

Multilin™ D60

LINE DISTANCE PROTECTION SYSTEM

High-speed transmission line protection with three/single pole tripping



KEY BENEFITS

- High-speed cost effective five zone quad or mho, phase and ground distance protection
- Complete IEC 61850 Process Bus solution providing resource optimization and minimizing total P&C life cycle costs
- Reliable and secure protection on series compensated lines
- Superior phase selection algorithm ensures secure high speed single pole tripping
- Supports multiple standard pilot schemes for fast fault clearance within the protected zone
- Flexible programmable logic for building customized schemes
- Embedded IEC 61850 Protocol
- Reduced relay to relay wiring and associated installation costs through high-speed inter-relay communications
- Simplified teleprotection interfaces with Direct I/O communications hardware for Transfer Trip and Pilot-Aided distance schemes
- Robust network security enabling Critical Infrastructure Protection through user command logging, and dual permission access control
- Phasor Measurement Unit - Synchronised phasor information according to IEEE C37.118 standard
- Ambient temperature monitoring with alarming when outside temperature exceeds upper thresholds

APPLICATIONS

- Overhead lines including series compensated lines and underground cables of different voltage levels
- Single and dual-breaker circuits requiring single pole/three-pole autoreclosing and independent synchrocheck
- Circuits with in-zone power transformers and tapped transformer feeders
- Secure application with Capacitively-Coupled Voltage Transformers (CCVTs)
- Backup protection for generators, transformers and reactors

FEATURES

Protection and Control

- Phase Distance (five zones) with independent compensation settings for in-zone power transformers
- Ground distance (five zones) with independent self and mutual zero sequence compensation
- Reverse power, Out of Step tripping and power swing blocking
- Line pickup, thermal protection, under /over frequency
- Thermal overload, phase, neutral and negative sequence directional overcurrent; and broken conductor
- Over, Under and rate of change of Frequency, Synchronism check for dual breaker applications
- Four-shot dual breaker auto-recloser, broken conductor
- VT fuse failure detector, compensated over-voltage

EnerVista™ Software

- Graphical Logic Designer and Logic Monitor to simplify designing and testing procedures
- Document and software archiving toolset to ensure reference material and device utilities are up-to-date
- EnerVista™ Integrator providing easy integration of data in the D60 into new or existing monitoring and control systems

IEC 61850 Process Bus Interface

- Robust communications with up to 8 HardFiber Bricks
- Seamless integration with existing D60 functions
- Redundant architecture for dependability and security

Monitoring and Metering

- P & M Class synchrophasors of voltage, current and sequence components – 1 to 120 frames/sec
- Metering - current, voltage, power, energy, frequency
- Oscillography – analog and digital parameters at 64 samples/cycle
- Event Recorder - 1024 time tagged events with 0.5ms scan of digital inputs
- Setting Security Audit Trail for tracking changes to D60 configuration

Communications

- Networking interfaces – 100Mbit Fiber Optic Ethernet, RS485, RS232, RS422, G.703, C37.94
- Multiple Protocols - IEC 61850, DNP 3.0 Level 2, Modbus RTU, Modbus TCP/IP, IEC60870-5-104, Ethernet Global Data (EGD)
- Direct I/O – secure, high-speed exchange of data between URs for Direct Transfer Trip and pilot-Aided schemes
- Embedded Managed Ethernet Switch with 4 - 100 Mbit Fiber optic ports and 2 copper ports

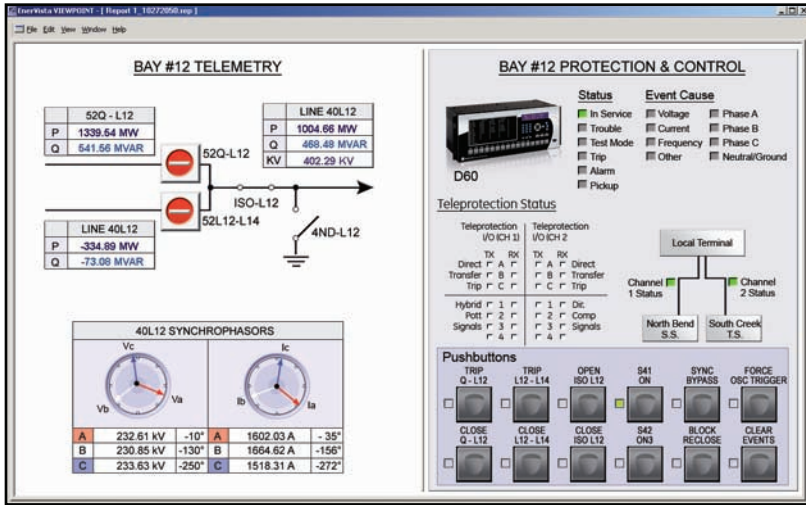
Protection & Control

The D60 is a high-end, cost effective distance protection relay intended for protecting transmission lines and cables providing reliable and secure operation even under the worst case power system conditions. Part of the Universal Relay family, the D60 comes with a variety of versatile features truly integrating protection, monitoring, metering, communication and control in one easy-to-use device. The Universal Relay family offers a high degree of modularity in its design and functionality providing superior performance in protection and control meeting the toughest requirements of the marketplace.

