



GE VERNOVA

Firmware Release Notes

UR Family

Version 8.60

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1 Summary

This document contains the release notes for firmware version 8.60 of the Universal Relay (UR) family of products.

This release note is applicable to the products: B30, B90, C30, C60, C70, C95, D30, D60, F35, F60, G30, G60, L30, L60, L90, M60, N60, T35, T60.

1.1 Date of release

Firmware 8.60: October 8 2024

Note: Major firmware releases can introduce new protection and control elements that can affect the device's Modbus memory map. Check the summary of released features to find out if it applies to a particular release.

1.2 Highlights of Firmware 8.60

- **NEW** - Added High speed Failing Conductor Protection (HFCCP) protection element in L90 line protection system
- **NEW** - Added functionality to protect two power transformers in the T60 transformer protection system
- **NEW** - Added new overvoltage protection element in the B90 bus differential system
- **NEW** - Added functionality to protect power transformer along with generator protection in G60 generator protection system
- **NEW** - Added support for 3 DSP modules in the G60 generator protection system
- **NEW** - Added support for two windings sources in the split phase protection element in the G30 and G60 generator protection systems
- Increased the maximum limit of the pickup setting to 70 Hz for the underfrequency and the overfrequency protection element in all applicable UR relays
- Increased the maximum limit of the Load Encroachment Angle setting to 80°
- Added capability to map the breakers and disconnect switches status to IEC61850 GOOSE DPS inputs
- Enhanced FW to verify the authenticity of the FW binary on a FW upgrade
- Enhanced the main CPU FW to accept IEC61850 GOOSE messages with invalid/questionable quality
- Changed behaviour of clearing the “SNTP Failure” self-test
- Added support to set the relay's local time only from the IRIG -B signal

2 Firmware version 8.60

2.1 Bus Differential Systems B30, B90

2.1.1 Added new overvoltage protection element in the B90 bus differential system

Category: N

Products: B90

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, a new overvoltage protection element was added to the B90 relay

2.1.2 Corrected processing of isolator “Bad Status” state based on IEC 61850 GOOSE DPS inputs in B30 with Process Bus Module

Category: G

Products: B30 with PBM

Impacted firmware: 8.30 to 8.51

Corrected firmware: 8.60

Workaround: N/A

Description: In previous versions, a B30 relay with Process Bus Module (PBM) did not correctly process the isolator “Bad Status” state based on the IEC61850 GOOSE DPS inputs. In firmware version 8.60, this issue is fixed

2.2 Generator Protection Systems G30, G60

2.2.1 Added functionality to protect power transformer along with generator protection in G60 generator protection system

Category: N

Products: G60

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the G60 relays provide a transformer protection in addition to generator protection, such as both the generator and the step-up transformer can be protected by separate set of protection elements for transformer and generator, including two differential protection elements in a single G60 relay. This feature is enabled by the “additional transformer differential” software option.

2.2.2 Added support for 3 DSP modules in the G60 generator protection system

Category: N

Products: G60

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In previous versions, the G60 relay supported up to two DSP modules. In firmware version 8.60, the G60 relay supports up to three DSP modules.

2.2.3 Added support for two winding sources in the split phase protection element in the G30 and G60 generator protection system

Category: E

Products: G30, G60

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the G30 and G60 relays allow for split phase protection with an option of using two individual generator split winding CTs, where the existing current input method of using either external sum or toroidal CTs will be maintained for backward compatibility.

2.2.4 Added metering actual value for the split phase protection element in the G30 and G60 generator protection system

Category: E

Products: G30, G60

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the split phase element in G30 and G60 supports metering actual values for the 3 phases of the split phase current and for the load current.

2.3 Line Differential Protection Systems L30, L90

2.3.1 Added High speed Falling Conductor Protection (HFCP) protection element in the L90 line protection system

Category: N

Products: L90

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: Description: In firmware version 8.60, a high-speed falling conductor protection (HFCP) element has been added to the L90 relays. This feature uses line series impedance change measurements to detect broken conductor conditions and trip the line before conductor touches the ground to mitigate potential risk of high-energy arcing.

2.3.2 Corrected erroneous activation of the STUB BUS OP in breaker-and-a-half bus configuration

Category: F

Products: L30, L90

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In previous versions, under rare intermittent assertion of contact input controlling activation of the stub bus conditions an erroneous stub bus operation may be activated resulting in an undesired 87L DIFF OP activation. In firmware version 8.60, this issue is fixed.

