



# APPLICATION NOTE

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## **Subject**

Murrelektronik EtherCAT IO-Link Master XG5000 Project Creation for XMC

## **Purpose**

This application note is intended to provide a basic project configuration for controlling Murrelektronik EtherCAT IO-Link Master (54632) using a LS Electric XMC programmable motion controller.

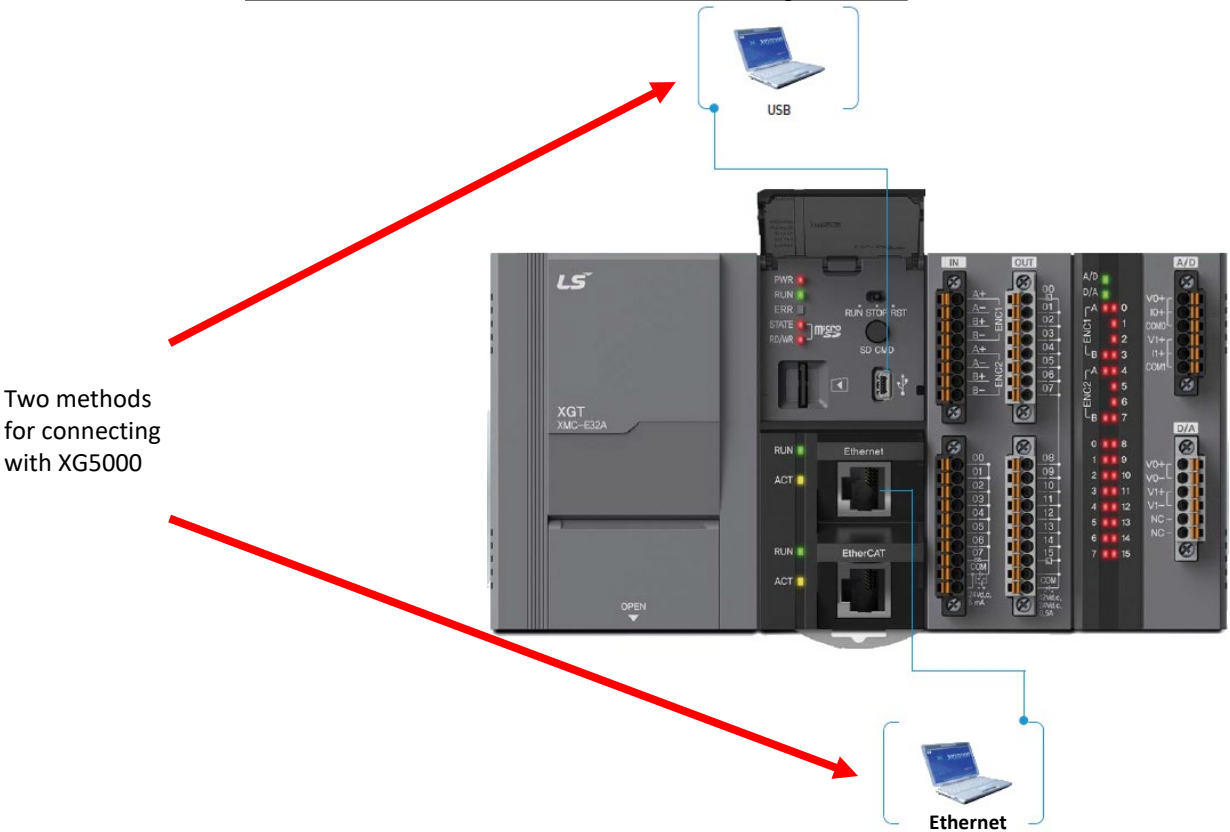
## **Date Issued**

2-27-2025

# XMC02 – XMC Murrelektronik EtherCAT IO-Link Master Project Creation

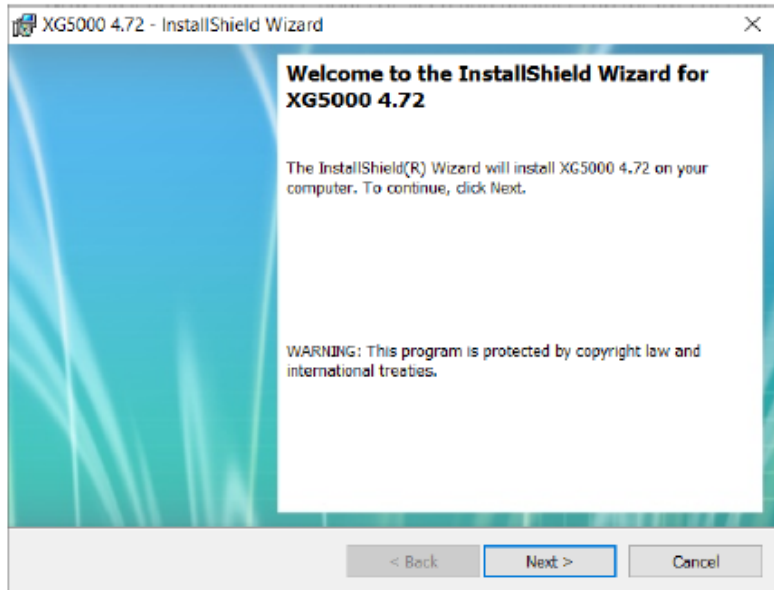
- XMCs are programmed in XG5000.
  - After mounting and powering it up, a user can connect to it through XG5000 for programming.
  - XG5000 can connect to the XMC with a USB series Mini-B cable or an Ethernet cable.
  - A USB series mini-B cable will connect to the port under the RUN/STOP Mode Switch and SD CMD button.
- (Shown Below)
- An ethernet cable will connect to the Ethernet port on the front.
  - The EtherCAT port can not be used for programming.

## XG5000 XMC Connection Options



## Section 1 – USB Connection to XMC

Step 1: Download and Install XG5000 software.

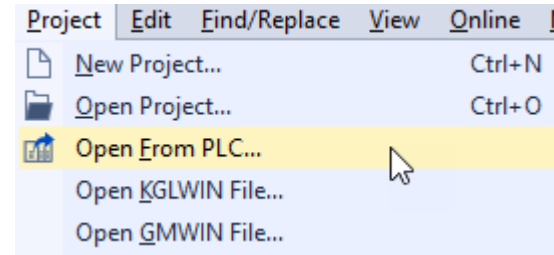
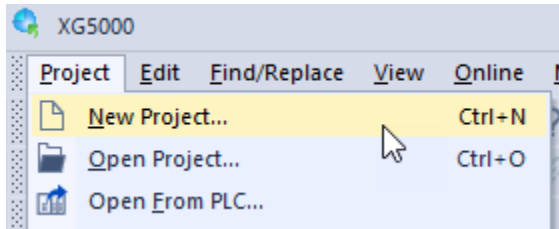


Step 2: Connect Computer with USB series Mini-B cable to the XMC.



Step 3: Open XG5000. Select Project Menu → New Project.