Distance Protection

The core of the D60 relay is the distance function providing high degree of sensitivity and selectivity for all types of faults. The distance function comes with five zones of phase distance and ground distance providing the user maximum flexibility to cater for different applications which include primary line protection and back-up protection for busbars generators, transformers and reactors. The relay can be applied to power systems with different earthing conditions, lines with in-zone transformers or tapped transformer feeders, and overhead lines with series compensation. Each zone element for the phase and ground distance can

D60 - Protection, Metering, Monitoring and Control



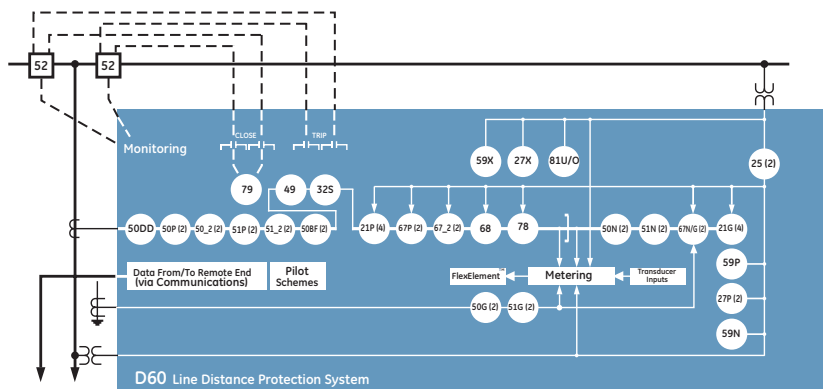
The D60 is the single point for protection, control, metering, and monitoring in one integrated device that can be easily connected directly to HMI or SCADA monitoring and control systems.

be independently set as Quad or Mho characteristics with the flexibility of designing different characteristic shapes to suit for different power system conditions.

The advanced comparator based distance elements provide utmost security, sensitivity and selectivity for different types of faults. Superior digital filtering techniques provide secure and optimum reach accuracy even under worst-case CVT transients. Secure directional discrimination is achieved by using positive sequence memory voltage polarization providing

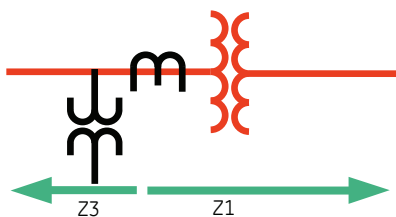
reliable directionality for worst-case close-in faults. The D60 employs a well-proven algorithm for phase selection which provides faster, secure and reliable faulted phase identification for single pole tripping and proper fault distance calculation for a variety of power system conditions. An additional voltage monitoring function provides extra security to the distance element, which can be used to block the distance elements under voltage source fuse failure conditions.

Functional Block Diagram

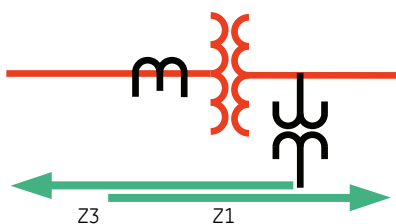


ANSI Device Numbers & Functions

Device Number	Function
21G	Ground Distance
21P	Phase Distance
25	Synchronism Check
27P	Phase Undervoltage
27X	Auxiliary Undervoltage
32	Sensitive Reverse Power
49	Thermal Overload
50BF	Breaker Failure
50DD	Current Disturbance Detector
50G	Ground Instantaneous Overcurrent
50N	Neutral Instantaneous Overcurrent
50P	Phase Instantaneous Overcurrent
50_2	Negative Sequence Instantaneous Overcurrent
51G	Ground Time Overcurrent
51N	Neutral Time Overcurrent
51P	Phase Time Overcurrent
51_2	Negative Sequence Time Overcurrent
52	AC Circuit Breaker
59C	Compensated Overvoltage
59N	Neutral Overvoltage
59P	Phase Overvoltage
59X	Auxiliary Overvoltage
59_2	Negative Sequence Overvoltage
67N	Neutral Directional Overcurrent
67P	Phase Directional Overcurrent
67_2	Negative Sequence Directional Overcurrent
68	Power Swing Blocking
78	Out-of-Step Tripping
79	Automatic Recloser
81U/O	Under /Over Frequency
ROCOF	Rate of change of frequency



Z1 looking through a transformer



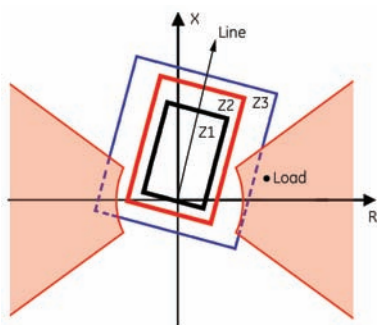
Z1 & Z3 looking through a transformer

In-Zone Transformer Compensation

Phase distance protection in the D60 can be used to detect faults through different types of three-phase wye/delta transformer, allowing application of the D60 for backup protection on generators. VTs and CTs can be installed independent of each other on either side of the power transformer. The relay automatically compensates for transformer connections, to guarantee accurate reach for any type of fault.

