



UR Family

IEC 61850

Upgrade Instructions

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This document outlines how to migrate IEC 61850 settings when upgrading a GE Universal Relay (UR) from version 7.20 or earlier to version 7.40.

Introduction

IEC 61850 settings in UR 7.20 and older firmware are subsets of settings available in UR 7.40. While migrating to UR 7.40, settings that are not available in UR 7.20 or earlier are defaulted or used as specified in this document.

UR 7.20 and earlier versions have only a few elements modelled into IEC 61850 and support a single logical device (without aggregator) with predefined datasets and report control blocks in respective logical nodes. The logical node prefixes are configurable. GOOSE subscription uses only the GoID and APPID fields of the GOOSE message header to filter the incoming GOOSE messages.

UR 7.40 has enhanced capabilities in terms of more protection and control elements and system features modelled in IEC 61850, multiple configurable logical devices (except Master), configurable datasets and control blocks (both report and GOOSE). However, it uses fixed logical node prefixes. For GOOSE subscription, the destination MAC and gocbRef fields are mandatory.

In this document, the UR 7.20 settings are considered as reference and the corresponding UR 7.40 setting references are provided.

IEC 61850 data model differences

Logical devices

UR 7.20 and earlier firmware versions support a single logical device with configurable name, using the



Logical Device Instance setting under **IEC 61850 > Server Configuration** in the software.

UR 7.40 can support up to 16 configurable logical devices (Master is mandatory), and the factory default configuration has six logical devices. The logical device instance (inst) names and logical node assignments are as per the following table.

Table 1: UR 7.40 logical devices and nodes

Default logical device inst name	By default, contains generally logical nodes modelling...
Master This is the root logical device. Its name is fixed.	Communications, including GOOSE, reports, Direct I/O, Virtual Inputs, setting group control To comply with IEC 61850-7-1 Edition 2 clause 6.4.5.1, all group L logical nodes (logical nodes with class names begin with "L"), except LLN0, belonging to this IED shall be in this logical device.
Prot	Protection and protection-related functions
Ctrl	Control and monitoring functions
System	Power system devices: breakers, switches, CTs, VTs, and so on, including interface to these such as AC inputs, contact I/O, transducer I/O, HardFiber I/O
Meter	Metering and measurement (other than PMU), including Signal Sources
Gen	FlexLogic, Virtual Outputs, non-volatile latches, FlexElements, FlexMath, recording (for example oscillography), security, front panel, clock

Logical nodes

Protection and control elements that are modelled in UR 7.20 are subsets of the elements modelled in UR 7.40, and the modelling philosophy is different between versions.

In UR 7.20 and earlier versions, the default prefix is null (""), and the logical node (LN) names for the elements that use the same LN class are differentiated using the instance number (prefix + LN class + Instance). For example, if the order code has two phase IOC elements and one ground IOC element, respective logical node names are PIOC1 (phase IOC element1), PIOC2 (phase IOC element2), and PIOC3 (ground IOC element1).

In UR 7.40, each element uses a unique prefix and the logical node names for the elements that use the same LN class are differentiated using prefixes (prefix + LN class + Instance). For example, if the order code has two phase IOC elements and one ground IOC element, respective logical node names are PhsPIOC1, PhsPIOC2, and GndPIOC1.

The table outlines the migration of the IEC 61850 data model references between UR 7.20 and UR 7.40. The configurable prefixes in UR 7.20 cannot be migrated to UR 7.40.

Table 2: Data reference mapping example

UR 7.20 and earlier data reference	UR 7.40 data reference
PIOC1.Str.general	PhsPIOC1.Str.general
PIOC1.Op.general	PhsPIOC1.Op.general
PIOC2.Str.general	PhsPIOC2.Str.general
PIOC2.Op.general	PhsPIOC2.Op.general
PIOC3.Str.general	GndPIOC1.Str.general



UR 7.20 and earlier data reference	UR 7.40 data reference
PIOC3.Op.general	GndPIOC1.Op.general

The following table summarizes the elements modelled in UR 7.20 and the corresponding Logical Device and Logical Node modelling in UR 7.40. See the UR 7.40 Communications Guide MICS section for detailed modelling of Logical Nodes.

Table 3: Element mappings

UR 7.20 and earlier element	Logical name in UR 7.40	Logical device in UR 7.40
Physical Device Information (LPHD)	LPHD	Master
LLN0	LLN0	Master
Transformer Instantaneous Differential (PDIF)	PiDiFPDIF	Prot
Transformer Percent Differential (PDIF)	PctDiFPDIF	Prot
Phase Distance (PDIS)	PhsDisPDIS	Prot
Ground Distance (PDIS)	GndDisPDIS	Prot
Phase Instantaneous Overcurrent (PIOC)	PhsIocPIOC	Prot
Neutral Instantaneous Overcurrent (PIOC)	NeuIocPIOC	Prot
Ground Instantaneous Overcurrent (PIOC)	GndIocPIOC	Prot
Negative Sequence Instantaneous Overcurrent (PIOC)	NegIocPIOC	Prot
End of Fault (PIOC)	B_EfnPIOC	Prot
Phase Time Overcurrent (PTOC)	PhsTocPTOC	Prot
Neutral Time Overcurrent (PTOC)	NeuTocPTOC	Prot
Ground Time Overcurrent (PTOC)	GndTocPTOC	Prot
Negative Sequence Time Overcurrent (PTOC)	NegTocPTOC	Prot
Phase Overvoltage (PTOV)	PhsOvPTOV	Prot
Auxiliary Overvoltage (PTOV)	AuxOvPTOV	Prot
Neutral Overvoltage (PTOV)	NeuOvPTOV	Prot
Negative Sequence Overvoltage (PTOV)	NegOvPTOV	Prot
Protection Trip Conditioning (PTRC)	TrOutPTRC	Prot
Phase Undervoltage (PTUV)	PhsUvPTUV	Prot
Auxiliary Undervoltage (PTUV)	AuxUvPTUV	Prot
Third Harmonic Neutral Undervoltage (PTUV)	Ha3NUvPTUV	Prot
B90 Undervoltage (PTUV)	B_UvPTUV	Prot
Breaker Failure (RBRF)	BkrFaRBRF	Prot
B90 Breaker Failure (RBRF)	B_BFaIRBRF and B_BFaIPIOC	Prot
Fault Location (RFLO)	FltRpt RFLO and FltRFLO	Ctrl
Power Swing detect (RSPB)	PwrSwgRSPB	Prot



UR 7.20 and earlier element	Logical name in UR 7.40	Logical device in UR 7.40
Autoreclosure (RREC)	Rec13pRREC and Rec3pRREC	Ctrl
Breaker Control (CSWI)	BkrCSWI	System
Switch Control (CSWI)	DiscCSWI	System
Breaker (XCBR)	Bkr0XCBR	System
Disconnect Switch (XSWI)	Disc0XSWI	System
FlexLogic Operand (GGIO1)	GGIO1	Master
Virtual Inputs (GGIO2)	GGIO2	Master
Remote Inputs (GGIO3)	GGIO3	Master
FlexAnalog (GGIO4)	GGIO4	Master
Unsigned Flex Integers (GGIO5)	Not available	Not available
Measurements (MMXU)	AcSrcMMXU	Meter
Non-phase related measurements (MMXN)	AcSrcMMXN	Meter
Sequence measurements (MSQI)	AcSrcMSQI	Meter