2.4 Transformer Protection System T60

2.4.1 Added functionality to protect two power transformers in the T60 transformer protection system

Category: N

Products: T60

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the T60 relays offer two sets of power transformer protection, including two independent transformer differential elements when the order code includes the “additional transformer differential” software option. This allows a single T60 device to provide transformer differential protection for two power transformers in a large protection and control scheme. When the additional transformer differential SW option is present the number of protection elements is increased as follows:

- The number of Transformer setup is increased from 1 to 2.
- The number of percent and instantaneous differential elements is increased from 1 to 2.
- The number of transformer thermal elements is increased from 1 to 2.
- The number of inter-turn protection elements is increased from 1 to 2
- The number of Volts/Hz elements is increased from 2 to 4.
- The number of thermal overload elements is increased from 4 to 6.
- The number of through fault monitoring elements is increased from 3 to 6

2.5 Common protection and control elements

2.5.1 Increased the maximum limit of the pickup setting to 70 Hz for the underfrequency protection element

Category: E

Products: B30, D30, D60, F35, F60, G30, G60, L30, L90, M60, N60, T35, T60

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the upper limit of the underfrequency element was increased from 50 Hz to 70 Hz.

2.5.2 Increased the maximum limit of the pickup setting to 70 Hz for the overfrequency protection element

Category: E

Products: C60, C95, D60, F60, G30, G60, L90, M60, N60, T60

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the upper limit of the overfrequency element was increased from 50 Hz to 70 Hz.

2.5.3 Increased the maximum limit of the Load Encroachment Angle setting to 80°

Category: E

Products: D30, D60, F60, L60, L90, T60

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the setting range for the “Load Encroachment Angle” setting is expanded to 5° to 80°.

2.5.4 Added capability to map the breakers and disconnect switches status to IEC61850 GOOSE DPS inputs

Category: E

Products: B30 with PBM

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the subscribed RxGOOSE DPS inputs can be directly mapped to the breaker control and the disconnect switch elements.

2.5.5 Fixed reset timer functionality of V/Hz element when the input is in the hysteresis region

Category: P

Products: G30, G60, L90, T60

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In previous versions, after the V/Hz element drops out, the reset timer is frozen if the input signal increases to above the hysteresis limit (2% of the pickup value) but remains below the pickup value. In firmware version 8.60, this issue is fixed.

2.5.6 Corrected menu displays for neutral directional overcurrent settings

Category: D

Products: B30, C70, D30, D60, F60, G30, G60, L30, L60, L90, M60, N60, T60

Impacted firmware: 7.90 to 8.51

Corrected firmware: 8.60

Workaround: N/A

Description: In previous versions, the relay's LCD include two sets of displays for the neutral directional overcurrent element. In firmware version 8.60, this issue is fixed.

2.6 Platform

2.6.1 Added text file that lists the serial numbers of the modules installed in the UR relay

Category: N

Products: All

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the file “ModuleSerialNumbers.txt” is listing the serial numbers of the modules installed in the relay with the exception of the power supply modules. EnerVista UR Setup retrieves this file as part of the service report.

2.6.2 Added commands to change the front panel type, add/remove redundant power supply, or to change power supply model in the order code

Category: N

Products: All products

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, commands have been added to change the front panel letter or the power supply letter in the relay’s order code and to add or remove a redundant power supply to the relay’s order code.

2.6.3 Added FlexAnalog for the fault values of the user programmable fault report

Category: E

Products: B30, B90, C70, G30, G60, M60, N60, T35, T60

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, two sets of 32 FlexAnalog have been added for the fault values (one for each of the two user programmable fault reports). The FlexAnalog can be read over Modbus, DNP, IEC104, and over IEC61850 (Logical nodes UFlt1RFLOxx.FltAnββ, where xx are the fault report number and ββ are the two digit FlexAnalog number 01 to 32), and they can be used in the GFP annunciator.

2.6.4 Added support to set the relay’s local time only from the IRIG -B signal

Category: E

Products: All products

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the relay can set the local time based only on the IRIG-B signal that includes the Control Function (CF) bits according to IEEE Standard 1344-1995. A new setting “UTC OFFSET” has been added for IRIG-B. When set to “IRIG-B Time” it allows the user to derive the UTC time, Local time, and DST from the IRIG-B CF bits , avoiding the need for the relay’s “LOCAL TIME” settings.
When set to “LOCAL TIME SETTINGS” the relay’s behaviour matches that in previous FW versions. This option is the default value for the new setting, for backwards compatibility with earlier versions of UR.

