

UR Family

Version 7.1x

Release Notes

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Overview

This document contains the release notes for firmware and software versions 7.10, 7.11, and 7.12 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 7.10: 17 April 2013

Date of release 7.11: 17 July 2013

Date of release 7.12: 4 April 2019

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.

Firmware

Firmware 7.10

Summary

Improvements include the following.

- Feeder Protection System – F60
 - The Hi-Z element has been changed to ensure that the relay does not reboot unexpectedly
- Line Protection Systems – L90
 - In-zone transformer functionality now supported by L90 devices
 - Voltage memory for distance polarization in L90 relays has been changed to ensure that only actual voltage values are used when there is an important difference between system and sampling frequencies
 - Distance protection element has been changed to ensure that setting changes to Line protection elements, made when the relay is in service, do not cause the phase distance element to operate
- Network Stability System – N60
 - Aggregator elements in the N60 device have been changed to match the number of phasor measurement unit (PMU) elements
- Common Protection and Control Elements
 - VT Fuse Failure (VTFF) element has been changed to correctly operate under specific fault conditions
 - Restricted Ground fault algorithm has been changed to correctly apply timers that determine the value of negative sequence restraining current used during transformers energization and operation
 - “Fault Type” comparator logic that is part of distance protection elements has been changed to correctly block the ground distance elements when sensing a double-line-to-ground fault
- Common Platform Functions
 - “Real Time Clock” element has been modified to ensure that the events timestamp is correct when the DST function is active and power is cycled
 - UR display has been changed to prevent showing the “87L Harm2 lad” string on a number of setting screens when the relay is set to Turkish language
- Cyber Security
 - Enhancements to CyberSentry for ease of use and accessibility
 - The term “Local Authentication”, part of CyberSentry security, has been replaced with “Device Authentication”
 - The existing CyberSentry RBAC model has been changed to ensure that upgrade of the relay's firmware version is only possible when logged in as Administrator
 - Rules for enforcing password complexity have been changed to ensure the correct compliance criteria are applied
 - Supervisor and Administrator roles have been modified to prevent UR device lockout when configured for remote authentication and communication with the RADIUS server is lost
 - Standard cyber security has been enhanced to ensure submitted passwords are protected from Modbus reading
 - Standard cyber security has been enhanced to allow users to identify default passwords
 - Password access timeout feature, part of the standard cyber security functionality, has been changed to correctly close access sessions

- Updating existing CyberSentry password rules
- Communications
 - New redundancy capabilities with zero recovery time by supporting the Parallel Redundancy Protocol (PRP)
 - IEC 61850 control blocks have been extended with the settings group control block (SGCB)
 - Enhanced IEC 61850 capabilities by supporting Select Before Operate (SBO) control with enhanced security
 - Latitude and longitude settings of the UR IEC61850 server have been changed to properly scroll when configured via the relay front panel
 - Gateway IP addresses of the UR Ethernet ports have been changed to better match the UR remote device port capabilities
 - Existing Breaker and Switch elements have been enhanced to support status update and control from the IEC 61850 XCBR, CSWI, and XSWI logical nodes
 - IEEE 1588 functionality has been changed to support a minimum Path Delay measurement of -100 nanoseconds
- Phasor Measurement Unit (PMU) - Synchrophasors
 - Phasor Measurement Unit (PMU) recording elements have been modified to allow successful retrieval of the first PMU record when set to automatic overwrite and three records
 - IEC 61850-90-5 MSV control blocks have been changed to correctly update the ConfRev value
 - One PMU software option has been changed to correctly show all applicable IEC 61850-90-5 components
 - IEC 61850-90-5 MSV control blocks have been changed to correctly support the Resv bit

Feeder Protection Systems – F60

B The Hi-Z element has been changed to ensure that the relay does not reboot unexpectedly

Products: F60

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: F60 devices with the optional Hi-Z protection and firmware version 7.01 can reboot every five minutes when a HiZ fault condition remains for such a long period. Once the fault condition is removed, the relay functions normally.

Firmware version 7.10 prevents the F60 from rebooting under the described conditions.

GE tracking number: 710-07

Line Protection Systems – L90

N L90 Line Current Differential element has been enhanced to support the “In-zone” power transformer functionality

Products: L90

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: Not applicable

Description: Firmware version 7.10 improves the L90’s protection capabilities by enabling the L90 to fit two and three terminal line differential schemes that have a power transformer within the protection zone with no dedicated set of CTs.

