Gateway Editor Wizard Explains

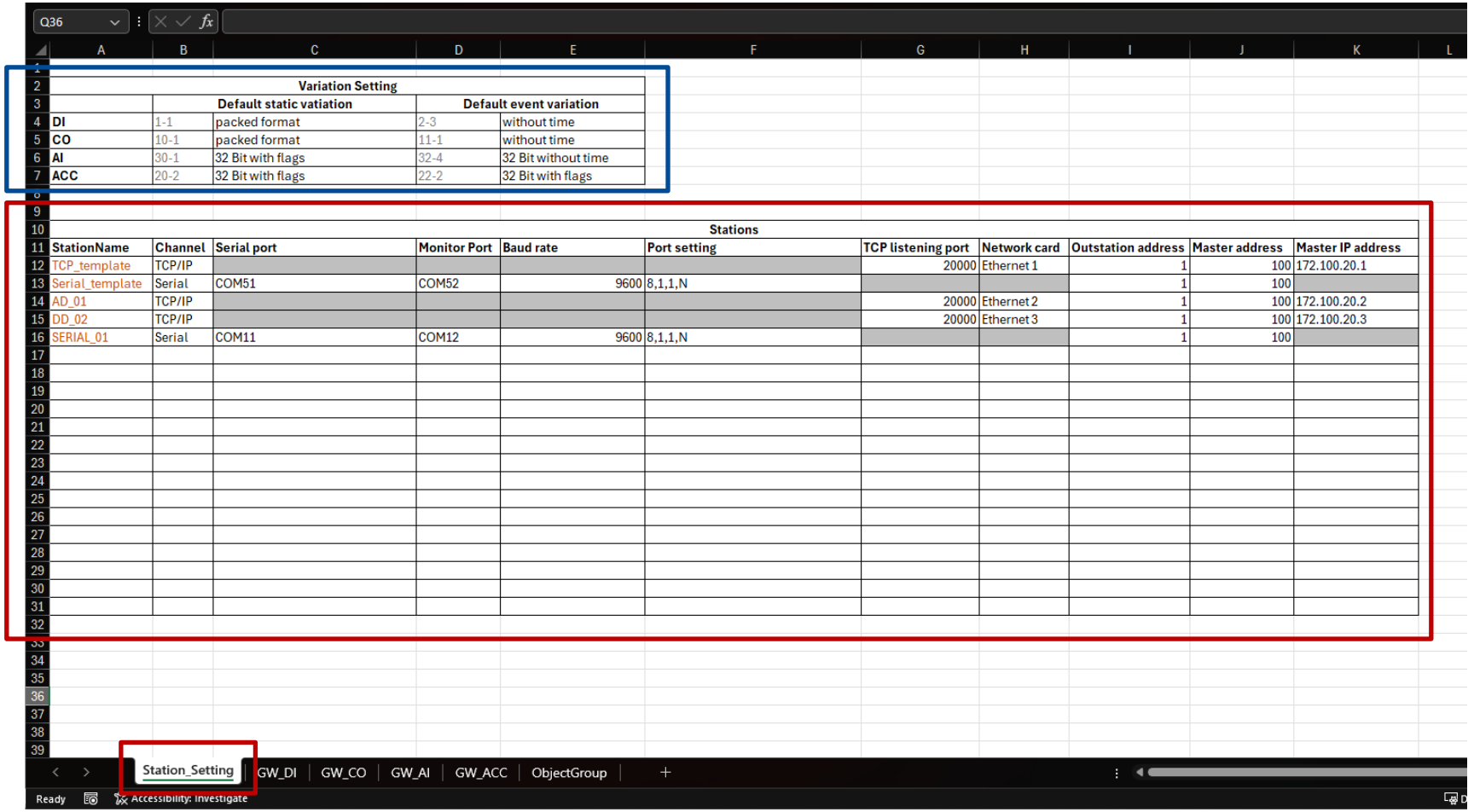
Document ID.: Rev.:

Template file [GW_PointList_Template.xlsx]

Station_Setting

- Default variation setting for each database.
- The setting for each variable can be changed in the following pages.

- Setting for all gateway stations.
- If StationName is written, all of the boxes not gray must be filled.
- “TCP_template” and “Serial_template” are examples for users, can be removed if necessary.
- Maximum 20 stations can be created with this wizard.



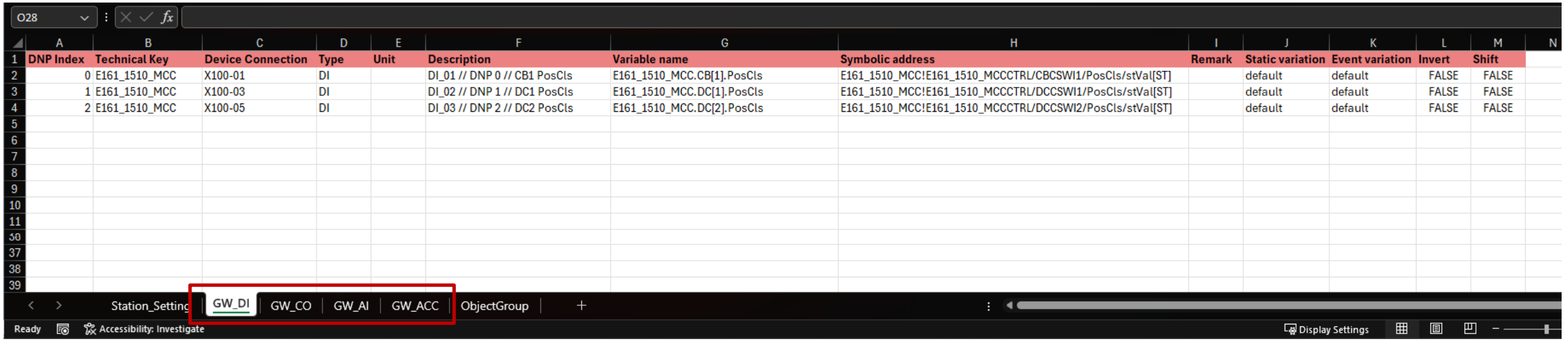
Variation Setting				
	Default static vatiation		Default event variation	
DI	1-1	packed format	2-3	without time
CO	10-1	packed format	11-1	without time
AI	30-1	32 Bit with flags	32-4	32 Bit without time
ACC	20-2	32 Bit with flags	22-2	32 Bit with flags

