

## UR Family

# Version 8.1x

## Release Notes

GE Publication Number: GER-4903D

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### Overview

This document contains the release notes for firmware and software version 8.10 and 8.11 of the GE Universal Relay (UR) family of products.

Applicable to products: B30, B90, C30, C60, C70, C95, D30, D60, F35, F60, G30, G60, L30, L60, L90, M60, N60, T35, T60

Date of release 8.10: 23 December 2020

Date of release 8.11: 3 September 2021

In the following descriptions, a category letter is placed to the left of the title. See the table at the end of this document for descriptions of the categories.

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.

### Highlights 8.10

- Enhanced firmware to allow up to six 5F (DCmA Inputs) modules in a C30 relay
- Graphical front panel now supports up to 48 user programmable pushbuttons for all UR products
- Increased the number of FlexLogic Virtual Outputs to 256
- **New** – Multi-range Signal Oscillation Detector (MSOD) element
- **New** – Transformer Through-Fault Monitoring element in T35 and T60
- Added 24-bay busbar protection in the B30 with Process Bus Module
- Enhanced the voltage elements with inverse time curves capability
- Multiple security improvements
- Improved performance of some offline device operations
- **New** – Support for Windows Server 2016
- **New** – Import/Export settings tool

## Highlights 8.11

- Corrected firmware to activate Subcycle Distance in the ground distance elements, when the ground CT is not configured in the distance source
- Corrected current metering in L60
- Corrected FW in relays without DSP modules (C30, B90 and N60) to have a uniform protection pass

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## Firmware

### Firmware 8.10

- Bus Differential Systems – B30, B90
  - Added 24-bay busbar protection in the B30 with Process Bus Module
  - Enhanced B30 with Process Bus Module to allow use of banks B1 to B6 in sources 7 and up
  - Corrected B90 End Fault Protection events in the event recorder
- Controller Systems – C30
  - Enhanced firmware to allow up to six 5F (DCmA Inputs) modules in a C30 relay
- Line Protection Systems – D60, L90
  - Corrected blocking functionality of the subcycle distance feature
  - Added support for partial blocking on SV Stream Trouble for cross-country isolated ground distance
- Transformer Protection Systems – G30, T35, T60
  - Added Transformer Through-Fault Monitoring element in T35, T60
  - Changed minimum range value of pickup delay in transformer Interturn Fault Detection element to 0.05 sec
- Common Platform Functions
  - Corrected Diagnostic Alarm error messages caused by DSP. Hardware changes may be required.
  - Enhanced graphical front panel firmware to support up to 48 user programmable pushbuttons
  - Increased the pickup range in Sensitive Directional Power element
  - Increased the number of FlexLogic Virtual Outputs to 256
  - Added a Multi-range Signal Oscillation Detector (MSOD) element
  - Increased the range of the **SYNCHK S-CLS MAX dF** setting
  - Improved security by adding **LOCK FIRMWARE** setting
  - Improved security by adding a setting for factory service access in relays without CyberSentry
  - Improved security by adding rule to prevent entering the “<” character in text-based settings
  - Improved security by adding setting to bypass access control for front panel RESET button on CyberSentry relays
  - Improved security by adding setting to disable SFTP in relays with IEC 61850 and without CyberSentry
  - Enhanced the voltage elements with inverse time curves capability
  - Added and renamed operands for AC sources switching
  - Added setting to enable breaker/switch controls from graphical front panel
  - Enhanced relay with Process Bus Module to allow subscription and publishing of more IEC 61850 GOOSE messages
  - Improved security and robustness to single event upsets by adding ECC support
  - Added option to disable overcurrent supervision in the Frequency Rate of Change element
  - Corrected echo duration and lockout in hybrid POTT scheme
  - Corrected reset timer functionality in Volts per Hertz element
  - Increased range of **VOLTAGE CUT-OFF LEVEL** setting to 0.1 to 2.0 V
  - Corrected inconsistency of Synchrocheck angle display range on front panel display and web page
  - Added breaker and disconnect switch tagging via MMS client

- Communications
  - Improved security by removing support for SSHv1 and weak ciphers
  - Improved security of UR web pages
  - Improved security by adding role-based access for SFTP in CyberSentry relays
  - Added **CONTACT I/O FORCING** setting to SCL files in relays with IEC 61850
  - Corrected firmware to reject IEC 61850 CID file with too many report dataset points
  - Corrected intermittent IEC 61850 RxGOOSE offline message when the Time Allowed to Live is twice the heartbeat rate of 1 sec
  - Corrected IEC 61850 fault location logical node
  - Shortened TCP disconnect time for Phasor Measurement Unit (PMU) connections
  - Modified firmware to accept an IEC 61850 CID file if all the IP addresses are at the default (127.0.0.1) and the CID file includes a single IED
  - Corrected issue with Synchrocheck IEC 61850 deadbands not being updated after sending a new CID file that changes the VT ratio
  - Shortened the IEC 61850 SCL data model acquisition time by MMS clients
  - Corrected IEC 61850 time quality attribute clockNotSynchronized when main CPU is synchronized to the Process Bus Module
  - Corrected object reference in “IEC 61850 Oscillatory History” web page
  - Corrected unicast IEC 61850 R-GOOSE functionality
  - Corrected the PMU TCP remaining connections actual value
  - Corrected scrolling of user-definable displays
  - Increased range of IEC 60870-5-103 **COMMAND ON/OFF** settings to allow use of all 128 Virtual Inputs
  - Corrected firmware to not record Date/Time Changed events for SNTP time changes when the **REAL TIME CLOCK EVENTS** setting is disabled
  - Corrected loss of communications when setting Modbus TCP port to 102

## Bus Differential Systems – B30, B90

### E Added 24-bay busbar protection in the B30 with Process Bus Module

Products: B30 with Process Bus Module (order code 85, 86, or 87)

Impacted firmware: 7.8x to 8.0x

Corrected firmware: 8.10

Workaround: None

Description: In version 7.8x to 8.0x, a B30 relay with Process Bus Module supports 8 and 16 feeders.