Alternate method is to Select Project Menu → Open From PLC... (Skip to Step 6).



Step 4: Fill in the information for a New Project.

Diagram illustrating the 'New Project' dialog box configuration with annotations:

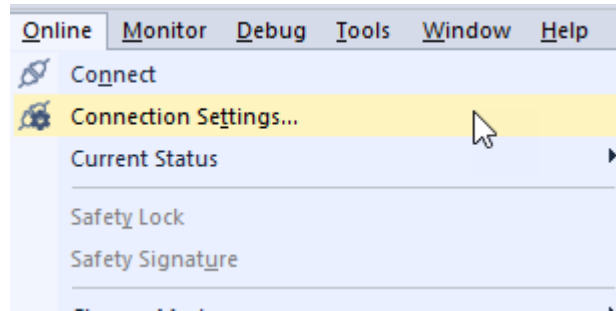
- Add Project Name** → Project name: [ ]
- Choose XMC** → CPU Series: XMC
- Choose CPU type XMC-E16A or XMC-E08A** → CPU type: XMC-E16A
- Add Program Name** → Program name: NewProgram
- Choose Program Language** → Program Language: LD

Other visible fields in the dialog:

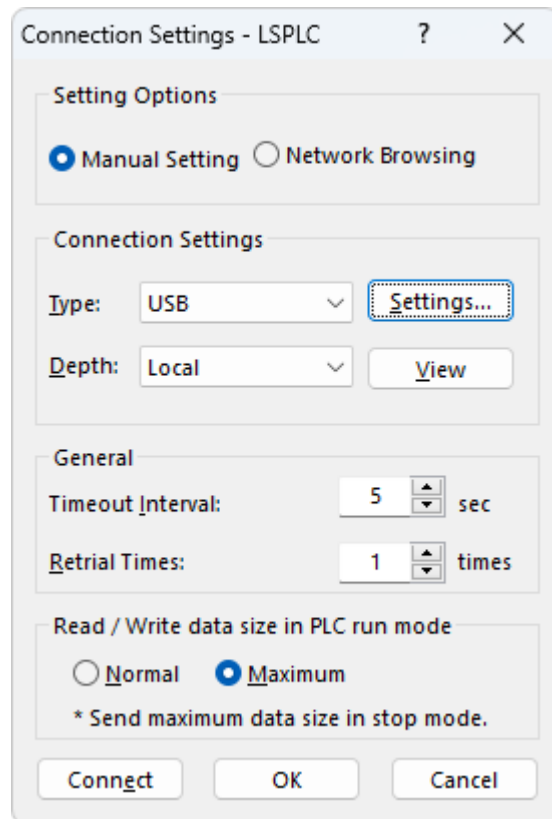
- File directory: C:\Projects
- Product Name: [ ]
- PLC Name: LSPLC
- Programming Format: XGI Programming

Buttons: OK, Cancel

Step 5: Select Online Menu → Connection Settings...

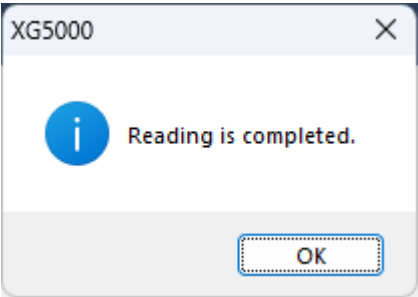
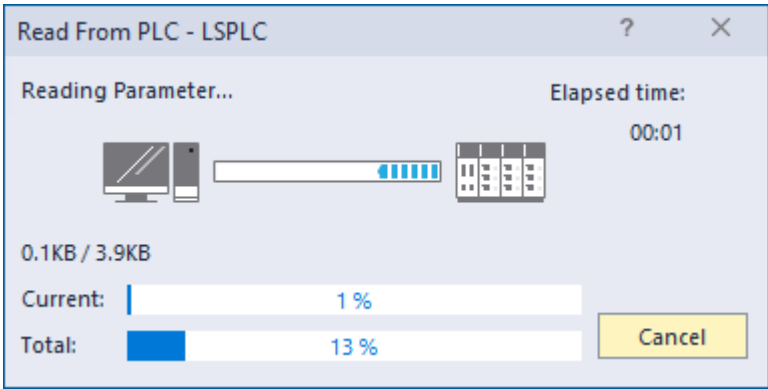


Step 6: Select USB as type. Press the Connect button when ready to connect.



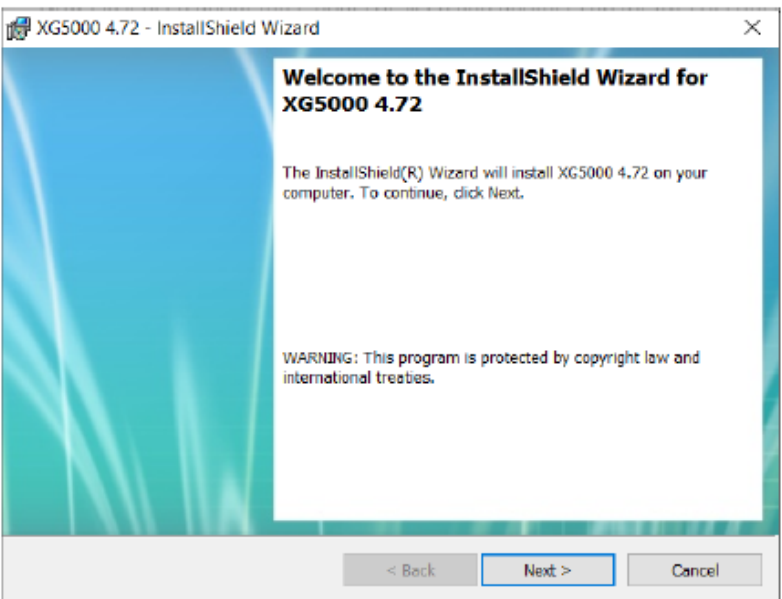
Step 7: XG5000 should display connection status at the bottom part of the software. Example Below.

If Using Open From PLC..., These screens will appear before the project is opened and showing connection status.

