TOSHIBA

Software Switch (SOFTSW) Configuration Guidance for

GR200-Series

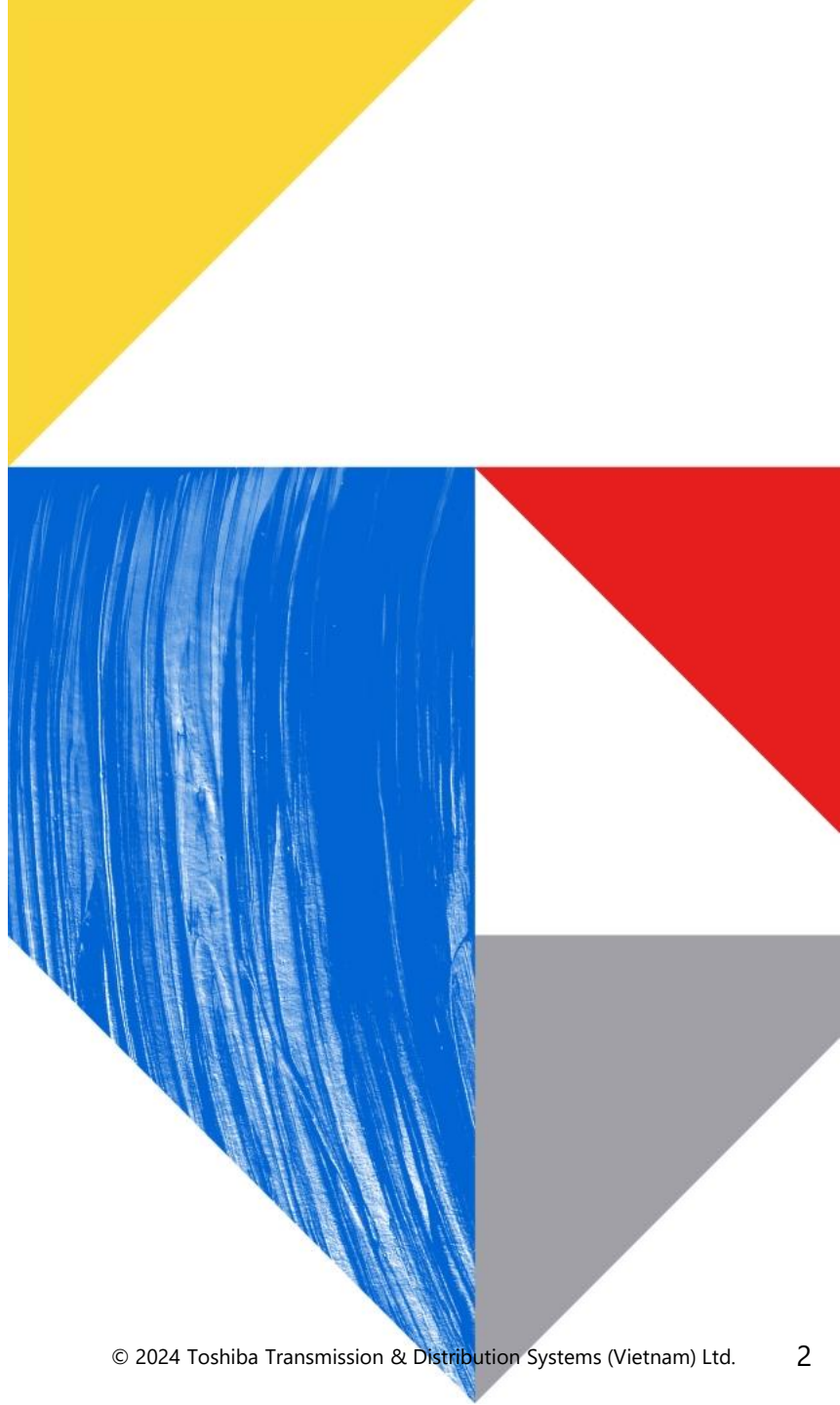
Toshiba Transmission & Distribution Systems (Vietnam) Ltd. - **TTDV**

October, 2024

Contents

01

Software Switch Function Introduction



Software Switch Introduction

Software Switches (S43) are provided in the GR200 as virtual switches.
They are used to determine the operation of internal processes in the IED. Either the criteria “Enable (On)” or “Disable (Off)” may be applied for each software witch
The first three have been pre-defined for special purposes, the rest are provided for general purpose usage

Setting Items	Current Val...	New Value	Unit	Range
CBK-EN	On			Off / On
CBK-NAME	CMDBLK			14 characters
CBK-OFFNAME	Off			14 characters
CBK-ONNAME	Blocked			14 characters
CBK-CTRMENU	Off			Off / On
CBK-CTRAHMI	SBO			DIR / SBO
ICB-EN	On			Off / On
ICB-NAME	ILKBYP			14 characters
ICB-OFFNAME	Off			14 characters
ICB-ONNAME	Bypass			14 characters
ICB-CTRMENU	Off			Off / On
ICB-CTRAHMI	SBO			DIR / SBO
SCB-EN	On			Off / On
SCB-NAME	SYNCBYP			14 characters
SCB-OFFNAME	Off			14 characters
SCB-ONNAME	Bypass			14 characters
SCB-CTRMENU	Off			Off / On
SCB-CTRAHMI	SBO			DIR / SBO

CBK: Command Blocking
ICB: Interlock Bypassing
SCB: Synchronism Bypassing

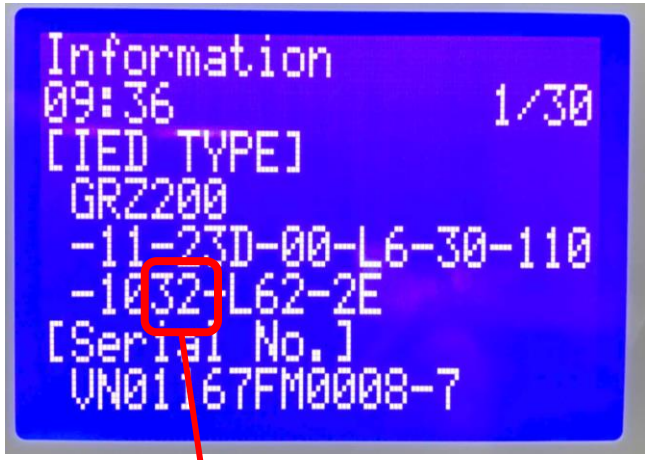
Setting Items	Current Val...	New Value	Unit	Range
S4301-EN	Off			Off / On
S4302-EN	Off			Off / On
S4303-EN	Off			Off / On
S4304-EN	Off			Off / On
S4305-EN	Off			Off / On
S4306-EN	Off			Off / On
S4307-EN	Off			Off / On
S4308-EN	Off			Off / On
S4309-EN	Off			Off / On
S4310-EN	Off			Off / On
S4311-EN	Off			Off / On
S4312-EN	Off			Off / On
S4313-EN	Off			Off / On
S4314-EN	Off			Off / On
S4315-EN	Off			Off / On
S4316-EN	Off			Off / On
S4317-EN	Off			Off / On