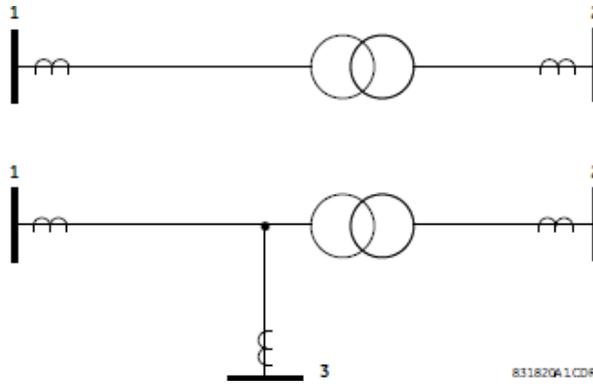


Illustration of in-zone transformer for two and three terminal lines

The new functionality provides internal magnitude and angle compensation plus magnetizing inrush inhibition capabilities that maintain the line differential protection selectivity. Magnitude values are compensated using the existing CT Taps setting fields. However, in order to compensate for current phase-shift caused by the transformer connection group and magnetizing inrush current, new setting fields have been added to the existing “87L Power System” and “Current Differential” elements.

The “In-zone Transformer” option can be ordered through the following software options.

Software Option Code	Description	FW Version	Applies to
24	In zone TX Protection	5.9x to 7.0x	L30
		7.1x or higher	L30 and L90
25	In zone TX Protection + IEC61850	5.9x to 7.0x	L30
		7.1x or higher	L30 and L90
26	In zone TX Protection + PMU	5.9x to 7.0x	L30
		7.1x or higher	L30 and L90
27	In zone TX Protection + IEC61850 + PMU	5.9x to 7.0x	L30
		7.1x or higher	L30 and L90

With firmware 7.10, both L30 and L90 devices share the same “In-zone transformer” functionality and software options. L90 devices that are equipped with the new In-zone transformer software option perform single terminal fault location only (no multiple terminal fault location).

For details on the “In-zone transformer” functionality, see the L90 Instruction manual.

GE tracking number: 710-1

E Voltage memory for distance polarization in L90 relays has been changed to ensure that only actual voltage values are used when there is an important difference between system and sampling frequencies

Products: L90

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: Not applicable

Description: Inter-relay communication (IRC) between L90 devices located at each line terminal is primarily required for line differential and pilot scheme applications. Single or redundant communication channels can be applied.

After recovering from a channel failure, L90 devices must synchronize for the Line Differential element to return to normal operation. The synchronization process can cause the tracking (sampling) frequency to deviate from the system frequency. A significant difference between the “system frequency” and “sampling frequency” can cause the distance element to operate if voltage memory is used for distance

polarization.

This firmware release prevents the use of voltage memory for distance polarization when under the described condition.

This issue only affects users who have both (line differential and distance) protection elements enabled. Users who set both distance and line differential elements to enable simultaneously are advised to upgrade their relay's firmware version with version 6.02 /7.1x.

GE tracking number: 710-11

E Distance protection element has been changed to ensure that setting changes to Line protection elements, made when the relay is in service, do not cause the phase distance element to operate

Products: L90

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: Not applicable

Description: Setting changes to UR devices can be carried out by uploading a complete setting file or editing individual setting fields via front panel or UR setup software.

When editing individual settings for a relay that is in service and reading close-to-nominal current and voltage signals, changing any of the line differential or distance protection setting fields can cause the phase distance element to operate.

This firmware release ensures that the phase distance element does not operate under the described conditions.

Standard operating procedures require users to remove the relay from service when protection related settings are changed or updated. Users who follow this type of procedure are not at risk of experiencing mis-operation.

GE tracking number: 710-12

Network Stability System – N60

C Aggregator elements in the N60 device have been changed to match the number of phasor measurement unit (PMU) elements

Products: N60

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: The N60 device has optional PMU capabilities that can be ordered via the following three software options: one PMU; two PMUs; and four PMUs.

Previous firmware versions show a total of four aggregator elements regardless of the number of available PMU elements. This condition does not introduce any performance issue.

In firmware 7.10, the aggregator elements in the N60 are directly linked to the PMU functionality and match the number of available PMU elements.

GE tracking number: 710-16

Common Protection and Control Elements

H VT Fuse Failure (VTFF) element has been changed to correctly operate under specific fault conditions

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

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: The logic scheme of the VTFF element has been enhanced with additional voltage comparators and timers to ensure that the VTFF element operates correctly under the following failure conditions:

- When, as a result of an external fault, the negative sequence voltage significantly increases over a few cycles immediately followed by a drop of the 50DD element. The VTFF element does not operate.
- When, as a result of a fault within the protected zone, the VTFF element operates and latches faster than the 50DD element. The VTFF element latches only after a two power cycles period.
- When all phase voltages significantly drop. The VTFF element operates instantaneously.

