

## UR Family

# Version 7.4x

## Release Notes

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### Overview

This document contains the release notes for firmware 7.40, 7.41, 7.42 and 7.43 and software versions 7.40, 7.41, 7.42 of the Universal Relay (UR) family of products.

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

Date of release 7.40: 8 December 2016

Date of release 7.41: 31 January 2017

Date of software release 7.42: 28 April 2017

Date of firmware release 7.42: 6 June 2017

Date of firmware release 7.43: 12 December 2023

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.

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## Firmware

### Firmware 7.40

#### Summary

Improvements include the following.

- Extends the new IEC 61850 software options to the 61850 functionalities already supported by version 7.30 devices
- Conforms to IEC 61850 Edition 2
- Compatible with new COMTRADE file standard as IEEE C37.111
- Extended password complexity rules according to IEEE 1686-2013 standard
- Added Routable GOOSE (R-GOOSE)
- Added element logical nodes
- Changed several minimum settings values
- Buffered and unbuffered reports are editable
- Buffer of buffered reports stores at least 1000 state changes
- Number of clients connected is visible on front panel, in UR software, and IEC 61850 client
- Number remote devices increased to 64
- Number of RxGOOSE Booleans (remote inputs) increased to 256
- IED names and Logical Device names up to 64 characters
- Added two Phase Directional Overcurrent elements to B30, as per F60
- Increased number of FlexLogic lines to 1024
- Enhanced Synchrocheck element; increased number for C60, D60, L90, N60, T60
- Synchrocheck now a standard feature for T60
- Added settings to enable/disable Ethernet ports
- Added VT Fuse Failure element to F35
- Added Engineer to UR software for FlexLogic design and monitoring
- Added ICD/CID file viewer
- Improved import and export of settings files, added SCL file merging
  
- Bus Differential System – B90
  - Increased numbers of Direct Inputs and Outputs to 256 for B90 (requires FPGA version 02.02 or greater)
  - Corrected possible unexpected restart in B90 due to mismatch between hardware configuration and software option
  - Increased the minimum value for B90 End Fault Protection pickup setting to 0.02pu
  - Increased minimum pickup setting for all B90 Breaker Failure Current Supervision
  - Corrected when B90 Isolator 2 Alarm is active when B90 Function setting is set to Protection
  
- Capacitor Bank Protection and Control System – C70
  - Corrected C70 Voltage Differential element calculation

- Generator Protection Systems – G30, G60
  - Increased minimum value of settings in Accidental Energization element
- Line Differential System – L90
  - Added Over Excitation V/HZ to L90 with in-zone transformer software option
  - Mapped L90 current differential ground element into 87L Trip scheme
- Motor Protection System – M60
  - Corrected setting group dependency of Motor Acceleration and Undercurrent elements
- Network Stability System – N60
  - Added protection elements to N60
- Transformer Protection Systems – T35, T60
  - Enhanced transformer percent differential element with CT saturation and direction element
  - Prevented T60 Inrush Inhibit level set at less than 2% from turning 2nd Harmonic operands permanently ON
  - Corrected transducer output when configured to use GOOSE analog with a value above 2,000,000
- Common Protection and Control Elements
  - Added pilot schemes POTT3 and DCB3 in F60
  - Increased number of Synchrocheck elements to 10 in C60, D60, L90
  - Improved breaker control logic with a BREAKER X OPEN SEAL-IN TIME
  - Modified Ground Distance current supervision
  - Enhanced Synchrocheck element
  - Enhanced Breaker Arcing Current element
  - Enhanced Fault Location element
  - Changed Breaker Arcing Current element with individual timers for each phase
  - Corrected unexpected 1-P Autoreclose lockout in AR “Protection Only” mode
  - Corrected Thermal Overload Protection operation when the pre-fault current is very close to the base current pickup
  - Corrected operation of Volts/Hz element with definite time
  - Corrected echo logic in the 1P POTT pilot scheme
  - Corrected RxGOOSE analogs not using RxGOOSE analogs pu base in FlexElements
  - Corrected operation of FlexElement in Delta mode when setting “FlexElement dt” is above 500 ms
  - Increased minimum values for several settings
- Common Platform Functions
  - Increased number of FlexLogic Entries from 512 to 1024
  - Changed name of “Disabled” option to “Normal” for Forcing Contact Input/Output
  - Added new FlexLogic operands for Contact Outputs
  - Updated firmware to store .FLE file to support UR Engineer
  - Added COMTRADE C37.111-2013 standard for COMTRADE files
  - Corrected behavior of front panel “Test Mode” LED for a relay in test mode and no contact I/O modules
  - Fixed message displayed during firmware upgrade
  - Increased source name fields to 20 characters
  - Added a name field to the UR latches
  - Added a name field for User-Programmable Pushbuttons
  - Added a name field for Control Pushbuttons

- Increased length of ID fields to 20 characters
- Corrected number of remaining SFTP connections
- Events and Records
  - Increased the number of events in the Security Events log to 1024
- Cyber Security
  - Added events “Authentication Failed” and “User Lockout” to security events file in relays with CyberSentry
  - Added setting to enable/disable each Ethernet port
  - Added “SETTING CHANGED” FlexLogic operand to indicate that a setting has been changed
  - Added front panel indication when SSH keys are recalculated
  - Corrected issue where Observer logout disconnects all other Observer instances and locks out further (Observer) logins
  - Corrected security events for role login/out over serial communications
  - Corrected recording of duplicate “Observer role logon” events after restarting the relay
  - Corrected IP address recorded in security events for remote login over Ethernet
  - Corrected security events recorded for local Administrator role
- Communications
  - Removed the MMS IP Port Number setting
  - Added setting to select local or UTC event time for SCADA protocols (DNP, IEC 60870-5-103, IEC 60870-5-104)
  - Blocked clock synchronization by communication protocols (DNP, IEC 60870-5-103, IEC 60870-5-104) if IRIG-B is active
  - Enhanced mapping of relay functionality to IEC 61850 logical nodes
  - Fixed firmware to accept CID file with two RxGOOSE with same dataset in E3 mode
  - Corrected error responses for unsuccessful IEC 61850 breaker or disconnect switch control
  - Preserved Private section and third-party elements in an IEC 61850 CID file
  - Corrected IEC 61850 DPS input default state
  - Fixed firmware to reject IEC 61850 CID file if the GSE MAC-Address is not multicast
  - Added setting for when relay drops connection if set to produce only IEC 61850 reports without polling from client
  - Removed limitation on number of IEC 61850 CID files with different names that can be sent to the relay
  - Corrected relay response for IEC 61850 breaker or disconnect switch controls with enhanced security
  - Corrected IEC 61850 attribute LPHD1.Sim.stVal when simulated GOOSE is being processed
  - Corrected L90 IEC 61850 line differential logical node when in-zone transformer software option is not present
  - Corrected error messages in case of failure of IEC 61850 service SelectActiveSG
  - Fixed firmware to accept two RxGOOSE with same dataset in E3 mode
  - Corrected first GOOSE message SqNum and StNum at power-up
  - Added “Push buttons only” option for Bypass Access setting in relays with CyberSentry software option
  - Corrected potential unexpected restart at bootup in relays using IEC 60870-5-104
  - Fixed issue where a relay with IEEE 1588 software option displays a different clock accuracy for Power Profile compared to standard PTP, for the same source
  - Changed GOOSE and report data scanning optimization
  - Added modes to IEC 61850 reports configuration

- Corrected issue where changing all three network IP addresses of the relay defaults all IEC 61850 configured GSE values
- Updated IEC 61850 Oscillatory GOOSE functionality to include any binary item in a dataset
- Corrected relay to trigger IEC 61850 unbuffered reports every protection pass (2 ms)
- Corrected deadband calculations for IEC 61850 sensitive directional power logical node
- Updated firmware to allow IEC 61850 report ID of up to 129 characters
- Fixed updating of IEC 61850 paramRev and Last Settings Change Date
- Fixed Phase Neutral current deadband calculations to use correct CT ratio
- Decreased default analog deadband values when using IEC 61850
- Fixed relay with no CID file to no longer record message in log file about loading ICD file
- Corrected number of available Modbus connections when DNP channels are set to NETWORK – TCP
- Corrected IEC 60870-5-104 IV (valid/invalid) bit in timestamp
- Prevented high CPU usage when transferring IEC 61850 CID files using SFTP
- Corrected firmware to not accept IEEE 1588 announce messages with currentUtcOffsetValid bit set as false
- Corrected issues with HardFiber contact inputs
- Phasor Measurement Unit (PMU) - Synchrophasors
  - Added event “PMU Record Triggered” whenever a PMU record is triggered
- Transducer Inputs and Outputs
  - Fixed DCmA input metering intermittent failure

## Bus Differential System – B90

### **E Increased numbers of Direct Inputs and Outputs to 256 for B90 (requires FPGA version 02.02 or greater)**

Products: B90

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: In release 7.40, the B90 supports 256 Direct Inputs and 256 Direct Outputs, up from 96. This feature requires FPGA binary version 02.02 or greater. The FPGA binary version can be checked from the front panel or EnerVista software (**ACTUAL VALUES > PRODUCT INFO > FIRMWARE REVISIONS > FPGA PROGRAM REVISION**). For instructions on how to upgrade the FPGA, contact GE customer support by email at [multilin.tech@ge.com](mailto:multilin.tech@ge.com) or visit the web site <http://www.gegridsolutions.com/multilin/support.aspx>. This feature also requires the use of a communication module that supports 213 kbps. For the list of communication modules that support 213 kbps, see the B90 instruction manual.  
GE tracking number: 740-46

### **B Corrected possible unexpected restart in B90 due to mismatch between hardware configuration and software option**

Products: B90

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Update hardware configuration to match software option

Description: Certain hardware (CT terminals) and software options combinations can cause an unexpected restart. The software option (number of feeders) in the B90 does not match the hardware in the order code, and in this case the number of CT banks.

Release 7.40 fixes the issue. The B90 element instantiation rules have been changed, so that in case of a mismatch between the number of feeders software option and the actual hardware, the relay prevents an unexpected restart and triggers a minor self-test message indicating hardware/order code mismatch.  
GE tracking number: 740-15, 732-1

**G Increased the minimum value for B90 End Fault Protection pickup setting to 0.02pu**

Products: B90

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: In previous versions, the B90 End Fault Protection element CT has 0 as minimum value for the setting EFP Pickup, as set under **Settings > Grouped Elements > Setting Group > End Fault Protection**.

The new release increases the minimum value to 0.020 pu.

GE tracking number: 740-72

**G Increased minimum pickup setting for all B90 Breaker Failure Current Supervision**

Products: B90

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: In previous versions, the minimum pickup value for the following B90 Breaker Failure Current Supervision settings is 0.001 pu:

BF AMP SUPV PICKUP

BF AMP HISET PICKUP

BF AMP LOSET PICKUP

as set under **Settings > Grouped Elements > Setting Group, Breaker Failure**.

The new release increases the minimum value to 0.020 pu.

GE tracking number: 740-73

**D Corrected when B90 Isolator 2 Alarm is active when B90 Function setting is set to Protection**

Products: B90

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: If isolator 2 is enabled and a contact discrepancy is detected, the ISOLATOR 2 ALARM is turned on even when the "B90 Function" setting is set to Protection.

The new release fixes the issue.

GE tracking number: 740-94

## Capacitor Bank Protection and Control System – C70

**C Corrected C70 Voltage Differential element calculation**

Products: C70

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Enter the K factor manually

Description: The 87V element does not calculate K factors correctly, when K factor is close to 1 or below 1.

The new release fixes the issue.