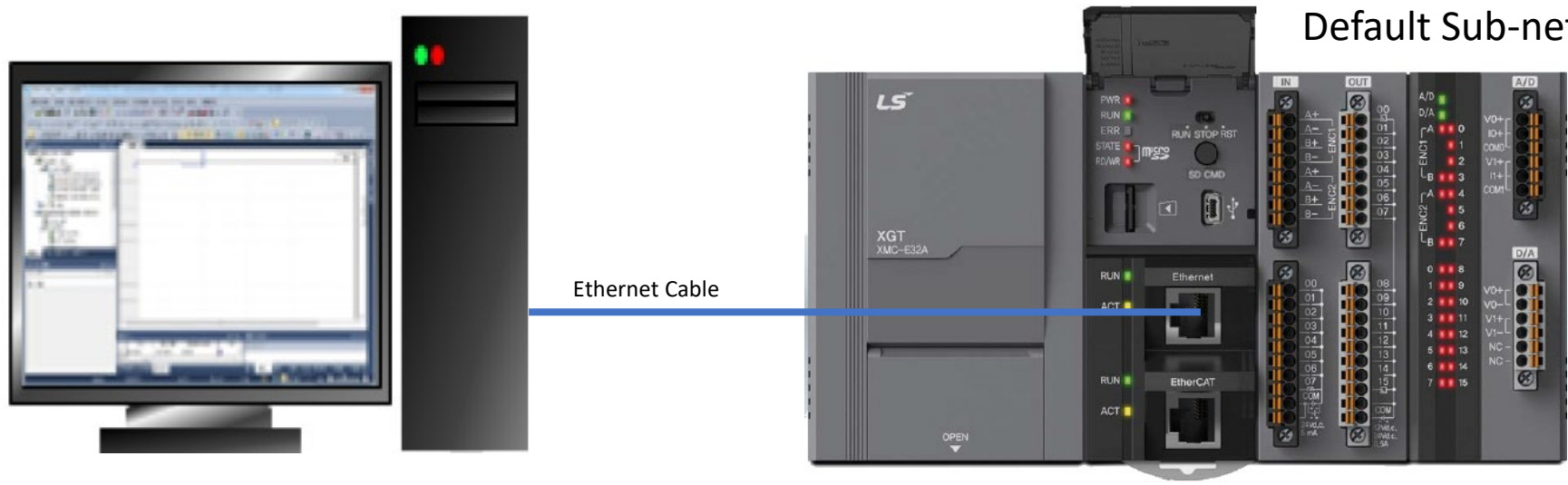


## Section 2 – Ethernet Connection to the XMC

Step 1: Download and Install XG5000 software.



Step 2: Connect Computer with Ethernet cable to the XMC.



Note: Default IP address of CPU is 192.168.250.110  
Default Sub-net: 255.255.255.0

Step 3: Change Computer network settings to be on the same sub-net range as the XMC.

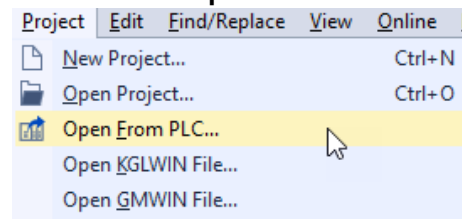
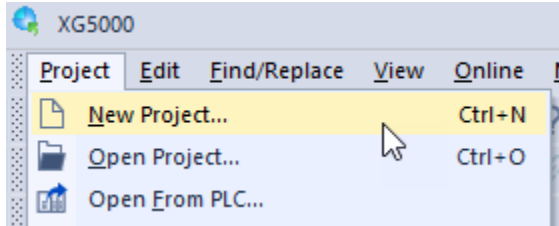
Note: If you can not change the IP address setup on your PC, try the USB connection.

Example: Set PC IP Address to 192.168.250.101

Set PC Sub-net to 255.255.255.0

Step 4: Open XG5000. Select Project Menu→ New Project.

Alternate method is to Select Project Menu → Open From PLC... (Skip to Step 7).



Step 5: Fill in the information for a New Project.

A screenshot of the 'New Project' dialog box in XG5000. The dialog box is divided into three sections: 'Project', 'PLC', and 'Program'. Red arrows point from text labels to specific fields in the dialog box. The 'Project' section has fields for 'Project name' and 'File directory'. The 'PLC' section has fields for 'CPU Series', 'CPU type', and 'PLC Name'. The 'Program' section has fields for 'Programming Format', 'Program name', and 'Program Language'. The 'CPU type' field is highlighted with a yellow background. The 'Program name' field contains the text 'NewProgram'. The 'Program Language' field is set to 'LD'. The 'OK' and 'Cancel' buttons are located at the top right of the dialog box.

Add Project Name →

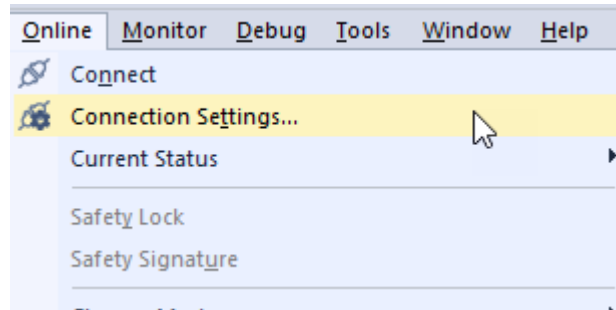
Choose XMC →

Choose CPU type XMC-E16A or XMC-E08A →

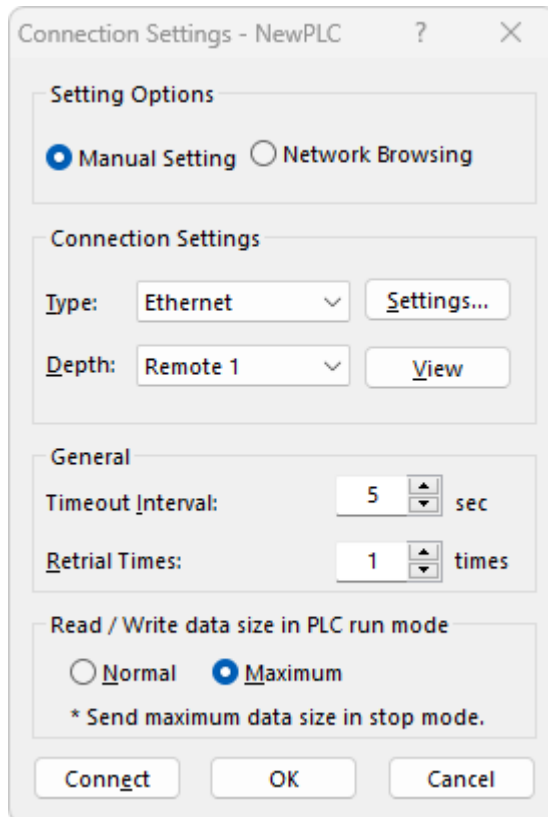
Add Program Name →

Choose Program Language →

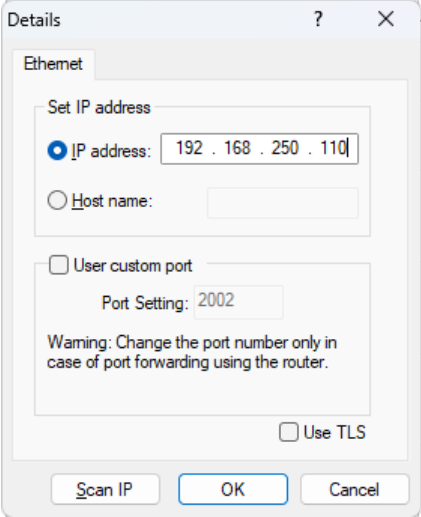
Step 6: Select Online Menu → Connection Settings...



Step 7: Select Ethernet as type. Press the Settings... Button to enter IP address information.