For details on the logic scheme changes, see the Instruction Manual of any of the listed UR devices.

This issue does not affect end users who set the VTFF element to disabled. End users who set the VTFF element to enabled are advised to upgrade their relay firmware with version 7.10.

GE tracking number: 710-06

P Restricted Ground fault algorithm has been changed to correctly apply timers that determine the value of negative sequence restraining current used during transformers energization and operation

Products: G30, G60, L90, T60

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: The Restricted Ground Fault element uses the maximum among the three current components as restraining signal:

$$I_{rest} = \max(I_{R0}, I_{R1}, I_{R2})$$

where the negative-sequence component of the restraining signal (I_{R2}) is calculated as follows:

$$I_{R2} = 1 \times |I_{-2}| \quad \text{or} \quad I_{R2} = 3 \times |I_{-2}|$$

Multiplier “1” is used right after five cycles of complete transformer de-energization, while multiplier “3” is used right after two cycles of complete transformer energization (during transformer’s normal operation). UR devices with previous FW versions showed timers were set to 10 and four cycles instead.

This firmware version fixes this out-of-specification issue.

GE tracking number: 710-13

P “Fault Type” comparator logic that is part of distance protection elements has been changed to correctly block the ground distance elements when sensing a double-line-to-ground fault

Products: D30, D60, G60, L60, L90, T60

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: In order to maintain selectivity during a double-line-to-ground fault, the ground distance element is supervised by the “Fault Type” comparator that uses phase angle between the negative and zero-sequence currents.

However, the “Fault Type” comparator can also be removed when under the following conditions:

- a. During an open pole condition or
- b. When “ $3I_{-0} > OC\ Supv$ and $I_{-2} < CutOff$ ”

Any of these conditions prevents the “Fault type” comparator from blocking the ground distance

elements.

Devices with previous firmware versions show that the CutOff level is not correctly scaled, which breaks the condition “b” described above.

End users who set the distance element to enabled are advised to upgrade their relay’s FW version with version 7.1x or later.

GE tracking number: 710-8

Common Platform Functions

R “Real Time Clock” element has been modified to ensure that the events timestamp is correct when the DST function is active and power is cycled

Products: All

Impacted firmware: 7.01

Corrected firmware: 7.10

Workaround: None

Description: The Real Time Clock element has a Daylight Savings Time (DST) function that allows the device to follow local DST.

UR firmware version 7.01 shows that, if the DST function is active and the device auxiliary power is cycled, the events timestamp shifts one hour from the actual time.

UR firmware 7.10 ensures that the DST time is preserved when the auxiliary power is removed from the relay. Furthermore, the DST function setting correctly biases the timestamp of all events that are shown on the fault report summary page when accessed through the UR software or web browser.

Customers who set the DST Function to disabled are not affected by this issue.

Devices with firmware versions prior to 7.01 are not affected by this issue.

GE tracking number: 710-31

D UR display has been changed to prevent showing the “87L Harm2 lad” string on a number of setting screens when the relay is set to Turkish language

Products: All

Impacted firmware: 7.01

Corrected firmware: 7.10

Workaround: Do not use Turkish

Description: UR devices support settings that are numbers and do not require specifying any unit (for example, L90 Power System\Number of terminals). Thus when looking at screens with this “number/no-unit” type of setting, only blank spaces are to follow the number.

UR FW version 7.01 shows that, when looking at “number/no-unit” type of settings in a device with Turkish language, the “87LHarm2 lad” string is appended to the number.

UR firmware 7.10 ensures that only blank spaces are shown following a “number/no-unit” setting type.

This issue only affects end users having UR devices configured to the Turkish language.

GE tracking number: 710-32

Cyber Security

E Enhancements to the CyberSentry UR software option for increased ease of use

Products: All with a CyberSentry software option

Impacted firmware: 7.00, 7.01

Corrected firmware: 7.10

Workaround: None

Description: Firmware version 7.10 introduces the following changes to CyberSentry functionality:

- The term “Local authentication” that describes the condition of doing password authentication at the relay level has been changed to “Device Authentication” for easier understanding
- The term “Remote authentication” that describes the condition of doing password authentication at the remote server (Radius Server) has been changed to “Server Authentication” for easier understanding
- Both terms have been changed on all device firmware, setup software, and instruction manuals
- Settings for independent local and remote password bypass have been added. Local Bypass refers to bypassing password requirements when using the push buttons or keypad or RS232 front port interfaces. Remote Bypass refers to bypassing password requirements when using the RS485 or Ethernet port interfaces. These new settings are accessible by the Administrator role only (provided password bypass is disabled).