Load Encroachment

The load encroachment feature offers discrimination between line loading conditions and fault conditions especially for long lines under heavy loads by supervising the distance elements or any overcurrent element. This prevents unwanted tripping under heavy line load conditions and enables optimum operation of the line while meeting regulatory requirements for line loading.



Distance relay quadrilateral characteristics supervised by Load Encroachment function

Fault Locator

The integrated fault locator provides distance to fault in km or miles. Parallel line zero-sequence current compensation and load current compensation enables the D60 to provide improved accuracy for fault distance measurement.

Line Pickup (Switch-on-to Fault)

The Line Pickup feature uses a combination of undercurrent and undervoltage to identify a line that has been de-energized (line end open). Three instantaneous overcurrent elements are used to identify a previously de-energized line that has been closed on to a fault.

Power Swing Detection

Dynamic transients in the power system due to short-circuits, circuit switching, or load unbalance changes can travel across the power network as power swings characterized by fluctuating currents and voltages. This can result in unwanted tripping since distance elements can respond to these power swings as faults. The D60 power swing detection element provides both power swing blocking and out-of-step tripping functions. The element measures the positive sequence apparent impedance and traces its locus with respect to either a two or three step user selectable mho or quad operating characteristics.

Series Compensated Lines

D60 provides enhanced stability and security by employing an adaptive distance reach control to cope with the overreaching and sub-synchronous oscillations when applied to, or in the vicinity of series compensated lines. For directional integrity the relay uses memory voltage polarization and a multi-input comparator to deal with current inversion issues in series compensated lines.

Single-Pole Tripping

The D60 relay uses an advanced phase selection algorithm that provides fast and accurate fault type identification even under weak-infeed conditions. A convenient trip function is built-in to coordinate actions of the key elements of the single-pole tripping package

Communication Aided (Pilot) Schemes

D60 supports different teleprotection functions for fast fault clearance for any faults within the protected line. The following types of pilot-aided schemes are available in the D60:

- Direct Under reach Transfer Trip (DUTT)
- Permissive Under reach Transfer Trip (PUTT)
- Permissive Overreach Transfer Trip (POTT)
- Hybrid Permissive Overreach Transfer Trip (HYB POTT) permissive echo and transient blocking logic incorporated
- Directional comparison blocking scheme
- Directional comparison unblocking scheme (DCUB)

Undervoltage & Overvoltage Protections

Long lines under lightly loaded conditions or no-load may experience voltages exceeding the rated insulation voltage level; use the D60's phase overvoltage element to detect them and trip the line. A second compensated overvoltage element detects overvoltage caused by breakers opening at the remote end. The D60 also provides additional voltage functions including neutral overvoltage, negative sequence overvoltage and phase undervoltage.

Overcurrent Functions

The D60 provides thermal overload, time and instantaneous overcurrent elements for phase, neutral, ground, negative sequence, phase and neutral directional. All of them can run in parallel with distance elements or can be programmed to provide overcurrent protection under conditions when the distance element is blocked (Eg. VT Fuse failure)

Autorecloser

The D60 provides multi shot autoreclosing for single pole or three pole autoreclose on all types of faults with independently settable dead time for each shot. Autoreclosing also can be dynamically blocked by user programmable logic. Four different autoreclose modes are available enabling the users to select the reclosing mode to suit specific applications.

Synchronism Check

The D60 monitors voltage difference, phase angle difference and slip frequency to ensure proper breaker closure as per user defined settings. The D60 provides additional enhancements in synchronizing by checking dead source conditions for synchronism bypass under these conditions.

Multiple Breaker Configurations

The D60 supports dual-breaker busbar configurations such as breaker-and-a-half or ring bus arrangements, providing dual breaker auto reclose, dual synch-check elements, and dual independent Breaker Failure elements. The design provides secure operation during external faults with possible CT saturation.

Breaker Failure

The D60 is able to provide fully independent breaker failure protection for the breakers associated to the line when connected to a substation with a breaker-and-a-half or ring bus arrangement. The D60 provides the elements to perform two independent breaker failure functions.