Other switches ranging from S4301 to S4361

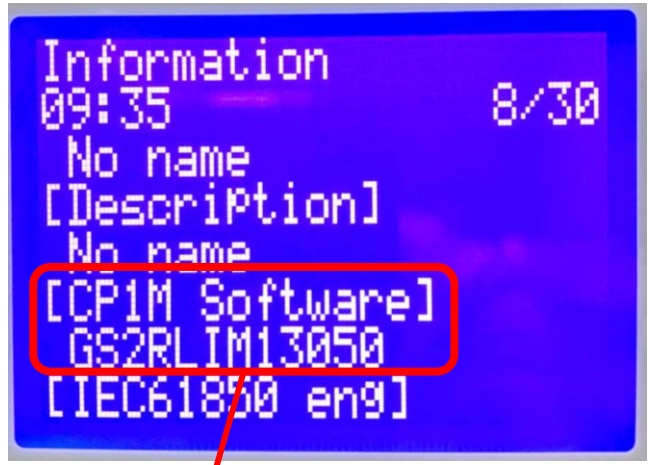
Software Switch Function Confirmation

❖ On LCD screen

Go to Main Menu -> Information to check software code and firmware version



Software code
1032



Firmware version
GS2RLIM13050

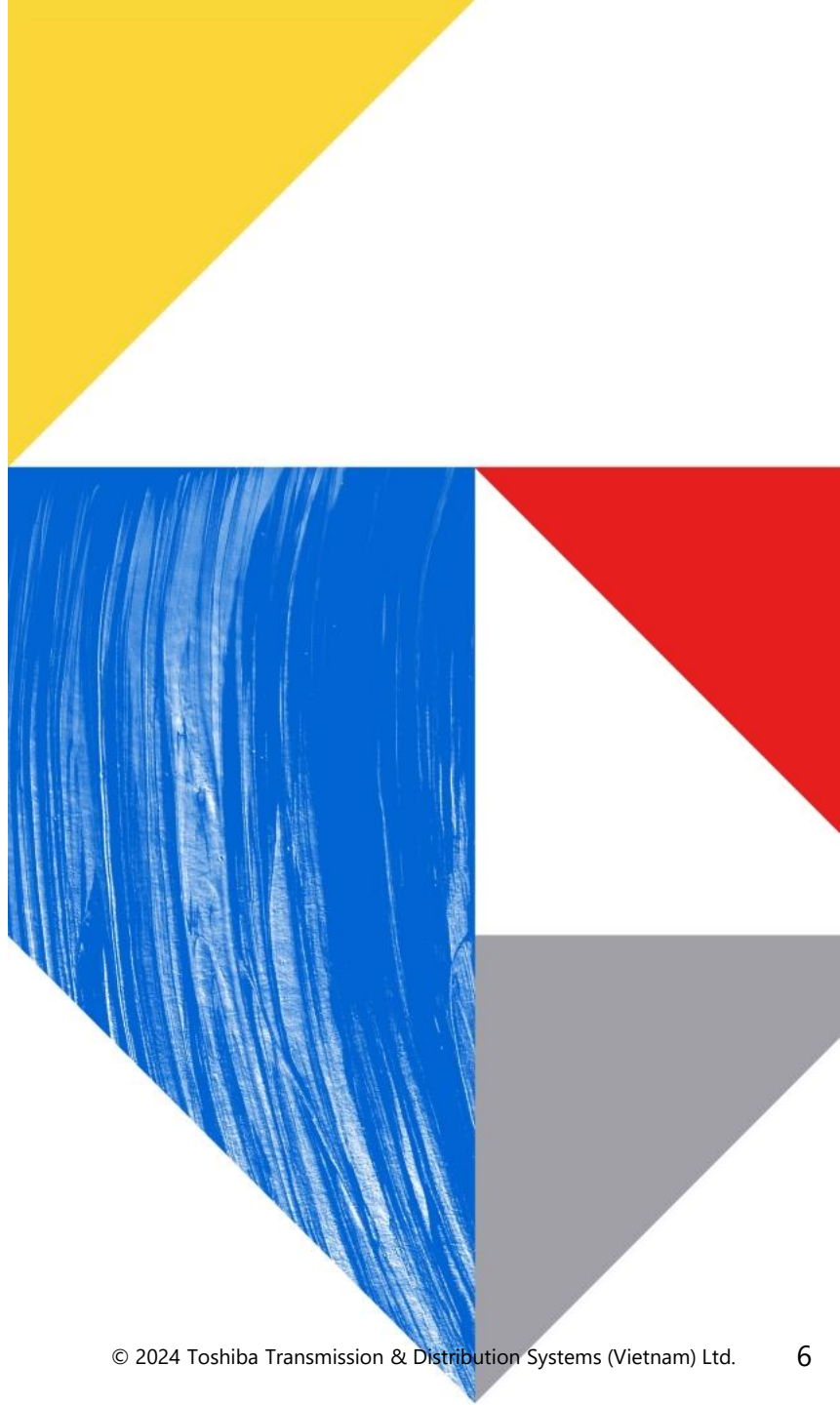
Software Switch Function Confirmation

Relays with these codes have Softswitch Control Function

Relay type	Software code	Firmware
GBU200	34,35	Any version
GRD200	3D, 3E	Any version
GRL200	37	Any version
GRZ200	32	Any version
GRB200-decentralized	31,32	Any version
GRB200-centralized	30	At least GS2RBIM13022
	31	
	32	
	33	
	34	
GRT200	3D	At least GS2RTIM13024
	3E	
	3F	

02

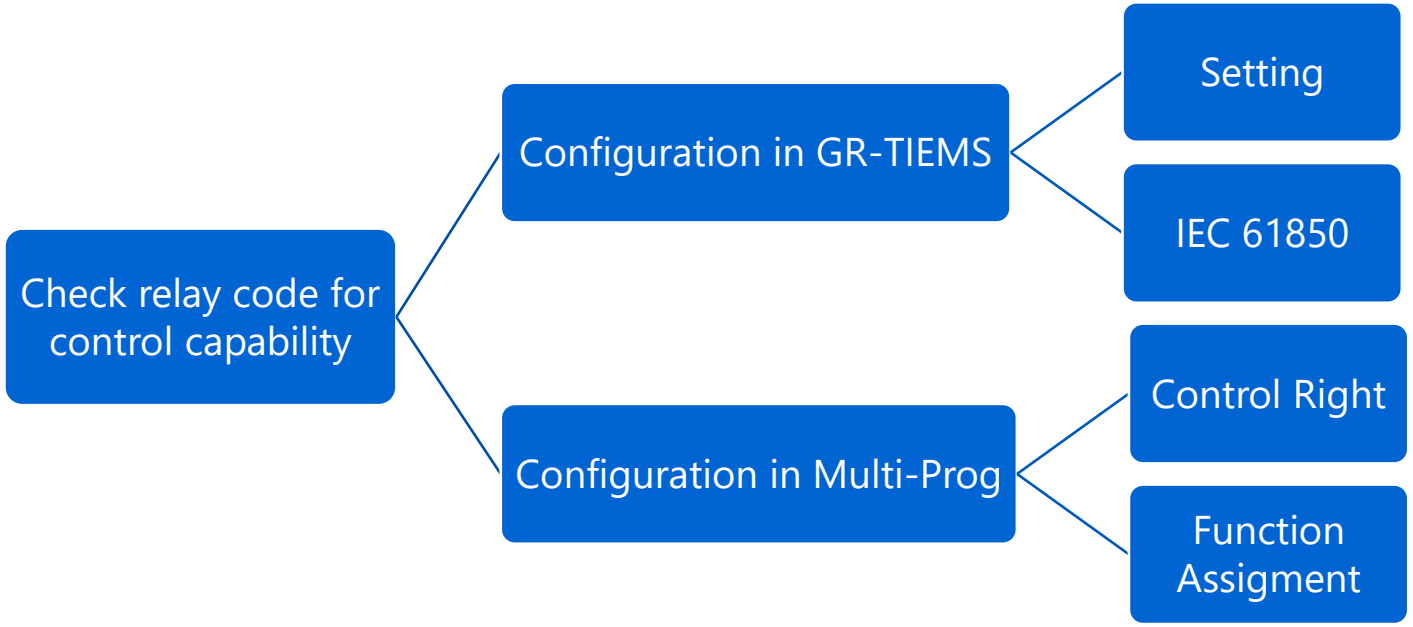
Application Sample



Application Sample

Case study: Using Software Switch (S4301) to control On/Off 87L Function

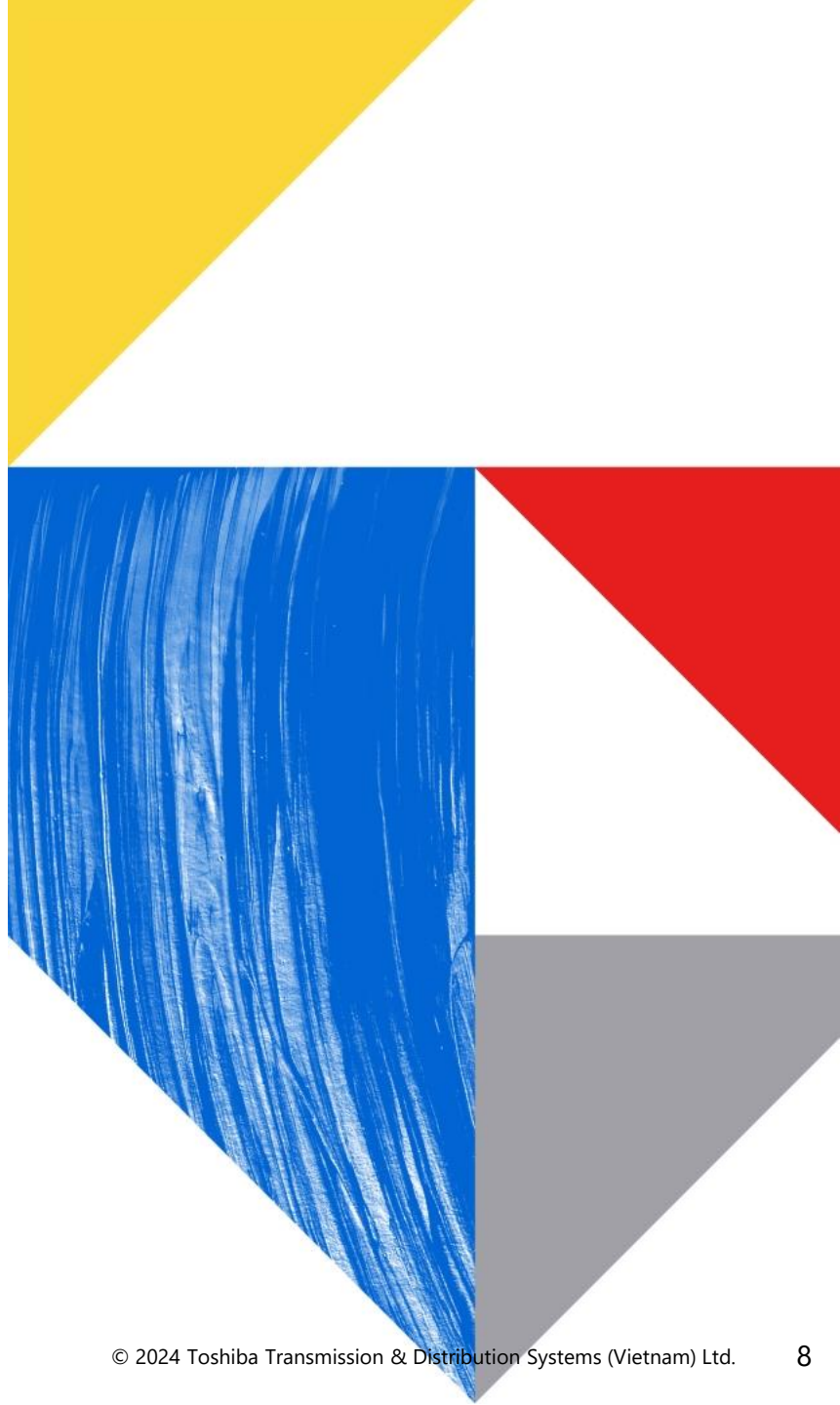
The configuration steps must be followed to configure Software Switch (SOFTSW).



