

User Manual

cMT+CODESYS and Remote I/O Quick Start Guide

This is a step-by-step instruction on how to set up cMT+CODESYS and Remote I/O.

UM018003E_20230817

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Software version: CODESYS V3.5 SP10 Patch 3

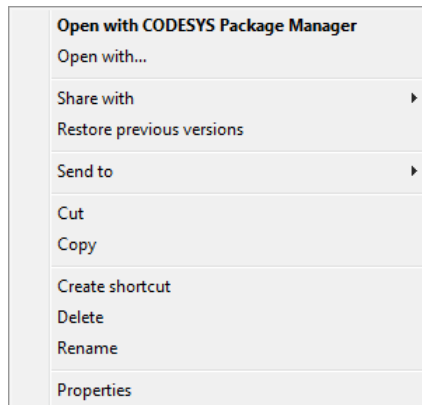
1 Installing Weintek Built-in CODESYS

Installing Weintek Built-in CODESYS allows users to easily create a cMT+CODESYS project in CODESYS software. Please find the Package file we prepared and follow these steps for quick installation.

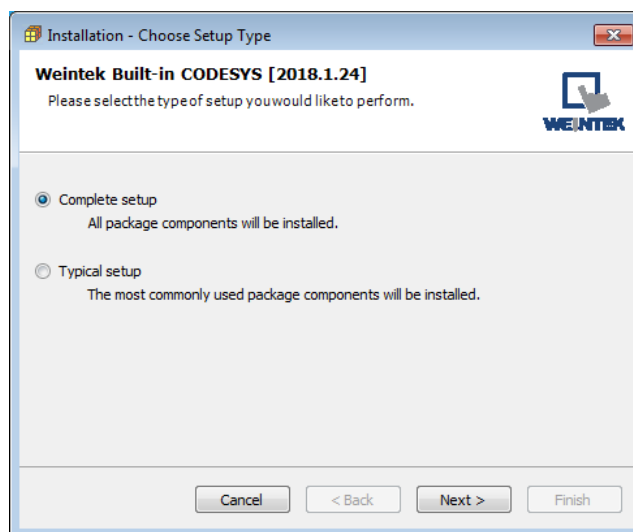
1. First, get a copy of CODESYS Package file.



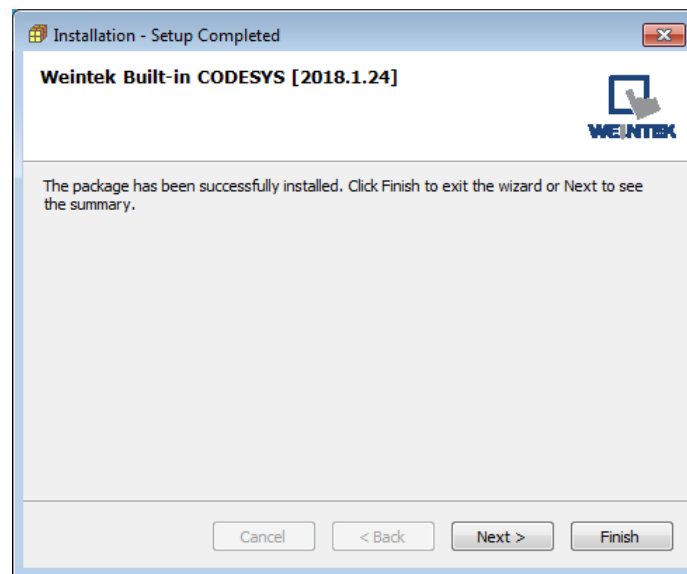
2. On your PC, right-click the mouse button and select [Open with CODESYS Package Manager].



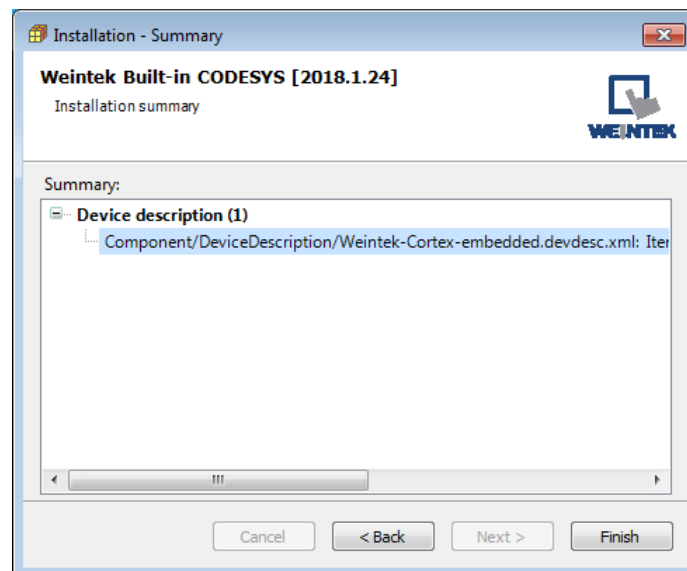
3. Select Complete Setup or Typical Setup (you may select any of these setup types since the components used by Weintek Built-in CODESYS exist in both types.)



4. Click [Next] when seeing the following message.



5. The installed component will be shown in the installation summary.



2 Connecting cMT CODESYS

2.1 Connecting Through Network

1. Connect cMT model's LAN 1 port with a router or PC.
2. Tap Start button to open HMI system settings window.

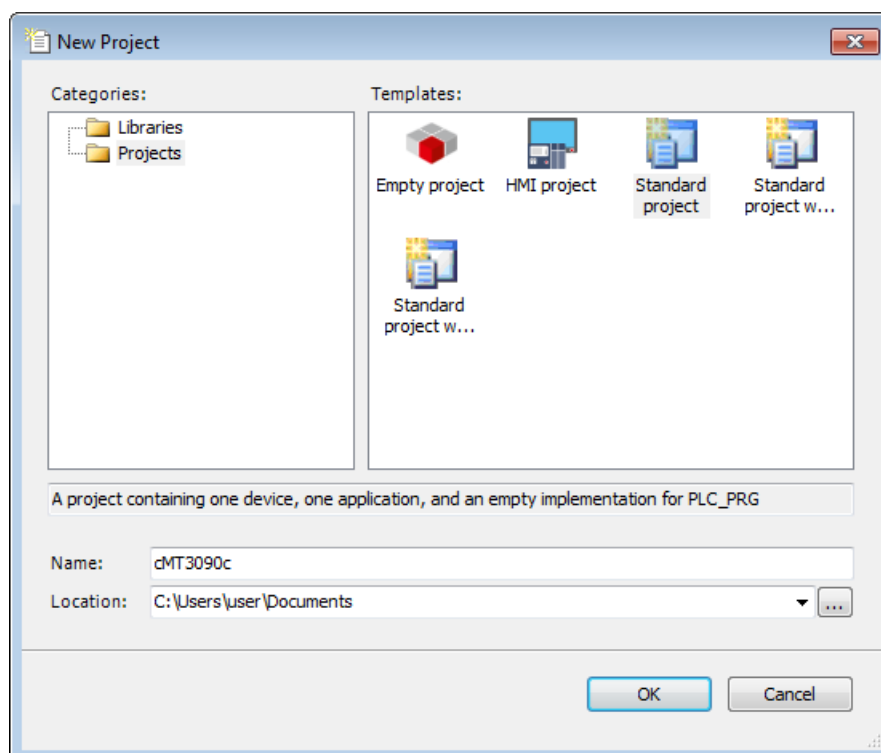


3. Open CODESYS page and find the IP address. By default, DHCP is used and it will automatically obtain an IP address.

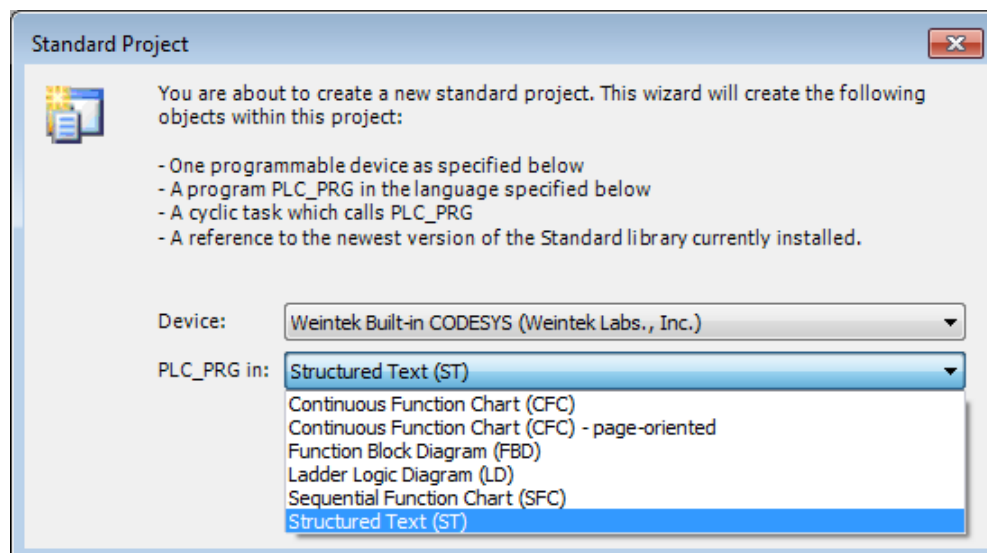


2.2 Creating CODESYS Project

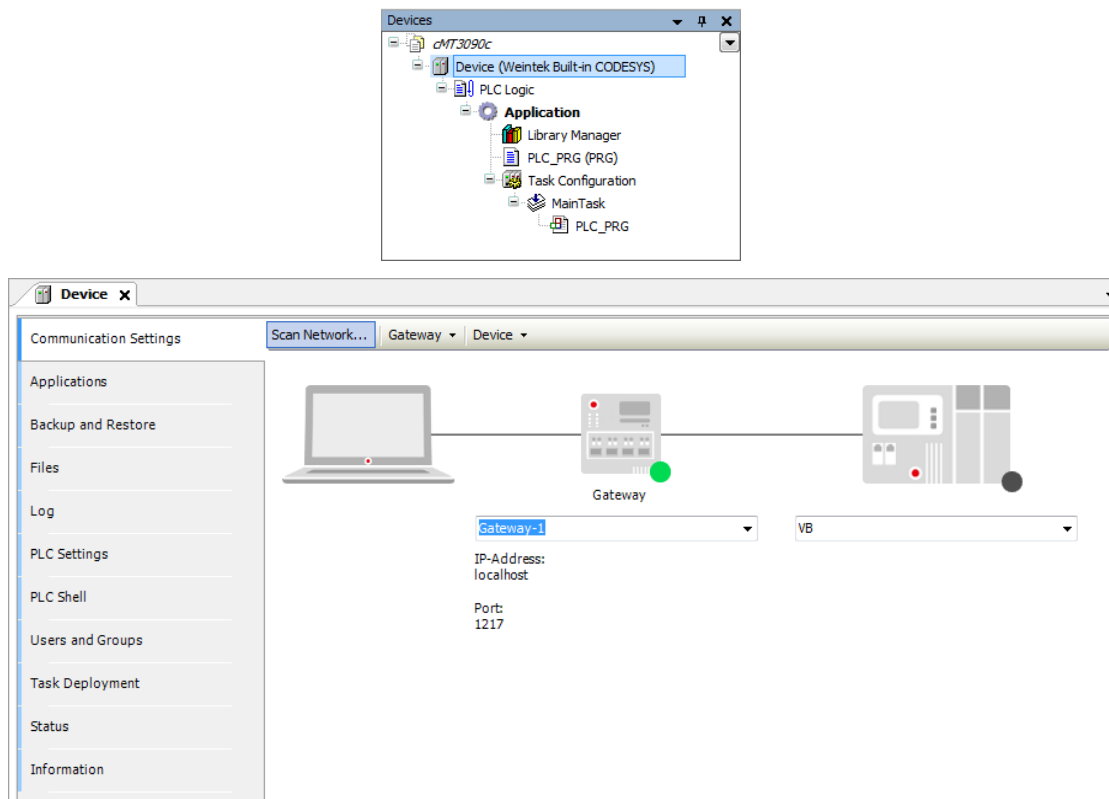
1. Launch CODESYS V3.5 and click [File] » [New Project], and then select [Standard project]. Enter the project name in Name field, browse for the location, and then click [OK] to leave.



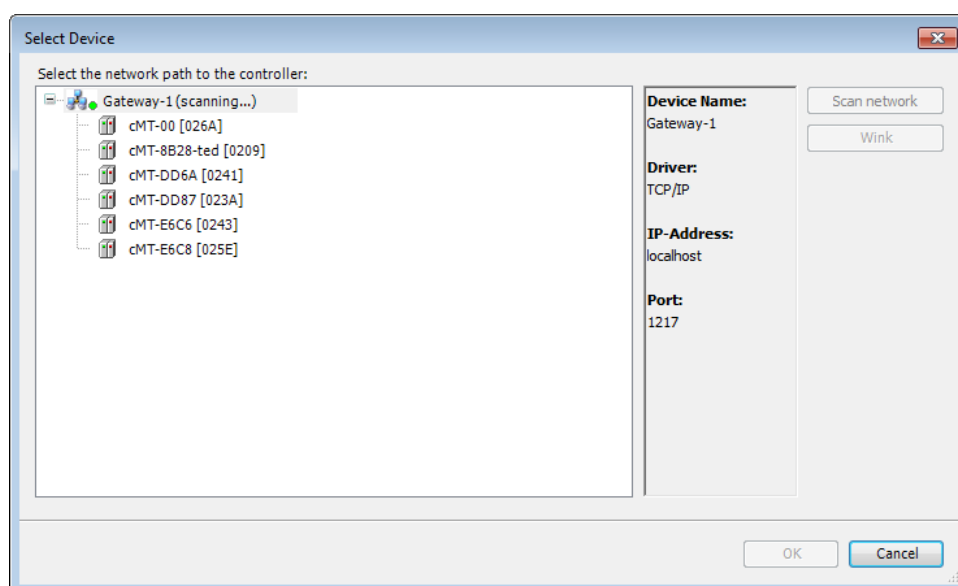
2. Select Weintek Built-in CODESYS. CODESYS software provides 6 languages that can be selected in [PLC_PRG in:] drop-down list as shown below. Structure Text (ST) is used as an example in this manual.



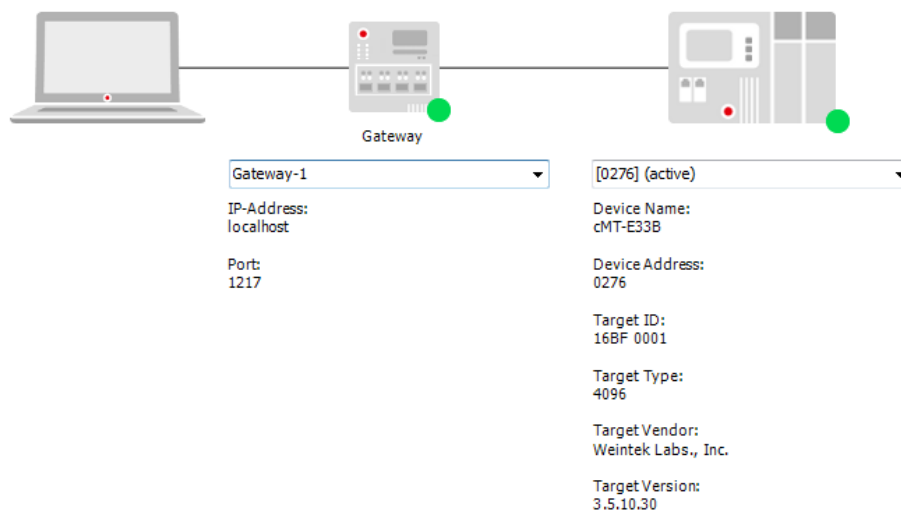
3. Double-click on Device (Weintek Built-in CODESYS) to open the settings window.



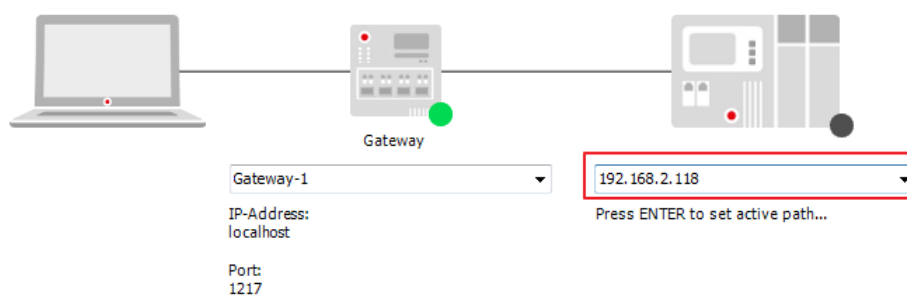
4. Open Scan Network tab, CODESYS software will start searching for the CODESYS devices on the same network. Select the desired device and then click [OK] to leave. The last two IP address parts (between dots) are converted into HEX digits and shown in this window. For example, if the IP address of the CODESYS device is 192.168.2.118, please select *HMI Name[0276]*.



5. The project will connect the selected device.

 **Note**

- IP address of the device can be entered in the field shown below.

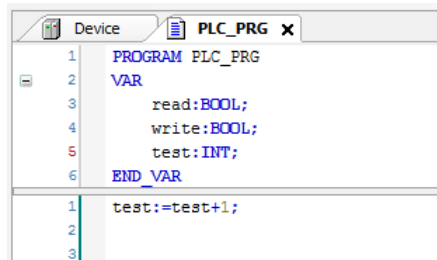


3 Creating EasyBuilder Project

*Please use EasyBuilder Pro v6.00.02 build 20180410 or later versions.

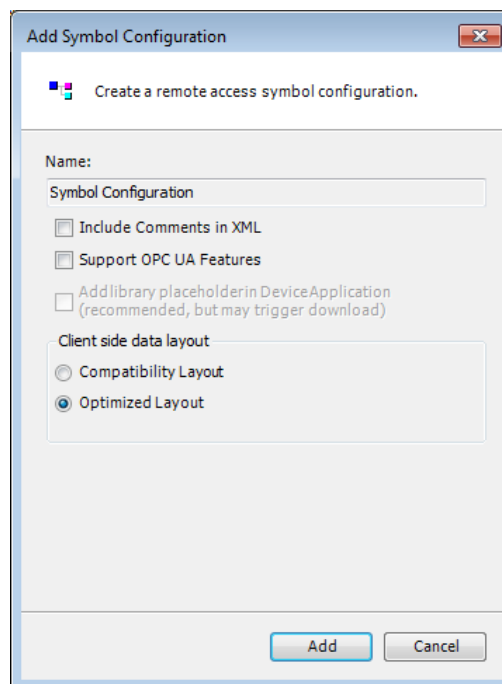
3.1 Creating Tags

1. Create several tags in PLC_PRG tab and make tag “test” accumulate automatically.

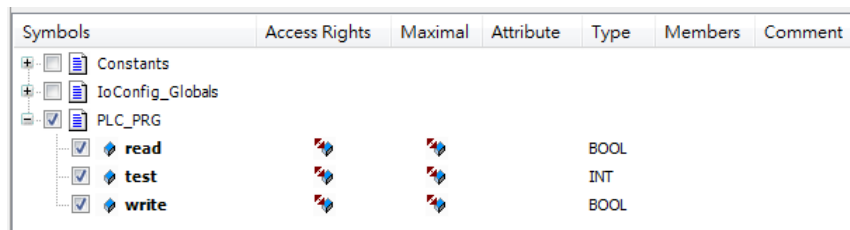


3.2 Exporting Tag

1. Right-click on Application in Devices tree and then select [Add Object] » [Symbol Configuration], use defaults.



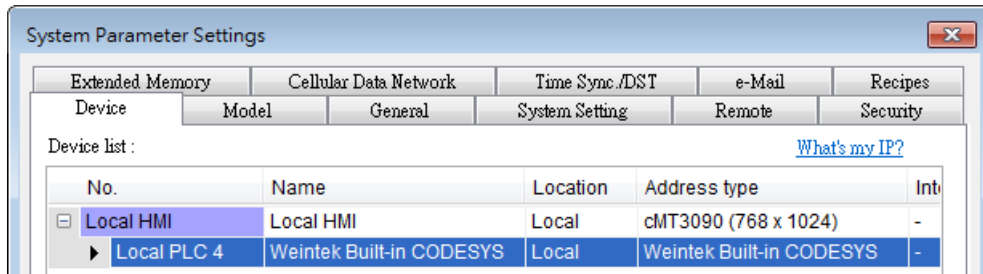
2. Find PLC_PRG, select the variables to be exported, and then click [Build].