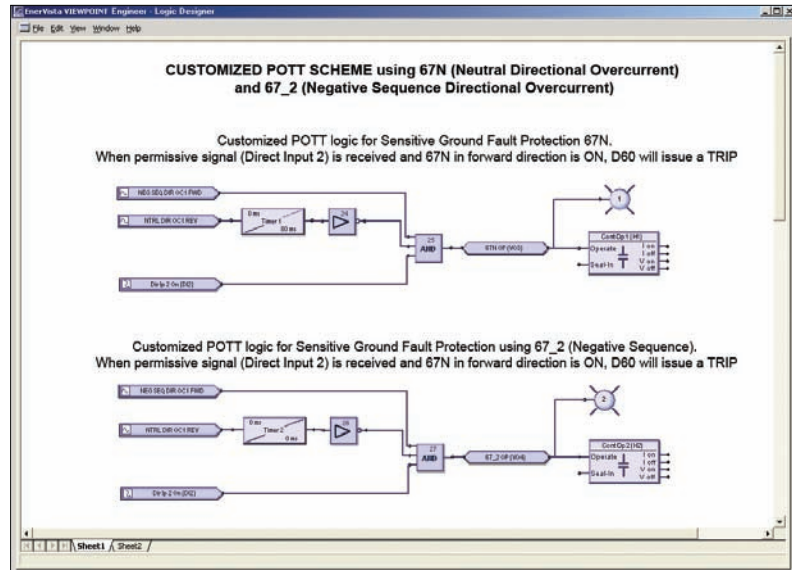
IEC 61850 Process Bus

The IEC 61850 Process Bus module is designed to interface with the Multilin HardFiber System, allowing bi-directional IEC 61850 fiber optic communications. The HardFiber System is designed to integrate seamlessly with the existing Universal Relay applications, including protection functions, FlexLogic, metering and communications.

The Multilin HardFiber System offers the following benefits:

- Communicates using open standard IEC 61850 messaging
- Drastically reduces P&C design, installation and testing labor by eliminating individual copper terminations
- Integrates with existing D60's by replacing traditional CT/VT inputs with IEC 61850 Process Bus module
- Does not introduce new Cyber Security concerns

Custom Programmable Logic Designer



FlexLogic™ allows customizing the D60 for custom protection, control and automation allowing users to build line protection schemes and applications for their equipment.

Visit the HardFiber System product page on the GE Digital Energy website for more details.

Advanced Automation

The D60 incorporates advanced automation features including powerful FlexLogic™ programmable logic, communication, and SCADA capabilities that far surpass what is found in the average line protection relay. The D60 integrates seamlessly with other UR relays for complete system protection, including the unit and auxiliary transformers, and Balance of Plant protection.

FlexLogic™

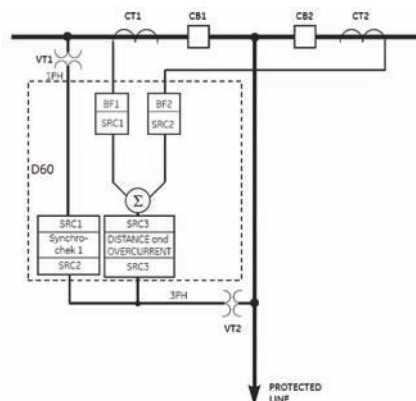
FlexLogic™ is the powerful UR-platform programming logic engine that provides the ability of creating customized protection and control schemes thereby minimizing the need, and the associated costs, of auxiliary components and wiring. Using FlexLogic™, the D60 can be programmed to provide required tripping logic along with custom scheme logic for breaker control (including interlocking with external synchronizers), transfer tripping schemes for remote breakers and dynamic setting group changes.

Scalable Hardware

The D60 is available with a multitude of I/O configurations to suit the most demanding application needs. The expandable modular design allows for easy configuration and future upgrades.

- Flexible, modular I/O covering a broad range of input signals and tripping schemes
- Types of digital outputs include tripped Form-A and Solid State Relay (SSR) mechanically latching, and Form-C outputs
- RTDs and DCmA inputs are available to monitor equipment parameters such as temperature & pressure

D60 Breaker-and-Half Configuration



D60 supports Breaker-and-Half configuration. Two CTs can be brought in individually and summed off at each terminal.

Monitoring and Metering

The D60 includes high accuracy metering and recording for all AC signals. Voltage, current, and power metering are built into the relay as a standard feature. Current and voltage parameters are available as total RMS magnitude, and as fundamental frequency magnitude and angle.

Fault and Disturbance Recording

The advanced disturbance and event recording features within the D60 can significantly reduce the time needed for postmortem analysis of power system events and creation of regulatory reports. Recording functions include:

- Sequence of Event (SOE)
 - 1024 time stamped events
- Oscillography,
 - 64 digital & up to 40 Analog channels
- Data Logger, disturbance recording – 16 channels up to 1 sample / cycle / channel
- Fault Reports
 - Powerful summary report of pre-fault and fault values

The very high sampling rate and large amount of storage space available for data recording in the D60 can eliminate the need for installing costly standalone recording equipment.

Advanced Device Health Diagnostics

The D60 performs comprehensive device health diagnostic tests during startup and continuously at runtime to test its own major functions and critical hardware. These diagnostic tests monitor for conditions that could impact security and availability of protection, and present device status via SCADA communications and front panel display. Providing continuous monitoring and early detection of possible issues helps improve system uptime.