In the new release, the B30 relay with Process Bus Module supports up to 24 bays for busbar protection, order code dependent. The 24 feeder with six zones options are offered on a solution basis only; contact GE technical support.

GE tracking number: 810-7

### E,P Enhanced B30 with Process Bus Module to allow use of banks B1 to B6 in sources 7 and up

Products: B30 with Process Bus Module (order code 85, 86, or 87)

Impacted firmware: 7.80 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous versions, a B30 relay with Process Bus Module can use banks B1 to B6 for configuring sources 1 to 6 and banks B7 and above for configuring extended sources 7 and above.

In the new release, it can use banks B1 to B6 to configure any source, including sources 7 and up.  
GE tracking number: 810-21

**R Corrected B90 End Fault Protection events in the event recorder**

Products: B90

Impacted firmware: 7.90 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: The B90 End Fault Protection element events appear as “Invalid” in the event log.

In the new release, these events are published correctly in the event log.

GE tracking number: 810-24

## Controller Systems – C30

**F Enhanced firmware to allow up to six 5F (DCmA Inputs) modules in a C30 relay**

Products: C30

Impacted firmware: All to 8.0x

Corrected firmware: 8.10

Workaround: Not applicable

Description: In previous versions, the C30 supports up to three 5F (8 DCmA Inputs) modules for a maximum of 24 DCmA Inputs.

In the new release, a C30 supports up to six 5F modules, for a maximum of 48 DCmA inputs. In order to use four or more 5F modules in the C30, the modules must have a manufacturing date of September 2020 or later.

GE tracking number: 810-1

## Line Protection Systems – D60, L60, L90

**P Corrected blocking functionality of the subcycle distance feature**

Products: D60, L90, with Process Bus Module (order code 85, 86, or 87)

Impacted firmware: 8.00 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous versions, the blocking signal of the Distance element given by the **PHS DIST Zx BLK** and **GND DIST Zx BLK** settings does not block the subcycle distance algorithm.

The new release corrects the issue.

GE tracking number: 810-38

**P Added support for partial blocking on SV Stream Trouble for cross-country isolated ground distance**

Products: D60, L90, with Process Bus Module (order code 85, 86, or 87)

Impacted firmware: 8.00 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous versions, partial blocking on SV Stream Trouble of the cross-country isolated ground distance element is missing.

The new release corrects the issue.

GE tracking number: 810-39

## Transformer Protection Systems – G30, T35, T60

### **N Added Transformer Through-Fault Monitoring element in T35 and T60**

Products: T35, T60

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: Not applicable

Description: A Transformer Through-Fault Element Monitoring element is added. It monitors external faults passing through the transformer per IEEE Std C57.109-2018 and IEEE Std C57.12. 59-2015. It monitors accumulated thermal and mechanical damage during through faults for the transformer life. Elements are available per each winding and configurable per specific transformer.

GE tracking number: 810-6

### **G,P Changed minimum range value of pickup delay in transformer Interturn Fault Detection element to 0.05 sec**

Products: T35, T60

Impacted firmware: 8.00 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous versions, the minimum value of the “**INTERTURN FLT DET PKP DELAY**” setting is 0.02 seconds.

In the new release, the minimum value of the setting increases to 0.05 seconds.

GE tracking number: 810-37

## Common Platform Functions

### **A, U Corrected Diagnostic Alarm error messages caused by DSP**

Products: All UR devices manufactured between 1 September 2011 and 1 December 2015

Impacted firmware: 7.27, 7.28, 7.60 and up

Corrected firmware Not applicable

Workaround: None

Description: A Diagnostic Alarm can occur in URs due to incorrect signal handling in the digital signal processor (DSP). The Diagnostic Alarm does not remove the UR from service and some functions remain available. This issue applies when upgrading from version 7.0x, 7.1x, 7.20 to 7.24, 7.30, 7.31 to firmware version 7.25, 7.26, 7.27, 7.28, 7.32, 7.4x, 7.60 and up. If a relay has already been upgraded to any version higher than 7.25, 7.26, 7.27, 7.28, 7.32, 7.4x, 7.60 and up and does not exhibit the issue, no action is required, and the relay can be upgraded to any version, which is 8.10 in this release.

Factory updates to the DSP correct the issue. Any DSP manufactured between 1 September 2011 and 1 December 2015 with impacted firmware must be sent back to the factory for updates before updating the firmware. Contact GE technical support at [ga.supportNAM@ge.com](mailto:ga.supportNAM@ge.com) for details.

GE tracking number: 728-6

### **E Enhanced graphical front panel firmware to support up to 48 user programmable pushbuttons**

Products: All with graphical front panel

Impacted firmware: 7.60 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In UR 7.9x and 8.0x, B30 relays with a graphical front panel, Process Bus Module, and “IY” software option support 48 user programmable pushbuttons: 8 hard pushbuttons and 40 pushbuttons (up

to 10 soft pushbuttons on every single-line diagram page, for a total of 40).  
The new release extends this feature to all UR relays with a graphical front panel.  
GE tracking number: 810-2

**E Increased the pickup range in Sensitive Directional Power element**

Products: All with Sensitive Directional Power (C60, C95, D60, F60, G30, G60, L90, M60, N60, T60)

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous versions, the Sensitive Directional Power element had the following range for these two settings:

**DIR POWER STG1 SMIN:** -1.2 to 1.2 pu in steps of 0.001 pu

**DIR POWER STG2 SMIN:** -1.2 to 1.2 pu in steps of 0.001 pu

In the new release, these two settings have the range -3.3 to 3.3 pu in steps of 0.001 pu.

GE tracking number: 810-3

**E Increased the number of FlexLogic Virtual Outputs to 256**

Products: All

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: Not applicable

Description: The number of FlexLogic Virtual Outputs increases from 128 to 256.

GE tracking number: 810-4

**N Added a Multi-range Signal Oscillation Detector (MSOD) element**

Products: D60 or L90 with digital signal processor modules (DSPs) or HardFiber (not with Process Bus Module), G30, G60, L90, N60, T60

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: Not applicable

Description: An advanced MSOD element is added. MSOD is important for wind and solar farms because of oscillation in the system. The element detects different oscillations in the power system, from DC to close to the system nominal frequency. Five frequency bands are available, with both alarm and trip thresholds. The MSOD element reports oscillation signal magnitude, frequency, damping ratio and can operate on various selectable input signals.