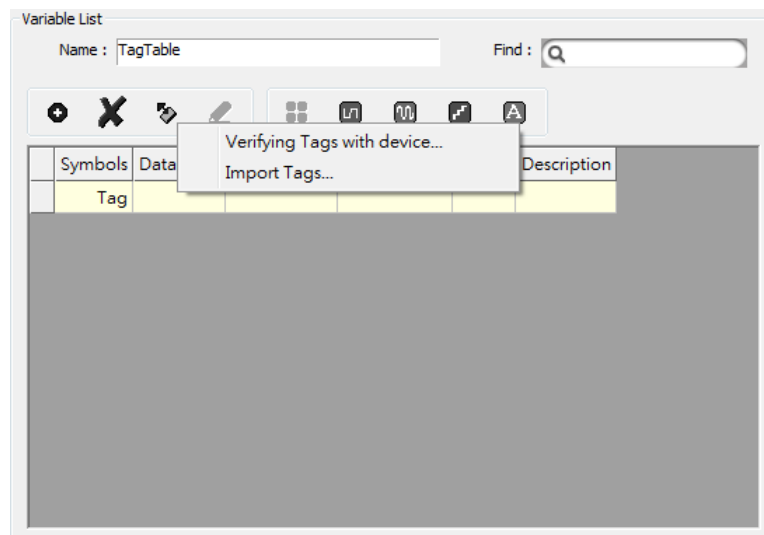
3. Select [Build] » [General code], the *.xml file can be found in the directory of the project.

3.3 Configuring EasyBuilder

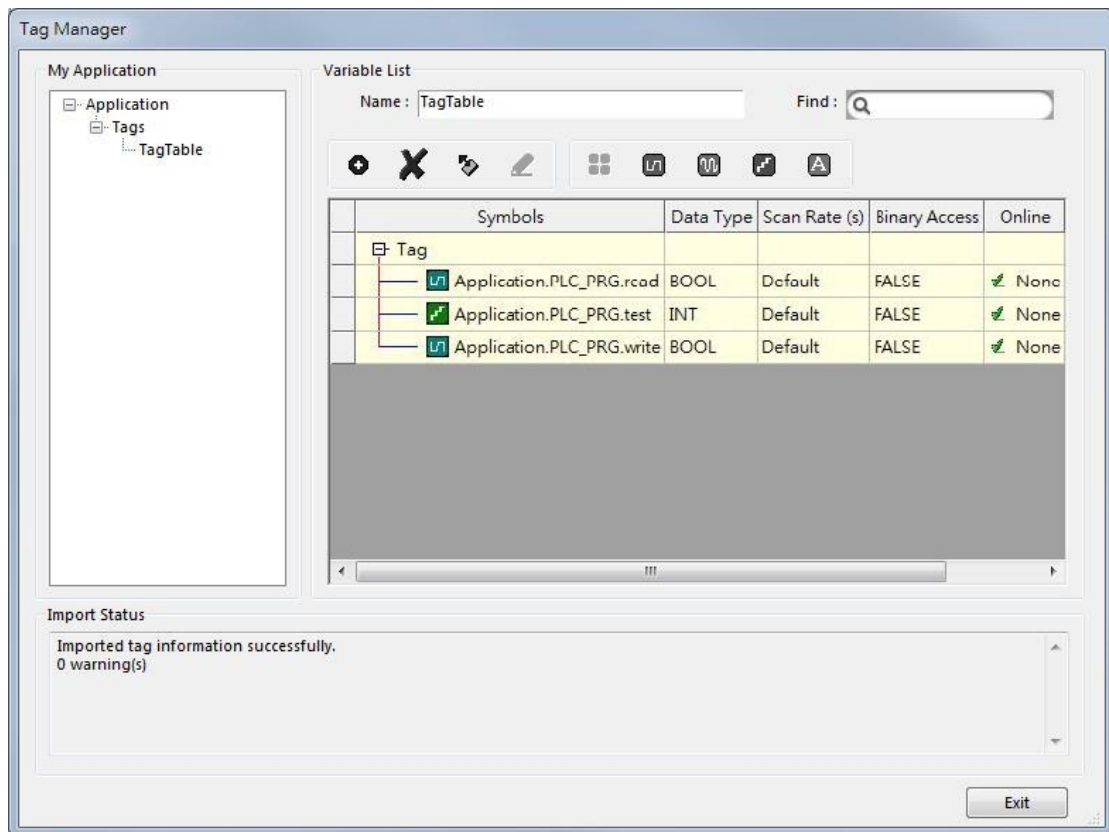
1. Create a project and select Weintek Built-in CODESYS in the device list.



2. Open Tag Manager and click , and then click [Import Tag] to import the *.xml file built in preceding steps.



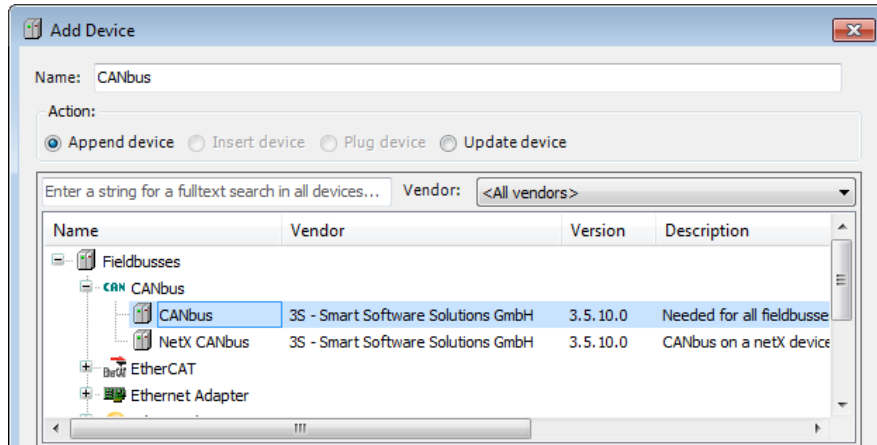
3. The CODESYS tags can now be found in Tag Manager.



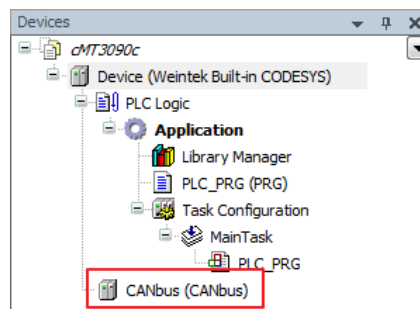
4. Create a Numeric object and use “Application.PLC_PRG.test” for address. After downloading the project to HMI, “test” tag data can be found.

4 Connecting cMT CODESYS to iR-COP

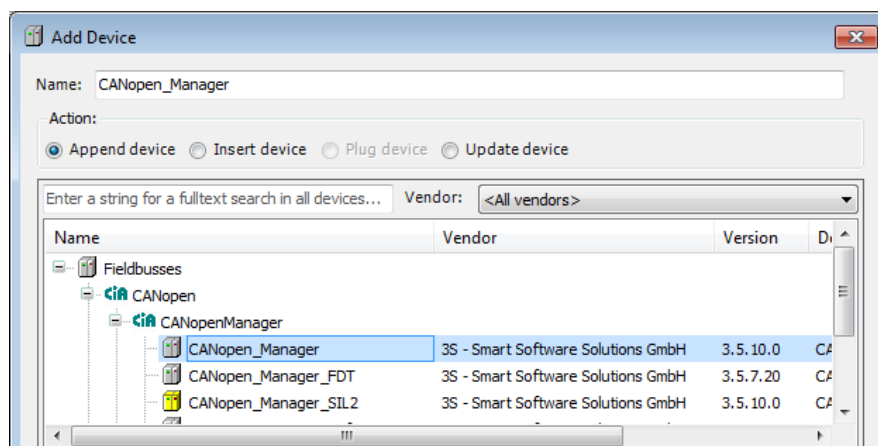
1. Right-click on Device (Weintek Built-in CODESYS) and then select [Add Device].
2. Select [CANbus] » [CANbus], and then select [Add Device].



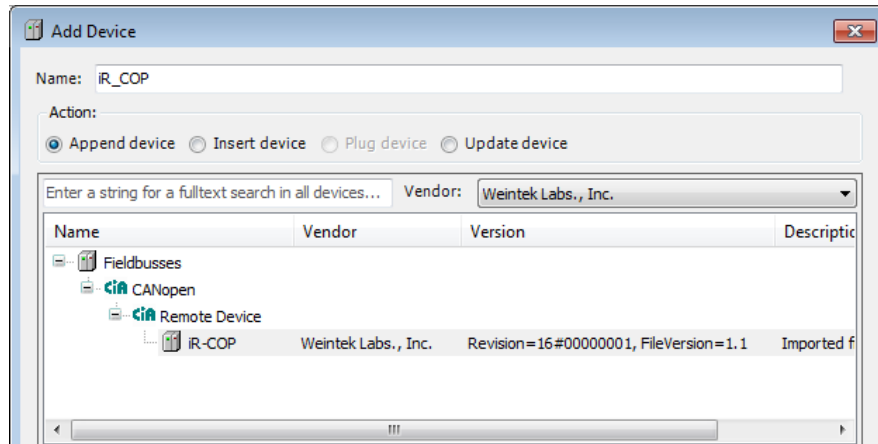
3. CANbus (CANbus) can be found in Devices tree.



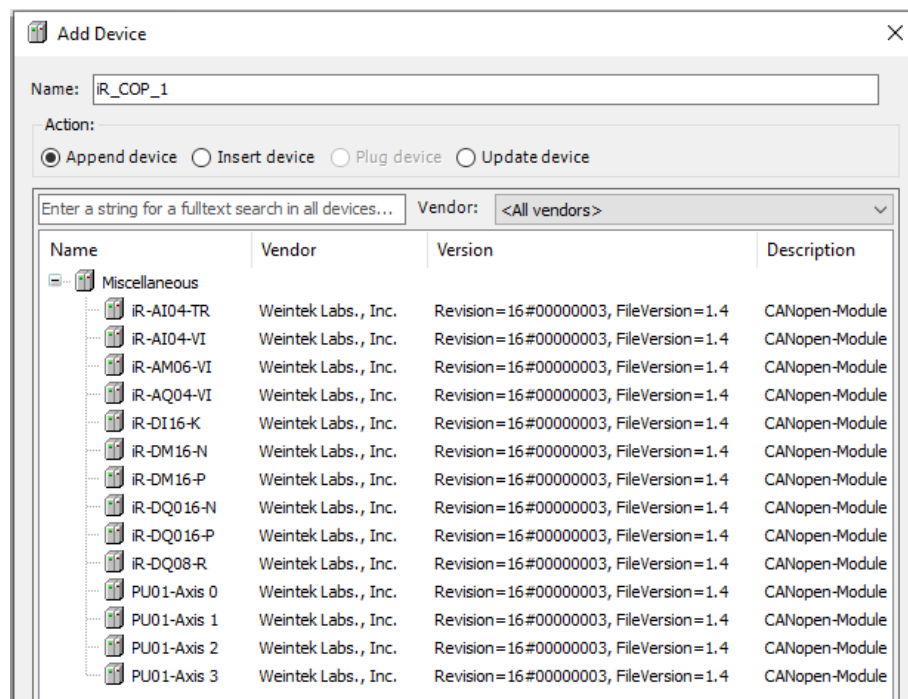
4. Double-click on CANbus (CANbus) with the current window opened in Devices tree, or right-click on CANbus (CANbus) and then select [Add Device].
5. Click [Fieldbusses] » [CANopen] » [CANopen Manager] » [CANopen Manager], and then select [Add Device].



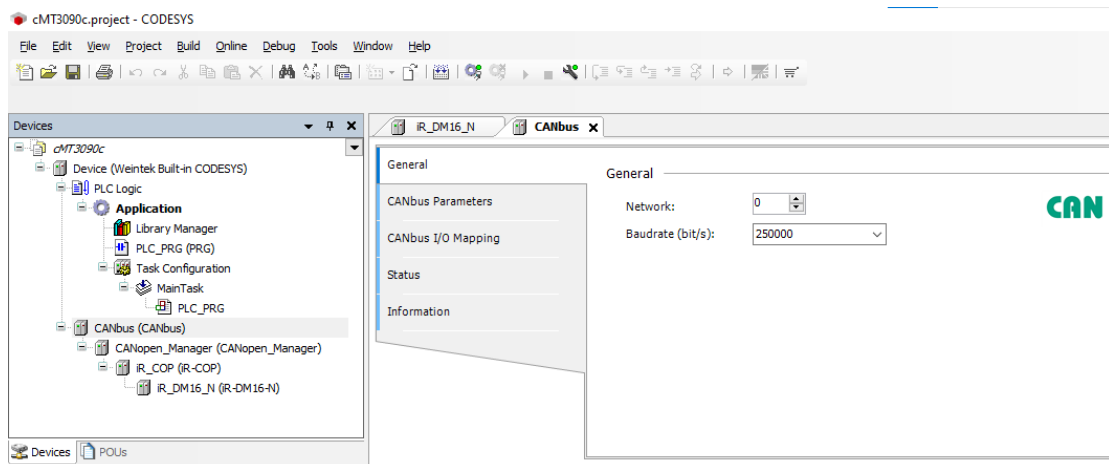
6. Double-click on CANopen_Manager with the current window opened in Devices tree or right-click on CANopen_Manager and then click [Add Device].
7. Click [Fieldbusses] » [CANopen] » [Remote Device], find iR-COP and then select [Add Device].



8. Under [iR-COP] select [Miscellaneous], add I/O module and then select [Add Device].



9. Double click on CANbus (CANbus) in Devices tree to open the settings window. Please select the correct baud rate for iR-COP in General tab.



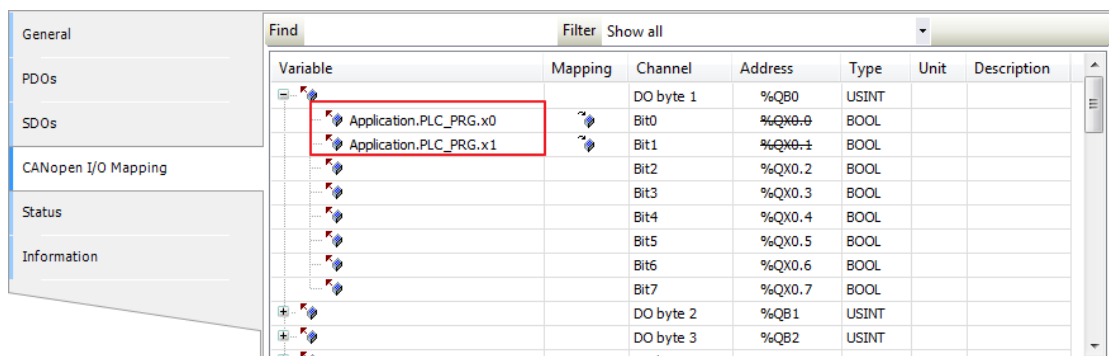
10. Create CANopen variables in PLC_PRG, for example:

```

1  PROGRAM PLC_PRG
2  VAR
3      x0 : BOOL;
4      x1 : BOOL;
5
6  END_VAR

```

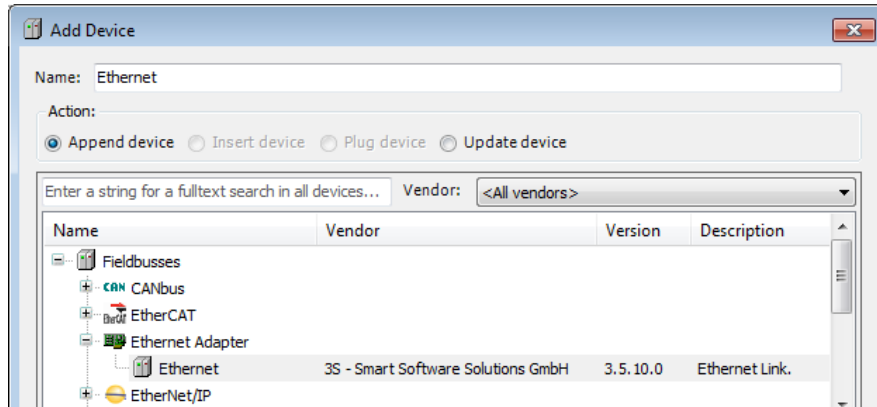
11. Double click on iR_Cop in Devices tree to open the settings window. Select related variables in CANopen I/O Mapping tab.



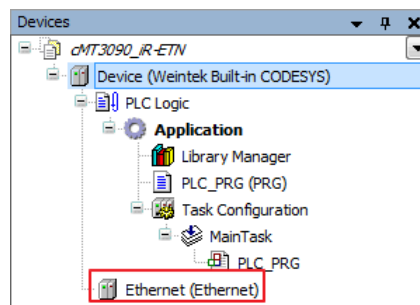
12. When finished, click [Online] » [Login] to download the project to CODESYS.

5 Connecting cMT CODESYS to iR-ETN

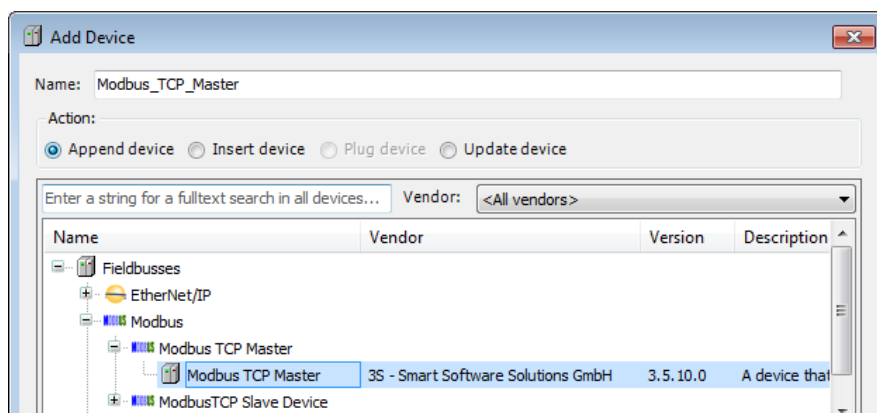
1. Right-click on Device (Weintek Built-in CODESYS/cMT-CTRL) and then select [Add Device].
2. Select [Ethernet Adapter] » [Ethernet] and then click [Add Device].