Overview of configuration steps

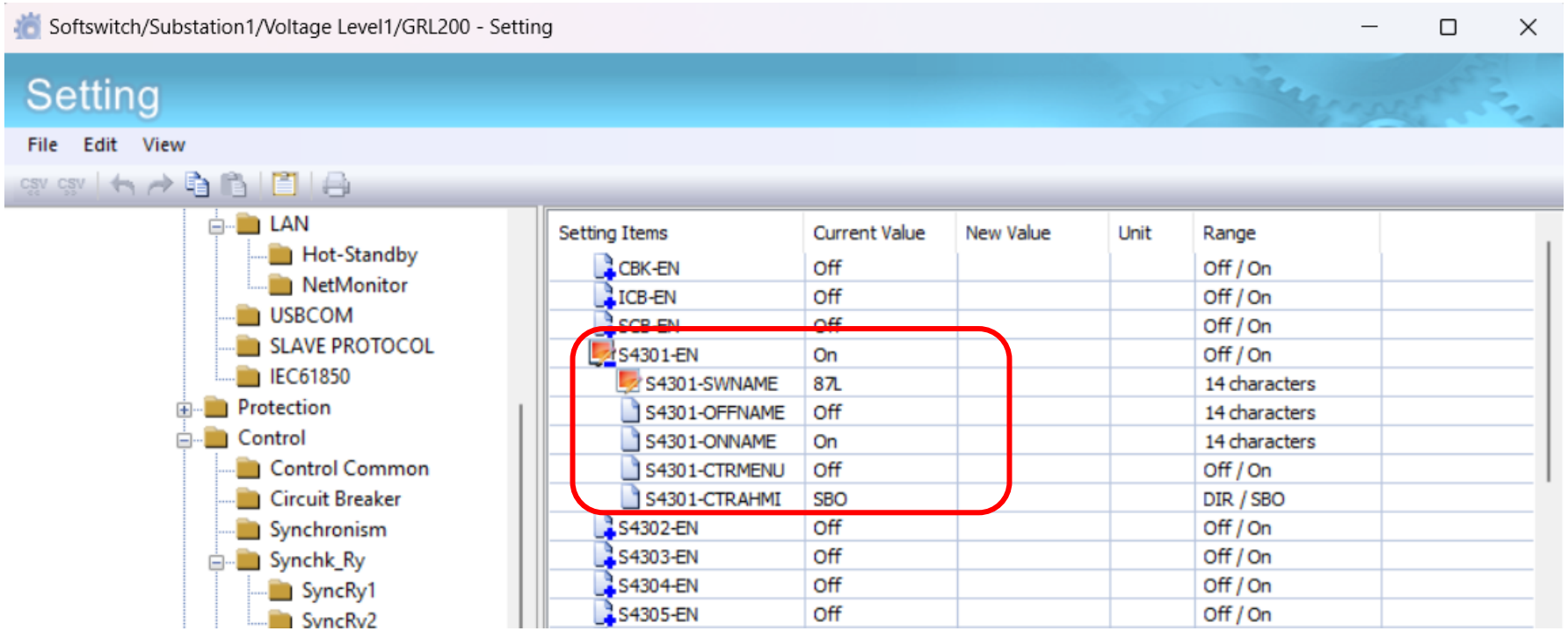
2.1

Configuration in GR-TIEMS



GR-TIEMS – Settings

Step 1: Enable Software Switch in GR-TIEMS Setting



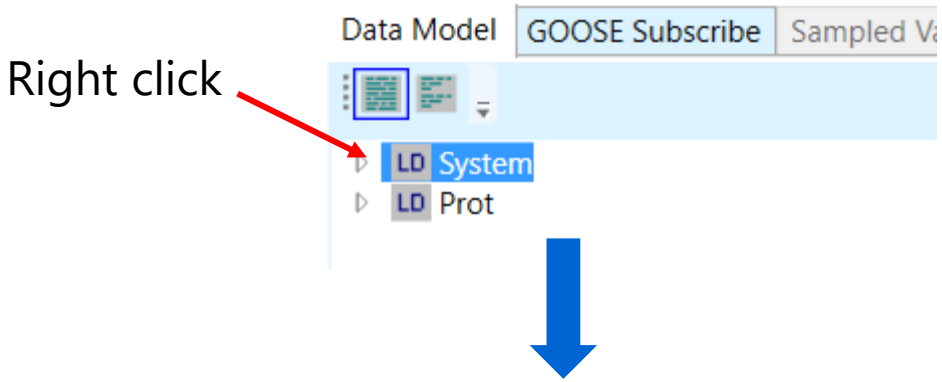
Example for settings of S4301 using to control 87L on/off

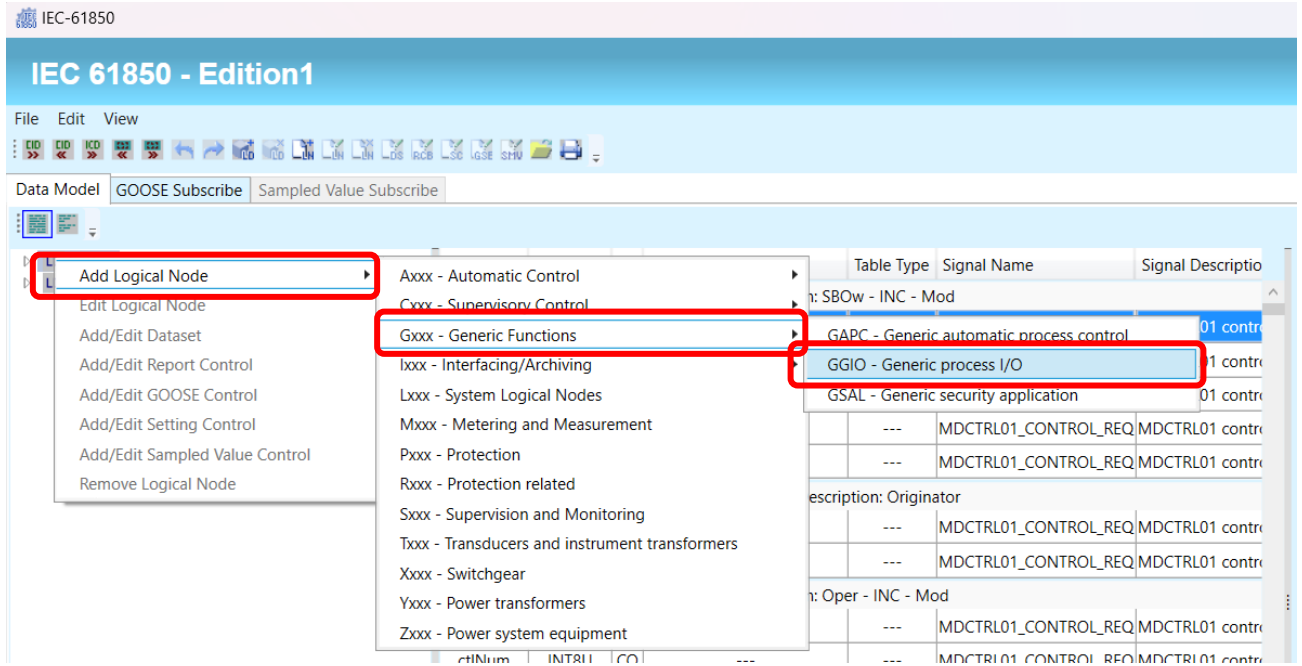
Step 2: IEC 61850 configuration

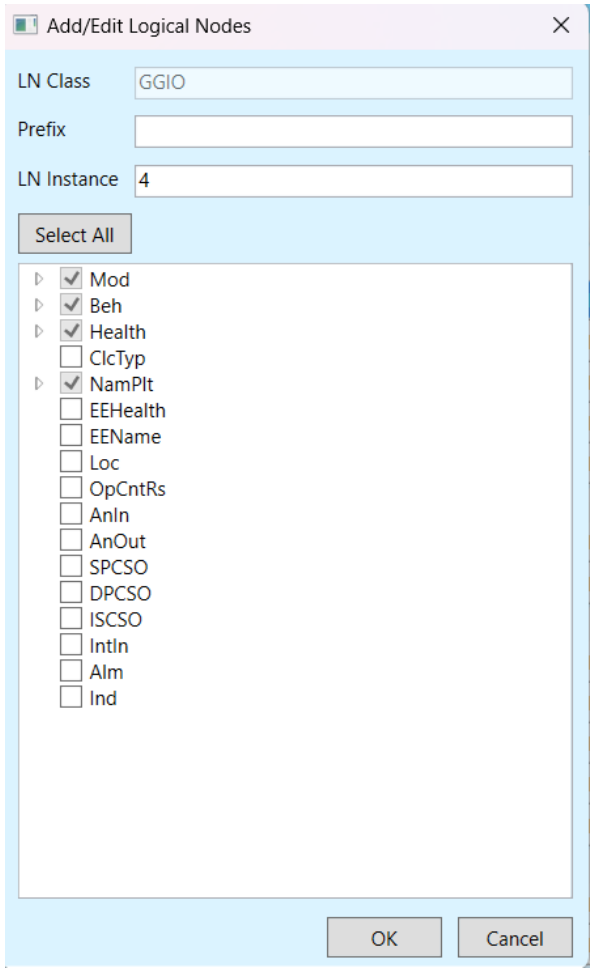
GR-TIEMS – IEC 61850

❖ Logical Node

User can define Prefix and LN Instance
Logical Node can be added to any Logical Device

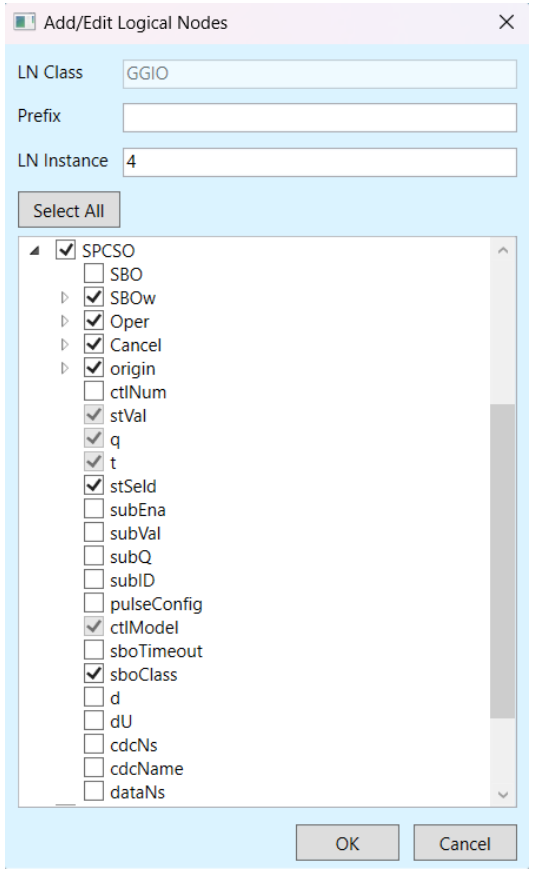




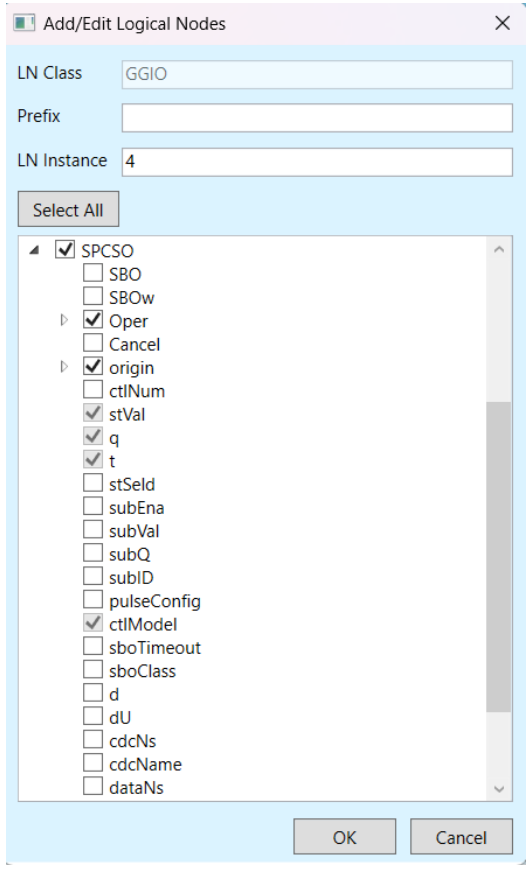


❖ Logical Node

Select SPCSO and tick these following categories



For SBO mode



For DIR mode

Select as below

System/GGIO4$SPCSO			Description: Controllable single point (SPC)		
stVal	BOOLEAN	ST	---	---	---
q	Quality	ST	---	---	---
t	Timestamp	ST	---	---	---
stSeld	BOOLEAN	ST	---	---	---
ctlModel	INT8	CF	sbo-with-enhanced-security	---	---
sboClass	INT8	CF	operate-once	---	---

