GE Consumer & Industrial

UR Universal Relay Series

Revision 5.42 Release Notes

GE Publication Number: GER-4126

Overview

Summary

GE Multilin issues the UR 5.42 release that introduces several new protection, security and ease of use features to the UR family. Highlights of this release include:

- **L90 Double Ended Fault Location** providing increased accuracy for detecting where the fault has occurred on a transmission line
- **L90 Single Pole Tripping** enhancement
- **M60 Setting Auto-Configurator** allowing for completely setting up the relay in 6 easy steps
- **L60 Breaker-a-Half application enhancements**
- **Securing and locking of Flexlogic** preventing unauthorized users from changing and/or viewing parts or all of the configured Flexlogic equations
- **Setting File Traceability** providing the ability to track if the settings originally sent to a relay from a file has been modified in the relay at some later date.

This document contains the release notes for the 5.42 release of the Universal Relay (UR) series.

- Affected products: B30, C30, C60, C70, D30, D60, F35, F60, G30, G60, L60, L90, M60, N60, T35, T60
- Date of release: October 19th, 2007
- Firmware revision: 5.42
- EnerVista Setup Software revision: 5.42

If users have existing UR Family relays installed with older versions of firmware, they can download and install this new firmware to benefit from the enhancements described in this release note. If the user does not require these new features and enhancements, no upgrading of the relays is required.

Products Affected

This release encompasses the following UR Family products:

- B30 Bus Differential Relay
- C30 Controller
- C60 Breaker Management Relay
- C70 Capacitor Bank Relay
- D30 Line Distance Relay
- D60 Line Distance Relay
- F35 Multiple Feeder Management Relay
- F60 Feeder Management Relay
- G30 Generator Management Relay
- G60 Generator Management Relay
- L60 Line Phase Comparison Relay
- L90 Line Differential Relay
- M60 Motor Relay
- N60 Network Stability and Synchrophasor Measurement System
- T35 Transformer Management Relay
- T60 Transformer Management Relay

Hardware / Software Compatibility

The new 5.42 firmware that is a part of this release is compatible with UR-series hardware version 4.00 and higher.

The use of the new 5.42 firmware requires the EnerVista UR Setup software to be version 5.42 and higher.

To take advantage of the L90 Multi-ended fault location feature described in these release notes, L90's that use a C37.94 module for inter-relay communications will need to be upgraded with a new revision of the C37.94 module (Rev D) to take advantage of this feature. All other types of inter-relay communications modules will work with this feature in their current configuration simply by uploading the relay with new firmware.

Release details

In the following enhancement descriptions, a revision category letter is placed to the left of the description. Refer to the Appendix at the end of this document for a description of the categories displayed.

Security Enhancements

N

Locking and Securing of Flexlogic Equations

Applicable: Entire UR Family

The UR family now supports a method for allowing users to select parts or all of the Flexlogic configured in a relay and securely prevent unauthorized users from viewing or changing the logic.

Using the "Template" function that is found in both the Online and Offline window menus, users can select individual lines of logic to be protected and apply a password to this template. Once applied, selected lines of logic will be unavailable for viewing unless the user has the appropriate password. Unselected lines of logic will always be available for viewing and modifying.

Templates that are applied to a setting file will be retained when setting files are sent to and retrieved from a relay. All methods of viewing the Flexlogic will continue to secure Locked lines of Flexlogic including through the software and on the Front Panel display.

N

Relay Setting Verification

Applicable: Entire UR Family

The UR and the UR Setup Software has been enhanced to log and record when a particular settings file has been loaded into a relay. The date and time that any setting file has been sent to a UR will be logged in the relay and can be viewed on the front panel or through the UR Setup Software. This same date and time will also be logged into the setting file that has been sent to the relay and can be viewed through the UR Setup software and on a printed hard copy of the setting file. Comparing the dates stored in the relay and on the setting file will indicate to users if any changes have been made to the relay's configuration since the setting file was originally sent to the relay.

M60 Enhancement

N

Motor Setting Auto-Configurator

Applicable: M60

The UR Setup software now contains an M60 Motor Setting Auto-Configurator that configures the settings required to protect and control a motor in six simple steps. Simply entering the motor nameplate data, the CT and VT parameters, motor starting data, and application information, will allow the UR Setup Software to generate a complete setting file customized for protecting and controlling the motor.

L90 Enhancement

N

Multi-Ended Fault Location

Applicable: L90

The L90 now supports Multi-ended Fault Location that uses information collected at each end of the transmission line to provide high-accuracy fault location information. By sharing information through the communication channel about the fault characteristic as measured by the relay at each end of the transmission line, the L90 can consistently calculate the location of the fault within 2% accuracy.