These changes provide customers with the access flexibility required when performing operations like testing, commissioning, and so on.

For details on CyberSentry implementation, see the UR Instruction manuals.

GE tracking number: 710-22

G The term “Local Authentication”, part of CyberSentry security, has been replaced with “Device Authentication”

Products: All with the CyberSentry software option

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: The term “Local authentication” means that, once a password has been submitted, validation of the submitted password is done at the relay level.

However, since the password can be submitted via either local access (front panel or serial port) or Ethernet access, the term “local authentication” has been replaced with “Device Authentication.”

This text string update affects all applicable documentation, relay firmware, and software.

GE tracking number: 710-23

C The existing CyberSentry RBAC model has been changed to ensure that upgrade of the relay's firmware version is only possible when logged in as Administrator

Products: All with the CyberSentry software option

Impacted firmware: 7.00, 7.01

Corrected firmware: 7.10

Workaround: None

Description: UR devices with CyberSentry functionality provide a role-based access control (RBAC) model with five pre-determined roles (Administrator, Engineer, Operator, Supervisor, and Observer).

Since upgrading firmware can default the relay's settings, this action is restricted to the Administrator role.

UR devices with firmware v7.0x failed to enforce this restriction.

Firmware version 7.10 fixes this issue.

GE tracking number: 710-24

C Rules for enforcing password complexity have been changed to ensure the correct compliance criteria are applied

Products: All

Impacted firmware: 7.00, 7.01

Corrected firmware: 7.10

Workaround: None

Description: UR devices support passwords to protect both access levels (standard security) and roles (RBAC CyberSentry).

All passwords must comply with complexity requirements as follows:

- Password cannot contain the user account name or parts of the user account that exceed two consecutive characters
- Password must be 6 to 20 characters in length
- Password must contain characters from three of the following four categories:
 - English uppercase characters (A through Z)
 - English lowercase characters (a through z)
 - Base 10 digits (0 through 9)
 - Non-alphabetic characters (for example, ~, !, @, #, \$, %, &)

UR devices with firmware v7.0x failed to enforce the three of four requirement of the last bullet. Instead, four out of four categories were enforced.

GE tracking number: 710-25

C Supervisor and Administrator roles have been modified to prevent UR device lockout when configured for remote authentication and communication with the RADIUS server is lost

Products: All with the CyberSentry software option

Impacted firmware: 7.00, 7.01

Corrected firmware: 7.10

Workaround: None

Description: UR devices ordered with the CyberSentry option support local authentication (device authentication) and remote authentication (server authentication).

Remote authentication means that communication to a RADIUS server is required for password and user name validation.

UR devices with firmware version 7.0x configured for remote authentication can lock themselves out, preventing access from any role access when communication to the Radius servers is lost. This forces end users to contact GE in order to get instructions on how to get their devices restored.

UR firmware v7.10 allows the Administrator and, if enabled, Supervisor roles to use local authentication for configuring the relay back to local authentication, which prevents UR devices from locking out.

End users not having their devices connected to RADIUS servers are not affected by this issue.

GE tracking number: 710-26

C Standard cyber security has been enhanced to ensure submitted passwords are protected from Modbus reading

Products: All

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: UR devices with standard cyber security functionality can receive password via Modbus commands.

When passwords are submitted via Modbus, a second Modbus client can see these passwords by reading "Password entry" Modbus registers.

UR firmware v7.10 ensures that submitted passwords are protected by always returning a string of spaces when Modbus clients read any "Password Entry."

GE tracking number: 710-27

E Standard cyber security has been enhanced to allow users to identify default passwords

Products: All

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: UR devices with standard cyber security functionality allow users to see the encrypted form of passwords by reading "Password Status" Modbus registers.

Considering that UR devices with basic security are shipped from factory with no password and authorized users can erase any relay password at any time (encrypted form of both passwords looks the same), default passwords have been changed to allow users to identify a default password.

UR firmware 7.10 ensures that the encrypted form of a default password is displayed as one "0" ASCII character (0x30) followed by hexadecimal zeros up to the latest character (20).

GE tracking number: 710-28

C Password access timeout feature, part of the standard cyber security functionality, has been changed to correctly close access sessions

Products: All

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: UR devices with standard cyber security functionality have an independent "password access timeout" setting field for each "Command" and "Settings" access level. These settings determine the inactivity period that the relays have to wait for before automatically closing access sessions to users that had logged in.