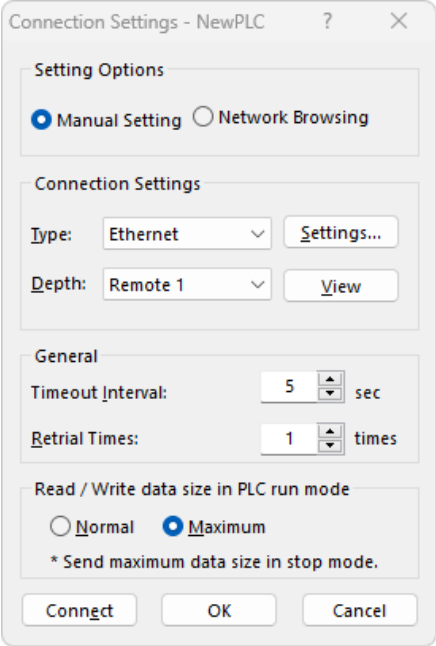


Step 8: Enter the default IP address of 192.168.250.110 in the IP address field. Press OK when done.



The 'Details' dialog box is shown with the 'Ethernet' tab selected. Under the 'Set IP address' section, the 'IP address' radio button is selected, and the text field contains '192 . 168 . 250 . 110'. The 'Host name' radio button is unselected. Below this, the 'User custom port' checkbox is unselected, and the 'Port Setting' text field contains '2002'. A warning message states: 'Warning: Change the port number only in case of port forwarding using the router.' At the bottom, there is a 'Use TLS' checkbox which is unselected. The 'Scan IP', 'OK', and 'Cancel' buttons are at the bottom of the dialog.

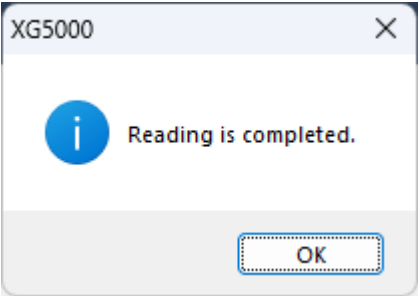
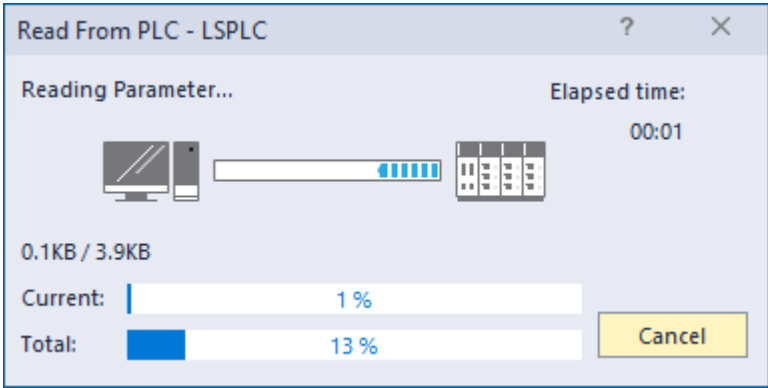
Step 9: Press Connect button to connect to XMC CPU.



The 'Connection Settings - NewPLC' dialog box is shown. Under 'Setting Options', the 'Manual Setting' radio button is selected. In the 'Connection Settings' section, 'Type' is set to 'Ethernet' and 'Depth' is set to 'Remote 1'. Below this, in the 'General' section, 'Timeout Interval' is set to '5 sec' and 'Retrial Times' is set to '1 times'. In the 'Read / Write data size in PLC run mode' section, the 'Maximum' radio button is selected. A note at the bottom states: '\* Send maximum data size in stop mode.' The 'Connect', 'OK', and 'Cancel' buttons are at the bottom of the dialog.

Step 10: XG5000 should display connection status at the bottom part of the software. Example Below.

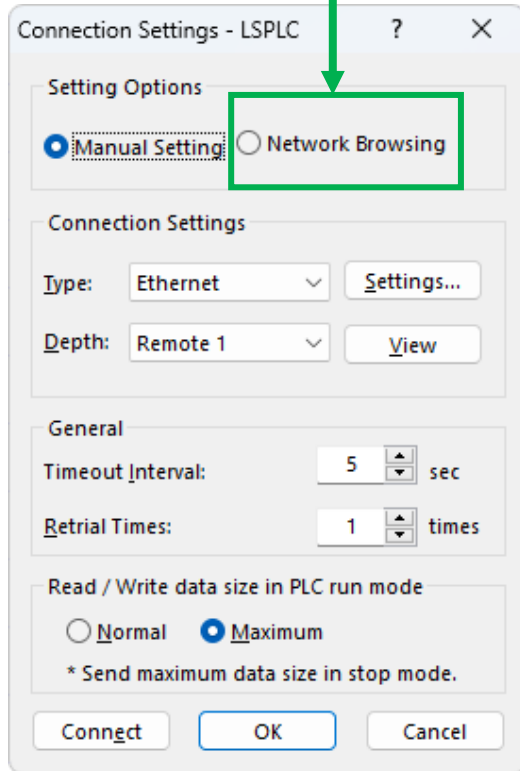
If Using Open From PLC..., These screens will appear before the project is opened and showing connection status.



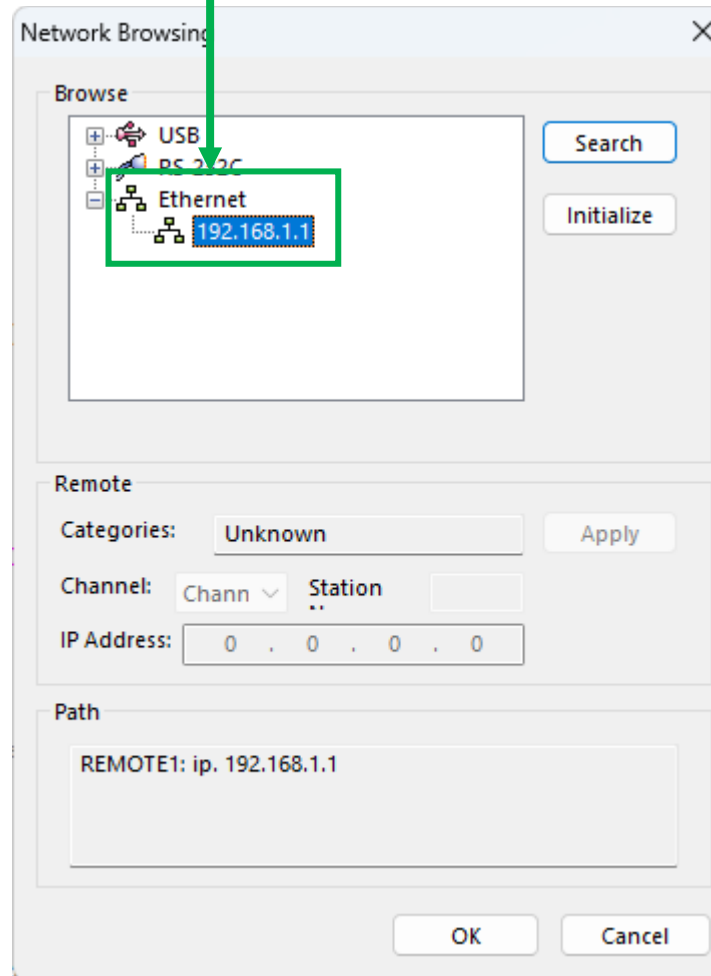
## Section 2.1 – Using Network Browsing to find IP Address of XMC CPU

Network Browsing can be used to find the IP address of an XMC. Connection settings can be found in Online Menu -> Connection Settings.