GE tracking number: 740-18

## Generator Protection Systems – G30, G60

### **G Increased minimum value of settings in Accidental Energization element**

Products: G30, G60

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: The Accidental Energization element has the following minimum values for the following elements:

“ACCDNT ENRG OC PICKUP” is 0

“ACCDNT ENRG UV PICKUP” is 0

The new release increases the minimum values of the settings as follows:

“ACCDNT ENRG OC PICKUP” is 0.020 pu

“ACCDNT ENRG UV PICKUP” is 0.004 pu

GE tracking number: 740-71

## Line Differential System – L90

### **E Added Over Excitation V/HZ to L90 with in-zone transformer software option**

Products: L90

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: With release 7.40, the L90 includes the over excitation V/Hz element when the in-zone transformer software option is ordered.

GE tracking number: 740-43

### **E Mapped L90 current differential ground element into 87L Trip scheme**

Products: L90

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: In previous releases, all 87L trip operands are hard-wired into 87L Trip element to facilitate 1P or 3P tripping. However, the ground differential operand 87LG is not part of the scheme. That is, the line differential ground element is not mapped into the 87L Trip scheme, forcing customers to create external logic in a 1-pole tripping applications or when disturbance detection supervision is required.

In the new release, ground differential is mapped into the 87L Trip scheme, allowing ground differential to operate either in a 1-pole or 3-pole tripping mode and be supervised by the dedicated 50DD SV 87LG disturbance detector operand.

GE tracking number: 740-107

## Motor Protection System – M60

### **P Corrected setting group dependency of Motor Acceleration and Undercurrent elements**

Products: M60

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The Motor Acceleration and Undercurrent elements do not handle settings group changes correctly.

The new release fixes the issue.

GE tracking number: 740-1

## Network Stability System – N60

### **N Added protection elements to N60**

Products: N60

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: Release 7.40 adds the following protection elements to N60: Phase TOC, Phase Directional, Neutral TOC, Neutral IOC, Neutral Directional Overcurrent, Ground TOC, Ground IOC, and CT Fail.

GE tracking number: 740-33

## Transformer Protection Systems – T35, T60

### **E Enhanced transformer percent differential element with CT saturation and direction element**

Products: All with transformer percent differential - G30, T35, T60

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: CT saturation detection and associated directional element are added to transformer differential protection to enhance security and also ease CT requirements for the transformer differential element. This addition allows saturation detection during an external fault within at least 3 ms from fault inception and relies on the directional principle to provide tripping in case the fault evolves from external to internal.

GE tracking number: 740-38

### **E Prevented T60 Inrush Inhibit level set at less than 2% from turning 2nd Harmonic operands permanently ON**

Products: T60

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: In previous releases, when the T60 Inrush Inhibit Mode is either Per Phase or 2-out of-3 and Inrush Inhibit level is set to less than 2%, it is possible to have 2nd Harmonic operands permanently ON after a 2nd Harmonic PKP – even if all signals are removed.

In the new release, the 2<sup>nd</sup> Harmonic operands are not set permanently to ON.

GE tracking number: 740-52

### **P Corrected transducer output when configured to use GOOSE analog with a value above 2,000,000**

Products: All with the IEC 61850 software option and DCmA outputs

Impacted firmware: All to 7.32



Corrected firmware: 7.40

Workaround: None

Description: The transducer output does not work correctly if DCmA Output is configured to use a GOOSE analog value with a value higher than two million.

The new release fixes the issue.

GE tracking number: 740-66

## Common Protection and Control Elements

### **N Added pilot schemes POTT3 and DCB3 in F60**

Products: F60

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: A directional comparison blocking scheme (DCB3) and a permissive transfer tripping scheme (POTT3) operating in a 3-pole tripping mode are added in F60.

GE tracking number: 740-4

### **N Increased number of Synchrocheck elements to 10 in C60, D60, L90**

Products: C60, D60, L90

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: In previous releases, there are four Synchrocheck elements for C60, D60, and L90.

In the new release, the number is increased to 10 for these products to allow additional flexibility for customers requiring seasonal or conditional control of Synchrocheck settings.

GE tracking number: 740-34

### **E Improved breaker control logic with a BREAKER X OPEN SEAL-IN TIME**

Products: B30, C30, C60, C70, D30, D60, F35, F60, G30, G60, L30, L60, L90, M60, N60, T35, T60

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Instead of assigning Breaker X Trip A/B/C operands directly to contact outputs, use FlexLogic virtual outputs where these operands can be OR-ed with a human machine interface (HMI) or communications inputs.

Description: Breaker Trip A/B/C operands are not activated from the front panel pushbutton or from BREAKER 1/2 OPEN setting or via IEC 61850 schema, which deviated from the Breaker Control logic diagram. If Breaker Trip A/B/C operands are assigned directly to Contact Outputs, above mentioned initiations do not operate contact outputs.

The new release fixes the issue. Breaker Trip A/B/C operands are activated not from TRIP PHASE A/B/C/3-POLE protection operands only but from front panel initiations too. A new BREAKER X OPEN SEAL-IN TIME setting is added to ensure even short breaker open command goes through to open the breaker.

GE tracking number: 740-17

### **E Modified Ground Distance current supervision**

Products: D30, D60, L60, L90, T60

Impacted firmware: 5.7 through 7.32

Corrected firmware: 7.40

Workaround: For single-pole applications, use Open Pole element, which ensures reset from seal-in

Description: Prior to this release, the pickup (GND DIST PKP) operand is correctly supervised by both neutral and phase OC, but the operate (GND DIST OP) operand is supervised by neutral OC only. In the new release, current supervision logic in the ground distance elements is modified to include both neutral and phase current supervision for both pickup and operate operands. There are three new FlexLogic operands in ground distance elements GND DIST Zn SUPN IA, GND DIST Zn SUPN IB, and GND DIST Zn SUPN IC are additionally added.  
GE tracking number: 740-45

**E Enhanced Synchrocheck element**

Products: C60, D30, D60, F60, G30, G60, L30, L60, L90, N60, T60

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: With release 7.40, the dynamic mode of synchrocheck is added. The angle difference between V1 and V2 is projected based on the slip frequency and the breaker closing time so that the breaker close command can be issued in advance (by taking into account the breaker close time) to ensure the V1 and V2 synchronism at the time when the breaker is actually closed.

GE tracking number: 740-47

**E Enhanced Breaker Arcing Current element**

Products: B30, C60, C70, D30, D60, F35, F60, G30, G60, L30, L60, L90, M60, N60, T60

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: In release 7.40, the accumulated arcing amps values can be reset by FlexLogic operands. The logic to check if the maximum current exceeds the breaker interruption rating and the associated metering values for this logic are added.

The  $I^2 \cdot t$  values integrated over the last event duration for each phase are added.

GE tracking number: 740-49

**E Enhanced Fault Location element**

Products: C60, D30, D60, F35, F60, L30, L60, L90

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: In release 7.40, accuracy of the fault locator is improved by applying sanity checks and averaging.

The fault locator is enhanced to take mutual coupling effect into account when the relay is applied on the parallel lines to increase fault location accuracy during faults.

The fault loop impedance during fault is now measured and recorded in the fault report.

The L90 multi-ended fault locator now reports fault resistance.

GE tracking number: 740-50

**E Changed Breaker Arcing Current element with individual timers for each phase**

Products: B30, C60, C70, D30, D60, F35, F60, G30, G60, L30, L60, L90, M60, T35, T60

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: Added the following functions:

- Individual delay and integration timers for each phase
- Individual state machine states for each phase
- Seal-in feature for the delay timers for each phase

GE tracking number: 740-60

**E Corrected unexpected 1-P Autoreclose lockout in AR "Protection Only" mode**

Products: C60, D60, L60, L90

Impacted firmware: 5.6 to 7.32

Corrected firmware: 7.40

Workaround: None

Description: Autoreclose can lock out in the "Protection Only" mode when Breaker Close timer is set too short.

The new release prevents lockout by resetting Latch before Close Breaker command 20 ms after Open Pole is declared regardless of the Breaker Close timer.

GE tracking number: 740-28

**P Corrected Thermal Overload Protection operation when the pre-fault current is very close to the base current pickup**

Products: All with Thermal Overload Protection - B30, C60, C70, D30, D60, F35, F60, G30, G60, L30, L60, L90, N60, T35, T60

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The Thermal Overload Protection element operates much faster than expected when the pre-fault current is very close to the base current pickup value.

The new release fixes the issue.

GE tracking number: 740-2

**P Corrected operation of Volts/Hz element with definite time**

Products: G30, G60, L90, T60

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The Volts/Hz element with a small definite time setting (for example 0.05TD) can assert pickup and operate operands at the same time.

The new release fixes the issue.

GE tracking number: 740-5

**P Corrected echo logic in the 1P POTT pilot scheme**

Products: All with the IEC 61850 software option

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Adding an MMS client that polls for data prevents the issue.

Description: In the one-pole POTT pilot scheme, if the Permissive RX signal is continuously ON, the echo signal oscillates (echo signal is repeated following ECHO DURATION and ECHO DURATION settings timers).

The new release fixes the issue. Echoed logic is modified so that the received RX signal is echoed once only with a settable duration and a lockout period.

GE tracking number: 740-12

**P Corrected RxGOOSE analogs not using RxGOOSE analogs pu base in FlexElements**

Products: All with the IEC 61850 software option

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: When using RxGOOSE analogs in FlexElements, the relay is not correctly using the RxGOOSE Analog pu base.

The new release fixes the issue.

GE tracking number: 740-63

**P Corrected operation of FlexElement in Delta mode when setting "FlexElement dt" is above 500 ms**

Products: All

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: In previous versions, the relay does not accurately measure the time set by the FlexElement setting "FlexElement dt" in Delta mode when this setting is higher than 500 ms.

Release 7.40 fixes the issue and the FlexElement operates correctly in Delta mode for "FlexElement dt" values above 500 ms.

GE tracking number: 740-70

**G Increased minimum values for several settings**

Products: B30, B90, C60, C70, D30, D60, F35, F60, G30, G60, L30, L60, L90, M60, N60, T35, T60

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: Minimum settings are increased as outlined in the table.

Element	Setting	Old minimum setting	New minimum setting	Note
CT Fail	CT FAIL 310 INP 1 PKP	0 pu	0.1 pu	<b>Settings &gt; Control Elements &gt; Monitoring Elements &gt; CT Failure Detector</b>
	CT FAIL 310 INP 2 PKP	0 pu	0.1 pu	
	CT FAIL 3V0 INPUT PKP	0 pu	0.04 pu	
Open Pole Detect	Open Pole Current Pickup	0 pu	0.020 pu	<b>Settings &gt; Control Elements &gt; Monitoring Elements &gt; Open Pole</b>
	Open Pole REM Current Pickup	0 pu	0.020 pu	
VT Fuse Failure	Neutral Wire Open 3rd Harmonic Pickup	0 pu	0.004 pu	<b>Settings &gt; Control Elements &gt; Monitoring Elements &gt; VT Fuse Failure</b>
Breaker Failure	BF PH AMP SUPV PICKUP	0 pu	0.02 pu	<b>Settings &gt; Grouped Elements &gt; Setting Group &gt; Breaker Failure &gt; Breaker Failure</b>
	BF N AMP SUPV PICKUP	0 pu	0.02 pu	
	BF PH AMP HISET PICKUP	0 pu	0.02 pu	
	BF N AMP HISET PICKUP	0 pu	0.02 pu	
	BF PH AMP LOSET PICKUP	0 pu	0.02 pu	
	BF N AMP LOSET PICKUP	0 pu	0.02 pu	
Breaker Flashover	V Pickup	0 pu	0.004 pu	<b>Settings &gt; Control Elements &gt; Monitoring Elements &gt; Breaker Flashover</b>
	Amp Pickup	0 pu	0.020 pu	

