

UR Family

Version 7.8x

Release Notes

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Overview

This document contains the release notes for firmware and software versions 7.80 and 7.81 of the GE 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 7.80: 19 December 2018

Date of release 7.81: 16 May 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 7.80

Summary

Improvements include the following.

- Added Process Bus Module option (order codes 85, 86, 87) for all products except B90, C30, and L60. A digital process bus enables digital transmission of data between the switchyard and relays in a control house using communication cables instead of hard-wired connections. The Process Bus Module supports IEC 61850-9-2LE/IEC 61869, switched networks, and two redundancy protocols. When enabling Ethernet ports on the Process Bus Module, always enable A and B pairs together. Enabling A only or B only ports is not supported.
- Bus Differential Systems – B30, B90
 - Added CT polarity reversal for B30 HardFiber relays
- Capacitor Bank Protection and Control Systems – C70
 - Changed firmware to apply consistently the “Phase Current Unbalance 1 Target” setting
 - Changed firmware to apply consistently the “Bank Voltage Differential 1 Target” setting
- Transformer Protection Systems – G30, T35, T60
 - Changed default value of “Reference Winding” setting from “Automatic Selection” to “Winding 1”
 - Enhanced Transformer Differential Protection specification with dynamic control of the windings
- Common Protection and Control Elements
 - Corrected functioning of Breaker Restrike elements 2 and 3
 - Corrected the Initiated flag in Breaker Failure element
- Common Platform Functions
 - Corrected firmware so that it does not reset the state of a latched User-Programmable Pushbutton when saving unrelated settings
 - Changed firmware to take relay out of service during firmware upgrade
 - Corrected truncation of analog channel identifier in oscillography record
 - Improved Virtual Inputs functionality to improve CPU usage
- Communications
 - Changed firmware to restore Ethernet communication after a reboot of a network switch for relays with optical SFP modules
 - Changed the IEC 61850 protocol namespace (ProtNS) to “IEC 61850-8-1:2003”
 - Corrected firmware to identify link status for third Ethernet port of a 9V CPU module
 - Enhanced the IEC 61850 MMS fdir and fopen file services
 - Enhanced firmware to produce IEC 61850 SCL files compliant with IEC 61850 schema 2007B4 by adding the TimeSyncProt element under ClientServices element
 - Corrected firmware to not default IEC 61850 disconnect switch data attributes DiscCSWI.PosctlModel, DiscCSWI.Pos.sboTimeout, and DiscCSWI.Pos.operTimeout at start-up
 - Corrected scaling of IEC 61850 logical data attributes mapped to fault impedance, fault loop resistance, and fault distance in km
 - Enhanced Setting Group control by separating between local control mode and IEC 61850 control mode

- Changed IEC 61850 data attribute DmdMMTR1.CF.RsStat.ctlModel to be read-only

Bus Differential Systems – B30, B90

E Added CT polarity reversal for B30 HardFiber relays

Products: B30 used with HardFiber

Impacted firmware: 5.60 to 7.71

Corrected firmware: 7.80

Workaround: None

Description: The new release adds “Bus Zone 1A DIR” to “Bus Zone 1F DIR” settings to configure CT orientation with respect to the protected zone. If CT orientation is selected as “IN,” the SRC current is added to the zone current as it is, otherwise, if CT orientation is selected as “OUT,” the SRC current is shifted by 180 degrees before being added to the zone current. This change applies only to B30 HardFiber relays.

GE tracking number: 780-17

Capacitor Bank Protection and Control Systems – C70

D Changed firmware to apply consistently the “Phase Current Unbalance 1 Target” setting

Products: C70

Impacted firmware: 5.20 to 7.71

Corrected firmware: 7.80

Workaround: After changing this setting or after applying an IEC 61850 CID file, confirm that this setting was applied correctly.

Description: Sometimes the relay does not apply correctly the “Phase Current Unbalance 1 Target” setting, for example the setting is updated only the second time an IEC 61850 CID file is sent.

The new release corrects the issue. The relay applies the setting value correctly and consistently.

GE tracking number: 780-6

D Changed firmware to apply consistently the “Bank Voltage Differential 1 Target” setting

Products: C70

Impacted firmware: 5.20 to 7.71

Corrected firmware: 7.80

Workaround: After changing this setting or after applying an IEC 61850 CID file, confirm that this setting was applied correctly.

