EnerVista Integrator
Quickstart Guide

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Introduction

EnerVista^{TM} Integrator^{TM} is the latest Power Management Control System in the EnerVista line from GE Multilin. EnerVista Integrator integrates the comprehensive line of POWER LEADER devices, as well as many new Modbus RTU devices and systems. EnerVista Integrator comes with built-in Ethernet compatibility and is optimized for the Windows operating system. In addition, the software can be installed and used with administrative user login. All of this adds up to the most flexible, high-performance, open-architecture power-management system available. EnerVista Integrator software is the heart of your new power management system, with state-of-the-art graphics and features designed to maximize productivity and minimize downtime and energy costs.

Performance

EnerVista Integrator delivers critical power-management information at baud rates up to 38.4 kbps on a Modbus RTU network and 10 Mbps on

an Ethernet TCP/IP network. This results in near real-time screen refresh rates and immediate access to critical event and alarm data.

Features

EnerVista Integrator comes with the following features that make the system powerful and easy to use:

- Compatible with industry-standard third-party SCADA platforms
- Built-in Modbus RTU network compatibility for an open network architecture and high-speed communication
- Built-in Ethernet TCP/IP network compatibility for high-speed communication and reduced wiring costs
- Built-in support for POWER LEADER and Multilin power-management devices, as well as additional GE meters and relays, Fanuc 90/30 and 90/70 programmable logic controllers, and third-party meters and relays
- 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
- Single Viewer Workstation support for seamless access and sharing of power-management data across your existing local area network (LAN)
- Configurable password protection and user-activity logging for improved security and restriction of setup or control operations
- Optional EnerVista Integrator modules are available to further increase productivity and reduce energy costs

EnerVista Integrator envelope definition

1. Physical system size

- 75 power management devices (intelligent electronic devices, or IEDs) (300 maximum)

- 150 I/O points (through IEDs or programmable logic controllers, or PLCs)
- 64 Ethernet serial communications ports
- 2 Modbus monitors (maximum) using standard Modbus Monitor Proxy

2. OPC clients data items size
- Up to 30,000 points/tags in OPC clients
- 10% of tags connected to enterprise solution

3. Special application issues
- No redundancy

4. Performance
Response times:
- 1 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
- Devices supporting 125 register block reads
- Average CPU utilization <35%
- 99% system uptime

Servers and executables

From the user's perspective EnerVista Integrator appears to be a single software unit but it is actually a suite of software running together. The software includes the following servers and functions:

- Two Modbus Server exe's — Polls for Modbus data from appropriate device. The servers do not poll for data on their own. A client (EnerVista Integrator, WFServer, EventServer, and so on) must request data.

- GE32MODB.exe — The Modbus RTU server. This server is used whenever the EnerVista Integrator computer is connected directly to a Modbus RTU communication network over the computer's COM ports. This is typically via a RS232/485 converter.
- GE32MTCP.exe — The Modbus TCP/IP server. This server is used when communicating to devices supporting a direct Ethernet interface (URs and so on) or Modbus RTU devices using a GE Multinet converter.
- Eventserver.exe — Polls and retrieves the device generated event log. The event is placed in an SQL database. For a device to be polled it must support an even t log function and also have the poll enabled in EnerVista Integrator.
- Eventlog.exe — Viewer for events collected by the Eventserver.exe
- Wfserver.exe — Polls and retrieves waveforms generated by devices. For a device to be polled it must support a waveform function and also have the poll enabled in EnerVista Integrator.
- WFC.exe — Waveform Client application to view the waveforms retrieved in CSV format by Wfserver.exe. It has features to trigger and upload the waveforms from supported devices.
- WaveformViewer.exe — Waveform Viewer application to view the waveforms retrieved in COMTRADE format by Wfserver.exe. It has features for viewing phasors and harmonics and play-back.

Devices supported

EnerVista Integrator supports the following devices. Firmware versions other than those listed may not be compatible; contact your GE Sales Representative or GE Digital Energy as outline in the **Installation** section.