2.6.5 Enhanced FW to verify the authenticity of the FW binary on a FW upgrade

Category: E

Products: All products

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, in addition to the verification in EnerVista UR Setup, during a FW upgrade the relay verifies the FW binary’s authenticity by verifying the signature embedded in the binary.

2.6.6 Fixed unexpected restart when attempting to read a PMU record

Category: B

Products: All products

Impacted firmware: 8.50

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 850, the relay experienced an unexpected restart when the user attempted to read a PMU record. In firmware version 8.60, this issue is fixed.

2.6.7 Added Polish language faceplate letter to the list of valid faceplate options

Category: D

Products: All products

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In previous versions, when the “Update order code” command is executed for a relay with support for Polish language (front panel letter ‘H’ or ‘O’) the relays changed the front panel letter to English. In firmware version 8.60, this issue is fixed.

2.6.8 Fixed the “FlexAnalog Parameter Listing” webpage

Category: R

Products: All products

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the “FlexAnalog Parameter Listing” webpage was fixed to always show all the available FlexAnalogs in the relay.

2.6.9 Corrected the “Last Settings Change” timestamp to include the DST time

Category: R

Products: All products

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In previous versions, the “Last Settings Change” timestamp did not include the Daylight Saving Time (DST) time. In firmware version 8.60, this issue is fixed.

2.6.1 Added the Process Bus Module general settings and the AC banks configuration settings to the data recorded in the oscillography settings file

Category: R

Products: All products with PBM

Impacted firmware: 8.50 to 8.51

Corrected firmware: 8.60

Workaround: N/A

Description: In previous versions, the Process Bus Module (PBM) general settings and the AC banks configuration settings were missing from the settings file recorded when an oscillography is triggered. In firmware version 8.60, this issue is fixed.

2.7 Communications

2.7.1 Enhanced the main CPU FW to accept IEC61850 GOOSE messages with invalid/questionable quality

Category: E, C

Products: All products with IEC61850

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, a new setting “RxGOOSE Quality Check” allows configuring the relay to accept or reject GOOSE messages with invalid/questionable quality. When the option ‘Accept Invalid or Questionable q’ is selected, the RxGOOSE inputs with invalid or questionable quality are accepted and processed. For backwards compatibility with earlier versions the default options it to reject GOOSE messages with invalid/questionable quality. This feature is not available for relays with Process Bus Module (PBM).

2.7.2 Changed FW to correctly use the IEC61850 MaxTime and TAL fields from the incoming CID file

Category: C

Products: All products with IEC61850

Impacted firmware: 7.00 onwards

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, EnerVista UR Setup is correctly populating the MaxTime and TAL fields in the CID file and the FW supports this change.

2.7.3 Changed behaviour of clearing the “SNTP Failure” self-test

Category: C

Products: All products

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, in SNTP unicast mode the “SNTP Failure” self-test is cleared only after the relay’s time is synchronized to the SNTP server. This will take an additional 200 sec compared to earlier versions.

2.7.4 Extended range of SNTP time synchronization to year 2104

Category: C

Products: All products

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the relay synchronizes correctly to an SNTP server up to year 2104.

2.7.5 Corrected default state of the remote inputs after a reboot

Category: C

Products: All products with IEC61850

Impacted firmware: 8.30 onwards

Corrected firmware: 8.60

Workaround: N/A

Description: In previous versions, the relay did not correctly apply the default state of the remote inputs when they were defined as "ON". In firmware version 8.60, this issue is fixed.

2.7.6 Added option to keep time synchronization in PMU frames for a defined period after the PTP clock loses GPS signal

Category: E, C

Products: All products with PMU

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, a "HOLDOVER MODE" is added to delay by a configurable period when the relay sets the PMU Sync Error flag after the PTP clock loses the GPS signal. By default, the holdover mode is turned off for backwards compatibility with earlier versions.

2.7.7 Changed Process Bus Module FW to accept PTP frames with invalid UTC offset

Category: C

Products: All products with PBM

Impacted firmware: 7.80 onwards

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the relay accepts an announce message with the invalid UTC Offset and the flag ptpTimescale set to false.

2.7.8 Increased the PTP holdover time to 60 sec for the Process Bus Module

Category: C

Products: All products with PBM

Impacted firmware: 7.80 onwards

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the PBM PTP has a holdover time of 60 seconds, which matches that of the main CPU PTP.