Migration guidelines

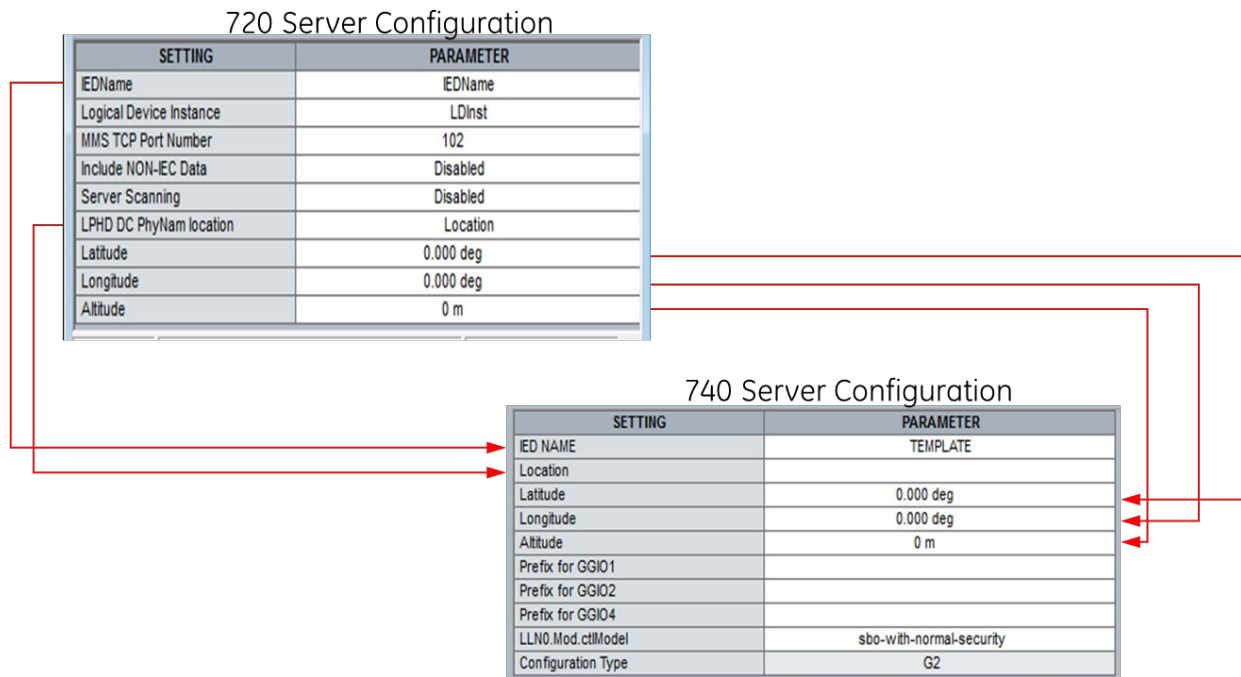
Server configuration

7.20 and 7.40 path: **Product Setup > Communications > IEC 61850 > Server Configuration**

The figure shows the mapping between UR 7.20 and 7.40 Server Configuration settings.



Figure 1: Server configuration settings



In UR 7.40, regarding the **Logical Device Instance** field from UR 7.20, the **IED NAME** and the **Product LD inst** name comprise the <LDName> for a product. The **MMS TCP Port Number**, **Include NON-IEC Data**, and **Server Scanning** settings are deprecated. The IEC 61850 server always uses MMS TCP Port Number “102,” and “Server Scanning” functionality is always enabled. UR 7.40 is IEC 61850 Edition 2 compliant and NON-IEC data is modelled using data extension rules as specified in IEC 61850 part 7-2.

Logical node prefixes

In UR 7.20 and earlier versions, the default prefix for all the Logical Nodes is null (“”), and Logical Node prefixes are configurable under **Product Setup > Communications > IEC 61850 > Logical Node Prefixes**.

In UR 7.40, each Logical Node uses a unique and fixed prefix (non-configurable) as tabled earlier in the Logical Nodes section. The configured prefixes in UR 7.20 and earlier versions cannot be migrated to 7.40.

Figure 2: Logical nodes in UR 7.40

AuxOvPTOV1
AuxOvPTOV2
AuxOvPTOV3
BkrFaRBRF1
BkrFaRBRF2
BkrFaRBRF3
BusDifPDIF1
BusDifPDIF2



The GGIO1, GGIO2, and GGIO4 Logical Node prefixes are configurable in 7.40 under **Product Setup > Communications > IEC 61850 > Server Configuration** and can be migrated from UR 7.20 to 7.40.

Figure 3: GGIO settings in UR 7.40

SETTING	PARAMETER
IED NAME	TEMPLATE
Location	
Latitude	0.000 deg
Longitude	0.000 deg
Altitude	0 m
Prefix for GGIO1	
Prefix for GGIO2	
Prefix for GGIO4	
LLN0.Mod.ctilModel	sbo-with-normal-security
Configuration Type	G2