Stations										
StationName	Channel	Serial port	Monitor Port	Baud rate	Port setting	TCP listening port	Network card	Outstation address	Master address	Master IP address
TCP_template	TCP/IP					20000	Ethernet 1	1	100	172.100.20.1
Serial_template	Serial	COM51	COM52	9600	8,1,1,N			1	100	
AD_01	TCP/IP					20000	Ethernet 2	1	100	172.100.20.2
DD_02	TCP/IP					20000	Ethernet 3	1	100	172.100.20.3
SERIAL_01	Serial	COM11	COM12	9600	8,1,1,N			1	100	

Template file [GW_PointList_Template.xlsx]

Each Database

- Excel sheets for each database are already created, input all variables and information in according pages
- The DNP index must start with 0, and no skip between 0 and the largest index
- If the DNP index for gateway upper station starts with 1, then the “Shift” in column M should be “TRUE”
- If the variables in excel files are not in editor yet, wizard will create the variables automatically, and input the following properties:
  - Driver and net address (according to Technical Key and existing driver in editor)
  - Unit, description, symbolic address



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	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	DNP Index	Technical Key	Device Connection	Type	Unit	Description	Variable name	Symbolic address	Remark	Static variation	Event variation	Invert	Shift	
2	0	E161_1510_MCC	X100-01	DI		DI_01 // DNP 0 // CB1 PosCls	E161_1510_MCC.CB[1].PosCls	E161_1510_MCC!E161_1510_MCCCTRL/CBCSWI1/PosCls/stVal[ST]		default	default	FALSE	FALSE	
3	1	E161_1510_MCC	X100-03	DI		DI_02 // DNP 1 // DC1 PosCls	E161_1510_MCC.DC[1].PosCls	E161_1510_MCC!E161_1510_MCCCTRL/DCCSWI1/PosCls/stVal[ST]		default	default	FALSE	FALSE	
4	2	E161_1510_MCC	X100-05	DI		DI_03 // DNP 2 // DC2 PosCls	E161_1510_MCC.DC[2].PosCls	E161_1510_MCC!E161_1510_MCCCTRL/DCCSWI2/PosCls/stVal[ST]		default	default	FALSE	FALSE	
5														
6														
7														
8														
9														
10														
11														
37														
38														
39														

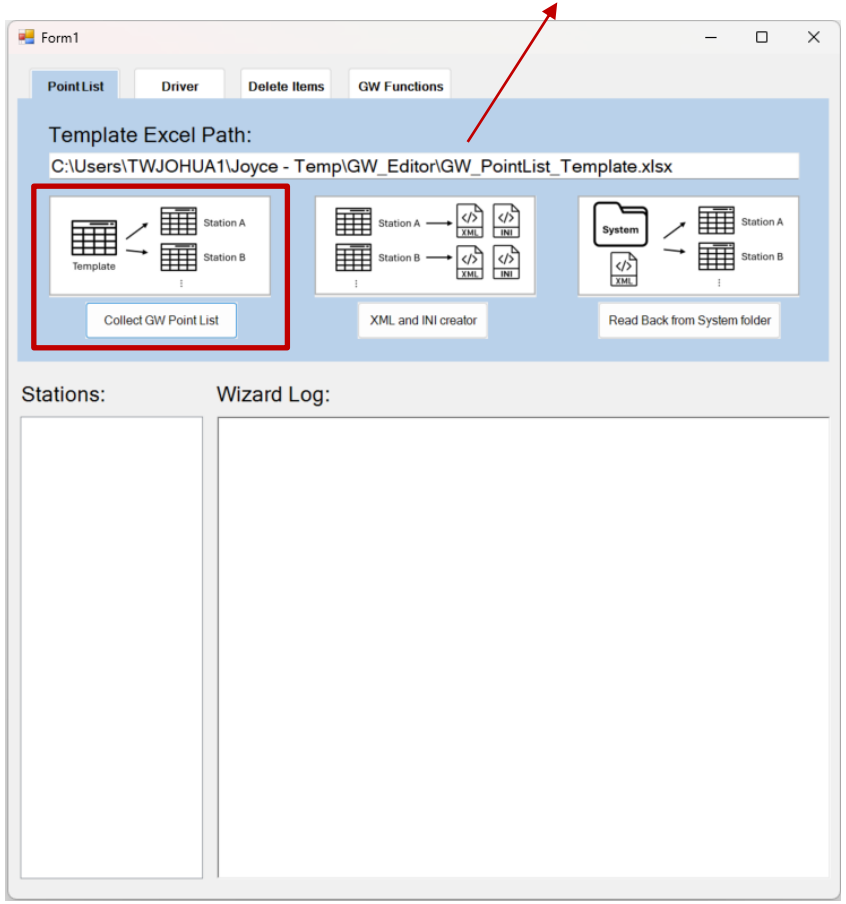
Station_Setting | GW_DI | GW_CO | GW_AI | GW_ACC | ObjectGroup

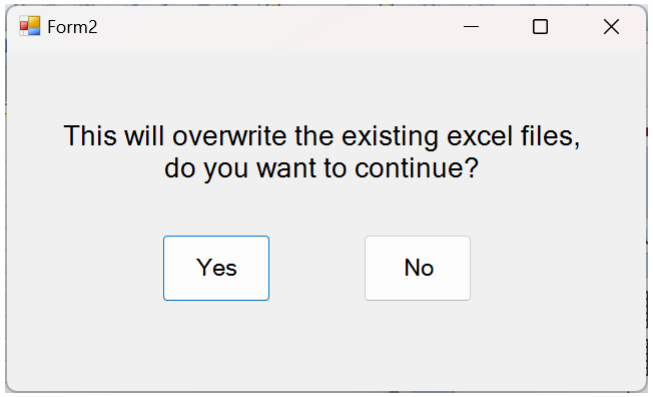
Ready | Accessibility: Investigate | Display Settings