Table 1: Devices supported

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

Device family	Device	Firmware
Distribution Feeder	350	1.2x to 1.4x
	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	1.3x to 4.03x
	D30	5.0x to 5.9x
	D60	2.6x to 5.9x
	D90[Plus]	1.8x
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

Device family	Device	Firmware
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

Unpacking checklist

The following items are included on the CD with purchase:

- EnerVista Integrator software
- Quickstart Guide
- Instruction Manual
- Additional documents in the **/Tech_Doc/GE_CD** folder

If any of the contents listed are missing or there is damage to the product, contact GE Digital Energy immediately using the contact information in the **Installation** section.

For product information and instruction manual updates, visit the GE Multilin website at **http://gedigitalenergy.com/multilin**.

Installation

This section outlines how to install the system. The process is as follows:

- Check the computer requirements
- Set up the computer system
- Install the EnerVista Integrator software

System requirements

Use a dedicated computer to run the software, else performance and data integrity cannot be predicted.

Operating system

EnerVista Integrator supports the following operating systems:

- Windows 2008 Server SP2
- Windows 2003 Server R2 SP2
- Windows 7
- Windows XP SP3 Professional

While the system can be installed on a Windows Vista operating system, some features, such as the Services feature whereby servers are converted into services and launched automatically, do not work.

Hardware requirements

The minimum computer requirements are as follows:

- 1 GHz processor
- 1 GB RAM
- 512 K cache
- 40 GB AT-100 hard drive (15 GB free space on System drive)
- 10/10/32 RW CD drive (not burning CDs while application is running)
- Video capable of 16-bit, 1024x768 resolution
- Two 10-BaseT Ethernet cards (static IP addresses; no DHCP support)
- Parallel port printer
- Analog phone modem (no Winmodems, which means no native modem support)
- With / without MS Office 2000/2003/2007/2010

The following items are recommended:

- Additional hard disk space for increased storage of log and trend data
- Uninterruptible power supply (UPS)
- 17-inch or larger monitor
- A backup mechanism
- 28.8 Kbps or faster modem if remote access technical support is required

Set up the computer system

Installation requires about an hour. The process is as follows:

- Optimize Windows XP (if applicable)
- Optimize Windows 2003 or 2008 (if applicable)

- Install RS485 interface card, Ethernet interface card, and/or local-area (LAN) interface
- Install other software, such as Microsoft Excel (if applicable)

Optimize Windows XP

On a Windows XP computer, performance can be enhanced by setting a greater share of processing power to the application.

To enhance performance on a Windows XP computer:

1. Click **Start > Settings > Control Panel**.
2. Access the **System** panel.
3. Click the **Advanced** tab and access the **Performance** panel.
4. Click the **Advanced** tab and verify that the processor and memory are optimized for programs. The virtual memory setting can be left at the default.

