Overview

This document contains the release notes for firmware and software version 7.80 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
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.Pos.ctlModel, 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 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/lnameMaster/COMTRADE…” is treated the same as “LD/lnameMaster/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
**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

**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

**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

**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.RsStatctlModel 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.RsStatctlModel can be configured from a CID file.

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

GE tracking number: 780-14
Software

Software 7.80

Summary

Improvements include the following (780-20):

- Software exceptions

EnerVista UR Setup Software

C  Software exceptions

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fixed undesirable password prompt although there is no password set</td>
</tr>
<tr>
<td>2</td>
<td>Fixed UR EnerVista Setup software connection loss to a B90 relay after the Actual Values/Metering/Bus screen is opened</td>
</tr>
<tr>
<td>3</td>
<td>Corrected an issue to keep a manual RxGOOSE message and its subscriptions unchanged after reimporting a CID file</td>
</tr>
<tr>
<td>4</td>
<td>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</td>
</tr>
</tbody>
</table>
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.
   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:
   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

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

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