3. Ethernet (Ethernet) can be found in Devices tree.



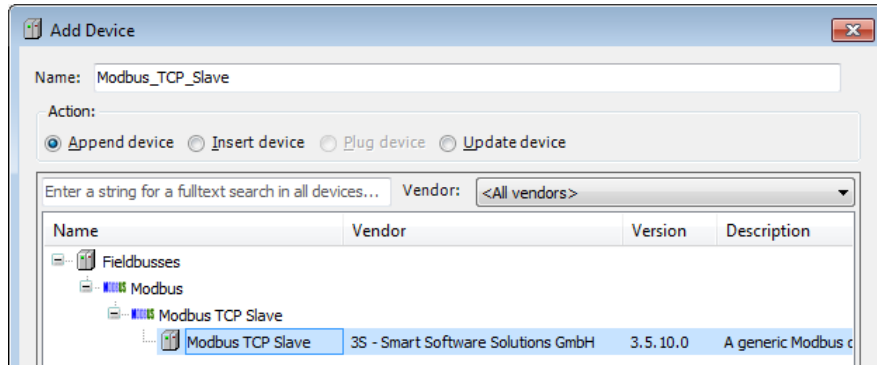
4. Double-click on Ethernet with the current window opened in Devices tree or right-click on Ethernet and then select [Add Device].
5. Click [Fieldbusses] » [Modbus] » [Modbus TCP Master] » [Modbus TCP Master], and then select [Add Device].



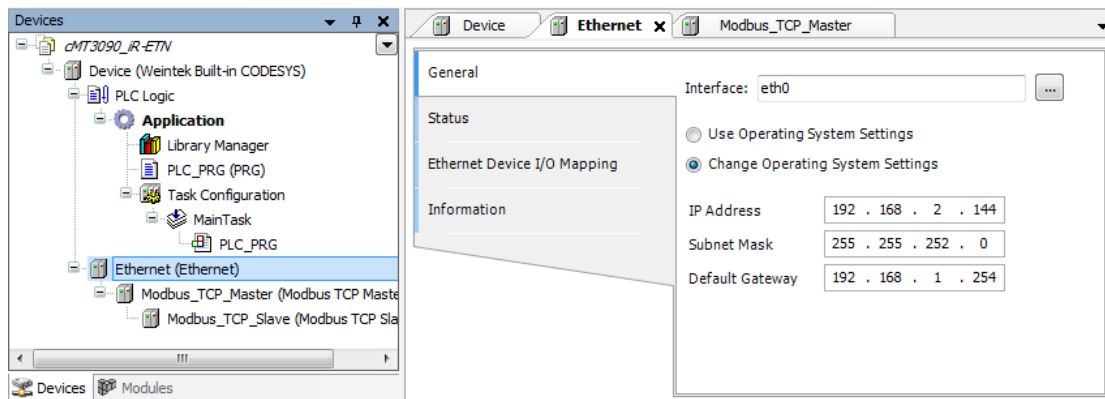
6. Double-click on Modbus TCP Master with the current window opened in Devices tree or right-click on Modbus TCP Master and then click [Add

Device].

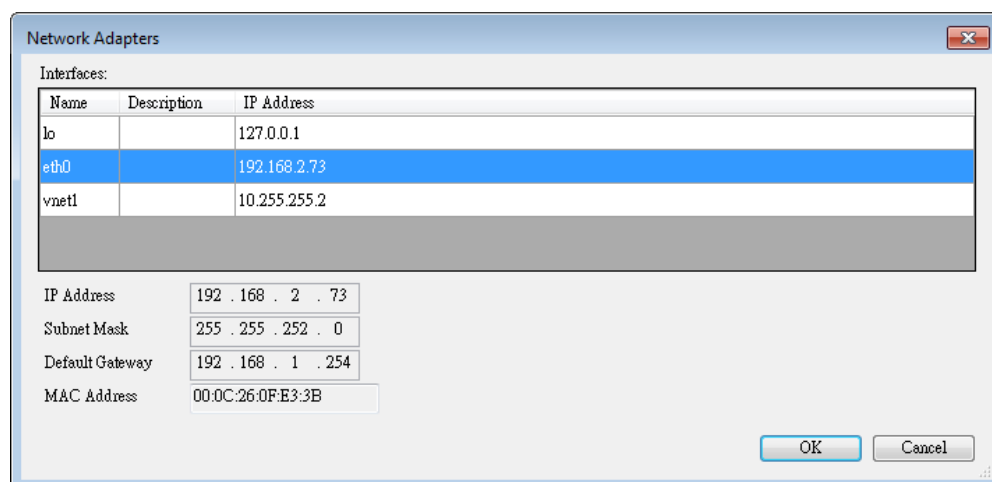
7. Click [Fieldbusses] » [Modbus] » [Modbus TCP Slave] » [Modbus TCP Slave], and then select [Add Device].



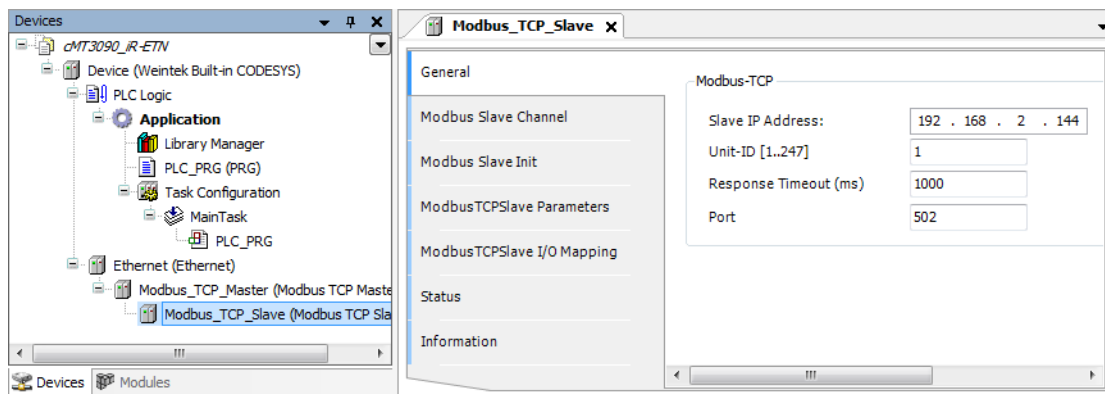
8. Double click on Ethernet in the Devices tree, enter CODESYS's IP address in General tab, and then select [Change Operating System Settings].



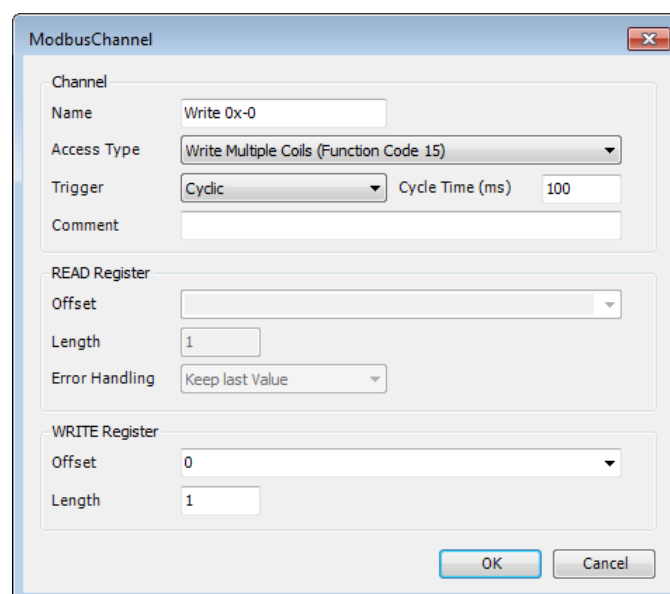
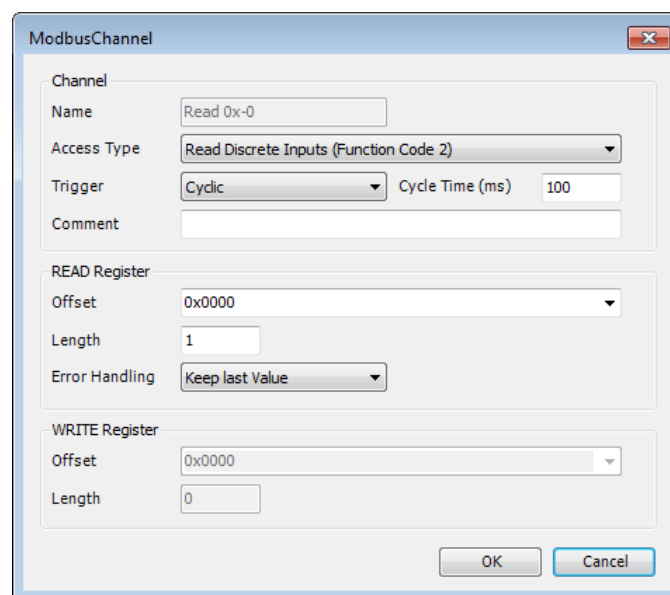
9. When CODESYS is already connected, go to General tab and click the [...] button near Interface field and select eth0.



10. Select Modbus_TCP_Slave in the Devices tree and then go to General tab to set up IR-ETN's IP address and Unit ID.



11. Open [Modbus Slave Channel] tab and create Modbus Variable.



12. Open PLC_PRG in Devices tree, create tag and set Bool as data type. Write

a command as shown below.

```

1  PROGRAM PLC_PRG
2  VAR
3      read:BOOL;
4      write:BOOL;
5  END_VAR
6
1  write:=1;
2

```

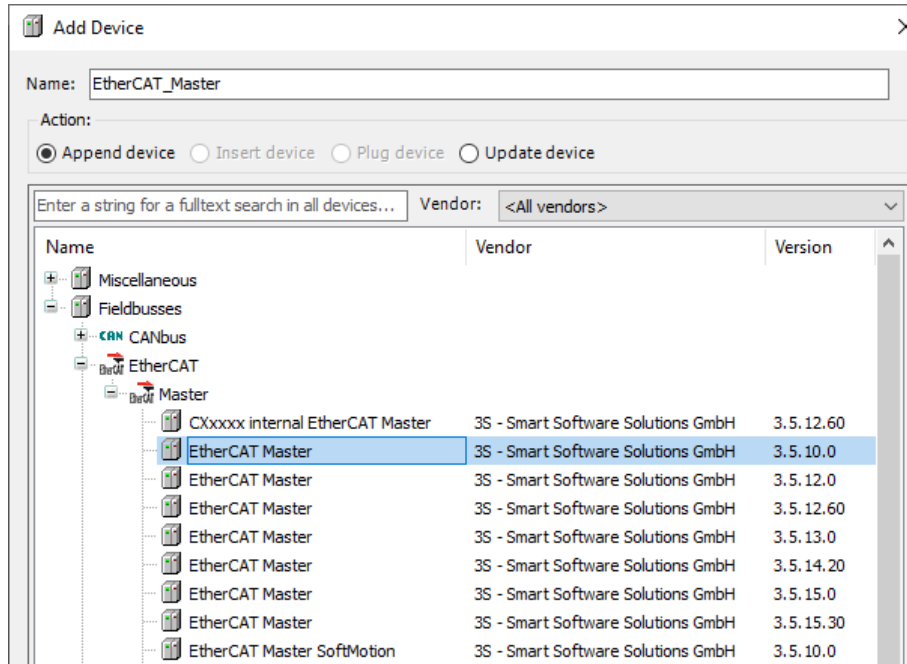
- 13.** Open Modbus_TCP_Slave in Devices tree and then go to [Modbus_TCPSlave I/O Mapping] tab to set variable mapping.

Variable	Mapping	Channel	Address	Type	Unit	Description
		Read 0x-0	%IB0	ARRAY [0..0] OF BYTE		Read Discrete Inputs
		Read 0x-0[0]	%IB0	BYTE		Read Discrete Inputs
Application.PLC_PRG.read		Bit0	%IX0-0	BOOL		0x0000
		Write 0x-0	%QB0	ARRAY [0..0] OF BYTE		Write Multiple Coils
		Write 0x-0[0]	%QB0	BYTE		Write Multiple Coils
Application.PLC_PRG.write		Bit0	%QX0-0	BOOL		0x0000

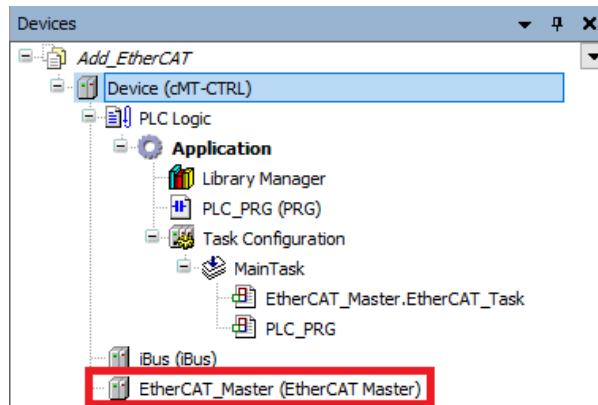
- 14.** When finished, click [Online] » [Login] to download the project to CODESYS.

6 Connecting cMT CODESYS to iR-ECAT

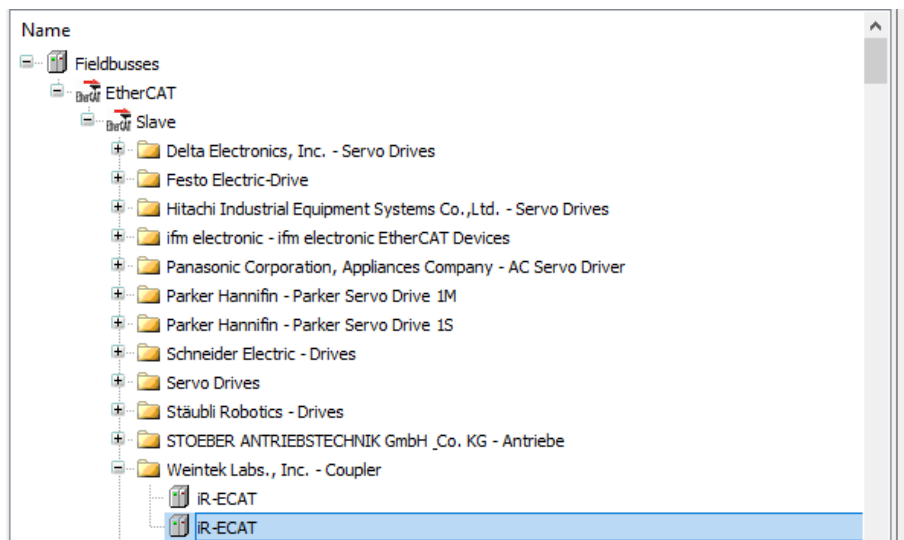
1. Right-click on Device (Weintek Built-in CODESYS/cMT-CTRL) and then select [Add Device].
2. Select [EtherCAT] » [Master] » [EtherCAT Master] and then click [Add Device].



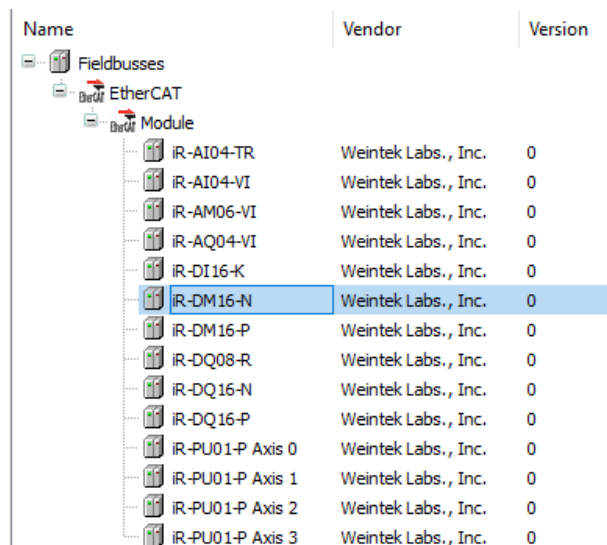
3. EtherCAT_Master can be found in Devices tree.



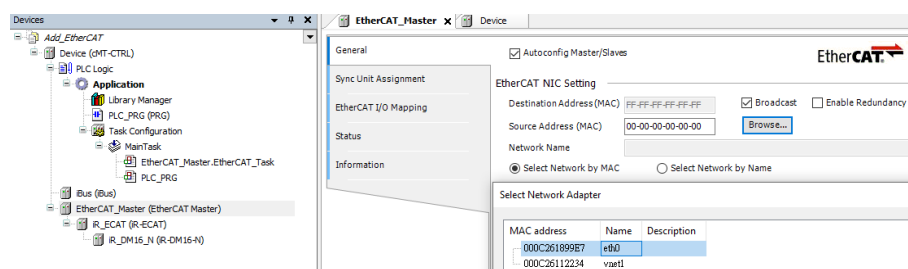
4. Double-click on EtherCAT_Master with the current window opened or in Devices tree right-click on EtherCAT_Master and then select [Add Device].
5. Click [Fieldbusses] » [EtherCAT] » [Slave] » [iR-ECAT], and then select [Add Device].



6. Double-click on iR-ECAT in Devices tree with the current window opened or right-click on iR-ECAT and then click [Add Device].
7. Click [Fieldbusses] » [EtherCAT] » [Module], and then select [Add Device].



8. Double click on EtherCAT in the Devices tree, click Browse in General tab, and then select [eth0].



9. Open PLC_PRG in Devices tree, create tag and set Bool as data type. Write a command as shown below.

```

1  PROGRAM PLC_PRG
2  VAR
3      read:BOOL;
4      write:BOOL;
5  END_VAR
6
1  write:=1;
2

```

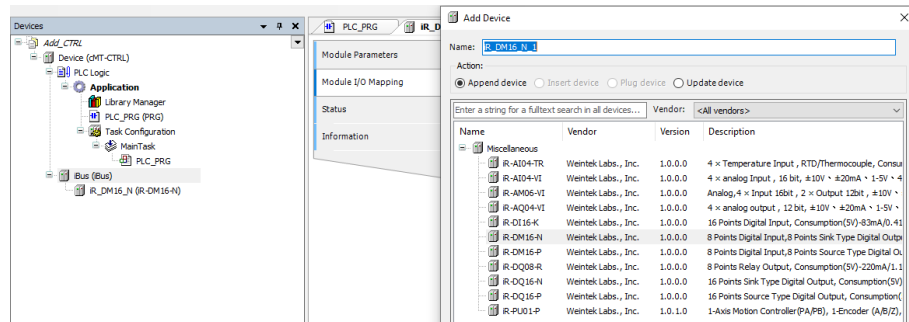
- 10.** In Devices tree open iR-ECAT » [EtherCAT I/O Mapping] and configure the settings.

