GE Grid Solutions

UR Family

GOOSE Communication between UR and Integrated MU320

Application Note

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This document outlines configuration required for a GE Universal Relay (UR) and a GE Reason MU320 Integrated Merging Unit for establishing GOOSE communication between them.

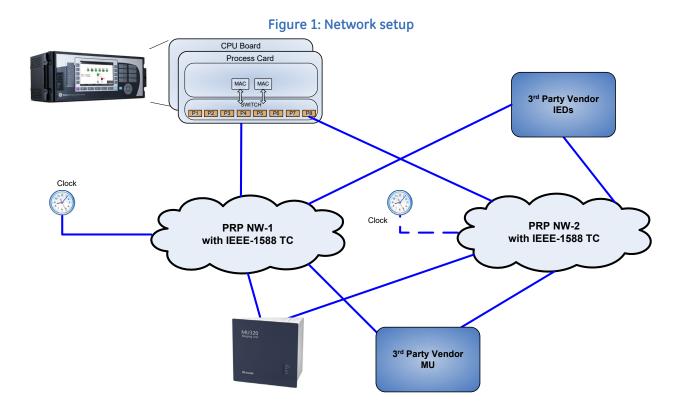
Introduction

The UR family of protection relays with firmware version 7.80 and higher have capability to include a process bus module for sampled values (SVs) and GOOSE communication with merging units. Peer-to-peer GOOSE messaging is used between URs and merging units for tripping circuit breakers via binary outputs and receiving breaker statuses in a UR relay. Any transducer-related analog signals also can be shared between a UR and an MU320 unit via GOOSE communication.

This document contains configuration examples to establish GOOSE communication between a UR and MU320.

Configuration to operate contact outputs in MU320 from UR

Consider the network diagram that consists of a UR and an MU320 unit where GOOSE communication is established between the Intelligent Electronic Devices (IEDs) and the merging unit. The contact output operation commands are transmitted as GOOSE Booleans from the UR to the MU320 unit for operating binary outputs located on the MU320 unit. In the opposite direction of network path, breaker statuses that are received as binary inputs in the MU320 unit are sent as GOOSE Booleans to the UR.



To send contact output operate commands from a UR to an MU320 unit:

- 1. Power-on the UR and MU320 unit. Connect both devices to the same network using rear Ethernet ports on each of the devices through an Ethernet managed switch.
- 2. Open the EnerVista UR Setup software on the computer and establish communication with UR.
- 3. In this example, Virtual Input 1 is being sent from the UR to the MU320 unit for operating the binary output 1 of the MU320 unit. Hence, Enable the Virtual Input under **Settings > Inputs/Outputs > Virtual Inputs**. Also enable the events for the operand in the UR that is driving the contact output of the MU320 unit. In the example shown, events are enabled for Virtual Input 1, which means that an event will be logged for VI1 activation when a contact output operation command is sent from the relay.

| PARAMETER |
|-----------|
| Enabled |
| Virt lp 1 |
| Latched |
| Enabled |
| |

Figure 2: EnerVista software setup

4. Under Settings> Product Setup> IEC61850>GGIO> GGIO1, assign binary operand Virtual Input 1 ON to the GGIO1 INDICATION 1 field.

| L90 PBM | SETTING | PARAMETER |
|------------------------------|---------------------|--------------------|
| ··· Developer IID/CID Viewer | GGI01 INDICATION 1 | Virt lp 1 On (VI1) |
| Server Configuration | GGI01 INDICATION 2 | OFF |
| Logical Devices | GGI01 INDICATION 3 | OFF |
| . GOOSE | GGI01 INDICATION 4 | OFF |
| | GGI01 INDICATION 5 | OFF |
| | GGI01 INDICATION 6 | OFF |
| ⊕ Product Setup | GGI01 INDICATION 7 | OFF |
| | GGI01 INDICATION 8 | OFF |
| | GGI01 INDICATION 9 | OFF |
| Grouped Elements | GGI01 INDICATION 10 | OFF |
| | GGI01 INDICATION 11 | OFF |
| Settings for Commands | GGI01 INDICATION 12 | OFF |
| GGIO | GGI01 INDICATION 13 | OFF |
| -GGIO1 | GGI01 INDICATION 14 | OFF |
| GGIO2 | GGI01 INDICATION 15 | OFF |
| | GGI01 INDICATION 16 | OFF |
| | | 055 |

Figure 3: GGIO setup for Virtual Input 1

5. Under the transmission section of GOOSE (TxGOOSE), that is, IEC61850> GOOSE>TxGOOSE>TxGOOSE1, go to TxGOOSE1. Configure the TxGOOSE1 MODE to GOOSE, TXGOOSE1 Datset to TT6DataSet1, and TxGOOSE1 PB PORT ASSIGNMENT to the PBM port through which it is connected to the network (communicating to the MU320 unit). Also in this window, map the GGIO1 Indication 1 status value (stVal) to TT6Dataset01. If you want to send quality attribute, then map the quality attribute to TT6DataSet01. GE recommends using TT6 datasets for tripping operation as they are associated with Fast GOOSE. TT3 datasets are associated to slow GOOSE, hence GE recommends them to be used for control operation. Booleans in fast GOOSE datasets are designed for the TT6 transfer time class (3 ms), while Booleans in the Normal datasets are designed for the TT3 class (100 ms).