For SBO

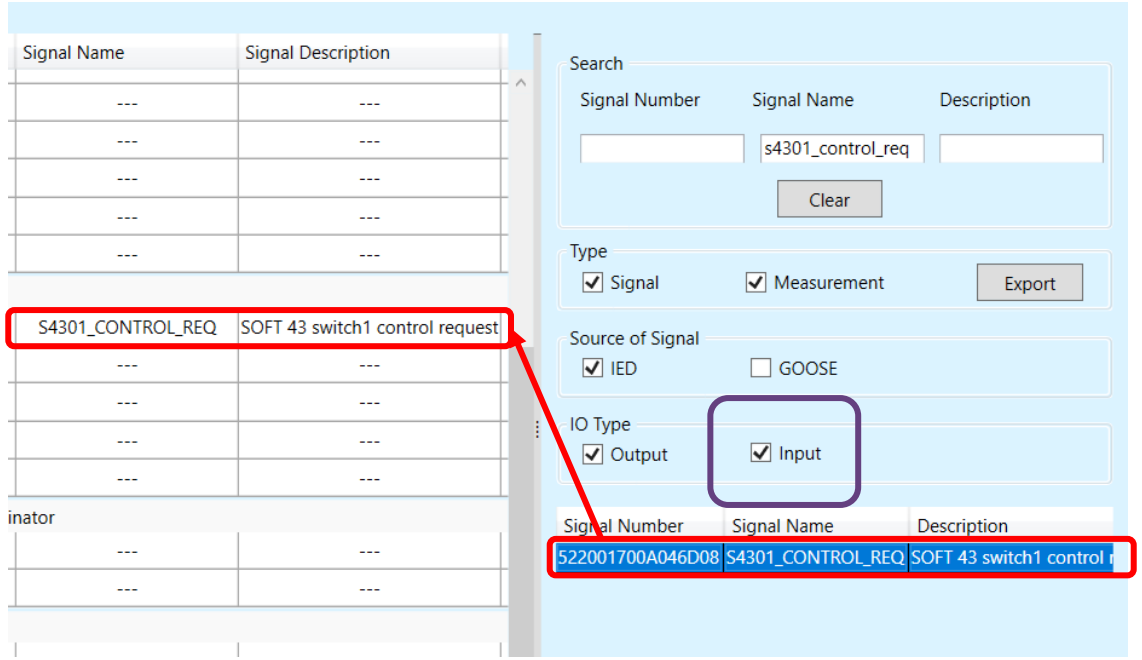
System/GGIO4$SPCSO			Description: Controllable single point (SPC)		
stVal	BOOLEAN	ST	---	---	
q	Quality	ST	---	---	
t	Timestamp	ST	---	---	
ctlModel	INT8	CF	direct-with-enhanced-security	---	

For DIR

GR-TIEMS – IEC 61850

❖ Mapping signals

Map signals as below



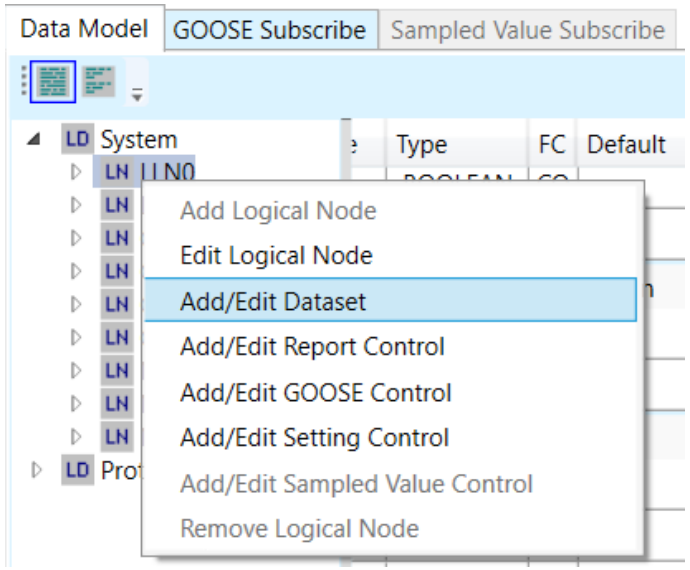
Object_reference	Attribute	Type	FC	Signal Number	Signal Name
Ctrl/GGIO701$SPCSO$origin	orCat	orCategory	ST	522001 310A041008	S4301_ORCAT
Ctrl/GGIO701$SPCSO$origin	orIdent	Octet64	ST	522001 6A0A041009	S4301_ORIDENT
Ctrl/GGIO701$SPCSO	stVal	INT32	ST	522001 000A041001	S4301_STATE
Ctrl/GGIO701$SPCSO	q	Quality	ST	522001 310A041005	S4301_QUALITY
Ctrl/GGIO701$SPCSO	t	Timestamp	ST	522001 900A041006	S4301_TIME
Ctrl/GGIO701$SPCSO	stSeld	BOOLEAN	ST	522001 000A041D90	S4301_STSELD

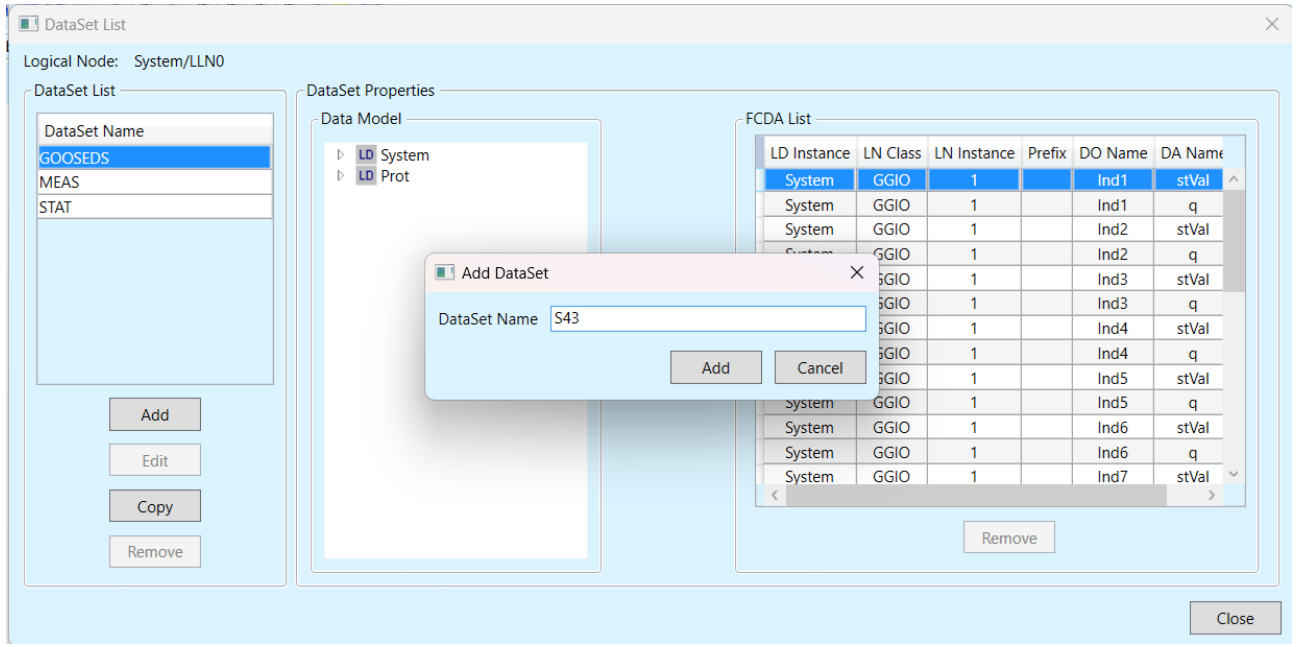
Object_reference	Attribute	Type	FC	Signal Number	Signal Name
Ctrl/GGIO701$SPCSO$SBOw	ctlVal	BOOLEAN	CO	522001 700A046D08	S4301_CONTROL_REQ
Ctrl/GGIO701$SPCSO$SBOw	ctlNum	INT8U	CO		
Ctrl/GGIO701$SPCSO$SBOw	T	Timestamp	CO		
Ctrl/GGIO701$SPCSO$SBOw	Test	BOOLEAN	CO		
Ctrl/GGIO701$SPCSO$SBOw	Check	Check	CO		
Ctrl/GGIO701$SPCSO$SBOw$origin	orCat	orCategory	CO		
Ctrl/GGIO701$SPCSO$SBOw$origin	orIdent	Octet64	CO		
Ctrl/GGIO701$SPCSO$Oper	ctlVal	BOOLEAN	CO		
Ctrl/GGIO701$SPCSO$Oper	ctlNum	INT8U	CO		
Ctrl/GGIO701$SPCSO$Oper	T	Timestamp	CO		
Ctrl/GGIO701$SPCSO$Oper	Test	BOOLEAN	CO		
Ctrl/GGIO701$SPCSO$Oper	Check	Check	CO		
Ctrl/GGIO701$SPCSO$Oper$origin	orCat	orCategory	CO		
Ctrl/GGIO701$SPCSO$Oper$origin	orIdent	Octet64	CO		
Ctrl/GGIO701$SPCSO$Cancel	ctlVal	BOOLEAN	CO		
Ctrl/GGIO701$SPCSO$Cancel	ctlNum	INT8U	CO		
Ctrl/GGIO701$SPCSO$Cancel	T	Timestamp	CO		
Ctrl/GGIO701$SPCSO$Cancel	Test	BOOLEAN	CO		
Ctrl/GGIO701$SPCSO$Cancel$origin	orCat	orCategory	CO		
Ctrl/GGIO701$SPCSO$Cancel$origin	orIdent	Octet64	CO		
Ctrl/GGIO701$SPCSO	ctlModel	ctlModel	CF		
Ctrl/GGIO701$SPCSO	sboClass	sboClass	CF		