Element	Setting	Old minimum setting	New minimum setting	Note
Synchrocheck	SYNCHK DEAD V1 MAX VOLT	0 pu	0.04 pu	<b>Settings &gt; Control Elements &gt; Synchrocheck &gt; Synchrocheck</b>
	SYNCHK DEAD V2 MAX VOLT	0 pu	0.04 pu	
	SYNCHK LIVE V1 MIN VOLT	0 pu	0.04 pu	
	SYNCHK LIVE V2 MIN VOLT	0 pu	0.04 pu	
Phase Directional Overcurrent	Pol V Threshold	0 pu	0.004 pu	<b>Settings &gt; Grouped Elements &gt; Setting Group &gt; Phase Current &gt; Phase Directional</b>
Load Encroachment	Minimum voltage	0 pu	0.004 pu	<b>Settings &gt; Grouped Elements &gt; Setting Group &gt; Load Encroachment</b>
Phase Overvoltage, Neutral Overvoltage, Negative Sequence Overvoltage, Auxiliary Overvoltage	PHASE OV PICKUP	0 pu	0.004 pu	
	NEUTRAL OV PICKUP	0 pu	0.004 pu	
	NEG SEQ OV PICKUP	0 pu	0.004 pu	
	AUX OV PICKUP	0 pu	0.004 pu	
Phase Undervoltage, Neutral Undervoltage, Negative Sequence Undervoltage, Auxiliary Undervoltage	PHASE UV PICKUP	0 pu	0.004 pu	
	NEUTRAL UV PICKUP	0 pu	0.004 pu	
	NEG SEQ UV PICKUP	0 pu	0.004 pu	
	AUX UV PICKUP	0 pu	0.004 pu	
Frequency Rate of Change	FREQ RATE OC SUPV PICKUP	0 pu	0.02 pu	<b>Settings &gt; Control Elements &gt; Frequency Rate of Change &gt; Frequency Rate of Change</b>
Line Pickup	PHASE IOC LINE PICKUP LINE PICKUP UV PKP	0.020 pu	0.004 pu	<b>Settings &gt; Grouped Elements &gt; Setting Group &gt; Line Pickup</b>
B90 Time Overcurrent, B90 Instantaneous Overcurrent	TOC PICKUP IOC PICKUP	0 pu 0 pu	0.02 pu 0.02 pu	<b>Settings &gt; Grouped Elements &gt; Setting Group &gt; Current Elements</b>
Instantaneous Overcurrent, Time Overcurrent	PHASE IOC PICKUP NEUTRAL IOC PICKUP NEG SEQ IOC PICKUP GROUND IOC PICKUP PHASE TOC PICKUP NEUTRAL TOC PICKUP NEG SEQ TOC PICKUP GROUND TOC PICKUP	0 pu 0 pu 0 pu 0 pu 0 pu 0 pu 0 pu 0 pu	0.020 pu 0.020 pu 0.020 pu 0.020 pu 0.020 pu 0.020 pu 0.020 pu 0.020 pu	If the relay has a sensitive ground DSP, the minimum value is 0.002 pu

GE tracking number: 740-74

## Common Platform Functions

### **E Increased number of FlexLogic Entries from 512 to 1024**

Products: All

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: The number of FlexLogic entries is increased from 512 to 1024.

GE tracking number: 740-37

### **E Extended password complexity rules according to IEEE 1686-2013 standard**

Products: All (with or without CyberSentry software option)

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: In previous versions, passwords have the following rules:

1. Passwords are between 6 and 20 characters long.
2. Passwords contain characters from three of the following four categories:
  - a) English upper case letters (A through Z)
  - b) English lowercase characters (a through z)
  - c) Base 10 digits (0 through 9)
  - d) Non-alphabetic characters (for example, !, \$, #, %)

In release 7.40, the password rules are extended as follows:

1. Password length is between 8 and 20 characters
2. Passwords must contain characters from all four categories above

GE tracking number: 740-30

### **E Changed name of "Disabled" option to "Normal" for Forcing Contact Input/Output**

Products: All

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: In previous versions, the first enumeration value for the "Force Contact Input", "Force Contact Output" setting, under the Testing menu, is "Disabled."

In the new release, this value is renamed "Normal" for clarity.

GE tracking number: 740-39

### **E Added new FlexLogic operands for Contact Outputs**

Products: All

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: A new FlexLogic operand "Contact Op X On" is added to indicate that a contact output is closed.

GE tracking number: 740-40

- E Updated firmware to store .FLE file to support UR Engineer**  
Products: All  
Impacted firmware: All to 7.32  
Corrected firmware: 7.40  
Workaround: Not applicable  
Description: The relay now stores the .FLE file to support UR Engineer, which was integrated with the UR in release 7.40.  
GE tracking number: 740-42
- E Added COMTRADE C37.111-2013 standard for COMTRADE files**  
Products: All  
Impacted firmware: All to 7.32  
Corrected firmware: 7.40  
Workaround: Not applicable  
Description: The products support the C37.111-1999 file format. In release 7.40, the user can choose between the 1999 and 2013 COMTRADE file format (oscillography, datalogger, PMU records).  
GE tracking number: 740-48
- D Corrected behavior of front panel "Test Mode" LED for a relay in test mode and no contact I/O modules**  
Products: All  
Impacted firmware: 7.30 to 7.32  
Corrected firmware: 7.40  
Workaround: None  
Description: The front panel "Test Mode" LED does not turn on if the relay is in Test Mode and does not have any contact I/O modules.  
The new release fixes the issue.  
GE tracking number: 740-21
- B Fixed message displayed during firmware upgrade**  
Products: All  
Impacted firmware: 7.30 to 7.32  
Corrected firmware: 7.40  
Workaround: None  
Description: The relay can display "System Exception" after rebooting at the end of a firmware upgrade.  
The new release fixes the issue. The "UR Rebooting" message displays as expected.  
GE tracking number: 740-23
- G Increased source name fields to 20 characters**  
Products: All  
Impacted firmware: All to 7.32  
Corrected firmware: 7.40  
Workaround: None  
Description: In previous releases, the source name fields are limited to six characters.  
In the new release, each source name can be up to 20 characters, as set under **Settings > System Setup > Signal Sources > Source**.  
GE tracking number: 740-56

### **G Added a name field to the UR latches**

Products: All

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: In previous versions, the UR latches have a hard-coded name (Latch 1, Latch 2, and so on).

In the new release, a 20 character ID field is added to the UR latches, as set under **Settings > FlexLogic > Non-Volatile Latches > Latch**.

GE tracking number: 740-57

### **G Added a name field for User-Programmable Pushbuttons**

Products: All

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: In previous releases, the user programmable pushbuttons do not have a name field in use in events and FlexLogic.

In the new release, the 20 character "Top Text" setting is used as a name field for the user-programmable pushbuttons in events and FlexLogic.

GE tracking number: 740-58

### **G Added a name field for Control Pushbuttons**

Products: All

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: In previous releases, the control pushbuttons do not have a name field.

In the new release, the 20 character ID setting is used as a name field for the control pushbuttons, as set under **Settings > Product Setup > Control Pushbuttons > Control Pushbutton**.

GE tracking number: 740-59

### **G Increased length of ID fields to 20 characters**

Products: All

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Use 12 characters

Description: In previous releases, the ID fields of the following settings are limited to 12 characters:

Virtual Input ID, Virtual Output ID, Contact Input ID, Contact Output ID, Field Contact Input ID, Field Contact Output ID, Field Latching Outputs ID, Field Shared Inputs ID, Field Shared Outputs ID, Remote Inputs ID, and Remote Double-Point Status Inputs ID.

In the new release, these ID fields are increased to 20 characters. That is, up to 20 characters can be used.

GE tracking number: 740-61

### **G Corrected number of remaining SFTP connections**

Products: All

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The number of remaining SFTP connections displayed in **Actual Values > Status > Comm**



**Status Remaining Connect** miscounts, then stays at 0.

The new release fixes the issue and the correct number of remaining SFTP connections displays.

GE tracking number: 740-62

## Events and Records

### **E Increased the number of events in the Security Events log to 1024**

Products: All with CyberSentry software option

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: In previous releases, the number of security events in the security\_events.csv file is limited to 10.

The new release increases the number to 1024.

GE tracking number: 740-51

## Cyber Security

### **N Added events "Authentication Failed" and "User Lockout" to security events file in relays with CyberSentry**

Products: All with the CyberSentry software option

Impacted firmware: 7.00 to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: In the new release, the relay records Authentication Failed and User Lockout events in the security events file. Previous releases do not have the feature.

GE tracking number: 740-97

### **E Added setting to enable/disable each Ethernet port**

Products: All

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: A new setting for each Ethernet port is added that enables/disables the respective port.

GE tracking number: 740-41

### **E Added "SETTING CHANGED" FlexLogic operand to indicate that a setting has been changed**

Products: All

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: In compliance with NERC Standard PRC-005-2, UR relays now alarm on any setting change. A new "SETTING CHANGED" FlexLogic operand has been added, which is associated with any setting change. This operand is turned on for at least one second upon any setting change and then self-resets.

GE tracking number: 740-101

- D Added front panel indication when SSH keys are recalculated**  
Products: All with the CyberSentry software option  
Impacted firmware: All to 7.32  
Corrected firmware: 7.40  
Workaround: Not applicable  
Description: When there are no SSH keys in non-volatile storage, for example after defaulting the settings with service command 20511, the relay recalculates the SSH keys at startup.  
In the new release, the relay displays "Init Security.." on the front panel LCD while it is generating the new SSH keys.  
GE tracking number: 740-16
- R Corrected issue where Observer logout disconnects all other Observer instances and locks out further (Observer) logins**  
Products: All with the CyberSentry software option  
Impacted firmware: 7.00 to 7.25  
Corrected firmware: 7.40  
Workaround: None  
Description: The UR relay allows for concurrent access of Observer roles, however when one instance disconnects, all the other instances also disconnect. Further logins or Observer logins are blocked depending on the firmware version.  
The new release fixes the issue.  
GE tracking number: 740-102
- R Corrected security events for role login/out over serial communications**  
Products: All with the CyberSentry software option  
Impacted firmware: 7.00 to 7.25, 7.30, 7.31  
Corrected firmware: 7.26, 7.32, 7.40  
Workaround: None  
Description: No security events are generated for any role for login/logout events over serial interface. And in the security events file, the user name field is blank when using the serial interface.  
The new releases fix the issues.  
GE tracking number: 740-103
- R Corrected recording of duplicate "Observer role logon" events after restarting the relay**  
Products: All with the CyberSentry software option  
Impacted firmware: 7.00 to 7.25, 7.30, 7.31  
Corrected firmware: 7.26, 7.32, 7.40  
Workaround: None  
Description: Restarting the relay generates duplicate events of "observer role logon" in the security events file.  
The new releases fix the issue.  
GE tracking number: 740-104
- R Corrected IP address recorded in security events for remote login over Ethernet**  
Products: All with the CyberSentry software option  
Impacted firmware: 7.00 to 7.32  
Corrected firmware: 7.40  
Workaround: None  
Description: If a role logs in remotely over Ethernet, its IP address is not recorded correctly in the security

events record (Security\_Events.csv file) and is recorded as 0.0.0.0.

The new release fixes the issue.

GE tracking number: 740-105

#### **R Corrected security events recorded for local Administrator role**

Products: All with the CyberSentry software option

Impacted firmware: 7.00 to 7.25, 7.30, 7.31

Corrected firmware: 7.26, 7.32, 7.40

Workaround: None

Description: The security events for the local Administrator role displays truncated role name "Administra" and the incorrect IP address in the Security\_Events.csv log.

The new releases fix the issues.

GE tracking number: 740-106

## **Communications**

#### **N Added Routable GOOSE**

Products: All with the IEC 61850 software option

Impacted firmware: All to 7.33

Corrected firmware: 7.40

Workaround: Not applicable

Description: The new release adds Routable GOOSE, which allows UR and other devices to be located on separate networks. Encryption/decryption of messages is performed by a separate gateway device. Messages are routed using a separate router, using IP addresses.