| L90 PBM | SETTING | | PARAM | ETER | |
|----------------------------|-------------------------------|---|------------------------|---------------------|------------|
| - Developer IID/CID Viewer | TxGOOSE1 MODE | | GOOS | | |
| Server Configuration | TxGOOSE1 GoCB name | | GoCB | | |
| Logical Devices | TxG00SE1 GolD | | TxGOO | ISE1 | |
| | TxG00SE1 DatSet | | TT6DataS | Set1 | |
| ⊨ TxGOOSE | TxGOOSE1 DST MAC | | 01-0C-CD-(| 01-00-00 | |
| TxGOOSE1 | TxG00SE1 VLAN PRIORITY | | 4 | | |
| - TxGOOSE2 | TxG00SE1 VLAN ID | | 0 | | |
| - TxGOOSE3 | TxGOOSE1 ETYPE APPID | | 0 | | |
| - TxGOOSE4 | TxG00SE1 CONFREV | | 1 | | |
| ··· TxGOOSE5 | TxGOOSE1 MIN TIME | | 4 ms | | |
| ··· TxGOOSE6 | TxGOOSE1 MAX TIME | | 10 s | | |
| TxGOOSE7 | TxG00SE1 TIME ALLOWED TO LIVE | | 20 s | | |
| - TxGOOSE8 | TxGOOSE1 CPU PORT ASSIGNMENT | | Disable | - | |
| TxGOOSE9 | TxG00SE1 PB PORT ASSIGNMENT | | Click to view or | | |
| TxGOOSE10 | R-TxG00SE1 IP CLASS | | 46 | | |
| - TxGOOSE11 | R-TxG00SE1 DST IP | | 224.0 | 0.0 | |
| - TxGOOSE12 | R-TxG00SE1 SECURITY | | None | | |
| - TxGOOSE13 | | | | | |
| TxGOOSE14 | B-L90-VE3-HKH-H86-P6C-W77 | ^ | SETTING | PARAMET | TER |
| TxGOOSE15 | ∺Master | | TT6DataSet01 name | TT6DataS | iet1 |
| TxGOOSE16 | ⊟-GGIO1 | | TT6DataSet01 shared by | TxG00S | E1 |
| ⊞··RxGOOSE | é-s⊤ | | TT6DataSet01 Member1 | Master.GGI01.ST.Inc | d001.stVal |
| B Reports | ₿-Beh | | TT6DataSet01 Member2 | Master.GGI01.ST. | Ind001.q |
| B-DataSets | ⊞-Health | | TT6DataSet01 Member3 | End of Lis | t |
| B-Product Setup | ⊟-Ind001 | | TT6DataSet01 Member4 | End of Lis | t |
| B System Setup | stVal | _ | TT6DataSet01 Member5 | End of Lis | t |
| # FlexLogic | -9 | | TT6DataSet01 Member6 | End of Lis | t |
| B Grouped Elements | t t | | TT6DataSet01 Member7 | End of Lis | t |
| B Control Elements | ⊞-Ind002 | | TT6DataSet01 Member8 | End of Lis | t |
| Settings for Commands | ⊞-Ind003 | | TT6DataSet01 Member9 | End of Lis | t |
| É GGIO | ⊞-Ind004 | | TT6DataSet01 Member10 | End of Lis | t |
| - GGIO1 | tienen auf Berlind005 | | TT6DataSet01 Member11 | End of Lis | t |
| GGIO2 | ⊞-Ind006 | | TT6DataSet01 Member12 | End of Lis | t |
| i≟- GGIO4 | # Ind007 | | TT6DataSet01 Member13 | Fnd of Lis | t |

Figure 4: GOOSE transmission setup

- 6. Once these IEC 61850 settings have been configured, click the **Save** button to retain them. While the software saves the settings, a new CID file is created in the relay. Once a new CID file is created, download the CID file from the relay and save the file to the computer.
- 7. Open the MU320 unit configurator. Establish communication with the MU320 unit.

8. Under the **GOOSE and Report** tab, click the **GOOSE Subscription** option, and click the **Add SCL File** button. A window opens to select the CID file that was saved from the UR, and you import the CID file that was saved from the UR into the MU320 software.