Description: Sometimes the relay does not apply correctly the “Bank Voltage Differential 1 Target” setting, for example the setting is updated only the second time an IEC 61850 CID file is sent.

The new release corrects the issue. The relay applies the setting value correctly and consistently.

GE tracking number: 780-7

Transformer Protection Systems – G30, T35, T60

G Changed default value of “Reference Winding” setting from “Automatic Selection” to “Winding 1”

Products: T35, T60

Impacted firmware: All to 7.71

Corrected firmware: 7.80

Workaround: None

Description: In previous versions, for transformer protection relays the default value of the **System Setup > Transformer > General > Reference Winding** setting is “Automatic Selection.”

In the new release, the default value is “Winding 1.”

GE tracking number: 780-10

E Enhanced Transformer Differential Protection specification with dynamic control of the windings

Products: T35, T60

Impacted firmware: All to 7.71

Corrected firmware: 7.80

Workaround: None

Description: The “Winding Status” setting is added so that each winding connection to the differential zone can be controlled dynamically (switch in or switch out) by the status input of this winding.

GE tracking number: 780-18

Common Protection and Control Elements

P Corrected functioning of Breaker Restrike elements 2 and 3

Products: B30, C60, C70, D60, F35, F60, G60, L60, L90, M60, T60

Impacted firmware: 5.50 to 7.71

Corrected firmware: 7.80

Workaround: None

Description: In previous versions, only the first Breaker Restrike protection element is operational.

The new release corrects the issue. All Breaker Restrike elements are operational.

GE tracking number: 780-15

P Corrected the Initiated flag in Breaker Failure element

Products: B30, C60, C70, D60, F60, G60, L30, L60, L90, M60, T60

Impacted firmware: 7.70 to 7.71

Corrected firmware: 7.80

Workaround: None

Description: The Breaker Failure Initiated flag is set incorrectly by the output of the breaker failure retrip timer instead of the input of the retrip timer.

The new release corrects the issue. The breaker failure Initiated flag is corrected.

GE tracking number: 780-12

Common Platform Functions

P Corrected firmware so that it does not reset the state of a latched User-Programmable Pushbutton when saving unrelated settings

Products: All with user-programmable pushbuttons

Impacted firmware: All to 7.71

Corrected firmware: 7.80

Workaround: None

Description: Saving setpoints unrelated to the user-programmable pushbuttons resets the state of a latched user-programmable pushbutton.

The new release corrects the issue. The state of a latched user-programmable pushbutton is not affected by saving unrelated setpoints.

GE tracking number: 780-1

G Changed firmware to take relay out of service during firmware upgrade

Products: All

Impacted firmware: 7.80 and up

Corrected firmware: 7.80

Workaround: None

Description: The relay continues to be in-service during a firmware upgrade operation.

In the new release, upgrading the firmware takes the relay out of service. At the end of the firmware upgrade, the relay restores the "In Service" state that existed before the upgrade.

GE tracking number: 780-2

R Corrected truncation of analog channel identifier in oscillography record

Products: All

Impacted firmware: 7.40 to 7.71

Corrected firmware: 7.80

Workaround: None

Description: An analog channel identifier may be truncated in the oscillography record.

The new release corrects the issue. No truncation occurs.

GE tracking number: 780-16

G Improved Virtual Inputs functionality to improve CPU usage

Products: All

Impacted firmware: 7.26, 7.30 to 7.71

Corrected firmware: 7.80

Workaround: None

Description: The Virtual Inputs functionality is improved to lower the CPU usage.

GE tracking number: 780-19

Communications

C Changed firmware to restore Ethernet communication after a reboot of a network switch for relays with optical SFP modules

Products: All with 9T or 9U CPU module using fiber Avago HFBR-57E5APZ SFP and a Cisco network switch

Impacted firmware: 7.00 to 7.61, 7.70

Corrected firmware: 7.62, 7.71, 7.80

Workaround: None

Description: For relays using a 9T or 9U CPU module with Avago fiberoptic small form-factor pluggable ports (SFPs), the Ethernet connection over fiber is not restored after a reboot of a Cisco network switch. Unplugging and replugging the cable restores the connection. Ethernet connections from other switch vendors or using copper SFPs with RJ45 are not affected by this issue.

A corrected firmware version fixes the issue. It restores Ethernet communications after reboot of any network switch regardless of the type of SFP transceiver used.