Select Network Browsing to open a new window.



Expand Ethernet Section to see the IP address of any XMC that is found.



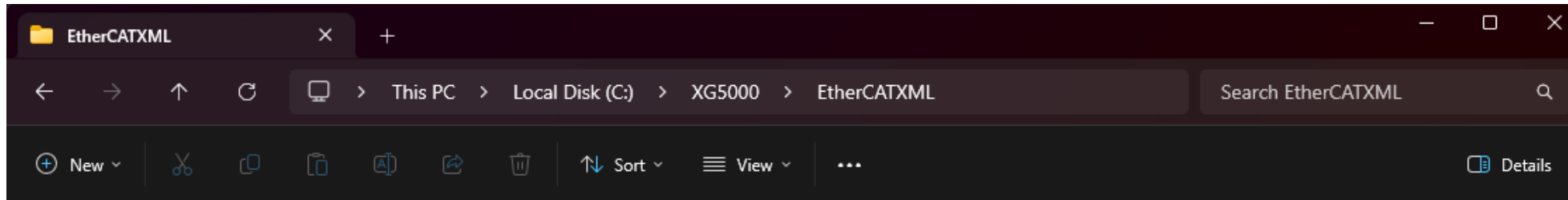
## Adding Murrelektronik EtherCAT IO-Link Master ESI File to XG5000

- The information for an EtherCAT slave is defined in the EtherCAT Slave Information (ESI) file.
- This file can be downloaded at [https://www.automationdirect.com/adc/shopping/catalog/field\\_i-z-o/io-link/io-link\\_masters/54632](https://www.automationdirect.com/adc/shopping/catalog/field_i-z-o/io-link/io-link_masters/54632)
- XG5000 can read the ESI file to configure communication settings for the XMC to connect with the IO-Link Master.

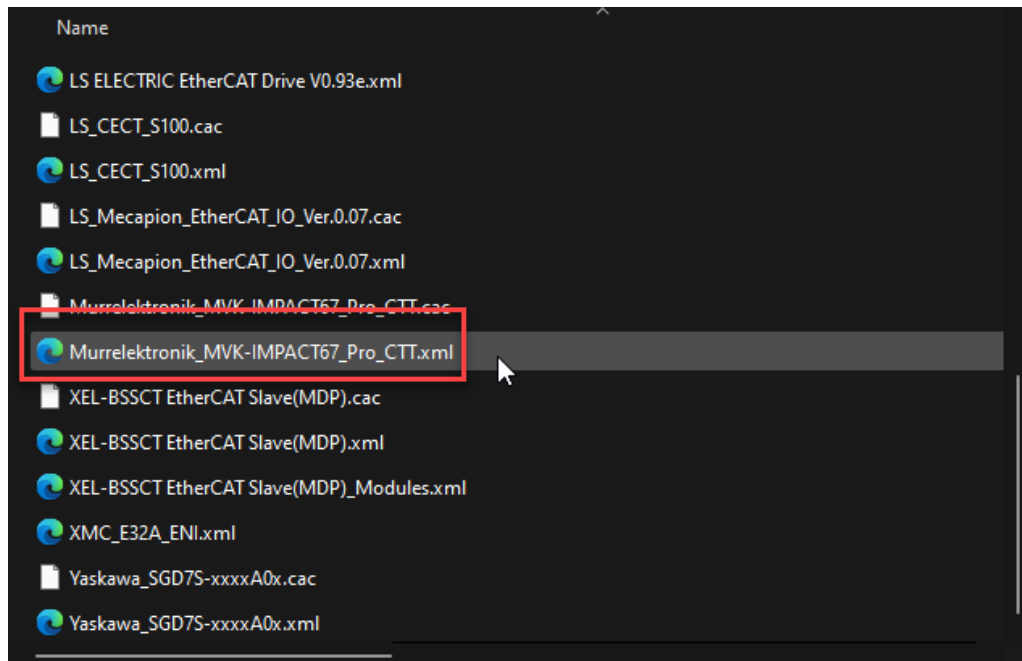
### Section 1 – Adding ESI file to XG5000

Step 1: Close all Instances of XG5000 and download the ESI file for your device.

Step 2: Open a Windows Explorer and navigate to C:\XG5000\EtherCATXML.

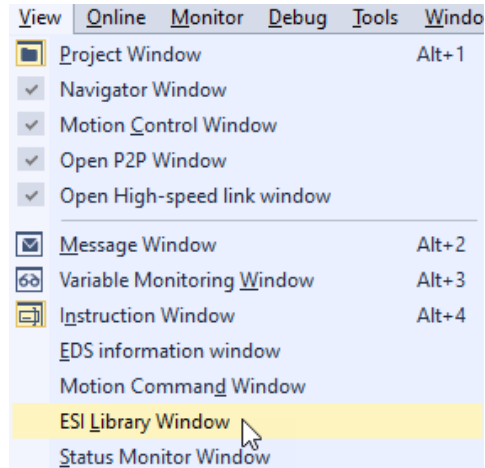


Step 3: Copy the IO-Link Master's ESI file to C:\XG5000\EtherCATXML.

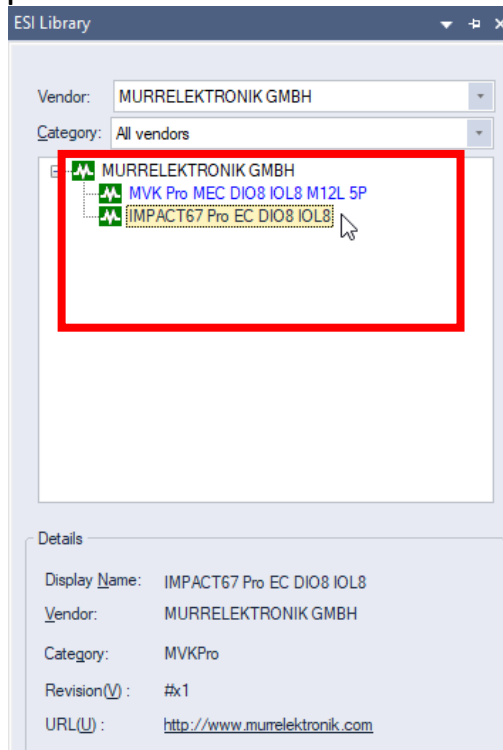


Step 4: Open your XMC project in XG5000.

