Your Global Automation Partner

How To Configure Block IO stations using Catalog Files

Configure Turck block IO with Allen Bradley PLC

555T00010 v1.0 3/20/17

Contents

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Overview

The configuration of the TURCK block IO stations with Allen Bradley PLC's may be done in two ways:
- The device EDS files or
- The Generic Ethernet Module profiles.

The EDS files are available for download from the TURCK web site. They are installed using Rockwell Software EDS installation tool.
The Generic Ethernet Module profile enables configuration of any device using simple method as it shown on Figure 1, for example. The configuration page contains information about assembly instance and data size of the input data, output data and configuration data. BLCEN-6M12LT-2RFID-S-8XSG-P configuration page for example, looks as follows:

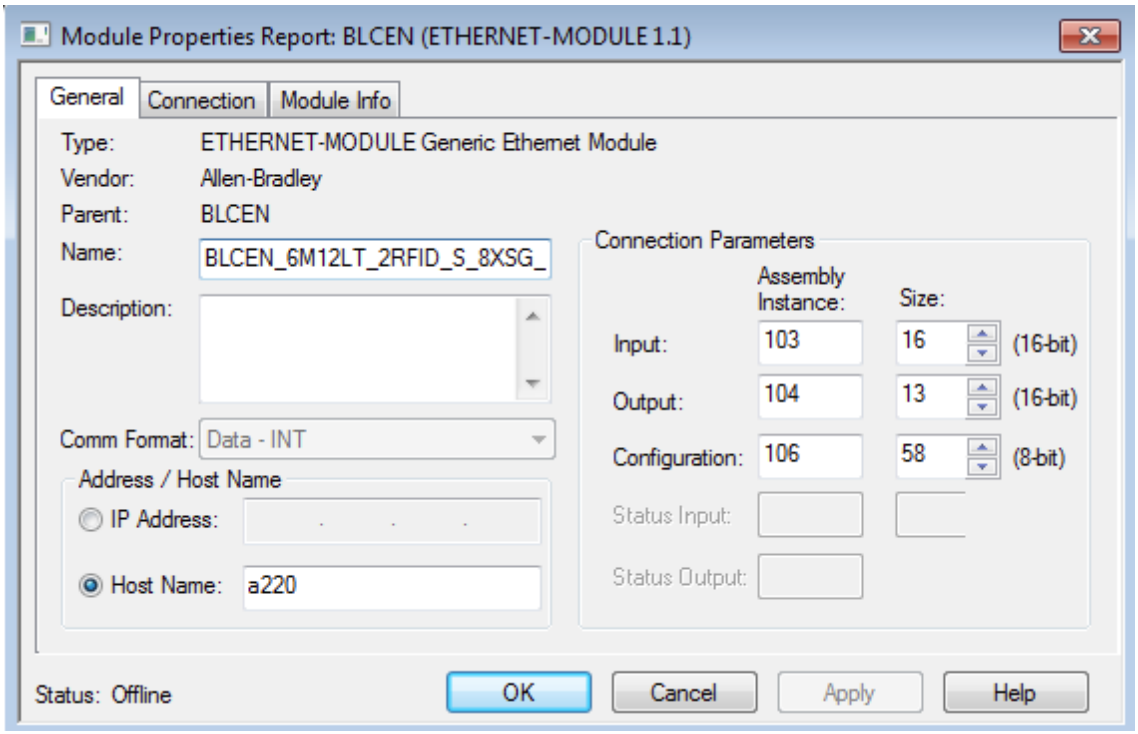


Figure 1: Generic Ethernet Module configuration page

The Generic Ethernet module profiles of the all TURCK block IO devices, i.e. device configurations, are entered into the RSLogix5000 project which is called "TURCK_BLOCK_IO_STATIONS" Catalog file (the Catalog file).The catalog file may be expanded with the future device additions.

Devices from the Catalog file are copied into user's main project as described in this document. This procedure is identical for any device. There are two configuration examples: one for discrete an IO station and another analog IO station.

Catalog file content

The Catalog file contains configurations of the following stations:

TBEN-Lx
- TBEN-L4-16DIP, TBEN-L4-16DOP, TBEN-L4-16DXP, TBEN-L4-8DIP-8DOP
- TBEN-L4-16DIN, TBEN-L4-16DON, TBEN-L4-16DXN, TBEN-L4-8DIN-8DON
- TBEN-L5-16DIP, TBEN-L5-16DOP, TBEN-L5-16DXP, TBEN-L5-8DIP-8DOP
- TBEN-LG-16DIP, TBEN-LG-16DOP, TBEN-LG-16DXP, TBEN-LG-8DIP-8DOP

TBEN-Sx
- TBEN-S1-8DIP, TBEN-S1-8DIP-D, TBEN-S1-8DOP, TBEN-S1-8DXP, TBEN-S1-4DIP-4DOP
- TBEN-S2-4AI, TBEN-S2-4AO, TBEN-S2-2COM-4DXP

FEN20
- FEN20-4DIP-4DXP, FEN20-16DXP

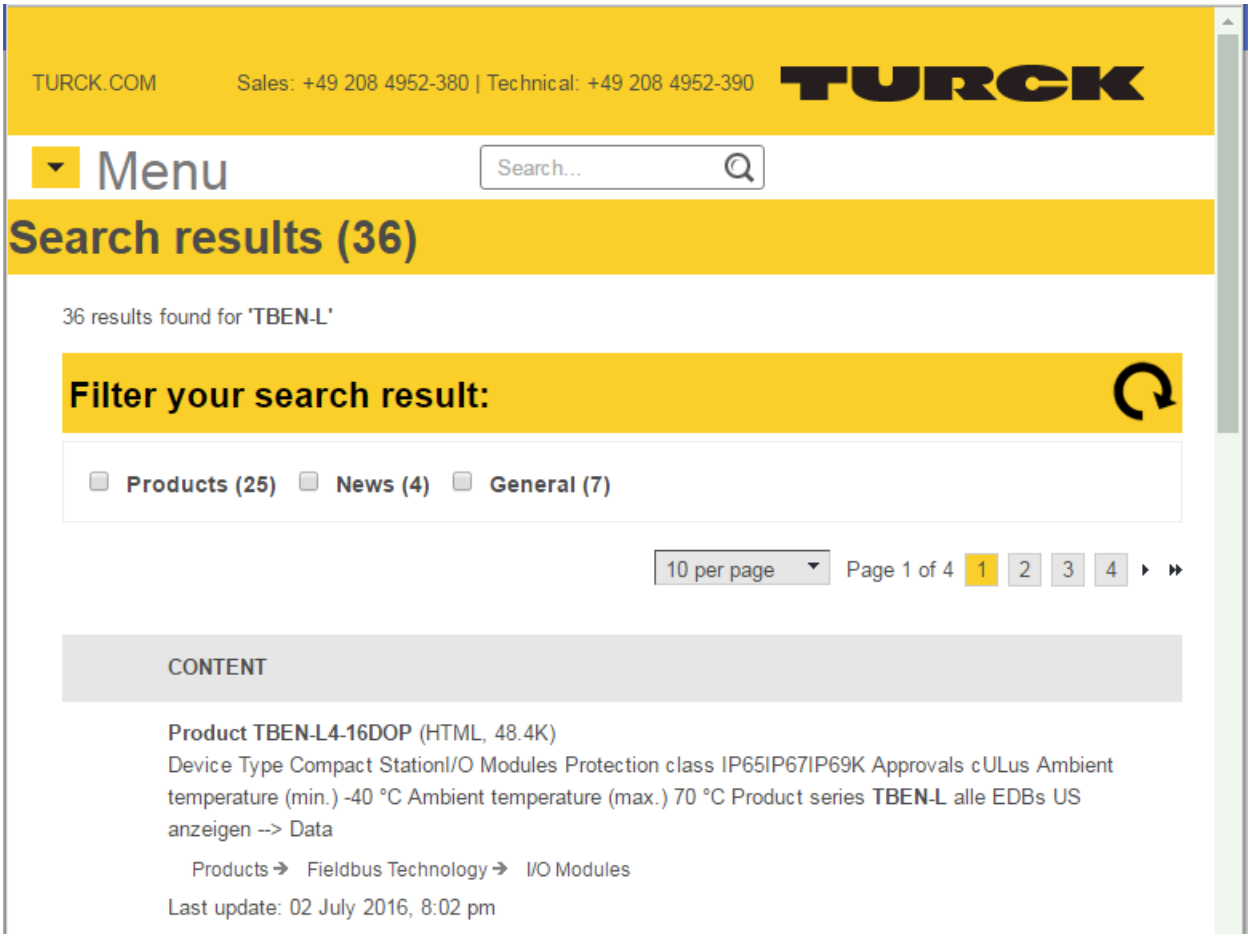
BLCEN
- All BLCEN multiprotocol devices

FGEN and FXEN
- FGEN-IM16-4001, FGEN-OM16-4001, FGEN-IOM88-4001, FGEN-16DXP-4001
- FGEN-IM16-5001, FGEN-OM16-5001, FGEN-IOM88-5001, FGEN-16DXP-5001
- FXEN-IM16-0001-IP/CS30007, FXEN-OM16-0001-IP/CS30007, FXEN-XSG16-0001-IP/CS30007
- FXEN-IOM88-0001-IP/CS30007