Not apply for DIR

❖ Dataset

Right click at LLN0, select “Add/Edit Dataset”, click “Add” and type the name



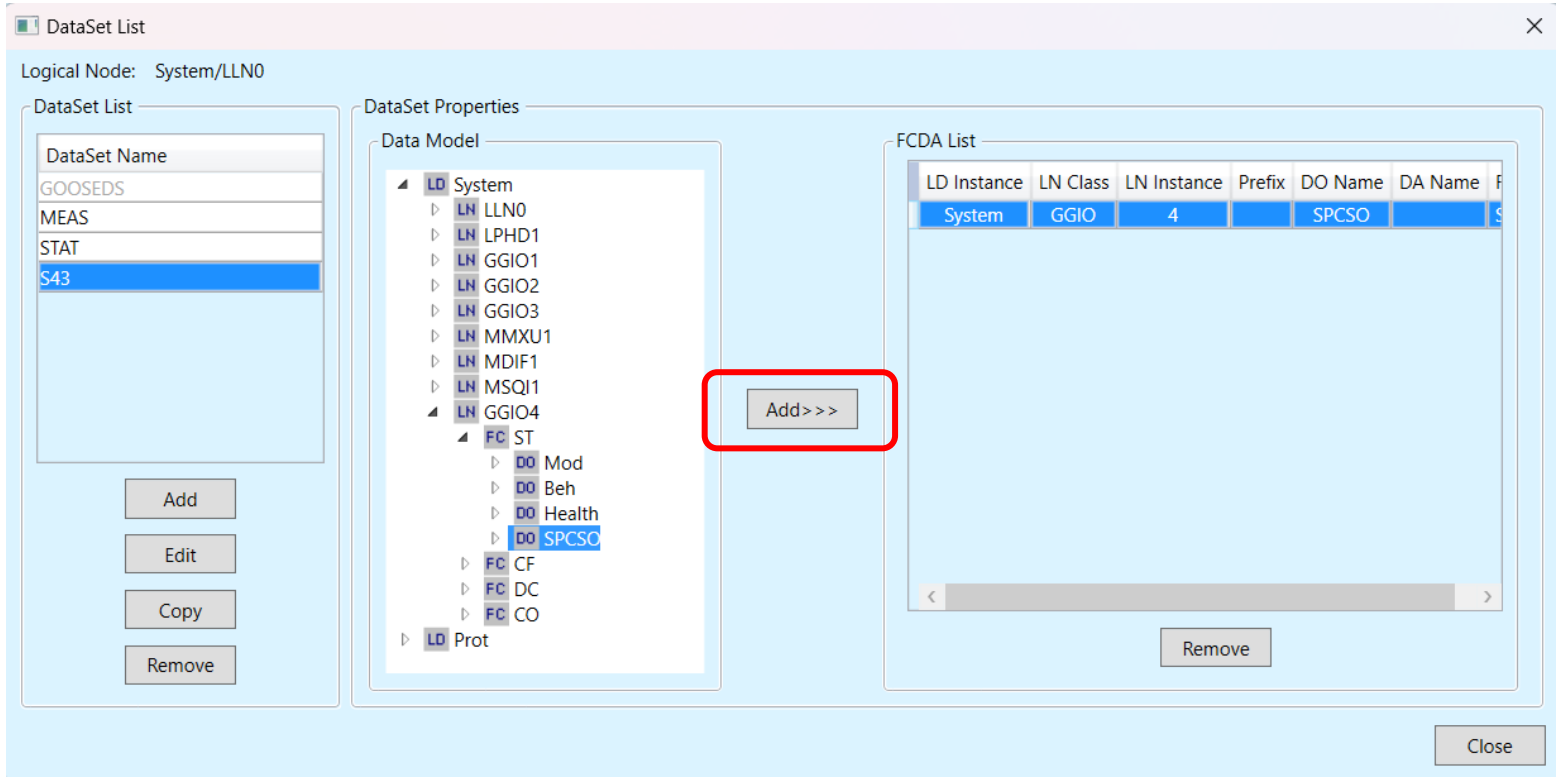


Example configuration, name can be changed

❖ Dataset

Select “S43”, then add Data Model as below

Note: Select the Logical Device that contains the Softswitch Logical Node

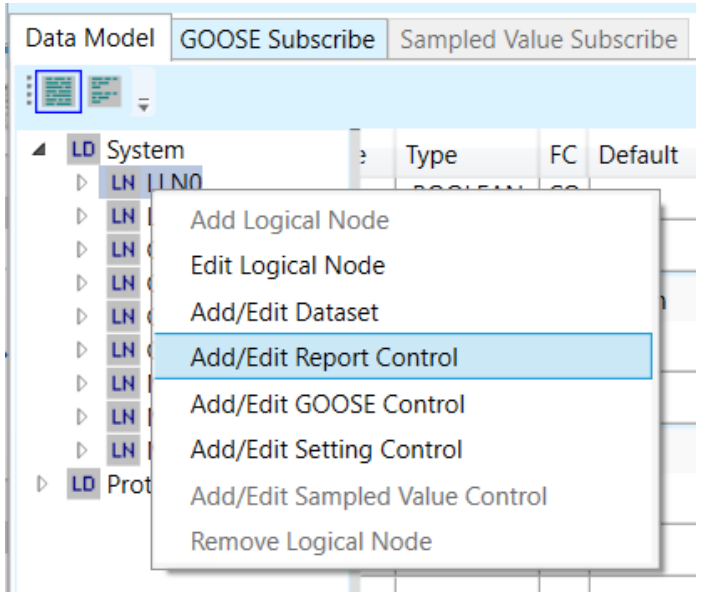


Example configuration, name can be changed

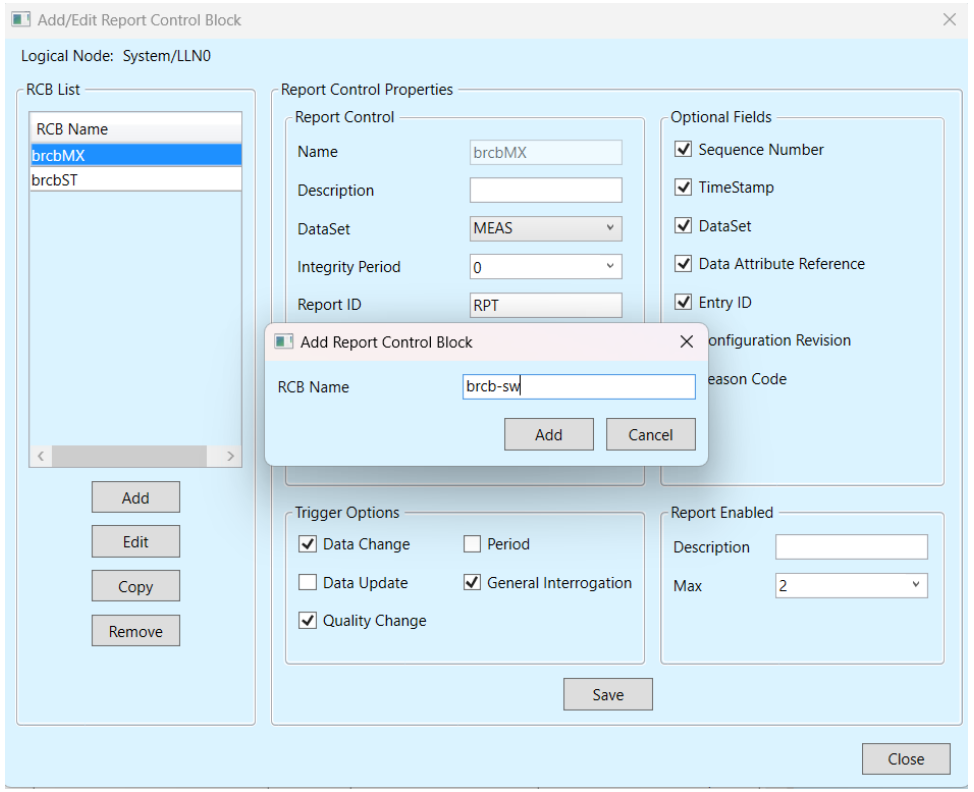
❖ Report Control

Right click at LLN0, select “Add/Edit Report Control”

Note: Edit Report Control in the same Logical Device that contains the Softswitch