GE tracking number: 810-5

**E Increased the range of the SYNCHK S-CLS MAX dF setting**

Products: All with Synchrocheck (B30, C60, C95, D30, D60, F60, G30, G60, L30, L60, L90, N60, T60)

Impacted firmware: 7.40 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous releases, the range of the Synchrocheck element **SYNCHK S-CLS MAX dF** setting is 0.100 to 2.000 Hz in steps of 0.005 Hz.

In the new release, the range increases to 0.100 to 10.000 Hz in steps of 0.005 Hz.

GE tracking number: 810-8

**E Improved security by adding LOCK FIRMWARE setting**

Products: All

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: The new release adds a **LOCK FIRMWARE** setting. In relays without a CyberSentry software option, a new setting controls firmware upgrade under **Settings > Product Setup > Security > Access Supervision > Lock Firmware**. In relays with CyberSentry, the **Settings > Product Setup > Security > Supervisory > Lock Relay** setting is split into the following two settings: **LOCK SETTINGS** and **LOCK FIRMWARE**.

The default value of the **LOCK FIRMWARE** setting is Enabled. When set to Enabled, the relay prevents an attempt to upgrade firmware and asserts a minor self-test if a firmware upgrade is attempted.

GE recommends strongly the use of a settings password on relays without CyberSentry.

GE tracking number: 810-11

#### **E Improved security by adding a setting for factory service access in relays without CyberSentry**

Products: All without a CyberSentry option

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In the new release, in relays without a CyberSentry software option, a new setting is added to control factory service access, under **Settings > Product Setup > Security > Access Supervision > Factory Service Mode**. This setting is similar to the existing setting in the Supervisory menu of a relay with CyberSentry. The default value is Disabled. When set to Disabled, it prevents a user from logging in as factory service. Enabling this setting records events in the event log and asserts a minor self-test.

GE tracking number: 810-12

#### **E Improved security by adding rule to prevent entering the "<" character in text-based settings**

Products: All

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: Avoid using the "<" character in text-based settings

Description: In the new release, for improved security, the less-than sign "<" is invalid for text-based settings, such as IED names and sources names.

GE tracking number: 810-13

#### **E Improved security by adding setting to bypass access control for front panel RESET button on CyberSentry relays**

Products: All with a CyberSentry option

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: The RESET button on the front panel clears messages.

In previous versions, on a relay with a CyberSentry software option, the Administrator or Engineer role must authenticate before the RESET button functionality is invoked.

The new release adds the **Settings > Product Setup > Security > Supervisory > Reset Key Access** setting. When Enabled, any user can activate the front panel RESET key without authentication. When Disabled, the Administrator or Engineer role can activate the RESET key after authentication, the same as in previous versions.

GE tracking number: 810-15



**C Improved security by adding setting to disable SFTP in relays with IEC 61850 and without CyberSentry**

Products: All with an IEC 61850 option and without a CyberSentry option

Impacted firmware: 7.30 to 8.03

Corrected firmware: 8.10

Workaround: Block port 22 by the substation firewall if SFTP is not required

Description: In previous versions, relays with IEC 61850 and without CyberSentry have SFTP (port 22) enabled by default and do not allow disabling this protocol.

The new release adds a **Settings > Product Setup > Communications > Protocol > SFTP Protocol** setting to allow disabling of the SFTP protocol. The setting displays when using IEC 61850 without CyberSentry. The default value is Enabled.

GE tracking number: 810-16

**E,P Enhanced the voltage elements with inverse time curves capability**

Products: All with Phase Undervoltage, Phase Overvoltage (B30, C60, C70, C95, D30, D60, F35, F60, G30, G60, L30, L60, L90, M60, N60, T60) and all with Auxiliary Undervoltage, Auxiliary Overvoltage (B30, C60, C70, C95, D30, D60, F35, F60, G30, G60, L30, L60, L90, M60, T60)

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In the new release, the following elements have been enhanced with inverse time curves: Phase Undervoltage, Phase Overvoltage, Auxiliary Undervoltage, Auxiliary Overvoltage.

GE tracking number: 810-17

**C Added and renamed operands for AC sources switching**

Products: All except B90 and C30

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In the new release, the following FlexLogic operand changes are made to the AC sources switching feature:

- Operand name changed from "SRC 1 CT SWITCH ON" to "SRC1 CT SW PROT BLK"
- Operand name changed from "SRC 1 VT SWITCH ON" to "SRC1 VT SW PROT BLK"
- Added operands "SRC CT ALT BANK ON" and "SRC VT ALT BANK ON"

For details, see a UR instruction manual.

GE tracking number: 810-18

**E Added setting to enable breaker/switch controls from graphical front panel**

Products: All with graphical front panel

Impacted firmware: 7.60 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: The new release adds a **Settings > Product Setup > Graphical Panel > Home Page > Enable Controls from GFP** setting. This new setting enables/disables breaker and switch control from the graphical front panel based on the ON/OFF value of the FlexLogic operand assigned to the setting.

GE tracking number: 810-19

**E,C Enhanced relay with Process Bus Module to allow subscription and publishing of more IEC 61850 GOOSE messages**

Products: All with an IEC 61850 option and Process Bus Module (order code 85, 86, or 87)

Impacted firmware: 7.80 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous versions, a relay with a Process Bus Module allowed the Process Bus Module to subscribe and publish GOOSE messages that include only a Boolean data attribute (DA).

In the new release, a relay with a Process Bus Module allows the Process Bus Module to subscribe to and to publish IEC 61850 GOOSE messages that include Boolean, double-point status (DPS), and FLOAT32 data objects/data attributes (DO/DA).