Variable	Mapping	Channel	Address	Type	Unit	Description
Application.PLC_PRG.read		iR_DM16_N Digital Output	%QB0	BYTE		iR_DM16_N Digital Output
		Bit0	%QX0.0	BOOL		
		Bit1	%QX0.1	BOOL		
		Bit2	%QX0.2	BOOL		
		Bit3	%QX0.3	BOOL		
		Bit4	%QX0.4	BOOL		
		Bit5	%QX0.5	BOOL		
		Bit6	%QX0.6	BOOL		
Application.PLC_PRG.write		iR_DM16_N Digital Input	%IB2	BYTE		iR_DM16_N Digital Input
		Bit0	%IX2.0	BOOL		
		Bit1	%IX2.1	BOOL		
		Bit2	%IX2.2	BOOL		
		Bit3	%IX2.3	BOOL		
		Bit4	%IX2.4	BOOL		
		Bit5	%IX2.5	BOOL		
		Bit6	%IX2.6	BOOL		
		Bit7	%IX2.7	BOOL		

- 11.** When finished, click [Online] » [Login] to download the project to CODESYS.

7 cMT-CTRL01 Quick Start

1. Right-click on iBus and select [Add Device].
2. Select [Miscellaneous], add the iR modules connected to cMT-CTRL01, and click [Add Device].



3. Open PLC_PRG in Devices tree, create tag and set Bool as data type. Write a command as shown below.

```

1  PROGRAM PLC_PRG
2  VAR
3      read:BOOL;
4      write:BOOL;
5  END_VAR
6
1  write:=1;
2

```

4. In Devices tree open iR module list » [Module I/O Mapping] tab and configure the settings.

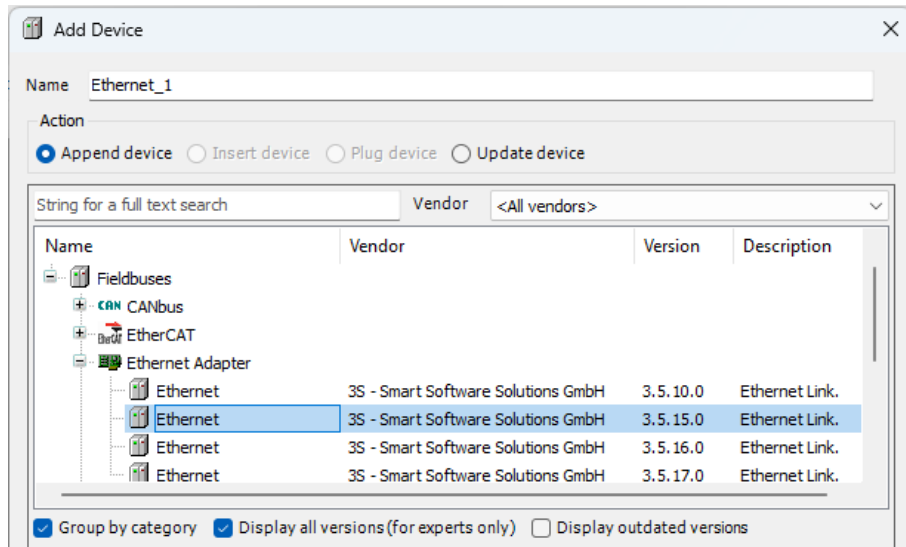
Module Parameters	Find	Filter	Show all
Module I/O Mapping	Variable	Mapping	Channel Address Type Unit Description
Status	Application.PLC_PRG.read	BIT0	%IB2.0 BOOL 24Vdc Source/Sink Input
Information		BIT1	%IX2.1 BOOL
		BIT2	%IX2.2 BOOL
		BIT3	%IX2.3 BOOL
		BIT4	%IX2.4 BOOL
		BIT5	%IX2.5 BOOL
		BIT6	%IX2.6 BOOL
		BIT7	%IX2.7 BOOL
	Application.PLC_PRG.write	OUT0	%QB0 BYTE 24Vdc Sink Output
		BIT0	%QX0.0 BOOL
		BIT1	%QX0.1 BOOL
		BIT2	%QX0.2 BOOL
		BIT3	%QX0.3 BOOL
		BIT4	%QX0.4 BOOL
		BIT5	%QX0.5 BOOL
		BIT6	%QX0.6 BOOL
		BIT7	%QX0.7 BOOL

5. When finished, click [Online] » [Login] to download the project to CODESYS.

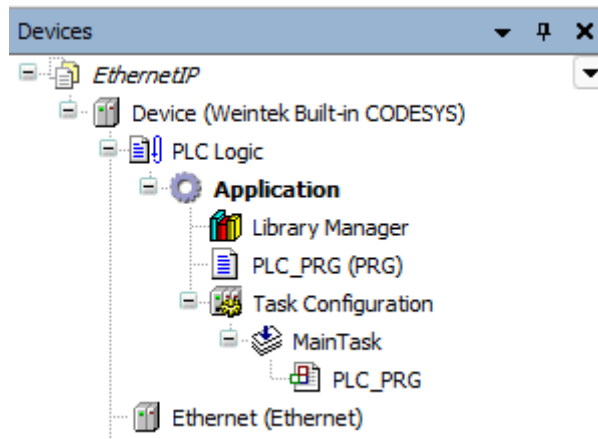
8 CODESYS Ethernet/IP Scanner Quick Start

CODESYS limitation: Currently, only the Ethernet/IP Scanner in CODESYS version 3.5.15 is supported. Using other versions may result in compilation failures.

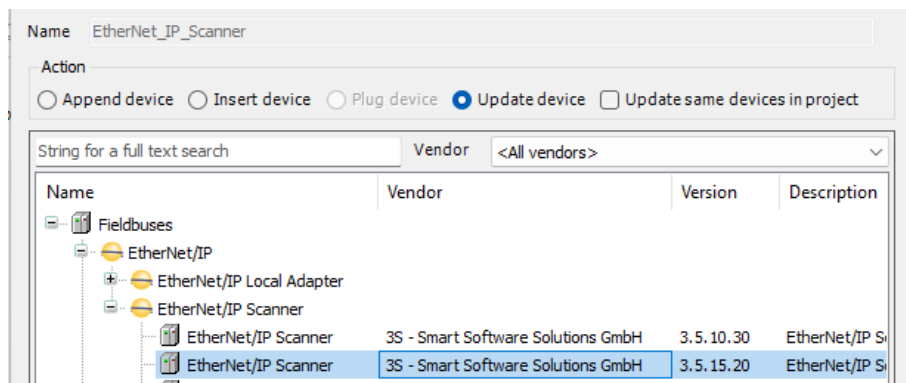
1. Right-click on Device (Weintek Built-in CODESYS/cMT-CTRL) and then select [Add Device].
2. Select [Ethernet Adapter] » [Ethernet] and then click [Add Device].



3. Ethernet (Ethernet) can be found in Devices tree.

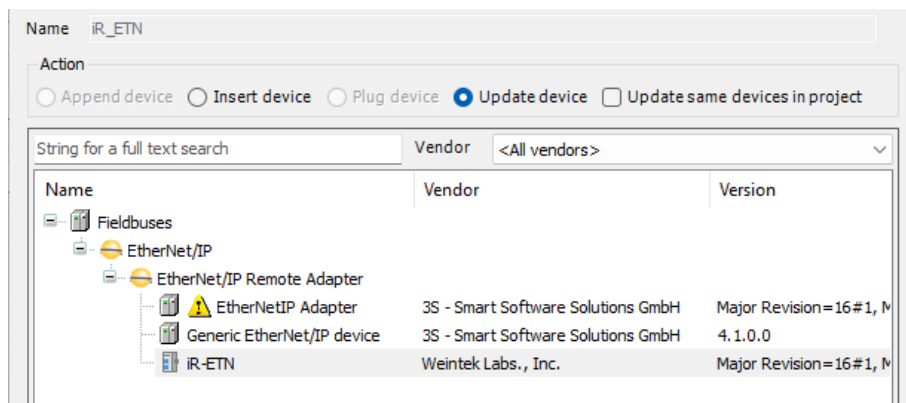


4. With the current window opened, double-click on [Ethernet] in Devices tree or right-click on [Ethernet] in Devices tree and then select [Add Device].
5. Click [Fieldbuses] » [Ethernet/IP] » [Ethernet/IP Scanner] » [Ethernet/IP Scanner], and then select [Add Device].

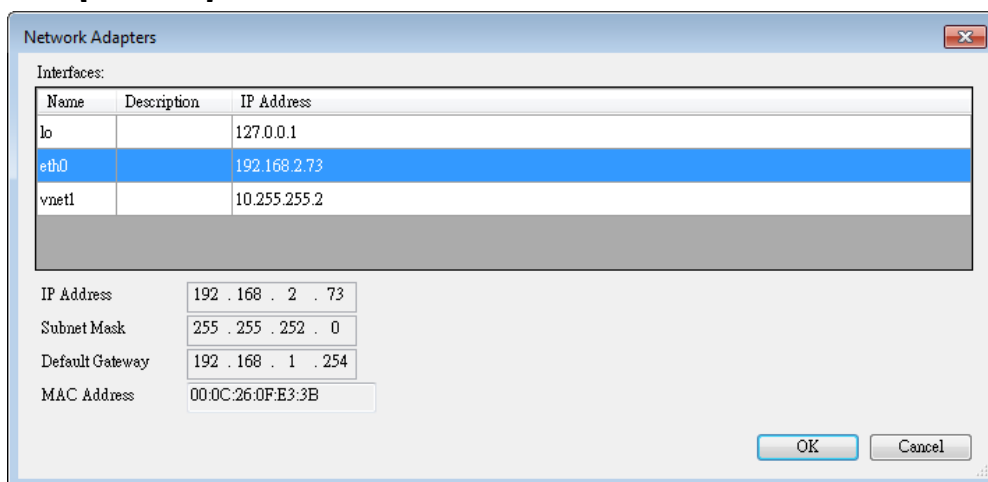


6. With the current window opened, double-click on [EtherNet/IP Scanner] in Devices tree or right-click on [EtherNet/IP Scanner] in Devices tree and then select [Add Device].
7. Click [Fieldbuses] » [EtherNet/IP] » [EtherNet/IP Remote Adapter] » [iR-ETN], and then select [Add Device].

For more information about how to generate and add iR-ETN.eds file, please see chapters 1 and 2 in [iR-ETN EtherNet/IP Connection Guide](#).

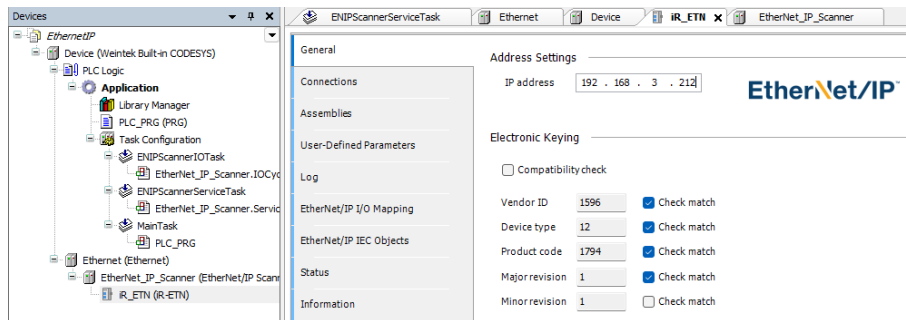


8. When CODESYS is already connected, go to General tab and click the [Browse...] button near Interface field and select eth0.



9. Select iR-ETN in Devices tree and then go to General tab to set up iR-ETN's

IP address.



10. Open PLC_PRG in Devices tree, create tag and set Bool as data type. Write a command as shown below.

```

1  PROGRAM PLC_PRG
2  VAR
3      read:BOOL;
4      write:bool;
5  END_VAR
1  write:=TRUE;

```

11. In Devices tree open iR_ETN » [Ethernet/IP I/O Mapping] tab and configure the settings.

Variable	Mapping	Channel	Address	Type	Unit	Description
Exclusive Owner						
Application.PLC_PRG.read		slot 1 DM16-N DI	%IB0	BYTE		New Help String
		Bit0	%IX0.0	BOOL		
		Bit1	%IX0.1	BOOL		
		Bit2	%IX0.2	BOOL		
		Bit3	%IX0.3	BOOL		
		Bit4	%IX0.4	BOOL		
		Bit5	%IX0.5	BOOL		
		Bit6	%IX0.6	BOOL		
		Bit7	%IX0.7	BOOL		
		slot 2 DM16-P DI	%IB1	BYTE		New Help String
Application.PLC_PRG.write		slot 1 DM16-N DO	%QB0	BYTE		New Help String
		Bit0	%QX0.0	BOOL		
		Bit1	%QX0.1	BOOL		
		Bit2	%QX0.2	BOOL		
		Bit3	%QX0.3	BOOL		
		Bit4	%QX0.4	BOOL		
		Bit5	%QX0.5	BOOL		
		Bit6	%QX0.6	BOOL		
		Bit7	%QX0.7	BOOL		
		slot 2 DM16-P DO	%QB1	BYTE		New Help String

12. When finished, click [Online] » [Login] to download the project to CODESYS.

9 Starting iR Analog Modules

9.1 Analog Module Wiring

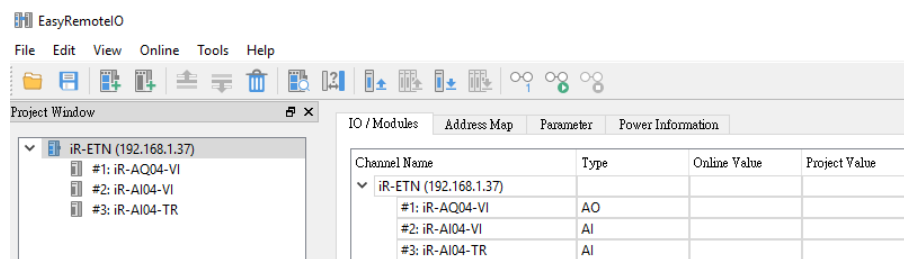
Please see [UM018013E iR-Axxx-VI UserManual eng.pdf](#) for information on wiring when using iR-AI04-VI,iR-AM06-VI,iR-AQ04-VI modules.

Please see [UM018014E iR-Axxx-TR UserManual eng.pdf](#) for information on wiring when using iR-AI04-TR module.

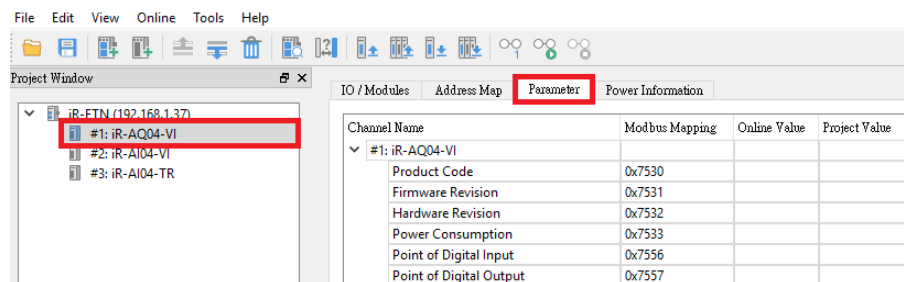
9.2 Setting Analog Channels

9.2.1 Using EasyRemoteIO to Set Channels (iR-ETN)

1. Search for iR-ETN on the network.



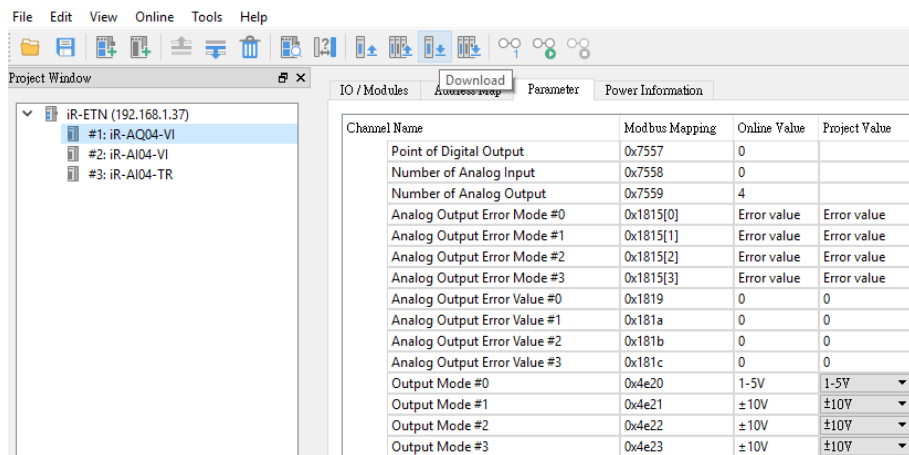
2. Open the parameter tab of the module to be set.



3. Enter the parameters as shown below.

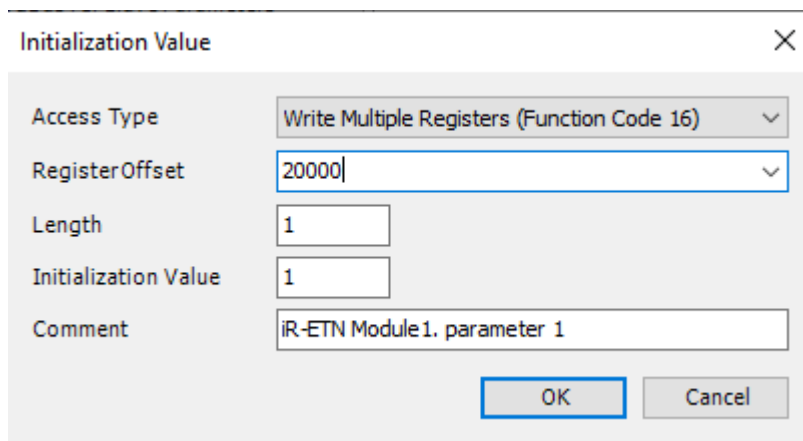
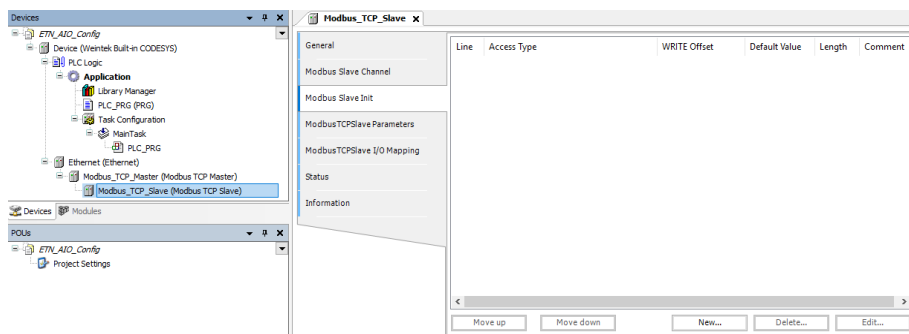
Channel Name	Modbus Mapping	Online Value	Project Value
Analog Output Error Mode #3	0x1815[3]		Keep last value
Analog Output Error Value #0	0x1819		0
Analog Output Error Value #1	0x181a		0
Analog Output Error Value #2	0x181b		0
Analog Output Error Value #3	0x181c		0
Output Mode #0	0x4e20		±10V
Output Mode #1	0x4e21		Close
Output Mode #2	0x4e22		±10V
Output Mode #3	0x4e23		±5V
Output Scale Range Upper Limit #0	0x4e24		1-5V
Output Scale Range Upper Limit #1	0x4e25		±20mA
Output Scale Range Upper Limit #2	0x4e26		4-20mA
Output Scale Range Upper Limit #3	0x4e27		32000

4. Download the project to finish setting parameters.



9.2.2 Using CODESYS to Set Channels (iR-ETN)

1. Add iR-ETN in CODESYS according to the wiring diagram.
2. [Modbus_TCP_Slave] » [Modbus Slave Init] » [New]



Find iR-ETN Modbus Address Mapping table in these user manuals:

For analog modules see [UM018013E iR-Axxx-VI UserManual eng.pdf](#)

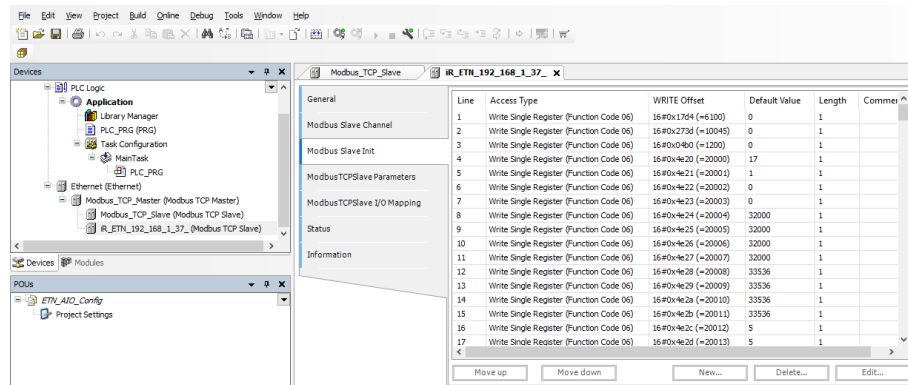
For temperature module see [UM018014E iR-Axxx-TR UserManual eng.pdf](#)

3. When finished, click [Online] » [Login] to download the project to

CODESYS.