GE tracking number: 762-1

C Changed the IEC 61850 protocol namespace (ProtNS) to "IEC 61850-8-1:2003"

Products: All

Impacted firmware: 7.80 and up

Corrected firmware: 7.80

Workaround: None

Description: In previous versions, the firmware uses the IEC 61850 protocol namespace "IEC 61850-8-1:2007."

The new release uses the protocol namespace (ProtNS) "IEC 61850-8-1:2003" to follow the standard.

GE tracking number: 780-3

C Corrected firmware to identify link status for third Ethernet port of a 9V CPU module

Products: All with type 9V CPU module

Impacted firmware: 7.61, 7.70, 7.71

Corrected firmware: 7.80

Workaround: None

Description: A 9V CPU module has three Small Factor Pluggable (SFP) connectors of RJ45 type. It has the link LED of the third Ethernet port permanently turned on, even when no link is detected.

The new release corrects the issue. The relay identifies correctly the link status for every Ethernet port in the module.

GE tracking number: 780-4

C Enhanced the IEC 61850 MMS fdir and fopen file services

Products: All with the IEC 61850 software option

Impacted firmware: All to 7.71

Corrected firmware: 7.80

Workaround: When using relays with firmware versions other than v780:

- Do not use a leading '/' delimiter in fdir and fopen requests
- Do not issue an fopen without an fclose request

Description: In the new release, the following enhancements are implemented in the IEC 61850 MMS file services.

1. In response to an fdir request with a subdirectory name in the request, the response from the relay is the following:

- a. If files are present in the directory, the relay responds with a listing of those files.
- b. If there are no files in the subdirectory, the relay responds with "file non-existent" error.

2. If the UR Data Logger COMTRADE data file is empty, none of the Data Logger COMTRADE files (DataLog.cfg, DataLog.dat) are listed in a response to an fdir request. If Data Logger data is available, the files DataLog.cfg and DataLog.dat are listed in an fdir response.

3. A leading delimiter '/' can now be present in fdir and fopen requests. For example, "/LD/ldnameMaster/COMTRADE..." is treated the same as "LD/ldnameMaster/COMTRADE..." In previous versions, the relay does not allow a leading '/' delimiter to be present in fdir and fopen requests.

4. To prevent a client from "locking" a file by issuing an fopen request and then not issuing any fread or fclose requests, a 30 second timer is introduced for the following files: event recorder, oscillography, data logger, fault report, and user fault report files.

GE tracking number: 780-5

- G Enhanced firmware to produce IEC 61850 SCL files compliant with IEC 61850 schema 2007B4 by adding the TimeSyncProt element under ClientServices element**
 Products: All with the IEC 61850 software option
 Impacted firmware: 7.30 to 7.71
 Corrected firmware: 7.80
 Workaround: None
 Description: In impacted releases, the IEC 61850 SCL files generated by the relay are compliant with schema 2007B for Edition 2.
 In the new release, the firmware is updated to produce IEC 61850 SCL files compliant with schema 2007B4 for Edition 2 by adding the TimeSyncProt element under the ClientServices element.
 GE tracking number: 780-8
- C Corrected firmware to not default IEC 61850 disconnect switch data attributes DiscCSWI.Pos.ctlModel, DiscCSWI.Pos.sboTimeout, and DiscCSWI.Pos.operTimeout at start-up**
 Products: All with the IEC 61850 software option
 Impacted firmware: 7.70 to 7.71
 Corrected firmware: 7.80
 Workaround: None
 Description: The relay defaults the following IEC 61850 data attributes for each disconnect switch every time it boots up:
 DiscCSWI.Pos.ctlModel
 DiscCSWI.Pos.sboTimeout
 DiscCSWI.Pos.operTimeout
 The new release corrects the issue. These disconnect switch data attributes are not defaulted every power-up. They default only when switching the IEC 61850 edition.
 GE tracking number: 780-9
- R Corrected scaling of IEC 61850 logical data attributes mapped to fault impedance, fault loop resistance, and fault distance in km**
 Products: C30, D30, D60, F35, F60, L30, L60, L90
 Impacted firmware: 7.40 to 7.71
 Corrected firmware: 7.80
 Workaround: None
 Description: The values of the following IEC 61850 data attributes are not scaled correctly:
 fault impedance (FltRFLO#.FltZ.cVal.mag.f)
 fault loop resistance (FltRFLO#.FltLoopRis.mag.f)
 fault distance in km (FltRFLO#.FltDiskm.mag.f),
 where # is the number of the respective fault report data file.
 The new release corrects the issue. The scaling is correct.
 GE tracking number: 780-11
- E, C Enhanced Setting Group control by separating between local control mode and IEC61850 control mode**
 Products: All with the IEC 61850 software option
 Impacted firmware: 7.30 to 7.71
 Corrected firmware: 7.80
 Workaround: None
 Description: The active setting group can be changed by a FlexLogic operand, or from MMS, or by changing the initial setting group value in a CID file.