| | 5 | | · | |
|---|--|---------------------------|--|--|
| MU320 Extended Configurator | | | | |
| File Communication | | | | |
| () MU320 Extende | ed powered by GE Grid Solutions | | | |
| IED Power System Sampled Values | Binary GOOSE and Report Logic | | | |
| IED Power System Sampled Values Dataset GOOSE Subscription GOOSE Publisher Report Report State St | Binary GOOSE and Report Logic SubNetworks W4 IED - | | >> D D D D D D D D D D D D D D D D D D D | GOOSE 1 (L90.TT6DataSet1.GGI01.Ind001) GOOSE 2 GOOSE 3 GOOSE 4 GOOSE 5 GOOSE 6 GOOSE 7 GOOSE 7 GOOSE 9 GOOSE 10 GOOSE 10 GOOSE 11 GOOSE 12 GOOSE 12 GOOSE 13 GOOSE 14 GOOSE 13 GOOSE 14 GOOSE 15 GOOSE 14 GOOSE 15 GOOSE 16 GOOSE 17 GOOSE 18 GOOSE 19 GOOSE 20 GOOSE 20 GOOSE 21 GOOSE 21 GOOSE 21 GOOSE 22 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 24 GOOSE 25 GOOSE 25 GOOSE 25 GOOSE 26 GOOSE 27 GOOSE 28 GOOSE 29 GOOSE 28 GOOSE 29 GOOSE 29 GOOSE 20 GOOSE 20 GOOSE 23 GOOSE 24 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 24 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 24 GOOSE 23 GOOSE 24 GOOSE 24 GOOSE 23 GOOSE 24 GOOSE 23 GOOSE 23 GOOSE 24 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 23 GOOSE 24 GOOSE 23 GOOSE 24 GOOSE 23 GOOSE 23 GOOSE 24 GOOSE 24 GOOSE 24 GOOSE 25 GOOSE 24 GOOSE 25 GOOSE 24 GOOSE 25 GOOSE 24 GOOSE 25 GOOSE 24 GOOSE 24 GOOSE 24 GOOSE 24 GOOSE 25 GOOSE 24 GOOSE 24 GOOSE 25 GOOSE 25 GOOSE 25 GOOSE 25 |
| | | | | |
| | Dataset: | | | |
| | Add SCL | File Remove SCL Reference | | _ |

Figure 5: MU320 Configurator window to import UR file

9. Click the UR device that was imported and map the data point from the transmission data sets (left side) to receiving GOOSE datasets (right side) in the MU320 unit. In this example, the status value and quality attribute associated to GGIO1 Indication 1 are mapped to GOOSE 1 boolean and quality respectively. Then click the **Ok** button to save the setting changes made.

| IED Power System Sampled Values | Binary GOOSE and Repo | rt Logic | | |
|---------------------------------|-----------------------|--|----------|--|
| Dataset | | SubNetworks | | GOOSE 1 (L90.TT6DataSet1.GGIO1.Ind001) |
| GOOSE Subscription | | ⊿ W4 | | boolean : stVal |
| GOOSE Publisher | | ▲ IED - L90 | | quality : q |
| Report | | Control Block = L90Master/LLN0\$GO\$GoCB01 | | Ø GOOSE 2 |
| | | GGIO1.Ind001.stVal | | Ø GOOSE 3 |
| | | GGIO1.Ind001.q | | GOOSE 4 |
| | | | | © GOOSE 5 |
| | | | | GOOSE 6 |
| | | | | GOOSE 7 |
| | | | | GOOSE 8 |
| | | | | © GOOSE 9 |
| | | | | D GOOSE 10 |
| | | | | © GOOSE 11 |
| | | | | D GOOSE 12 |
| | | | | D GOOSE 13 |
| | | | | D GOOSE 14 |
| | | | | GOOSE 15 GOOSE 16 |
| | | | | © GOOSE 17 |
| | | | >> | © GOOSE 17 |
| | | | | GOOSE 18 GOOSE 19 |
| | | | << | © GOOSE 20 |
| | | | | © GOOSE 21 |
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| | | | | D GOOSE 27 |
| | | | | © GOOSE 28 |
| | | | | Ø GOOSE 29 |
| | | | | GOOSE 30 |
| | | | | GOOSE 31 |
| | | | | GOOSE 32 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | J L | |
| | | Dataset: L90Master/LLN0\$TT6DataSet1 | | |
| | | | | |
| | | Add SCL File Remove SCL Reference | | |
| | | | oncel Ok | |
| | | | UK | |
| | | | | |

Figure 6: Map status and quality to the UR

10. Under the **Logic** tab, access the **Binary Outputs**. In this example, select **GOOSE Inputs** for the **Group** of inputs, then select the first GGIO1 Ind1 that was mapped to receiving dataset for the signal source.

| Fic | jure | 7: | Se | lect | in | puts |
|-----|------|----|----|------|----|------|
| | | | | | | |

| File Communication | |
|--|--|
| (WU320 Extende | ed powered by GE Grid Solutions |
| IED Power System Sampled Values | Binary GOOSE and Report Logic |
| Circuit Breakers Circuit Switches Monitoring Binary Outputs Slot C - Board B4 Slot D - Board B4 | Slot C - Board B4 Output operates a circuit breaker or switch Group GOOSE Inputs Signal CTRL/GOOSEGGIO3.Ind1.stVal - L90.TT6DataSet1.GGIO1.Ind001.stVal CTRL/GOOSEGGIO3.Ind1.stVal CTRL/GOOSEGGIO3.Ind2.stVal CTRL/GOOSEGGIO3.Ind3.stVal CTRL/GOOSEGGIO3.Ind4.stVal CTRL/GOOSEGGIO3.Ind5.stVal CTRL/GOOSEGGIO3.Ind5.stVal CTRL/GOOSEGGIO3.Ind5.stVal CTRL/GOOSEGGIO3.Ind5.stVal CTRL/GOOSEGGIO3.Ind5.stVal CTRL/GOOSEGGIO3.Ind5.stVal |

11. Once the signal source is selected, click the + (add) symbol. This ensures that the first contact output (CO1) on Slot C - Board B4 of the MU320 unit operates when the received GOOSE signal is asserted. Finally, click the **Ok** button at the bottom of window to save the settings.