UR devices with firmware v7.01 failed to enforce this automatic action.

UR firmware 7.10 ensures that access sessions are closed upon password access timeout.

GE tracking number: 710-29

C Updating existing CyberSentry password rules

Products: All with the CyberSentry software option

Impacted firmware: 7.00, 7.01

Corrected firmware: 7.10

Workaround: None

Description: UR devices with CyberSentry functionality enforce compliance with multiple password requirements rules when a password is created. One of the rules dictates that a role password must not contain more than two consecutive characters of the role name.

UR devices with firmware v7.01 show that rule was not implemented as case sensitive.

UR firmware 7.10 changes that rule to be case sensitive.

GE tracking number: 710-30

Communications

N New redundancy capabilities with zero recovery time by supporting the Parallel Redundancy Protocol (PRP)

Products: All

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: Firmware version 7.10 provides UR device with support for PRP specified by the IEC62439-3 (2012) standard.

Traditional redundancy protocols depend on reconfiguring the active topology of the substation LAN (switchover), which introduces short communication interruptions that range from a few milliseconds to seconds depending on the LAN configuration (ring, mesh, and so on).

PRP instead uses a different approach since no LAN reconfiguration is required. PRP makes a device replicate frames over two different networks, so both LANs become active. The substation client receives both frames and discards the replicated one. This removes the short communication interruption produced by the switchover of other redundancy methods.

UR devices equipped with PRP functionality can enable this redundancy via settings. When enabled, the UR device support two independent IP addresses (not three as per default settings).

The PRP functionality requires, as a minimum, the software option "CO – PRP". Additional software options, combining PRP with other existing optional functionality, are available.

For details on the PRP implementation, see the UR Instruction manuals.

GE tracking number: 710-09

E IEC 61850 control blocks have been extended with the settings group control block (SGCB)

Products: All with the IEC 61850 software option

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: Not applicable

Description: Firmware version 7.10 introduces IEC 61850 settings group control block functionality. This SGCB is linked to the LLNO logical node and reflects the actual setting group indication (status) of the relay's setting group element.

For details on SGCB implementation, see the UR Instruction manuals.

GE tracking number: 710-10

E Enhanced IEC 61850 capabilities by supporting Select Before Operate (SBO) control with enhanced security

Products: All with the IEC 61850 software option

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: Firmware version 7.10 extends SBO functionality by adding an enhanced security control class model to the list of models already available. SBO allows exclusive use of a function, preventing multiple users from modifying a function concurrently. With this addition, UR devices support the following control models: direct control with normal security; SBO control with normal security; and SBO control with enhanced security.

For details on the SBO control with enhanced security implementation, see the UR Instruction manuals.

GE tracking number: 710-14

D Latitude and longitude settings of the UR IEC 61850 server have been changed to properly scroll when configured via the relay front panel

Products: All with the IEC 61850 software option

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: The UR IEC 61850 server element has latitude and longitude settings that are required by the UR embedded IEC61850-90-5 capabilities. These setting can be modified using the UR setup software or the front panel.

When modifying any of the two settings using the front panel, the value shown on the display may not scroll properly after reaching the maximum or minimum range value (value shown gets stuck).

This firmware release fixes this issue.

End users who do not use the IEC UR 61850-90-5 capabilities or who do setting changes with the UR Setup software are not affected by the issue.

GE tracking number: 710-04

C Gateway IP addresses of the UR Ethernet ports have been changed to better match the UR remote device port capabilities

Products: All

Impacted firmware: 7.01

Corrected firmware: 7.10

Workaround: None

Description: Each of the three Ethernet ports supported by UR firmware v7.01 devices have a “Gateway IP Address” setting (total three Gateway IP Addresses) that have been replaced with a common Gateway IP Address and seven “Static Network Routes.”

Prior to these changes, UR devices with firmware version 7.01 can fail to communicate to the UR setup software when there is a router in between and connecting to Ethernet ports 2 or 3.

This change fixes this condition by allowing UR devices to simultaneously connect to multiple devices located on remote networks that are accessible via routers.

Customers whose communication requirements demand UR devices to link to remote devices on Ethernet ports 2 and 3 via routers must upgrade to firmware version 7.1x.

GE tracking number: 710-05

E Existing Breaker and Switch elements have been enhanced to support status update and control from the IEC 61850 XCBR, CSWI, and XSWI logical nodes

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

Impacted firmware: 7.01

Corrected firmware: 7.10

Workaround: None

Description: Breaker and Disconnect Switch elements are used as an interface to control and get status feedback from power breakers and disconnect switches respectively.