Exporting PLCOpenXML from EasyRemoteIO:

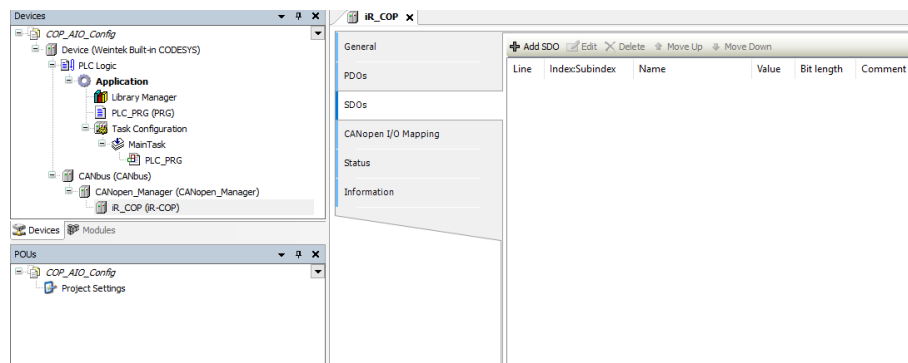
1. Open EasyRemoteIO » [File] » [Export PLCOpen XML].
2. Select Modbus_TCP_Master device, open Project tab » [Import PLCOpenXML File].

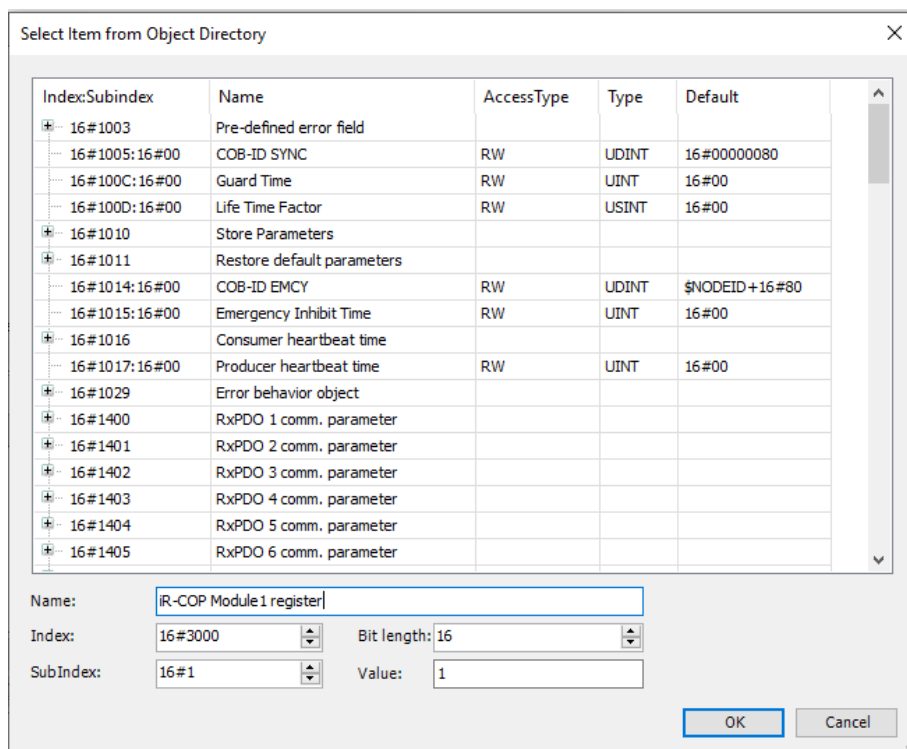


Parameter settings in EasyRemoteIO will be imported to CODESYS, and the parameters are written to the module after login.

9.2.3 Using CODESYS to Set Channels (iR-COP)

1. Add iR-COP following the steps explained in Chapter 4 in this manual.
2. [iR_COP] » [SDOs] » [Add SDO]





Find iR-COP Address Mapping table in these user manuals:

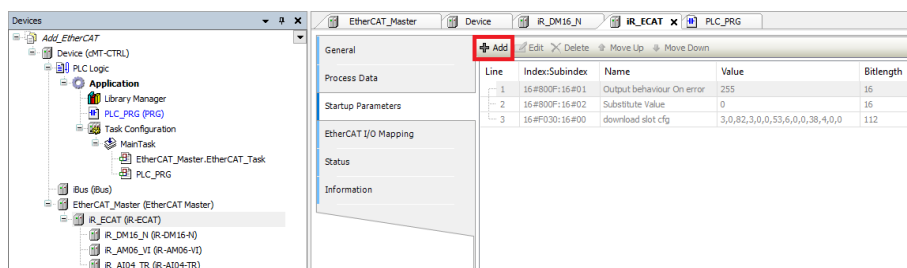
For analog modules see [UM018013E iR-Axxx-VI UserManual eng.pdf](#)

For temperature modules see [UM018014E iR-Axxx-TR UserManual eng.pdf](#)

- When finished, click [Online] » [Login] to download the project to CODESYS.

9.2.4 Using CODESYS to Set Channels (iR-ECAT)

- Add iR-ECAT following the steps explained in Chapter 6 in this manual.
- [iR_ECATT] » [Startup Parameters] » [Add]



Select Item from Object Directory

Index:Subindex	Name	Flags	Type	Default
16#7000:16#00	Digital Output	RW	USINT	
16#7010:16#00	Analog Output	RW	USINT	
16#800F:16#00	output value Parameter On error			
16#8010:16#00	iR-AM06-VI Parameter			
16#01	Channel 0 Output Mode	RW	UINT	16#0001
16#02	Channel 1 Output Mode	RW	UINT	16#0001
16#05	Channel 0 Output Scale Range Up...	RW	INT	
16#06	Channel 1 Output Scale Range Up...	RW	INT	
16#09	Channel 0 Output Scale Range Lo...	RW	INT	
16#0A	Channel 1 Output Scale Range Lo...	RW	INT	
16#0D	Channel 0 Update Time	RW	UINT	16#0000
16#0E	Channel 1 Update Time	RW	UINT	16#0000
16#11	Error Code	RW	UINT	16#0000
16#12	Command	RW	UINT	16#0000
16#13	Channel Detection	RW	UINT	16#0000
16#14	Conversion Time	RW	UINT	16#0000

Name: Channel 0 Output Mode

Index: 16# 8010 Bitlength: 16

SubIndex: 16# 1 Value: 1

☐ Complete Access ☐ Byte Array

OK Cancel

- When finished, click [Online] » [Login] to download the project to CODESYS.

9.3 Analog Channel IO Mapping

9.3.1 Reading / Writing iR-ETN Channels

- [Modbus_TCP_Slave] » [Modbus Slave Channel] » [Add Channel]

ModbusChannel

Channel

Name: iR-ETN AI Channel 0

Access Type: Read Input Registers (Function Code 4)

Trigger: Cyclic Cycle Time (ms): 100

Comment:

READ Register

Offset:

Length: 1

Error Handling: Keep last Value

WRITE Register

Offset:

Length: 1

OK Cancel

Channel Input Function Code 3 & 4, Modbus address start from 0x0000.

Channel Output Function Code 6 & 16, Modbus address start from 0x0100.

See [UM018002E iR-ETN UserManual_eng.pdf](#) for information on:

Analog Input Mapping to Modbus (also applicable for temperature module).

Analog Output Mapping to Modbus.

2. Open PLC_PRG in Devices tree, create tag and set INT as data type. Write a command as shown below.

```

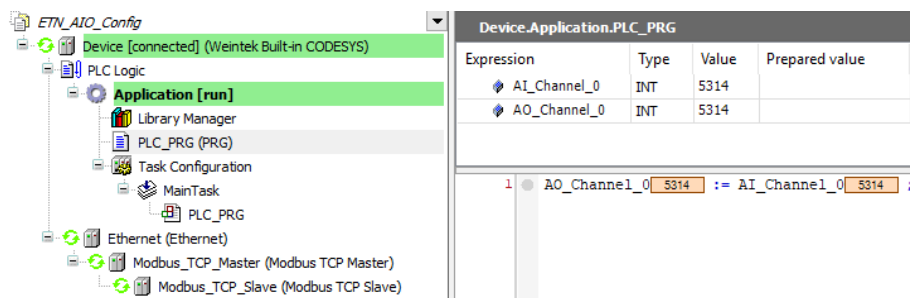
1  PROGRAM PLC_PRG
2  VAR
3      AI_Channel_0 : INT ;
4      AO_Channel_0 : INT ;
5  END_VAR
6
7  1  AO_Channel_0 := AI_Channel_0 ;

```

3. In Devices tree open Modbus_TCP_Slave » [ModbusTCPSlave I/O Mapping] tab and configure the settings.

General		Find	Filter	Show all
Modbus Slave Channel	Variable	Mapping	Channel	Address
Modbus Slave Init	Application.PLC_PRG.AI_Channel_0	IR-ETN AI Channel 0	%IWW9	ARRAY [0..0] OF WORD
ModbusTCPSlave Parameters	Application.PLC_PRG.AO_Channel_0	IR-ETN AO Channel 0	%QWW9	ARRAY [0..0] OF WORD
ModbusTCPSlave I/O Mapping				
Status				
Information				

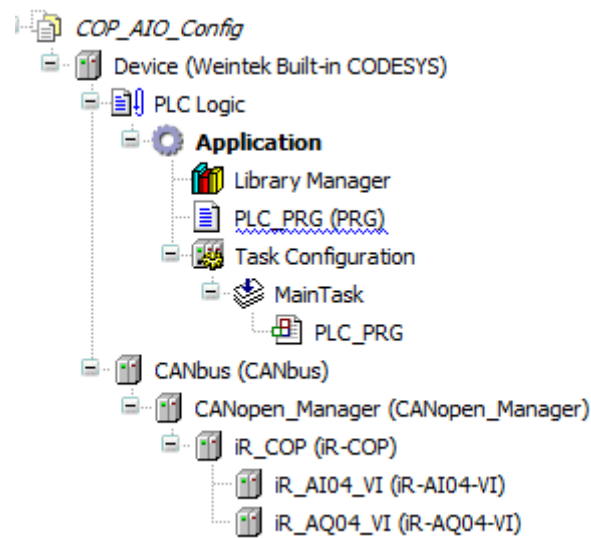
4. When finished, click [Online] » [Login] to download the project to CODESYS.



The screenshot shows the CODESYS IDE interface. On the left, the 'Devices tree' displays the project structure, including 'ETN_AIO_Config', 'Device [connected] (Weintek Built-in CODESYS)', 'PLC Logic', 'Application [run]', 'Library Manager', 'PLC_PRG (PRG)', 'Task Configuration', 'MainTask', 'PLC_PRG', 'Ethernet (Ethernet)', 'Modbus_TCP_Master (Modbus TCP Master)', and 'Modbus_TCP_Slave (Modbus TCP Slave)'. The 'Modbus_TCP_Slave' is selected. On the right, the 'Device.Application.PLC_PRG' window shows the program code. The 'Expression' column lists 'AI_Channel_0' and 'AO_Channel_0', both of type 'INT'. The 'Value' column shows '5314' for both. The 'Prepared value' column is empty. Below the table, the program code is displayed: '1 AO_Channel_0 := AI_Channel_0 ;'.

9.3.2 Reading / Writing iR-COP Channels

1. Add Analog module.



2. Open PLC_PRG in Devices tree, create tag and set INT as data type. Write a command as shown below.

```

1  PROGRAM PLC_PRG
2  VAR
3      COP_AI_Channel_0 : INT ;
4      COP_AO_Channel_0 : INT ;
5  END_VAR

```

```

1  COP_AO_Channel_0 : COP_AI_Channel_0 ;

```

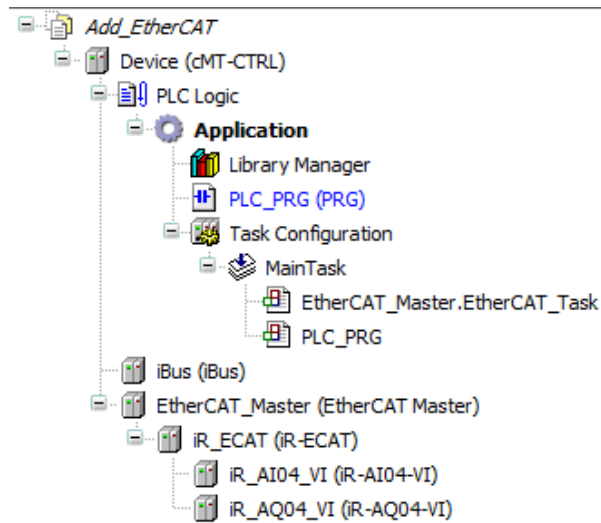
3. In Devices tree open the list of Analog Module » [CANopen-Module I/O Mapping] tab and configure the settings.

CANopen-Module I/O Mapping		Find	Filter	Show all		
Status	Variable	Mapping	Channel	Address	Type	
Information	COP_AI_Channel_0		Analog Input-16Bit : iR_AI04_VI	%IW0	WORD	
			Analog Input-16Bit : iR_AI04_VI	%IW1	WORD	
			Analog Input-16Bit : iR_AI04_VI	%IW2	WORD	
			Analog Input-16Bit : iR_AI04_VI	%IW3	WORD	

4. When finished, click [Online] » [Login] to download the project to CODESYS.

9.3.3 Reading / Writing iR-ECAT Channels

1. Add Analog module.



2. Open PLC_PRG in Devices tree, create tag and set INT as data type. Write a command as shown below.

```

1  PROGRAM PLC_PRG
2  VAR
3      ECAT_AI_Channel_0 : INT ;
4      ECAT_AO_Channel_0 : INT ;
5  END_VAR

```

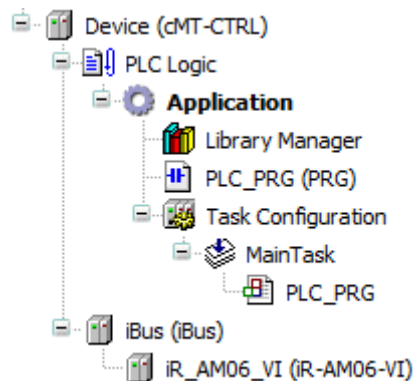
3. In Devices tree open the list of iR-ECAT » [EtherCAT I/O Mapping] tab and configure the settings.

CANopen-Module I/O Mapping		Find	Filter	Show all		
Status	Information	Variable	Mapping	Channel	Address	Type
		* COP_AI_Channel_0		Analog Input-16Bit : iR_AI04_VI	%IW0	WORD
		* COP_AI_Channel_0		Analog Input-16Bit : iR_AI04_VI	%IW1	WORD
		* COP_AI_Channel_0		Analog Input-16Bit : iR_AI04_VI	%IW2	WORD
		* COP_AI_Channel_0		Analog Input-16Bit : iR_AI04_VI	%IW3	WORD

4. When finished, click [Online] » [Login] to download the project to CODESYS.

9.3.4 Reading / Writing cMT-CTRL01 Channels

1. Add Analog module.



- Open PLC_PRG in Devices tree, create tag and set INT as data type. Write a command as shown below.

```

1  PROGRAM PLC_PRG
2  VAR
3      ECAT_AI_Channel_0 : INT ;
4      ECAT_AO_Channel_0 : INT ;
5  END_VAR

```

- In Devices tree open the [iR_AM06_VI] » [Module I/O Mapping] tab and configure the settings.

Module Parameters	FindFilterShow allAdd FB for IO Channel						
Module I/O Mapping							
Status							
Information							
	Variable	Mapping	Channel	Address	Type	Unit	Description
	Application.PLC_PRG.CTRL_AI_Channel_0		AI0	%IW1	INT		Analog Input 0
			AI1	%IW2	INT		Analog Input 1
			AI2	%IW3	INT		Analog Input 2
			AI3	%IW4	INT		Analog Input 3
	Application.PLC_PRG.CTRL_AO_Channel_0		AO0	%QW0	INT		Analog Output 0
			AO1	%QW1	INT		Analog Output 1

- When finished, click [Online] » [Login] to download the project to CODESYS.

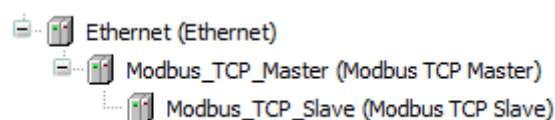
9.4 Accessing Analog Module Registers Using Function Blocks

Before proceeding, make sure that the cMT+CODESYS Package has been downloaded and installed.

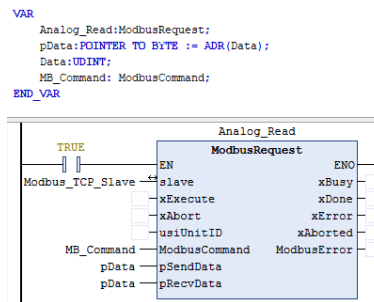
 cMT+CODESYS Firmware (HMI) 9.1MB	2023/02/23	20230204	CODESYS Firmware for HMI Use with Utility Manager from EBPro to update the firmware.		
---	------------	----------	---	---	---

9.4.1 iR-ETN

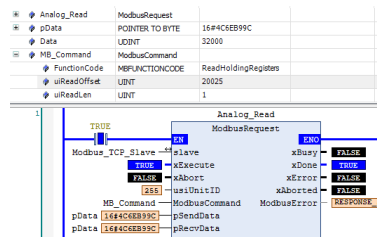
- Add the [Ethernet], [Modbus_TCP_Master], and [Modbus_TCP_Slave] devices, and configure their communication parameters. For detailed instructions, refer to Chapter 5 of this manual:
[Device] » [Add device] » [Ethernet].
[Ethernet] » [Add device] » [Modbus_TCP_Master].
[Modbus_TCP_Master] » [Add device] » [Modbus_TCP_Slave].