GE tracking number: 740-11

#### **E Improved features related to IEC 61850 edition 2**

Products: All with the IEC 61850 software option

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: Several improvements and changes are made, including the following:

- Increased number of TxGOOSE from 8 to 16, fast GOOSE from two to four, slow GOOSE from 6 to 12
- Increased number of configurable logical devices from 6 to 16
- Increased number of remote inputs for GOOSE from 128 to 256
- Increased number of datasets used by a report from 4 to 6
- Increased number of buffered report control blocks (BRCBs) from 20 to 30
- Increased number of unbuffered report control blocks (URCBs) from 14 to 18
- Supported structured data objects in RxGOOSE
- Buffer of BRCB stores at least 1000 state changes

GE tracking number: 740-68

#### **E Removed the MMS IP Port Number setting**

Products: All with the IEC 61850 software option

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: In previous versions, the relays supports an MMS IP Port Number setting for IEC 61850 operation, specifically IEC/MMS TCP PORT NUMBER.

In the new release, this setting is removed.

GE tracking number: 740-44

**E Added setting to select local or UTC event time for SCADA protocols (DNP, IEC 60870-5-103, IEC 60870-5-104)**

Products: All

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: A new setting is added for the DNP, IEC 60870-5-103, and IEC 60870-5-104 protocols, to enable selection between local time and UTC for the event time. The setting is DNP EVENT TIME BASE under **Settings > Product Setup > Communications > DNP Protocol**.

GE tracking number: 740-53

**E Blocked clock synchronization by communication protocols (DNP, IEC 60870-5-103, IEC 60870-5-104) if IRIG-B is active**

Products: All with the IEC 61850 software option

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: In previous releases, clock synchronization by communications protocols is allowed even when a clock synchronization source with higher accuracy is available, for example IRIG-B.

In the new release, if IRIG-B is enabled and active, clock synchronization by communication protocols (DNP, IEC 60870-5-103, IEC 60870-5-104) is blocked. Clock synchronization from the front panel and over Modbus is always enabled.

GE tracking number: 740-54

**E Enhanced mapping of relay functionality to IEC 61850 logical nodes**

Products: All with the IEC 60870-5-104 software option

Impacted firmware: 7.30 to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The relay functionality is partially mapped to IEC 61850 logical nodes.

In the new release, updates and additions include the following:

Harmonics & THD metering (HThd)

100% Stator Ground (Statr)

8 Bit Comparator

8 Bit Switch (Sw8bit)

87L Composite Voltages (VComp)

Accidental Energization (AcdEnr)

Amp Unbalance (AmpUnb)

Automatic Voltage Regulator (Avr)

B90 Instantaneous Overcurrent (B\_loc)

B90 Time Overcurrent (B\_Toc)

Breaker Arcing Current (CBArc)

Breaker Flashover (FlshOv)

Breaker Restrike (BkrRtk)

Broken Conductor Detection (BknCnd)  
Broken Rotor Bar (BknRot)  
Cap Bank Phase Overvoltage (CPhOv)  
Capacitor Control (CapCtl)  
Cold Load Pickup (Cold)  
Compensated Overvoltage (CompOv)  
Continuous Monitor (CnMntr)  
Control Push Buttons (CtlPsh)  
CT Fail Detector (CtFail)  
CT Trouble (CtTb)  
Demand Metering (DmdMtr)  
Digital Counters (DigCnt)  
Digitizer  
Directional Comparison Blocking<sup>3</sup> (DCB<sup>3</sup>)  
Permissive Over-reaching Transfer Trip<sup>3</sup> (POTT<sup>3</sup>)  
Field Contact Inputs (FCIn)  
Field Contact Outputs (FCOut)  
Field Current (FldAmp)  
Field Ground (FldGnd)  
Field Latching Outputs (FLOut)  
Field RTDs (FRTDs)  
Field Shared Inputs (FShIn)  
Field Shared Outputs (FShOut)  
Field Transducers (FTDRs)  
Field Units (FUnit)  
Frequency Out-of-band Accumulation (HzBnd)  
Front Panel LEDs (LEDs)  
Generator Unbalance (GnUnb)  
High Impedance Fault Detection (HiZ)  
Incipient Cable Fault (ICFlt)  
Load Encroachment (LodEnc)  
Loss of Excitation (LosExt)  
Maximum Starting Rate (StrRte)  
Mechanical Jam (MecJam)  
Motor Acceleration Time (MAccTm)  
Motor Thermal Model (MotThm)  
Neutral Current Unbalance (NeAUn)  
Neutral Voltage Unbalance (NuVUn)  
Phase Comparison (PhCmp)  
Phase Current Unbalance (PhAUn)  
Phase Select (PhSel)  
PID Regulator (PIDReg)  
Power System (LPHD1)  
Real Time Clock (TmClk)  
Reduced Voltage Start (LoVStr)  
Restart Delay (StrDI)  
RRTD Protection (RRTDs)

RTD Protection (PRTDs)  
Security (Sec)  
Speed2 Motor Acceleration Time (S2AcTm)  
Split Phase (SpltPh)  
Sub Harmonic Stator Ground (SubHa)  
Target Resetting (TgtRs)  
Third Harmonic Neutral Undervoltage (Ha3NUV)  
Time Between Starts (TmBtwn)  
Time of Day Timer (TmDay)  
Transducer IO DCmA Inputs (TDCIn)  
Transducer IO DCmA Outputs (TDCOut)  
Transducer IO RTDs (TRTDs)  
Undercurrent (UnCur)  
UnderPower (UnPwr)  
User Definable Displays (UsrDs)  
User Programmable Fault Report (UFlt)  
User Programmable Push Buttons (UsrPb)  
Voltage Differential (VDif)  
GE tracking number: 740-69

**C Fixed firmware to accept CID file with two RxGOOSE with same dataset in E3 mode**

Products: All with the IEC 61850 software option  
Impacted firmware: 7.30 to 7.32  
Corrected firmware: 7.40  
Workaround: None  
Description: The relay rejects an IEC 61850 CID file in E3 format having two RxGOOSE sharing the same dataset.  
The new release fixes the issue so that the file is accepted.  
GE tracking number: 740-3

**C Corrected error responses for unsuccessful IEC 61850 breaker or disconnect switch control**

Products: All with the IEC 61850 software option  
Impacted firmware: 7.30 to 7.32  
Corrected firmware: 7.40  
Workaround: None  
Description: The relay does not respond with the correct error responses (AddCause) for unsuccessful IEC 61850 breaker/ disconnected switch controls.  
The new release fixes the issue.  
GE tracking number: 740-6

**C Preserved Private section and third-party elements in an IEC 61850 CID file**

Products: All with the IEC 61850 software option  
Impacted firmware: 7.30 to 7.32  
Corrected firmware: 7.40  
Workaround: None  
Description: The relay does not preserve the Private section and third-party elements in an IEC 61850 CID file.  
The new release fixes the issue, preserving the Private section, and preserving the third-party elements in

the IID file.

GE tracking number: 740-7

**C Corrected IEC 61850 DPS input default state**

Products: All with the IEC 61850 software option

Impacted firmware: 7.30 to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The relay does not correctly apply the default values for IEC 61850 RxGOOSE DPS Inputs and RxGOOSE Analog Inputs.

The new release fixes the issue so that the relay correctly applies the default value for RxGOOSE DPS Inputs and Analog Inputs.

GE tracking number: 740-9

**C Fixed firmware to reject IEC 61850 CID file if the GSE MAC-Address is not multicast**

Products: All with the IEC 61850 software option

Impacted firmware: 7.30 to 7.32

Corrected firmware: 7.40

Workaround: Always use a multicast GSE MAC address

Description: The relay incorrectly accepts a CID file if the GSE MAC address is not multicast, but no GOOSE control block is created.

The new release fixes the issue so that the UR rejects a CID file if the GSE MAC address is not multicast.

GE tracking number: 740-10

**C Added setting for when relay drops connection if set to produce only IEC 61850 reports without polling from client**

Products: All with the IEC 61850 software option

Impacted firmware: 7.30 to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: If the relay is set up for IEC 61850 reports (buffered or unbuffered), without an MMS client polling for data, the relay dropped the connection every two minutes. This issue was fixed in version 7.32 so that the relay does not drop the connection.

The new release adds a setting to configure timeout duration, under **Settings > Product Setup > Communications > Protocol > MMS Connection Timeout**.

GE tracking number: 740-13

**C Removed limitation on number of IEC 61850 CID files with different names that can be sent to the relay**

Products: All with IEC 61850 software option

Impacted firmware: 7.30 to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The user can send a maximum of 15 IEC 61850 CID files with different names to the relay.

The new release fixes the issue. A relay reboot resets the count, thereby removing the limitation.

GE tracking number: 740-19

**C Corrected relay response for IEC 61850 breaker or disconnect switch controls with enhanced security**

Products: All with the IEC 61850 software option

Impacted firmware: 7.30 to 7.32

Corrected firmware: 7.40

Workaround: Adding the breaker or disconnect switch position to a dataset causes the relay to update the breaker/disconnect switch position

Description: The relay does not update the breaker or the disconnect switch position, causing an incorrect response to IEC 61850 controls with enhanced security.

The new release fixes the issue.

GE tracking number: 740-20

**C Corrected IEC 61850 attribute LPHD1.Sim.stVal when simulated GOOSE is being processed**

Products: All

Impacted firmware: 7.30 to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The relay processes simulated GOOSE messages when Test Mode is in either Forcible or Isolated mode. However, the attributes LPHD1.Sim.stVal is 1 only for Forcible mode, and remains 0 for Isolated mode.

The new release fixes the issue and LPHD1.Sim.stVal is 1 for both Forcible Isolated mode.

GE tracking number: 740-22

**C Corrected L90 IEC 61850 line differential logical node when in-zone transformer software option is not present**

Products: L90

Impacted firmware: 7.30 to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The IEC 61850 line differential logical nodes contain additional objects that exist only when the in-zone transformer software option is present.

The new release fixes the issue.

GE tracking number: 740-24

**C Corrected error messages in case of failure of IEC 61850 service SelectActiveSG**

Products: F60

Impacted firmware: 7.00 to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The relay sends incorrect error messages in case of failure of the IEC 61850 service SelectActiveSG.

The new release fixes the issue.

GE tracking number: 740-25

**C Fixed firmware to accept two RxGOOSE with same dataset in E3 mode**

Products: All with the IEC 61850 software option

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The relay rejects a IEC61850 CID file in E3 format having two RxGOOSE sharing the same dataset.

The new release fixes the issue.



GE tracking number: 740-26

**C Corrected first GOOSE message SqNum and StNum at power-up**

Products: All with the IEC 61850 software option

Impacted firmware: 7.30 to 7.32

Corrected firmware: 7.40

Workaround: None

Description: According to the IEC 61850 standard, the first GOOSE message at power-up is to have a StNum of 1 and a SqNum of 1. In v7.30 to 7.32, the first GOOSE message has StNum and SqNum different from 1.

The new release fixes the issue.

GE tracking number: 740-29

**B Added "Push buttons only" option for Bypass Access setting in relays with CyberSentry software option**

Products: All with a CyberSentry software option

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: A relay with a CyberSentry software option has the Bypass Access setting under **Settings > Product Setup > Security > Supervisory** to bypass the use of passwords, for example during commissioning. Previous versions have the Bypass Access options of "Local," "Remote," and "Local and Remote."

The new release adds a "Push buttons only" option. When selected, the relay bypasses security for Control Pushbuttons and for User Programmable Pushbuttons.

GE tracking number: 740-31

**B Corrected potential unexpected restart at bootup in relays using IEC 60870-5-104**

Products: All relays configured to use IEC 60870-5-104

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: In relays configured to use IEC 60870-5-104 under **Settings > Product Setup > Communications**, there is a low possibility of an unexpected restart during bootup.

The new release fixes the issue.