| | ed powered by GE Grid Solutions | | | | | |
|--|--|-----|----|---|-------|---|
| IED Power System Sampled Value D Circuit Breakers Circuit Switches D Monitoring Binary Outputs Slot C - Board B4 Slot D - Board B4 | s Binary GOOSE and Report Logic Slot C - Board B4 Output operates a circuit breaker or switch roup GOOSE Inputs v Signal Input RL/GOOSEGGIO3.ind1.stVal - L90.TT6DataSet1.GGIO1.ind001 | NOT | OR | CTRL/CMDOUTGGIO2.Ind1.stV Mode Straight-through Timer Setting Pick Up Timer Drop Off Timer Latch Settings (Set Dominanti Group All Reset | ms ms | Ð |

Figure 8: Add the configuration and save

12. The settings have not been sent to the MU320 unit yet. To do so, click the **Communication > Send Configuration** menu. This saves the setting changes made to the MU320 unit.

| Figure 9: Saving settings on the MU320 unit | | | | | | |
|---|--------------------|-------------|-------------|-----------------------------|--|--|
| MU M | 1U320 | Extended Co | onfigurator | | | |
| File | Com | munication | | | | |
| | | Receive Co | nfiguration | | | |
| (9 | Send Configuration | | | owered by GE Grid Solutions | | |
| | ン | | | , | | |

Once the virtual input 1 is ON, an event is logged in the EnerVista UR Setup software, and contact output 1 (Slot C - Board B4) of the MU320 unit is asserted.

| Virtual Inputs / | // Sanjay Panel: I | L90 PBM: C | omm 🗖 | | | |
|-----------------------|--------------------|--------------------------|------------------|-------------|----------|---------|
| | Restore | Default | Reset | VIEW AL | | |
| VIRTUAL | INPUT | | STATE | | | |
| Virt lp 1 (VI 1) | | | On | | | |
| | | | | | | all di |
| Event Record // S | anjay Panel: L90 | PBM: Actu | al Values: Recor | ds | | x |
| | | | | | | |
| File Name | C:\Us | ers\Public\D | ocuments\GE Po | wer Managem | ent\URP(| C\Data' |
| Date / Time of Last 0 | lear Mond: | au Eabruaru | 10, 2020 21:13:3 | 4 | | _ |
| Date / Time of Last t | | ay, rebruary | 10, 2020 21.15.5 | + | | |
| Events Since Last Cl | ear | 2 Shown Number of Events | | | 2 | |
| | | | | | | |
| | | | <u> </u> | | | |
| | | days Uh: | 0 m : 0.000000 | S | | |
| | | | | | | |
| Event Number | Date/Tin | ne | | Cause | | Data |
| 2 F | eb 10 2020 21:22 | :10.236790 | Virt lp 1 0 | Dn (VI1) | | |
| 1 F | eb 10 2020 21:13 | :34.750629 | EVENTS CLEAR | ED | | |
| | | | | | | |

Figure 10: Event record in UR

In order to verify the status of the contact output of the MU320 unit, the contact output status is required to be sent back to UR relay as a GOOSE Boolean from MU320 (next section).

Configuration to receive contact outputs or breaker state statuses from MU320 in UR

The status of contact outputs that have operated in the MU320 unit or breaker statuses that are received as binary inputs in the MU320 unit are sent to the UR through peer-to-peer GOOSE messaging.

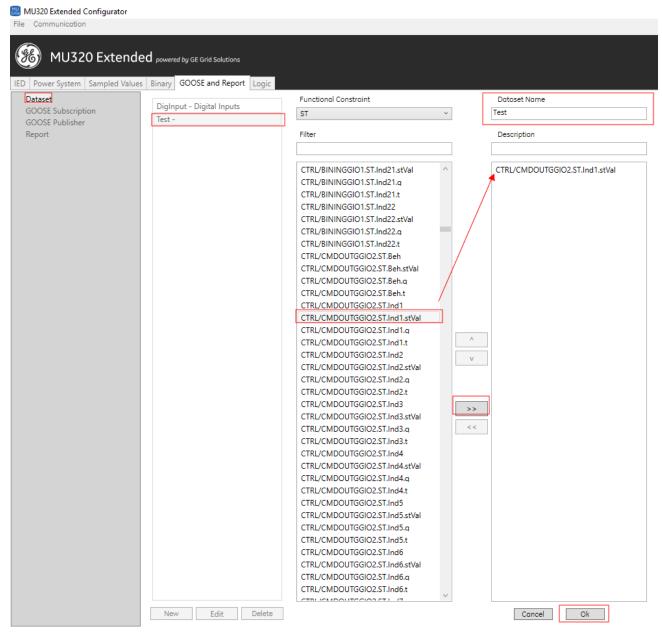
To establish this communication:

1. In the MU320 software, under the **GOOSE and Report** tab, go to **Dataset** and create a new dataset. In this example, a Test dataset has been created. Then map the CTRL/CMDOUTGGIO2.Ind1.stVal that is tied to Contact Output 1 status to one of the binary points in the "Test" dataset.