In the new release, a new setting "Control Mode" separates the two modes of controlling the setting group locally or from IEC 61850, as follows:

- When this setting is set to "Local," the active setting group selection is based on the FlexLogic operand states selected by GROUP ACTIVE ON settings and the SelectActiveSG request from an IEC 61850 client generates a negative response
- When this setting is set to "IEC61850 Client," the SelectActiveSG request from an IEC 61850 client selects the active setting group and the FlexLogic operand states of the GROUP ACTIVE ON settings are ignored/not used

GE tracking number: 780-13

C Changed IEC 61850 data attribute DmdMMTR1.CF.RsStat.ctlModel to be read-only

Products: B30, C60, D60, F35, F60, G60, L60, L90, N60, T60 with the IEC 61850 software option

Impacted firmware: 7.40 to 7.71

Corrected firmware: 7.80

Workaround: None

Description: In previous versions, the IEC 61850 data attribute DmdMMTR1.CF.RsStat.ctlModel can be configured from a CID file.

In the new release, this data attribute is read-only.

GE tracking number: 780-14

Firmware 7.81

Summary

Improvements include the following.

- Common Platform Functions
 - Fixed reporting of timestamps in MMS and SCADA clients for contact inputs of the high-density input module (6W)
 - Removed phasor plot from graphical front panel source phasor page
 - Corrected firmware to prevent an unexpected restart in relays using IEC 61850 reports
 - Improved IEEE 1588 PTP switchover time over Parallel Redundancy Protocol network
 - Improved firmware to allow retrieval of HardFiber Brick diagnostics with EnerVista UR Service Report
 - Changed firmware to publish the power-on time in the timestamps of all IEC 61850 attributes upon boot-up
 - Corrected trigger on state change for a GOOSE/IEC 61850 report when breaker or switch LN DA Pos.stSeld is included in dataset
 - Enhanced access rights for M2M role used for SSH tunnel by the D400 gateway

Common Platform Functions

C Fixed reporting of timestamps in MMS and SCADA clients for contact inputs of the high-density input module (6W)

Products: All with high-density input module (6W) and using MMS or SCADA clients

Impacted firmware: 7.61 to 7.80

Corrected firmware: 7.81

Workaround: None

Description: For a high-density input module (6W), the relay reports incorrect contact input timestamps to MMS and SCADA clients (DNP, IEC 60870-5-104, IEC 60870-5-103). The timestamps have the millisecond part of the timestamp set to zero. Other input modules do not have this problem.

In the corrected firmware, the relay reports correct contact input timestamps for all types of input modules.

GE tracking number: 781-1

D Removed phasor plot from graphical front panel source phasor page

Products: All with graphical front panel except C30

Impacted firmware: 7.60, 7.61, 7.62, 7.70, 7.71, 7.80

Corrected firmware: 7.63, 7.72, 7.81

Workaround: Do not use rolling mode with source phasor page

Description: The graphical front panel displays a phasor page for each configured AC source. The page displays a phasor plot and a table with the numerical values of all currents, voltages, and symmetrical components of the respective AC source. If the source phasor page is included in the rolling mode configuration, the graphical front panel can experience an unexpected restart, without affecting protection.

In the new releases, the phasor plot is removed from the graphical front panel source phasor page. The page displays only the table with the numerical values of the currents, voltages, and symmetrical components. This change prevents the graphical front panel from experiencing an unexpected restart if the rolling mode is configured to include at least one source phasor page.

GE tracking number: 763-1

B Corrected firmware to prevent an unexpected restart in relays using IEC 61850 reports

Products: All with an IEC 61850 software option and configured IEC 61850 report settings

Impacted firmware: 7.70 to 7.80

Corrected firmware: 7.81

Workaround: None

Description: A relay configured to send out IEC 61850 reports can experience an unexpected restart. The higher the number of reports used (buffered and unbuffered), the higher the chance of an unexpected restart.