- Declare the ModbusRequest function block and its associated function block parameters. Log in to CODESYS to proceed.



- After assigning address parameters in CODESYS, trigger “xExecute” to read the data, which will be displayed in “Data”.

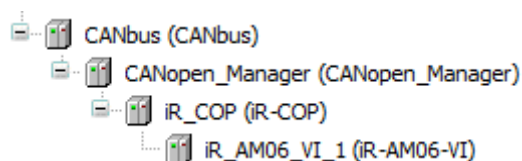


✂ ModbusCommand's function code 3 (ReadHoldingRegister) is used to read word addresses.

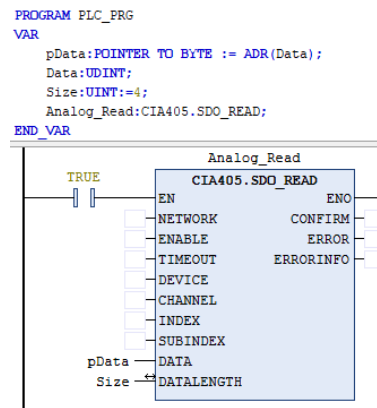
✂ For Modbus address mapping, refer to “[Analog Module Manual Chapter 8](#)” for detailed information.

9.4.2 iR-COP

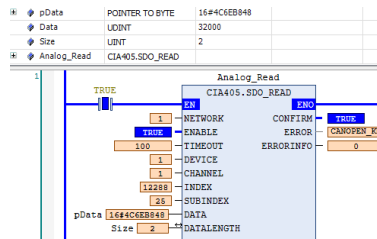
- Add the [CANbus], [CANopen_Manager], [iR_COP], [iR_Module] devices, and configure their communication parameters. For detailed instructions, refer to Chapter 4 of this manual:
 [Device] » [Add device] » [CANbus].
 [CANopen_Manager] » [Add device] » [iR_COP].
 [iR_COP] » [Add device] » [iR_AM06_VI].



- Declare the CIA405.SDO_READ function block and its associated function block parameters. Log in to CODESYS to proceed.



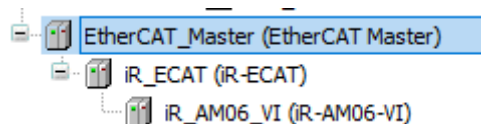
- After assigning required parameters in CODESYS, trigger “ENABLE” to read the data, which will be displayed in “DATA”.



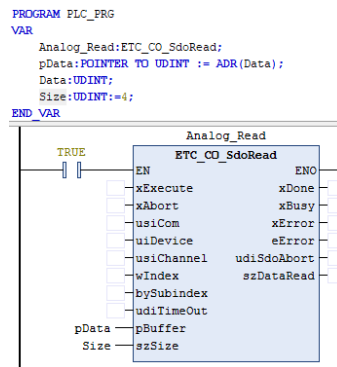
- ✂ The iR_COP Coupler Node_ID corresponds to the DEVICE. Refer to [iR_COP] » [General] » [Node ID] for more information.
- ✂ For INDEX and SUBINDEX address mapping, refer to “[Analog Module Manual Chapter 9](#)” for detailed information.

9.4.3 iR-ECAT

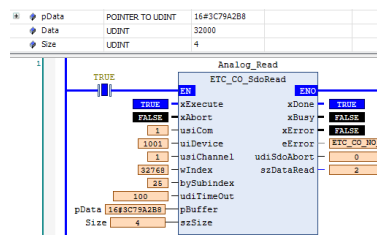
- Add the [EtherCAT_Master], [iR_ECAT], [iR_Module] devices, and configure their communication parameters. For detailed instructions, refer to Chapter 6 of this manual:
 [Device] » [Add device] » [EtherCAT_Master].
 [EtherCAT_Master] » [Add device] » [iR_ECAT].
 [iR_ECAT] » [Add device] » [iR_AM06_VI].



- Declare the ETC_CO_Read function block and its associated function block parameters. Log in to CODESYS to proceed.



- After assigning required parameters in CODESYS, trigger “xExecute” to read the data, which will be displayed in “Data”.



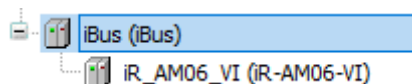
※The EtherCAT Coupler's address corresponds to uiDevice. Please refer to [iR_ECAT] » [General] » [EtherCAT address] for more information.

※For module sequence addressing, use wIndex, where the Index address of the first analog module is 16#8000.

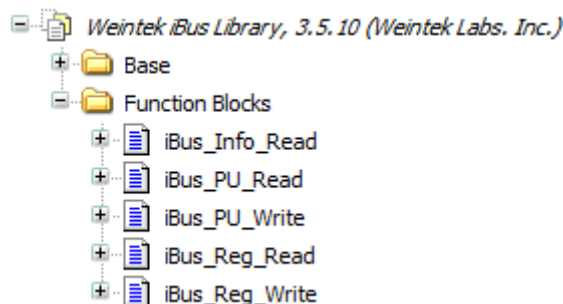
※The address mapping for analog module's registers is done using bySubIndex.

9.4.4 cMT-CTRL01

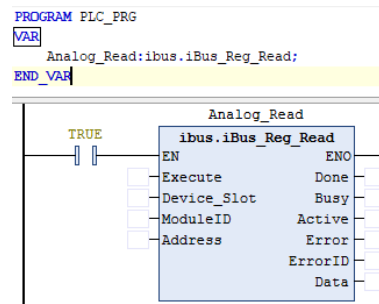
- Under [iBus] » [Add device], add the analog module.



- Under [Library Manager] » [Add Library], add Weintek iBus Library.

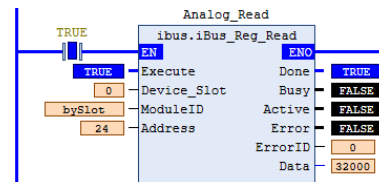


- Declare the iBus.iBus_Reg_Read function block and log in to CODESYS.



4. Input the desired parameter into the function block for reading, then trigger "Execute" to display the current value in "Data".

※ For input parameter configuration, refer to "[Weintek Library User Manual Chapter 10 - Weintek iBus Library](#)".



10 Starting iR Motion Control Module

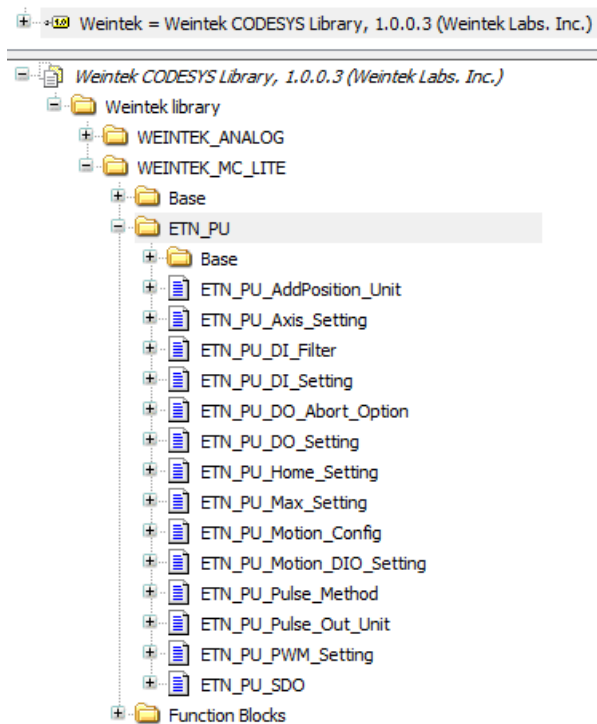
10.1 Motion Control Module Wiring

Please see [UM019004E iR-PU01-P UserManual eng.pdf](#) for information on wiring when using iR-PU01-P module.

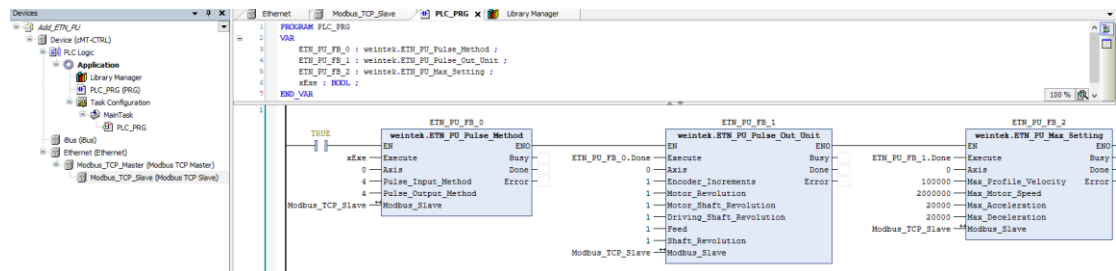
10.2 Setting Motion Control Module Parameters

10.2.1 Writing Motion Control Parameters from iR-ETN

1. Add iR-ETN following the steps explained in Chapter 5 in this manual.
2. Go to [Library Manager] » [Add library] and add Weintek_CODESYS_Library V1.0.0.3.
3. The Function Blocks for writing parameters to iR-PU01P are placed in the ETN_PU folder.



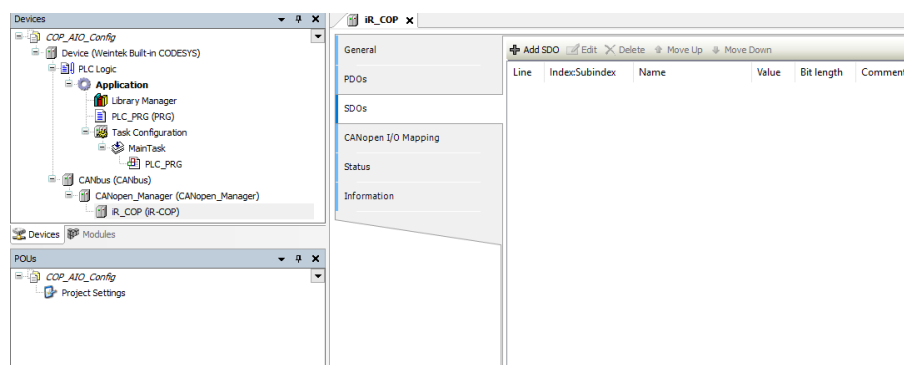
4. Write iR-PU01-P parameters in the program.

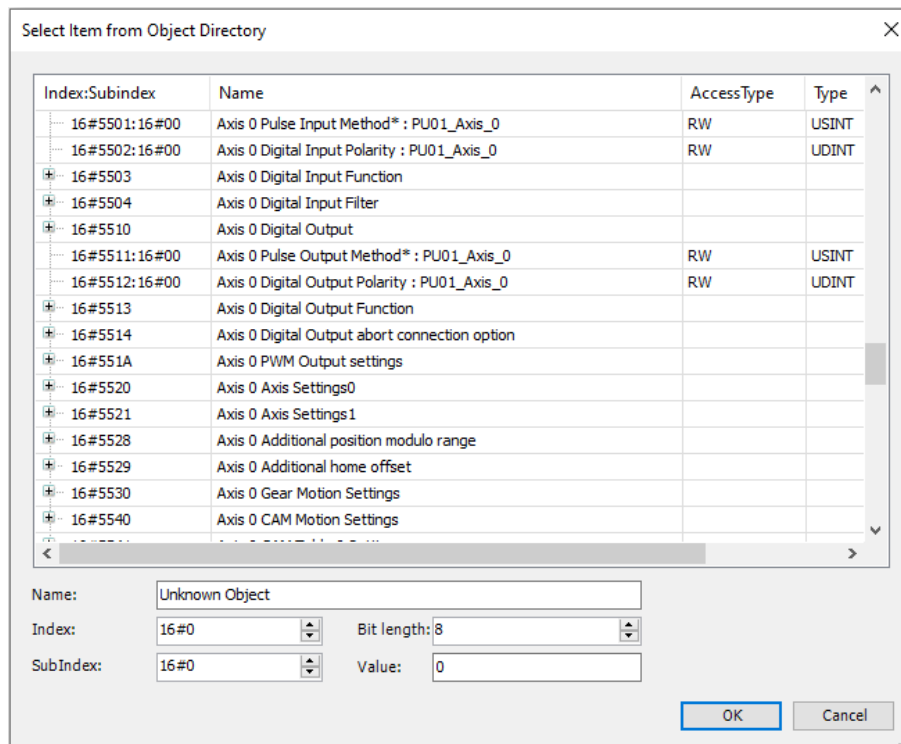


- When finished, click [Online] » [Login] and download the project to CODESYS. Trigger Execute to write parameters into iR-PU01-P.

10.2.2 Writing Motion Control Parameters from iR-COP

- Add iR-COP following the steps explained in Chapter 4 in this manual.
- [iR_COP] » [SDOs] » [Add SDO]



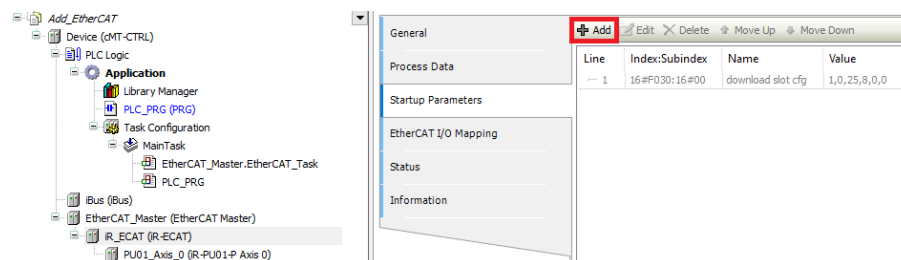


See [UM019004E iR-PU01-P UserManual eng.pdf](#) for information on motion control parameter configuration and object dictionary when using analog modules.

3. When finished, click [Online] » [Login] and download the project to CODESYS.

10.2.3 Writing Motion Control Parameters from iR-ECAT

1. Add iR-ECAT following the steps explained in Chapter 6 in this manual.
2. [iR_ECAT] » [Startup Parameters] » [Add]



Select Item from Object Directory

Index:Subindex	Name	Flags	Type	Def
16#5501:16#00	Axis 0 Pulse Input Method*	RW	USINT	
16#5502:16#00	Axis 0 Digital Input Polarity	RW	UDINT	
16#5503:16#00	Axis 0 Digital Input Function			
16#5504:16#00	Axis 0 Digital Input Filter			
16#5510:16#00	Axis 0 Digital Output			
16#5511:16#00	Axis 0 Pulse Output Method*	RW	USINT	
16#5512:16#00	Axis 0 Digital Output Polarity	RW	UDINT	
16#5513:16#00	Axis 0 DO Function			
16#5514:16#00	Axis 0 Digital Output abort connection option			
16#551A:16#00	Axis 0 PWM Output settings			
16#5520:16#00	Axis 0 Axis Settings0			
16#5521:16#00	Axis 0 Axis Settings1			
16#5528:16#00	Axis 0 Additional position modulo range			
16#5529:16#00	Axis 0 Additional home offset			
16#5530:16#00	Axis 0 Gear motion Settings			

Name:

Index: 16# Bitlength:

SubIndex: 16# Value:

☐ Complete Access ☐ Byte Array

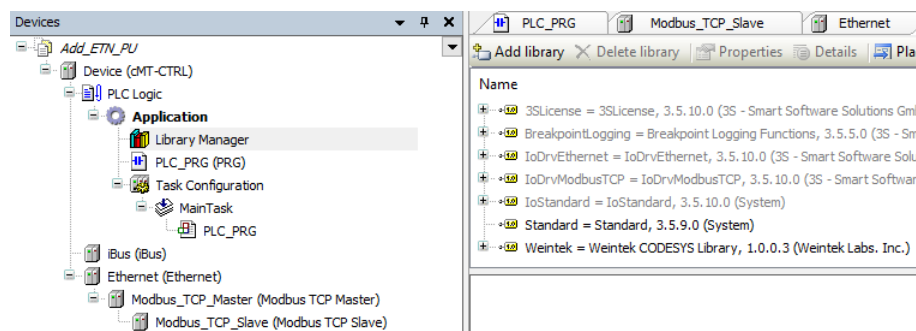
See [UM019004E iR-PU01-P UserManual eng.pdf](#) for information on motion control parameter configuration and object dictionary when using analog modules.

- When finished, click [Online] » [Login] and download the project to CODESYS.

10.3 Motion Control Module I/O Mapping

10.3.1 Reading / Writing iR-ETN Channels

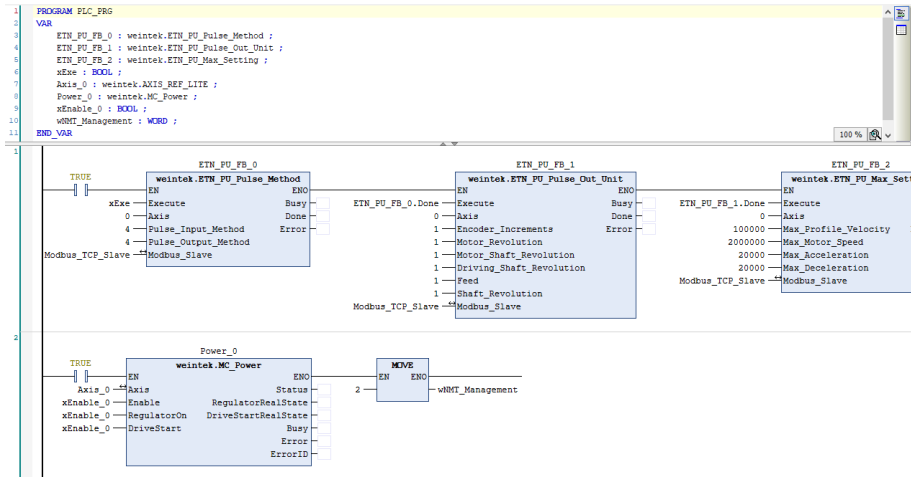
- Add Weintek_CODESYS_Library and follow the steps in Chapter 5 in this manual to add Modbus TCP device.



- Add motion control channels and NMT network management channels.

General	Name	Access Type	Trigger	READ Offset	Length	Error Handling	WRITE Offset	Length
Modbus Slave Channel	0 Axis_0	Read/Write Multiple Registers (Function Code 23)	Cyclic, t#1ms	16#9C40	12	Keep last Value	16#9E34	12
Modbus Slave Init	1 NMT management	Write Multiple Registers (Function Code 16)	Cyclic, t#100ms				16#FFF8	1
ModbusTCP Slave Parameters								
ModbusTCP Slave I/O Mapping								
Status								
Information								

3. Open PLC_PRG in Devices tree, create tag and set AXIS_REF_Lite as data type. Edit motion control function blocks as shown below.