If users are using a C37.94 inter-relay communications card to link the L90's (modules 2A, 2B, 2E, 2F, 76, 77), a new revision of the communications module (Rev D) must be purchased from GE Multilin. Modules that support this feature will have Rev D marked on the module's label. All other types of inter-relay communications modules (fiber, G.703, RS422) do not need to be upgraded and will support the Multi-ended Fault Location simply by upgrading the relay's firmware.

P

Single-Pole Tripping functionality tripping all three poles

Applicable: L90

The L90 Line Differential protection (87L) single pole tripping logic was enhanced to ensure that the relay only trips one pole during single-phase fault conditions. In the previous version of firmware, when the 87L TRIP function detected a single-phase fault, a command to trip all 3 phases was given.

L60 Enhancements

P

L60 Fault detection enhancements for Breaker-and-a-Half applications

Applicable: L60

The L60 fault detection algorithm was enhanced for Breaker-and-a-Half applications by adding supervision that operates on the summed current from both breaker CT's. In the previous version of the firmware, the fault detectors operated independently from each breaker CT that could cause a mal-operation of protection in some Breaker-and-a-Half situations.

E

Pickup settings to create square pulses range increased

Applicable: L60

The L60 Pickup setting for creating square pulses was decreased from 0.02pu to 0.005pu to create reliable square pulses at low fault currents.

Platform Enhancements

N

Support for varying frequency conditions

Applicable: Entire UR family

The Frequency Tracking feature has been enhanced to accept a wider range of operating frequencies to support conditions that may have a varying operating frequency. The UR now provides a wider tolerance around the fundamental frequency before an invalid frequency condition is declared.

Communications Enhancements

C

DNP3.0: Analog Values not being reported correctly

Applicable: all UR-Series Relays

The DNP3.0 Analog reporting has been enhanced to ensure that analog values are correctly updated and reported to the DNP master. In the previous version of firmware, the Universal Relay would meter analog values properly however, after prolonged periods of time, the analog values being reported over DNP would stop being updated and continually report the last known value. All protection and control functions continued to operate correctly when this occurred.

Upgrade paths

It is our recommendation that all customers upgrade to the latest version of UR-series firmware to take advantage of the latest developments and feature enhancements. Firmware upgrades can be easily preformed using the EnerVista UR Setup software. This software can also convert settings files from an older version to the latest version and provides a Difference Report once the conversion has been completed. This Difference Report identifies new settings and additional information to assist the user during the upgrade.

Upgrade path for versions 4.00 and above

For UR-series devices installed with versions 4.00 firmware and above, the revision 5.40 release can be uploaded to the relay using the EnerVista UR Setup software.

Upgrade path for revisions below version 4.00

For UR-series devices installed with versions of firmware below 4.00, an upgrade package must be obtained from GE Multilin to upgrade the relay CPU and CT/VT modules.

Benefits of revision 4.00 and above:

The benefits of revision 4.00 and above are as follows:

- Supports many new features and functionality
  - IEC 61850 communications protocol
  - 100 Mb Ethernet
  - IRIG-B repeater
  - Isolated RS485 and IRIG-B
  - Synchrophasors in the D60, L90, N60 & G60
  - Support for Breaker-and-a-Half Transmission Line Protection (D60, L90)
  - Motor Health Diagnostics (M60)
  - Enhanced Front Panel
- Exceeds new IEEE C37.90 requirements
  - Transient immunity (2 to 4 kV)

Appendix

Change categories

This document uses the following categories to classify the changes.

Table 1: Revision categories

Code	Category	Comments
N	New feature	A separate feature added to the relay. Changes to existing features even if they significantly expand the functionality are not in this category
G	Change	A neutral change that does not bring any new value and is not correcting any known problem
E	Enhancement	Modification of an existing feature bringing extra value to the application
D	Changed, incomplete or false faceplate indications	Changes to, or problems with text messages, LEDs and user pushbuttons
R	Changed, incomplete or false relay records	Changes to, or problems with relay records (oscillography, demand, fault reports, etc.)
C	Protocols and communications	Changes to, or problems with protocols or communication features
M	Metering	Metering out of specification or other metering problems
P	Protection out of specification	Protection operates correctly but does not meet published specifications (example: delayed trip)
U	Unavailability of protection	Protection not available in a self-demonstrating way so that corrective actions could be taken immediately
H	Hidden failure to trip	Protection may not operate when it should
F	False trip	Protection may operate when it should not
B	Unexpected restart	Relay restarts unexpectedly

The revision category letter is placed to the left of the change description.

GE Multilin technical support

GE Multilin contact information and call center for product support is shown below:

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