GE tracking number: 740-32

**D Fixed issue where a relay with IEEE 1588 software option displays a different clock accuracy for Power Profile compared to standard PTP, for the same source**

Products: All with the IEEE 1588 software option

Impacted firmware: 7.0 to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The displayed clock accuracy for IEEE 1588 (PTP) power profile is different from the standard profile. The relay shows the accuracy value from the incoming Announce message of the selected Master PTP clock even if it is below 1000 ns. For PP profile, the accuracy is clamped at 1000 ns.

The new release fixes the issue. For both PP and PTP profiles, the accuracy value does go below 1000 ns.

GE tracking number: 740-36

### **G Changed GOOSE and report data scanning optimization**

Products: All with the IEC 61850 software option

Impacted firmware: 7.30 to 7.32

Corrected firmware: 7.40

Workaround: None

Description: In the impacted releases, the first two GCB in CID file are flagged as fast GOOSE, the datasets used by these two GOOSE are up to two; there are four datasets used by report, so the total number of dataset scanned every protection pass is up to six. The fast scan list contains all boolean or DPS data from the six datasets, which are determined by the user, that is, fast GOOSE or report.

In the new release, the GOOSE Control block (GoCB) naming is configurable.

The string of a dataset name determines the rate of scanning. If the string is "TT6" or absence of it implies a scan rate of 1/8th protection cycle, fast dataset.

If the starting string is "TT3," it implies a scan rate of 100 ms, slow dataset.

The datasets can be assigned to any GoCBs (GOOSE control block).

A maximum of six fast datasets is allowed.

A maximum of four GoCBs can be assigned fast datasets.

Any of these six fast dataset can be assigned to Report Control Blocks.

GE tracking number: 740-64

### **G Added modes to IEC 61850 reports configuration**

Products: All with the IEC 61850 software option

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: Not applicable

Description: BRCB and URCB refer to buffered and unbuffered report control blocks.

In the new release, users are able to edit the 61850 BRCB and URCB settings in two different ways: using UR EnerVista Setup software and via 61850 clients. End users are able to select file dominant or client dominant mode. A new setting is added to allow user to lock out the client from changing the report settings in CID. In other words, the new release adds client dominant or file dominant modes to the IEC 61850 reports configuration.

GE tracking number: 740-65

### **C Corrected issue where changing all three network IP addresses of the relay defaults all IEC 61850 configured GSE values**

Products: All with the IEC software option

Impacted firmware: 7.30 to 7.32

Corrected firmware: 7.40

Workaround: Avoid changing all three IP addresses of the relay at the same time

Description: After changing all three network IP address on the relay, all configured GSE values are defaulted, as displayed in GSE section of the IID file.

The new release fixes the issue so that GSE values are retained.

GE tracking number: 740-67

### **C Updated IEC 61850 Oscillatory GOOSE functionality to include any binary item in a dataset**

Products: All with the IEC 61850 software option

Impacted firmware: 7.30, 7.31

Corrected firmware: 7.40

Workaround: None

Description: When four state changes are detected on a dataitem in a dataset within 40 ms, the state

change monitoring is suppressed for one second. This detects chattering state changes and suppresses GOOSE, reports transmission.

The new release includes the monitoring of the attributes of the FlexLogic logical node (FlxLgcGAPC), contact input logical node (ConInGGIO), and contact output logical node (ConOutGGIO) for oscillations, in addition to the rest of the other Boolean attributes.

GE tracking number: 740-88

**C Corrected relay to trigger IEC 61850 unbuffered reports every protection pass (2 ms)**

Products: All with the IEC 61850 software option

Impacted firmware: 7.30 to 7.32

Corrected firmware: 7.40

Workaround: None

Description: In version 73x releases, the relay is incapable of triggering IEC 61850 on state changes less than 32 ms apart.

In the new release, the relay can trigger IEC 61850 unbuffered reports on state changes that happen every protection pass (2 ms).

GE tracking number: 740-89

**C Corrected deadband calculations for IEC 61850 sensitive directional power logical node**

Products: All with the IEC 61850 software option

Impacted firmware: 7.30, 7.31, 7.32

Corrected firmware: 7.40

Workaround: None

Description: The IEC 61850 deadband calculations for sensitive directional power logical node (SenPDOP#.TotW.db) are three times too large.

The new release fixes the issue.

GE tracking number: 740-90

**C Updated firmware to allow IEC 61850 report ID of up to 129 characters**

Products: All with the IEC 61850 software option

Impacted firmware: 7.30 to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The relay does not allow an IEC 61850 report ID longer than 68 characters.

In the new release, the ID can be up to 129 characters, as mandated by IEC 61850 Edition 2.

GE tracking number: 740-91

**C Fixed updating of IEC 61850 paramRev and Last Settings Change Date**

Products: All with the IEC 61850 software option

Impacted firmware: 7.30, 7.31

Corrected firmware: 7.32, 7.40

Workaround: None

Description: The actual value "Last Settings Change Date" and LLN0.NamPlt.paramRev are not updated correctly.

The new releases fix the issue. The actual value "Last Settings Change Date" is updated when the configuration of the relay is modified using a CID file in addition to the existing configuration update via MODBUS protocol. The LLN0.NamPlt.paramRev is updated correctly for configuration changes.

GE tracking number: 740-92

- C Fixed Phase Neutral current deadband calculations to use correct CT ratio**  
 Products: All with the IEC 61850 software option  
 Impacted firmware: 7.30, 7.31  
 Corrected firmware: 7.32, 7.40  
 Workaround: None  
 Description: The wrong CT ratio (ground CT ratio) is used in the calculation of the deadband for the neutral current in IEC 61850 MMXU nodes.  
 The new releases fix the issue.  
 GE tracking number: 740-93
- G Decreased default analog deadband values when using IEC 61850**  
 Products: All with the IEC 61850 software option  
 Impacted firmware: 7.30 to 7.32  
 Corrected firmware: 7.40  
 Workaround: Not applicable  
 Description: In a relay with the IEC 61850 software option, all default analog deadband values are 10%. In the new release, the default analog deadband values are 0, which stops scanning for deadband triggering. These DB values are user-configurable in various IEC 61850 settings.  
 GE tracking number: 740-95
- R Fixed relay with no CID file to no longer record message in log file about loading ICD file**  
 Products: All with the IEC 61850 software option  
 Impacted firmware: 7.30 to 7.32  
 Corrected firmware: 7.40  
 Workaround: None  
 Description: A relay with the IEC 61850 software option and no CID file incorrectly records a message in the SCL log file that the relay is loading the ICD file.  
 The new release fixes the issue. The relay does not record the message when no CID file is present.  
 GE tracking number: 740-96
- C Corrected number of available Modbus connections when DNP channels are set to NETWORK – TCP**  
 Products: All  
 Impacted firmware: All to 7.32  
 Corrected firmware: 7.40  
 Workaround: None  
 Description: The number of available Modbus connections (**Actual Values > Status > Comm Status Remaining Connect > Modbus TCP**) is incorrect when DNP channels are set to NETWORK - TCP.  
 The new release fixes the issue and the correct number of remaining Modbus connections displays.  
 GE tracking number: 740-99
- C Corrected IEC 60870-5-104 IV (valid/invalid) bit in timestamp**  
 Products: All with the IEC 60870-5-104 software option  
 Impacted firmware: 7.20 to 7.26, 7.30 to 7.32  
 Corrected firmware: 7.40  
 Workaround: None  
 Description: The IEC 60870-5-104 invalid/valid (IV) bit in timestamp was inconsistent for different transmissions. For example, the single-point with date/time transmission might have a different bit value than the integrated totals with date/time transmission.  
 The new release fixes the issue.

GE tracking number: 740-100

**C Prevented high CPU usage when transferring IEC 61850 CID files using SFTP**

Products: All with the IEC 61850 software option

Impacted firmware: 7.30 to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The relay experiences high CPU usage during transfer of an IEC 61850 CID file by SFTP.

The new release fixes the issue, preventing high CPU usage.

GE tracking number: 740-55

**G Corrected firmware to not accept IEEE 1588 announce messages with currentUtcOffsetValid bit set as false**

Products: All with the IEEE 1588 software option

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: A relay with IEEE 1588 software option accepts announce messages with the timePropertiesDS.currentUtcOffsetValid bit set to false.

The new release fixes the issue so that the messages are not accepted.

GE tracking number: 740-14

**C Corrected issues with HardFiber contact inputs**

Products: All with HardFiber

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: In the case of intermittent communications failure between the HardFiber and the Process Bus Card, multiple events can be logged into the event recorder indicating status change of the field contact outputs and inputs. This happens due to last valid status values being substituted with default values if even one sample is detected as bad in the frame.

With the new release, at least two bad frames are required (two protection passes) to substitute the field contact inputs and outputs with default status values.

GE tracking number: 740-27

## Phasor Measurement Unit (PMU) – Synchrophasors

**R Added event “PMU Record Triggered” whenever a PMU record is triggered**

Products: All with PMU software option - C60, D60, F60, G60, L30, L90, N60, T60

Impacted firmware: All to 7.32

Corrected firmware: 7.40

Workaround: None

Description: The relay does not record an event when a PMU record is triggered.

The new release fixes the issue so that the relay records a “PMU Record Triggered” event when a PMU record is triggered.

GE tracking number: 740-8

## Transducer Inputs and Outputs

### **M Fixed DCmA input metering intermittent failure**

Products: All with a DCmA input software option (modules 5A, 5E, 5F)

Impacted firmware: 7.00 to 7.25

Corrected firmware: 7.26, 7.32, 7.40

Workaround: None

Description: The metered value occasionally increases by up to 6% for 1 mA full scale and by up to 1.7% for 20 mA full scale. The published specification for DCmA accuracy is 0.2%. This occasional DCmA increase lasts for one second. This condition is more visible when the steady state expected DCmA input is less than 50% of full scale.

The new releases fix the issue.

GE tracking number: 740-98

## Firmware 7.41

### Summary

Improvements include the following.

- Common Platform Functions
  - Increased default value of contact input threshold to 84 V DC
- Phasor Measurement Unit (PMU) – Synchrophasors
  - Modified PMU record file name

### Common Platform Functions

#### **G Increased default value of contact input threshold to 84 V DC**

Products: All with contact input modules

Impacted firmware: All to 7.40

Corrected firmware: 7.41

Workaround: Manually increase this setting to 84 V DC

Description: In previous versions, the default threshold value of the contact inputs is 33 V DC.

In the new release, the default threshold value of the contact inputs is 84 V DC.

GE tracking number: 741-2

### Phasor Measurement Unit (PMU) – Synchrophasors

#### **R Modified PMU record file name**

Products: All with PMU software option - C60, D60, F60, G60, L30, L90, N60, T60

Impacted firmware: All to 7.40

Corrected firmware: 7.41

Workaround: None

Description: The file names of the PMU records in the COMTRADE 1999 format are listed in the dir.txt files and are based on the following pattern, where nnn is a three-digit number between 1 and 999:

Binary format      PMUnnn.cfg, PMUnnn.dat, PMUnnn.hdr

ASCII format        PMUnnnA.cfg, PMUnnnA.dat, PMUnnnA.hdr

In the new release, the file names of the PMU records in COMTRADE-1999 or COMTRADE-2013 format are listed in a separate file "PMU\_Records\_List.txt" and use the following pattern:

PMUp\_xxxxn.eee

where

p is the PMU recorder instance

xxxx is the COMTRADE format (16 bit binary, 32 bit binary, 32 bit float binary or ASCII)

n is the file sequence number in integer format from 1 to 999

eee is the extension (cfg, dat, hdr, cff)

GE tracking number: 741-1

## Firmware 7.42

### Summary

Improvements include the following.