Figure 11: Create a test dataset

| File Communication | | | | |
|---|----------|---------|------------------|-----------|
| () MU320 Extende | ed power | ed by G | E Grid Solutions | 5 |
| IED Power System Sampled Values | Binary | GOC | SE and Repo | ort Logic |
| IED Power System Sampled Values Dataset GOOSE Subscription GOOSE Publisher Report | | put - | ISE and Repo | |
| | Ne | N | Edit | Delete |

Figure 12: Map the output status to the test dataset



2. Note the DigInput dataset that is already available in MU320 unit by default. This dataset contains the binary points that are already mapped to binary/contact inputs of the MU320 unit. These inputs are wired to 52a/52b contacts of the breaker in order to receive the statuses of breakers, switches, isolators, or any other field contacts. In this example, consider Contact Inputs 1 and 2 are wired – where contact input 1 is always asserted (ON) and contact input 2 is tied to 52a contact of breaker that is operating on the basis of contact output 1 status that was configured in the previous section. Map CTRL/BININGGIO1.ST.Ind1.stVal and CTRL/BININGGIO1.ST.Ind2.stVal for transmission under DigInput

| () MU320 Extende | d powered by GE Grid Solutions | 1 | | | | |
|------------------|--------------------------------|----------|--|--|----|--|
| WU320 Extende | | rt Logic | Functional Constraint ST Filter binin*ind*(stVal]q) CTRL/BININGGIO1.ST.Ind1.stVal CTRL/BININGGIO1.ST.Ind2.stVal CTRL/BININGGIO1.ST.Ind2.stVal CTRL/BININGGIO1.ST.Ind3.stVal CTRL/BININGGIO1.ST.Ind3.qtVal CTRL/BININGGIO1.ST.Ind3.qtVal CTRL/BININGGIO1.ST.Ind5.stVal CTRL/BININGGIO1.ST.Ind5.qtVal CTRL/BININGGIO1.ST.Ind5.qtVal CTRL/BININGGIO1.ST.Ind5.qtVal CTRL/BININGGIO1.ST.Ind5.qtVal CTRL/BININGGIO1.ST.Ind5.qtVal CTRL/BININGGIO1.ST.Ind5.qtVal CTRL/BININGGIO1.ST.Ind17.qtVal CTRL/BININGGIO1.ST.Ind18.stVal CTRL/BININGGIO1.ST.Ind18.qtVal CTRL/BININGGIO1.ST.Ind19.stVal CTRL/BININGGIO1.ST.Ind19.qtVal CTRL/BININGGIO1.ST.Ind20.stVal CTRL/BININGGIO1.ST.Ind21.stVal CTRL/BININGGIO1.ST.Ind21.stVal CTRL/BININGGIO1.ST.Ind22.stVal CTRL/BININGGIO1.ST.Ind22.stVal CTRL/BININGGIO1.ST.Ind22.qtVal CTRL/BININGGIO1.ST. | Dataset Name DigInput Description Digital Inputs CTRL/BININGGIO1.ST. CTRL/BININGGIO1.ST. | | |
| | New Edit | Delete | | Cancel | Ok | |

Figure 13: Map DigInput contact inputs

dataset. Click the **OK** button to save the setting changes made on this page.

3. With the datasets created, access **GOOSE Publisher** under the **GOOSE and Report** tab. Note that the GOOSE message with FastGOOSE1 is already available. Edit this GOOSE message by enabling it, entering a **GOOSE ID**, and assigning the **Dataset** field to the DigInput that is associated to the binary inputs. Click the **Ok** button at the bottom of the window to save the changes.

| D Power System Sampled Values | Binary GOOSE and Report Logic | | | |
|---------------------------------------|-----------------------------------|---|---|----------|
| Dataset | FastGOOSE1 - Fast GOOSE Publisher | ✓ Enable | | |
| GOOSE Subscription GOOSE Publisher | GOCB - GOOSE Control Block | Message Name | FastGOOSE1 | |
| Report | | Description | Fast GOOSE Publisher | |
| | | GOOSE ID | MU320GOOSE | |
| | | Dataset | DigInput | |
| | | APP ID MAC-Address VLAN-PRIORITY VLAN-ID Minimum Time Maximum Time Encoding | 0x1000 01-0C-CD-01-00-00 4 0 0x0 1 1000 Fixed | ms ms |

Figure 14: Enable GOOSE messages and assign to dataset

4. Create a new GOOSE message named GOCB with a **GOOSE ID** of MU320GOOSE2. Map the Test dataset that contains the status of contact output 1 to this GOOSE message. Click the **Ok** button to save the settings.

| MU320 Extended powered by GE Grid Solutions | | | | | | | | | |
|--|--------|---|--|---|--|--|--|--|--|
| IED Power System Sampled Values | Binary | GOOSE and Report Logic | | | | | | | |
| Dataset GOOSE Subscription GOOSE Publisher Report | FastGC | OOSE und Report OOSE 1 - Fast GOOSE Publisher - GOOSE Control Block | | Message Name Description GOOSE ID Dataset APP ID MAC-Address VLAN-PRIORITY VLAN-ID Minimum Time Maximum Time | | GOCB GOOSE Control Block MU320GOOSE2 Test 0×1000 01-0C-CD-01-00-00 4 ~ ~ 0 0×0 20 1000 BER ~ | | | |
| | | | | Encoding | | DEN . | | | |

Figure 15: Create GOOSE message and map to dataset

5. Send the settings to the MU320 unit using **Communication > Send Configuration**, and save it. This saves the setting changes made to the MU320 unit.