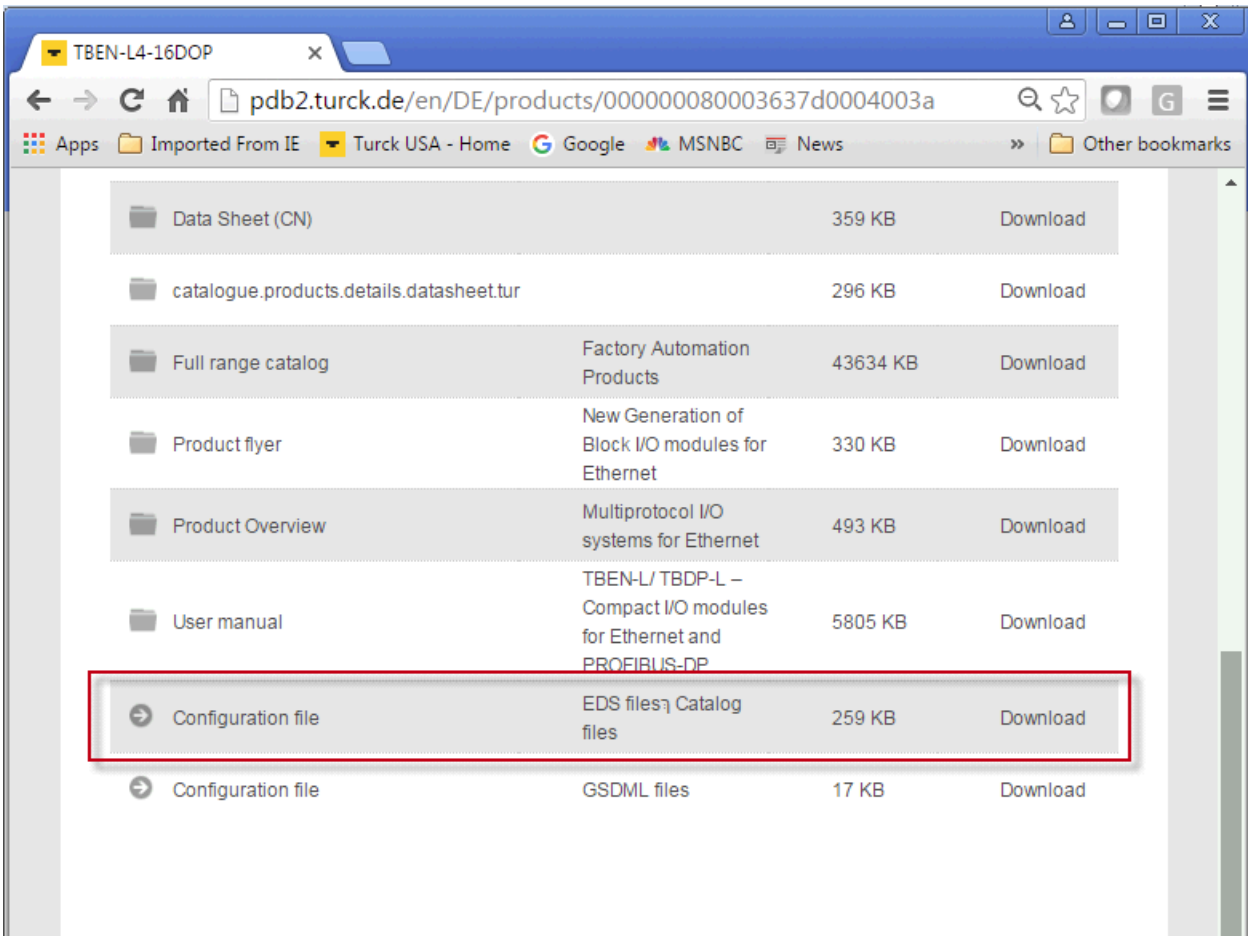
Discrete IO Station Configuration

1. Download the Catalog file: Enter TBEN-L in search field of the TURCK home page:

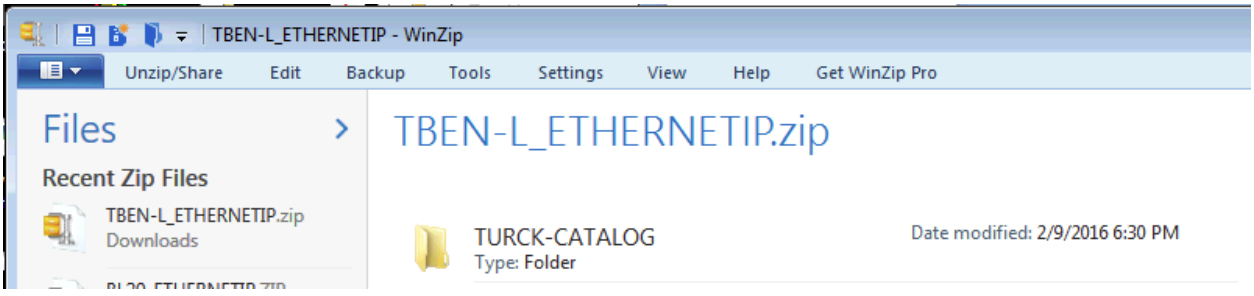
2. Click on any TBEN-Lx link



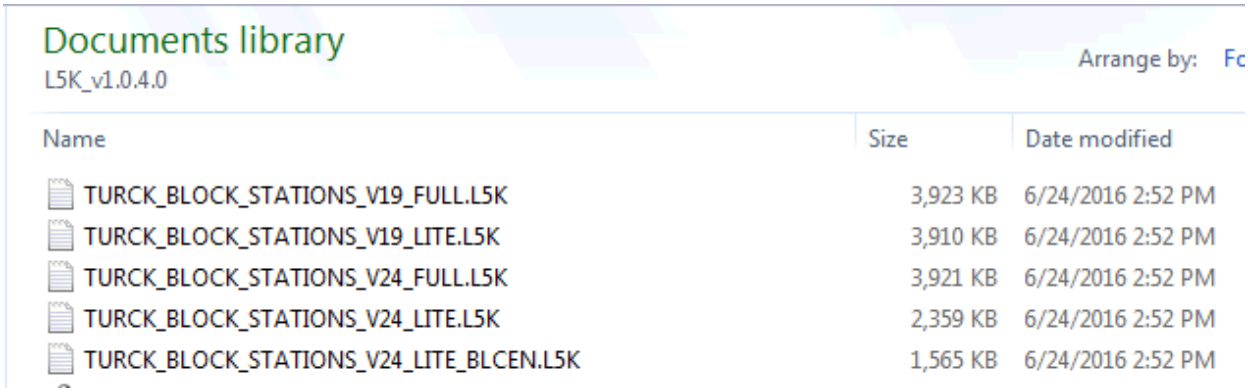
3. Download “Configuration file” which contains EDS files and Catalog files



4. Unzip configuration file into any folder of your choice and open TURCK-CATALOG folder



5. “TURCK-CATALOG” folder contains “TURCK_BLOCK_STATIONS_xxx.L5K” files.

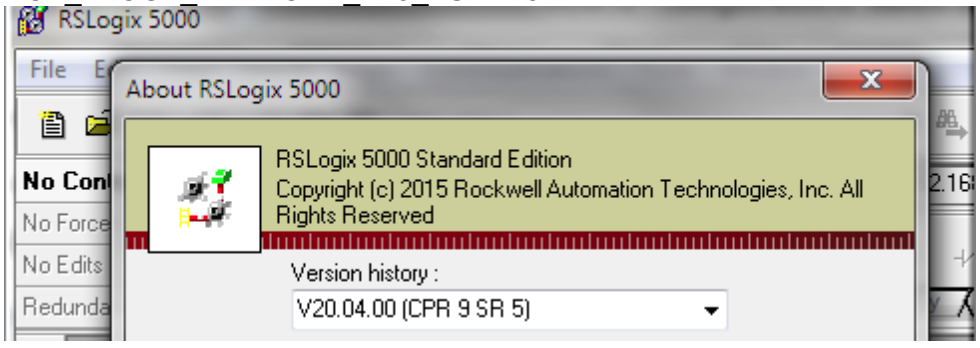


These files are RSLogix5000 / Studio 5000 project files utilizing text data format (file type “L5K”) and have to be converted into “ACD” data format.
Different files are created for users that may have different revisions of RSLogix5000 or Studio5000 programming software. For example RSLogix5000 Lite or Mini versions run CompactLogix PLCs only. If you have RSLogix5000 / Studio5000 full edition, you may use any catalog file.
Following matrix shows how to use catalog file, based on a revision of RSLogix/Studio 5000:

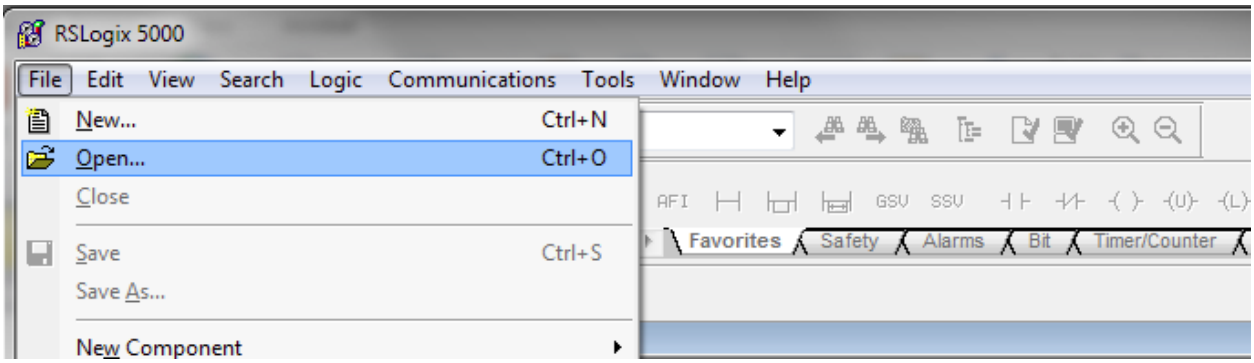
	RSLogix5000 Enterprise Edition (revision 19 and 20)	
	Professional, Full, Standard Editions	Lite, Mini and Service Edition
BLOCK IO	TURCK_BLOCK_STATIONS_V19_FULL.L5K	TURCK_BLOCK_STATIONS_V19_LITE.L5K
BL20	BL20_Catalog_file_V19_2014_8_10.L5K	BL20_Catalog_file_V20_2014_08_27_LITE.L5K
BL67	BL67_Catalog_file_V19_2014_12_08.L5K	BL67_Catalog_file_V20_2014_12_08_LITE.L5K
	Studio5000 / Logix Designer (revisions 24 and above)	
	Professional, Full, Standard Editions	Lite, Mini and Service Edition
BLOCK IO	TURCK_BLOCK_STATIONS_V24_FULL.L5K	TURCK_BLOCK_STATIONS_V24_LITE.L5K
		TURCK_BLOCK_STATIONS_V24_LITE_BLCEN.L5K
BL20	BL20_Catalog_file_v24_2015_07_01.L5K	BL20_Catalog_file_v24_2015_07_01_LITE.L5K
BL67	BL67_Catalog_file_v24_2015_07_01.L5K	BL67_Catalog_file_v24_2015_07_01_LITE.L5K

Example:

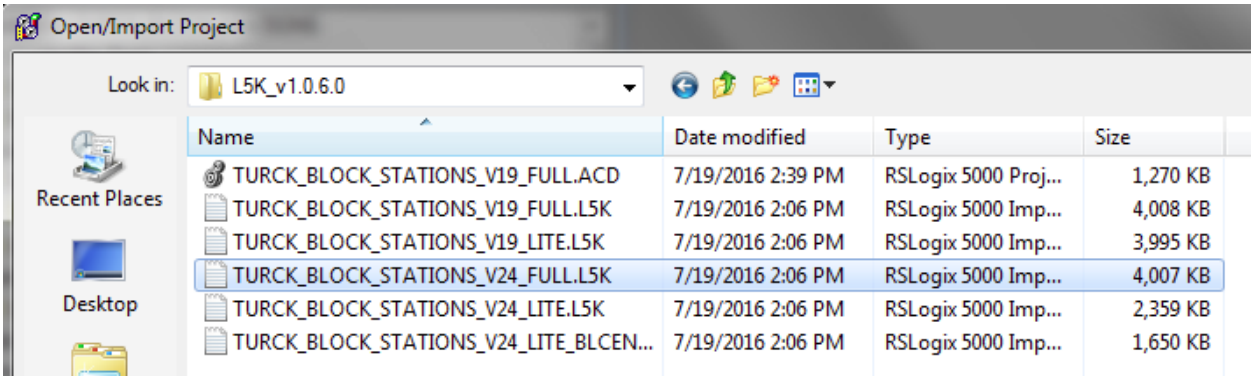
- If you have RSLogix5000 rev 20 Full edition, use TURCK_BLOCK_STATIONS_V19_FULL.L5K” file



