzing metering quantities, along with the power, demand and energy values that may be measured by the relay. If supported 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.



- 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



UPPORTED DEVICES:		E	EnerVista VIEWPOINT - [	EMVTD_Overview.s	រា				
MVT MicroVersa Trip Unit EMVT Enhanced Microversa	GTU EntelliGuard TU Trip Unit     Entellisys Low-Voltage		Main Menu Me	etering S.	etup				
Trip unit	Switchgear		Cu	rrent		Voltage (L	N)		
THP dillt	Owitchigedi		A	ВС		Α Ε	С	Volts A-B	1.38 kV
			100		2.0:		I	Volts B-C	1.39 kV
								Volts C-A	1.41 kV
			75 ***		1.5			Real Energy	107
					- 1.0			Real Power demand	101.7
			50 ***		- 1.0	•		Peak Real Power demand	133.8
			25					PF	1.000
			49.17		0.5			Frequency	60 Hz
			0		- 0			Breaker Status	Closed
			6					Wires	4 Wire
				A	В	С	N		
			Current	78 A	73 A	79 A	2.1 A	Trip Operation Counter	Enabled
			Voltage (L-N)	796 V	802 V	814 V		Sw. Inst/Short Time	Enabled
								Current Unbalance Relay	Disabled
				A	В	С	Total	Gnd Fault ZS1 Selected	Enabled
			Real Power	107	101	111	106.4	Short Time 7S1 Selected	Enghlad

Monitor breaker equipment with predefined screens.

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## Plug-and-Play Power Quality Monitoring

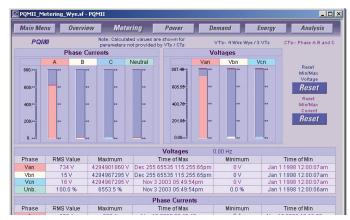
## **Use Viewpoint Monitoring to Monitor Power Quality Equipment and Measure Usage**

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 • EPM 7000/7000P/7100 Power Quality Meter Electronic Power Meter • EPM 2000/2200 • EPM 9450/9650/9700 Electronic Power Meter Electronic Power Meter • EPM 4600 • EPM 9800 Electronic Power meter Electronic Power Meter • EPM 5200/5300/5350 • EPM 9900/9900P Electronic Power Meter Electronic Power Meter • EPM 6000/6100 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







Monitor the status of critical backup assets.

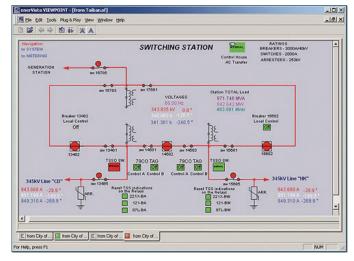
## Single-Line Monitoring and Control

#### 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**

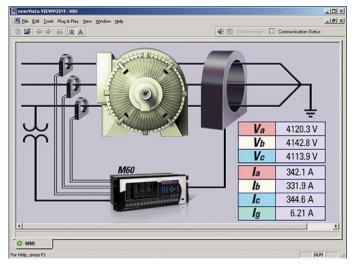
- Create single-line diagrams using user-friendly, drag-and-drop tools with standardized symbols and components representing power system assets (transformers, breakers, CT's and PT's)
- Import graphics (bmp, jpg, png) to customize single-line diagrams more quickly
- Display power system values and status 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**

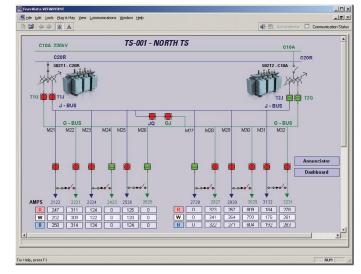
- Provide a system-wide view of the power system on one single-line monitoring screen
- Analyze the magnitude of critical power quantities measured by devices
- Generate alarm warnings when measured values exceed configurable critical levels
- Create links to multiple monitoring screens to analyze power 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 Vernova Multilin devices ensures availability of detailed information for diagnosing power system events.

#### **Event Logging**

The event records from GE Vernova 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 Vernova 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**

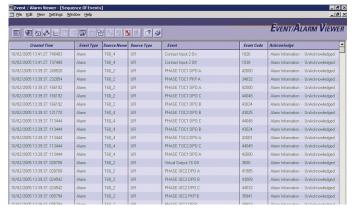
The waveform (oscillography) files from GE Vernova Multilin devices can be automatically downloaded from each device and stored on your hard drive. Similar to Event Logging, Viewpoint Monitoring will continually poll each GE Vernova Multilin device to see if any new waveform files have been created. 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.