This issue is fixed in the corrected firmware. No unexpected restart occurs even with the maximum configuration of buffered/unbuffered reports.

GE tracking number: 781-2

C Improved IEEE 1588 PTP switchover time over Parallel Redundancy Protocol network

Products: All with IEEE 1588 and Parallel Redundancy Protocol (PRP) software options

Impacted firmware: 7.00 to 7.80

Corrected firmware: 7.81

Workaround: None

Description: A relay using PRP and IEEE 1588 Precision Time Protocol (PTP) time synchronization has a 60 second holdover time when switching from one port to the other.

The new firmware shortens the holdover time to three seconds.

GE tracking number: 781-3

G Improved firmware to allow retrieval of HardFiber Brick diagnostics with EnerVista UR Service Report

Products: All with HardFiber

Impacted firmware: 5.62 to 7.80

Corrected firmware: 7.81

Workaround: None

Description: HardFiber Brick diagnostic log files cannot be retrieved in the field.

The new firmware allows retrieval of Brick diagnostic log files by creating Service Reports with the EnerVista UR Setup software.

GE tracking number: 781-4

C Changed firmware to publish the power-on time in the timestamps of all IEC 61850 attributes upon boot-up

Products: All with an IEC 61850 software option

Impacted firmware: All to 7.80

Corrected firmware: 7.81

Workaround: None

Description: After the relay starts up, the timestamps of all IEC 61850 attributes are January 1, 1970.

In the new firmware, after startup the timestamps of all IEC 61850 attributes are the power-on timestamp of the relay.

GE tracking number: 781-5

C Corrected trigger on state change for a GOOSE/IEC 61850 report when breaker or switch LN DA Pos.stSeld is included in dataset

Products: All with an IEC 61850 software option and configured to include any of the affected attributes in a dataset for GOOSE or reports

Impacted firmware: 7.30 to 7.80

Corrected firmware: 7.81

Workaround: None

Description: A change in the following IEC 61850 attributes is not reflected if they are included in a dataset for GOOSE or reports:

DiscCSWI#.Pos.stSeld, Disc0XSWI#.Pos.stSeld, BkrCSWI#.Pos.stSeld, Bkr0XCBR#.Pos.stSeld.

These attributes can still be read with an MMS client.

In the new firmware, the listed attributes are scanned and a change in one of any of these attributes is reflected in GOOSE packets or reports.

GE tracking number: 781-6

C Enhanced access rights for M2M role used for SSH tunnel by the D400 gateway

Products: All with the CyberSentry software option

Impacted firmware: 7.60 to 7.80

Corrected firmware: 7.81

Workaround: None

Description: The GE D400 substation gateway supports SSH secure tunnel support to the UR relay for Machine-to-Machine (M2M) access. The M2M role does not have Administrator and Supervisor access rights.

The new firmware changes the M2M role (m2m_user) used for the SSH secure tunnel through the D400 gateway to allow Administrator and Supervisor access rights, thus enabling these users to perform the full range of relay functions.

GE tracking number: 781-7

Software

Software 7.80

Summary

Improvements include the following (780-20):

- Software exceptions

EnerVista UR Setup Software

C Software exceptions

Number	Description
1	Fixed undesirable password prompt although there is no password set
2	Fixed UR EnerVista Setup software connection loss to a B90 relay after the Actual Values/Metering/Bus screen is opened
3	Corrected an issue to keep a manual RxGOOSE message and its subscriptions unchanged after reimporting a CID file
4	Fixed adding a non-IEC 61850 device or an IEC 61850 device with version pre-7.30 from a URS file that resulted in a device folder being created inside a folder with the same name

Upgrade

Compatibility

The 7.80 firmware runs on the T, U, V, and W CPU modules. View the order code to determine the CPU module in the relay. For example, in C60-V03-HPH-H6H, the relay has a V CPU module.

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

The 7.80 firmware release is not compatible with previous UR CPU hardware (CPU types A, B, D, E, G, H, J, K, N, and S).

The 7.80 firmware release requires EnerVista UR Setup software version 7.8x 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. Upgrade of the software takes about five minutes, and upgrade of firmware takes about 25 minutes. They can be done over an Ethernet connection. The USB port cannot be used for the upgrade.

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:

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