- Comprehensive device health diagnostic performed during startup
- Monitors the CT/VT input circuitry to validate the integrity of all signals

Settings Security & Device Status Reports

SECURITY/CHANGE HISTORY REPORT									
Generated at: Nov 20 2009 11:44:39									
Device Summary									
Device Name:	Point Blank								
Device Type:	UR								
Order Code:	D60-H00-HCH-F8F-H6K-P4D-USA								
Firmware Version:	5.20								
Serial Number:	ABHC05000009								
IP Address:	3. 94.248.240								
Settings Summary									
Setting File Name:	D60_PointBlankFeeder_1, Version 480								
Last Changed:	Nov 11 2006 22:04:58.070966 via Ethernet								
Changed by Whom (MAC Address):	00166FB5EFE3								
Setting Changes History									
Event	Date of Change	# of Changes	Password Entered	Method of Change	Changed by Whom (MAC address)	Filename Uploaded	Rev	Status	Firm. Version
46	11/11/09 11:48 PM	1	Yes	Ethernet	00166FB5EFE3	Point Blank F1 Setting	46	In Service	5.20
45	11/11/09 10:59 PM	2	Yes	Ethernet	00166FB5EFE3	Point Blank F1 Setting	45	In Service	5.20
44	11/11/09 10:51 PM	3	Yes	Ethernet	000000001DE	Point Blank F1 Setting	44	In Service	5.20
43	11/11/09 10:04 PM	39	Yes	Ethernet	00166FB5EFE3	Point Blank F1 Setting	43	In Service	5.20
42	11/08/09 07:46 PM	13	Yes	Ethernet	00166FB5EFE3	Point Blank F2 Setting	42	In Service	5.20
41	10/24/09 09:17 AM	1	Yes	Keypad			41	In Service	5.20
40	10/16/09 09:02 AM	49	Yes	Front Port	000F1FCBD808		40	In Service	5.20
39	10/16/09 08:59 AM	0	Yes	Keypad			39	Out of Service	5.20
38	10/12/09 06:02 PM	2	Yes	Keypad			38	In Service	5.20
37	10/12/09 05:46 PM	5	Yes	Front Port	00166FB5EFE3		37	In Service	5.20
Version 2.00 Page 1									

Track changes of settings to your D60 & view health and operating status by generating a report at the click of a button

Communications

The D60 provides for secure remote data and engineering access, making it easy and flexible to use and integrate into new and existing infrastructures. Fiber optic Ethernet provides high-bandwidth communications allowing for low-latency controls and high-speed file transfers of relay fault and event record information. The available redundant Ethernet option and the embedded managed Ethernet switch provide the means of creating fault tolerant communication architectures in an easy, cost-effective manner.

The D60 supports the most popular industry standard protocols enabling easy, direct integration into monitoring and SCADA systems.

- IEC 61850
- DNP3.0
- Ethernet Global Data (EGD)
- IEC60870-5-104
- Modbus RTU, Modbus TCP/IP

Interoperability with Embedded IEC 61850

The D60 with integrated IEC 61850 can be used to lower costs associated with protection, control and automation. GE Energy's leadership in IEC 61850 comes from thousands of installed devices and follows on Multilin's extensive development experience with UCA 2.0.

- Replace expensive copper wiring between devices with direct transfer of data using GOOSE messaging
- Configure systems based on IEC 61850 and also monitor and troubleshoot them in real-time with EnerVista™ Viewpoint Engineer
- Integrate Multilin IEDs and generic IEC 61850-compliant devices seamlessly in EnerVista™ Viewpoint Monitoring

Direct I/O Messaging

Direct I/O allows for sharing of high-speed digital information between multiple UR relays via direct back-to-back connections or multiplexed through a standard DS0 multiplexer channel bank. Regardless of the connection method, Direct I/O provides continuous real-time channel monitoring that supplies diagnostics information on channel health.

Direct I/O provides superior relay-to-relay communications that can be used in advanced interlocking and other special protection schemes.

- Communication with up to 16 UR relays in single or redundant rings rather than strictly limited to simplistic point-to-point configurations between two devices
- Connect to standard DS0 channel banks through standard RS422, G.703 or IEEE C37.94 interfaces or via direct fiber optic connections
- No external or handheld tester required to provide channel diagnostic information

Multi-Language

The D60 supports English, French, Russian, Chinese and Turkish Languages on the front panel, EnerVista™ setup software, and product manual. Easily switch between English and an additional language on the local displays without uploading new firmware.

EnerVista™ Software

The EnerVista™ Suite is an industry-leading set of software programs that simplifies every aspect of using the D60 relay. The EnerVista™ suite provides all the tools to monitor the status of the protected asset, maintain the relay, and integrate information measured by the D60 into DCS or SCADA monitoring systems. Convenient COMTRADE and Sequence of Events viewers are an integral part of the UR Setup software included with every UR relay, to carry out postmortem event analysis to ensure proper protection system operation.

EnerVista™ Launchpad

EnerVista™ Launchpad is a powerful software package that provides users with all of the setup and support tools needed for configuring and maintaining Multilin products. The setup software within Launchpad allows configuring devices in real-time by communicating using serial, Ethernet, or modem connections, or offline by creating setting files to be sent to devices at a later time.

