Multilin™
C30
CONTROLLER SYSTEM

Substation hardened programmable logic controller

KEY BENEFITS

- Powerful and deterministic programmable logic suitable for creating most customized automated substation control solutions
- Complete IEC 61850 Process Bus solution providing resource optimization and minimizing total P&C lifecycle costs
- Reduced bay or station wiring through the use of high-speed peer-to-peer communication for sending and accepting control commands from other relays
- Modular hardware architecture allowing for flexibility in the I/O configuration to support most bay management applications
- Advanced Sequence of Events and disturbance recording providing accurate logging of station events thus eliminating the need for external recording devices
- Simplified system integration and access to information through the use of multiple communication options and protocols not found in industrial grade PLCs
- Embedded IEC 61850 Protocol
- Ambient temperature monitoring with alarming when outside temperature exceeds upper thresholds
- Robust network security enabling Critical Infrastructure Protection through user command logging, and dual permission access control

APPLICATIONS

- Bay control and substation automation
- Programmable Logic Control
- UR I/O expansion
- Sequence of Events (SOE) recorder replacement

FEATURES

Protection and Control

- Programmable logic, timers, counters
- Distributed logic, remote I/O expansion
- User-definable protection elements
- Up to 96 digital input and 64 digital outputs
- Transducer I/Os (RTD, dcmA)

IEC 61850 Process Bus Interface

- Robust communications with up to 8 HardFiber Bricks
- Seamless integration with existing C30 functions
- Redundant architecture for dependability and security

Communication

- 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, IEC 60870-5-104, Ethernet Global Data (EGD)
- Direct I/O – secure, high-speed exchange of data between URs for Direct Transfer Trip and I/O Extension applications
- Embedded Managed Ethernet Switch with 4 - 100 Mbit Fiber optic ports and 2 copper ports

Monitoring and Metering

- Oscillography – analog and digital parameters at 64 samples/cycle
- Event Recorder - 1024 time tagged events with 0.5ms scan of digital inputs
- Data Logger - 16 channels with sampling rate up to 1 sample / cycle
- Setting Security Audit Trail for tracking changes to C30 configuration

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 C30 into new or existing monitoring and control systems
Protection and Control

The C30 Controller System is a substation hardened device designed to perform substation Control Logic that can also expand the I/O capability of protection devices and replace existing Sequence of Events (SOE) Recorders. The C30 provides fast and deterministic execution of programmable logic with I/O capabilities far above an average protection relay. Graphical programming tools, supported by a library of logic operators, make the C30 simple to use and configure. Using high-speed peer-to-peer communications for inter-device messaging, the C30 can also accept signals and commands from other protection and control devices at a fraction of the cost of hard-wiring these signals.

Control, automation, I/O expansion and data gathering are ideally suited for the C30 in the following applications:

- Bay control
- Substation automation
- Remote I/O

Advanced Automation

The C30 incorporates advanced automation features including powerful FlexLogic™ programmable logic, peer-to-peer communications and SCADA capabilities that far surpass what is found in the average PLC or controller. The C30 integrates seamlessly with other UR relays to extend the I/O capabilities and perform complete Bay management and control.

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. The execution of all logic is performed every 2ms regardless of the complexity or amount of logic used thereby providing the determinist operation required for utility power system control schemes.

Scalable Hardware

The C30 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
- RTDs and DCmA inputs are available to monitor equipment parameters such as temperature & pressure

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 C30’s by replacing traditional CT/VT inputs with IEC 61850 Process Bus module
- Does not introduce new Cyber Security concerns

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

Monitoring and Metering

The C30 provides high resolution measuring of the status of external devices wired to its contact inputs. The changing of a Contact Input status can be measured and timestamped with a 0.5ms resolution making the C30 ideal for bay or substation sequence of event recording.

Fault and Disturbance Recording

The advanced disturbance and event recording features within the C30 can significantly reduce the time needed for postmortem analysis of power system events and creation of regulatory reports.

Advanced Device Health Diagnostics

The C30 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.

**Communications**

The C30 provides advanced communications technologies for remote data and engineering access, making it easy and flexible to use and integrate into new and existing infrastructures. Direct support for 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 without the need for intermediary communication hardware. The C30 supports the most popular industry standard protocols enabling easy, direct integration into DCS and SCADA systems.

- IEC 61850
- DNP 3.0
- Ethernet Global Data (EGD)
- IEC 60870-5-104
- Modbus RTU, Modbus TCP/IP

**Interoperability with Embedded IEC 61850**

Use the C30 with integrated IEC 61850 to lower costs associated with breaker protection, control and automation. GE Energy’s leadership in IEC 61850 comes from thousands of installed devices and follows on seven years of 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 D50 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, generation rejection 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 D50 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 C30 supports English, French, Russian, and Chinese 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 C30 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 C30 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

**FlexLogic™ Designer**

Click here to view the FlexLogic™ Designer.