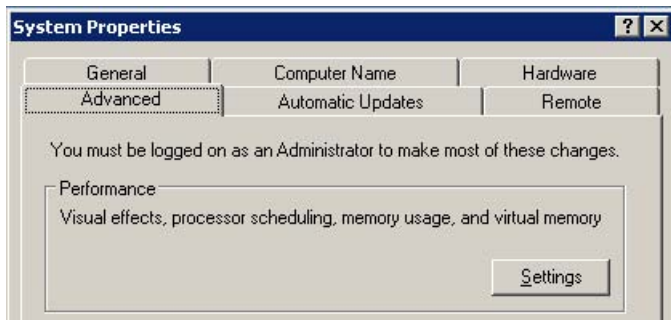**Figure 1: Optimizing performance on Windows XP**
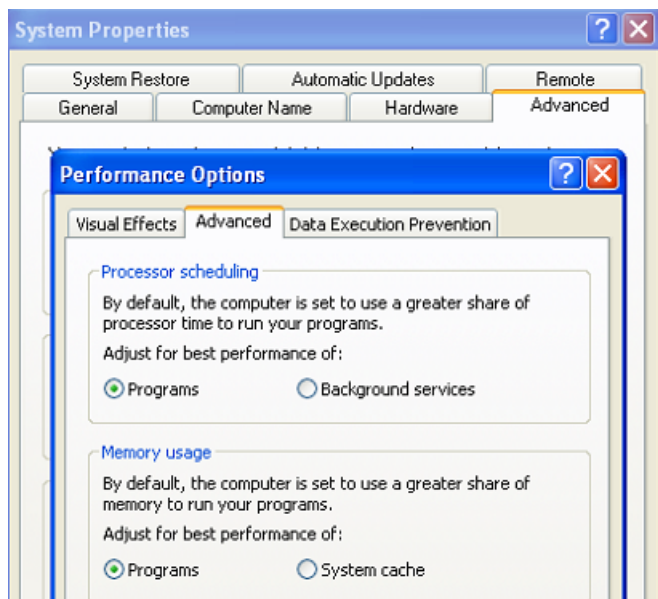
Optimize Windows Server 2003 or 2008

To install the EnerVista Integrator software on Windows Server 2003 or 2008:
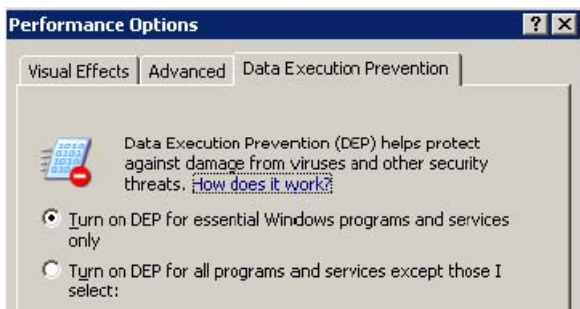
1. Right-click **My Computer** and select **Properties**.
2. Click the **Advanced** tab.

Figure 2: Installing on a Windows Server computer

3. Click the **Settings** button in the Performance section.
4. Enable the first option to **Turn on DEP for essential Windows programs and services only**.

Figure 3: Protecting the data with the DEP option

5. Click the **Apply** button, then the **OK** button.
6. Restart the computer.
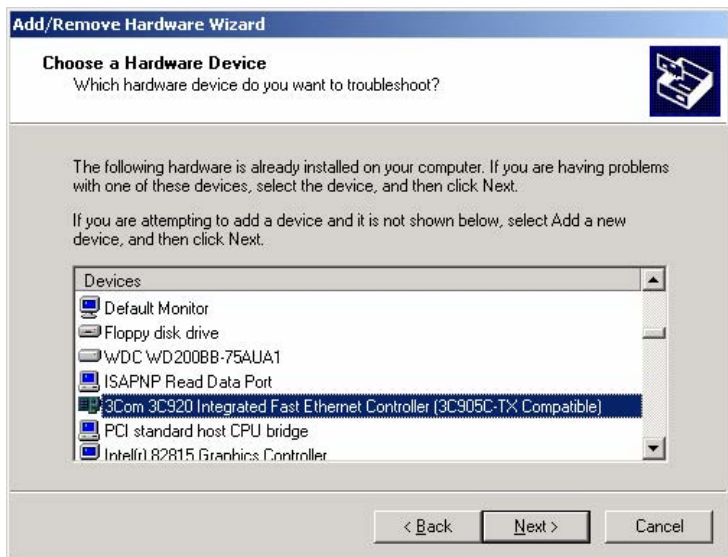
Install interface

The computer needs an RS485, Ethernet, and or LAN interface to communicate with devices. A computer with an RS485 network interface requires an additional LAN interface card to support remote clients. Otherwise, only one interface is required, though more than one can be installed. For example, if you have an Ethernet card installed in the computer, there can also be a LAN interface.