Gateway Editor Wizard

Page 1: Point List / Section 1: Collect GW Point List

Gateway point list template file saving path



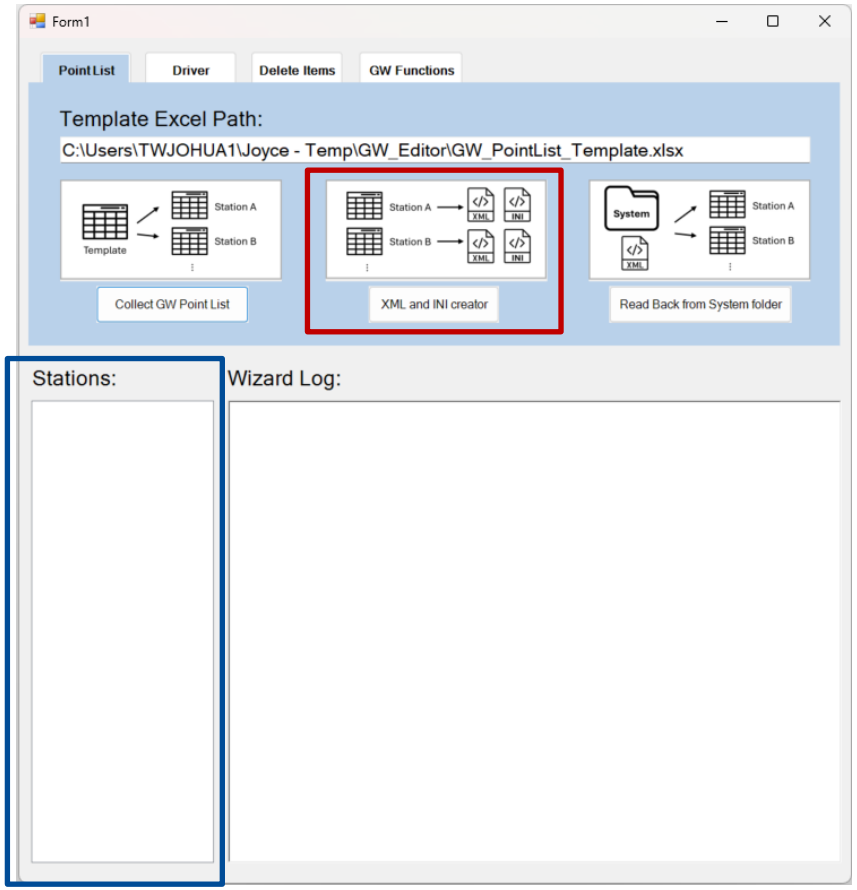


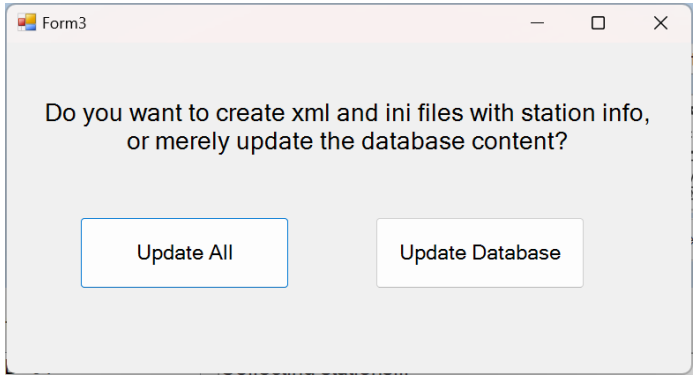
1. Create excel files for all stations from Template file
   - Template file storage path: [TemplatePath] // GW_Template_PointList.xlsx
   - New excel files saving folder: [TemplatePath] // GW_PointList // GW_PointList_[StationName].xlsx
   - This operation replaces the existing excel files in target folder, if they already existed, popup message will show for confirmation
   - Different variable setting for each station can be changed in each excel files

2. Create variables in Editor if they were not existed
   - Also modify the net address & unit & description & symbolic address