With firmware version 7.10, these elements have been directly connected to the IEC 61850 model via applicable logical nodes. “Breaker” elements are connected to bkrXCBR and bkrCSWI logical nodes, while “Disconnect Switch” elements are connected to swCSWI and swXSWI logical nodes.

This enhancement allows users to directly control power breakers and disconnect switches via IEC 61850 services, and so, creating dedicated FlexLogic is no-longer required.

GE tracking number: 710-07

C IEEE 1588 functionality has been changed to support a minimum Path Delay measurement of -100 nanoseconds

Products: All

Impacted firmware: 7.01

Corrected firmware: 7.10

Workaround: None

Description: UR devices with IEEE 1588 Precision Time Protocol functionality must measure and monitor communication Path Delay.

Firmware version 7.01 discarded all measured Path Delay values below 0.

The new firmware version extends the Path Delay low limit to accept measurements down to -100 ns. This accommodates small errors in the PHYTER and/or the Ethernet switch.

For more details on the IEEE 1588 functionality, see the instruction manual of any applicable UR device.

Users who have their UR devices synchronized using IEEE 1588 are advised to upgrade their devices to firmware version 7.10 or higher.
GE tracking number: 710-15

Phasor Measurement Unit (PMU) – Synchrophasors

R Phasor Measurement Unit (PMU) recording elements have been modified to allow successful retrieval of the first PMU record when set to automatic overwrite and three records

Products: D60, F60, G60, L30, L90, N60, T60

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: UR firmware version 7.10 changes the PMU recording element to prevent retrieval errors when users try to access recorded PMU data. Retrieval errors can show up only when the setting fields have been set as follows:

Number of time records = 3

Trigger mode = Automatic overwrite

Firmware version 7.10 fixes this issue.

Users not using the PMU recording element or having different settings are not affected by this issue.

GE tracking number: 710-17

M IEC 61850-90-5 MSV control blocks have been changed to correctly update the ConfRev value

Products: N60

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: Reporting PMU data using IEC 61850-90-5 requires synchrophasors to be mapped into MSV control blocks (MSVCB) via independent PMU aggregator (AGG) elements. Each PMU AGG element requires a dedicated MSVCB, which supports an independent configuration revision (ConfRev) value.

UR firmware versions released prior to version 7.10 show that confrev values of all MSVCB were incremented when either changing settings to any AGG element or cycling power.

UR firmware version 7.10 changes the ConfRev update-logic to correctly increase its value only when settings of the corresponding AGG element are changed.

Users not reporting PMU data using 61850-90-5 are not affected by this issue.

GE tracking number: 710-18

M One PMU software option has been changed to correctly show all applicable IEC61850-90-5 components

Products: D60, F60, G60, L30, L90, N60, T60

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: UR devices that are ordered with both PMU and IEC61850 options also include the IEC61850-90-5 implementation. This implementation creates one logical device per available PMU element and another logical device for all aggregators (AGG), which means that a UR device with one PMU element shows an additional logical device for its PMU element (default name PMU1) when either exporting an ICD file or being browsed by a 61850 client.

UR devices with one PMU element and firmware version 7.1x do not show the PMU1 logical node when

browsed by a IEC61850 client or when looking into its ICD file.

Users not reporting PMU data using 61850-90-5 are not affected by this issue.

GE tracking number: 710-20

M IEC 61850-90-5 MSV control blocks have been changed to correctly support the Resv bit

Products: D60, F60, G60, L30, L90, N60, T60

Impacted firmware: All to 7.01

Corrected firmware: 7.10

Workaround: None

Description: When an IEC 61850-90-5 client connects to a multicast sampled value control block (MSVCB) supported in UR devices, the client is to set the "Resv" attribute to "True", which indicates that MSVCB is exclusively reserved for the client that is connected.

UR firmware versions released prior to version 7.10 show that the "Resv" attribute was not available for clients connecting to the MSVCB.

UR firmware version 7.10 makes the "Resv" attribute available on all existing MSVCBs.

Users not reporting PMU data using IEC 61850-90-5 are not affected by this issue.

GE tracking number: 710-21

Firmware 7.11

Summary

Improvements include the following.