Install RS485 interface card

For EnerVista Integrator systems using one or more GE Multilin RS232 to RS485 converters (or equivalent), no additional drivers are required. Go to the next section.
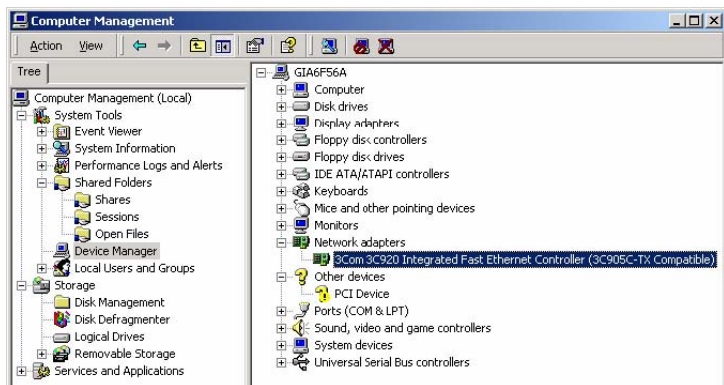
If you are using an RS485 interface card to connect to the EnerVista Integrator network, install the card following the manufacturer's instructions. Be sure to install any Windows drivers provided by the card vendor. Follow the instructions provided on the screen to complete the network card installation. You typically select the appropriate network adapter from the list and click **Have Disk**.

Figure 4: Installing an interface card

Typically, installed drivers are viewable at **Control Panel > Administrative Tools > Computer Management > System Tools > Device Manager > Network adapters**.

Figure 5: RS485 card installed

Install Ethernet interface card

If you are using an Ethernet interface card to connect to the EnerVista Integrator network through one or more Ethernet Gateways or directly to a network of Universal Relays, EPM 9450 / 9650s, F650, EntellisysLVS (Modbus TCP/IP), follow the manufacturer's installation instructions and be sure to install the Windows drivers provided using **Control Panel > Administrative Tools > Computer Management > System Tools > Device Manager > Network adapters**. See the previous figures for an example, though the selections differ based on the hardware you are installing.

Ethernet requires the TCP/IP protocol for compatibility with the Ethernet Gateway. TCP/IP typically is installed with Window XP SP2; you can check this using **Control Panel > Administrative Tools > Computer Management > System Information > Components > Network > Protocol**. The following figure shows a system with TCP/IP installed. If TCP/IP is not installed on your system, see the Windows XP SP2 documentation for installation instructions.

Figure 6: TCP/IP installed on a computer
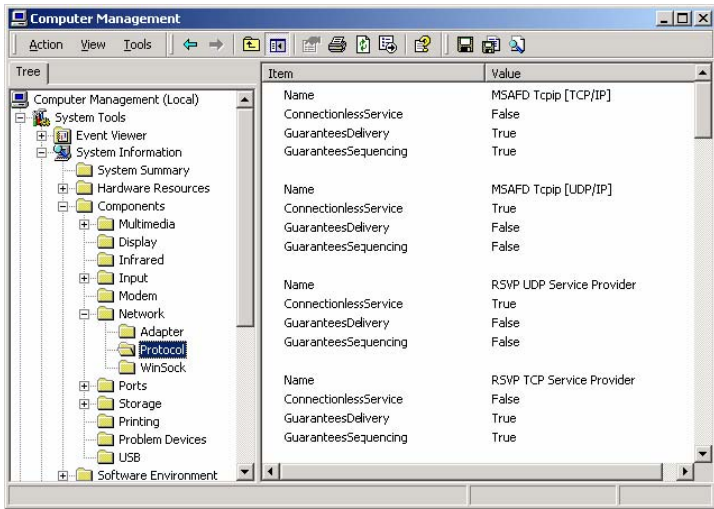
Install LAN interface card

EnerVista Integrator supports multiple remote clients through OPC links over a local area network. Thus, in addition to the EnerVista Integrator network interface, the host computer can also have a LAN interface.