Gateway Editor Wizard

Page 1: Point List / Section 2: XML & INI Creator

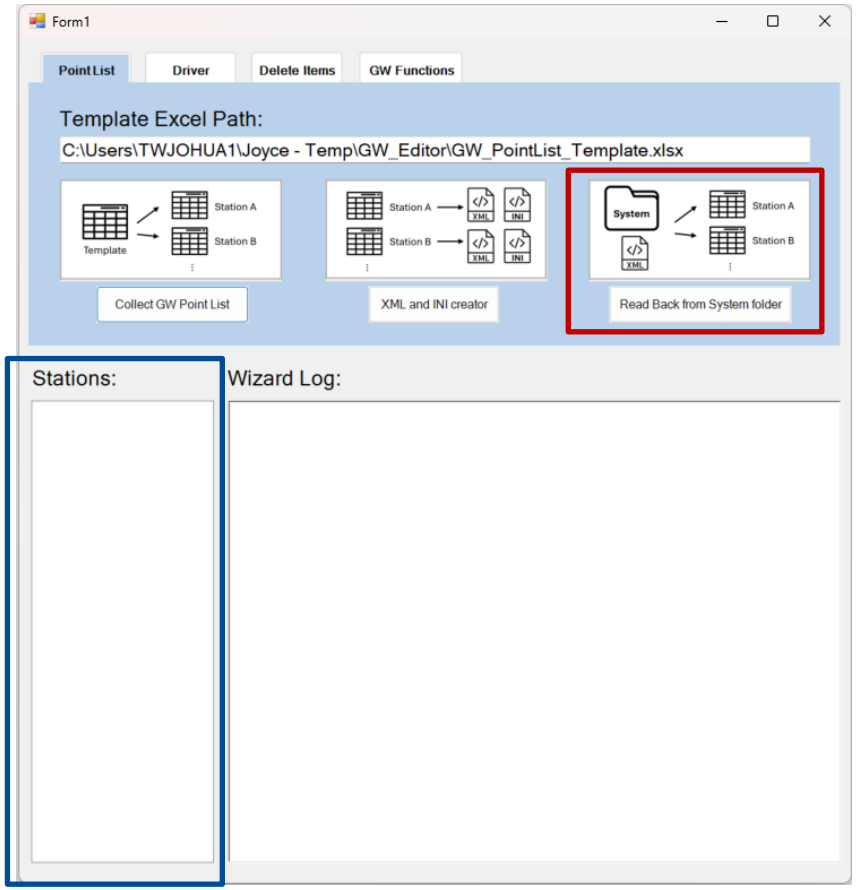




1. Two operations can be selected
2. Update All:
   - Create XML and INI for each station, according to excel files content for each station
   - XML and INI files are saved in the same folder of excel files
   - Folder path: [TemplatePath] // GW_PointList //
3. Update Database
   - Select station from “Stations List Box”
   - Only modify the database part of XML (XML must already be created in GW_PointList folder)
   - Does not affect connection setting for the stations

Gateway Editor Wizard

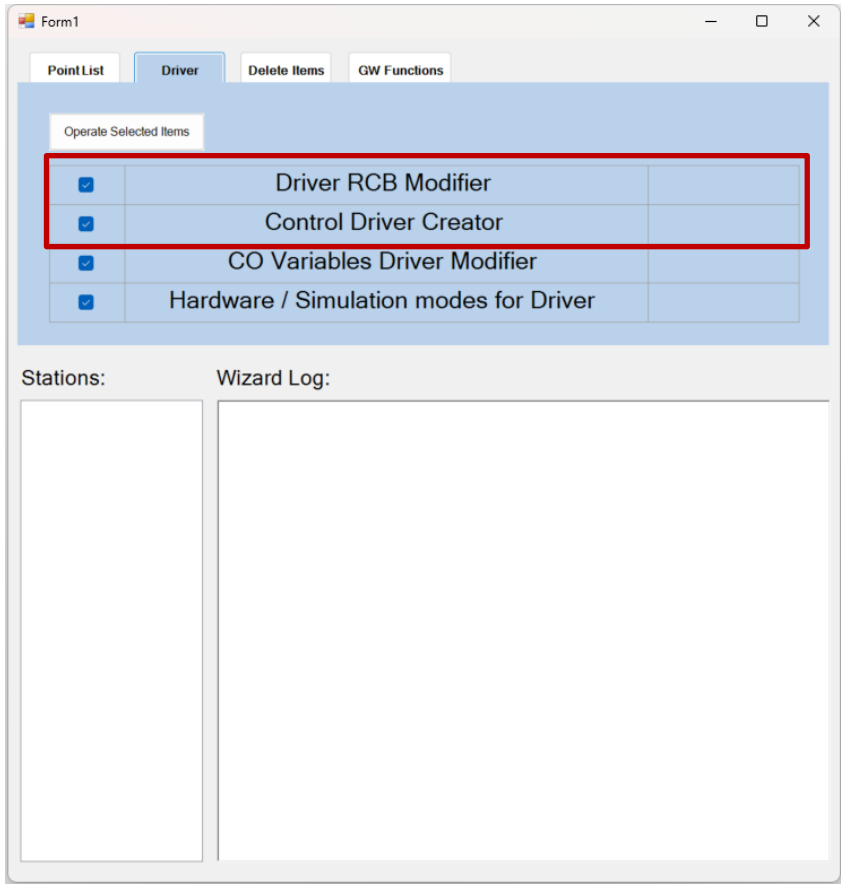
Page 1: Point List / Section 3: Read Back from System Folder



1. When operating Process Gateway in Runtime, created XML and INI files must be put in C:\ProgramData\ABB\System folder
2. After operating Process Gateway, the XML file in System folder may be changed
3. This operation can read back variable setting from XML in System folder to the excel files for each station
4. Connection setting cannot be read back
5. Stations to read back must be selected in the station list box