MMXU deadbands

7.20 path: **Product Setup > Communications > IEC 61850 > MMXU Deadbands**

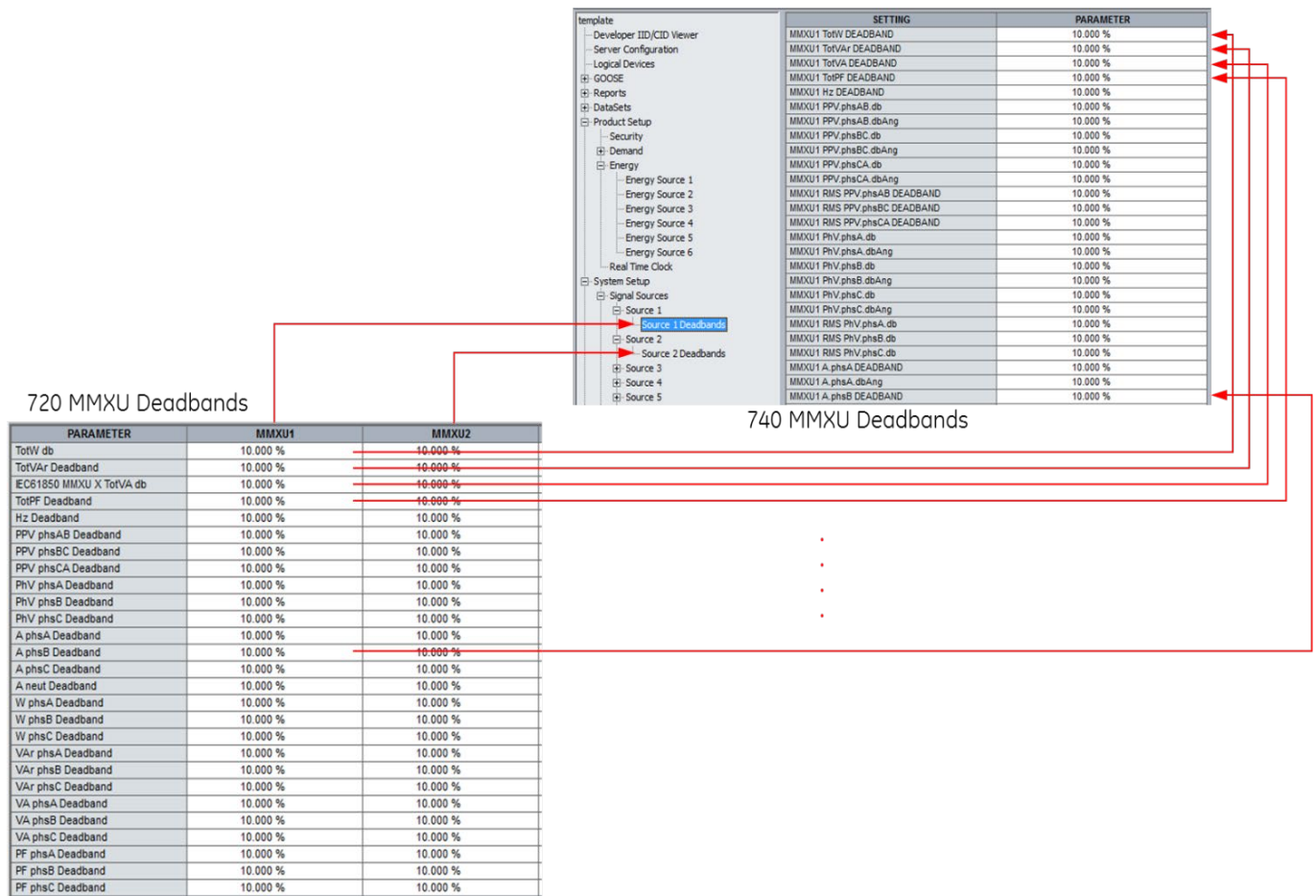
7.40 path: **Product Setup > Communications > IEC 61850 > System Setup > Signal Sources > Source # > Source # Deadbands**

is the Signal Source number. Signal Source 1 corresponds to MMXU1, Signal Source 2 corresponds to MMXU2, and so on.

The figure shows the mapping between UR 7.20 and 7.40 MMXU deadband settings. Note that UR 7.40 uses dbAng for deadband calculations for angle attributes as specified in IEC 61850 part 7-3.



Figure 4: Deadband settings



GGIO1 status configuration

Both UR 7.20 and 7.40 support 128 configurable GGIO1 Indications to model UR FlexLogic operands into the IEC 61850 server using the following software windows:

7.20 path: **Product Setup > Communications > IEC 61850 > GGIO1 Status Configuration**

7.40 path: **Product Setup > Communications > IEC 61850 > GGIO > GGIO1**

UR 7.40 models the majority of the protection, control, and system functions into the IEC 61850 server. The FlexLogic operands that are mapped to GGIO1 indications in UR 7.20 configuration may be available in UR 7.40 using the standard Logical Nodes (defined in IEC 61850 part 7-4: 2010).

The **Number of Status Points** setting is deprecated in UR 7.40. In UR 7.20, this setting auto populates the number of dataset members in GGIO1.ST fixed dataset. In UR 7.40, all datasets are configurable.

GGIO2 control configuration

Both UR 7.20 and 7.40 model the 64 Virtual Inputs using GGIO2 single point controllable status outputs,



and the controls models for individual Virtual Inputs are configurable using the following software windows:

7.20 path: **Product Setup > Communications > IEC 61850 > GGIO1 Control Configuration**

7.40 path: **Product Setup > Communications > IEC 61850 > GGIO > GGIO2**

GGIO4 analog configuration

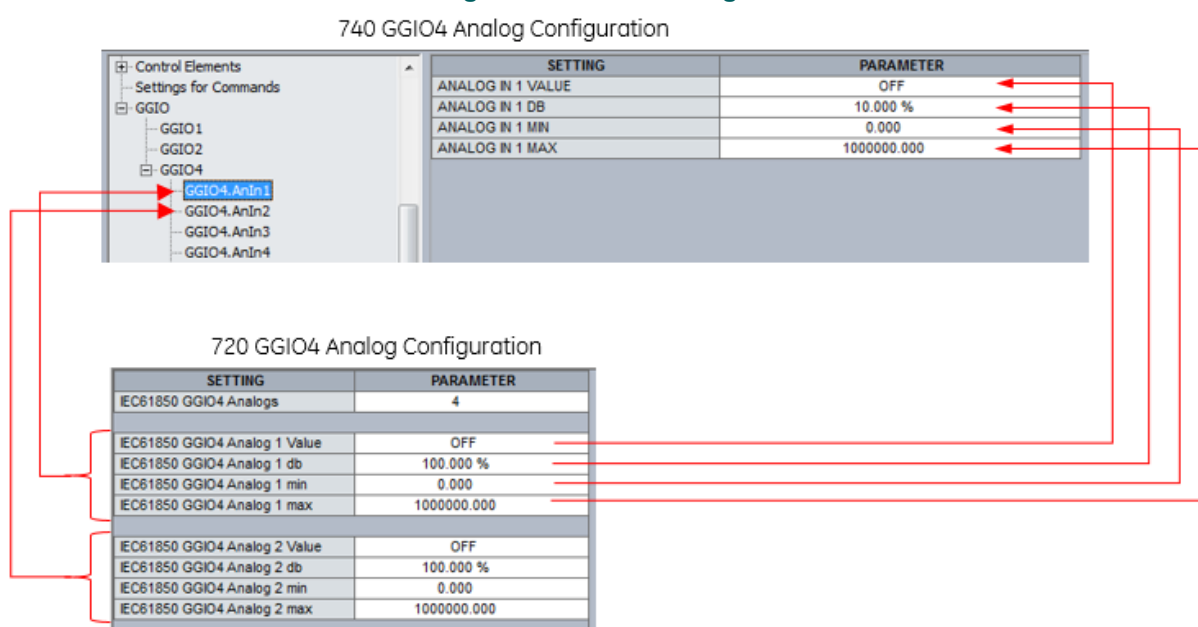
Both UR 7.20 and UR 7.40 support 32 configurable GGIO4 Analog Inputs to model UR FlexAnalog operands into the IEC 61850 server. They use the following software windows:

7.20 path: **Product Setup > Communications > IEC 61850 > GGIO4 Analog Configuration**

7.40 path: **Product Setup > Communications > IEC 61850 > GGIO > GGIO4**

The figure shows the mapping between UR 7.20 and 7.40 GGIO4 settings.

Figure 5: GGIO4 settings



GGIO5 status configuration

UR 7.20 supports mapping of FlexUIntegers into MMS, using GGIO5 Logical Node by means of data objects with private CDCs. UR 7.40 do not support GGIO5 functionality.