A host computer with an EnerVista Integrator network interface can use either the same Ethernet card as the LAN interface or a separate LAN interface card. A host computer with an RS485 EnerVista Integrator network interface requires an additional LAN interface card to support remote clients.

Typical LAN interface cards include Ethernet and token ring. Install the LAN interface card according to the manufacturer's instructions.

Install other software

If you have other software to install on the computer, such as Microsoft Office, Excel, or COMTRADE, do so. COMTRADE file browsers are used for analyzing waveform files. Restart the computer when done.

Install the software

After setting up the computer system and installing third-party software, install the Integrator software.

The software license allows for installation on one computer. To install the software on multiple computers, you need a license key for each computer.

This section outlines how to install Integrator version 7.x.

Upgrade support for Integrator 6.20 and above

EnerVista Integrator 7.x automatically installs and upgrades over any previous installations of EnerVista Integrator that are version 6.20 or newer. Existing configurations are supported.

Upgrade support for Integrator 6.16 and below

When upgrading from Integrator 6.16 and below, the SQL Express 2008 installation does not work as expected. Continue to use MSDE or SQL Express 2005, or if you want to upgrade to SQL Express 2008, install it manually from the installation CD. The path is
<drive:>\ISSetupPrerequisites\Microsoft SQL Server 2008 Express\ SQLEXPR32_x86_ENU.exe

Then follow the steps in the document
Appnote 121 - Migrating Eventlogger database to another SQL Server.pdf
located in
<drive:>\GE_PMCS\Tech_Doc\GE_CD
for migrating the existing database to new the SQLServer.

Upgrade support for PMCS

Upgrade from the GE PMCS product is not supported.

Install the software

Install the software from the CD.
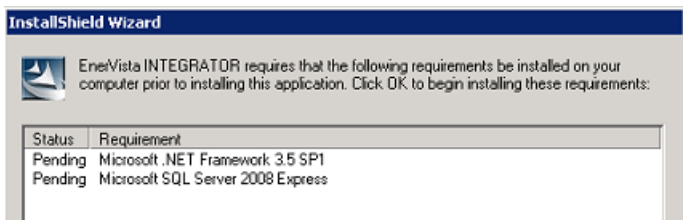
To install EnerVista Integrator software:

1. Close any open applications.
2. Insert the EnerVista Integrator Installation CD into the drive.
3. Click **Start > Run**.
4. In the Run window, enter E:\SetUp.exe, where E is the drive. This launches the installation wizard.

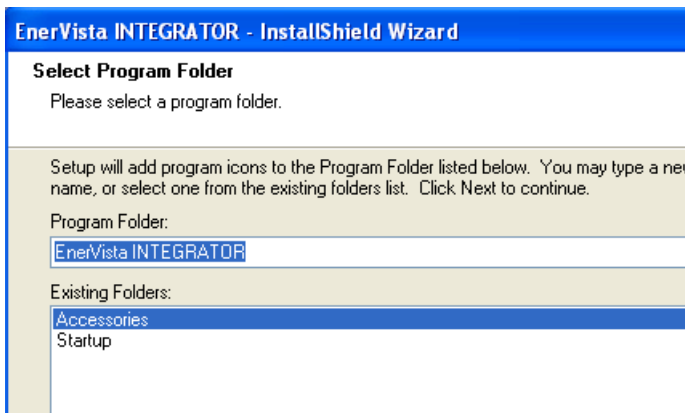### Figure 7: Enter the path to the setup file
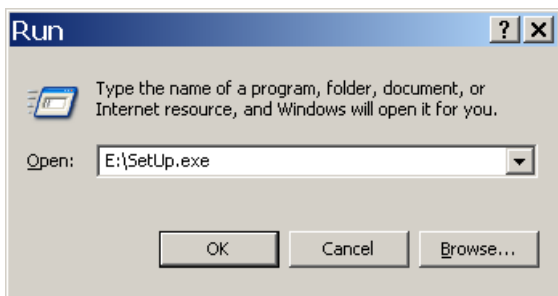
5. To install requisite software, click the **Install** button.