Step 5: Select View Menu -> ESI Library Window



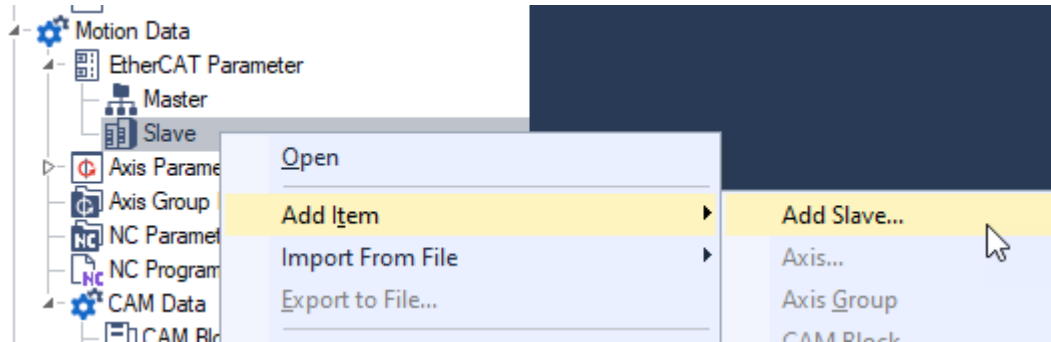
Step 6: The IO-Link Master should appear in the ESI Library window. This device can now be added to the XMC project.



## Adding IO-Link Master to an XMC Project

- The Murrelektronik IO-Link Master ESI file must be loaded into XG5000 before it can be used in a project.

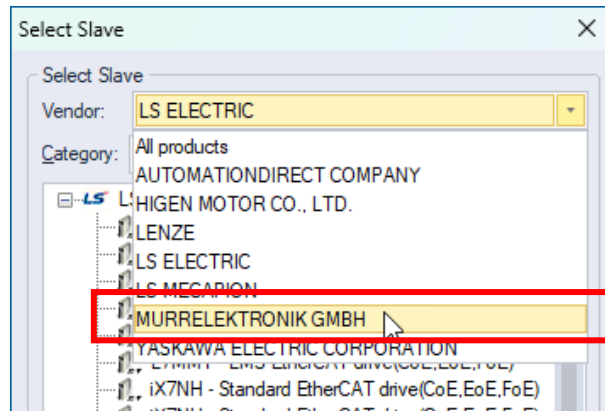
Step 1: In the Project Window, Right click on Slave under EtherCAT Parameter Section. Select Add item -> Add Slave...



Step 2: Press the '...' button next to the Slave Name property.

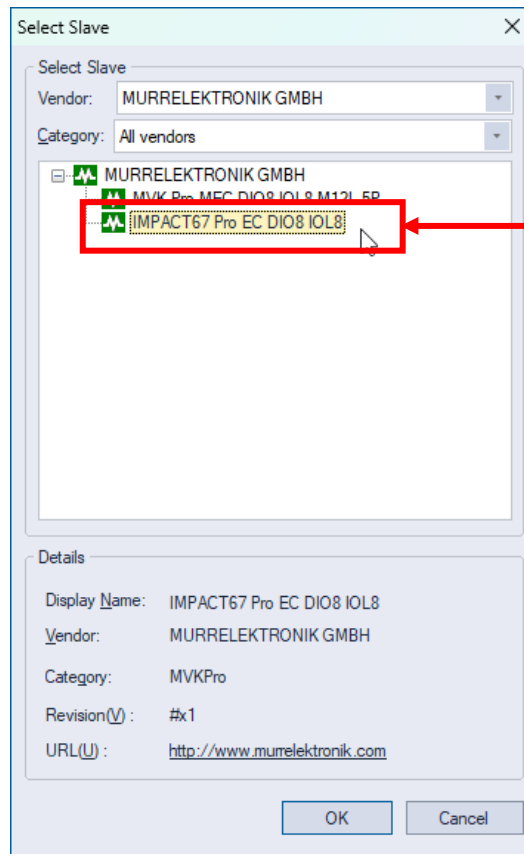


Step 3: Select MURRELEKTRONIK GMBH from the Vendor List.



Select MURRELEKTRONIK GMBH

Step 4: Select IMPACT67 Pro EC DIO8 IOL8 from the list. Press OK button



Select IMPACT67 Pro EC DIO8 IOL8

Step 5: Press OK on the Slave information screen to add the IO-Link Master to the project.

Slave Information

Slave Information Slave Configuration

Slave Name: IMPACT67 Pro EC DIO8 IOL8

Station No.: 1

Vendor: MURRELEKTRONIK GMBH

Category: MVKPro

Revision(V): #x1

Port:

☐ A

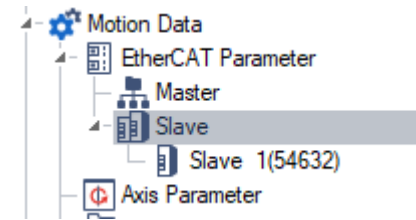
☐ D

☒ B

☐ C

Description:

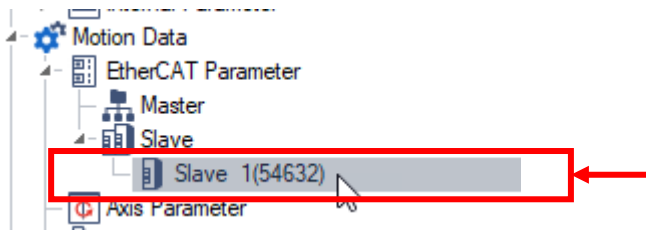
OK Cancel



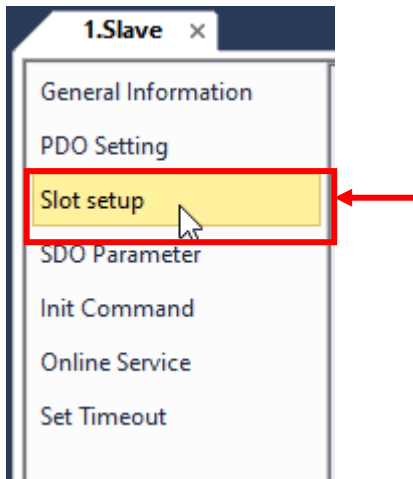
## Configuring IO-Link Master's Ports

- After adding the IO-Link master to the XMC project, the ports must be configured for them to function.