- Common Protection and Control Elements
  - Corrected firmware to correctly restore the latched Virtual Inputs state at power-up
  - Corrected availability of breaker restrike elements
  - Corrected inactive non-directional ground distance element for zones 2 to 5
- Common Platform Functions
  - Corrected firmware to prevent defaulting of all settings on restart when using inter-relay communications module 2G or 2H
  - Corrected firmware to prevent incorrect triggering of Equipment Mismatch self-test error
- Cyber Security
  - Added PAP RADIUS authentication method
- Communications
  - Modified firmware to allow configuration of settings "Modbus Slave Address" and "Modbus TCP Port Number" by CID file
  - Corrected firmware to allow retrieval of IEC 61850 IID file, after serial upload of the IID file fails
  - Corrected service type for R-GOOSE in external reference in IEC 61850 SCL files
  - Modified firmware to allow configuration of setting "PRT2 Redundancy" from IEC 61850 CID file
  - Modified generation of IEC 61850 IID file, when an incoming third-party CID file includes a wrong Data Attribute type
  - Corrected list of IEC 61850 DAIs in DOI "TmOfMax" in broken rotor bar logical node BknRotSVBR
  - Corrected generation of IEC 61850 IID file for DA type "Cancel," "Oper," and "SBOW"
  - Corrected firmware to apply port IP address setting changes to IEC 61850 R-GOOSE without relay reboot
  - Corrected firmware to allow IEC 61850 R-GOOSE message from any Ethernet port to be forwarded by a router
  - Corrected firmware to allow changes to the IEC 61850 GI attribute only for the client that reserved the IEC 61850 report

### Common Protection and Control Elements

#### **G Corrected firmware to restore correctly the latched Virtual Inputs state at power-up**

Products: All

Impacted firmware: 7.26, 7.32, 7.41

Corrected firmware: 7.42

Workaround: Avoid using self-reset Virtual Inputs in affected firmware versions. If this is not possible, assign all self-reset Virtual Inputs and all latched Virtual Inputs to two separate groups of 32 Virtual Inputs.

Description: The UR has a total of 64 Virtual Inputs, which are divided in two groups of 32 Virtual Inputs. In previous versions, if a self-reset Virtual Input in one of these two groups changes state before the relay is powered-down, on power-up the relay fails to correctly restore the state of the latched Virtual Inputs in the respective group.

The new release fixes the issue.



GE tracking number: 742-1

**U Corrected availability of breaker restrike elements**

Products: C60, F35, F60, L90, T60

Impacted firmware: 7.41

Corrected firmware: 7.42

Workaround: Avoid enabling more breaker restrike elements than the number of installed DSP modules

Description: If more breaker elements are enabled than the number of installed DSP modules, the excess elements are not functional and can trigger self-test error "Module Failure 33."

The new release fixes the issue. The firmware does not allow enabling more breaker restrike elements than the number of installed DSP modules, and upon attempt, the relay displays a minor self-test message as follows:

"BKR RESTRIKE ELEMENT:  
MAXIMUM EXCEEDED"

GE tracking number: 742-2

**H Corrected inactive non-directional ground distance element for zones 2 to 5**

Products: D30, D60, L30, L90, T60

Impacted firmware: 7.32, 7.41

Corrected firmware: 7.42

Workaround: None

Description: The non-directional ground distance element is inactive for zones 2 to 5. The functionality for zone 1 is correct.

The new release fixes the issue. All zones are active.

GE tracking number: 742-5

## Common Platform Functions

**U Corrected firmware to prevent defaulting all settings on restart when using inter-relay communication module 2G or 2H**

Products: All with 2G or 2H module (view in order code)

Impacted firmware: 7.41

Corrected firmware: 7.42

Workaround: Use inter-relay communication module other than 2G or 2H

Description: If the order code includes a 2G or 2H inter-relay communication module, upon restart the relay defaults all settings to factory defaults.

The new release fixes the issue. Settings are not defaulted.

GE tracking number: 742-3

**U Corrected firmware to prevent incorrect triggering of Equipment Mismatch self-test error**

Products: All

Impacted firmware: 7.20 to 7.41

Corrected firmware: 7.42

Workaround: None

Description: Incorrect serial peripheral interface (SPI) initialization of the coprocessor in the CPU module can prevent the CPU from correctly identifying one or more of the installed modules and incorrectly trigger the Equipment Mismatch self-test.

The new release fixes the issue.

GE tracking number: 742-8

## Cyber Security

### E Added PAP RADIUS authentication method

Products: All with the CyberSentry software option

Impacted firmware: 7.0 to 7.41

Corrected firmware: 7.42

Workaround: Not applicable

Description: In previous versions, only EAP-TTLS RADIUS authentication method is available.

In the new release, PAP authentication method is added when using a RADIUS server. The setting "Spare Setting 3" is used to select between EAP-TTLS (value 0) and PAP (value 1). If this setting is configured through a CID file, the relay requires a manual restart to apply it.

GE tracking number: 742-14

## Communications

### E Modified firmware to allow configuration of settings "Modbus Slave Address" and "Modbus TCP Port Number" by CID file

Products: All with the IEC 61850 software option

Impacted firmware: 7.30 to 7.41

Corrected firmware: 7.42

Workaround: None

Description: The firmware does not allow configuration of the settings "Modbus Slave Address" and "Modbus TCP Port Number" by an IEC 61850 CID file.

The new release fixes the issue. These two settings can be configured through an IEC 61850 CID file.

Modifying the setting "Modbus TCP Port Number" requires a manual reboot after the CID file is accepted to apply the new setting value.

GE tracking number: 742-4

### C Corrected firmware to allow retrieval of IEC 61850 IID file, after serial upload of the IID file fails

Products: All with the IEC 61850 software option

Impacted firmware: 7.41

Corrected firmware: 7.42

Workaround: Avoid using a serial link for reading the IID file

Description: If an attempt to read the IEC 61850 IID file over serial link (RS232 or RS485) fails, the file is locked and not available for retrieval via TFTP, UR EnerVista software, or serial link. In this case, UR EnerVista software displays a "-2000" communication error.

The new release fixes the issue.

GE tracking number: 742-6

### C Corrected service type for R-GOOSE in external reference in IEC 61850 SCL files

Products: All with the IEC 61850 software option

Impacted firmware: 7.41

Corrected firmware: 7.42

Workaround: None

Description: In the relay's IEC 61850 IID file, the service type for R-GOOSE is stated incorrectly as serviceType="RGOOSE."

The new release fixes the issue. The service type is corrected to "GOOSE."  
GE tracking number: 742-7

**E Modified firmware to allow configuration of setting "PRT2 Redundancy" from IEC 61850 CID file**

Products: All with the IEC 61850 software option

Impacted firmware: 7.30 to 7.41

Corrected firmware: 7.42

Workaround: None

Description: The setting "PRT2 Redundancy" cannot be configured through the IEC 61850 CID file.

The new release fixes the issue. It is possible to configure this setting through a CID file.

GE tracking number: 742-9

**C Modified generation of IEC 61850 IID file, when an incoming third-party CID file includes a wrong Data Attribute type**

Products: All with the IEC 61850 software option

Impacted firmware: 7.41

Corrected firmware: 7.42

Workaround: None

Description: The native IED signals (UR settings, FlexLogic operands FlexAnalog operands, and actual values) are assigned to entities known as Data Attributes (DAs). Data Attributes typically contain the value of a single signal, most often with a Boolean, Float or Enumerated value. If an IEC 61850 CID file generated by a third-party tool has an incorrect DA type, the relay generates an incorrect IID file.

The new release fixes the issue. The relay ignores the incorrect DA type and corrects it in the relay-generated IID file.

GE tracking number: 742-10

**C Corrected list of IEC 61850 DAIs in DOI "TmOfMax" in broken rotor bar logical node BknRotSVBR**

Products: M60 with the IEC 61850 software option

Impacted firmware: 7.41

Corrected firmware: 7.42

Workaround: None

Description: In ICD, SCL, and CID files, the DOI element contains at least one DAI element. In version 7.41, in the DOI "TmOfMax" of the broken rotor bar logical node "BknRotSVBR, the DAIs TmOfMax.units.SIUnit and TmOfMax.units.multiplier are listed out of order in the SCL files generated by the relay.

The new release fixes the issue.

GE tracking number: 742-11

**C Corrected generation of IEC 61850 IID file for DA types "Cancel," "Oper," and "SBOW"**

Products: All with the IEC 61850 software option

Impacted firmware: 7.41

Corrected firmware: 7.42

Workaround: None

Description: In version 7.41, the relay-generated IEC 61850 IID file does not include ProtNs (<ProtNs type="8-MMS">IEC 61850-8-1:2007</ProtNs>) for the DA types "Cancel," "Oper," and "SBOW" after accepting an EnerVista-software-generated CID file.

The new release fixes the issue.

GE tracking number: 742-12

- C Corrected firmware to apply port IP address setting changes to IEC 61850 R-GOOSE without relay reboot**  
Products: All with the IEC 61850 software option  
Impacted firmware: 7.41  
Corrected firmware: 7.42  
Workaround: None  
Description: In version 7.41, a relay reboot is required to apply port IP address changes to the R-GOOSE configuration.  
In version 7.42, the port IP address changes are applied without the need to restart the relay.  
GE tracking number: 742-13
- C Corrected firmware to allow IEC 61850 R-GOOSE message from any Ethernet port to be forwarded by a router**  
Products: All with the IEC 61850 software option  
Impacted firmware: 7.41  
Corrected firmware: 7.42  
Workaround: Avoid configuration of R-GOOSE transmission for more than one Ethernet port when using a router  
Description: IEC 61850 R-GOOSE packets from only the first Ethernet port of the port assignment list is forwarded by a router instead of all ports in the list.  
The new release fixes the issue. The firmware allows an IEC 61850 R-GOOSE message from any Ethernet port of the port assignment list to be forwarded by a router.  
GE tracking number: 742-15
- C Corrected firmware to allow changes to the IEC 61850 GI attribute only for the client that reserved the IEC 61850 report**  
Products: All with the IEC 61850 software option  
Impacted firmware: 7.0 to 7.41  
Corrected firmware: 7.42  
Workaround: Avoid issuing a GI request from a client that has not enabled an IEC61850 report.  
Description: If IEC 61850 client #1 enabled a buffered or unbuffered report and IEC 61850 client #2 issued a GI request, the relay still issues a report to client #1.  
The new release fixes the issue. The GI attribute is writeable only for the client that reserved the report.  
This is applicable to both URCB and BRCB.  
GE tracking number: 742-16

## Firmware 7.43

### Summary

Improvements include the following :

- Common Protection & Control Elements
  - Fixed incorrect Load Encroachment operation in relays with HardFiber when setting group is changed during load/fault condition
  - Improved Restricted Ground Fault (RGF) element
- Communications
  - Resolved Wind River TCP/IP stack (IPnet, Urgent/11) vulnerabilities published in ICSA-19-211-01
  - Resolved DNP3 vulnerability published in ICSA-20-105-02
  - Fixed three cybersecurity vulnerabilities
  - Corrected firmware to prevent an unexpected restart when attempting to retrieve files over RS232
  - Corrected redundant quotation mark in IEC 61850 IID files in specific scenarios
- Cyber Security
  - Changed firmware in relays with CyberSentry to allow activating the RESET button without logging in

### Common Protection & Control Elements

#### **F Fixed incorrect Load Encroachment operation in relays with HardFiber when setting group is changed during load/fault condition**

Products: All with HardFiber

Impacted firmware: 7.00 to 7.42, 7.60 to 8.30

Corrected firmware: 7.43, 8.40

Workaround: None

Description: In previous versions, in relays with HardFiber the Load Encroachment element could assert incorrectly when changing from one setting group where it correctly operated to another setting group where it was disabled.

The new release fixes the issue.

GE tracking number: 840-42

#### **E Improved Restricted Ground Fault (RGF) element**

Products: All with Restricted Ground Fault element (F60, G30, G60, L90, T35, T60)

Impacted firmware: All to 8.02

Corrected firmware: 7.43, 8.03

Workaround: None

Description: The new release improves the Restricted Ground Fault element by adding supervision of the ground current to prevent misoperation due to unbalanced phase currents during normal load conditions.