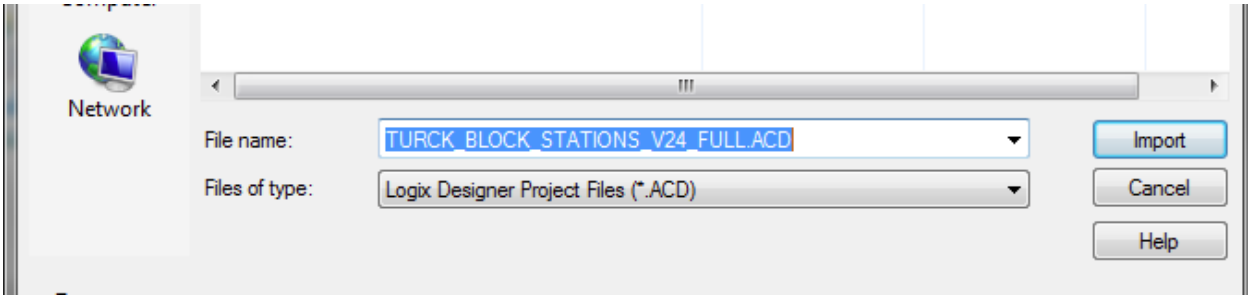
6. Import “L5K” file into RSLogix and save it as “ACD” file
   - *Start RSLogix5000 click “File” select “Open”*



Go to folder where L5K files are saved
- Highlight file to import
- Click “Open”

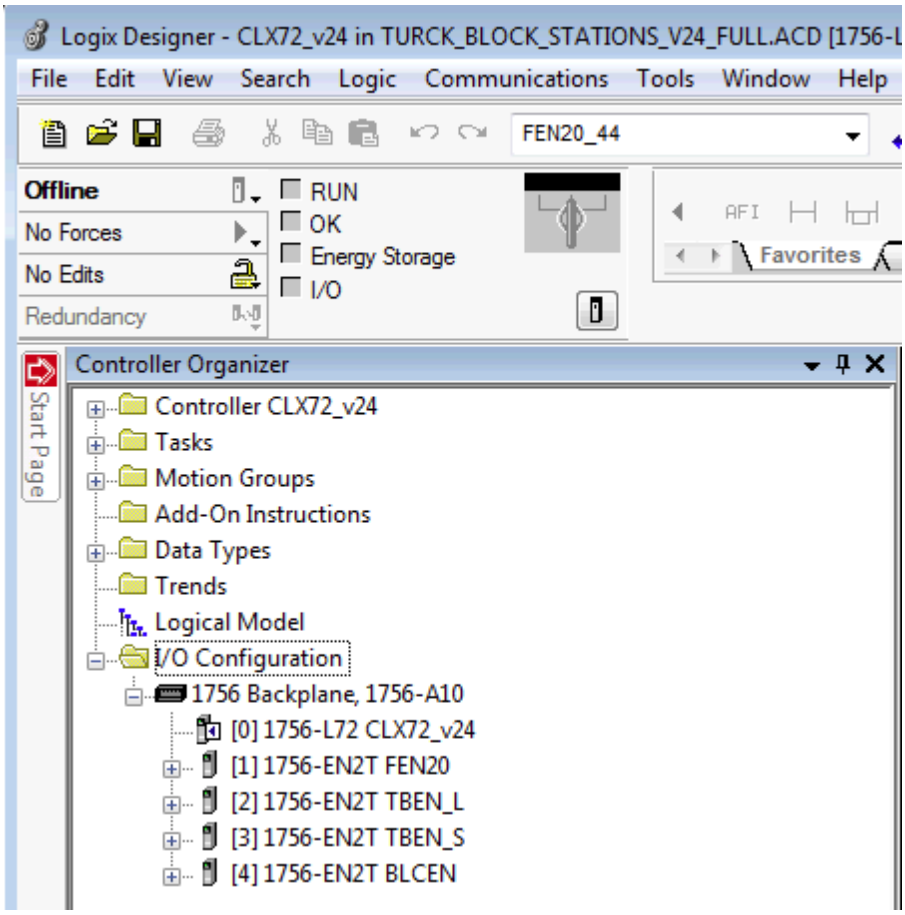


- Select directory to save file (may use the same directory where L5K files are located)
- Click “Import”

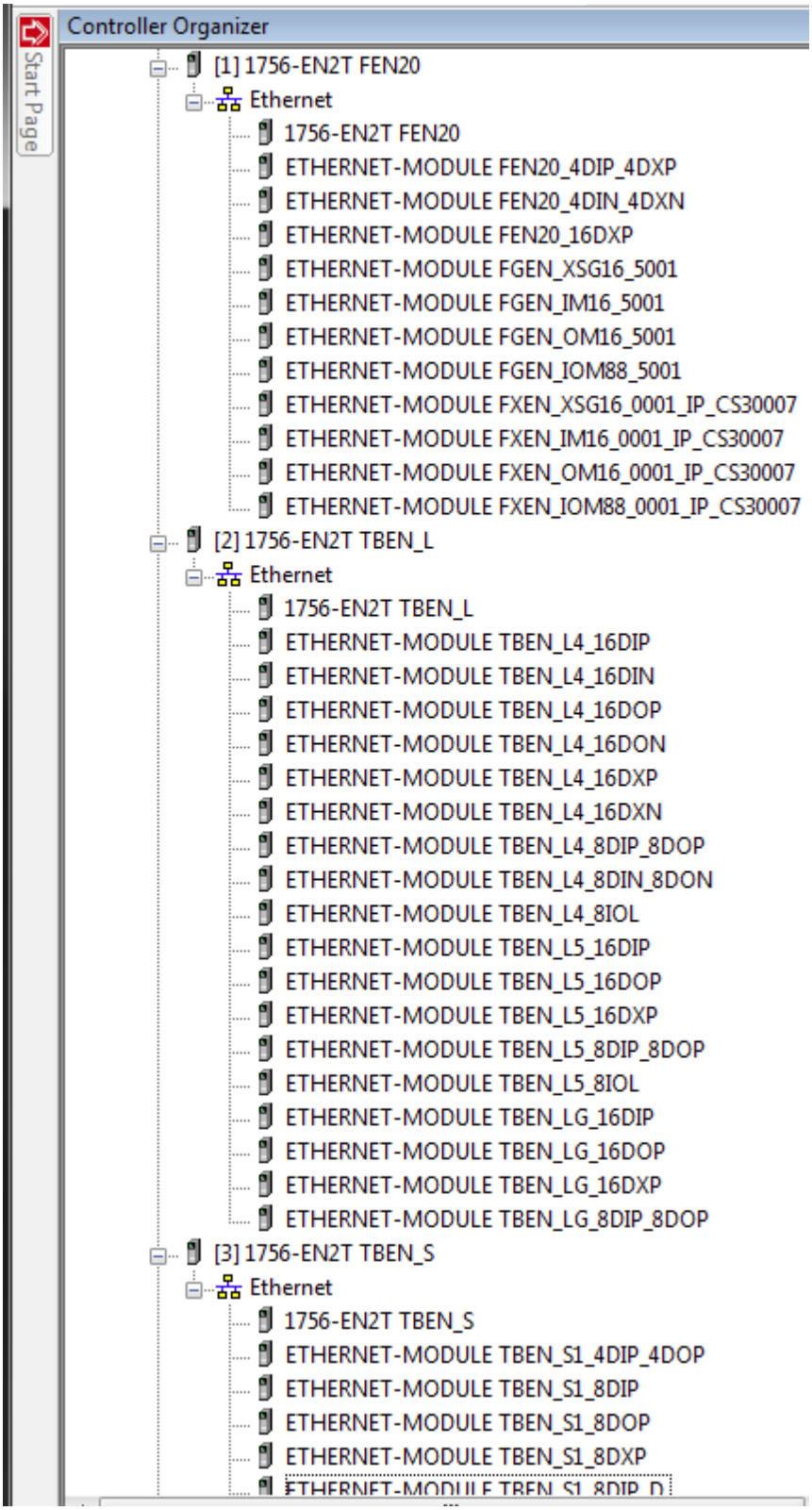


- Follow dialog to save it as “ACD” file.

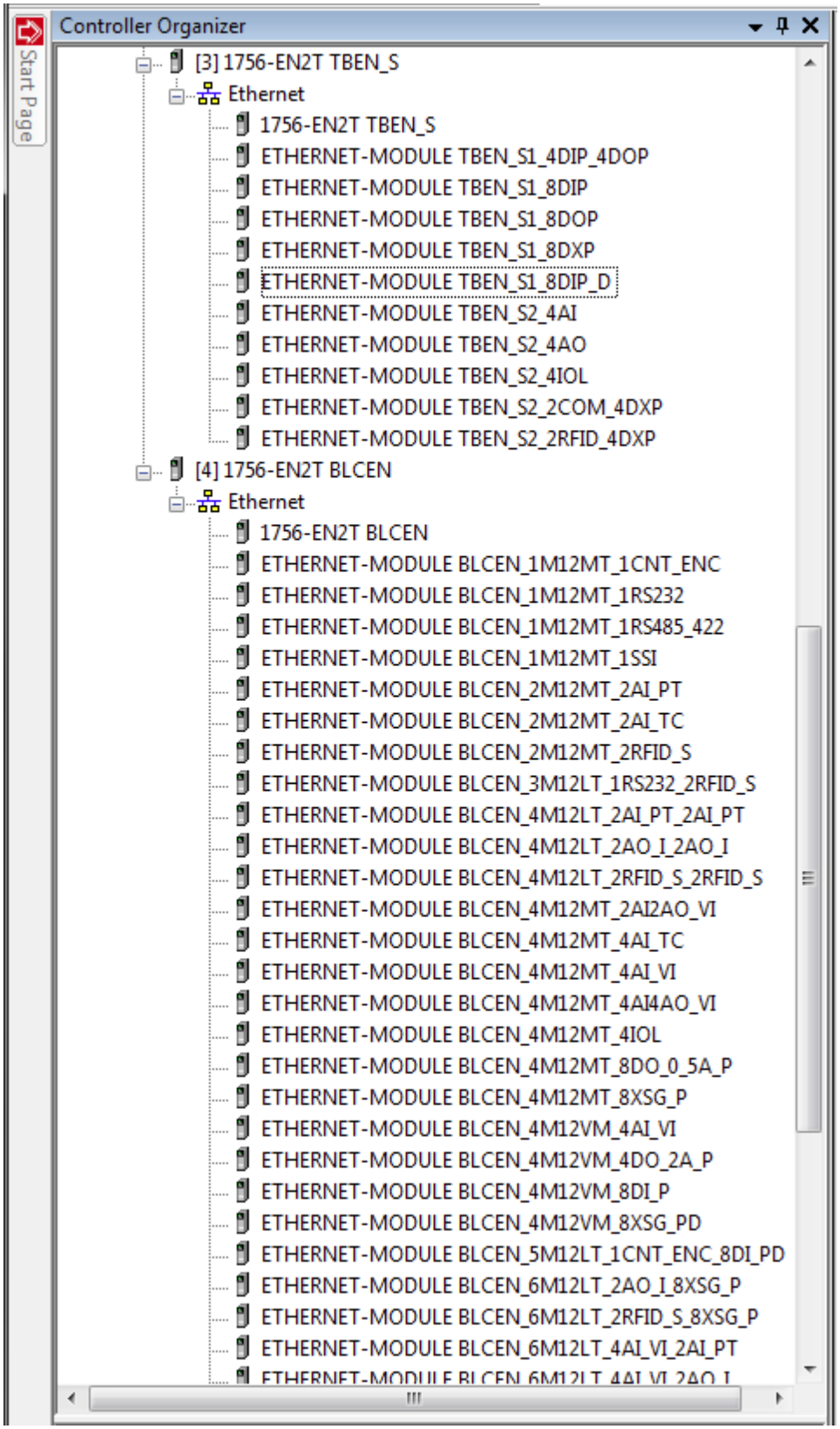
The catalog file “TURCK_BLOCK_STATIONS_V24_FULL.ACD” is the RSLogix project which contains multiple 1756-EN2T bridges.