- Common Platform Functions
 - Voltage transformer fuse failure (VTFF) element changes
- Phasor Measurement Unit (PMU) – Synchrophasors
 - Phasor measurement unit (PMU) positive one-shot trigger support
 - Increased sensitivity for PMU voltage and frequency hysteresis levels
- Software
 - Exporting setting files to IED Capability Description (ICD) format

B90 is affected by software changes, not these firmware changes.

Common Platform Functions

P VTFF element has been modified to prevent continued operation after healthy voltages are restored and to increase selectivity for slight voltage disturbance events

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

Impacted firmware: 7.10

Corrected firmware: 7.11

Workaround: Do not enable the VTFF element

Description: With firmware version 7.10, new dV/dt comparators were added to each voltage phase of the VTFF element to speed up its operation. This ensures reliable blocking of high-speed protection elements when a fuse failure event occurs (for example, distance element zone 1).

However, further changes were required because of the following conditions:

- While implementing the dV/dt comparators, a flaw in the logic was inadvertently introduced. As a result, when a valid VTFF condition occurred, the VTFF element operated as expected. But when healthy voltage was restored, the VTFF element remained operational until either the 50DD element (disturbance detector) operated or the protected asset was de-energized (current signals drop to zero).
Protection elements were not compromised if assigned to be blocked by the VTFF element (the VTFF element reset momentarily when a fault occurs), allowing the operation of the protection element even though the VTFF element was in operating condition prior to the fault. Therefore, the described VTFF alarm behavior did not compromise performance of protection elements.
The 7.1 FW release fixes this condition.
- The dV/dt comparator threshold level was changed from 10 to 20%. This increases the VTFF element selectivity when sensing slight voltage variations. UR devices with FW version 7.10 can show nuisance VTFF alarms under the described conditions.

If the VTFF element in your UR with FW 7.10 device is not enabled, no action is required.

GE tracking number: 711-1

Phasor Measurement Unit (PMU) – Synchrophasors

E New positive one-shot trigger for PMU elements

Products: D60, F60, G60, L30, L90, N60, T60

Impacted firmware: All to 7.10

Corrected firmware: 7.11

Workaround: None

Description: PMU elements count with a trigger mechanism that activates PMU data recording under the following conditions: over/under frequency, over/under voltage, overcurrent, overpower, and high rate of change of frequency.

With this firmware release, a rising edge trigger has been added. The rising edge trigger works as a positive one-shot trigger providing a deterministic interval pulse that allows one trigger per event only. UR devices with FW revisions 7.10 or prior can see the trigger operands are activated as long as the disturbance condition remains, which can cause nuisance alarms at Phasor Data Concentrator (PDC) and super PDC level.

GE tracking number: 711-2

E Increased sensitivity for PMU voltage and frequency hysteresis levels

Products: D60, F60, G60, L30, L90, N60, T60

Impacted firmware: All to 7.10

Corrected firmware: 7.11

Workaround: None

Description: Each PMU trigger element counts with pre-determined hysteresis levels.

With this firmware release, the hysteresis levels of PMU frequency and voltage trigger comparators have been changed as follows:

- Frequency from 0.03 to 0.02 Hz
- Voltage from 3 to 1%

UR devices with FW revisions 7.10 or prior can see the frequency and voltage trigger operands do not reset due to the high hysteresis levels.

GE tracking number: 711-3

Firmware 7.12

Summary

Improvements include the following.

- Common Platform Functions
 - Fixed settings template mode
- Cyber Security
 - Corrected firmware to prevent an unexpected restart due to MMS frames with corrupted CLNP header
- Communications
 - Corrected PRP firmware component to prevent corruption of outgoing GSSE frames

Common Platform Functions

G Fixed settings template mode

Products: All

Impacted firmware: 7.00, 7.01, 7.10, 7.11

Corrected firmware: 7.12, 7.20

Workaround: None

Description: The settings template mode allows the user to define which settings are visible in the EnerVista UR Setup software, thereby simplifying the configuration and commissioning of multiple relays that protect similar assets. In the impacted releases, the template mode is broken inadvertently.

The new releases correct the settings template mode; use UR EnerVista Setup software version 7.40 or up.

When downgrading the firmware from a higher version (versions 7.26, 7.32, and up) to version 7.12, the Storage Media Alarm can be asserted occasionally indicating that the Flash memory card needs to be formatted. Contact customer support for instructions on how to format the memory card.

GE tracking number: 720-53

Cyber Security

B, C Corrected firmware to prevent an unexpected restart due to MMS frames with corrupted CLNP header

Products: All with the IEC 61850 software option

Impacted firmware: All to 6.05, 7.00 to 7.25

Corrected firmware: 6.06, 7.12, 7.26

Workaround: None

Description: MMS frames with a corrupted Connectionless Network Protocol (CLNP) header can cause an unexpected restart of the relay. The frames are corrupted as outlined in item 726-11.