Figure 16: Send settings to merging unit

| MU SZOW | 1U320 Extended Configurator | |
|------------|-----------------------------|-----------------------------|
| File | Communication | |
| | Receive Configuration | |
| (9 | Send Configuration | owered by GE Grid Solutions |
| C. | | |

6. Once the settings have been saved to the MU320 unit, download the settings from the MU320 unit to the offline CID file on the computer by acccessing the **Communication > Receive Configuration** menu option.

Figure 17: Download settings from merging unit

| MU SZON | U320 Extended Configurator | |
|----------|----------------------------|-----------------------------|
| File | Communication | |
| | Receive Configuration | |
| (G | Send Configuration | owered by GE Grid Solutions |
| U | | |

 Once the settings file is saved on the computer from the MU320 unit, the file has to be imported in the UR. Access Settings > Product Setup > Communications > IEC 61850 > RxGOOSE > RxGOOSE Bolean Inputs. Click the Add IED button, and select the settings file (.CID) saved from the MU320 unit.

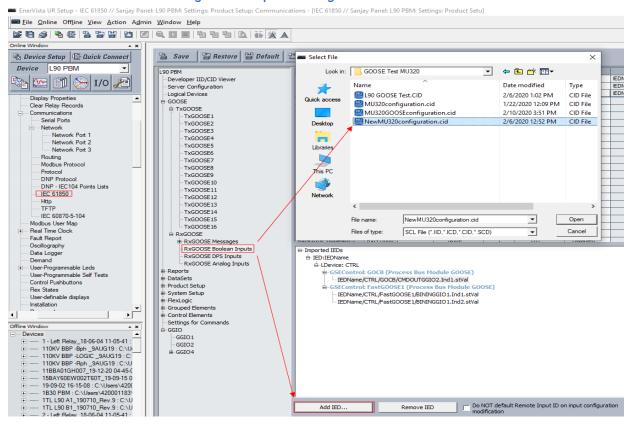


Figure 18: Import settings file in UR software

8. Once the CID file is imported, the transmitted GOOSE booleans from the MU320 unit are seen under the imported device. Map these binary points to RxGOOSE Booleans in the window by dragging and dropping to **RxGOOSE Boolean** fields. You can name the RxGOOSE Booleans in the **ID** field and enable the events for it. Events then are logged when RxGOOSE Booleans are asserted (it configures automatically the **Subscribed to** section).

| 90 goose test | Inputs | ID | RxGOOSE | Member | DEFAULT STAT | EVENTS | Subscribed to |
|--------------------------|-------------------|----------------------|------------------|--------|--------------|----------|--|
| Developer IID/CID Viewer | RxGOOSE Boolean1 | CO1 Status | RxG00SE1 | 1 | Off | Enabled | IEDName/CTRL/GOCB/CMDOUTGGIO2.Ind1.stVal |
| Server Configuration | RxGOOSE Boolean2 | CI1 | RxG00SE2 | 1 | Off | Enabled | IEDName/CTRL/FastGOOSE1/BININGGIO1.Ind1.st |
| - Logical Devices | RxGOOSE Boolean3 | BKR Status Cl2 | RxG00SE2 | 2 | Off | Enabled | IEDName/CTRL/FastGOOSE1/BININGGIO1.Ind2.st |
| GOOSE | RxGOOSE Boolean4 | RxG Bool4 | None | 1 | Off | Disabled | |
| ⊨ TxGOOSE | RxGOOSE Boolean5 | RxG col5 | None | 1 | Off | Disabled | |
| TxGOOSE1 | RxGOOSE Boolean6 | RxG E ool6 | None | 1 | Off | Disabled | |
| TxGOOSE2 | RxGOOSE Boolean7 | RxG Bool7 | None | 1 | Off | Disabled | |
| - TxGOOSE3 | RxGOOSE Boolean8 | RxG Bool8 | None | 1 | Off | Disabled | |
| TxGOOSE4 | RxGOOSE Boolean9 | RxG Bool9 | None | 1 | Off | Disabled | |
| - TxGOOSE5 | RxGOOSE Boolean10 | RxG Bool10 | None | 1 | Off | Disabled | |
| TxGOOSE6 | RxGOOSE Boolean11 | RxG Bool11 | None | 1 | Off | Disabled | |
| - TxGOOSE7 | RxGOOSE Boolean12 | RxG Bool12 | None | 1 | Off | Disabled | |
| - TxGOOSE8 | RxGOOSE Boolean13 | RxG Bool13 | None | 1 | Off | Disabled | |
| - TxGOOSE9 | RxGOOSE Boolean14 | RxG Bool14 | None | 1 | Off | Disabled | |
| - TxGOOSE10 | RxGOOSE Boolean15 | RxG Bool15 | None | 1 | Off | Disabled | |
| TxGOOSE11 | RxGOOSE Boolean16 | RxG Bool16 | None | 1 | Off | Disabled | |
| TxGOOSE12 | RxGOOSE Boolean17 | RxG Bool17 | None | 1 | Off | Disabled | |
| TxGOOSE13 | RxGOOSE Boolean18 | RxG Bool18 | None | 1 | Off | Disabled | |
| TxGOOSE14 | RxGOOSE Boolean19 | RxG Bool19 | None | 1 | Off | Disabled | |
| TxGOOSE15 | RxGOOSE Boolean20 | RxG Bool20 | None | 1 | Off | Disabled | |
| TxGOOSE16 | RxGOOSE Boolean21 | RxG Bool21 | None | 1 | Off | Disabled | |
| B-RxGOOSE | RxGOOSE Boolean22 | RxG Bool22 | None | 1 | Off | Disabled | |
| RxGOOSE Messages | RxGOOSE Boolean23 | RxG Bool23 | None | 1 | Off | Disabled | |
| RxGOOSE Boolean Inputs | ⊟-Imported IEDs | | | | | | |
| | i⊟-IED:IEDName | | | | | | |
| RxGOOSE Analog Inputs | | | | | | | |
| -Reports | B- GSEContro | l: FastG005E1 (Proce | ss Bus Module GO | OSE) | | | |
| DataSets | | CTRL/FastGOOSE1/BINI | | 1 | | | |
| - Product Setup | | CTRL/FastGOOSE1/BINI | | | | | |
| -System Setup | | l: GOCB (Process Bus | | - | | | |
| 8-FlexLogic | | /CTRL/GOCB/CMDOUTGO | | | | | |