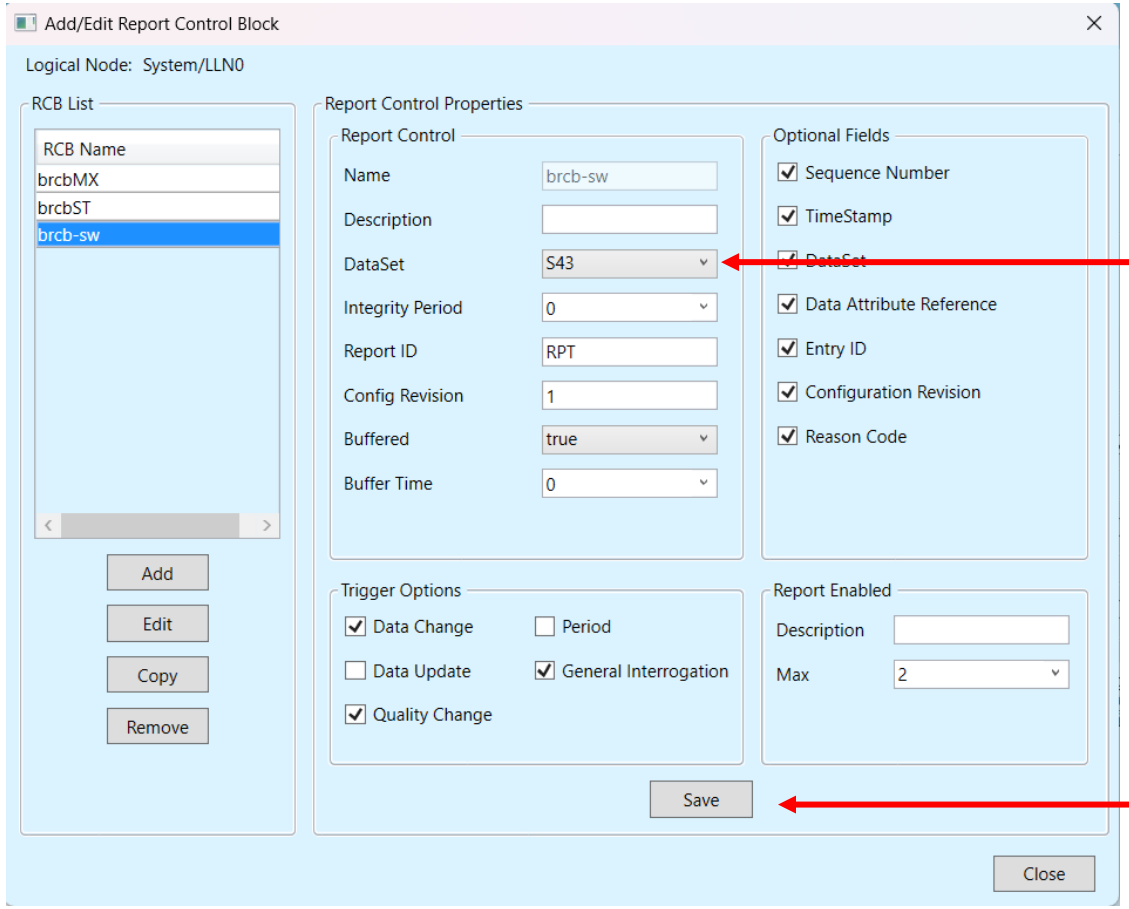


Select “Add” and type the name



❖ Report Control

Select the added RCB list, and tick as below



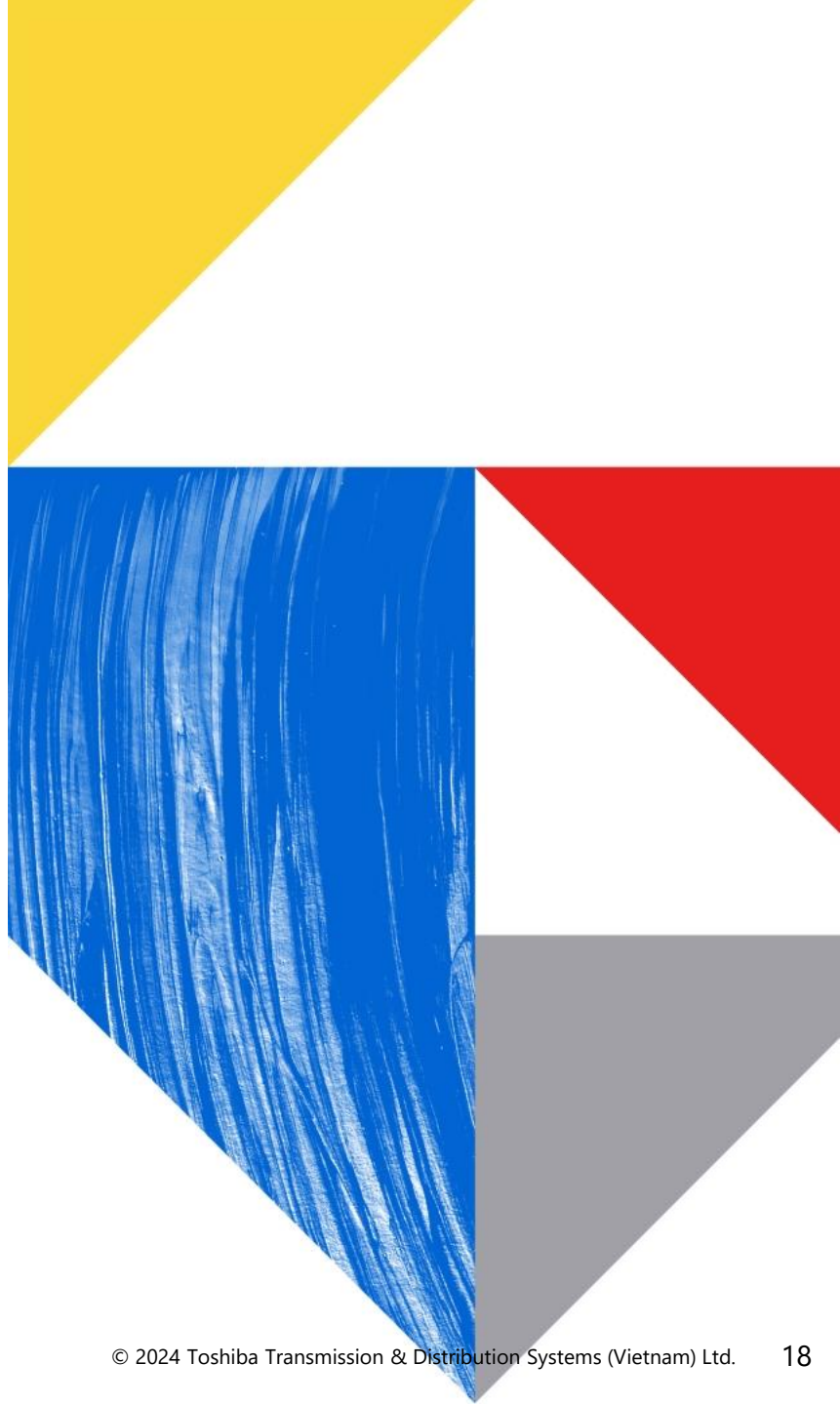
Select recently added Dataset

Example configuration, name, trigger options, optional fields, report enabled, buffer setting can be changed

Finally, click “Save”

2.2

Configuration in MULTIPROG

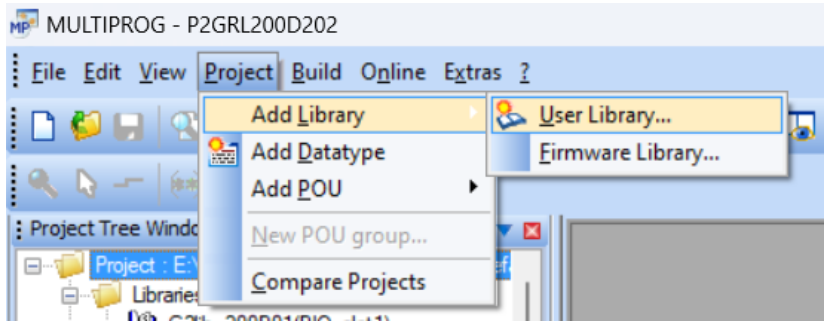


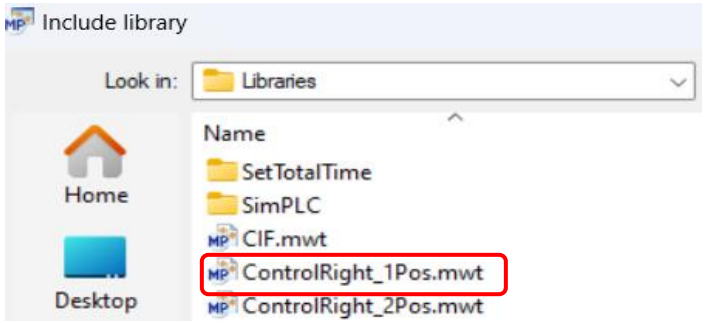
MULTIPROG – Control Right Configuration

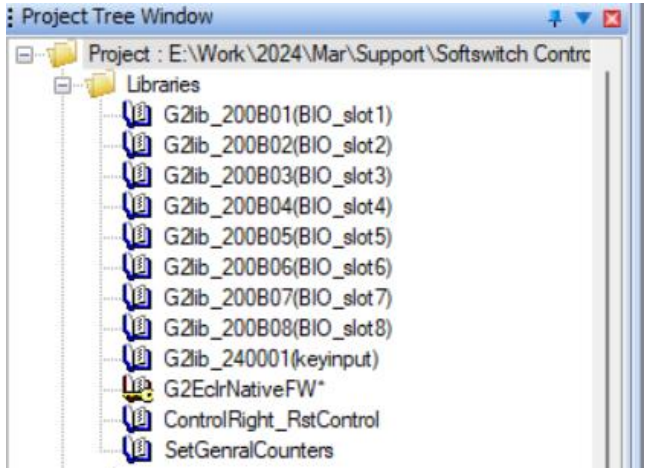
Step 1: Control Right Configuration

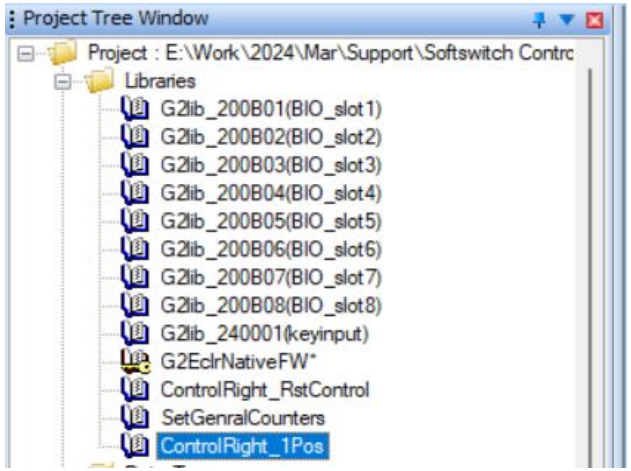
❖ Add Library

Click “Project” → “Add Library” → “User Library” → Double Click at “ControlRight_1Pos.mwt”





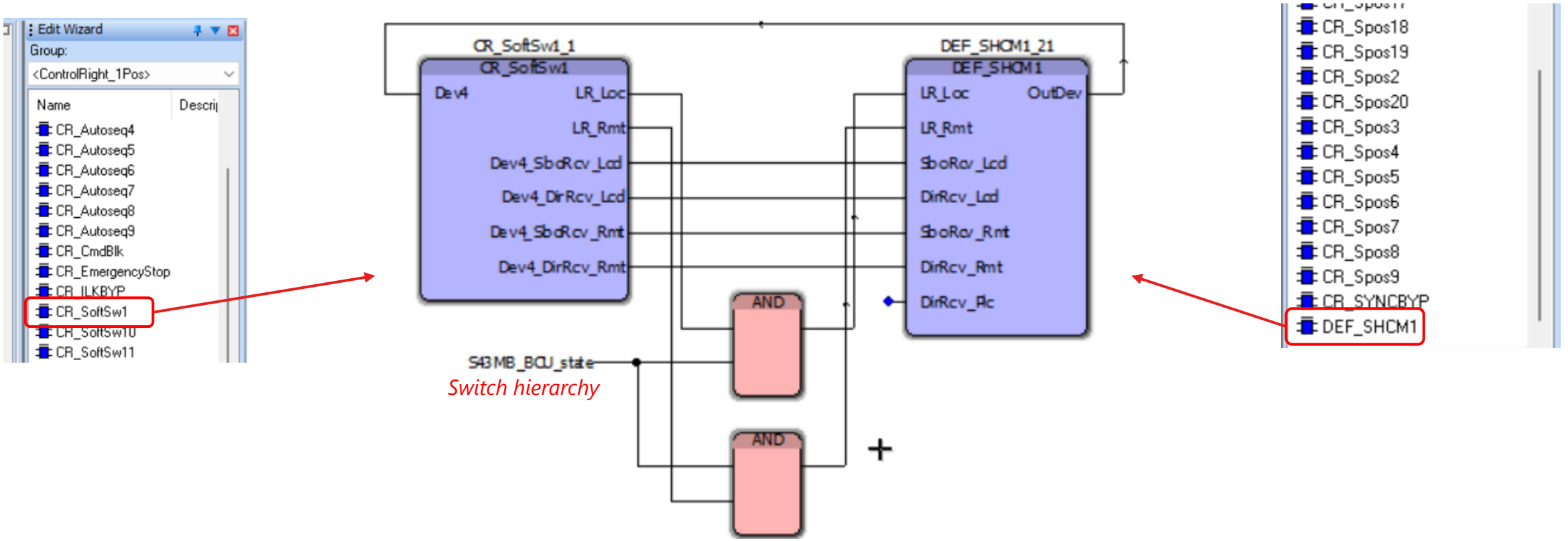




Confirm library has been added

MULTIPROG – Control Right Configuration

❖ Add block to code worksheet



Make sure there is only ONE Control Right block for S4301 in Multi Prog

MULTIPROG – SOFTSW Function Configuration

Step 2: SOFTSW Function Configuration

❖ **Example of applying softswitch state to block function 87L (DIFL and DIFGL)**