XCBR configuration

Both UR 7.20 and 7.40 model breaker elements into MMS. The breaker settings are configurable using the following software windows:

7.20 path: **Product Setup > Communications > IEC 61850 > XCBR Configuration**

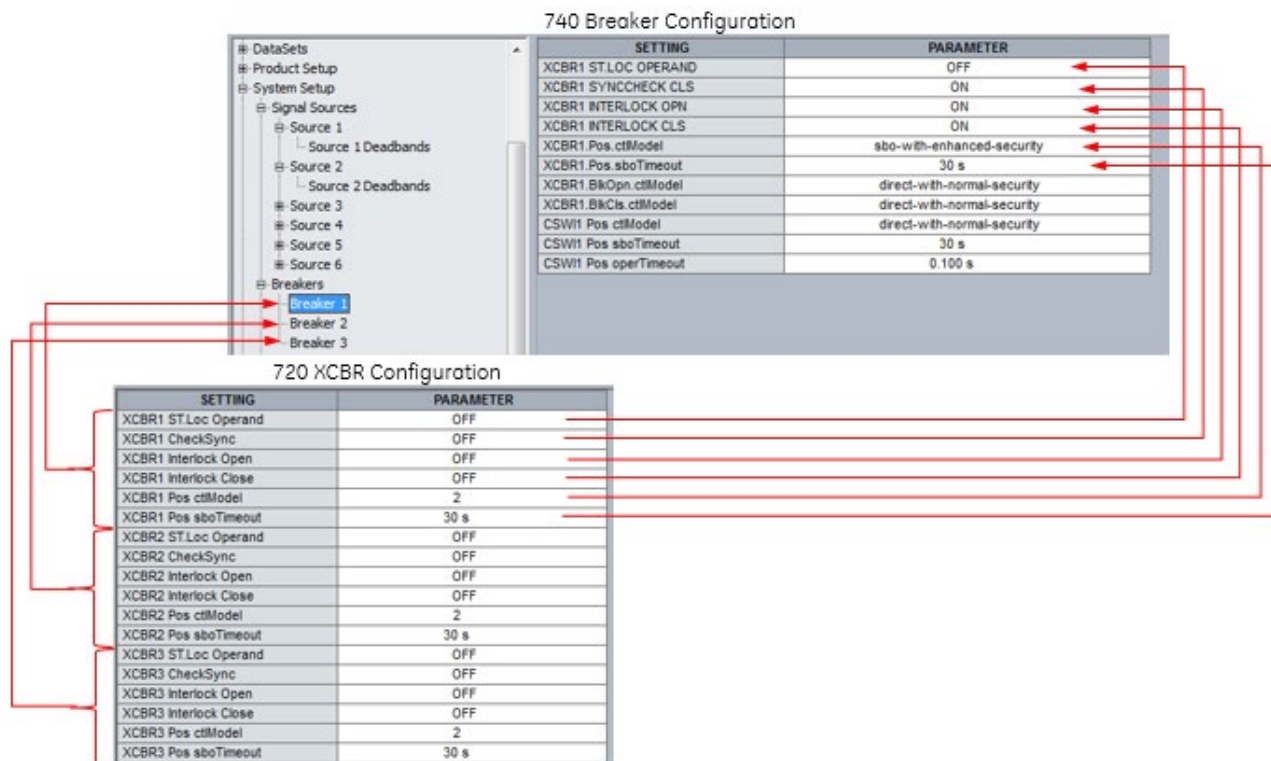


7.40 path: **Product Setup > Communications > IEC 61850 > System Setup > Breakers**

The figure shows the mapping between UR 7.20 and 7.40 Breaker (XCBR) settings. See the UR 7.40 Communications Guide for the following settings in 7.40:

XCBR#.BlkOpn.CtlModel, **XCBR#.BlkCls.CtlModel**, **CSWI# Pos CtlModel**, **CSWI# Pos sboTimeout**, **CSWI# Pos operTimeout**

Figure 6: XCBR breaker settings



XSWI configuration

Both UR 7.20 and 7.40 model disconnect Switch elements into MMS. The Switch settings are configurable using the following software windows:

7.20 path: **Product Setup > Communications > IEC 61850 > XSWI Configuration**

7.40 path: **Product Setup > Communications > IEC 61850 > System Setup > Switches**

The table shows the mapping between UR 7.20 and 7.40 switch (XSWI) settings.

Table 4: XSWI switch settings

UR 7.20 setting	UR 7.40 setting
XSWI# ST.Loc Operand	Disc0XSWI#.InRef5.setSrcRef

The **CLEAR XSWI# OpCnt** setting in UR 7.20 is relocated from the **Settings** menu to the **Commands > Clear Records** menu in UR 7.40. This command is not modeled in IEC 61850 as IEC 61850-7-4 Edition 2.0 requires that the OpCnt not be resettable remotely.



CLEAR XSWI1 OpCnt:	Range: No, Yes
No	

See the UR 7.40 Communications Guide for the following settings in 7.40:

XSWI# INTERLOCK OPN, INTERLOCK CLS, Pos ctlModel, Pos sboTimeout,

Dis0XSWI# BlkOpn ctlModel, BlkCls ctlModel, Pos ctlModel, Pos sboTimeout, Pos operTimeout

Datasets

UR 7.20 and earlier versions support predefined datasets (under respective Logical Nodes GGIO1, GGIO4, and MMXU#), and the dataset names and dataset members are fixed. The dataset members of LLN0.BR1 are configurable under **Product Setup > Communications > IEC 61850 > Report Control Configuration**. All Tx Configurable GOOSE dataset members are configurable. The following is the list of datasets available in UR 7.20 and earlier versions:

- MMXU#.MX datasets (# is the number of signal sources available in order code)
- GGIO1.ST
- GGIO4.MX
- LLN0.BR1
- LLN0.GOOSE1 to LLN0.GOOSE8

In UR 7.40, all datasets are configurable under **Product Setup > Communications > IEC 61850 > Datasets**, and no predefined datasets are available. UR 7.40 supports six fast datasets and 12 slow datasets. All Boolean and Dbpos type values in “fast” datasets are scanned for exception every protection pass (that is, every ~2 ms). All other values in “fast” datasets and all values in “slow” datasets are scanned for exception every 100 ms. The dataset is considered slow if the dataset name is prefixed with the string “TT3” and the dataset is considered fast if the dataset name is prefixed with “TT6” or no prefix.

UR 7.40 instantiates all datasets under Master.LLN0 Logical Node and after migration dataset references are updated accordingly.

In UR 7.20 and earlier versions, LLN0.GOOSE1 and LLN0.GOOSE2 are fast datasets. GE recommends use of the prefix “TT3” for all other datasets except LLN0.GOOSE1 and LLN0.GOOSE2.

The figure shows an example that imports the LLN0.BR1 dataset from UR 7.20 to 7.40. The UR 7.20 Dataset reference is “<LDName>/LLN0.BR1.” After migration, the UR 7.40 Dataset reference is “Master/LLN0.TT3BR1.”