Included in Launchpad is a document archiving and management system that ensures critical documentation is up-to-date and available when needed. Documents made available include:

- Manuals
- Application Notes
- Guideform Specifications
- Brochures
- Wiring Diagrams
- FAQ's
- Service Bulletins

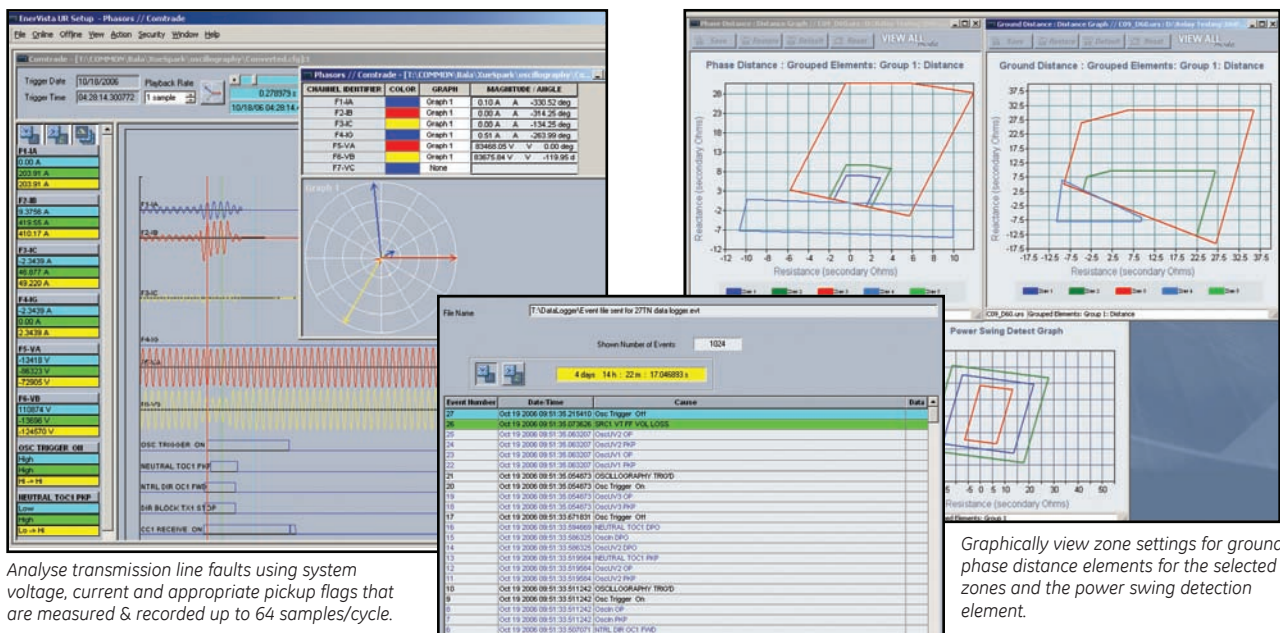
Viewpoint Monitoring

Viewpoint Monitoring is a simple-to-use and full-featured monitoring and data recording software package for small systems. Viewpoint Monitoring provides a complete HMI package with the following functionality:

- Plug-&-Play Device Monitoring
- System Single-Line Monitoring & Control

Power System Troubleshooting

The D60 contains many tools and reports that simplify and reduce the amount of time required for troubleshooting power system events.



Analyse transmission line faults using system voltage, current and appropriate pickup flags that are measured & recorded up to 64 samples/cycle.

Record the operation of the internal D60 elements and external connected devices with 1ms time-stamped accuracy to identify the Sequence of Operation of station devices during faults and disturbances.

Graphically view zone settings for ground phase distance elements for the selected zones and the power swing detection element.

- Annunciator Alarm Screens
- Trending Reports
- Automatic Event Retrieval
- Automatic Waveform Retrieval

Viewpoint Engineer

Viewpoint Engineer is a set of powerful tools that will allow the configuration and testing of UR relays at a system level in an easy-to-use graphical drag-and-drop environment. Viewpoint Engineer provides the following configuration and commissioning utilities:

- Graphical Logic Designer
- Graphical System Designer
- Graphical Logic Monitor
- Graphical System Monitor

Viewpoint Maintenance

Viewpoint Maintenance provides tools that will create reports on the operating status of the relay, simplify the steps to download fault and event data, and reduce the work required for cyber-security compliance audits. Tools available in Viewpoint Maintenance include:

- Settings Security Audit Report
- Device Health Report
- Single Click Fault Data Retrieval