The new release fixes the issue.

GE tracking number: 803-6

## Communications

- C Fixed firmware to close the HTTP TCP port when the HTTP TCP PORT NUMBER is set to “0”**  
Products: All  
Impacted firmware: 7.00 to 7.42, 7.60 to 8.24  
Corrected firmware: 7.43, 8.30  
Workaround: Blocking the HTTP port in the firewall is recommended.  
Description: In previous versions, setting the HTTP TCP PORT NUMBER to “0” did not close the HTTP port.  
The new release fixes the issue.  
GE tracking number: 830-51
- C Fixed open port after firmware upgrade of relays with PMU**  
Products: All with PMU  
Impacted firmware: 6.00 to 7.42, 7.60 to 8.24.  
Corrected firmware: 7.43, 8.30  
Workaround: Power cycle or reboot the relay immediately after a firmware upgrade.  
Description: In previous versions, a port scan done immediately after the firmware upgrade of a relay with the PMU software option will reveal an open port with a random number. A subsequent reboot resolves this issue.  
The new release fixes the issue.  
GE tracking number: 830-53
- C Resolved DNP3 vulnerability published in ICSA-20-105-02**  
Products: All using DNP3 protocol  
Impacted firmware: 6.06, 7.21 to 7.91  
Corrected firmware: 7.43, 8.02  
Workaround: None. Apply the mitigations recommended in the ICS advisory.  
Description: In April 2020, ICS-CERT published ICS advisory [ICSA-20-105-02](#) affecting the DNP3 protocol.  
The new release fixes the issue.  
GE tracking number: 802-10
- C Resolved Wind River TCP/IP stack (IPnet, Urgent/11) vulnerabilities published in ICSA-19-211-01**  
Products: All  
Impacted firmware: 7.00 to 7.27, 7.30 to 7.42, 7.60 to 7.63, 7.70 to 7.73, 7.80, 7.81, 7.90 to 7.92  
Corrected firmware: 7.28, 7.43, 7.64, 7.82, 8.02  
Workaround: None. Potential mitigation is possible for some vulnerabilities according to the Wind River security advisory.  
Description: Previous versions are affected by the Wind River TCP/IP stack (IPnet, Urgent/11) vulnerabilities published in the July 2019 in ICS advisory [ICSA-19-211-01](#).  
The new release fixes the issue.  
GE tracking number: 802-9
- B,C Corrected firmware to prevent an unexpected restart when attempting to retrieve files over RS232**  
Products: All  
Impacted firmware: 7.30 to 7.42, 7.60 to 7.72, 7.80 to 7.81

Corrected firmware: 7.43, 7.73, 782

Workaround: Retrieve files or write IEC 61850 SCL files over Ethernet instead of RS232

Description: Attempts to retrieve files such as event log, fault report, oscillography, and data logger from the relay over an RS232 connection or to write an IEC 61850 SCL file over RS232 can result in an unexpected restart. The likelihood increases when the EnerVista UR Setup software is installed on Windows 10. Reading or writing settings, actual values, or commands over Modbus from individual EnerVista dialog windows does not result in an unexpected restart.

In the new release, the relay does not restart unexpectedly when retrieving files over RS232 connection or when writing SCL files to the relay over RS232.

The new release fixes the issue.

GE tracking number: 773-1

### **C Corrected redundant quotation mark in IEC 61850 IID files in specific scenarios**

Products: All with IEC 61850 software option

Impacted firmware: 7.30 to 7.42

Corrected firmware: 7.43

Workaround: None

Description: In previous versions, in very specific cases when the IEC 61850 GOOSE subscription was configured using a remote IED from a third party SCL file, the IEC 61850 IID file generated by the relay was an invalid XML file because it included a redundant quote mark in the "Check" BDA (basic data attribute).

The new release fixes the issue.

GE tracking number: 743-1

## **CyberSecurity**

### **G Fixed three cybersecurity vulnerabilities**

Products: All for CVE-2020-35198

All with IEC 61850 for CVE-2016-9841 and CVE-2016-9840

Impacted firmware: 7.00 and up for CVE-2020-35198

7.30 and up for CVE-2016-9841 and CVE-2016-9840

Corrected firmware: 7.43, 8.40

Workaround: None

Description: In previous versions, vulnerabilities CVE-2016-9841 and CVE-2016-9840 are present in the application firmware and vulnerability CVE-2020-35198 is present in the real-time operating system.

The new release fixes the issue. GE tracking number: 840-15

### **G Changed firmware in relays with CyberSentry to allow activating the RESET button without logging in**

Products: All with CyberSentry software option

Impacted firmware: 7.00 to 7.42, 7.60 to 8.05

Corrected firmware: 7.43, 8.10

Workaround: None

Description: In previous versions, in a cybersecurity relay in RESET button could be activated only if the role with the correct rights was logged into the relay (Administrator, Engineer, Operator). In firmware version 7.43, the firmware was changed to always allow activating the RESET button even if no role is logged in.

The new release fixes the issue.

GE tracking number: 743-2

**C Changed access rights of pushbuttons from front panel simulator in EnerVista UR Setup for a relay with CyberSentry software option**

Products: All with CyberSentry software option

Impacted firmware: 7.00 to 7.42, 7.60 to 8.24

Corrected firmware: 7.43, 8.30

Workaround: None

Description: In previous versions, in a relay with the CyberSentry software option it was possible to activate the relay's pushbuttons without role authentication remotely from the front panel simulator in EnerVista UR Setup, when the BYPASS ACCESS setting was set to "Pushbuttons" or "Local".

In version 7.43 and 8.30, a relay with CyberSentry software option with BYPASS ACCESS set to "Pushbuttons" or "Local" will deny activation of the pushbuttons without role authentication. Only the "Remote" and "Local and Remote" bypass access options allow activation of the pushbuttons remotely in EnerVista UR Setup without the need for role authentication.

The new release fixes the issue.

GE tracking number: 830-55, 39406

## Common Platform Functions

**R Fixed firmware to prevent erroneous assertion of Module Failure 32 in relays with PMU**

Products: All with PMU software option

Impacted firmware: 5.00 to 7.60 except 5.84, 6.06 to 6.08, 7.27 and 7.28

Corrected firmware: 7.43, 5.84, 6.06 to 6.08, 7.27, 7.28, 7.61

Workaround: None

Description: In previous versions, a relay with PMU may have erroneously asserted Module Failure 32.

The new release fixes the issue.

GE tracking number: 743-3

**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: 5.84, 6.07, 7.28, 7.43, 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.

The new release fixes the issue.

GE tracking number: 810-13



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## Software

### Software 7.40

#### Summary

- EnerVista UR Setup Software
  - Corrected issue with 87L DIFF HARM operands
  - Corrected settings comparisons
  - Corrected stack dump access violation when opening IEC 61850 window

#### EnerVista UR Setup Software

##### **G Corrected issue with 87L DIFF HARM operands**

Products: L90

Impacted firmware: All to 7.33

Corrected firmware: 7.40

Workaround: None

Description: In UR Setup Software version 7.33, the settings file cannot be loaded to a relay with firmware 7.11. The software incorrectly allows the selection of L90 operands related to In-Zone Transformer Protection when the relay order code does not include the In-Zone Transformer Protection software option, for example 87L DIFF HARM2 A OP, 87L DIFF HARM2 B OP, and 87L DIFF HARM2 C OP. When one of these operands is entered at FlexLogic Entry 120, the setting file cannot be loaded to the relay.

The new release fixes the issue.

GE tracking number: 740-75

##### **G Corrected settings comparisons**

Products: All

Impacted firmware: All to 7.33

Corrected firmware: 7.40

Workaround: None

Description: In UR Setup Software version 7.33, when sending the settings from an online device to the offline area and then running a comparison report, many differences are shown when there are in fact none. This issue is caused when in template mode and the software does not update settings that are protected by the template when sending to the offline settings file.

The new release fixes the issue.

GE tracking number: 740-76

##### **G Corrected stack dump access violation when opening IEC 61850 window**

Products: All with the IEC 61850 software option

Impacted firmware: All to 7.33

Corrected firmware: 7.40

Workaround: None

Description: In UR Setup Software version 7.33, there is a Stack Dump – Access Violation when opening the **Settings > Product Setup > Communications > IEC 61850** window. It occurs when retrieving an

invalid IID file from the relay when opening the IEC 61850 window. An invalid IID file can be generated in such a case. After a valid CID file is accepted by the relay, if the user manually changes the IP address, for example using the front panel, and restarts the relay, the new IID file generated by the relay misses the entire IED section, or over 80 percent of its typical contents.

The new release fixes the issue. The IED section is checked.

GE tracking number: 740-77

## Software 7.41

### Summary

- EnerVista UR Setup Software
  - Improved software
  - Corrected CID file importing
  - Corrected RxGOOSE NAME fields to be user-configured values instead of default values
  - Corrected configuration file retrieval from newer switch module
  - Corrected issue when sending offline settings to new devices

### EnerVista UR Setup Software

#### **N Improved software**

Products: All

Impacted firmware: All to 7.40

Corrected firmware: 7.41

Workaround: Not applicable

Description: Several improvements are made to the software, including

- Added the support to send and store FlexLogic design information to UR
- Implemented the utility 'Merge SCL Files'
- Improved IEC 61850 configuration user experience with following enhancements:
  - Automatically fill RxGOOSE messages from remote IED's CID file
  - Using tree-view to display remote IED's GOOSE publishing information and dataset
  - Automatically fill RxGOOSE Boolean, Analog, and DPS input subscriptions using drag and drop
  - Using tree-view to display Dataset drop-down list
  - Support drag and drop in Dataset and TxGOOSE configuration
  - Support copy/paste in Dataset configuration
  - Developer XML Viewer to view IID/CID file
- Implemented "Device Connectivity Report"
- Implemented new SCD/CID importer to allow importing multiple UR devices at once using a two-step process that allows user to quickly view all GE and non-GE devices in a SCL file, select a single or multiple UR devices to import at once. It eliminates many redundancies from the old process, reduces the steps required to import devices from a SCL file, and enhances user experience.
- Improved the process time of importing a SCD/CID
- Implemented the support for non-English characters in UR CID file. Encoding between ANSI and UTF-8 are required during SCL generation and import.
- Added a PMU icon to the event record view to open the associated PMU record
- Implemented a new 'Device Folder' for an offline device, which includes the settings file and SCL files
- Improved the offline window look and menu command operations
- Added instruction manuals in the online help for all UR products

GE tracking number: 741-3

### **G Corrected CID file importing**

Products: All

Impacted firmware: All to 7.40

Corrected firmware: 7.41

Workaround: None

Description: After importing a CID file, some settings are incorrect, such as Group x Activate On. The issue occurs because Private and Public settings values are not synchronized.

The new release fixes the issue.

GE tracking number: 741-4

### **G Corrected RxGOOSE NAME fields to be user-configured values instead of default values**

Products: All with the IEC 61850 software option

Impacted firmware: All to 7.40

Corrected firmware: 7.41

Workaround: None

Description: In the **Actual Values > Status > RxGOOSE Status** window, the **NAME** fields reflect the default values instead of configured values set in the **RxGOOSE goID** fields under **IEC 61850 > GOOSE > RxGOOSE > RxGOOSE Messages**.

The new release fixes the issue. The user-configured goID values display in the actual values window.

GE tracking number: 741-5

### **G Corrected configuration file retrieval from newer switch module**

Products: All

Impacted firmware: All to 7.40

Corrected firmware: 7.41

Workaround: None

Description: With newer switch modules, version 5.32 or above, the UR software fails to retrieve the configuration file from the switch module. The switch module has a message that the software cannot handle properly, which results in failure when retrieving the file from the switch module.