Gateway Editor Wizard

Page 2: Driver

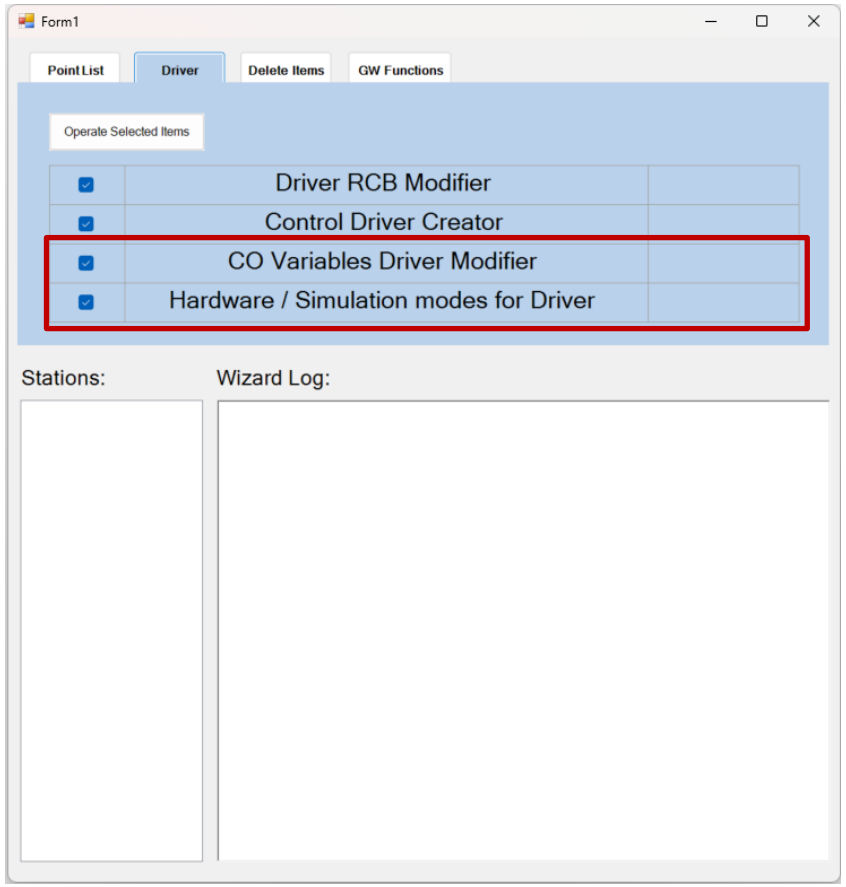


1. Driver RCB Modifier
   - This operation changes the RCB setting in all drivers
     - Client1 to Client3
     - Client2 to Client4
     - RCB 01 to RCB 03
     - RCB 02 to RCB 04
   - Set property: Stopped on Standby-Server

2. Control Driver Modifier
   - This operation creates separated driver for CO for all drivers
   - Remove all RCB setting in new CO drivers
   - Set property: Stopped on Standby-Server

Gateway Editor Wizard

Page 2: Driver

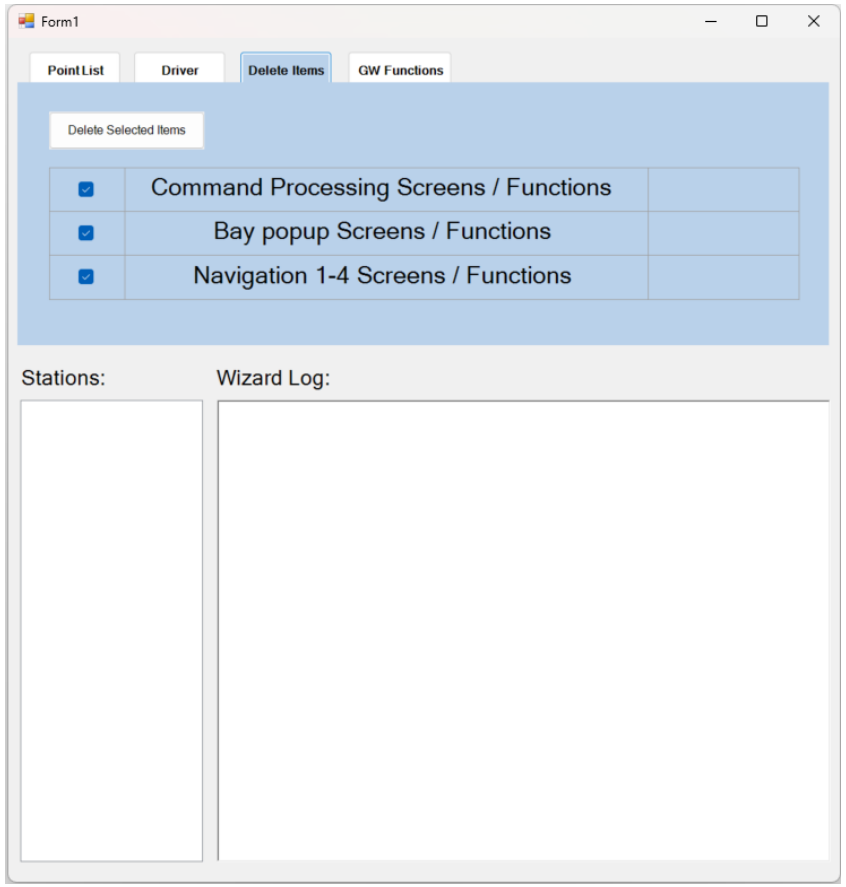


3. CO Variables Driver Modifier
   - Change all Control variables to new CO driver

4. Hardware / Simulation modes for Driver
   - Create variables for showing driver mode
     - Variable name: [TechnicalKey]_DriverMode (Offset 5)
   - Create functions for switching driver mode
     - Function name for hardware mode: [TechnicalKey]_DriverMode_H
     - Function name for simulation mode: [TechnicalKey]_DriverMode_S
   - Create scripts for functions
     - Script for hardware mode: DriverMode_H
     - Script for simulation mode: DriverMode_S

Gateway Editor Wizard

Page 3: Delete Items



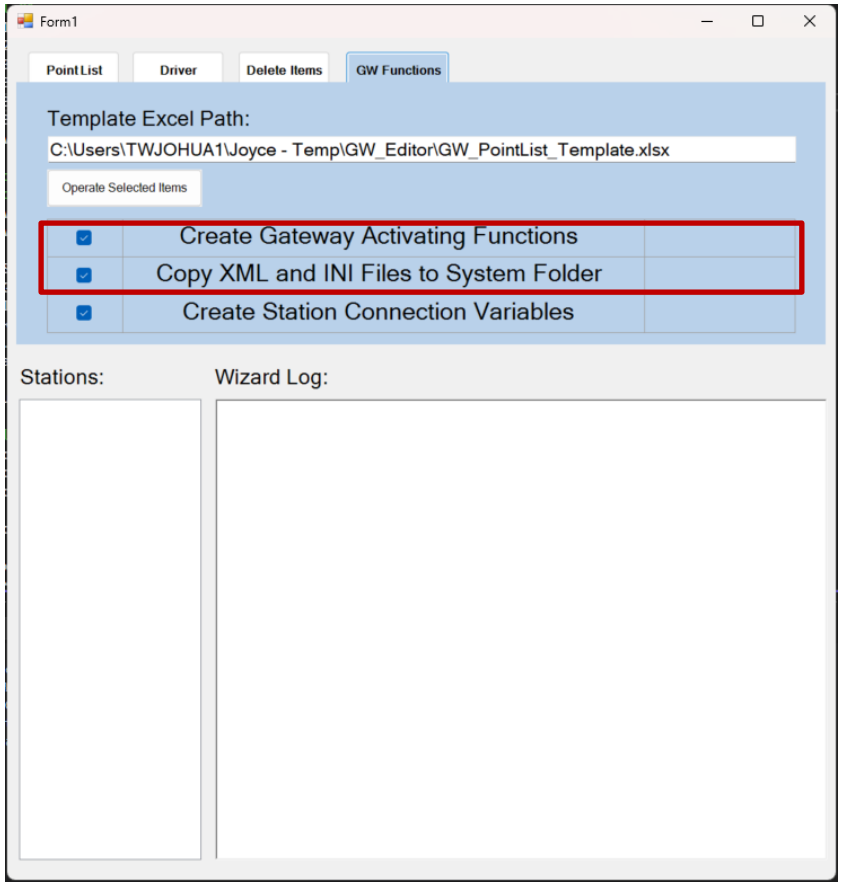
1. Command Processing Screens / Functions
   - Delete all screens with CommandProcessing Screen type
   - Delete all screens contain name “Command Processing”
   - Delete all ScreenSwitch function for CommandProcessing screen
   - Delete all Screen contain name “CP” and “On” or “Off”