Figure 7: Importing an LLN0.BR1 dataset into UR 7.40

SETTING	PARAMETER
Config Report 1 Dataset Item 1	PIOC1.ST.Str.general
Config Report 1 Dataset Item 2	PIOC1.ST.Op.general
Config Report 1 Dataset Item 3	PTOC1.ST.Op.general
Config Report 1 Dataset Item 4	None
Config Report 1 Dataset Item 5	None
Config Report 1 Dataset Item 6	None
Config Report 1 Dataset Item 7	None
Config Report 1 Dataset Item 8	None

SETTING	PARAMETER
TT3DataSet01 name	TT3BR1
TT3DataSet01 shared by	
TT3DataSet01 Member1	Prot.PhlocPIOC1.ST.Str.general
TT3DataSet01 Member2	Prot.PhlocPIOC1.ST.Op.general
TT3DataSet01 Member3	Prot.PhlocPTOC1.ST.Op.general
TT3DataSet01 Member4	End of List
TT3DataSet01 Member5	End of List
TT3DataSet01 Member6	End of List
TT3DataSet01 Member7	End of List
TT3DataSet01 Member8	End of List
TT3DataSet01 Member9	End of List
TT3DataSet01 Member10	End of List
TT3DataSet01 Member11	End of List
TT3DataSet01 Member12	End of List
TT3DataSet01 Member13	End of List
TT3DataSet01 Member14	End of List
TT3DataSet01 Member15	End of List
TT3DataSet01 Member16	End of List
TT3DataSet01 Member17	End of List
TT3DataSet01 Member18	End of List
TT3DataSet01 Member19	End of List
TT3DataSet01 Member20	End of List

GSSE / GOOSE configuration

GSSE and Fixed GOOSE features are not supported in UR 7.40, and the configuration cannot be migrated.

GOOSE transmission

UR 7.20 supports eight configurable GOOSE transmissions (Tx Configurable GOOSE).

The steps to migrate Tx Configurable GOOSE settings from UR 7.20 to 7.40 are as follows.

1. Open the Tx Configurable GOOSE dataset items in UR 7.20 under **Product Setup > Communications > IEC 61850 > GSSE/GOOSE Configuration > Transmission > Tx Configurable GOOSE**. Migrate these UR 7.20 GOOSE datasets to UR 7.40 datasets as per the guidelines in the preceding Datasets section.



Figure 8: Tx GOOSE dataset configuration in UR 7.20

GOOSEOut 1 Function	Disabled
GOOSEOut 1 ID	GOOSEOut_1
GOOSEOut 1 Destination MAC	00 00 00 00 00 00
GOOSEOut 1 VLAN Priority	4
GOOSEOut 1 VLAN ID	0
GOOSEOut 1 ETYPE APPID	0
GOOSEOut 1 ConfRev	1
GOOSEOut 1 Retransmission Curve	Relaxed
GOOSEOut 1 Dataset Item 1	None
GOOSEOut 1 Dataset Item 2	None
GOOSEOut 1 Dataset Item 3	None
GOOSEOut 1 Dataset Item 4	None
GOOSEOut 1 Dataset Item 5	None
GOOSEOut 1 Dataset Item 6	None
GOOSEOut 1 Dataset Item 7	None
GOOSEOut 1 Dataset Item 8	None
GOOSEOut 1 Dataset Item 9	None
GOOSEOut 1 Dataset Item 10	None
GOOSEOut 1 Dataset Item 11	None
GOOSEOut 1 Dataset Item 12	None
GOOSEOut 1 Dataset Item 13	None
GOOSEOut 1 Dataset Item 14	None
GOOSEOut 1 Dataset Item 15	None
GOOSEOut 1 Dataset Item 16	None
GOOSEOut 1 Dataset Item 17	None
GOOSEOut 1 Dataset Item 18	None
GOOSEOut 1 Dataset Item 19	None
GOOSEOut 1 Dataset Item 20	None
GOOSEOut 1 Dataset Item 21	None
GOOSEOut 1 Dataset Item 22	None
GOOSEOut 1 Dataset Item 23	None
GOOSEOut 1 Dataset Item 24	None
GOOSEOut 1 Dataset Item 25	None
GOOSEOut 1 Dataset Item 26	None
GOOSEOut 1 Dataset Item 27	None
GOOSEOut 1 Dataset Item 28	None
GOOSEOut 1 Dataset Item 29	None
GOOSEOut 1 Dataset Item 30	None

- Import UR 7.20 Tx Configurable GOOSE message settings (**Function**, **ID**, **Destination MAC**, **VLAN Priority**, **VLAN ID**, **ETYPE APPID**, **ConfRev**) to UR 7.40 TxGOOSE# message settings under **Product Setup > Communications > IEC 61850 > GOOSE > TxGOOSE > TxGOOSE#**. The following figure shows the mapping between the settings.



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Figure 9: Tx GOOSE settings

720 Tx Configurable GOOSE Configuration

SETTING	PARAMETER
GOOSEOut 1 Function	Enabled
GOOSEOut 1 ID	GOOSEOut_1
GOOSEOut 1 Destination MAC	01 0C CD 01 00 23
GOOSEOut 1 VLAN Priority	4
GOOSEOut 1 VLAN ID	10
GOOSEOut 1 ETYP APPID	5
GOOSEOut 1 ConfRev	1
GOOSEOut 1 Retransmission Curve	Relaxed
GOOSEOut 1 Dataset Item 1	PIDC1 ST Str general
GOOSEOut 1 Dataset Item 2	PIDC1 ST Op general
GOOSEOut 1 Dataset Item 3	PIDC2 ST Str general
GOOSEOut 1 Dataset Item 4	PIDC2 ST Op general
GOOSEOut 1 Dataset Item 5	None
GOOSEOut 1 Dataset Item 6	None

SETTING	PARAMETER
TxGOOSE1 MODE	GOOSE
TxGOOSE1 GoCB name	GoCB01
TxGOOSE1 GoID	GOOSEOut_1
TxGOOSE1 DataSet	TT6DataSet1
TxGOOSE1 DST MAC	01-0C-CD-01-00-23
TxGOOSE1 VLAN PRIORITY	4
TxGOOSE1 VLAN ID	10
TxGOOSE1 ETYP APPID	5
TxGOOSE1 CONFREV	1
TxGOOSE1 RETRANS TIME	4 ms
TxGOOSE1 TIME TO LIVE	300 s
TxGOOSE1 UPDATE TIME	60 s
TxGOOSE1 PORT ASSIGNMENT	Ports-1,2,3
R-TxGOOSE1 IP CLASS	46
R-TxGOOSE1 DST IP	224.0.0.0
R-TxGOOSE1 SECURITY	None