EnerVista™ Integrator

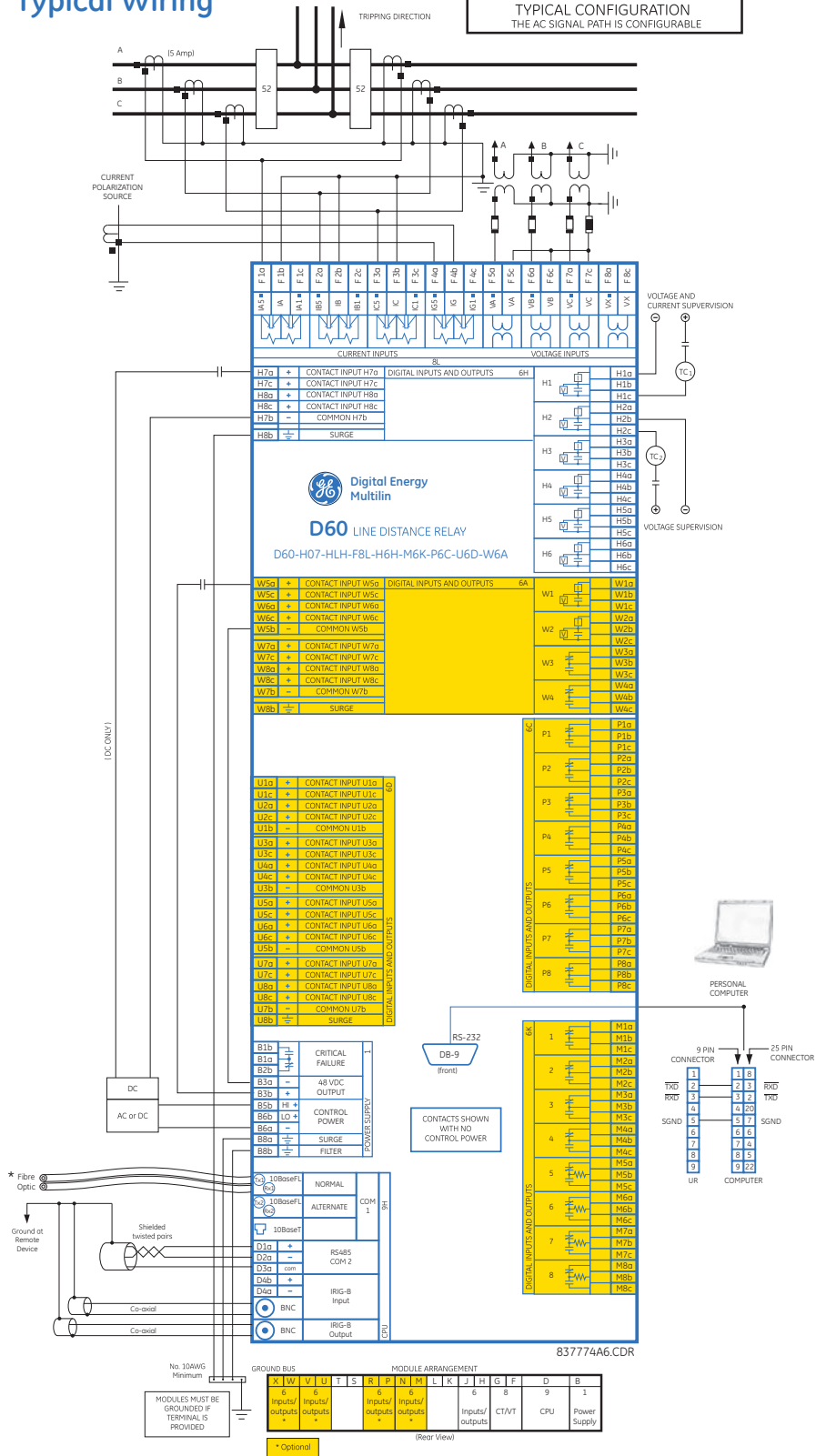
EnerVista™ Integrator is a toolkit that allows seamless integration of Multilin devices into new or existing automation systems. Included in EnerVista™ Integrator is:

- OPC/DDE Server
- Multilin Drivers
- Automatic Event Retrieval
- Automatic Waveform Retrieval

User Interface

The D60 front panel provides extensive local HMI capabilities. The local display is used for monitoring, status messaging, fault diagnosis, and device configuration. User configurable messages that combine text with live data, can be displayed when user-defined conditions are met.

Typical Wiring



This diagram is based on the following order code: **D60-H07-HLH-F8L-H6H-M6K-P6C-U6D-W6A**. This diagram provides an example of how the device is wired, not specifically how to wire the device. Please refer to the Instruction Manual for additional details on wiring based on various configurations.