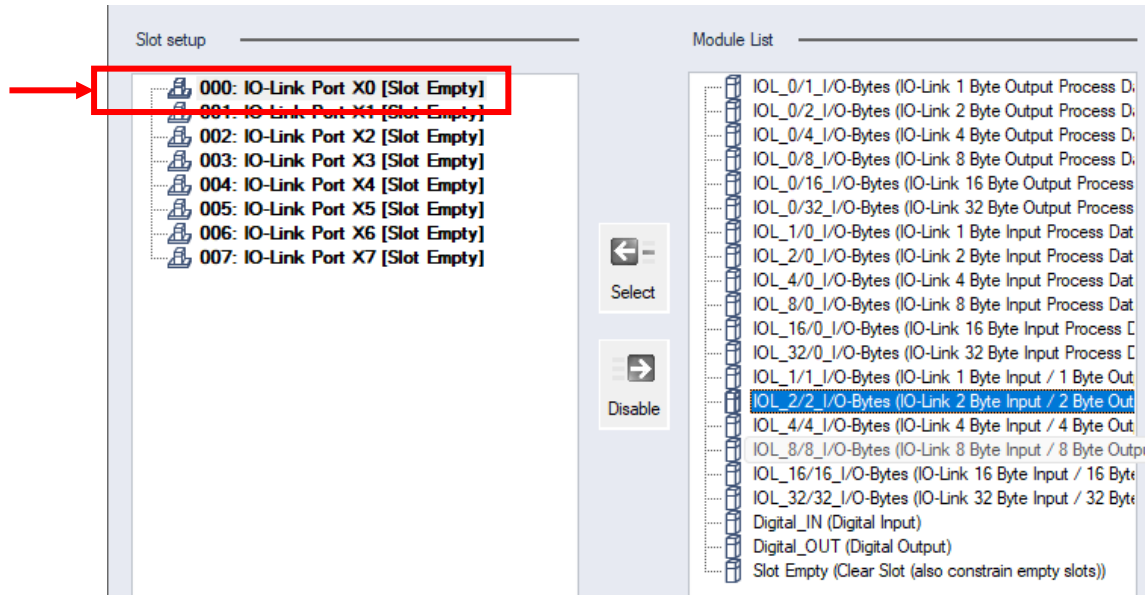
Step 1: In the Project Window, Double click on Motion Data->Slave-> Slave 1(54632). This opens up the slave window.



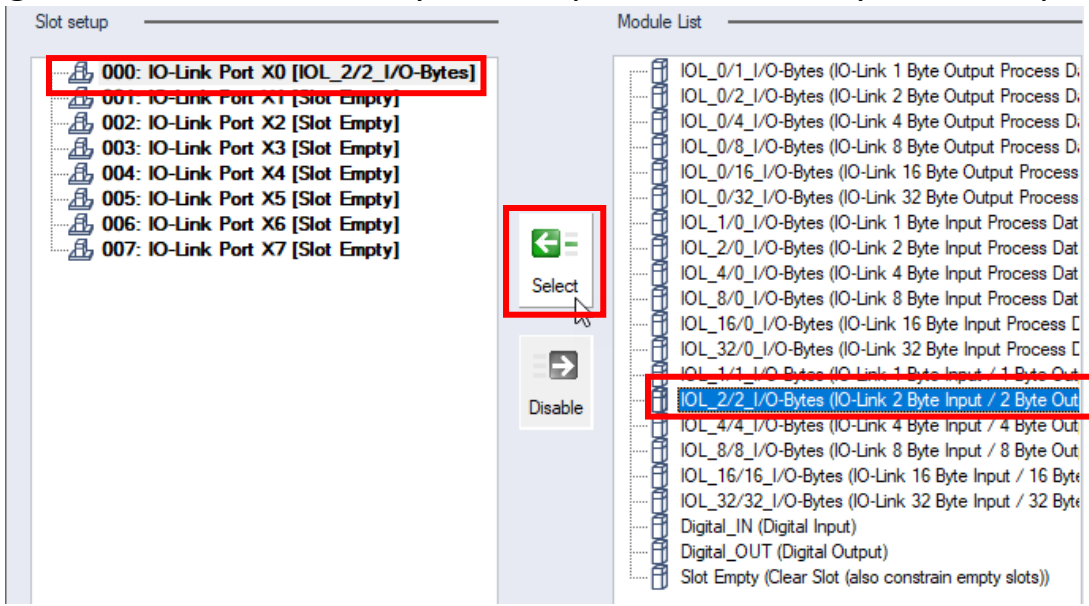
Step 2: Choose Slot setup to configure the ports on the IO-Link master.



Step 3: Each port can be configured separately. This will depend on your system setup.  
This example has a Murrelektronik 59719 IO-link hub connected to Port X0. Select Port X0.



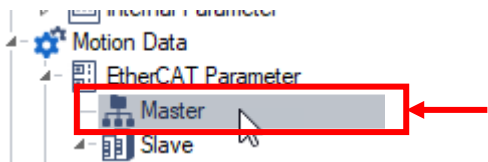
Step 4: The 59719 has 2 bytes of input data and 2 bytes of output data. Select “IOL\_2/2” and press the Select button. This will configure the Port X0 for 2 bytes of input data and 2 bytes of output data.



# Accessing IO-Link Master Data

- The data for IO-Link Ports is accessible from the Master window that is opened from the Project Window.

Step 1: In the Project Window, Double click on Motion Data->Master. This opens up the Master window.



Step 2: Choose PDO Variable.

General Information

PDO Variable

Diagnostics

Format: HEX

Variable setting

Send PDO initiator device: %IW64

Receive PDO initiator device: %QW64

☐ %MX0 => %MW0.0 Displayed In Format

Used Frame: [Progress Bar]

[Usage: 2 %, Frames: 1 / 4]

	Station No.	Rx/Tx	Object index	Object Name	Variable	Type	Device	Monitor value
1	1	Rx	0x1610	1. Rx PDO parameter				
2					_EC001_RxPDO_1610_0_PD_I_Q_Pin2_C_Q_Pin4_	UINT	%QW64	
3			0x1600	2. Rx PDO parameter				
4					_EC001_SL000_RxPDO_1600_0_output_byte_0	USINT	%QB130	
5					_EC001_SL000_RxPDO_1600_1_output_byte_1	USINT	%QB131	
6		Tx	0x1A10	1. Tx PDO parameter				
7					_EC001_TxPDO_1A10_0_PD_I_Q_Pin2_C_Q_Pin4_	UINT	%IW64	
8			0x1A11	2. Tx PDO parameter				
9					_EC001_TxPDO_1A11_0_New_Message_Available_Flag	BOOL	%IX1040	
10					_EC001_TxPDO_1A11_1_Dummy	ARRAY[0..6] OF BOOL	%IX1041	
11			0x1A80	3. Tx PDO parameter				
12					_EC001_TxPDO_1A80_0_State_of_IO_Link_Port_X0	USINT	%IB131	
13					_EC001_TxPDO_1A80_1_State_of_IO_Link_Port_X1	USINT	%IB132	
14					_EC001_TxPDO_1A80_2_State_of_IO_Link_Port_X2	USINT	%IB133	
15					_EC001_TxPDO_1A80_3_State_of_IO_Link_Port_X3	USINT	%IB134	
16					_EC001_TxPDO_1A80_4_State_of_IO_Link_Port_X4	USINT	%IB135	
17					_EC001_TxPDO_1A80_5_State_of_IO_Link_Port_X5	USINT	%IB136	
18					_EC001_TxPDO_1A80_6_State_of_IO_Link_Port_X6	USINT	%IB137	
19					_EC001_TxPDO_1A80_7_State_of_IO_Link_Port_X7	USINT	%IB138	
20			0x1A00	4. Tx PDO parameter				
21					_EC001_SL000_TxPDO_1A00_0_input_byte_0	USINT	%IB139	
22					_EC001_SL000_TxPDO_1A00_1_input_byte_1	USINT	%IB140	