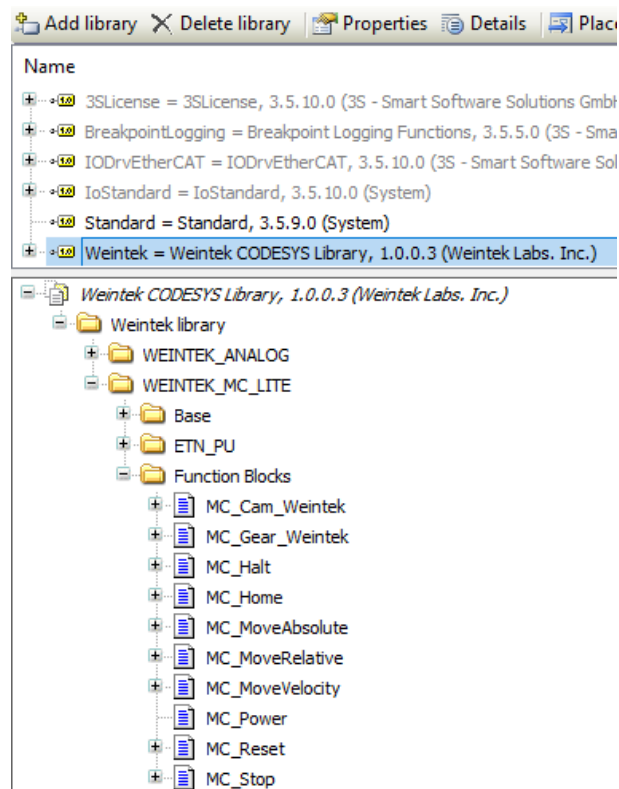
4. In Devices tree open [iR-COP] » [CANopen I/O Mapping] tab to configure the settings.

General	Find	Filter	Show all	
Modbus Slave Channel	Variable	Mapping	Channel	Address
Modbus Slave Init	Application.PLC_PRG.Axis_0.Mapping_I_Reg		Axis_0	16#9C40
ModbusTCP Slave Parameters	Application.PLC_PRG.Axis_0.Mapping_Q_Reg		Axis_0	16#9E34
ModbusTCP Slave I/O Mapping	Application.PLC_PRG.vNMT_Management		NMT management	16#FFF8
Status				Type
Information				Unit
				Description

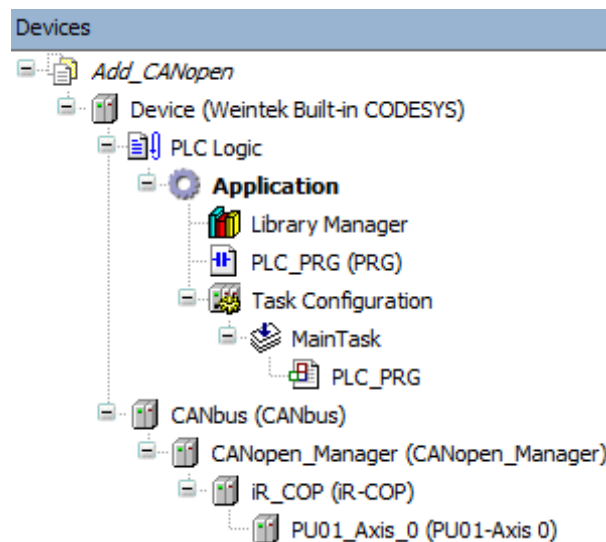
5. When finished, click [Online] » [Login] and download the project to CODESYS. After triggering xExecute_0, iR-PU01-P enters standstill state.

10.3.2 Reading / Writing iR-COP Channels

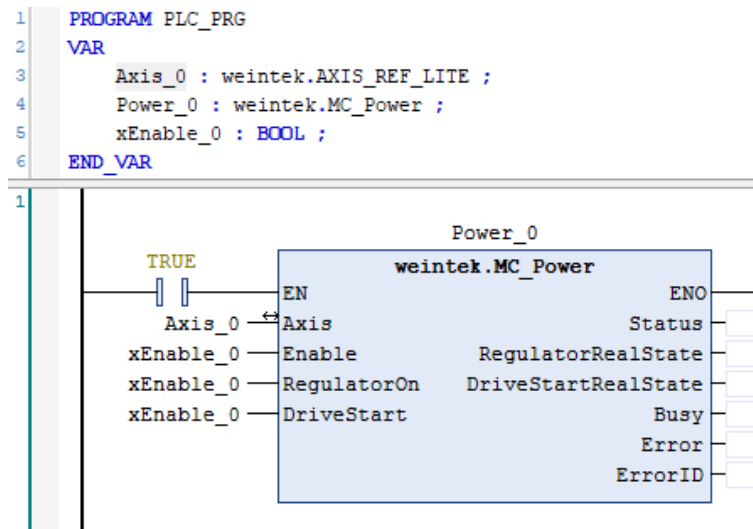
1. Add Weintek_CODESYS_Library.



2. Add motion control modules.



3. Open PLC_PRG in Devices tree, create tag and set AXIS_REF_Lite as data type. Edit motion control function blocks as shown below.



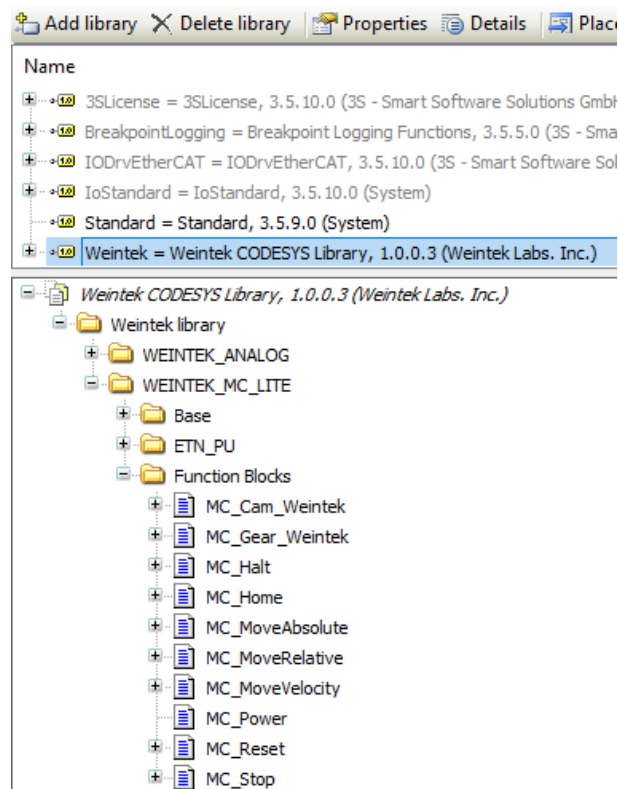
4. In Devices tree open [iR_COP] » [CANopen I/O Mapping] tab and configure the settings.

General	Find	Filter	Show all	
PODs	Variable	Mapping	Channel	Address Type
SDOs	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.DO_B0	↕	Axis 0 DO byte 0 : PU01_Axis_0	%QB0 USINT
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ModeOp	↕	Axis 0 Modes of operation : PU01_Axis_0	%QB1 SINT
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.Controlword	↕	Axis 0 Controlword : PU01_Axis_0	%QW1 UINT
CANopen I/O Mapping	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.TargetVelocity	↕	Axis 0 Target velocity : PU01_Axis_0	%QB2 DINT
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.TargetPosition	↕	Axis 0 Target position : PU01_Axis_0	%QB3 DINT
Status	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileVelocity	↕	Axis 0 Profile velocity : PU01_Axis_0	%QB4 UDINT
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileAcc	↕	Axis 0 Profile acceleration : PU01_Axis_0	%QB5 UDINT
Information	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileDec	↕	Axis 0 Profile deceleration : PU01_Axis_0	%QB6 UDINT
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.DI_B0	↕	Axis 0 DI byte 0 : PU01_Axis_0	%IB0 USINT
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.ModeOpDisp	↕	Axis 0 Modes of operation display : PU01_Axis_0	%IB1 SINT
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.Statusword	↕	Axis 0 Statusword : PU01_Axis_0	%IW1 UINT
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.PositionActual	↕	Axis 0 Position actual value : PU01_Axis_0	%ID1 DINT
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.VelocityActual	↕	Axis 0 Velocity actual value : PU01_Axis_0	%ID2 DINT
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.PositionDemandInternal	↕	Axis 0 Position demand internal value : PU01_Axis_0	%ID3 DINT
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.DO_Status_B0	↕	Axis 0 DO status byte 0 : PU01_Axis_0	%IB16 USINT
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.CAP_Status_B0	↕	Axis 0 Capture status byte 0 : PU01_Axis_0	%IB17 USINT
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.ErrorCode	↕	Axis 0 Error code : PU01_Axis_0	%IW9 UINT
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.AddPositionActual	↕	Axis 0 2nd additional position actual value : PU01_Axis_0	%ID5 DINT

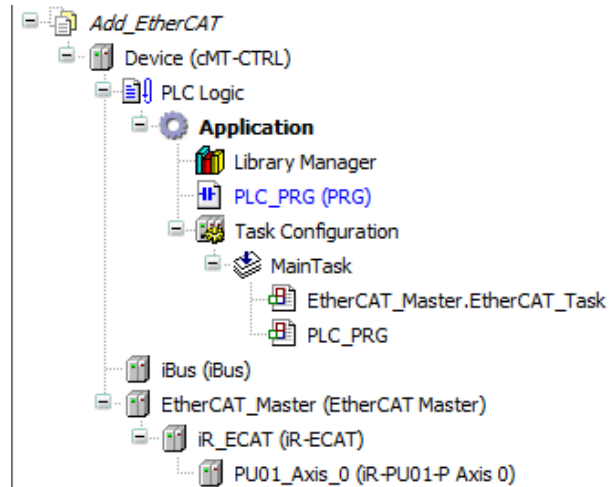
5. When finished, click [Online] » [Login] to download the project to CODESYS. After triggering xExecute_0, iR-PU01-P enters standstill state.

10.3.3 Reading / Writing iR-ECAT Channels

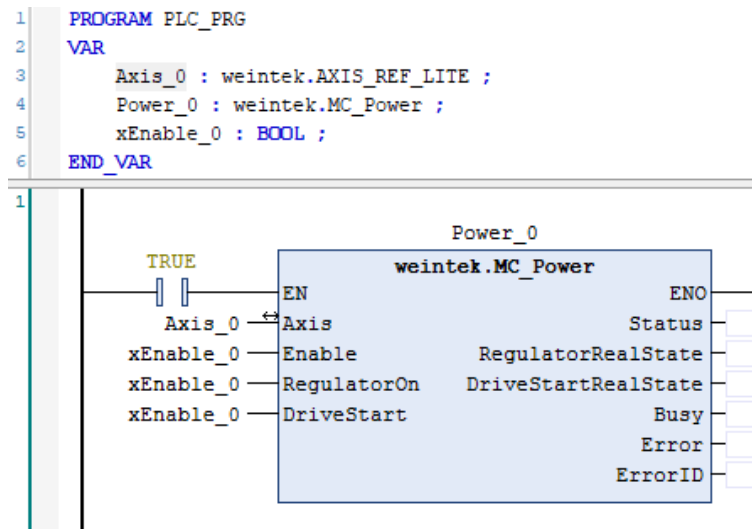
1. Add Weintek_CODESYS_Library.



2. Add motion control modules.



3. Open PLC_PRG in Devices tree, create tag and set AXIS_REF_Lite as data type. Edit motion control function blocks as shown below.



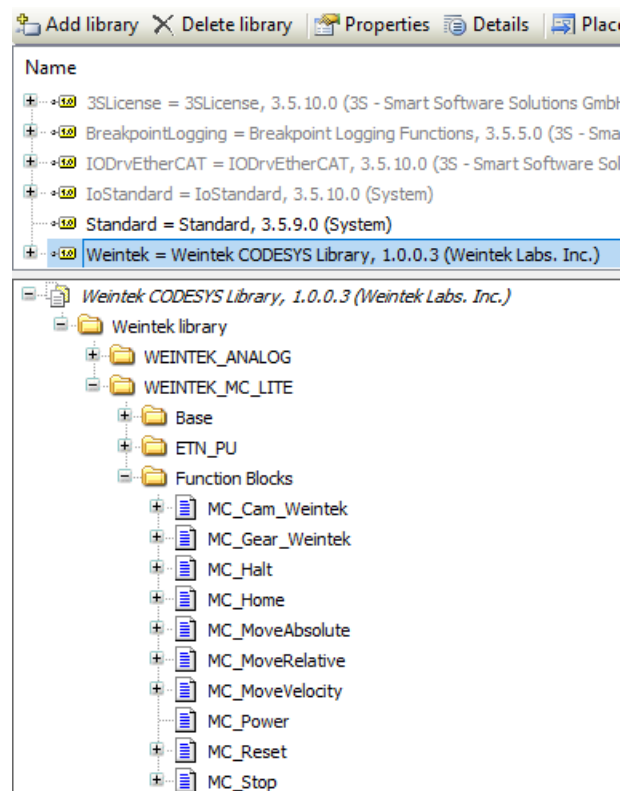
4. In Devices tree open [iR_ECMT] » [EtherCAT I/O Mapping] tab and configure the settings.

Variable	Mapping	Channel	Address	Type	Unit	Description
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.DO_B0		PU01_Axis_0 Axis 0 DO byte 0	%QB0	USINT		PU01_Axis_0 Axis 0 DO byte 0
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ModeOp		PU01_Axis_0 Axis 0 Mode of operation	%QB1	USINT		PU01_Axis_0 Axis 0 Mode of operation
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.Controlword		PU01_Axis_0 Axis 0 Controlword	%QW4	UINT		PU01_Axis_0 Axis 0 Controlword
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.TargetVelocity		PU01_Axis_0 Axis 0 Target velocity	%QB4	DINT		PU01_Axis_0 Axis 0 Target velocity
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.TargetPosition		PU01_Axis_0 Axis 0 Target position	%QB2	DINT		PU01_Axis_0 Axis 0 Target position
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileVelocity		PU01_Axis_0 Axis 0 Profile velocity	%QB3	UCDINT		PU01_Axis_0 Axis 0 Profile velocity
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileAcc		PU01_Axis_0 Axis 0 Profile acceleration	%QB4	DINT		PU01_Axis_0 Axis 0 Profile acceleration
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileDec		PU01_Axis_0 Axis 0 Profile deceleration	%QB5	DINT		PU01_Axis_0 Axis 0 Profile deceleration
		PU01_Axis_0 Reserved	%QB6	DINT		PU01_Axis_0 Reserved
		PU01_Axis_0 Reserved	%QB7	DINT		PU01_Axis_0 Reserved
Application.PLC_PRG.Axis_0.Mapping_I.Obj.DI_B0		PU01_Axis_0 Axis 0 DI byte 0	%IB4	USINT		PU01_Axis_0 Axis 0 DI byte 0
Application.PLC_PRG.Axis_0.Mapping_I.Obj.ModeOpDisp		PU01_Axis_0 Axis 0 Mode of operation display	%IB5	USINT		PU01_Axis_0 Axis 0 Mode of operation display
Application.PLC_PRG.Axis_0.Mapping_I.Obj.Statusword		PU01_Axis_0 Axis 0 Statusword	%IB9	UINT		PU01_Axis_0 Axis 0 Statusword
Application.PLC_PRG.Axis_0.Mapping_I.Obj.PositionActual		PU01_Axis_0 Axis 0 Position actual value	%IB2	DINT		PU01_Axis_0 Axis 0 Position actual value
Application.PLC_PRG.Axis_0.Mapping_I.Obj.VelocityActual		PU01_Axis_0 Axis 0 Velocity actual value	%IB3	DINT		PU01_Axis_0 Axis 0 Velocity actual value
Application.PLC_PRG.Axis_0.Mapping_I.Obj.PositionDemandInternal		PU01_Axis_0 Axis 0 Position demand internal value	%IB4	DINT		PU01_Axis_0 Axis 0 Position demand internal value
Application.PLC_PRG.Axis_0.Mapping_I.Obj.DO_Status_B0		PU01_Axis_0 Axis 0 DO status byte 0	%IB20	USINT		PU01_Axis_0 Axis 0 DO status byte 0
Application.PLC_PRG.Axis_0.Mapping_I.Obj.CAP_Status_B0		PU01_Axis_0 Axis 0 Capture status byte 0	%IB21	USINT		PU01_Axis_0 Axis 0 Capture status byte 0
Application.PLC_PRG.Axis_0.Mapping_I.Obj.ErrorCode		PU01_Axis_0 Axis 0 Error code	%IB24	UINT		PU01_Axis_0 Axis 0 Error code
Application.PLC_PRG.Axis_0.Mapping_I.Obj.AddPositionActual		PU01_Axis_0 Axis 0 2nd additional position actual value	%IB6	DINT		PU01_Axis_0 Axis 0 2nd additional position actual value
		PU01_Axis_0 Reserved	%IB7	DINT		PU01_Axis_0 Reserved
		PU01_Axis_0 Reserved	%IB8	DINT		PU01_Axis_0 Reserved

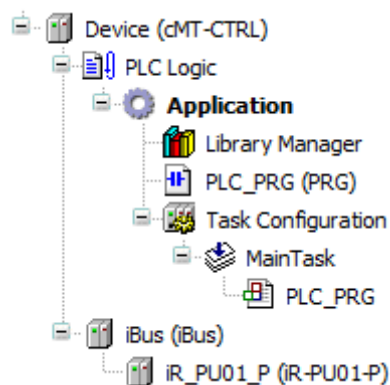
5. When finished, click [Online] » [Login] to download the project to CODESYS. After triggering xExecute_0, iR-PU01-P enters standstill state.

10.3.4 Reading / Writing cMT-CTRL01 Channels

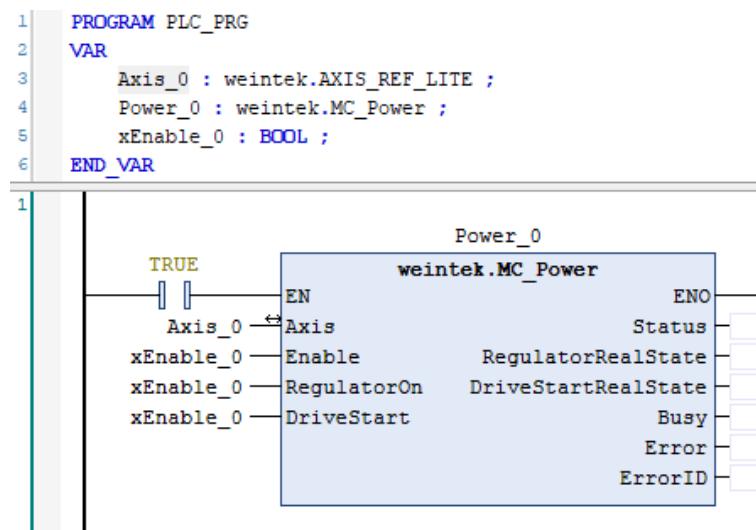
1. Add Weintek_CODESYS_Library.



2. Add the motion control module.



3. Open PLC_PRG in Devices tree, create tag and set AXIS_REF_Lite as data type. Edit motion control function blocks as shown below.