2.7.9 Corrected “Sync Source” actual value for the Process Bus Module PTP when the PTP function is set to “Slave-Only” and the PTP synchronization state is either “Synchronized” or “Synch'd (No PDelay)”

Category: C

Products: All products with PBM

Impacted firmware: 7.80 onwards

Corrected firmware: 8.60

Workaround: N/A

Description: In previous versions, if the Process Bus Module PBM PTP Function setting is configured to “Slave-only” the “Sync Source” is incorrect when the PTP state is either “Synchronized” or “Synch'd (No PDelay)”. In firmware version 8.60, this issue is fixed

2.7.10 Fixed FW to prevent an unexpected restart when the DNP UDP port number is set to specific values

Category: C

Products: All products with CyberSentry or IEC61850

Impacted firmware: 7.40 onwards

Corrected firmware: 8.60

Workaround: Configure the DNP UDP port number to a different value.

Description: In firmware version 8.60, the FW prevents the user from the setting the following DNP port numbers for the “NETWORK – UDP” channel: These port numbers are used internally by the device.

- Order codes with IEC61850 SW option: DNP UDP port numbers 20028 and 20029.
- Order codes with CyberSentry SW option: DNP UDP port numbers 20020, 20021, 20028, 20029.

2.7.11 Corrected FW to correctly process fragmented IP frames

Category: C

Products: All products

Impacted firmware: 7.00 onwards

Corrected firmware: 8.60

Workaround: N/A

Description: In previous versions, the relay may incorrectly discard fragmented IP frames. In firmware version 8.60, this issue is fixed.

2.7.12 Changed IEC61850 real time clock logical node TmCikLTMS

Category: C

Products: All products with IEC61850

Impacted firmware: 7.00 onwards

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the real time clock logical node was changed and a new data object output TmCikLTMS1.TmSrcTyp was added to indicate the time source used for time synchronization by the relay.

2.7.13 Corrected functionality of Process Bus Module IEC61850 RxGOOSE NdsCom flag when the RxGOOSE is offline

Category: C

Products: All products with PBM

Impacted firmware: 8.50 to 8.51

Corrected firmware: 8.60

Workaround: N/A

Description: In previous versions, the Process Bus Module (PBM) IEC61850 RxGOOSE NdsCom flag was activated despite the RxGOOSE being offline. The issue does not exist for the main CPU RxGOOSE. In firmware version 8.60, this issue is fixed.

2.7.14 Corrected FW to allow subscription to legacy fixed GOOSE messages from URPlus devices

Category: C

Products: All products

Impacted firmware: 8.40 to 8.51

Corrected firmware: 8.60

Workaround: N/A

Description: In previous versions, the subscription to legacy fixed GOOSE messages from URPlus devices did not work. In firmware version 8.60, this issue is fixed, and UR relay can subscribe to legacy fixed GOOSE messages from URPlus relays.

2.8 Cybersecurity

2.8.1 Corrected syslog priority for values with two digits to match RFC 5424

Category: C

Products: All products

Impacted firmware: 7.70 onwards

Corrected firmware: 8.60

Workaround: N/A

Description: In previous versions, if the syslog priority value had only two digits the relay is adding a leading 0 to the priority value. For example, instead of the correct value <38> the relay is using the value <038>. In firmware version 8.60, this issue is fixed, and the priority value matches the requirement of RFC 5424.

2.8.2 Added security events in relay with CyberSentry when attempting to change settings from the front panel while “Lock Settings” is enabled

Category: R

Products: All products with CyberSentry

Impacted firmware: All

Corrected firmware: 8.60

Workaround: N/A

Description: In firmware version 8.60, the relay does generate security events for both local and remote attempts to change the settings while “Lock Settings” is enabled.

3 Appendix

3.1 Change categories

This document uses the following categories to classify the changes.

Code	Category	Comments
N	New feature	A separate feature added to the relay.
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
U	Unavailability of protection	Protection not available in a self-demonstrating way so that corrective actions should 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

3.2 For Further Assistance

For product support, contact the information and call center as follows:

GE Grid Solutions
650 Markland Street
Markham, Ontario
Canada L6C 0M1
Worldwide telephone: +1 905 927 7070
Europe/Middle East/Africa telephone: +34 94 485 88 54
North America toll-free: 1 800 547 8629
Worldwide e-mail: multilin.tech@ge.com
Europe e-mail: multilin.tech.euro@ge.com
Website: <https://www.governova.com/grid-solutions/multilin>