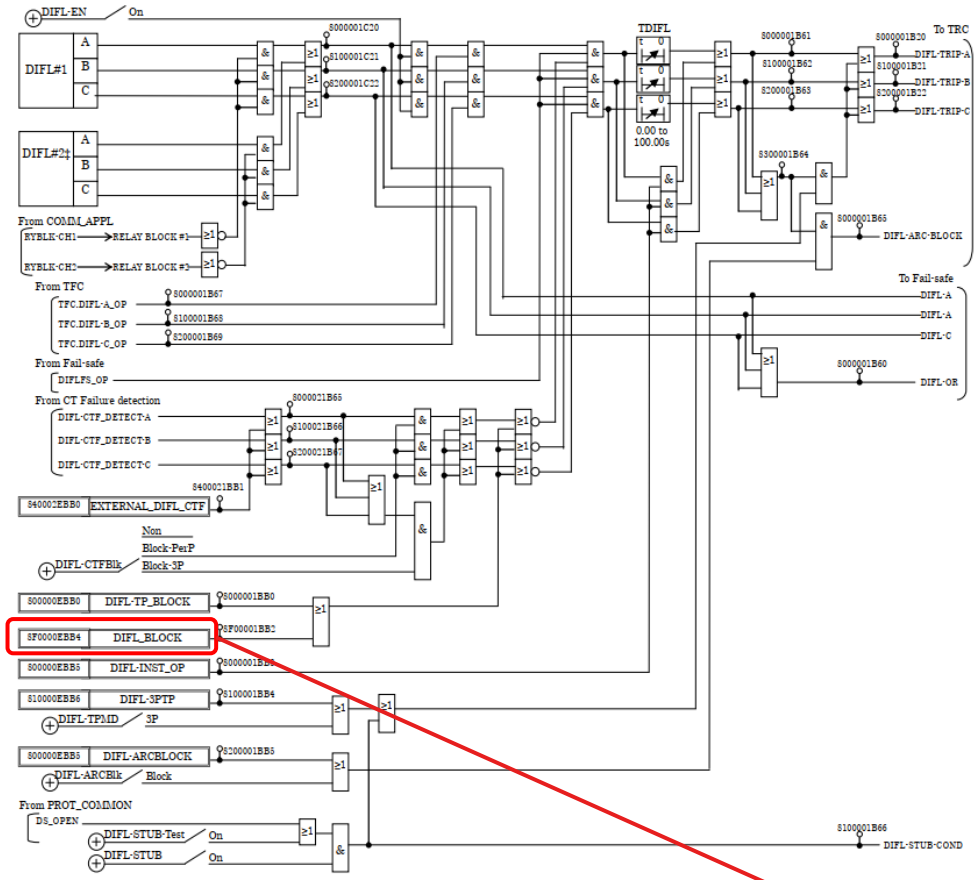


Figure 2.2-3 Generation of trip signals in the DIFL function

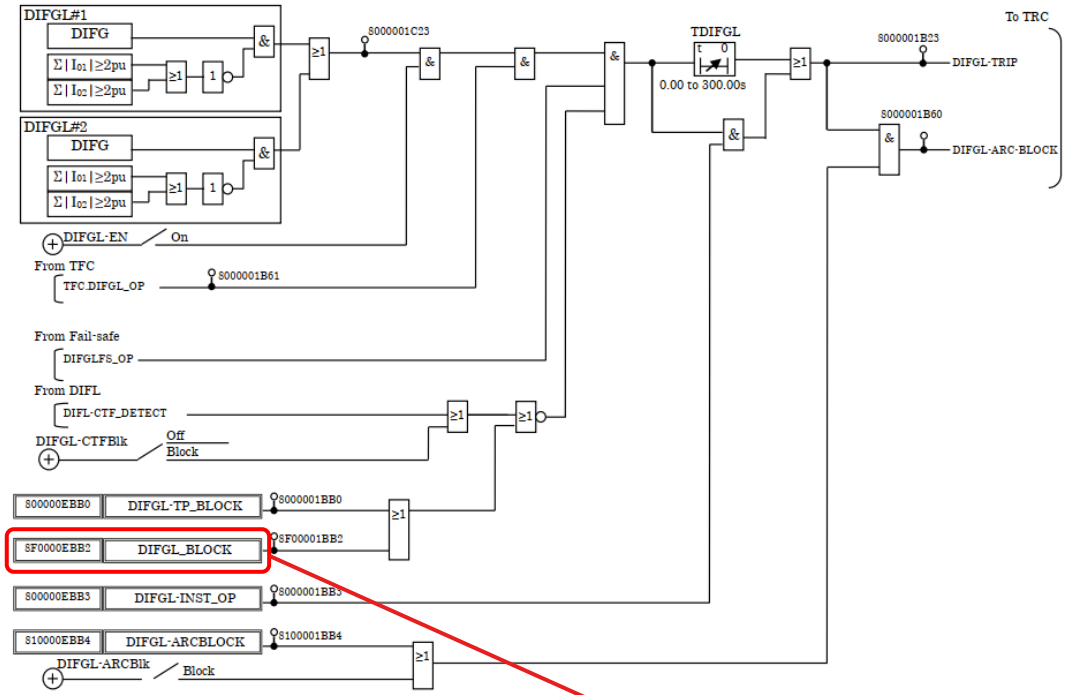
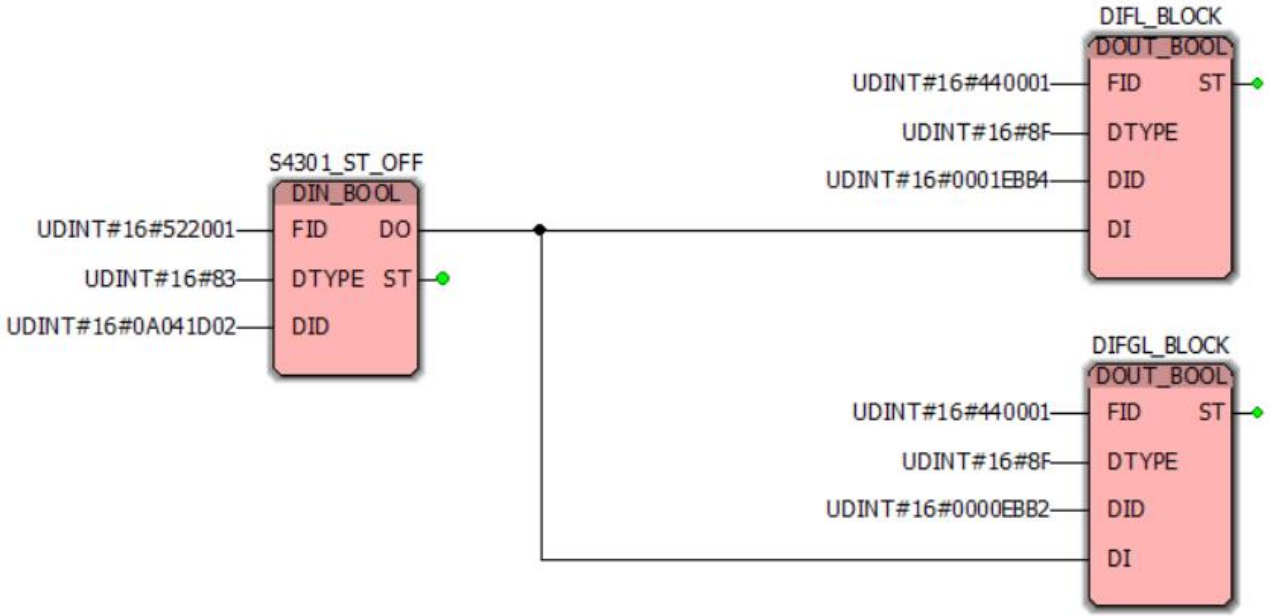