Ordering

Transmission Line Protection

	D60 - * ** - H * * - F ** - H** - M** - P** - U**-W**											For Full Sized Horizontal Mount			
Base Unit	D60												Base Unit	RS485 & RS485 (IEC 61850 option not available)	
CPU	E G H J K N S													RS485 + Multi-mode ST 10BaseF	
Software Options	00 02 03 05 06 07 08 09													RS485 + Multi-mode ST Redundant 10BaseF	
Mount		H A V B												RS485 + Multi-mode ST 100BaseFX	
User Interface			K L M N O T U V F W Y											RS485 + Multi-mode ST Redundant 100BaseFX	
Power Supply				H								RH		RS485 + 10/100 BaseT	
CT/VT DSP					8L 8M			8L 8M							RS485 + 6 port, 100 Mbps, Managed Ethernet Switch
IEC 61850 Process Bus						81									No Software Options
Digital I/O						XX	XX	XX	XX	XX					Breaker & Half
						4A	4A	4A	4A	4A					IEC 61850
						4C	4C	4C	4C	4C					Breaker and Half + IEC 61850
						4D	4D	4D	4D	4D					Phasor Measurement Unit (PMU)
						4L	4L	4L	4L	4L					IEC 61850 + Phasor Measurement Unit (PMU)
						67	67	67	67	67					Breaker and Half + Phasor Measurement Unit (PMU)
						6C	6C	6C	6C	6C					Breaker and Half + IEC 61850 + Phasor Measurement Unit (PMU)
						6D	6D	6D	6D	6D					Horizontal (19" rack) - Standard
						6E	6E	6E	6E	6E					Horizontal (19" rack) - Harsh Chemical Environment Option
						6F	6F	6F	6F	6F					Vertical (3/4 size) - Standard
						6K	6K	6K	6K	6K					Vertical (3/4 size) - Harsh Chemical Environment Option
						6M	6M	6M	6M	6M					Enhanced English Front Panel
						6N	6N	6N	6N	6N					Enhanced English Front Panel with User-Programmable Pushbuttons
						6P	6P	6P	6P	6P					Enhanced French Front Panel
						6R	6R	6R	6R	6R					Enhanced French Front Panel with User-Programmable Pushbuttons
						6S	6S	6S	6S	6S					Enhanced Russian Front Panel
						6T	6T	6T	6T	6T					Enhanced Russian Front Panel with User-Programmable Pushbuttons
						6U	6U	6U	6U	6U					Enhanced Chinese Front Panel
						6V	6V	6V	6V	6V					Enhanced Chinese Front Panel with User-Programmable Pushbuttons
Transducer I/O						5A	5A	5A	5A	5A					Vertical Front Panel with English display
						5F	5F	5F	5F	5F					Enhanced Turkish Front Panel
															Enhanced Turkish Front Panel with User-Programmable Pushbuttons
Inter-Relay Communications															125/250 V AC/DC w/ redundant 125/250 V AC/DC power supply
															8 Port IEC 61850 Process Bus Module
															Standard 4CT/4VT w/ enhanced diagnostics
															Sensitive Ground 4CT/4VT w/ enhanced diagnostics
															8 Port IEC 61850 Process Bus Module
															No module
															4 Solid State (No Monitoring) MOSFET Outputs
															4 Solid State (Current w/ opt Voltage) MOSFET Outputs
															16 Digital Inputs with Auto-Burnish
															14 Form-A (No Monitoring) Latchable Outputs
															8 Form-A (No Monitoring) Outputs
															8 Form-C Outputs
															16 Digital Inputs
															4 Form-C Outputs, 8 Digital Inputs
															8 Fast Form-C Outputs
															4 Form-C & 4 Fast Form-C Outputs
															2 Form-A (Current w/ opt Voltage) & 2 Form-C Outputs, 8 Digital Inputs
															2 Form-A (Current w/ opt Voltage) & 4 Form-C Outputs, 4 Digital Inputs
															4 Form-A (Current w/ opt Voltage) Outputs, 8 Digital Inputs
															6 Form-A (Current w/ opt Voltage) Outputs, 4 Digital Inputs
															2 Form-A (No Monitoring) & 2 Form-C Outputs, 8 Digital Inputs
															2 Form-A (No Monitoring) & 4 Form-C Outputs, 4 Digital Inputs
															4 Form-A (No Monitoring) Outputs, 8 Digital Inputs
															2 Form-A (No Monitoring) Outputs, 4 Digital Inputs
															6 Form-A (Cur w/ opt Volt) 1 Form-C Output, 2 Latching Outputs, 8 Digital Inputs
															4 dcmA Inputs, 4 dcmA Outputs
															8 dcmA Inputs
															7A 820 nm, multi-mode, LED, 1 Channel
															7B 1300 nm, multi-mode, LED, 1 Channel
															7C 1300 nm, single-mode, ELED, 1 Channel
															7H 820 nm, multi-mode, LED, 2 Channels
															7I 1300 nm, multi-mode, LED, 2 Channels
															7J 1300 nm, single-mode, ELED, 2 Channels
															7S G.703, 2 Channels
															7W RS422, 2 Channels
															73 1550 nm, single-mode, LASER, 2 Channels
															77 IEEE C37.94, 820 nm, multimode, LED, 2 Channel
															2B C37.94SM, 1300nm Singlemode, ELED, 2 Channel Single mode
															2S 6 port, 100 Mbps, Managed Ethernet Switch, HI (125/250V AC/DC)
															2T 6 port, 100 Mbps, Managed Ethernet Switch, LO (24-48 Vdc)

Ordering Notes:

- 1 - For vertical mounting order codes, please visit our online store
- 2 - To view the latest options available for the D60, or to order the UR Classic Front Panel, please visit our online store for more details.

Accessories for the D60

- UR Applications I Learning CD TRCD-URA1-C-S-1
- Multilink Ethernet Switch ML2400-F-HI-HI-A2-A2-A6-G1
- Viewpoint Engineer VPE-1
- Viewpoint Maintenance VPM-1
- Viewpoint Monitoring IEC 61850 VP-1-61850

Visit www.GEMultilin.com/D60 to:



- View Guideform specifications
- Download the instruction manual
- Review applications Notes and support documents
- Buy a D60 online
- View the UR Family brochure