GE tracking number: 810-20

#### **N Improved security and robustness to single event upsets by adding ECC support**

Products: All

Impacted firmware: 7.x

Corrected firmware: 8.10

Workaround: None

Description: CPU firmware code execution security is improved to detect and correct memory bit errors, to prevent incorrect relay operation. The new release adds support for Error-Correction Code (ECC) to protect against inadvertent changes in RAM memory due to Single Event Upset (SEU), which changes the state of the memory bit due to an energetic particle. Inadvertent changes in RAM memory due to SEU have very low statistical probability. ECC detects and corrects single-bit errors. This feature requires upgrading to the latest UR 7 bootloader versions 703 and 704, depending on the CPU type without or with graphical front panel connection, respectively. Look for the boot files at

<https://www.gegridsolutions.com/app/viewfiles.aspx?prod=urfamily&type=7&test=yes>

GE tracking number: 810-22

#### **E,P Added option to disable overcurrent supervision in the Frequency Rate of Change element**

Products: All with Frequency Rate of Change (ROCOF) element (D30, D60, F60, G30 G60, L30, L90, N60, T60)

Impacted firmware: 7.40 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous versions, overcurrent supervision of the Frequency Rate of Change element cannot be disabled.

In the new release, using a value of 0.02 pu for the **FREQ RATE OC SUPV PICKUP** setting disables the overcurrent supervision for the frequency rate of change element.

GE tracking number: 810-26

#### **P Corrected echo duration and lockout in hybrid POTT scheme**

Products: D60, L90

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: The echo duration and lockout feature in the Hybrid Permissive Overreach Transfer Trip (POTT) scheme Tx follows Rx instead of providing a deterministic lockout delay per the **ECHO DURATION** setting.

The new release corrects the issue.

GE tracking number: 810-30

#### **P Corrected reset timer functionality in Volts per Hertz element**

Products: All with Volts per Hertz element (G30, G60, L90, T60)

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: The reset timer of the Volts per Hertz element delays the dropout of the “PKP” operand instead of delaying the dropout of the “OP” operand.

The new release corrects the issue.

GE tracking number: 810-41

#### **E Increased range of VOLTAGE CUT-OFF LEVEL setting to 0.1 to 2.0 V**

Products: All except C30

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous versions, the range of the **VOLTAGE CUT-OFF LEVEL** setting is 0.1 to 1.0 V.

In the new release, the range of the setting increases to 0.1 to 2.0 V. Settings conversion in the EnerVista software preserves the **VOLTAGE CUT-OFF LEVEL** value from the original settings. The software for the current release allows usage of the new extended range for firmware 8.10 and up and for version 6.07.

GE tracking number: 810-43

#### **R Corrected inconsistency of Synchrocheck angle display range on front panel display and web page**

Products: All with Synchrocheck (B30, C60, C95, D30, D60, F60, G30, G60, L30, L60, L90, N60, T60)

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous versions, the ranges of the angles of the Synchrocheck actual values are inconsistent between the relay’s web page (-180° to 180°) and the front panel display (0° to 359°).

In the new release, the angles of the Synchrocheck actual values have a consistent range of -180° to 180° for the relay’s web page and front panel.

GE tracking number: 810-47

#### **E,C,P Added breaker and disconnect switch tagging via MMS client**

Products: All with an IEC 61850 option

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: A new setting is added to allow breaker/disconnect switch tagging via a MMS client. See the “Breaker 1 Tagging” and “Switch 1 Tagging” descriptions in a UR instruction manual.

GE tracking number: 810-48

## **Communications**

#### **C Improved security by removing support for SSHv1 and weak ciphers**

Products: All with a CyberSentry option or an IEC 61850 option

Impacted firmware: 7.30 to 8.03

Corrected firmware: 8.10

Workaround: Use a client that support SSHv2 and strong ciphers

Description: A UR relay with CyberSentry order code or a relay with an IEC 61850 order code supports SSH/SFTP and SFTP, respectively. UR SSH included support for SSHv1 (less secure) and weak ciphers.

In the new release, support for SSH v1 and weak ciphers is removed from the UR product line, leaving support for SSH v2 (more secure) and stronger ciphers.

GE tracking number: 810-9

**C Improved security of UR web pages**

Products: All

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: Secure access to the relay's web pages by strong security practices in the substation

Description: The new release includes a number of security enhancements to prevent possible corruption of the relay's web pages by a malicious user.

GE tracking number: 810-10

**E Improved security by removing webpages that contain settings information**

Products: All products, with or without a CyberSentry™ option

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous versions, content of files that included settings information could be viewed on the relay's web server.

This release removes webpages that include settings information from the relay's webserver, for example the settings Modbus memory map, the front panel display report, and the DNP/IEC104/IEC103 points list. A text file with the respective information can be retrieved using TFTP in relays without IEC 61850 or CyberSentry software option or using TFTP/ SFTP in relays with either IEC 61850 or CyberSentry software option.

For better security, GE recommends turning off the HTTP and TFTP protocols.

GE tracking number: 810-14

**C Added CONTACT I/O FORCING setting to SCL files in relays with IEC 61850**

Products: All with an IEC 61850 option

Impacted firmware: 7.30 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: The **CONTACT I/O FORCING** setting is not included in IEC 61850 SCL files (IID, ICD) generated by a relay with an IEC 61850 software option. Saving the relay's settings offline in the EnerVista software for a UR reverts the value of this setting to its default.

In the new release, the **CONTACT I/O FORCING** setting is included in the relay's SCL files (IID, ICD).

GE tracking number: 810-23

**C Corrected firmware to reject IEC 61850 CID file with too many report dataset points**

Products: All with an IEC 61850 option

Impacted firmware: 7.30 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: A relay with an IEC 61850 software option accepted a third-party CID file that included a report dataset exceeding the capability of the relay. The same dataset, if used for a GOOSE message, causes the CID file to be rejected.

In the new release, a CID file with a dataset exceeding the capability of the relay, whether for GOOSE or reports, is rejected.

GE tracking number: 810-25

**C Corrected intermittent IEC 61850 RxGOOSE offline message when the Time Allowed to Live is twice the heartbeat rate of 1 sec**

Products: All with an IEC 61850 option

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: If the IEC 61850 Time Allowed to Live (TAL) is twice the heartbeat rate of 1 sec, the relay can intermittently show RxGOOSE offline messages.

The new release corrects the issue.