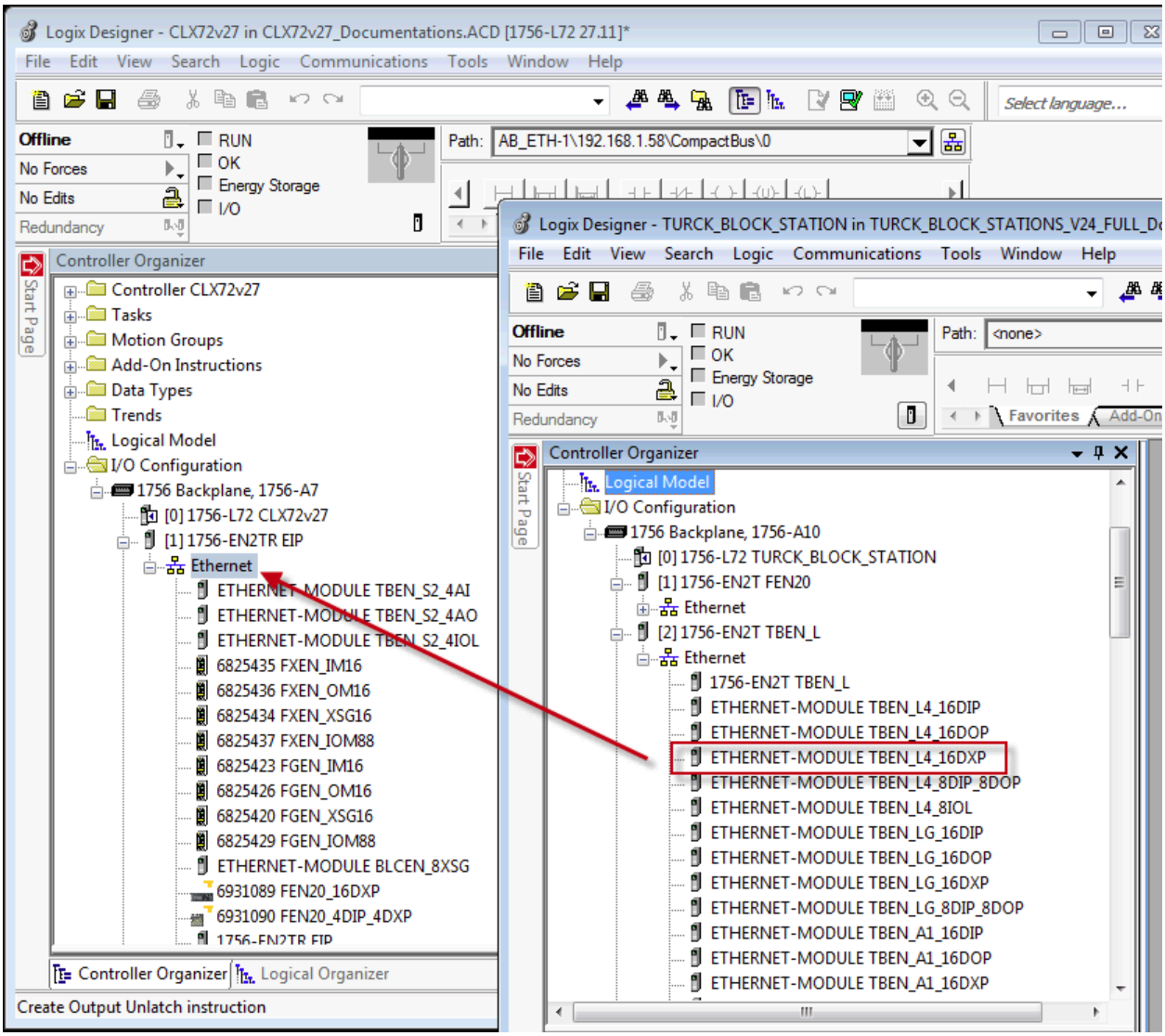
Click on “+” to expand the content of the bridge:



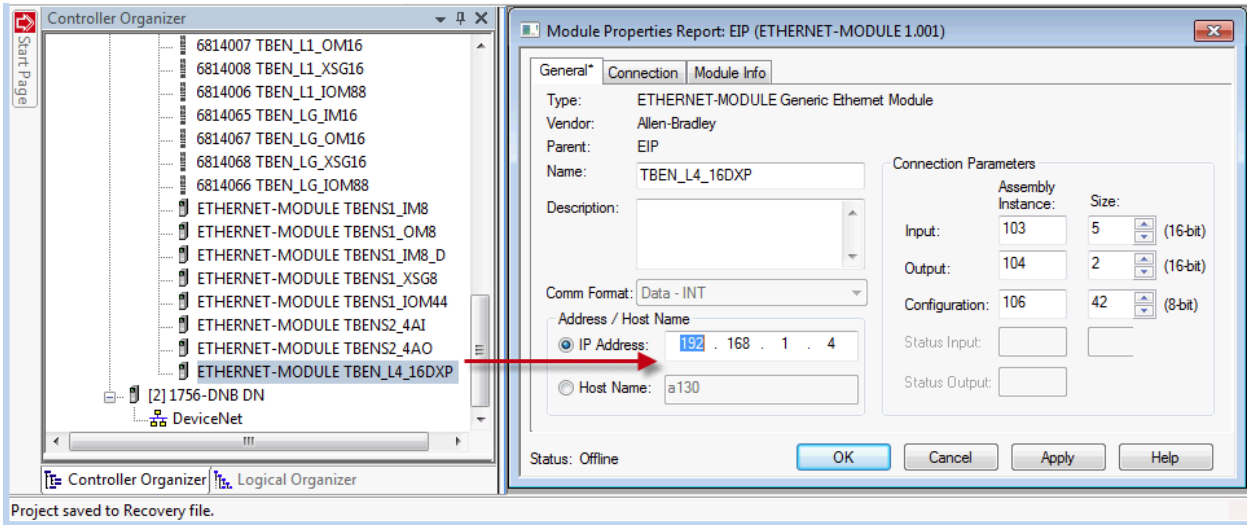
Examples of TBEN-Sx and BLCEN's configurations:



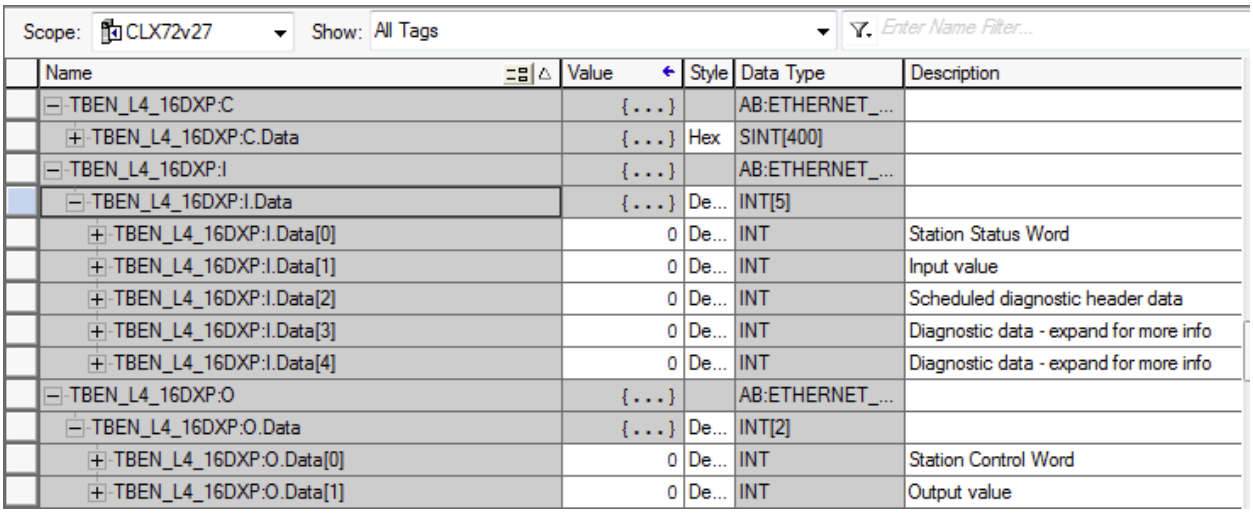
7. Copy TBEN-L4-16DXP configuration into your project:
   - Open both your online project and the “TURCK_BLOCK_STATIONS_V24_FULL.ACD” catalog file in separate windows
   - Expand the “1756-EN2T TBEN_L” bridge in the catalog file
   - Drag the “TBEN-L4-16DXP” from the catalog file and drop it into your project, into Ethernet
   - Close the catalog file



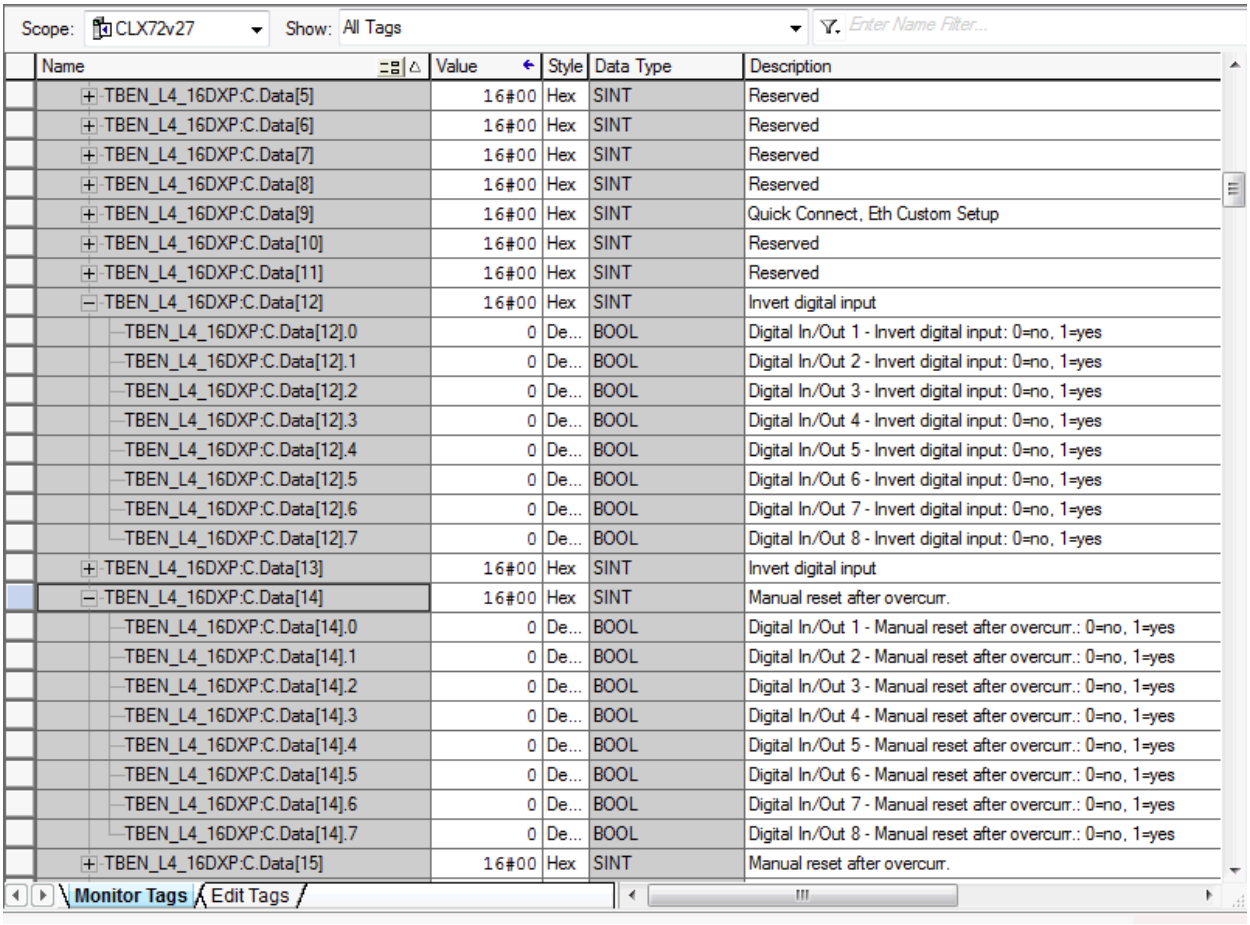
8. Assign IP address to the station
   - Right-click on TBEN-L4-16DXP and open device properties
   - Assign device name; it can be changed to fit your project needs
   - Assign IP address
   - Click “Apply” and “OK”