Figure 19: Map binary points to RxGOOSE

9. Once the settings are saved in the UR, it completes GOOSE reception settings in the relay. The RxGOOSE messages are populated automatically.

Figure 20: Automatic completion of RxGOOSE1 settings

| Save Bestore Default Breset VIEW ALL mode | | | | | | |
|---|----------|-----------------------|--------------------------|--|--|--|
| ··· TxGOOSE6 | <u>^</u> | SETTING | PARAMETER | | | |
| ··· TxGOOSE7 | RxG | OOSE1 MODE | Process Bus Module GOOSE | | | |
| ··· TxGOOSE8 | RxG | OOSE1 golD | MU320GOOSE2 | | | |
| ··· TxGOOSE9 | RxG | OOSE1 Dst MAC | 01-0C-CD-01-00-00 | | | |
| ··· TxGOOSE10 | RxG | OOSE1 ETYPE APPID | 4096 | | | |
| ··· TxGOOSE11 | RxG | OOSE1 GoCBRef | IEDNameCTRL/LLN0.GOCB | | | |
| ··· TxGOOSE12 | RxG | OOSE1 datSet | Test | | | |
| ··· TxGOOSE13 | RxG | OOSE1 ConfRev | 1 | | | |
| ··· TxGOOSE14 | R-R | GOOSE1 RECEPTION MODE | SSM | | | |
| TxGOOSE15 | R-R | GOOSE1 SRC IP | 192.168.1.28 | | | |
| TxGOOSE16 | R-R | GOOSE1 DST IP | 224.0.0.0 | | | |
| ⊟-RxGOOSE | R-R | GOOSE1 SECURITY | None | | | |
| e-RxGOOSE Messages | RxG | OOSE1 Member1 | BOOLEAN | | | |
| RxGOOSE1 | RxG | OOSE1 Member2 | End of List | | | |
| - RxGOOSE2 | RxG | OOSE1 Member3 | End of List | | | |
| | | | | | | |

| Figure 21: Automatic | ompletion of | f RxGOOSE2 settings |
|----------------------|--------------|---------------------|
|----------------------|--------------|---------------------|

| TxGOOSE6 | SETTING | PARAMETER |
|--------------------|---------------------------|----------------------------------|
| TxGOOSE7 | RxGOOSE2 MODE | Process Bus Module GOOSE |
| ··· TxGOOSE8 | RxGOOSE2 golD | MU320GOOSE |
| TxGOOSE9 | RxG00SE2 Dst MAC | 01-0C-CD-01-00-00 |
| TxGOOSE10 | RxGOOSE2 ETYPE APPID | 4096 |
| TxGOOSE11 | RxGOOSE2 GoCBRef | IEDNameCTRL/LLN0.FastGOOSE1 |
| TxGOOSE12 | RxG00SE2 datSet | DigInput |
| TxGOOSE13 | RxGOOSE2 ConfRev | 1 |
| TxGOOSE14 | R-RxGOOSE2 RECEPTION MODE | SSM |
| TxGOOSE15 | R-RxGOOSE2 SRC IP | |
| TxGOOSE16 | R-RxGOOSE2 DST IP | 224.0.0.0 |
| 🖶 RxGOOSE 🚽 | R-RxG00SE2 SECURITY | None |
| B-RxGOOSE Messages | RxGOOSE2 Member1 | BOOLEAN |
| RxGOOSE1 | RxGOOSE2 Member2 | BOOLEAN |
| RxGOOSE2 | RxGOOSE2 Member3 | End of List |
| | D. DODDED M. J. J. | F 1 C 1 C 1 |

Status of remote devices and RxGOOSE Booleans

To check operation:

1. In the UR software, the **Actual Values > Status > RxGOOSE Status** window displays whether the configured RxGOOSE messages are online. In this example, both RxGOOSE messages MU320GOOSE and MU320GOOSE2 are received from the same MU320 unit and they are online.