740 TxGOOSE# Configuration

SETTING	PARAMETER
TT6DataSet01 name	GOOSE1
TT6DataSet01 shared by	TxGOOSE1
TT6DataSet01 Member1	Prot PhsTocPTOC1 ST Str general
TT6DataSet01 Member2	Prot PhsTocPTOC1 ST Op general
TT6DataSet01 Member3	Prot PhsTocPTOC2 ST Str general
TT6DataSet01 Member4	Prot PhsTocPTOC2 ST Op general
TT6DataSet01 Member5	End of List
TT6DataSet01 Member6	End of List
TT6DataSet01 Member7	End of List
TT6DataSet01 Member8	End of List
TT6DataSet01 Member9	End of List
TT6DataSet01 Member10	End of List
TT6DataSet01 Member11	End of List
TT6DataSet01 Member12	End of List
TT6DataSet01 Member13	End of List
TT6DataSet01 Member14	End of List
TT6DataSet01 Member15	End of List
TT6DataSet01 Member16	End of List
TT6DataSet01 Member17	End of List
TT6DataSet01 Member18	End of List
TT6DataSet01 Member19	End of List
TT6DataSet01 Member20	End of List
TT6DataSet01 Member21	End of List
TT6DataSet01 Member22	End of List
TT6DataSet01 Member23	End of List
TT6DataSet01 Member24	End of List

After migration, in UR 7.40

- The **TxGOOSE# MODE** should be GOOSE
- **TxGOOSE# GoCB names** are configurable. GE recommends leaving the default.
- **TxGOOSE# Dataset** should reference the dataset configured in step 1
- See the UR 7.40 Communications Guide for the settings **TxGOOSE# RETRANS TIME**, **TIME TO LIVE**, **UPDATE TIME**, and **PORT AASIGNMENT**.

GOOSE reception

UR 7.20 can subscribe up to 16 GOOSE messages. The migration steps from UR 7.20 to 7.40 are as follows:

1. The subscribing GOOSE message dataset structures are configured using the following software windows:

UR 7.20 path: **Product Setup > Communications > IEC 61850 > GSSE/GOOSE Configuration > Reception > Rx Configurable GOOSE**

UR 7.40 path: **Product Setup > Communications > IEC 61850 > GOOSE > RxGOOSE > RxGOOSE Messages > RxGOOSE #**

Import the UR 7.20 **GOOSEIn # Dataset Item \$** setting values into the 7.40 **RxGOOSE# Member \$** settings, where

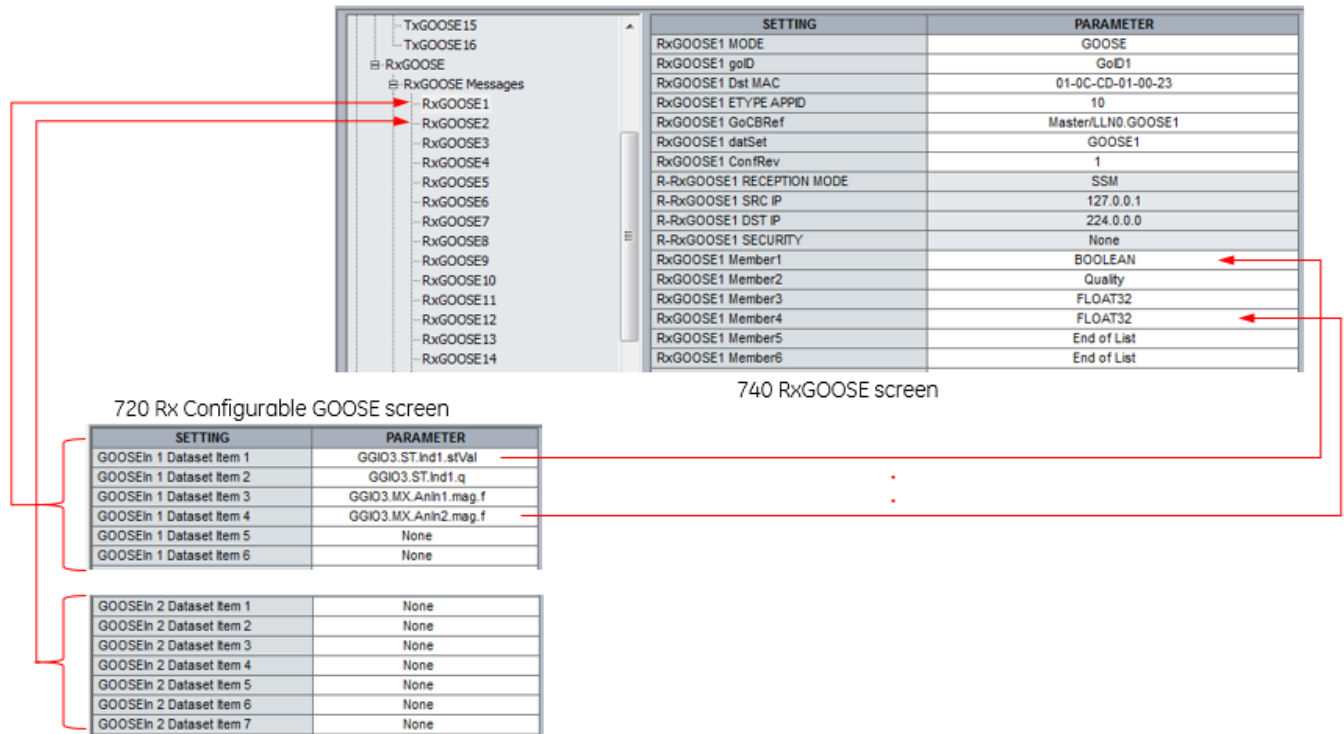
is the GOOSE message number

\$ is the dataset item number within the GOOSE message



The figure shows the mapping of subscribing GOOSE dataset members between UR 7.20 and 7.40.

Figure 10: Rx GOOSE settings



The **GOOSEIn # Dataset Item \$** setting in UR 7.20 and **RxGOOSE # member \$** setting in UR 7.40 have different enumeration values. The table maps them.

Table 5: Rx GOOSE settings

UR 7.20 setting	UR 7.40 setting
GGIO3 Indication (SPS) Ex: GGIO3.ST.Ind1.stVal	BOOLEAN
GGIO3 quality attribute Ex: GGIO3.ST.Ind1.q	Quality
GGIO3 Analog Input Ex: GGIO3.MX.AnIn1.mag.f	FLOAT32
GGIO3 double point status Ex: GGIO3.ST.IndPos1.stVal	Dbpos
GGIO3 Unsigned Integer Ex: GGIO3.ST.UIntIn1.stVal	Not supported, as it is a custom CDC in UR 7.20