   - The controller creates the configuration tag, input tag and output tag.



9. Use Configuration tag to setup IO properties
   − Expand the configuration tag to set IO configuration parameters (parameterization) to desired values.



Scope: CLX72v27 Show: All Tags Enter Name Filter...

Name	Value	Style	Data Type	Description
TBEN_L4_16DXP:C.Data[5]	16#00	Hex	SINT	Reserved
TBEN_L4_16DXP:C.Data[6]	16#00	Hex	SINT	Reserved
TBEN_L4_16DXP:C.Data[7]	16#00	Hex	SINT	Reserved
TBEN_L4_16DXP:C.Data[8]	16#00	Hex	SINT	Reserved
TBEN_L4_16DXP:C.Data[9]	16#00	Hex	SINT	Quick Connect, Eth Custom Setup
TBEN_L4_16DXP:C.Data[10]	16#00	Hex	SINT	Reserved
TBEN_L4_16DXP:C.Data[11]	16#00	Hex	SINT	Reserved
TBEN_L4_16DXP:C.Data[12]	16#00	Hex	SINT	Invert digital input
TBEN_L4_16DXP:C.Data[12].0	0	De...	BOOL	Digital In/Out 1 - Invert digital input: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[12].1	0	De...	BOOL	Digital In/Out 2 - Invert digital input: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[12].2	0	De...	BOOL	Digital In/Out 3 - Invert digital input: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[12].3	0	De...	BOOL	Digital In/Out 4 - Invert digital input: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[12].4	0	De...	BOOL	Digital In/Out 5 - Invert digital input: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[12].5	0	De...	BOOL	Digital In/Out 6 - Invert digital input: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[12].6	0	De...	BOOL	Digital In/Out 7 - Invert digital input: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[12].7	0	De...	BOOL	Digital In/Out 8 - Invert digital input: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[13]	16#00	Hex	SINT	Invert digital input
TBEN_L4_16DXP:C.Data[14]	16#00	Hex	SINT	Manual reset after overcurr.
TBEN_L4_16DXP:C.Data[14].0	0	De...	BOOL	Digital In/Out 1 - Manual reset after overcurr.: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[14].1	0	De...	BOOL	Digital In/Out 2 - Manual reset after overcurr.: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[14].2	0	De...	BOOL	Digital In/Out 3 - Manual reset after overcurr.: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[14].3	0	De...	BOOL	Digital In/Out 4 - Manual reset after overcurr.: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[14].4	0	De...	BOOL	Digital In/Out 5 - Manual reset after overcurr.: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[14].5	0	De...	BOOL	Digital In/Out 6 - Manual reset after overcurr.: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[14].6	0	De...	BOOL	Digital In/Out 7 - Manual reset after overcurr.: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[14].7	0	De...	BOOL	Digital In/Out 8 - Manual reset after overcurr.: 0=no, 1=yes
TBEN_L4_16DXP:C.Data[15]	16#00	Hex	SINT	Manual reset after overcurr.

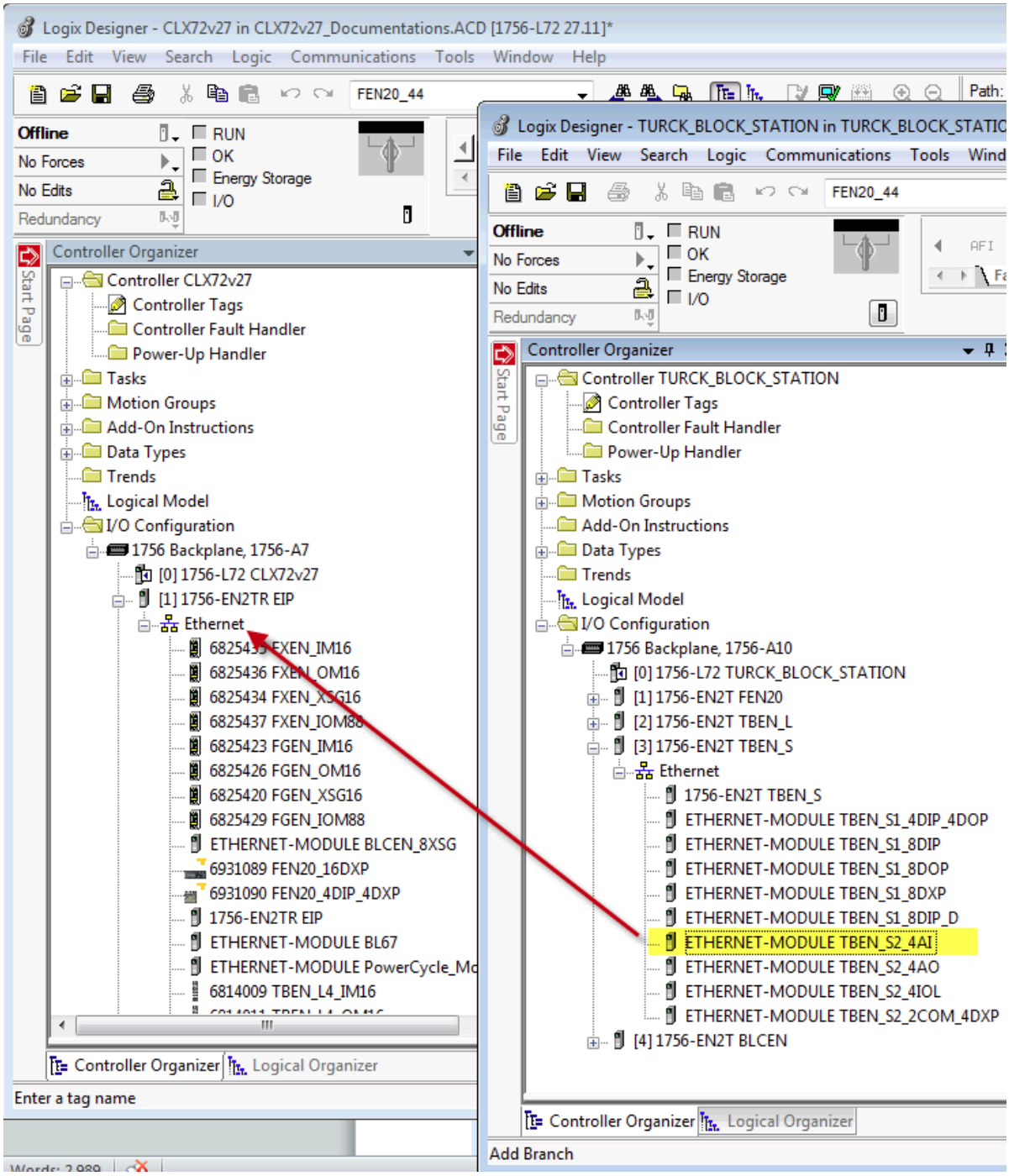
Monitor Tags | Edit Tags

10. The configuration tag is used to set analog IO or communication IO channels for example.

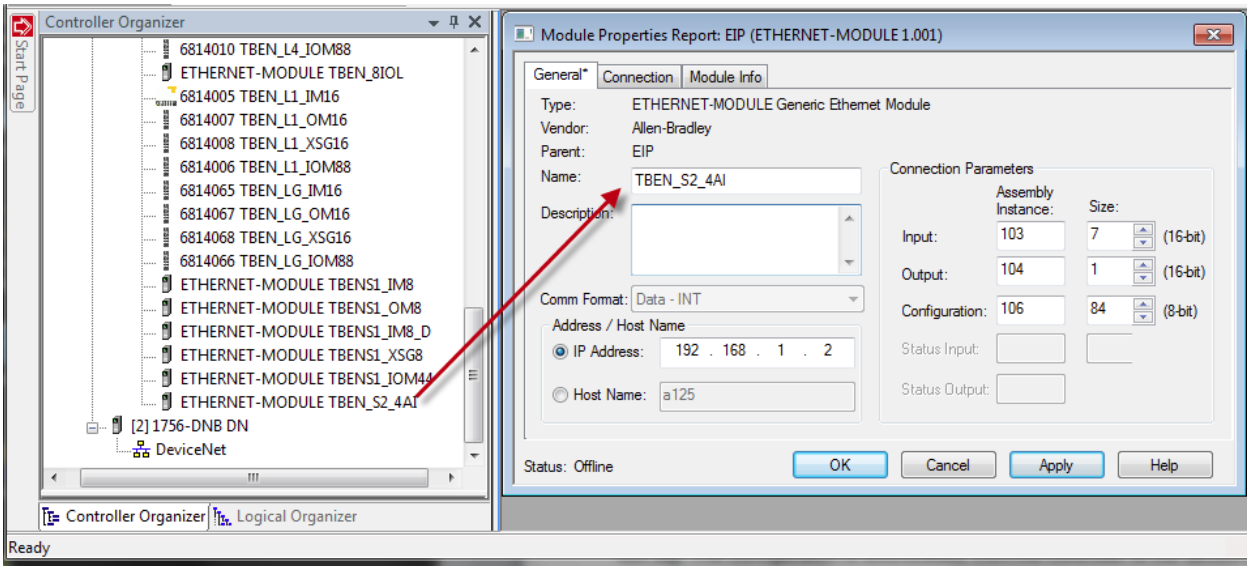
11. Controller downloads configuration data to the device whenever the connection between the PLC and the device is established.