Figure 2.3-3 Generation of trip signal in the DIFGL function

MULTIPROG – SOFTSW Function Configuration

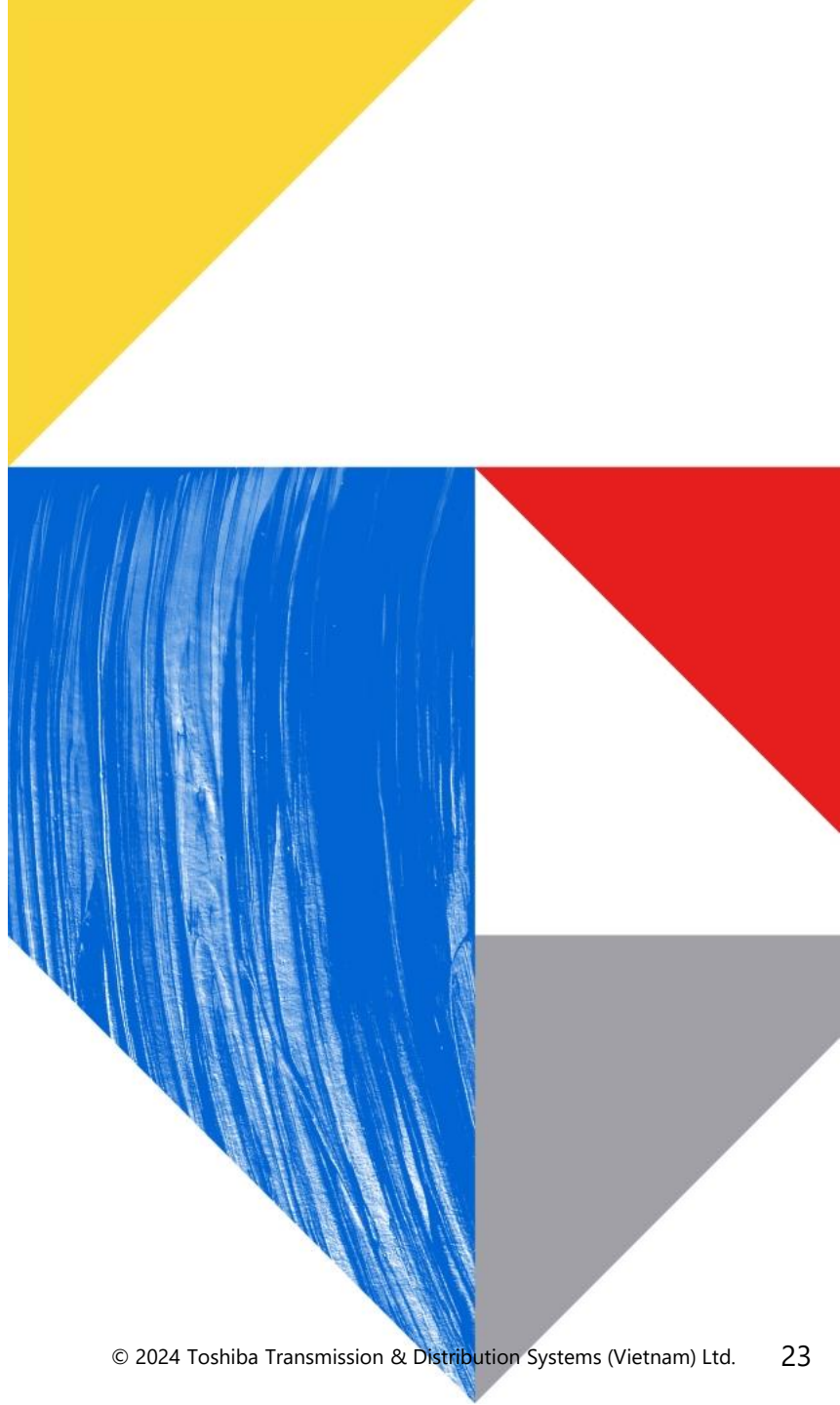
Example of applying softswitch state to block function 87L (DIFL and DIFGL)



Sample configuration for 87L on/off control

03

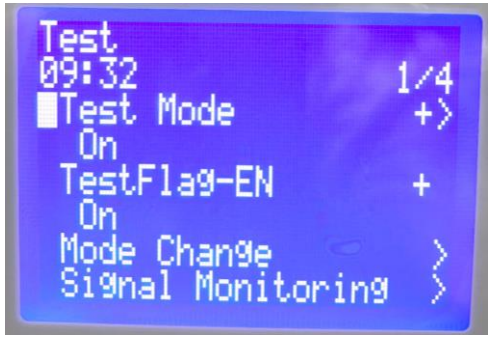
Troubleshooting



Troubleshooting

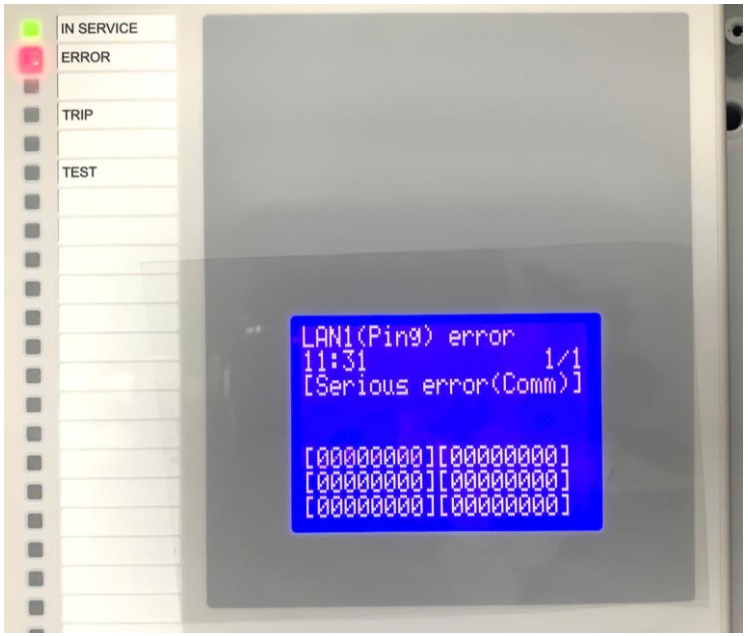
In case you have trouble in SOFTSW control from IEC 61850, the cause may come from the below issues:

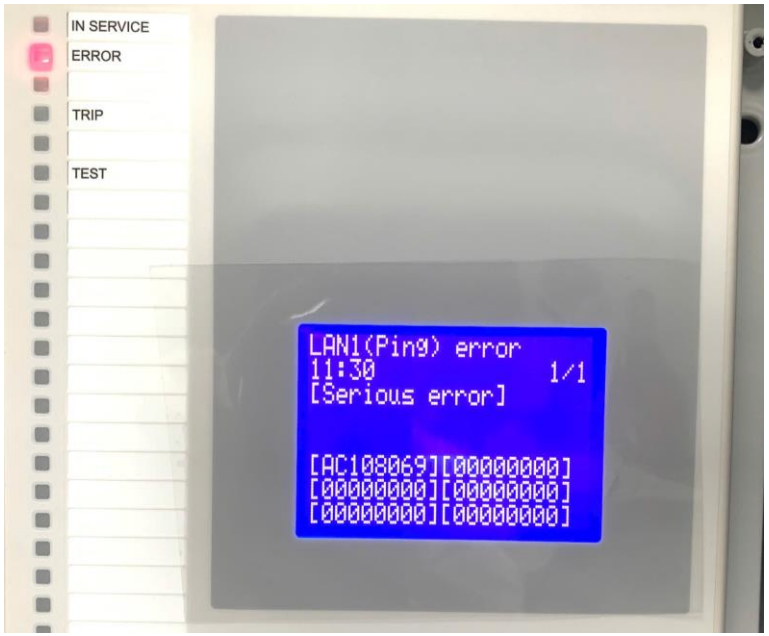
1. Relay is in Test mode



2. Remote/Local button is in Local mode

3. Relay Error: Serious or Serious (Comm)





Revision Up Record

Revision	Date of issuance	Change log	Information	Issued by
0	02/10/2024	All	First Issued	P&C Engineer Department

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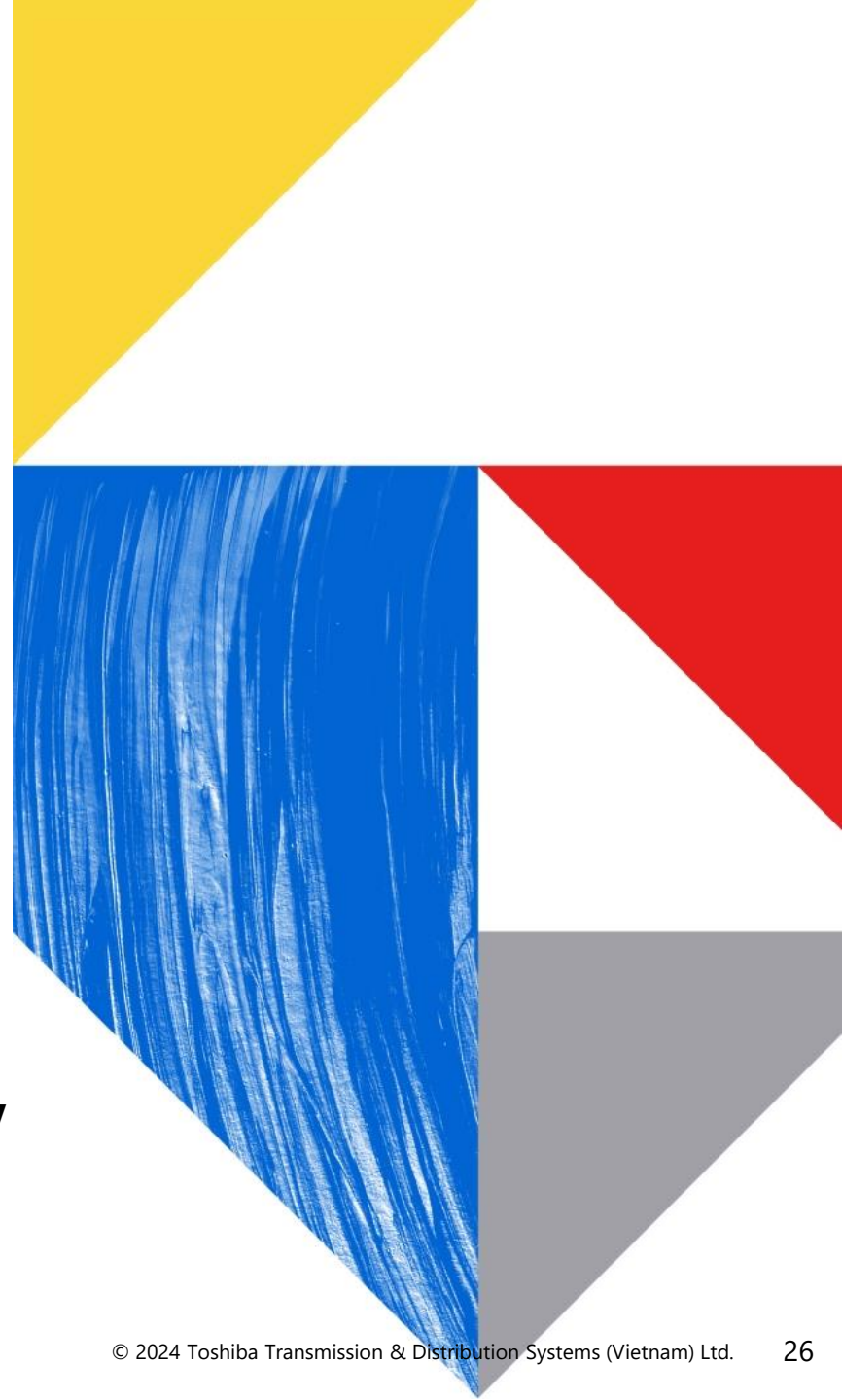

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