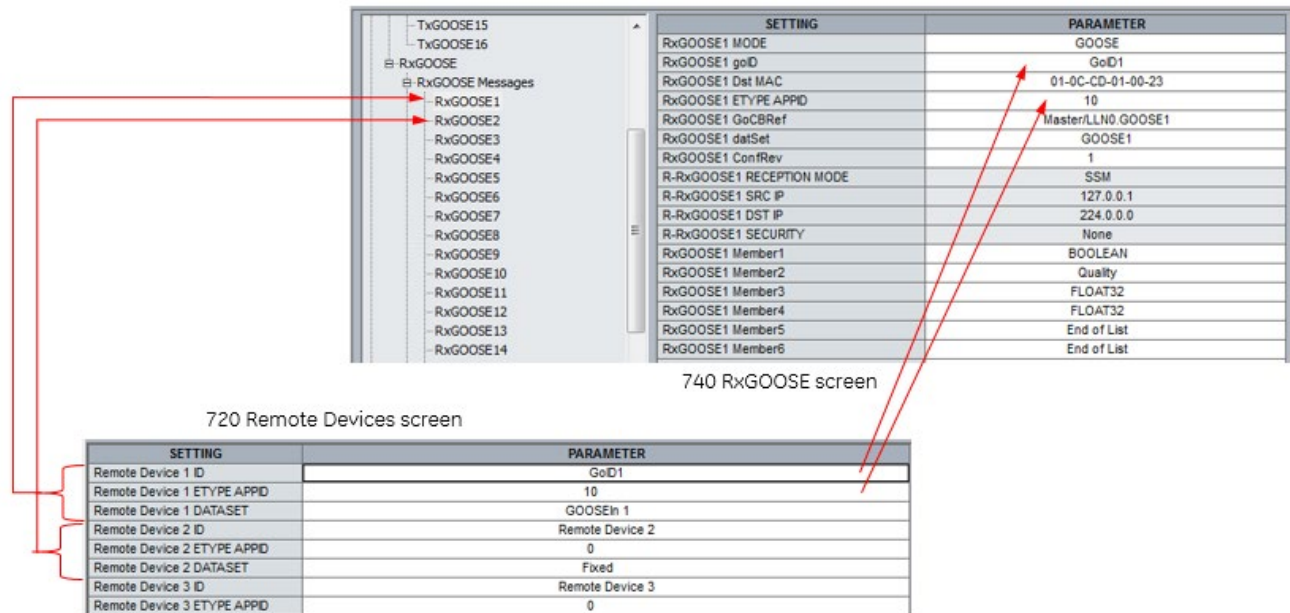
- Configure the subscribing GOOSE message settings using the following software windows:
 UR 7.20 path: **Inputs/Outputs > Remote Devices**
 UR 7.40 path: **Product Setup > Communications > IEC 61850 > GOOSE > RxGOOSE > RxGOOSE Messages > RxGOOSE #**



UR 7.20 validates only the GOOSE ID (GOOSE message header) and Ethernet APP ID fields of the subscribing GOOSE message, whereas UR 7.40 additionally validates the destination MAC address and GOOSE control block reference. Use the destination MAC and gocdRef settings from the publisher device.

The figure shows the mapping of subscribing GOOSE message settings between UR 7.20 and 7.40.

Figure 11: More Rx GOOSE settings



After migration, in UR 7.40, the settings

- **RxGOOSE# MODE** should be GOOSE
- **RxGOOSE # Dst MAC**, **RxGOOSE # GoCRef**, **RxGOOSE # datSet**, and **RxGOOSE # ConfRev** should match the publisher device settings

The **Remote Device # DATASET** setting in UR 7.20 is not the actual publisher dataset name. The setting is deprecated in UR 7.40.

3. In both UR 7.20 and 7.40, Remote Inputs provides a means to use the subscribed GOOSE message data in FlexLogic. In UR 7.40, Remote Inputs are referred as RxGOOSE Inputs.

UR 7.20 supports up to 32 Remote Inputs, five Remote DPS Inputs, and 32 IEC 61850 GOOSE Analog Inputs.

UR 7.40 supports 256 RxGOOSE Boolean Inputs, five RxGOOSE DPS Inputs, and 32 RxGOOSE Analog Inputs.

In UR 7.40, RxGOOSE Boolean Inputs are configured under **Product Setup > Communications > IEC 61850 > GOOSE > RxGOOSE > RxGOOSE Boolean Inputs**.

The following text describes the mapping of subscribing GOOSE message data to RxGOOSE inputs (Boolean, DPS, and analog) in UR 7.40.



Figure 12: RxGOOSE Boolean Inputs in UR 7.40

template	Inputs	ID	RxGOOSE	Member	DEFAULT STAT	EVENTS	Subscribed to
Developer IID/CID Viewer	RxGOOSE Boolean1	RxG Bool1	RxGOOSE1	1	Off	Disabled	AA1J1Q01A1/LD0/TMPDRE1.RcdMade.stVal
Server Configuration	RxGOOSE Boolean2	RxG Bool2	None	1	Off	Disabled	
Logical Devices	RxGOOSE Boolean3	RxG Bool3	None	1	Off	Disabled	
GOOSE	RxGOOSE Boolean4	RxG Bool4	None	1	Off	Disabled	
TxGOOSE	RxGOOSE Boolean5	RxG Bool5	None	1	Off	Disabled	
RxGOOSE	RxGOOSE Boolean6	RxG Bool6	None	1	Off	Disabled	
RxGOOSE Messages	RxGOOSE Boolean7	RxG Bool7	None	1	Off	Disabled	
RxGOOSE Boolean Inputs	RxGOOSE Boolean8	RxG Bool8	None	1	Off	Disabled	
RxGOOSE DPS Inputs	RxGOOSE Boolean9	RxG Bool9	None	1	Off	Disabled	
RxGOOSE Analog Inputs	RxGOOSE Boolean10	RxG Bool10	None	1	Off	Disabled	
Reports	RxGOOSE Boolean11	RxG Bool11	None	1	Off	Disabled	
DataSets	RxGOOSE Boolean12	RxG Bool12	None	1	Off	Disabled	
Product Setup	RxGOOSE Boolean13	RxG Bool13	None	1	Off	Disabled	
System Setup	RxGOOSE Boolean14	RxG Bool14	None	1	Off	Disabled	
FlexLogic	RxGOOSE Boolean15	RxG Bool15	None	1	Off	Disabled	
Grouped Elements	RxGOOSE Boolean16	RxG Bool16	None	1	Off	Disabled	
Control Elements	RxGOOSE Boolean17	RxG Bool17	None	1	Off	Disabled	
Settings for Commands	RxGOOSE Boolean18	RxG Bool18	None	1	Off	Disabled	
GGIO	RxGOOSE Boolean19	RxG Bool19	None	1	Off	Disabled	
	RxGOOSE Boolean20	RxG Bool20	None	1	Off	Disabled	
	RxGOOSE Boolean21	RxG Bool21	None	1	Off	Disabled	
	RxGOOSE Boolean22	RxG Bool22	None	1	Off	Disabled	

The setting fields are as follows.

ID

This setting allows the user to assign descriptive text to the name of the RxGOOSE Boolean1 FlexLogic operand. The full operand name is the value of this setting appended with “ On”.

RxGOOSE

This setting selects the corresponding RxGOOSE message (“RxGOOSE#”) to which the RxGOOSE Boolean# subscribes. If set to None, the RxGOOSE Boolean1 FlexLogic operand assumes its default state. For example, a setting of RxGOOSE5 means that the RxGOOSE Boolean is subscribed from RxGOOSE5 that is configured in step1.