Analog IO Station Configuration

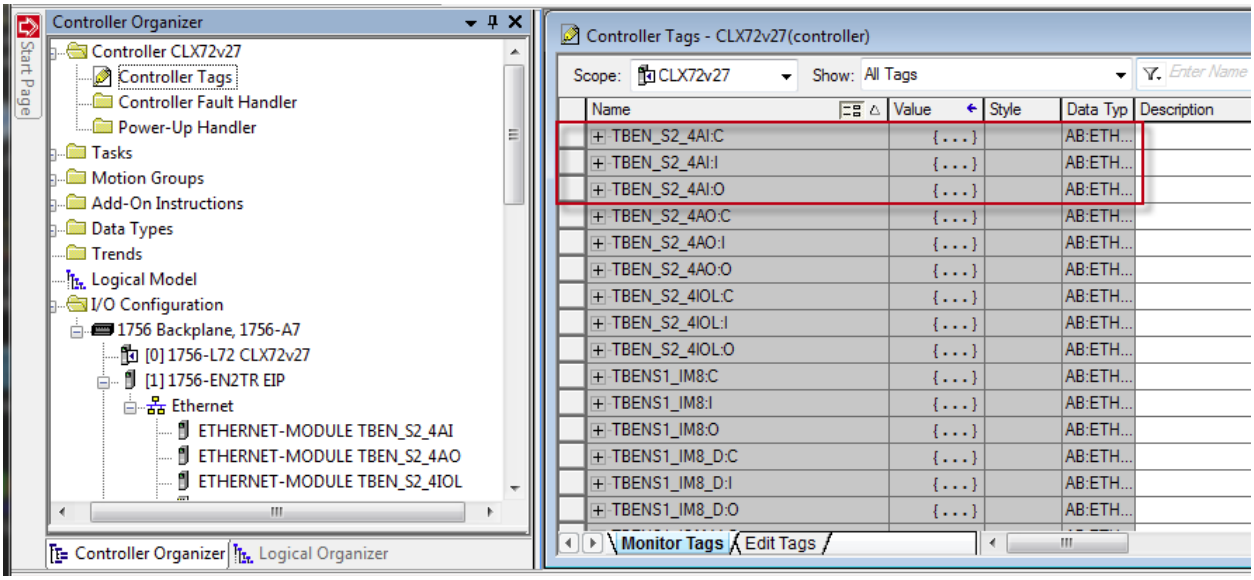
1. TBEN-S2-4AI is a universal analog input station which is configured as follows:
   - Open both your online project and the “TURCK_BLOCK_STATIONS_V24_FULL.ACD” catalog file in separate windows.
   - Expand the “1756-EN2T TBEN_S” bridge in the catalog file
   - Drag the “TBEN-S2-4AI” device from the catalog file and drop it into your project, into Ethernet



2. Highlight the “ETHERNET-MODULE TBEN_S2_4AI” in the Controller organizer of the project and open “Module Properties” page. Assign IP address; name can be changed as well. Click Apply and OK.



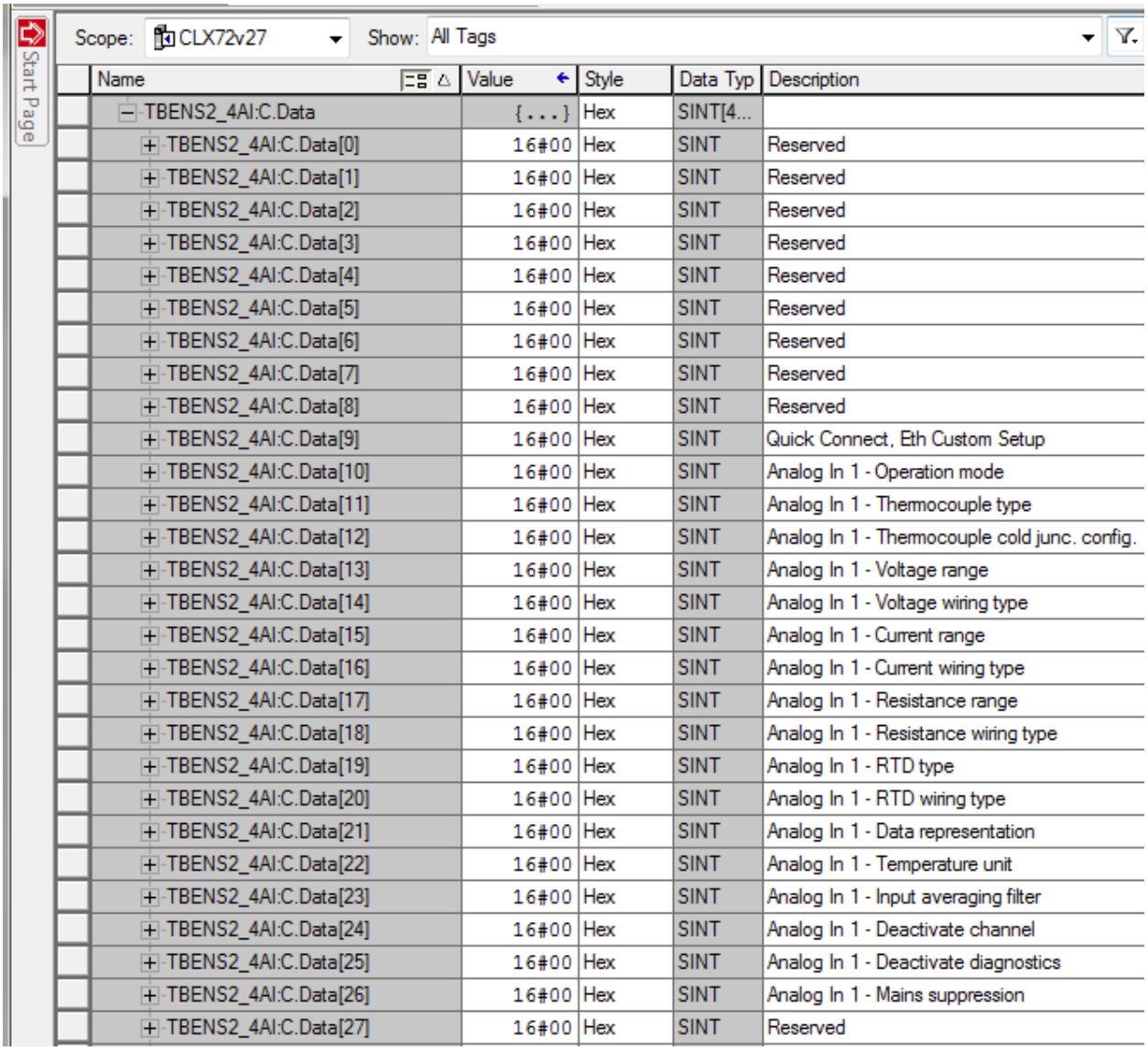
The controller creates configuration tag, input tag and output tag. It also saves content of the configuration tag. The configuration is downloaded from the controller to the device every time when device is connected to the controller.



TBEN-S2-4AI is universal analog input device. It supports multiple analog signal inputs such as: thermocouple input, voltage or current inputs, resistance or RTD inputs. 4 analog input channels may be set to different mode of operation which has dedicated set of configuration parameters. These are contained in the configuration tag.

Configuration Tag

Following example shows configuration parameters of a single analog channel when configuration tag is expanded. Other channels (analog inputs) have identical set of parameters.



Scope: CLX72v27 Show: All Tags

Name	Value	Style	Data Typ	Description
TBENS2_4AI:C.Data	{...}	Hex	SINT[4...	
TBENS2_4AI:C.Data[0]	16#00	Hex	SINT	Reserved
TBENS2_4AI:C.Data[1]	16#00	Hex	SINT	Reserved
TBENS2_4AI:C.Data[2]	16#00	Hex	SINT	Reserved
TBENS2_4AI:C.Data[3]	16#00	Hex	SINT	Reserved
TBENS2_4AI:C.Data[4]	16#00	Hex	SINT	Reserved
TBENS2_4AI:C.Data[5]	16#00	Hex	SINT	Reserved
TBENS2_4AI:C.Data[6]	16#00	Hex	SINT	Reserved
TBENS2_4AI:C.Data[7]	16#00	Hex	SINT	Reserved
TBENS2_4AI:C.Data[8]	16#00	Hex	SINT	Reserved
TBENS2_4AI:C.Data[9]	16#00	Hex	SINT	Quick Connect, Eth Custom Setup
TBENS2_4AI:C.Data[10]	16#00	Hex	SINT	Analog In 1 - Operation mode
TBENS2_4AI:C.Data[11]	16#00	Hex	SINT	Analog In 1 - Thermocouple type
TBENS2_4AI:C.Data[12]	16#00	Hex	SINT	Analog In 1 - Thermocouple cold junc. config.
TBENS2_4AI:C.Data[13]	16#00	Hex	SINT	Analog In 1 - Voltage range
TBENS2_4AI:C.Data[14]	16#00	Hex	SINT	Analog In 1 - Voltage wiring type
TBENS2_4AI:C.Data[15]	16#00	Hex	SINT	Analog In 1 - Current range
TBENS2_4AI:C.Data[16]	16#00	Hex	SINT	Analog In 1 - Current wiring type
TBENS2_4AI:C.Data[17]	16#00	Hex	SINT	Analog In 1 - Resistance range
TBENS2_4AI:C.Data[18]	16#00	Hex	SINT	Analog In 1 - Resistance wiring type
TBENS2_4AI:C.Data[19]	16#00	Hex	SINT	Analog In 1 - RTD type
TBENS2_4AI:C.Data[20]	16#00	Hex	SINT	Analog In 1 - RTD wiring type
TBENS2_4AI:C.Data[21]	16#00	Hex	SINT	Analog In 1 - Data representation
TBENS2_4AI:C.Data[22]	16#00	Hex	SINT	Analog In 1 - Temperature unit
TBENS2_4AI:C.Data[23]	16#00	Hex	SINT	Analog In 1 - Input averaging filter
TBENS2_4AI:C.Data[24]	16#00	Hex	SINT	Analog In 1 - Deactivate channel
TBENS2_4AI:C.Data[25]	16#00	Hex	SINT	Analog In 1 - Deactivate diagnostics
TBENS2_4AI:C.Data[26]	16#00	Hex	SINT	Analog In 1 - Mains suppression
TBENS2_4AI:C.Data[27]	16#00	Hex	SINT	Reserved

The first and most important action is to define mode of operation of a channel that is being configured. Each channel supports any of these operation modes:

Parameter name	Analog Input	Parameter value	
		decimal	binary
Operation Mode	Thermocouple (*)	0	0000
	Voltage	1	0001
	Current	2	0010
	Resistance	3	0011
	RTD	4	0100

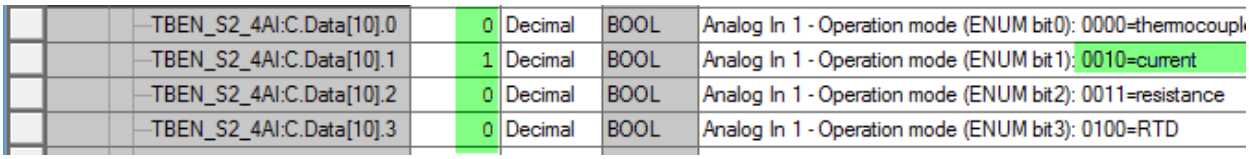
Note: (*) default setting

Here is example how to select current input. You can either enter decimal value 2 into operation mode tag:

Or

Expand that tag and enter it as binary value 0010. Binary representation looks as follows:

b0 = 0
b1 = 1
b2 = 0
b3 = 0



Configure thermocouple input

TBEN-S2-4AI analog input supports different types of thermocouples. There are additional parameters which determine other features of the thermocouple input. In the following example, the analog input 1 is configured to as highlighted:

Analog Input Thermocouples		Parameter value	
Parameter name	Type	decimal	Binary
Thermocouple type	Type K, -270…1370 °C, -454…2498 °F (*)	0	0000
	Type B, 100…1820 °C, 212…3308 °F	1	0001
	Type E, -270…1000 °C, -454…1832 °F	2	0010
	Type J, -210…1200 °C, -346…2192 °F	3	0011
	Type N, -270…1300 °C, -454…2372 °F	4	0100
	Type R, -50…1768 °C, -58…3214 °F	5	0101
	Type S, -50…1768 °C, -58…3214 °F	6	0110
	Type T, -270…400 °C, -454…752 °F	7	0111
	Type C, 0…2315 °C, 32…4199 °F	8	1000
	Type G, 0…2315 °C, 32…4199 °F	9	1001
Thermocouple cold	PT1000(*)	0	0000
	PT100	1	0001
	cold junction from channel 1	2	0010
	none	3	0011
Temperature unit	Celsius(*)	0	0
	Fahrenheit	1	1
Input averaging filter	standard(*)	0	0000
	smooth	1	0001
	fast	2	0010
	off	3	0011

Select operation mode – thermocouple

	TBEN_S2_4AI:C.Data[10]	16#00	Hex	SINT	Analog In 1 - Operation mode
	TBEN_S2_4AI:C.Data[10].0	0	Decimal	BOOL	Analog In 1 - Operation mode (ENUM bit0): 0000=thermocouple, 0001=voltage
	TBEN_S2_4AI:C.Data[10].1	0	Decimal	BOOL	Analog In 1 - Operation mode (ENUM bit1): 0010=current
	TBEN_S2_4AI:C.Data[10].2	0	Decimal	BOOL	Analog In 1 - Operation mode (ENUM bit2): 0011=resistance
	TBEN_S2_4AI:C.Data[10].3	0	Decimal	BOOL	Analog In 1 - Operation mode (ENUM bit3): 0100=RTD

Select thermocouple type

	TBEN_S2_4AI:C.Data[11]	16#03	Hex	SINT	Analog In 1 - Thermocouple type
	TBEN_S2_4AI:C.Data[11].0	1	Decimal	BOOL	Analog In 1 - Thermocouple type (ENUM bit0): 0000=type K, -270...1370 C, -454...2498 F, 0001=type B, +100.....
	TBEN_S2_4AI:C.Data[11].1	1	Decimal	BOOL	Analog In 1 - Thermocouple type (ENUM bit1): 0011=type J, -210...1200 C, -346...2192 F, 0100=type N, -270.....
	TBEN_S2_4AI:C.Data[11].2	0	Decimal	BOOL	Analog In 1 - Thermocouple type (ENUM bit2): 0110=type S, -50...1768 C, -58...3214 F, 0111=type T, -270...40...
	TBEN_S2_4AI:C.Data[11].3	0	Decimal	BOOL	Analog In 1 - Thermocouple type (ENUM bit3): 1000=type C, 0...2315 C, 32...4199 F, 1001=type G, 0...2315 C, ...
	TBEN_S2_4AI:C.Data[11].4	0	Decimal	BOOL	Reserved
	TBEN_S2_4AI:C.Data[11].5	0	Decimal	BOOL	Reserved
	TBEN_S2_4AI:C.Data[11].6	0	Decimal	BOOL	Reserved
	TBEN_S2_4AI:C.Data[11].7	0	Decimal	BOOL	Reserved

Select thermocouple cold junction configuration

	TBEN_S2_4AI:C.Data[12]	16#00	Hex	SINT	Analog In 1 - Thermocouple cold junc. config.
	TBEN_S2_4AI:C.Data[12].0	0	Decimal	BOOL	Analog In 1 - Thermocouple cold junc. config. (ENUM bit0): 0000=PT1000
	TBEN_S2_4AI:C.Data[12].1	0	Decimal	BOOL	Analog In 1 - Thermocouple cold junc. config. (ENUM bit1): 0001=PT100
	TBEN_S2_4AI:C.Data[12].2	0	Decimal	BOOL	Analog In 1 - Thermocouple cold junc. config. (ENUM bit2): 0010=cold junction from channel 1
	TBEN_S2_4AI:C.Data[12].3	0	Decimal	BOOL	Analog In 1 - Thermocouple cold junc. config. (ENUM bit3): 0011=none

Select temperature unit

	TBEN_S2_4AI:C.Data[22]	16#01	Hex	SINT	Analog In 1 - Temperature unit
	TBEN_S2_4AI:C.Data[22].0	1	Decimal	BOOL	Analog In 1 - Temperature unit (ENUM bit0): 0=Celsius, 1=Fahrenheit
	TBEN_S2_4AI:C.Data[22].1	0	Decimal	BOOL	Reserved
	TBEN_S2_4AI:C.Data[22].2	0	Decimal	BOOL	Reserved
	TBEN_S2_4AI:C.Data[22].3	0	Decimal	BOOL	Reserved

Select input average filtering

	TBEN_S2_4AI:C.Data[23]	16#02	Hex	SINT	Analog In 1 - Input averaging filter
	TBEN_S2_4AI:C.Data[23].0	0	Decimal	BOOL	Analog In 1 - Input averaging filter (ENUM bit0): 0000=standard
	TBEN_S2_4AI:C.Data[23].1	1	Decimal	BOOL	Analog In 1 - Input averaging filter (ENUM bit1): 0001=smooth
	TBEN_S2_4AI:C.Data[23].2	0	Decimal	BOOL	Analog In 1 - Input averaging filter (ENUM bit2): 0010=fast
	TBEN_S2_4AI:C.Data[23].3	0	Decimal	BOOL	Analog In 1 - Input averaging filter (ENUM bit3): 0011=off
	TBEN_S2_4AI:C.Data[23].4	0	Decimal	BOOL	Reserved
	TBEN_S2_4AI:C.Data[23].5	0	Decimal	BOOL	Reserved
	TBEN_S2_4AI:C.Data[23].6	0	Decimal	BOOL	Reserved
	TBEN_S2_4AI:C.Data[23].7	0	Decimal	BOOL	Reserved

Configure voltage input

There are multiple voltage input options available for selection. Following example shows how to set analog input 2 as follows:

Analog Input Voltage		Parameter value	
Parameter name	Type	decimal	binary
Voltage range	-10 ... 10 V (*)	0	0000
	0 ... 10 V	1	0001
	2 ... 10 V	2	0010
	0 ... 5 V	3	0011
	1 ... 5 V	4	0100
	-1 ... 1 V	5	0101
	-500 ... 500 mV	6	0110
	-100 ... 100 mV	7	0111
	-50 ... 50 mV	8	1000
Voltage wiring type	differential(*)	0	00
	single ended	1	01
	differential without ground	2	10
Data representation	standard	0	00
	NE43	1	01
	extended range	2	10
Input averaging filter	standard(*)	0	00
	smooth	1	01
	fast	2	10
	off	3	11

Select operation mode – voltage

TBEN_S2_4AI:C.Data[28]	16#01	Hex	SINT	Analog In 2 - Operation mode
TBEN_S2_4AI:C.Data[28].0	1	Decimal	BOOL	Analog In 2 - Operation mode (ENUM bit0): 0000=thermocouple, 0001=voltage
TBEN_S2_4AI:C.Data[28].1	0	Decimal	BOOL	Analog In 2 - Operation mode (ENUM bit1): 0010=current
TBEN_S2_4AI:C.Data[28].2	0	Decimal	BOOL	Analog In 2 - Operation mode (ENUM bit2): 0011=resistance
TBEN_S2_4AI:C.Data[28].3	0	Decimal	BOOL	Analog In 2 - Operation mode (ENUM bit3): 0100=RTD

Select voltage range “0…10V”

TBEN_S2_4AI:C.Data[31]	16#01	Hex	SINT	Analog In 2 - Voltage range
TBEN_S2_4AI:C.Data[31].0	1	Decimal	BOOL	Analog In 2 - Voltage range (ENUM bit0): 0000=-10...10 V, 0001=0...10 V, 0010=2...10 V
TBEN_S2_4AI:C.Data[31].1	0	Decimal	BOOL	Analog In 2 - Voltage range (ENUM bit1): 0011=0...5 V, 0100=1...5 V
TBEN_S2_4AI:C.Data[31].2	0	Decimal	BOOL	Analog In 2 - Voltage range (ENUM bit2): 0101=-1...1 V, 0110=-500...500 mV
TBEN_S2_4AI:C.Data[31].3	0	Decimal	BOOL	Analog In 2 - Voltage range (ENUM bit3): 0111=-100...100 mV, 1000=-50...50 mV
TBEN_S2_4AI:C.Data[31].4	0	Decimal	BOOL	Reserved
TBEN_S2_4AI:C.Data[31].5	0	Decimal	BOOL	Reserved
TBEN_S2_4AI:C.Data[31].6	0	Decimal	BOOL	Reserved
TBEN_S2_4AI:C.Data[31].7	0	Decimal	BOOL	Reserved

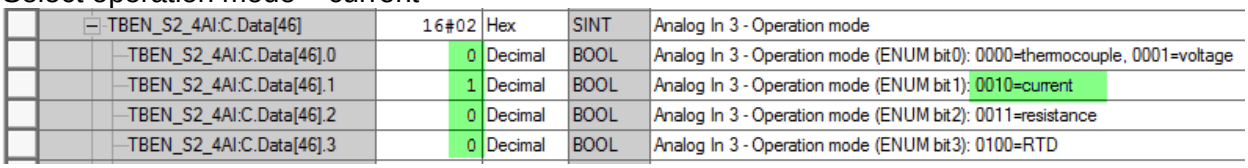
Other “Analog in 2” parameters: voltage wiring type, data representation and input average filtering are set to default value.