Flexlogic allows for creating customized C30 substation control schemes that include receiving interlock and lockout functionality using locally measured inputs along with receiving information received from external devices through communications.
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:

- 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 C30 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.

The Viewpoint Monitoring software can merge the Events logged by the C30 with those logged in other Multilin relays to create a station wide sequence of event record.

LED Indicators

Multi-Language Display
- English
- Russian
- French
- Chinese

User Programmable Pushbuttons
Typical Wiring

C30 CONTROLLER

**NOTES:**

1. This diagram is based on the following order code:
   C30-HPD-HCH-F6B-HHE-M6G-P6K-U6D-W6D
2. 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.

Visit www.GEDigitalEnergy.com for more information.
## Ordering

<table>
<thead>
<tr>
<th>C30 Controller System</th>
<th>For Full Sized Horizontal Mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Base Unit</td>
</tr>
<tr>
<td></td>
<td>RS485 + RS485</td>
</tr>
<tr>
<td></td>
<td>RS485 + Multi-mode ST 10BaseF</td>
</tr>
<tr>
<td></td>
<td>RS485 + Multi-mode ST Redundant 10BaseF</td>
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<tr>
<td></td>
<td>RS485 + Multi-mode ST 10BaseFX</td>
</tr>
<tr>
<td></td>
<td>RS485 + Multi-mode ST Redundant10BaseFX</td>
</tr>
<tr>
<td></td>
<td>RS485 + 10/100 BaseT</td>
</tr>
<tr>
<td></td>
<td>RS485 + 6 port, 100 Mbps, Managed Ethernet Switch</td>
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<tr>
<td>Software Options</td>
<td>No Software Options</td>
</tr>
<tr>
<td></td>
<td>Ethernet Global Data</td>
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<tr>
<td></td>
<td>IEC 61850</td>
</tr>
<tr>
<td>Mount/Coating</td>
<td>Vertical (3/4 size) - Standard</td>
</tr>
<tr>
<td></td>
<td>Vertical (3/4 size) - Harsh Chemical Environment Option</td>
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<tr>
<td>User Interface</td>
<td>Enhanced English Front Panel</td>
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<tr>
<td></td>
<td>Enhanced French Front Panel</td>
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<tr>
<td></td>
<td>Enhanced Russian Front Panel</td>
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<tr>
<td></td>
<td>Enhanced Chinese Front Panel</td>
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<tr>
<td>Power Supply</td>
<td>125 / 250 V AC/DC</td>
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<tr>
<td>IEC 61850 Process Bus</td>
<td>125/250 V AC/DC with redundant 125/250 V AC/DC power supply</td>
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<tr>
<td>Digital I/O</td>
<td>24 - 48 V (DC only)</td>
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<td></td>
<td>8 Port IEC 61850 Process Bus Module</td>
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<tr>
<td>Transducer I/D</td>
<td>4 dcmA Inputs, 4 dcmA Outputs</td>
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<tr>
<td></td>
<td>8 RTD Inputs</td>
</tr>
<tr>
<td></td>
<td>4 RTD Inputs, 4 dcmA Outputs</td>
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<td>Inter-Relay Communications</td>
<td>2A C37.94SM, 1300nm single-mode, ELED, 1 channel single-mode</td>
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<tr>
<td></td>
<td>4 C37.94SM, 1300nm single-mode, ELED, 2 channel single-mode</td>
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<td></td>
<td>10B 820 nm, multi-mode, ELED, 1 Channel</td>
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<td></td>
<td>10B 1300 nm, multi-mode, ELED, 1 Channel</td>
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<tr>
<td></td>
<td>7C 1300 nm, single-mode, ELED, 1 Channel</td>
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<td></td>
<td>7B 820 nm, multi-mode, ELED, 2 Channels</td>
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<td>7I 1300 nm, multi-mode, ELED, 2 Channels</td>
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<td>7R G.703, 1 Channel</td>
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<td></td>
<td>7S G.703, 2 Channels</td>
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<td>RS422, 1 Channel</td>
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<td>RS422, 2 Channels</td>
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<td></td>
<td>IEEE C37.94, 820 nm, multimode, ELED, 1 Channel</td>
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<td>2S 6 port, 100 Mbps, Managed Ethernet Switch, HI/125/250V AC/DC</td>
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<tr>
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<td>2T 6 port, 100 Mbps, Managed Ethernet Switch, LO (24-48 Vdc)</td>
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</table>

### Accessories for the C30

- 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

Visit www.GEMultilin.com/C30 to:

- View Guideform specifications
- Download the instruction manual
- Review applications notes and support documents
- Buy a C30 online
- View the UR Family brochure

**Ordering Note:** To view the latest options available for the C30, or to order the UR Classic Front Panel, please visit our online store for more details.