GE tracking number: 810-27

**C Corrected IEC 61850 fault location logical node**

Products: All with an IEC 61850 option and fault report (C60, C95, D30, D60, F35, F60, L30, L60, L90)

Impacted firmware: 7.40 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: The following errors are present in the IEC 61850 fault location Logical Node (LN):

- The timestamps of the IEC 61850 FltRFLO fault location data attributes are incorrect by one hour when Daylight Saving Time (DST) is active
- The IEC 61850 mapping of the fault resistance, fault loop resistance, and fault loop reactance (FltRis, FltLoopRis, and FltLoopReact) are larger by a factor of 100 than in the fault report because of an incorrect multiplier code

The new release corrects these issues.

GE tracking number: 810-28

**C Shortened TCP disconnect time for Phasor Measurement Unit (PMU) connections**

Products: All with PMU option (C60, C95, D60, F60, G60, L30, L90, N60, T60)

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: If a client drops out unexpectedly or is removed from the network, approximately five minutes are required before the Transmission Control Protocol (TCP) connection is made available to another PMU client.

In the new release, if a client drops out unexpectedly or is removed from the network, the TCP disconnect time is shortened to 10 seconds before the connection is made available to another PMU client.

GE tracking number: 810-29

**C Modified firmware to accept an IEC 61850 CID file if all the IP addresses are at the default (127.0.0.1) and the CID file includes a single IED**

Products: All with an IEC 61850 option

Impacted firmware: 7.30 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous versions, the relay rejected an IEC 61850 CID file if all its IP addresses were at the default (127.0.0.1).

In the new release, an IEC 61850 CID file in G2 format that includes a single intelligent electronic device (IED) is accepted when all the relay's IP addresses are at the default (127.0.0.1).

GE tracking number: 810-31

- C Corrected issue with Synchrocheck IEC 61850 deadbands not being updated after sending a new CID file that changes the VT ratio**  
Products: All with an IEC 61850 option and Synchrocheck (B30, C60, C95, D30, D60, F60, G30, G60, L30, L60, L90, N60, T60)  
Impacted firmware: 7.30 to 8.03  
Corrected firmware: 8.10  
Workaround: After sending a CID file that changes the VT ratio, restart the relay  
Description: In previous versions, if an IEC 61850 CID file that changes the VT ratio is sent to the relay, the Synchrocheck deadbands are not functional. Rebooting the relay restores functionality.  
The new release corrects the issue.  
GE tracking number: 810-32
- C Shortened the IEC 61850 SCL data model acquisition time by MMS clients**  
Products: All with an IEC 61850 option  
Impacted firmware: 7.30 to 8.03  
Corrected firmware: 8.10  
Workaround: None  
Description: In previous versions, the maximum number of named identifiers for the MMS protocol is 100. This causes MMS clients to issue many requests when reading the IEC 61850 model from the relay. In the new release, the maximum number of named identifiers for the MMS protocol increases to 1600, shortening the time required for an MMS client to read the IEC 61850 data model from the relay.  
GE tracking number: 810-33
- C Corrected IEC 61850 time quality attribute clockNotSynchronized when main CPU is synchronized to the Process Bus Module**  
Products: All with a Process Bus Module (order code 85, 86, or 87)  
Impacted firmware: 7.90 to 8.03  
Corrected firmware: 8.10  
Workaround: None  
Description: In previous versions, when the main CPU time is synchronized to the Process Bus Module, the IEC 61850 time quality attribute clockNotSynchronized is set to true.  
The new release corrects the issue.  
GE tracking number: 810-34
- R Corrected object reference in "IEC 61850 Oscillatory History" web page**  
Products: All with an IEC 61850 option  
Impacted firmware: 7.70 to 8.03  
Corrected firmware: 8.10  
Workaround: None  
Description: The data reference field in the "IEC 61850 Oscillatory History" web page is missing the Logical Device (LD) name.  
The new release corrects the issue.  
GE tracking number: 810-35
- C Corrected unicast IEC 61850 R-GOOSE functionality**  
Products: All with an IEC 61580 option  
Impacted firmware: 7.40 to 8.03  
Corrected firmware: 8.10  
Workaround: None

Description: The unicast IEC 61850 routable GOOSE (R-GOOSE) is not functional and the R-GOOSE statistics web page lacks details.

The new release corrects the issues.

GE tracking number: 810-36

**C Corrected the PMU TCP remaining connections actual value**

Products: All with PMU option (C60, C95, D60, F60, G60, L30, L90, N60, T60)

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: The Actual Values > Status > Comm Status Remaining Connect > PMU TCP value is incorrect.

The new release corrects the issue.

GE tracking number: 810-40

**D Corrected scrolling of user-definable displays**

Products: All

Impacted firmware: 7.90 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In the impacted versions, the scrolling functionality of the user-definable displays does not work.

The new release corrects the issue.

GE tracking number: 810-42

**C Increased range of IEC 60870-5-103 COMMAND ON/OFF settings to allow use of all 128 Virtual Inputs**

Products: All

Impacted firmware: 7.90 to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous versions, the IEC 60870-5-103 **COMMAND ON** and **COMMAND OFF** settings use only Virtual Inputs 1 to 64.

The new release corrects the issue. All 128 Virtual Inputs can be used for these settings. The number of commands is unchanged (32).

GE tracking number: 810-44

**C Corrected firmware to not record Date/Time Changed events for SNTP time changes when the REAL TIME CLOCK EVENTS setting is disabled**

Products: All when using SNTP

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous versions, SNTP time synchronization events are recorded as Data/Time Changed events, even when the **Settings > Product Setup > Real Time Clock > Real Time Clock Events** setting is disabled.

The new release corrects the issue.

GE tracking number: 810-45

**C Corrected loss of communications when setting Modbus TCP port to 102**

Products: All with an IEC 61850 option

Impacted firmware: All to 8.03

Corrected firmware: 8.10

Workaround: None

Description: In previous versions, setting the Modbus TCP port to 102 causes the relay to lose communications and freeze.

The new release corrects the issue by preventing configuration of a TCP/UDP port to one of the following port numbers: 22, 500, 848, 102, 18246.