2. Bay popup Screens / Functions
   - Delete all screens contain name “Bay popup”
   - Delete all functions contain name “Bay popup”

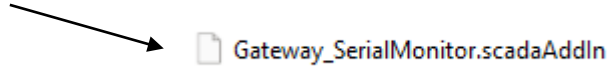
3. Navigation 1-4 Screens / Functions
   - Delete navigation 1-4 screens
   - Delete functions for navigation 1-4 screens

Gateway Editor Wizard

Page 4: GW Functions



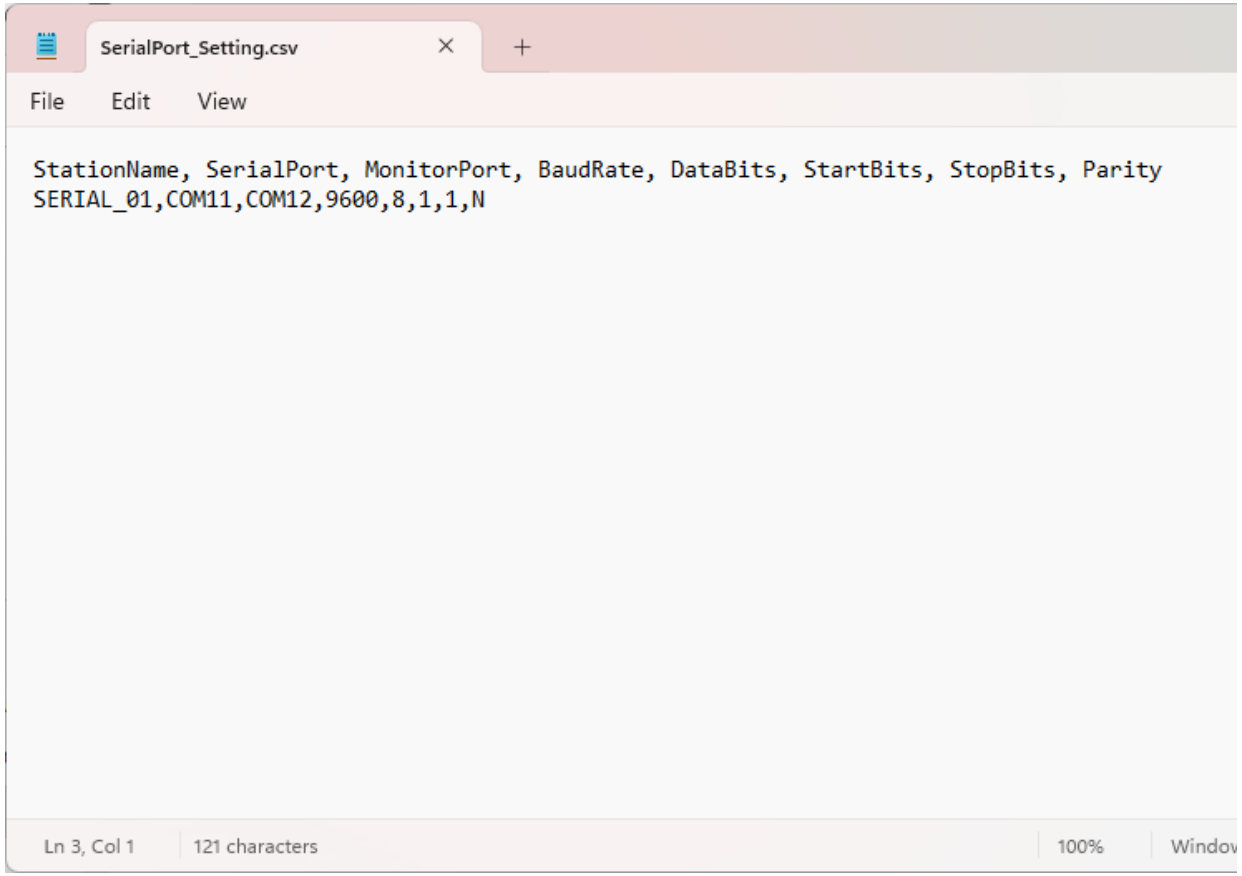
1. Create Gateway Activating Functions
   - Create functions for starting Process Gateway Program
   - Assign station parameter to each function
   - Collect Serial Port setting from template excel, and create new file as: C:\ProgramData\ABB\System\SerialPort_Setting.csv
     - Monitor port number can be changed in this file in site computer
     - Make sure the port setting in this file (ex: parity/data bits) is same as Process Gateway setting
     - This file works with Serial Port Monitoring Add-in



2. Copy XML and INI files to System Folder
   - Copy XML and INI files from [TemplatePath] // GW_PointList // to C://ProgramData//ABB//System
   - This operation replaces the existing files in System folder