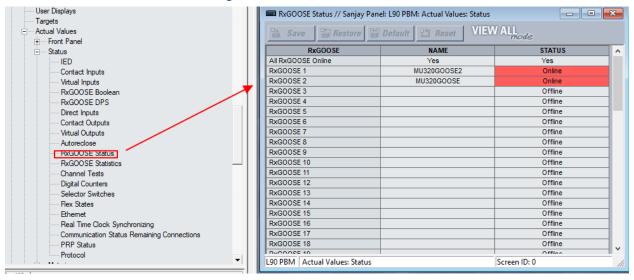


Figure 22: Check RxGOOSE status

2. Under the **RxGOOSE Boolean** option, you can view the status of the each GOOSE Input. Binary Input 1 is always asserted in the MU320 unit, hence the CI1 status indication in the relay is On.

| | J | | | |
|---|--------------------------------|----------------------|---------------|---|
| Targets ⊡ Actual Values ⊕ Front Panel | 📾 RxGOOSE Boolean // Sanjay Pa | | | × |
| E Status | 📑 Save 📑 Restore | Default 💾 Reset VIEV | / ALL mode | |
| Contact Inputs | RxGOOSE Boolean | NAME | STATUS | ^ |
| Virtual Inputs | RxGOOSE Boolean 1 | CO 1 Status | Off | |
| RxGOOSE Boolean | RxGOOSE Boolean 2 | CI1 | On | |
| RxGOOSE DPS | RxGOOSE Boolean 3 | BKR Status Cl2 | Off | |
| Direct Inputs | RxGOOSE Boolean 4 | RxG Bool4 | Off | - |
| Contact Outputs | RxGOOSE Boolean 5 | RxG Bool5 | Off | - |
| ······ Virtual Outputs | RxGOOSE Boolean 6 | RxG Bool6 | Off | |
| Autoreclose | RxGOOSE Boolean 7 | RxG Bool7 | Off | |
| RxGOOSE Status | RxGOOSE Boolean 8 | RxG Bool8 | Off | |
| RxGOOSE Statistics | RxGOOSE Boolean 9 | RxG Bool9 | Off | |
| Channel Tests | RxGOOSE Boolean 10 | RxG Bool10 | Off | |
| Digital Counters | RxGOOSE Boolean 11 | RxG Bool11 | Off | |
| Selector Switches | RxGOOSE Boolean 12 | RxG Bool12 | Off | |
| F O . | | | | _ |

Figure 23: Check input status

3. When Virtual Input 1 is On, the Contact Output 1 from the MU320 unit also is On (status is received in UR) and the corresponding breaker status is received as On via GOOSE as RxGOOSE Boolean 3. Since the events are enabled in the UR, events are registered in **Actual Values > Records > Event Record**. Note the timing difference between the events of trip command (Virtual Input 1 ON) sent to the MU320 unit and contact output 1 status received in the UR. It is around 4.3 ms. Considering the GOOSE transmission and reception time of Fast Datasets in URs and the operating time for contact output of the MU320 unit, after the trip command is sent from relay, the difference can be expected to be less than or equal to 4 ms.

| Virtual Inputs // Sanjay Panel: | | 1 10000 | ■ XX ALL mode | U | 2 |
|--|------------------------|------------------|---------------------|------------|----|
| VIRTUAL INPUT | STATE | | | | |
| Virt lp 1 (VI 1) | On | | | | |
| L90 PBM Commands | | Screen ID: 138 | | | |
| RxGOOSE Boolean // Sanjay Pa | nel: L90 PBM: Actual | | | | 23 |
| Save Restore | Default 💾 Rese | t VIEW | ALL mode | | |
| RxGOOSE Boolean | NAME | | ST | ATUS | ^ |
| RxGOOSE Boolean 1 RxGOOSE Boolean 2 | CO 1 Statu Cl1 | s | | On On | |
| RxGOOSE Boolean 3 | BKR Status CI2 | | On | | |
| RxGOOSE Boolean 4 | RxG Bool4 | | Off | | |
| PxGOOSE Boolean 5 | PyG Bool | : | 0.ff | | |
| Event Record // Sanjay Pane | l: L90 PBM: Actual Val | ues: Records | - | | |
| File Name | C:\Users\Public\Docum | ents\GE Power | Management\L | IRPC\Data' | |
| Date / Time of Last Clear | Wednesday, February 12 | 2, 2020 18:46:38 | } | | |
| Events Since Last Clear | 4 Showr | n Number of Eve | ents | 4 | |
| | Odays Oh:Om: | 0.004369 s | | | - |
| Event Number Dat | e/Time | Cau | se | Data | 1 |
| 4 Feb 12 2020 | 18:47:00.312716 BKR | Status Cl2 C | On (RI3) | | - |
| | | | n (RI1) | | × |
| | 18:47:00.300043 Virt I | | /11) | | |
| 1 Feb 12 2020 | 18:46:38.780736 EVE | ITS CLEARED | | | |

Figure 24: View event record

Conclusion

These examples help to understand the configuration required in a UR and the MU320 unit for operating contact outputs and determining the binary input statuses.

The MU320 unit does not have event records to record binary input and output statuses. The Actual Values menu in the MU320 unit does not indicate statuses for its binary inputs and outputs. GE therefore recommends enabling the events in the UR for the operands that are driving the contact outputs in the MU320 unit as well as for the GOOSE inputs that are received in the UR from the MU320 unit.

For further assistance

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

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