GE tracking number: 810-46



## Firmware 8.11

### Line Protection Systems – D60, L60, L90

**P Corrected firmware to activate Subcycle Distance in the ground distance elements, when the ground CT is not configured in the distance source**

Products: D60, L90, with a Subcycle Distance software option

Impacted firmware: 8.00 to 8.04, 8.10, 8.20

Corrected firmware: 8.05, 8.11, 8.21

Workaround: None

Description: If the ground CT bank is not configured in the distance source, Subcycle Distance is not activated in the ground distance elements. Regular Ground Distance elements remain active and operational.

The new release corrects the issue. Subcycle Distance is activated even when ground CT is not configured in the distance source.

GE tracking number: 821-4

**E Corrected current metering in L60**

Products: L60

Impacted firmware: 8.10, 8.20

Corrected firmware: 8.11, 8.21

Workaround: None

Description: In the impacted firmware, the metering of ground and sequence components currents is not functional. Phase RMS and phasor values are not affected.

The new release corrects the issue.

GE tracking number: 821-1

### Common Platform Functions

**B,P Corrected FW in relays without DSP modules (C30, B90 and N60) to have a uniform protection pass**

Products: C30, B90 without DSP modules, N60 without DSP modules

Impacted firmware: 7.90, 7.91, 8.00 to 8.04, 8.10

Corrected firmware: 7.92, 8.05, 8.11, 8.20

Workaround: Not applicable

Description: In previous versions, a B90 or N60 relay without DSP modules or a C30 relay may not have a regular protection pass, which may lead to unexpected behavior, including an unexpected restart.

GE tracking number: 820-9

### Communications

**C Corrected potential failure to synchronize to SNTP server when duplicate frames are present in the network**

Products: All using SNTP

Impacted firmware: All versions except those corrected.

Corrected firmware: 6.07, 7.28, 7.82, 8.02 to 8.05, 8.11, 8.21

Workaround: None

Description: In previous versions, if duplicate frames are present in the network the relay can fail to synchronize correctly to the Simple Network Time Protocol (SNTP) server.

The new release corrects the issue.

GE tracking number: 802-17

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## Software

### Software 8.10

#### **Character "<" not allowed in a setting that holds ASCII characters like virtual input ID**

Workaround: Do not use "<" character in the Modbus settings of ASCII text type

Description: The less than "<" character interferes with relay webserver in certain scenarios when used in Modbus settings of ASCII text type.

In the new release, "<" is now treated as a special character like ",", and "=". The graphical user interface screens of the Modbus settings have an additional validation rule to filter it.

#### **Added "Move URS/CID..." functionality with "Add Device from File"**

Workaround: Manually remove the original files, if so wanted

Description: When users execute the "Add Device from File" option, EnerVista UR Setup software preserves their original file outside of a newly created device folder and populates device folders with copies of the original files. It is these copies in the device folder that are modified whenever users make subsequent changes to device settings using the software.

In the new release, when the Device Folder Selection window displays, it allows users to select "Preserve the original file at its current location" to preserve their original file. Else, if they uncheck this box, the original file outside of device folder is removed after the software has fully populated the device folder.

#### **Added 40 programmable pushbuttons for graphical front panel**

Workaround: Not applicable

Description: All the order codes with the graphical front panel now have 40 programmable pushbuttons. This feature was previously available only to B30 devices with the IY software option.

For any order code that supports the graphical front panel, the software now shows 40 soft pushbuttons and 8 hard pushbuttons in the User-Programmable Pushbuttons screen and in the side button dropdown lists that appear in the Pushbutton Configuration window of the Single Line Diagram Editor screen. FlexLogic dropdown lists show 48 PUSHBUTTON ON and 48 PUSHBUTTON OFF.

#### **Added LOCK FIRMWARE and LOCK SETTINGS to devices with CyberSentry**

Workaround: None

Description: In previous releases, the **LOCK RELAY** setting did not allow a setting change or firmware upgrade operations.

To allow users independent locking of settings and firmware upgrade, this setting is now replaced with two new settings, **LOCK FIRMWARE** and **LOCK SETTINGS**.

#### **Improved performance of some offline device operations**

Workaround: None

Description: Some operations triggered in EnerVista UR Setup software require long wait times.

In the new release, some offline operations improved are when saving Modbus screens, opening IEC 61850 screens, device conversions, and SCL file merge.

#### **Added support for Windows Server 2016**

Workaround: None

Description: EnerVista UR Setup software can now be installed on the Windows Server 2016 operating system.

## Allow use of RESET button in certain scenario with CyberSentry

Workaround: None

Description: A new **RESET KEY ACCESS** setting is added to **Settings > Product Setup > Security > Supervisory**. When enabled, it allows a user to operate the RESET button without authentication. The RESET button resets active targets/messages on the UR relay.

## Added Import/Export settings tool

Workaround: None

Description: This new feature allows users to export partial configuration and import it back into the device. This feature is available in offline devices only. The exported file retains the information in a GE proprietary XML schema file. On import, an automatic compare screen is provided. It provides flexibility to view and import settings per selection. The feature supports two devices with the same or different order codes but having the same version.

The screenshot shows the 'Import Settings' dialog box. It features a 'Comparison Report' tab and a 'Target Device Report' tab. The main area displays a comparison table between two devices. The left device is '802-d60-pbm' and the right device is '802-n60-dsps'. The table lists various settings such as 'Breaker 1 Function', 'Breaker 1 Name', 'Breaker 1 Mode', etc., and compares their values between the two devices. A legend at the bottom indicates the status of each setting: 'Number of Settings with Different Values: 20', 'Setting with Different Values' (orange), 'Missing Settings' (grey), 'Imported Settings' (green), 'Invalid Imports' (red), and 'Search Result' (blue).