SerialPort_Setting.csv

Setting file for serial port monitor

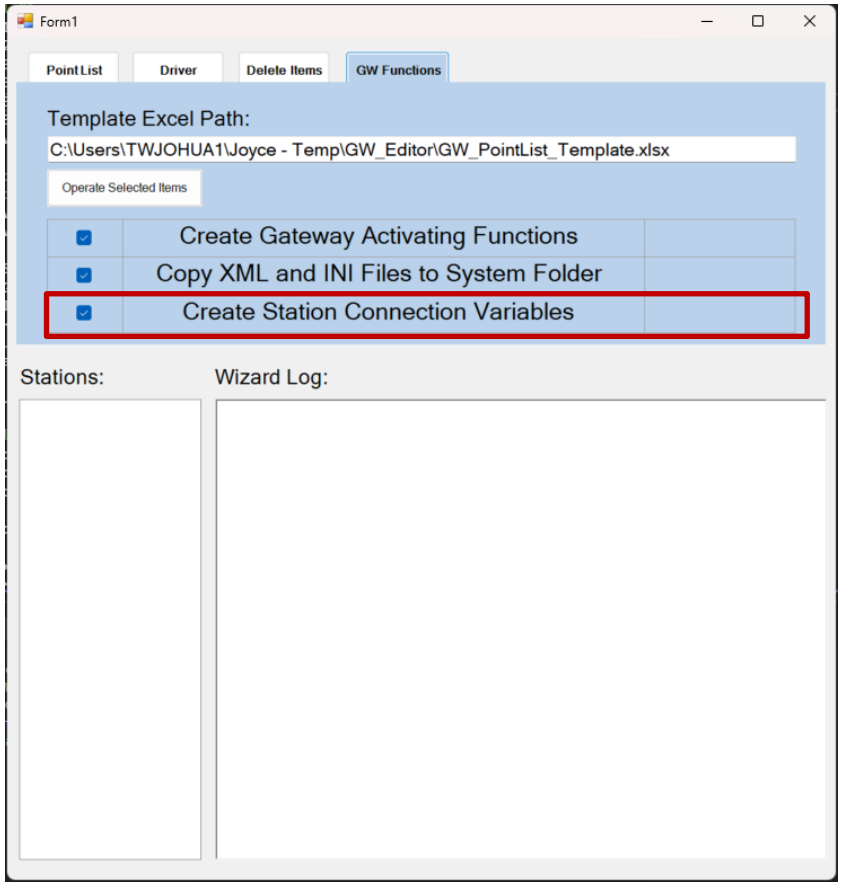


- Monitor Port number can be changed here, but serial port number needs to be changed in Process Gateway
- Baud rate, data bits, start bits, stop bits, parity must be the same as Process Gateway setting

- All serial port must be divided into 2 ports by TCP COM bridge for monitoring!

Gateway Editor Wizard

Page 4: GW Functions



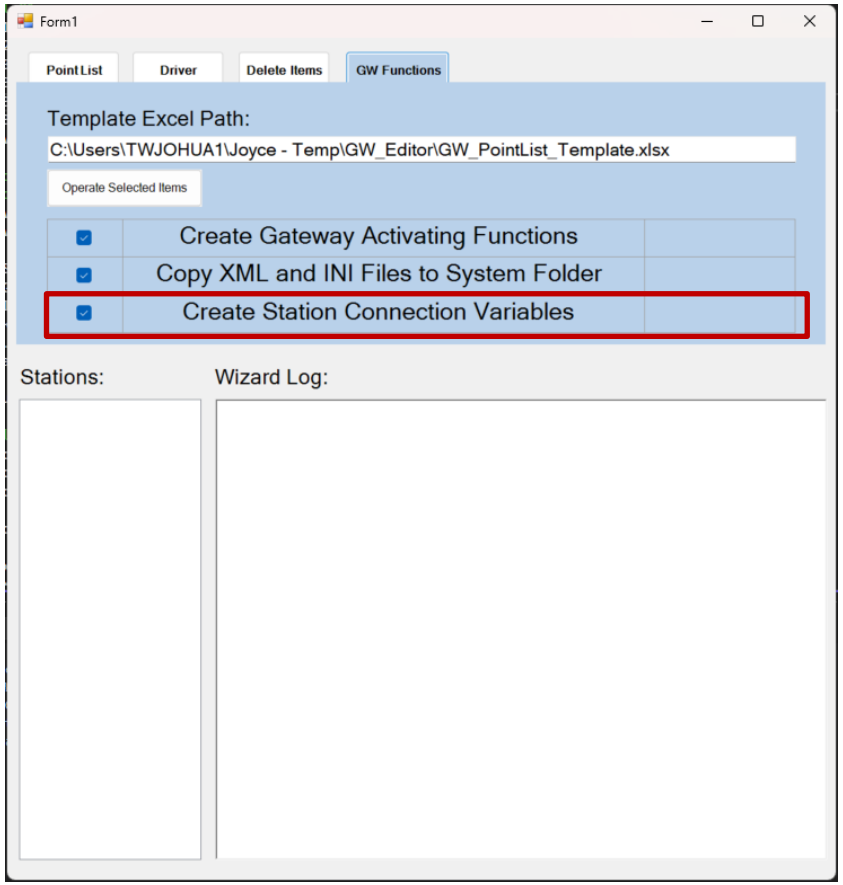
3. Create Station Connection Variables
    1. Create variables for Serial connection status
        - Ex: GW_[StationName]_Serial_Status
    2. Create variables for TCP/IP connection status
        - Ex: GW_[StationName]_TCP_Status
    3. Create xml file for SCADA LOGIC
        - Saving path: [TemplatePath] // GW_PointList // DNP_Connection_Logic.xml
        - This XML must be imported to SCADA LOGIC
        - After making sure all of the variables in LOGIC are created, and successfully built, add the Serial Port Monitoring Add-in to project. (Maximum 10 Serial Port connection)

          Gateway_SerialMonitor.scadaAddIn

        - This connection status of stations will show as following bool variables:
            - GW_[StationName]_Serial_Status
            - GW_[StationName]_TCP_Status

Gateway Editor Wizard

Page 4: GW Functions



4. Create Process Gateway Program Status related items
   - This part use internal variable [StationName]_AccessDNP3_SG_status to detect Process Gateway Program status, and return to variable GW_[StationName]_ProgramStatus
   - The integer and status relation is shown as the table in next page

   - Variable for detecting status: [StationName]_AccessDNP3_SG_status
   - Variable for showing status: GW_[StationName]_ProgramStatus
   - Function for setting alarm state: GW_[StationName]_AlarmStatus
   - Function for setting normal state: GW_[StationName]_NormalStatus
   - Reaction matrix for converting status: GW_[StationName]_StatusRM

Gateway Editor Wizard

Page 4: GW Functions

Process status

In Service Engine, the current process status is displayed with a variable. To do this, configure a numeric variable of the internal driver.