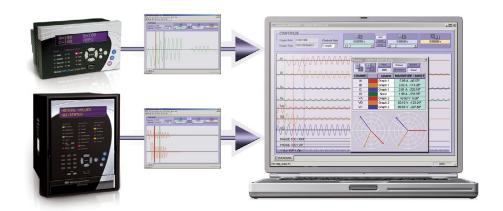


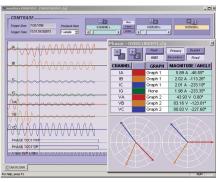
Create comprehensive, centralized, system-wide sequence of event records for analysis of power system faults.

## **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**

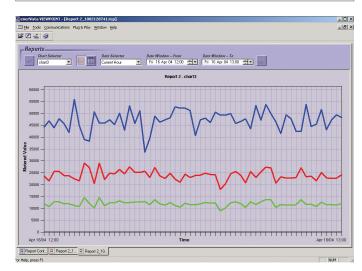
 Manually archive recorded data for storage onto network data repositories to reduce risk of data loss and decrease data storage requirements on local workstations

#### **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 Vernova) 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

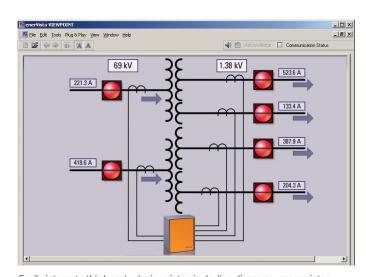
- · Read the status of digital point
- Read the value of analog data
- · Send commands to control power system equipment

#### **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**

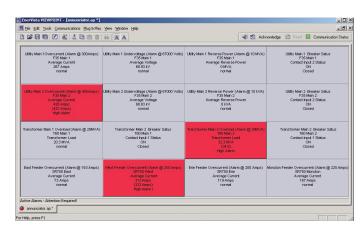
 Ensures annunciators and alarms are always active, even when the annunciator screens or the Viewpoint Monitoring software is closed in error

#### **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 - Remote Access/Monitoring

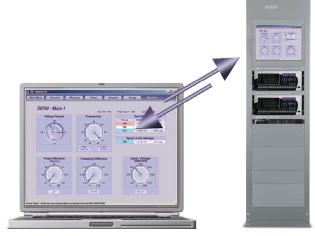
Remote access to a EnerVista Viewpoint Monitoring instance is optionally available through EnerVista Viewpoint Monitoring ViewNodes (requires separate ViewNodes license) or Windows Server Remote Desktop Services (requires Windows Server option and Windows Remote Desktop Services (RDS) license from Microsoft).

#### **EnerVista Viewpoint Monitoring ViewNodes**

Install ViewNode client software on a remote workstation with up to 10 concurrent ViewNode clients accessing a EnerVista Viewpoint Monitoring instance.

### **Windows Server Remote Desktop Services**

- Connect up to 5 workstations (1 admin; 4 users) to a single Viewpoint Monitoring system using Terminal Services in Microsoft Windows Server 2019/2022.
- Implement security access through user accounts with configurable permissions for:
  - Plug and Play screens
  - One-Line diagrams
  - Annunciators panels/trending reports
  - Events
  - Waveforms



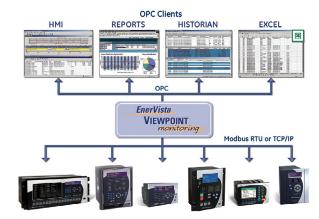
Available remote access/monitoring

## **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 Vernova 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 v8.14

COMPONENT	REQUIREMENT
Supported Operating Systems	Windows® 10 64 bit Windows® 10 64 bit Windows® Server 2022* Windows® Server 2019*
Supported Databases	• SQL Server 2019 Express • SQL Server 2019
Computer and Processor	Recommended workstation:  • Intel® Core™ i3 CPU or higher  • Speakers (to support audible alarms)
Memory	4 GB of RAM (minimum)

<sup>\*</sup> Remote access requires Microsoft Windows Server Remote Desktop Services (User or Device) purchased separately.