Setting Name	Value	Value	Setting Name
Breaker 1 Function	Enabled	Disabled	Breaker 1 Function
Breaker 1 Name	Bkr 1	Bkr 1	Breaker 1 Name
Breaker 1 Mode	3-Pole	3-Pole	Breaker 1 Mode
Breaker 1 Phase A/3-Pole Opened	OFF	OFF	Breaker 1 Phase A/3-Pole Opened
Breaker 1 Phase A/3-Pole Closed	OFF	OFF	Breaker 1 Phase A/3-Pole Closed
Breaker 1 Phase B Opened	OFF	OFF	Breaker 1 Phase B Opened
Breaker 1 Phase B Closed	OFF	OFF	Breaker 1 Phase B Closed
Breaker 1 Phase C Opened	OFF	OFF	Breaker 1 Phase C Opened
Breaker 1 Phase C Closed	OFF	OFF	Breaker 1 Phase C Closed
Breaker 1 Alarm Delay	0.000 s	0.000 s	Breaker 1 Alarm Delay
Breaker 1 External Alarm	OFF	OFF	Breaker 1 External Alarm
Breaker 1 Racked In	OFF	OFF	Breaker 1 Racked In
Breaker 1 Out Of Service	OFF	OFF	Breaker 1 Out Of Service
Breaker 1 Open	Virt Ip 1 On (V1)	OFF	Breaker 1 Open
Breaker 1 Close	Virt Ip 2 On (V2)	OFF	Breaker 1 Close
Breaker 1 Push Button Control	OFF	OFF	Breaker 1 Push Button Control
Breaker 1 Operate	70 ms	70 ms	Breaker 1 Operate
Breaker 1 Manual Close Recal Time	0.000 s	0.000 s	Breaker 1 Manual Close Recal Time
Breaker 1 Open Seal In	0.000 s	0.000 s	Breaker 1 Open Seal In
Breaker 1 Block Open	Virt Ip 1 On (V1)	OFF	Breaker 1 Block Open
Breaker 1 Block Close	Virt Ip 2 On (V2)	OFF	Breaker 1 Block Close
Breaker 1 Bypass	Enabled	Disabled	Breaker 1 Bypass
Breaker 1 Tagging	Disabled	Disabled	Breaker 1 Tagging
Breaker 1 Substitution	Enabled	Disabled	Breaker 1 Substitution
Breaker 1 Events	Enabled	Disabled	Breaker 1 Events
Breaker 1 Local	ON	OFF	Breaker 1 Local
Breaker 1 Interlock Open	ON	ON	Breaker 1 Interlock Open
Breaker 1 Interlock Close	ON	ON	Breaker 1 Interlock Close
Breaker 1 Pos Reached Check	Enabled	Enabled	Breaker 1 Pos Reached Check
Breaker 1 Synccheck Close	ON	ON	Breaker 1 Synccheck Close
Breaker 2 Function	Disabled	Disabled	Breaker 2 Function
Breaker 2 Name	Bkr 2	Bkr 2	Breaker 2 Name

## Added support for DPS and FLOAT32 data types in datasets for Process Bus Module

Workaround: None

Description: The software now allows DPS and FLOAT32 data types to be added to a Process Bus Module TxGOOSE dataset.

## Corrected Logic Designer process for conversion of FlexLogic equation inputs

Workaround: Open Logic Designer after the device conversion and execute "Auto Populate Workbook"

Description: After converting a device from version 7.80 or earlier to version 8.10, in some situations certain FlexLogic equation inputs were defaulted in diagrams even though the equations were correctly displayed in the FlexLogic Editor screen.

The new release requires users to compile their logic designer diagrams before executing the device conversion. This preliminary operation allows EnerVista UR Setup software to properly show Logic Designer diagrams in the converted device, based upon the correctly converted equations and the (now) guaranteed synchronicity between equations and diagram.

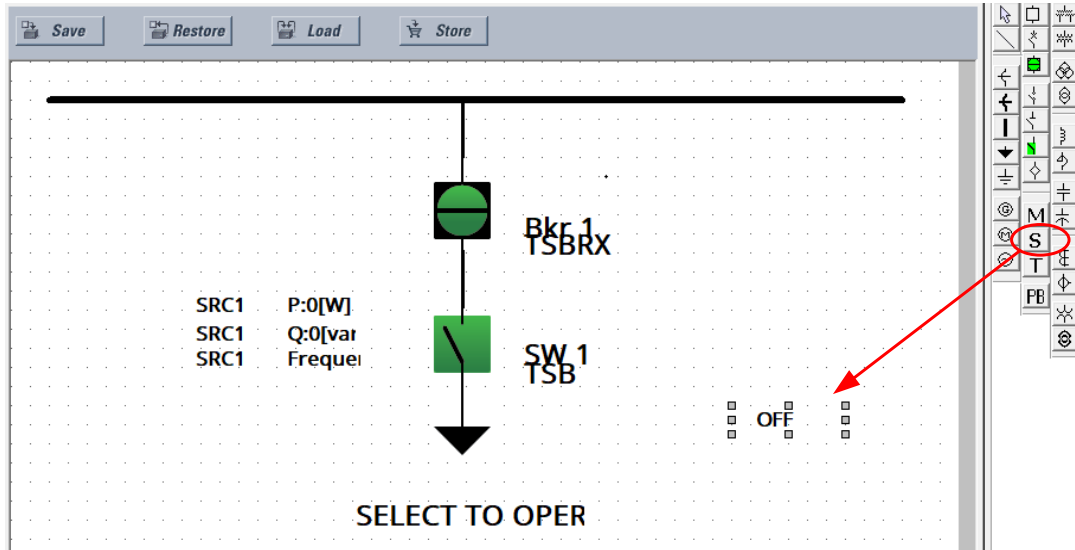
## Corrected display of Status components in single-line diagrams

Workaround: Add/edit Status components in the single-line diagram screen of an online device

Description: Users can add Status components to graphical front panel screens by using the Single Line

Diagram Editor windows in the EnerVista UR Setup software. After synchronizing these screens to the UR, the graphical front panel shows the actual status value for each of the Status components. In previous versions, this is achieved by adding/editing Status components in the single-line diagram screen of an online device, not when adding/editing the components in offline devices that were subsequently synchronized to UR.

In the new release, this configuration is included in CID files, allowing relays to show the actual status value for each of the Status components in their graphical front panel screens.



### Corrected grouping of specific FlexLogic operands for IEC 61850

Workaround: None

Description: Irrespective of DSP or Process Bus Module order codes, the IEC 61850 CONF REV and IEC 61850 TEST MODE FlexLogic operands were in the Process Bus family.