Nomenclature of the variable

The name of the variable of the current process status must be configured as follows:

[Name of the configuration file for the Process Gateway]_[DLL name of the Process Gateway]__status

Example: zenProcGateway_AccessDNP3_SG_status

If the name has been configured correctly, the value of the respective status of the variable is written:

Variable value	Option	Description
0	Unknown	Gateway not started
1	Starting	Gateway is being started (initializing, establishing communication)
2	Running 1	Gateway is running - status alternates with Running 2 (every 5 seconds)
3	Running 2	Gateway is running - status alternates with Running 1 (every 5 seconds)
4	Restarting	Gateway is being restarted
5	Shutting down	Gateway has been closed

Note: In normal, trouble-free operation of the Process Gateway, the status alternates cyclically every 5 seconds between Runing 1 and Running 2. This enables watchdog monitoring in Service Engine. (Reaction matrix with delayed limit value status. If the value remains at 2 or 3 for longer than 7 seconds, the Process Gateway will no longer be executed correctly and an alarm, for instance, can be generated.

If necessary, the displayed process status can also be communicated back to the master via the DNP3 outstation. To do this, configure the internal variable in the outstation.

DNP_Connection_Logic.xml

TCP/IP Connection Setting

- In default setting for TCP connection, the program will detect the status every second, and after 5 seconds without valid connection, the Status variable will return as FALSE
- The above 1 second and 5 seconds setting can be changed manually in LOGIC

```
// TCP
Inst_PLS( True, t#1s );
Q := Inst_PLS.Q;

if (Q = true) then
    // AD_01
    GW_AD_01_TCP_Update := AD_01_AccessDNP3_SG_master0_DL_FramesReceived - GW_AD_01_TCP_Temp;

    if ( GW_AD_01_TCP_Update <> 0) then
        GW_AD_01_TCP_Cnt := 0;
        GW_AD_01_TCP_Status := true;
    end_if;

    if (GW_AD_01_TCP_Update = 0) then
        GW_AD_01_TCP_Cnt := GW_AD_01_TCP_Cnt + 1;
    end_if;

    if (GW_AD_01_TCP_Cnt > 5) then
        GW_AD_01_TCP_Status := false;
    end_if;

    GW_AD_01_TCP_Temp := AD_01_AccessDNP3_SG_master0_DL_FramesReceived;

    // DD_02
    GW_DD_02_TCP_Update := DD_02_AccessDNP3_SG_master0_DL_FramesReceived - GW_DD_02_TCP_Temp;

    if ( GW_DD_02_TCP_Update <> 0) then
        GW_DD_02_TCP_Cnt := 0;
        GW_DD_02_TCP_Status := true;
    end_if;

    if (GW_DD_02_TCP_Update = 0) then
        GW_DD_02_TCP_Cnt := GW_DD_02_TCP_Cnt + 1;
    end_if;

    if (GW_DD_02_TCP_Cnt > 5) then
        GW_DD_02_TCP_Status := false;
    end_if;

    GW_DD_02_TCP_Temp := DD_02_AccessDNP3_SG_master0_DL_FramesReceived;

end_if;
```

DNP_Connection_Logic.xml

Serial connection setting

- In default setting for Serial connection, the program will update the connection status every 5 seconds, when valid
- If the latest update time is longer than 5 seconds, the status variable will return as FALSE
- The update duration setting can be changed in LOGIC (must be <= 5 seconds)
- This program works with Serial Port Monitoring Add-in and SerialPort_Setting.csv

Gateway_SerialMonitor.scadaAddIn

SerialPort_Setting.csv

File Edit View

```
StationName, SerialPort, MonitorPort, BaudRate, DataBits, StartBits, StopBits, Parity
SERIAL_01,COM11,COM12,9600,8,1,1,N
```

```
// Serial
Inst_PLS1( True, t#5s );
Q1 := Inst_PLS1.Q;

if (Q1 = true) then
    GW_Timer := true;
end_if;

if (Q1 = false) then
    GW_Timer := false;
end_if;
```

All items created

	Variable	Function	Others
Page 1 – Section 1	variables in template excel file		File: excel files for each station
Page 1 – Section 2			File: xml and ini files for each station
Page 2 – Section 2			Driver: [DriverName]_CO
Page 2 – Section 3	Recreate control variables		
Page 2 – Section 4	[TechnicalKey]_DriverMode	[TechnicalKey]_DriverMode_H	Script: DriverMode_H
		[TechnicalKey]_DriverMode_S	Script: DriverMode_S
Page 4 – Section 1		GW_[StationName]	SerialPort_Setting.csv
Page 4 – Section 3	GW_Timer	GW_[StationName]_NormalStatus	Reaction Matrix: GW_[StationName]_StatusRM
	GW_[StationName]_Serial_Update	GW_[StationName]_AlarmStatus	DNP_Connection_Logic.xml
	GW_[StationName]_Serial_Status		
	[StationName]_AccessDNP3_SG_master0_DL_FramesReceived		
	GW_[StationName]_TCP_Update		
	GW_[StationName]_TCP_Status		
	GW_[StationName]_TCP_Temp		
	GW_[StationName]_TCP_Cnt		
	[StationName]_AccessDNP3_SG_status		
	GW_[StationName]_ProgramStatus		


ABB