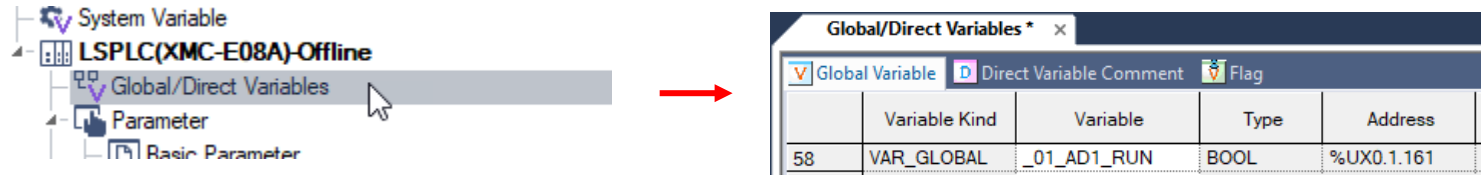
EC001 will be Slave 1 data.

SL000\_TxPDO will be input data for Port X0. RxPDO is output data.

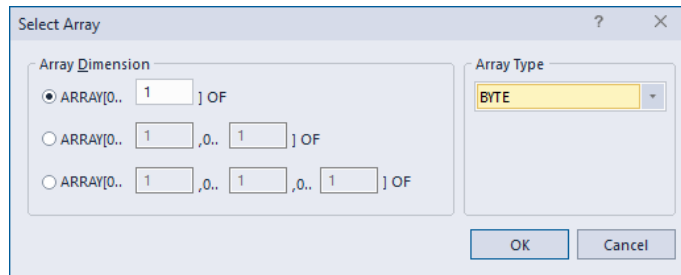
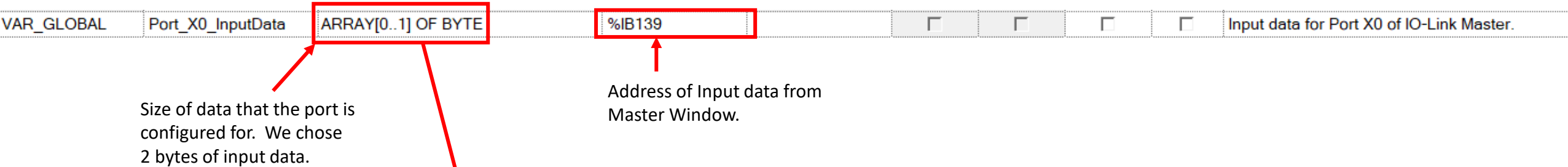
These are the address devices for the Input Data.



Step 3: Open Global/Direct Variables. Select Global Variable tab.



Step 4: Create a Global Variable named Port\_X0\_InputData with type Array[0...1] of BYTE. This will give us a tag with access to the input data of Port X0

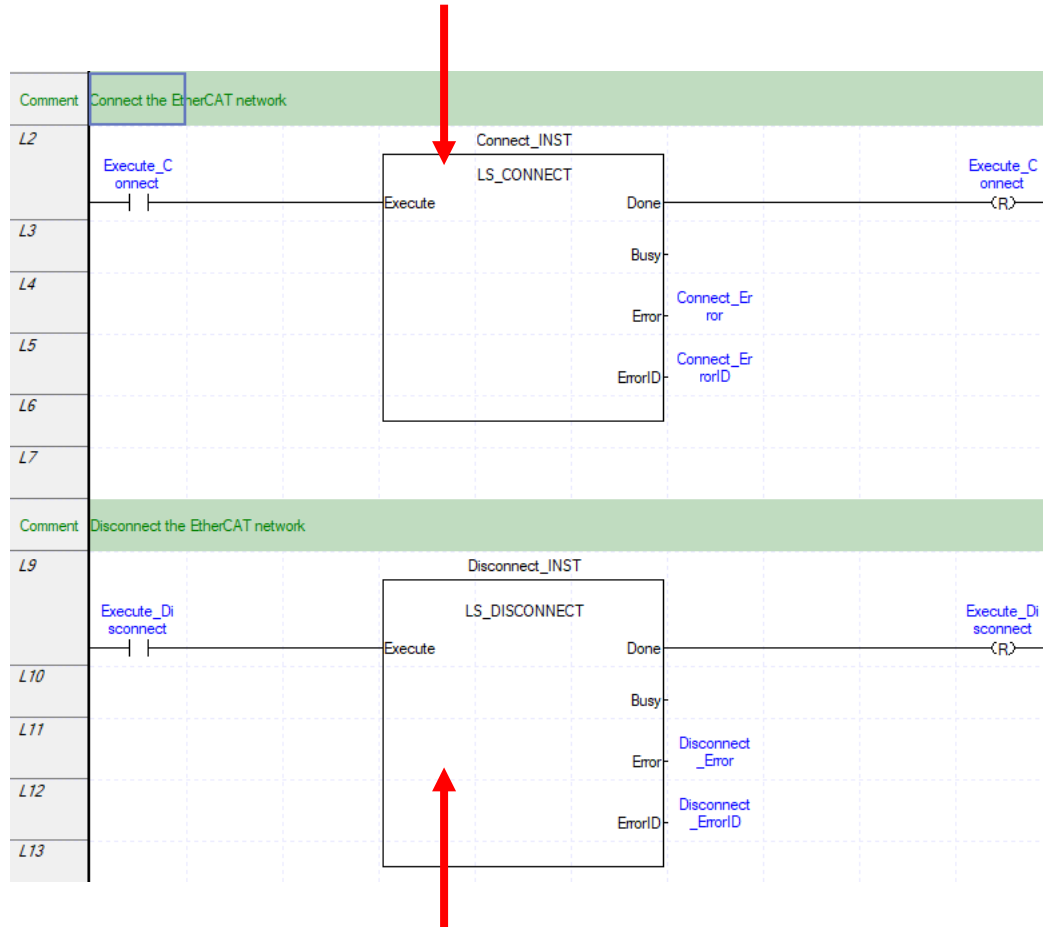


Array creation screen will appear.

## Example Code

- After adding code to your project, Write the project to the XMC.

LS\_Connect must be called first to connect the EtherCAT network.



LS\_Disconnect is used to disconnect the EtherCAT network. Must be done before doing a project write if the network is connected.

Variable/Device	Value	Type	Device/Variable
Port_X0_InputData		ARRAY[0..	%IB139
Port_X0_InputData[0]	16#01	BYTE	%IB139
Port_X0_InputData[1]	16#00	BYTE	%IB140

Data for the Port will update after connecting the EtherCAT network.