Configure current input

There are multiple current input options available for selection. Following example shows how to set analog input 3 using following parameter setup:

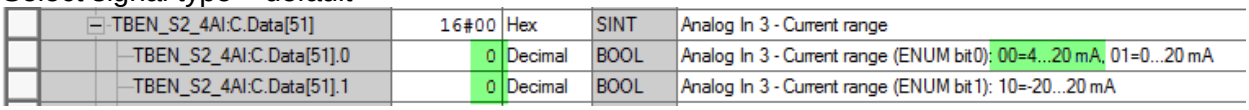
Analog Input Current		Parameter Value	
Parameter name	Type	decimal	binary
Current range	4 ... 20 mA (*)	0	00
	0 ... 20 mA	1	01
	-20…20 mA	2	10
Current wiring type	differential (*)	0	00
	single ended	1	01
	differential without ground	2	10
Data representation	standard (*)	0	00
	NE43	1	01
	extended range	2	10
Input averaging filter	standard(*)	0	0000
	smooth	1	0001
	fast	2	0010
	off	3	0011

Select operation mode – current



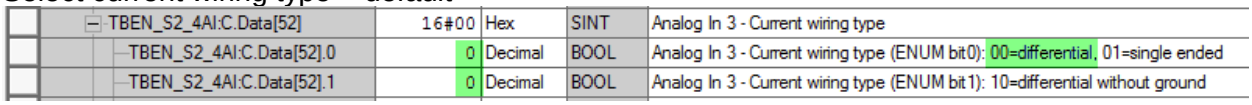
TBEN_S2_4AI:C.Data[46]	16#02	Hex	SINT	Analog In 3 - Operation mode
TBEN_S2_4AI:C.Data[46].0	0	Decimal	BOOL	Analog In 3 - Operation mode (ENUM bit0): 0000=thermocouple, 0001=voltage
TBEN_S2_4AI:C.Data[46].1	1	Decimal	BOOL	Analog In 3 - Operation mode (ENUM bit1): 0010=current
TBEN_S2_4AI:C.Data[46].2	0	Decimal	BOOL	Analog In 3 - Operation mode (ENUM bit2): 0011=resistance
TBEN_S2_4AI:C.Data[46].3	0	Decimal	BOOL	Analog In 3 - Operation mode (ENUM bit3): 0100=RTD

Select signal type – default



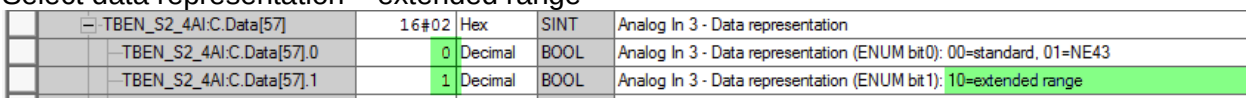
TBEN_S2_4AI:C.Data[51]	16#00	Hex	SINT	Analog In 3 - Current range
TBEN_S2_4AI:C.Data[51].0	0	Decimal	BOOL	Analog In 3 - Current range (ENUM bit0): 00=4...20 mA, 01=0...20 mA
TBEN_S2_4AI:C.Data[51].1	0	Decimal	BOOL	Analog In 3 - Current range (ENUM bit1): 10=-20...20 mA

Select current wiring type – default



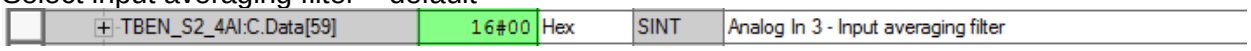
TBEN_S2_4AI:C.Data[52]	16#00	Hex	SINT	Analog In 3 - Current wiring type
TBEN_S2_4AI:C.Data[52].0	0	Decimal	BOOL	Analog In 3 - Current wiring type (ENUM bit0): 00=differential, 01=single ended
TBEN_S2_4AI:C.Data[52].1	0	Decimal	BOOL	Analog In 3 - Current wiring type (ENUM bit1): 10=differential without ground

Select data representation – extended range



TBEN_S2_4AI:C.Data[57]	16#02	Hex	SINT	Analog In 3 - Data representation
TBEN_S2_4AI:C.Data[57].0	0	Decimal	BOOL	Analog In 3 - Data representation (ENUM bit0): 00=standard, 01=NE43
TBEN_S2_4AI:C.Data[57].1	1	Decimal	BOOL	Analog In 3 - Data representation (ENUM bit1): 10=extended range

Select input averaging filter – default



TBEN_S2_4AI:C.Data[59]	16#00	Hex	SINT	Analog In 3 - Input averaging filter

Configure resistance input

There are multiple RTD input options supported by the station. Following example shows how to set analog input 4 using following parameter setup:

Analog Input Resistance		Parameter Value	
Parameter name	Type	decimal	binary
Resistance range	0 ... 100 Ohm (*) 0... 400 Ohm 0... 2000 Ohm 0... 4000 Ohm	0 1 2 3	00 01 10 11
Resistance wiring type	2-wire (*) 3-wire 4-wire	0 1 2	00 01 10
Input averaging filter	standard(*) smooth fast off	0 1 2 3	0000 0001 0010 0011

Select operation mode – resistance

TBEN_S2_4AI:C.Data[64]	16#03	Hex	SINT	Analog In 4 - Operation mode
TBEN_S2_4AI:C.Data[64].0	1	Decimal	BOOL	Analog In 4 - Operation mode (ENUM bit0): 0000=thermocouple, 0001=voltage
TBEN_S2_4AI:C.Data[64].1	1	Decimal	BOOL	Analog In 4 - Operation mode (ENUM bit1): 0010=current
TBEN_S2_4AI:C.Data[64].2	0	Decimal	BOOL	Analog In 4 - Operation mode (ENUM bit2): 0011=resistance
TBEN_S2_4AI:C.Data[64].3	0	Decimal	BOOL	Analog In 4 - Operation mode (ENUM bit3): 0100=RTD

Select resistance range

TBEN_S2_4AI:C.Data[71]	16#02	Hex	SINT	Analog In 4 - Resistance range
TBEN_S2_4AI:C.Data[71].0	0	Decimal	BOOL	Analog In 4 - Resistance range (ENUM bit0): 00=0...100 Ohm, 01=0...400 Ohm
TBEN_S2_4AI:C.Data[71].1	1	Decimal	BOOL	Analog In 4 - Resistance range (ENUM bit1): 10=0...2000 Ohm, 11=0...4000 Ohm

Select wiring type

TBEN_S2_4AI:C.Data[72]	16#01	Hex	SINT	Analog In 4 - Resistance wiring type
TBEN_S2_4AI:C.Data[72].0	1	Decimal	BOOL	Analog In 4 - Resistance wiring type (ENUM bit0): 00=2-wire, 01=3-wire
TBEN_S2_4AI:C.Data[72].1	0	Decimal	BOOL	Analog In 4 - Resistance wiring type (ENUM bit1): 10=4-wire

Select input average filter – default

TBEN_S2_4AI:C.Data[77]	16#00	Hex	SINT	Analog In 4 - Input averaging filter
TBEN_S2_4AI:C.Data[77].0	0	Decimal	BOOL	Analog In 4 - Input averaging filter (ENUM bit0): 0000=standard
TBEN_S2_4AI:C.Data[77].1	0	Decimal	BOOL	Analog In 4 - Input averaging filter (ENUM bit1): 0001=smooth
TBEN_S2_4AI:C.Data[77].2	0	Decimal	BOOL	Analog In 4 - Input averaging filter (ENUM bit2): 0010=fast
TBEN_S2_4AI:C.Data[77].3	0	Decimal	BOOL	Analog In 4 - Input averaging filter (ENUM bit3): 0011=off

Configure RTD input

There are multiple RTD input options supported by the station. Following example shows how to set analog input 4 using following parameter setup:

Analog Input RTD		Parameter value	
Parameter name	Type	decimal	binary
RTD Type	PT100, -200... 850 °C, -328...1562 °F (*)	0	0000
	PT100, -200... 150 °C, -328...302 °F	1	0001
	NI100, -60... 250 °C, -76...482 °F	2	0010
	NI100, -60... 150 °C, -76...302 °F	3	0011
	PT200, -200... 850 °C, -328...1562 °F	4	0100
	PT200, -200... 150 °C, -328...302 °F	5	0101
	PT500, -200... 850 °C, -328...1562 °F	6	0110
	PT500, -200... 150 °C, -328...302 °F	7	0111
	PT1000, -200... 850 °C, -328...1562 °F	8	1000
	PT1000, -200... 150 °C, -328...302 °F	9	1001
	NI1000, -60... 250 °C, -76...482 °F	10	1010
	NI1000, -60... 150 °C, -76...302 °F	11	1011
RTD wiring type	2-wire(*)	0	00
	3-wire	1	01
	4-wire	2	10
Temperature unit	Celsius(*)	0	0
	Fahrenheit	1	1

Select Operation mode – RTD

	TBEN_S2_4AI:C.Data[64]	16#04	Hex	SINT	Analog In 4 - Operation mode
	TBEN_S2_4AI:C.Data[64].0	0	Decimal	BOOL	Analog In 4 - Operation mode (ENUM bit0): 0000=thermocouple, 0001=voltage
	TBEN_S2_4AI:C.Data[64].1	0	Decimal	BOOL	Analog In 4 - Operation mode (ENUM bit1): 0010=current
	TBEN_S2_4AI:C.Data[64].2	1	Decimal	BOOL	Analog In 4 - Operation mode (ENUM bit2): 0011=resistance
	TBEN_S2_4AI:C.Data[64].3	0	Decimal	BOOL	Analog In 4 - Operation mode (ENUM bit3): 0100=RTD

Select RTD type – PT1000

	TBEN_S2_4AI:C.Data[73]	16#08	Hex	SINT	Analog In 4 - RTD type
	TBEN_S2_4AI:C.Data[73].0	0	Decimal	BOOL	Analog In 4 - RTD type (ENUM bit0): 00000000=PT100, -200...850 C, -328...1562 F, 00000001=PT100, -200.....
	TBEN_S2_4AI:C.Data[73].1	0	Decimal	BOOL	Analog In 4 - RTD type (ENUM bit1): 00000010=NI100, -60...250 C, -76...482 F, 00000011=NI100, -60...150 C,...
	TBEN_S2_4AI:C.Data[73].2	0	Decimal	BOOL	Analog In 4 - RTD type (ENUM bit2): 00000100=PT200, -200...850 C, -328...1562 F, 00000101=PT200, -200.....
	TBEN_S2_4AI:C.Data[73].3	1	Decimal	BOOL	Analog In 4 - RTD type (ENUM bit3): 00000110=PT500, -200...850 C, -328...1562 F, 00000111=PT500, -200.....
	TBEN_S2_4AI:C.Data[73].4	0	Decimal	BOOL	Analog In 4 - RTD type (ENUM bit4): 00001000=PT1000, -200...850 C, -328...1562 F
	TBEN_S2_4AI:C.Data[73].5	0	Decimal	BOOL	Analog In 4 - RTD type (ENUM bit5): 00001001=PT1000, -200...150 C, -328...302 F
	TBEN_S2_4AI:C.Data[73].6	0	Decimal	BOOL	Analog In 4 - RTD type (ENUM bit6): 00001010=NI1000, -60...250 C, -76...482 F
	TBEN_S2_4AI:C.Data[73].7	0	Decimal	BOOL	Analog In 4 - RTD type (ENUM bit7): 00001011=NI1000, -60...150 C, -76...302 F

Select RTD wiring type – 3 wire

	TBEN_S2_4AI:C.Data[72]	16#01	Hex	SINT	Analog In 4 - Resistance wiring type
	TBEN_S2_4AI:C.Data[72].0	1	Decimal	BOOL	Analog In 4 - Resistance wiring type (ENUM bit0): 00=2-wire, 01=3-wire
	TBEN_S2_4AI:C.Data[72].1	0	Decimal	BOOL	Analog In 4 - Resistance wiring type (ENUM bit1): 10=4-wire

Select RTD temperature unit – Fahrenheit

	TBEN_S2_4AI:C.Data[74]	16#01	Hex	SINT	Analog In 4 - RTD wiring type
	TBEN_S2_4AI:C.Data[74].0	1	Decimal	BOOL	Analog In 4 - RTD wiring type (ENUM bit0): 00=2-wire, 01=3-wire
	TBEN_S2_4AI:C.Data[74].1	0	Decimal	BOOL	Analog In 4 - RTD wiring type (ENUM bit1): 10=4-wire