In the new release, these two operands are moved to the "Miscellaneous..." family.

### Corrected printing time of wide Logic Designer diagrams

Workaround: Wait for the sheets to print

Description: In previous versions, Logic Designer diagram sheets that are extra-wide can take more than 10 minutes each to print.

The new release avoids this behavior by processing extra-wide diagrams more efficiently.

### Improved grouping of process bus FlexLogic operands

Workaround: None

Description: In previous versions, the process bus related FlexLogic operands are not grouped under their own family.

The new release has a Process Bus family that includes operands such as RxSC Delay Alarm, RxSV On/Off/Lost, SV Trbl, Process Bus Failure, and Process Bus PTP Failure.

### Corrected windows opened with Template Mode to show the last elements

Workaround: None

Description: With Template Mode set, the scroll bar on windows does not display the last element instance -- Virtual Inputs, Virtual Outputs, Contact Inputs, Contact Outputs or Digital Elements.

The new release corrects the issue.

### **Corrected firmware version displayed after failed upgrade**

Workaround: None

Description: If a firmware upgrade operation from an earlier version to 8.0x fails for any reason, the EnerVista UR Setup environment erroneously shows that the relay's version is 8.0x.

In the new release, the version is updated only after successful firmware upgrade.

### **Corrected version 7.1x settings files being sent to 7.2x relays**

Workaround: None

Description: Version 7.1x data can corrupt 7.2x relays when sent. The software relies on its environment data to assess a relay's version, which creates the issue.

The new release corrects the issue. The software reads relay version information directly from the device before allowing data to be sent to it.

### **Corrected boot firmware upgrade to B90 devices**

Workaround: None

Description: When trying to upgrade the boot firmware for B90, EnerVista UR Setup software incorrectly rejects the file, claiming that an attempt was made to load non-B90 firmware to a B90 device.

The new release corrects the issue.

### **Corrected display of Auxiliary Undervoltage settings in Protection Summary window for B30 with IY software option**

Workaround: Use the Auxiliary Undervoltage window to open the settings

Description: For a B30 with IY software option, the "Aux UV" element settings from group 1 to group 6 are not opened from the Protection Summary window.

The new release corrects the issue.

### **Corrected software to open URS or CID when file name has space character before the extension**

Workaround: Remove the space in the file name before the extension

Description: When adding a .urs or a .cid file with a file name that contains a space character before the extension, the software reports an error with message "The File could not be accessed (write protected or access denied or ...)".

In the new release, the file can be added to EnerVista UR Setup software.

### **Corrected vertical front panel display in the software**

Workaround: None

Description: A device with vertical front panel order code (such as F60-V03-BFL-F8F-H6L-M6L-PXX) displays the horizontal front panel image in the software.

The new release corrects the issue.

### **Corrected issue when importing SCD or CID file without W1 subnetwork configuration information**

Workaround: None

Description: If a CID or SCD file has no W1 subnetwork configured, the software stops functioning on importing the file to an offline device.

In the new release, the software can import an SCD or CID file without W1 subnetwork configuration.

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## Upgrade

### Compatibility

The 8.10 firmware runs on the T, U, V, and W CPU modules. View the order code to determine the CPU module in the relay. For example, in C60-V03-HPH-H6H, the relay has a V CPU module.

The graphical front panel requires a T, U, V, or W CPU module that has two connector slots on the front of the module. One connector allows a basic or enhanced front panel to be connected, and the other connector allows a graphical front panel.

The 8.10 firmware release is not compatible with previous UR CPU hardware (CPU types A, B, D, E, G, H, J, K, N, and S).

The 8.10 firmware release requires EnerVista UR Setup software version 8.0x or higher. GE suggests use of the latest available version of the software.

### Upgrade

When upgrading both EnerVista software and UR firmware, upgrade the software first. Upgrade of the software takes about five minutes, and upgrade of firmware takes about 25 minutes. They can be done over an Ethernet connection. The USB port cannot be used for the upgrade.

When upgrading on a computer with Windows Server 2012, its Release 2 needs the KB2919355 update first. Follow the instructions described in the link, which works in Internet Explorer, not Chrome.

<https://www.microsoft.com/en-US/download/details.aspx?id=42334>

Any DSP manufactured between 1 September 2011 and 1 December 2015 with versions 7.27, 7.28, or 7.60 and up must be sent back to the factory for updates before updating the firmware. See item 728-6.

To upgrade the software:

1. If a beta version of the EnerVista UR Setup software is installed, uninstall it, for example using the Windows Control Panel.
2. Download the new software from <http://www.gegridsolutions.com/app/ViewFiles.aspx?prod=urfamily&type=7>  
The software is a .exe file.
3. Install the new software by (double-)clicking the file.
4. Refresh the order code in EnerVista under the **Device Setup** button.

To upgrade the firmware:

1. Download the firmware from <http://www.gegridsolutions.com/app/ViewFiles.aspx?prod=urfamily&type=7>  
The firmware is a .SFD file.
2. Under **Settings > Product Setup > Security > Access Supervision** or **Settings > Product Setup > Security > Supervisory**, the **Lock Firmware** setting needs to be disabled.
3. In the EnerVista software, navigate to **Maintenance > Update Firmware** and select the .SFD file.  
For any issues, see a UR instruction manual.  
When the upgrade finishes, the relay restarts.
4. Reconnect the EnerVista software to the relay and refresh the order code in EnerVista under the **Device Setup** button.
5. Convert any existing settings file, then load the converted settings to the relay. See the instruction manual

for information.

6. Set the device to "Programmed" under **Settings > Product Setup > Installation** to put it into service.
7. If you changed the **LOCK FIRMWARE** setting, reset it.



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## Categories

This document uses the following categories to classify changes.

### Revision categories

Code	Category	Description
A	Hardware change	This change may require hardware to be updated and/or replaced
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 add 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, and so on)
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 can be taken immediately
H	Hidden failure to trip	Protection does not operate when appropriate
F	False trip	Protection operates when it is not appropriate
B	Unexpected restart	Relay restarts unexpectedly

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## For further assistance

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

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