## Technical Specifications (Cont'd)

## **Supported Devices**

DEVICE FAMILY	DEVICE	FIRMWARE
ATS	MX150	5.4x, 6.0x
	MX250	5.4x, 6.0x
	MX350	Up to 1.20
UPS	UPS, UPS LP, UPS SG	1.0
Trip Units/	Spectra MicroVersa Trip 5.1x	5.1x
Switchgear	Enhanced MicroVersa Trip C 4.1x	4.1x
	Enhanced MicroVersa Trip D 4.1x	4.1x
	GTU (EntelliGuard TU Trip Unit)	7.0x
	ELVS (Entellisys)	5.0x
	MET	12.02.02
Meters/	PQM	3.3x to 3.6x
Switches	PQMII	1.0x to 2.2x
	EPM 1000	
	EPM 2000	
	EPM 2200	
	EPM 4000	
	EPM 4600S	
	EPM 4600T	
	EPM 5000P	
	EPM 5300P	
	EPM 5350P	
	EPM 6000	
	EPM 6000T	
	EPM 6010	
	EPM 6100	
	EPM 7000	
	EPM 7000T	
	EPM 7000P	
	EPM 7000PT	
	EPM 7100	
	EPM 9450Q	
	EPM 9650Q	
	EPM 9700	
	EPM 9800	
	EPM 9900	
	EPM 9900P	
	ML2400	3.0x
Distribution	3 Series 350	1.2x to 2.5x
Feeder	DGCM Field RTU	4.0x
	F35	2.6x to 8.4x
	F60	2.6x to 8.4x
	F650	1.6x to 7.7x
	MIF 2	2.40
	735/737	1.5x
	750/760	3.6x to 7.4x
	G30	4.4x to 8.4x
	G60	2.6x to 8.4x
	8 Series 850	1.1x to 2.9x

DEVICE FAMILY	DEVICE	FIRMWARE		
Generator	489	1.3x to 4.03x		
	8 Series 889	1.1x to 2.9x		
	D30	3.0x to 8.4x		
	D60	2.6x to 8.4x		
	D90Plus	1.8x		
Line Current	L30	5.6x to 8.4x		
Differential Protection	L60	2.6x to 8.4x		
Trotection	L90	2.6x to 8.4x		
Transformer	745	2.4x to 5.2x		
	T35	2.6x to 8.4x		
	T60	2.6x to 8.4x		
	3 Series 345	1.3x to 2.5x		
	8 Series 845	1.4x to 2.9x		
Motor	239	2.3x to 2.7x		
	269+	6.0x		
	3 Series 339	1.3x to 2.5x		
	369	1.6x to 3.6x		
	469	2.5x to 5.2x		
	8 Series 859	4.0x		
	8 Series 869	1.3x to 2.9x		
	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 8.4x		
Network	N60	3.4x to 8.4x		
Bus	B30	2.6x to 8.4x		
	B90	4.8x to 8.4x		
Specialized	C30	2.6x to 8.4x		
	C60	2.6x to 8.4x		
	C90Plus	1.6x to 1.8x		
	U90 <sup>Plus</sup>	1.1		
Miscellaneous	MRPO	1.0		
	FIRETRACER	1.0		
	VERSAMAX	1.0		

## EnerVista Viewpoint Monitoring v8.14 Order Codes

## **EnerVista Viewpoint Monitoring**

	VP	-	*	*	*	*	_ *	k _	*	-	*	Description
Package		-	X 0 0 0 1 U U U U U	X 0 1 3 5 0 0 1 1 1 3 3 5	X 5 0 0 0 0 0 0 0 1 0	X 0 0 0 0 1 3 5 0 5						None 50 Devices / 3000 Points License 100 Devices / 5000 Points License 300 Devices / 30000 Points License 300 Devices / 30000 Points License 500 Devices / 65000 Points License 1000 Devices / 20000 Points License Device/Point Upgrade 50 Devices / 3000 Points to 100 / 5000 Points Device/Point Upgrade 100 Devices / 5000 Points to 300 / 30000 Points Device/Point Upgrade 100 Devices / 5000 Points to 500 / 65000 Points Device/Point Upgrade 100 Devices / 5000 Points to 1000 / 20000 Points Device/Point Upgrade 300 Devices / 30000 Points to 500 / 65000 Points Device/Point Upgrade 300 Devices / 30000 Points to 1000 / 20000 Points Device/Point Upgrade 500 Devices / 65000 Points to 1000 / 20000 Points
Server Installation								6				None Windows Server Installation
OPC								-	X			None OPC Option
Version Upgrade										-	X	None 1 Additional Year of Version Upgrades

## **EnerVista Viewpoint Monitoring ViewNodes**

	VP	-	*	*	*	*	-	*	-	*	-	*	Description
ViewNodes			V	ı	Е	W	-	Χ	-	Χ	-	Χ	EnerVista Viewpoint Monitoring ViewNode

## For more information, visit **gevernova.com/grid-solutions**

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