The new releases correct the issue. Corrupt GSSE packets do not cause unexpected restart.

GE tracking number: 606-6,

Communications

C Corrected PRP firmware component to prevent corruption of outgoing GSSE frames

Products: All with the PRP software option

Impacted firmware: 7.00, 7.01, 7.10, 7.11, 7.20 to 7.25, 7.30, 7.31

Corrected firmware: 7.12, 7.26, 7.32, 7.40 and above

Workaround: None

Description: In previous versions, an error in the Parallel Redundancy Protocol (PRP) component can corrupt the CLNP header of outgoing GSSE packets. A relay without the fix from item 606-6 can experience an unexpected restart resulting in a System Exception.

The new releases correct the issue and GSSE packets are sent correctly.

GE tracking number: 726-11

Software

Software 7.10

Summary

Improvements include the following).

- Software exceptions (fix)

EnerVista UR Setup Software

G Software exceptions (fix)

Applicable: UR Setup and UR Viewpoint Engineer

The reset command from the software (**Commands > Clear Records > Reset Device**) fails when bypass access setting is "Remote" or "Local and Remote." Relays with the CyberSentry option.

Software 7.11

Summary

Improvements include the following).

- Exporting setting files to ICD file format
- Software exceptions (fix)

EnerVista UR Setup Software

E Exporting setting files to ICD file format

Applicable: UR Setup and UR Viewpoint Engineer

EnerVista UR Setup and UR engineer software version 7.11 provides an option that allows users generating an ICD file with the actual IED name when following the process described below:

1. Find the .ini file (urpc.ini for URPC, ureng.ini for UR Eng) in ALL Users folder
2. Locate the “[Customize]” section within the .ini file
3. Add the entry ‘IIDOption=1’ under [Customize].

The URPC.INI file can be found in the following folders (Windows 7):

<C:\ProgramData\GE Power Management\URPC> or
<C:\Users\<USERNAME>\AppData\Local\VirtualStore\ProgramData\GE Power Management\URPC>

Without this entry, the ICD file is generated with TEMPLATE as the IED name, which is compliant with the IEC61850 Standard as well as KEMA's requirement.

Previous versions of the software generated ICD files that showed only “Template” as the IED name.

G Software exceptions (fix)

Applicable: UR Setup and UR Viewpoint Engineer

- When using EnerVista UR 7.10, making a settings file conversion in the offline window can change some of the 'OR' gates in FlexLogic to 'XOR' gates.

Software 7.12

Summary

There is a known issue with display of the firmware version when using Quick Connect.

EnerVista UR Setup Software

Known issue

Products: All

Impacted firmware: 7.12

Workaround: Read the order code in the Device Setup window

Description: When using the Quick Connect feature in the UR EnerVista Setup software version 7.40 or above, the firmware version of a version 7.12 relay is identified incorrectly.

Upgrade

Compatibility

The 7.1x firmware release is not compatible with previous UR CPU hardware (CPU types A, B, D, E, G, H, J, K, N, and S).

The 7.1x firmware release requires EnerVista UR Setup software version 7.1x or higher. GE suggests use of the latest available version of the software.

Upgrade path for versions 4.00 and above

Firmware version 7.0x requires a new version 7.01 CPU module. Upgrading UR devices installed with firmware versions 4.xx, 5.xx, or 6.xx requires replacement of the CPU module to T, U, or V.

Depending on the original order code and age of the relay, replacement of additional modules can be required.

Upgrade path for revisions below version 4.00

For UR devices with firmware versions below 4.00, new CPU and digital signal processor (DSP) modules are required to upgrade the relay to version 7.01.

Depending on the original order code and age of the relay, replacement of additional modules can be required.

Upgrade

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

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. Convert the existing setting file, then load the converted settings to the relay.
5. Set the device to "Programmed" under **Settings > Product Setup > Installation**.

Categories

This document uses the following categories to classify changes.

Revision categories

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

For further assistance

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

GE Grid Solutions
650 Markland Street
Markham, Ontario
Canada L6C 0M1
Worldwide telephone: +1 905 927 7070
Europe/Middle East/Africa telephone: +34 94 485 88 54
North America toll-free: 1 800 547 8629
Fax: +1 905 927 5098
Worldwide e-mail: multilin.tech@ge.com
Europe e-mail: multilin.tech.euro@ge.com
Website: <http://www.gegridsolutions.com/multilin/>