Figure 8: Installing SQL Server Express

6. Complete the wizard. The Integrator software, documentation, and online help are installed.
7. After installation completes, restart the computer.

Figure 9: Naming the Integrator folder

Configuration

This section outlines how to configure the system. The process is as follows:

- Configure the ports
- Configure the computer

Configure the ports

You need the following information to properly configure the EnerVista Integrator software for the host computer.

To configure the system:

1. For RS485 EnerVista Integrator network interfaces, list all devices in the power-management network (including Modbus Concentrators) with associated device types, Modbus RTU addresses, and COM ports. Assign names of less than 20 characters (no spaces) to these devices.

For example, in a simple system with four devices (and one Modbus Concentrator), you have a table similar to the following:

Table 2: RS485 configuration example for four devices

COM port	Modbus RTU address	Device type	Device (topic) name
1	2	MODCONC	MCI
1	12	E3720	Main_Meter
1	33	PLEPM	Mfg_Meter
1	61	MVT	Mfg_Breaker
2	210	ML269	Mill_Relay

2. For an Ethernet EnerVista Integrator network interface (Ethernet Gateway), list all devices in the power-management network, including the device types and Modbus RTU addresses. You need to know the appropriate Ethernet Gateway IP address and COM port (1 to 4) to which each device is connected. Assign names of less than 20 characters (no spaces) to these devices.

    For example, in a simple system with 10 devices, you have a table similar to the following (this system uses one Ethernet Gateway and other devices).

Table 3: Ethernet configuration example for 10 devices

Ethernet Gateway IP address	COM port	Modbus RTU address	Device type	Device (topic) name
10.47.28.201	1	2	EPM 9650Q	E9650Q
10.47.28.201	1	12	E3720	Main_Meter
10.47.28.201	1	33	PLEPM	Mfg_Meter
10.47.28.201	1	61	PLEPM	Plating_Meter
10.47.28.201	2	12	UR L90	UR
10.47.28.201	2	66	PLEPM	Office1_Meter
10.47.28.201	2	80	PLM	Office2_Meter
10.47.28.201	2	90	MDP	Feeder1_Relay
10.47.28.201	2	100	MVT	Mfg_Breaker

Ethernet Gateway IP address	COM port	Modbus RTU address	Device type	Device (topic) name
10.47.28.201	3	200	ML269	Mill_Relay
10.47.28.201	4	21	EPM5350P	E5350P
10.47.28.201	4	201	MVT	Plating_Breaker
10.47.28.201	4	210	MVT	Office_Breaker

3. Archive your configuration setup for any future maintenance of your system.

Configure the computer

To configure the host computer running the Integrator software:

1. Configure the DDE/OPC Server. Your host computer likely has several versions of the DDE/OPC Server installed (RS485-Modbus, TCP/IP Modbus, TCP/IP Encapsulated Modbus and Ethernet-TCP/IP). Configure only the server appropriate for your EnerVista Integrator network interface (EnerVista Integrator-RS485 or EnerVista Integrator-TCPIP). See the document **PMCS Network and Device Configurator** (document number GEH-6510) for details.

Congratulations. EnerVista Integrator has been installed and configured for use. To launch the application, click **Start > All Programs > EnerVista Integrator > EnerVista Configurator**. For information on how to use the software, see the EnerVista Integrator Instruction Manual.

Uninstall the software

If required, the Integrator software can be uninstalled.

Uninstalling the Integrator 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 EnerVista Integrator 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 EnerVista Integrator software:

1. Click **Start > Control Panel**.
2. Click **Programs and Features**.
3. Click **EnerVista Integrator**.
4. Click **Uninstall**, and confirm the deletion. The Integrator software is deleted.

For further assistance

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

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Fax: +1 905 927 5098
E-mail: multilin.tech@ge.com
Website: **http://gedigitalenergy.com/multilin**

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