Member

This setting selects the member offset in the corresponding RxGOOSE message (“RxGOOSE#”) to which RxGOOSE Boolean# subscribes. A setting of 1 selects the first member of RxGOOSE#, 2 selects the second member of RxGOOSE#, and so on.

DEFAULT STATE

This setting selects the logic state for the RxGOOSE Boolean1 FlexLogic operand if the UR has just completed startup and the selected RxGOOSE has not yet received a message, or the selected RxGOOSE has lost its connectivity with the publisher.

EVENTS

This setting selects whether to log events for the RxGOOSE Boolean1 FlexLogic operand in the event recorder or not.

- Repeat step 3 for RxGOOSE DPS Inputs and RxGOOSE Analog Inputs.



Report control blocks

UR 7.20 supports predefined (both buffered and unbuffered) indexed report control blocks (RCBs) under logical nodes LLN0, GGIO1, GGIO4, and MMXU#. RCBs are not configurable and dataset assignments are fixed.

UR 7.20 supports the predefined report control blocks under the following logical nodes.

Buffered Reports:

- LLN0 (BRCB name: brcb, maximum clients: 2, dataset assignment: BR1)
- GGIO1 (BRCB name: brcbST, maximum clients: 2, dataset assignment: ST)
- MMXU# (BRCB name: brcbMX, maximum clients: 2, dataset assignment: MX)

Unbuffered Reports:

- GGIO1 (URCB name: urcbST, maximum clients: 3, dataset assignment: ST)
- GGIO4 (URCB name: urcbMX, maximum clients: 3, dataset assignment: MX)
- MMXU# URCB name: urcbMX, maximum clients: 3, dataset assignment: MX)

Conversely, UR 7.40 supports only the configurable report control blocks (no predefined RCBs) under **Product Setup > Communications > IEC 61850 > Reports**. RCBs are instantiated only under Master/LLN0 Logical Node and after migration RCB references are updated accordingly. In UR 7.40, you need to configure the report control blocks as needed. The settings are as follows.

Figure 13: Buffered report settings in UR 7.40

SETTING	PARAMETER
Buffered Report1 RptID	brcb01
Buffered Report1 Name	BRCB01
Buffered Report1 DataSet	TT6DataSet1
Buffered Report1 ConfRev	1
Buffered Report1 OptFlds	Click to view or edit (255)
Buffered Report1 BuTm	0 ms
Buffered Report1 TrgOps	Click to view or edit (15)
Buffered Report1 IntgPd	0 ms

SETTING	PARAMETER
TT6DataSet01 name	TT6DataSet1
TT6DataSet01 shared by	Buffered Report1
TT6DataSet01 Member1	Master.GGIO1.ST.Ind001.stVal
TT6DataSet01 Member2	Master.GGIO1.ST.Ind002.stVal
TT6DataSet01 Member3	Master.GGIO1.ST.Ind003.stVal
TT6DataSet01 Member4	End of List
TT6DataSet01 Member5	End of List
TT6DataSet01 Member6	End of List

Buffered Report1 RptID

The name of the report. The entered value sets the RptID value in Buffered Report1 messages. If the number of characters entered is zero, the value used for RptID in messages is an ObjectReference to the report's control block, that is, "<LDName>/LLN0\$BR\$BRCB01."

Buffered Report1 Name

The entered value sets the report control block name value for Buffered Report1.



Buffered Report1 DataSet

This setting selects the dataset whose members' status is reported in Buffered Report1. The IEC 61850 name of the datasets is configured in the Datasets panel, as described earlier in the Datasets section.

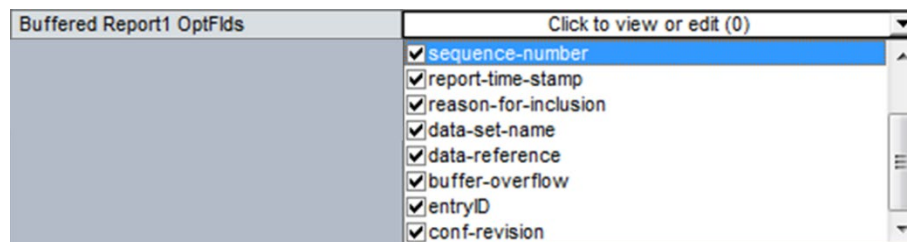
Buffered Report1 ConfRev

The entered value sets the confRev value in Buffered Report1 messages.

Buffered Report1 OptFlds

The OptFlds setting is a bitstring that controls which of the optional fields are included in report messages. The following figure shows the configurable bits. To reduce message size, uncheck any fields that are not needed.

Figure 14: Optional fields



Buffered Report1 OptFlds	Click to view or edit (0)
☒	sequence-number
☒	report-time-stamp
☒	reason-for-inclusion
☒	data-set-name
☒	data-reference
☒	buffer-overflow
☒	entryID
☒	conf-revision

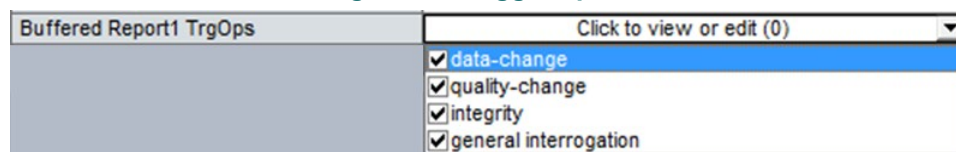
Buffered Report1 BufTm

The entered value sets the time interval in milliseconds for the buffering of events for inclusion in a single report.

Buffered Report1 TrgOps

The TrgOps setting is a bitstring that controls which trigger conditions are monitored in this report. The following figure shows the configurable bits. Uncheck any trigger conditions that are not needed.

Figure 15: Trigger options



Buffered Report1 TrgOps	Click to view or edit (0)
☒	data-change
☒	quality-change
☒	integrity
☒	general interrogation

Buffered Report1 IntgPd

The entered value sets the period in milliseconds for generating Buffered Report1 integrity reports. An integrity report includes the values of all members of the referenced dataset, whether a change has occurred or not. The minimum supported integrity report interval is 250 milliseconds and any value between 1 to 250 milliseconds is considered a minimum integrity period, for example 250 milliseconds.

Both Buffered and Unbuffered report control blocks have the same settings.



Client configuration changes

For client (MMS and GOOSE) configuration, note

- UR 7.40 uses the predefined prefixes for the logical nodes, which need the changes in dataset member references
- All control blocks (buffered, unbuffered, and GOOSE) are instantiated under Master/LLN0 logical node and control block references are changed
- Datasets are instantiated under Master/LLN0 logical node and datSet references are changed

After migration, necessary configuration changes are required in MMS client and GOOSE client (remote device) configurations, in order to successfully communicate with the UR.

For further assistance

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

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Worldwide e-mail: GA.support@gevernova.com
Website: <https://www.gevernova.com/grid-solutions/multilin/>