The new release fixes the issue. Proper handling is added to UR software.

GE tracking number: 741-6

### **G Corrected issue when sending offline settings to new devices**

Products: All

Impacted firmware: All to 7.40

Corrected firmware: 7.41

Workaround: None

Description: Using template mode in the online window to make a file for the offline window for backup works without issue. With template mode, the user can set which settings cannot be changed, for example. When sending the offline file to other devices, which are new, unconfigured, online devices, the template mode information is not applied.

The new release fixes the issue. Files can be sent from the offline area to unconfigured online devices using the **Write Settings to Device** option and the template mode information is applied.

GE tracking number: 741-7

## Software 7.42

### Summary

Improvements include the following.

- EnerVista UR Setup Software
  - Software exceptions

### EnerVista UR Setup Software

#### C Software exceptions

Number	Description
1	Changed software so that when adding a URS file that is in a device folder, the file is automatically added to environment and the existing device folder is reused.
2	Changed software so that the pop-up Quick Navigation window in Oscillography/Trip Bus settings displays only when double-clicking the cell.
3	Updated equation layout in the FlexLogic Equation Viewer such that empty lines are removed.
4	Changed software so that any settings screens are no longer closed when opening either FlexLogic Equation Editor or Logic Designer. The IEC 61850 windows still require other windows to be closed.
5	Fixed issue so that the BUS 1 OP operands convert properly from 7.20 to 7.41.
6	Changed the software so that setting windows are editable when the FlexLogic Equation Editor is open.
7	Fixed issue so that RxGOOSE information no longer gets initialized during conversion from 7.40 to 7.41.
8	Fixed issue so that Dataset "Shared By" information no longer disappears in Print Preview/Print output.
9	Fixed import of SCD file (which has multiple UR CID files), whereby importing always picked IP address from file 1 and applied same IP to all imported CID files. Now each device has its own network settings.
10	Fixed issue so that the text names of inputs/outputs, for example contact inputs, virtual inputs, and contact outputs, are now reflected in GGIO INDICATION fields when using those I/O onto GGIO.
11	Corrected the preferences option of IEC 61850, specifically so spacing between the options is uniform.
12	Corrected typographical errors in the Device Connectivity Report.
13	Changed software so that when adding/importing a SCL file with only one IED, the SCD Importer window is no longer shown.
14	Modified the text message "The URS file you selected..." to indicate that the URS file does not include the complete IEC 61850 configuration and to use the CID file instead for complete IEC 61850 configuration.
15	Change made to use the source folder (SCD) as the default target folder in the import window.
16	Added a "Cancel" button in SCD Import to stop the importing operation.
17	Fixed the issue with SCD importer where unselected devices' rows are not cleared out in Selected IEDs list.
18	Changed the "Finish" button in the SCD Importer to "Start Import" button.

Number	Description
19	Fixed the issue where opening the Event Recorder takes too long, retrieving OSC files for 10 minutes when there are six OSC records.
20	Fixed issue to print only enabled Direct Analog Inputs when option is selected, as follows. For direct analog inputs/direct integer inputs, it does not print when device or number is zero. For direct analog outputs/direct integer outputs, it prints when value is not off.
21	Corrected RxGOOSE error message so that it does not display when importing 7.3x CID file and then opening the IEC 61850 Developer IID/CID Viewer to view the file. The issue was with E3 type, when a 7.3x device was added from a CID file and viewed using the Developer IID/CID Viewer, the software detected and reported a validation error on RxGOOSE configuration.
22	Changed behavior. Instead of an Offline window tree element for a device collapsing when the status of the device changes, the tree remains expanded.
23	Fixed issue so that IEC61850:GGIO:GGIO1 settings appear in a print-out.
24	New feature. Added FPGA upgrade support. This appears under <b>Maintenance &gt; Update FPGA</b> when the device is connected via serial cable and the firmware revision is 7.0 or higher.
25	Optimized file validation for importing multiple devices in SCD Import. The schema validation for the whole file is done only once, not multiple times based on multiple IEDs selected.
26	Fixed issue where a Service Report does not retrieve event records.
27	Corrected spelling of "Admininstrator" role name to "Administrator."
28	Investigated issue where the IEC 61850 Dataset Summary window does not show all the configurations after being saved and re-opened. Fixed "Shared by" information of a dataset to show all GoCBs and RCBs that use the dataset. The same issue is also fixed for Print Summary.
29	Fix made so that when importing G2 CID file with "E3" and "Preserve..." preferences, all RXGOOSE information is no longer deleted.
30	Fix made so that drag-and-drop from one file to another file now works when created file with version 7.3x.
31	Fix made so that when the "Preserve custom attributes when importing SCD/CID files..." option is checked in preferences, devices now consistently import from a multiple devices SCD file.
32	Made a change to avoid CID validation error for a non-GE IED in SCD file.
33	Made a change so that the Redundancy field of Network Port 2 is editable in the Offline window area.
34	Corrected to allow a maximum of 32 characters to configure BRCB and URCB Names in the software for buffered and unbuffered reports.
35	Corrected addition of stand-alone 7.4x device (with IEC 61850 options) in the EnerVista software, so that the updated path of the URS now shows in the software.
36	Fixed issue so that remote operands are no longer defaulted in the FlexLogic Equation Editor after converting from 7.1, 7.2x to 7.3x, 7.4x.
37	Fixed issue so that GGIO 1 Indication Contact input setting now prints in the print-out when changing it in the Modbus screen.
38	Fixed issue when adding a device from a URS file using the "Add Device from File" option. The URS file timestamp is no longer affected when the device is expanded.
39	Made a change to disallow overwriting the device folder when "Import SCD" and "Add Device from File" options are selected. This is done to preserve the timestamps of both URS and CID files. This also eliminates creating folders in a loop like Device1->Device1->Device1....
40	Fixed an issue so that the Phase Distance Shape and 100% Stator Ground Function settings can be changed.
41	Fixed issue that occurred while importing an invalid CID/SCD file in the Offline window using the "Import Files from SCD" option. It also launched the Empty Import SCD wizard window.

Number	Description
	With the fix, the wizard no longer launches.
42	Enhancement made to allow drag-and-drop of a CID file to the Online Window area from outside the EnerVista software, for example from a Windows folder.
43	Made a change so that the message "Saving setting" displays when switching to the Developer IID/CID Viewer, instead of a "changes will be lost" message. When working with configuration in an IEC 61850 window and opting to view the file in the Developer IID/CID Viewer, the configuration is saved automatically before opening the viewer.
44	Fixed issue in the IEC 61850 interface so that the IED name is updated in the Logical Devices tree.
45	Fixed issue in the IEC 61850 interface so that the Restore operation is available for RxGOOSE Boolean/DPS/Analog mapping windows.
46	Fixed issue in IEC 61850 interface so that the selection of a dataset is reflected without having to click somewhere else in the window.
47	Corrected an issue so that "Restore" and "Default" buttons apply to the selected RxGOOSE Boolean/DPS/Analog window itself, not the entire configuration.
48	Fixed an issue so that there is no missing information when printing version 7.3x IEC 61850 device settings. The Summary and "shared by" information for TxGOOSE, Buffered and Unbuffered reports in Print, Print Preview, and Export is shown correctly.
49	Fixed an issue so that file writing succeeds for L90 device type, for example when converting a 7.3x file to 7.4x and writing the file to the L90.
50	Changed behavior so that when importing a single CID file, the Import CID wizard does not display, and content imports directly.
51	Fixed issue whereby a CID Validation failed while importing a CID file because a SubNetwork cannot be empty according to the DTD/Schema. If the imported CID file has an error, the EnerVista software shows the error after the validation. If you choose to continue to add the file to the Offline Window, then the CID file generated does not have the issue. A subsequent import of the corrected CID file does not show validation errors.
52	Corrected issue when adding a URS file that overwrites the existing device folder structure, for example version 7.3x files replace 7.4x files when using "Add Device from File" option. A check is now made and the user is prompted if they want to overwrite files or not.
53	Made change so that when adding a URS file that is located in a device folder, the file is automatically added to the Offline window and the existing device folder is reused.
54	Fixed issue so that 87LP Supervision setting is written to L90 device type.
55	Fixed issue so that the firmware accepts a CID file for an order code without DSP. The order code is valid, so the UR needs to accept the CID file.
56	Fixed issue when using "Add Device to Offline Window" option so that duplicate offline settings file names can be created, which point to the same file. Fixed for consistency among firmware versions. When the user reads the online device to the existing offline device, a message prompts the user to confirm, and the existing offline device is overwritten by the online device.
57	Fixed issue when importing G2 CID file with Struct type RxGOOSE configured in E3 Environment so that it does not give error in SCL viewer or write failed in post import content file.
58	Added support to "Add Device from File" option for IID files as SCL source.
59	Added the enhancement to default the state of RxGOOSE Inputs with a drag-and-drop operation when doing subscription mapping.
60	Fixed issue so that RxGOOSE Analog subscription mapping refers to correct member.

Number	Description
61	Fixed issue so that user can add manually RxGoose configuration (Boolean/DPS/Analog) in the software without a validation error.
62	Fixed issue so that file write succeeds for G2 CID file with Remote IED information.
63	Fixed issue so that the B90 LED panel layout label 'OTHER' is in the correct slot on the front panel.
64	Fixed issue so that the subscription ID updates correctly for RxGOOSE Boolean/DPS/Analog.
65	Fixed issue so that adding another URS file with the same name does not overwrite the existing device folder structure. User is prompted.
66	Fixed issue so that TxGOOSE MODE settings are written to the device after converting from 7.3 to 7.4x.
67	Corrected behavior so that folder/file creation using the "Add Device from File" option reflects option "Preserve Custom Attribute."
68	Fixed issue so that the software does not create duplicate files and folders when using the "Import Device from SCD" operation in the Offline Window area.
69	Fixed issue so that drag-and-drop from one file to another file works when the file is created with version 7.3x.
70	Fixed issue so that RxGOOSE Boolean online settings from 65 to 256 are not defaulted in the software after writing offline settings.



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## Upgrade

### Compatibility

The 7.42 firmware runs on the T, U, and V 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 7.42 firmware release is not compatible with previous UR CPU hardware (CPU types A, B, D, E, G, H, J, K, N, and S).

The 7.42 firmware release requires EnerVista UR Setup software version 7.4x or higher. GE suggests use of the latest available version of the software.

### Upgrade

If upgrading both EnerVista software and UR firmware, upgrade the software first.

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 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 .bin file.
2. In the EnerVista software, navigate to **Maintenance > Update Firmware** and select the .bin file.  
For any issues, see a UR instruction manual.  
When the update finishes, the relay restarts.
3. Restart the EnerVista software, and refresh the order code in EnerVista under the **Device Setup** button.
4. Set the device to "programmed" under **Settings > Product Setup > Installation**.

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## Categories

This document uses the following categories to classify changes.

### Revision categories

Code	Category	Description
<b>N</b>	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.
<b>G</b>	Change	A neutral change that does not add new value and is not correcting any known problem
<b>E</b>	Enhancement	Modification of an existing feature bringing extra value to the application
<b>D</b>	Changed, incomplete, or false faceplate indications	Changes to, or problems with text messages, LEDs, and user pushbuttons
<b>R</b>	Changed, incomplete, or false relay records	Changes to, or problems with relay records (oscillography, demand, fault reports, and so on)
<b>C</b>	Protocols and communications	Changes to, or problems with protocols or communication features
<b>M</b>	Metering	Metering out of specification or other metering problems
<b>P</b>	Protection out of specification	Protection operates correctly but does not meet published specifications (example: delayed trip)
<b>U</b>	Unavailability of protection	Protection not available in a self-demonstrating way so that corrective actions can be taken immediately
<b>H</b>	Hidden failure to trip	Protection does not operate when appropriate
<b>F</b>	False trip	Protection operates when it is not appropriate
<b>B</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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