4. In Devices tree open [iR_ECMT] » [EtherCAT I/O Mapping] tab and configure the settings.

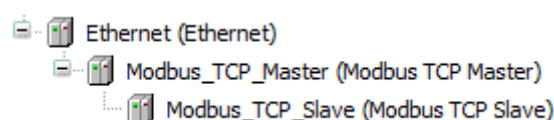
Module Parameters	Find	Filter	Show all	+	Add FB for IO Channel...	Go to Instance	
Module I/O Mapping	Variable	Mapping	Channel	Address	Type	Unit	Description
Status	Application.PLC_PRG.Axis_0.Mapping_I.Obj.DI_B0	?	DI byte 0	%I04	USINT		Digital Input
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.ModeOpDisp	?	Mode of operation display	%I05	SINT		Mode of operation display
Information	Application.PLC_PRG.Axis_0.Mapping_I.Obj.Statusword	?	Statusword	%I03	UINT		
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.PositionActual	?	Position actual value	%I02	DINT		
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.VelocityActual	?	Velocity actual value	%I03	DINT		
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.PositionDemandInternal	?	Position demand internal value	%I04	DINT		
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.DO_Status_B0	?	DO status byte 0	%I00	USINT		
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.CAP_Status_B0	?	Capture status byte 0	%I01	USINT		
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.ErrorCode	?	Error code	%I04+1	UINT		
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.AddPositionActual	?	2nd additional position actual value	%I06	DINT		
		?	Reserved	%I07	LCINT		
		?	Reserved	%I08	LCINT		
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.DO_B0	?	DO byte 0	%Q00	USINT		Digital Output
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ModeOp	?	Mode of operation	%Q01	SINT		
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.Controlword	?	Controlword	%Q03	UINT		
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.TargetVelocity	?	Target velocity	%Q04	DINT		
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.TargetPosition	?	Target position	%Q02	DINT		
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileVelocity	?	Profile velocity	%Q05	LCINT		
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileAcc	?	Profile acceleration	%Q04	LCINT			
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileDec	?	Profile deceleration	%Q05	LCINT			
	?	Reserved	%Q06	LCINT			
	?	Reserved	%Q07	DINT			

5. When finished, click [Online] » [Login] to download the project to CODESYS. After triggering xExecute_0, iR-PU01-P enters standstill state.

10.4 Accessing Motion Control Module Registers Using Function Blocks

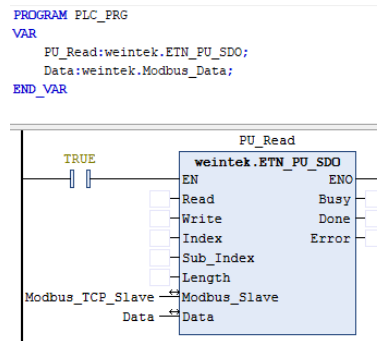
10.4.1 iR-ETN

- Add the [Ethernet], [Modbus_TCP_Master], and [Modbus_TCP_Slave] devices, and configure their communication parameters. For detailed instructions, refer to Chapter 5 of this manual:
[Device] » [Add device] » [Ethernet].
[Ethernet] » [Add device] » [Modbus_TCP_Master].
[Modbus_TCP_Master] » [Add device] » [Modbus_TCP_Slave].

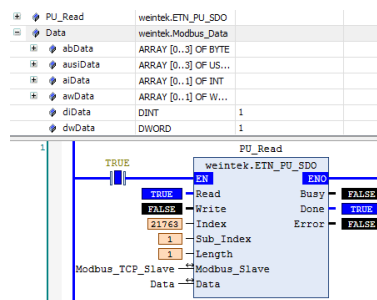


- Under [Library Manager] » [Add Library], add Weintek_CODESYS_Library.

3. Declare the `weintek.ETN_PU_SDO` function block and its associated function block parameters. Log in to CODESYS to proceed.



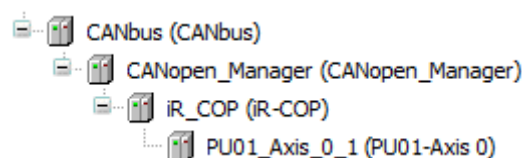
4. After assigning address parameters in CODESYS, trigger “Read” to read the data, which will be displayed in “Data”.



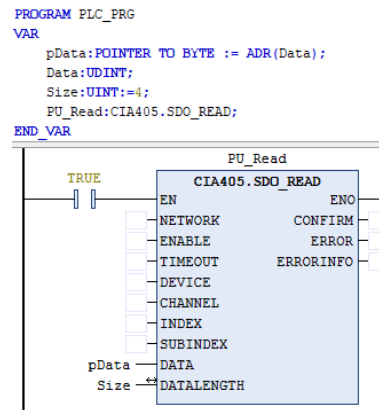
※ For Index and Sub_Index address mapping, refer to “[iR-PU01-P User Manual](#)” for detailed information.

10.4.2 iR-COP

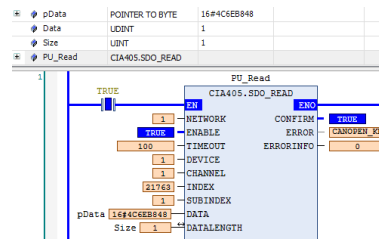
1. Add the [CANbus], [CANopen_Manager], [iR_COP], [iR_Module] devices, and configure their communication parameters. For detailed instructions, refer to Chapter 4 of this manual:
 [Device] » [Add device] » [CANbus].
 [CANopen_Manager] » [Add device] » [iR_COP].
 [iR_COP] » [Add device] » [iR_PU01_P].



2. Declare the `CIA405.SDO_READ` function block and its associated function block parameters. Log in to CODESYS to proceed.



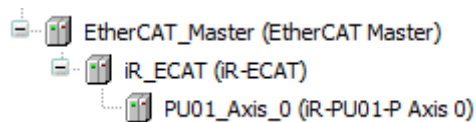
- After assigning required parameters in CODESYS, trigger “ENABLE” to read the data, which will be displayed in “DATA”.



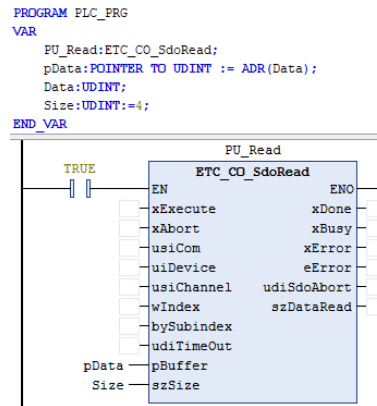
- ✂ The iR_COP Coupler Node_ID corresponds to the DEVICE. Refer to [iR_COP] » [General] » [Node ID] for more information.
- ✂ For INDEX and SUBINDEX address mapping, refer to “[iR-PU01-P User Manual](#)” for detailed information.

10.4.3 iR-ECAT

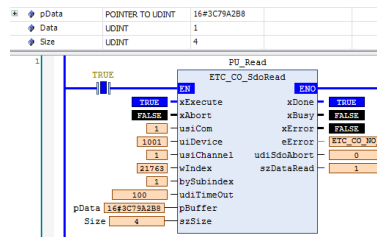
- Add the [EtherCAT_Master], [iR_ECAT], [iR_Module] devices, and configure their communication parameters. For detailed instructions, refer to Chapter 6 of this manual:
 [Device] » [Add device] » [EtherCAT_Master].
 [EtherCAT_Master] » [Add device] » [iR_ECAT].
 [iR_ECAT] » [Add device] » [iR_PU01_Axis_0].



- Declare the ETC_CO_Read function block and its associated function block parameters. Log in to CODESYS to proceed.



- After assigning required parameters in CODESYS, trigger “xExecute” to read the data, which will be displayed in “Data”.

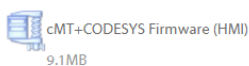


※The EtherCAT Coupler's address corresponds to uiDevice. Please refer to [iR_ECAT] » [General] » [EtherCAT address] for more information.

※For address mapping using wIndex and bySubIndex, refer to “[iR-PU01-P User Manual](#)” for detailed information.

10.4.4 cMT-CTRL01

- Download and install the cMT+CODESYS Package.



cMT+CODESYS Firmware (HMI)
9.1MB

2023/02/23

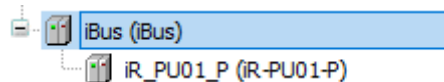
20230204

CODESYS Firmware for HMI

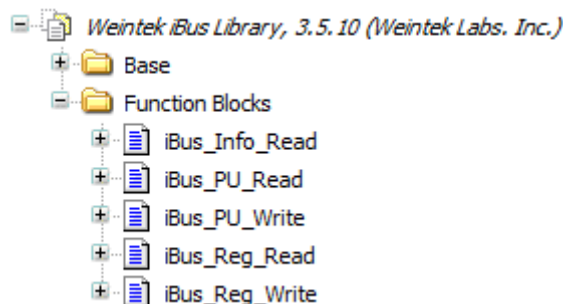
Use with Utility Manager from EBPro to update the firmware.



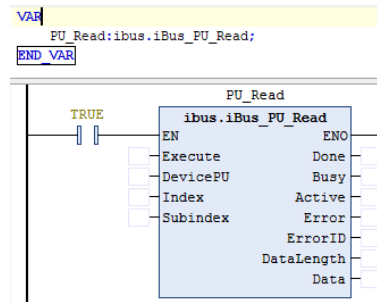
- Under [iBus] » [Add device], add the motion control module.



- Under [Library Manager] » [Add Library], add Weintek iBus Library.

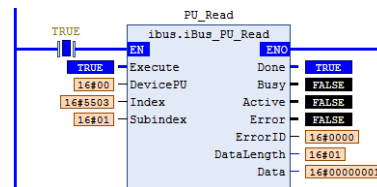


4. Declare the iBus.iBus_PU_Read function block and log in to CODESYS.



5. Input the desired parameter into the function block for reading, then trigger "Execute" to display the current value in "Data".

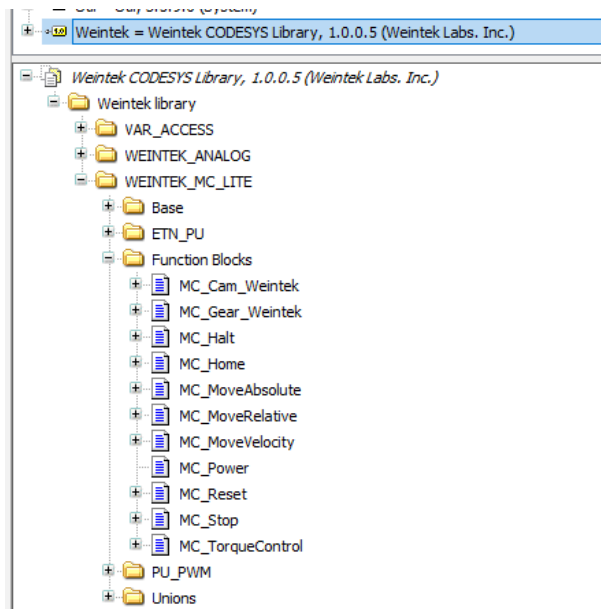
※ For input parameter configuration, refer to "[Weintek Library User Manual Chapter 10 - Weintek iBus Library](#)".



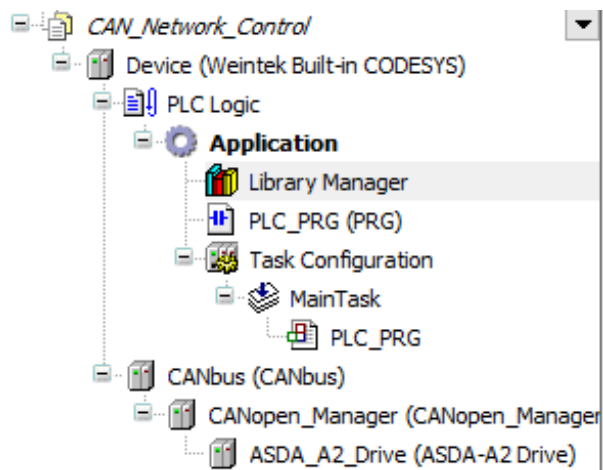
11 Starting Driver

11.1 CANopen Driver

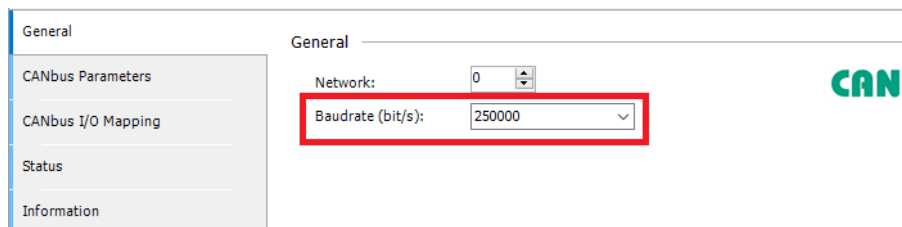
1. Add Weintek_CODESYS_Library.



2. Add CANbus, CANopen_Manager, CANopen drivers.



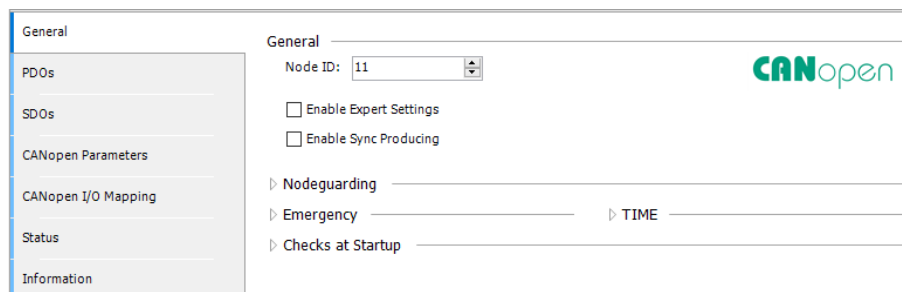
3. CANbus -> Baudrate settings:



CODESYS baudrate must be identical to the driver's baudrate.

4. CANopen driver settings:

(1) Node ID



Node ID settings must be identical to that of the driver.

(2) PDO settings:

Receive PDOs (Master => Slave)		
+ Add PDO + Add Mapping Edit Delete Move Up Move Down		
Name	Object	Bit length
☒ 16#1400: Receive PDO Communication Parameter	16#20B (\$NODEID+16#200)	56
Controlword	16#6040:16#00	16
Modes of operation	16#6060:16#00	8
Target velocity	16#60FF:16#00	32
☒ 16#1401: Receive PDO Communication Parameter	16#30B (\$NODEID+16#300)	64
Target Position	16#607A:16#00	32
Profile velocity	16#6081:16#00	32
☒ 16#1402: Receive PDO Communication Parameter	16#40B (\$NODEID+16#400)	64
Profile acceleration	16#6083:16#00	32
Profile deceleration	16#6084:16#00	32

See Axis Variable Instance Mapping_Q to add variables for output

channels.

Transmit PDOs (Slave => Master)		
Add PDO Add Mapping Edit Delete Move Up Move Down		
Name	Object	Bit length
☒ 16#1800: Transmit PDO Communication Parameter	16#18B (\$NODEID+16#180)	56
Modes of operation display	16#6061:16#00	8
Statusword	16#6041:16#00	16
Position actual value	16#6064:16#00	32
☒ 16#1801: Transmit PDO Communication Parameter	16#28B (\$NODEID+16#280)	64
Velocity actual value	16#606C:16#00	32
Position demand value*	16#60FC:16#00	32

See Axis Variable Instance Mapping_I to add variables for input channels.

(3) SDO settings:

General		Add SDO Edit Delete Move Up Move Down		
PDOs		Line	Index:Subindex	Name
SDOs		1	16#607F:16#00	Max profile velocity
CANopen Parameters		2	16#6080:16#00	Max motor speed
CANopen I/O Mapping		3	16#6085:16#00	Quick stop deceleration
Status		4	16#60C5:16#00	Max acceleration
Information		5	16#60C6:16#00	Max deceleration
				Value
				Bit length

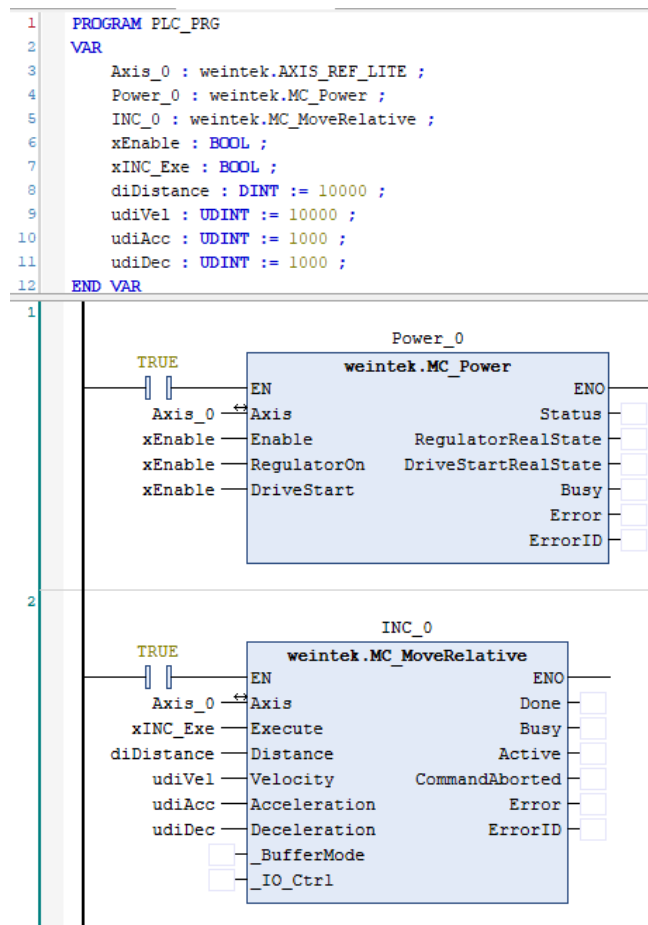
Follow the settings in the screenshot above to set initial values for checking motor rotation.

(4) CANopen I/O Mapping:

Find	Filter	Show all			
Variable	Mapping	Channel	Address	Type	
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.Controlword		Controlword	%QW0	UINT	
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ModeOp		Modes of operation	%QB2	SINT	
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.TargetVelocity		Target velocity	%QD1	DINT	
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.TargetPosition		Target Position	%QD2	DINT	
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileVelocity		Profile velocity	%QD3	UDINT	
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileAcc		Profile acceleration	%QD4	UDINT	
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileDec		Profile deceleration	%QD5	UDINT	
Application.PLC_PRG.Axis_0.Mapping_I.Obj.ModeOpDisp		Modes of operation display	%IB0	SINT	
Application.PLC_PRG.Axis_0.Mapping_I.Obj.Statusword		Statusword	%IW1	UINT	
Application.PLC_PRG.Axis_0.Mapping_I.Obj.PositionActual		Position actual value	%ID1	DINT	
Application.PLC_PRG.Axis_0.Mapping_I.Obj.VelocityActual		Velocity actual value	%ID2	DINT	
Application.PLC_PRG.Axis_0.Mapping_I.Obj.PositionDemandInternal		Position demand value*	%ID3	DINT	

Mapping_I and Mapping_Q should be mapped to CANopen I/O Mapping.

5. Programming:



Function blocks MC_Power & MC_MoveRelative are needed for testing motor rotation.

Trigger “xEnable” and then trigger “xINC_Exe” to give command to the motor to perform positioning. When MC_Power.Status = FALSE, use MC_Reset function block to reset the motor and then trigger “xINC_Exe”.

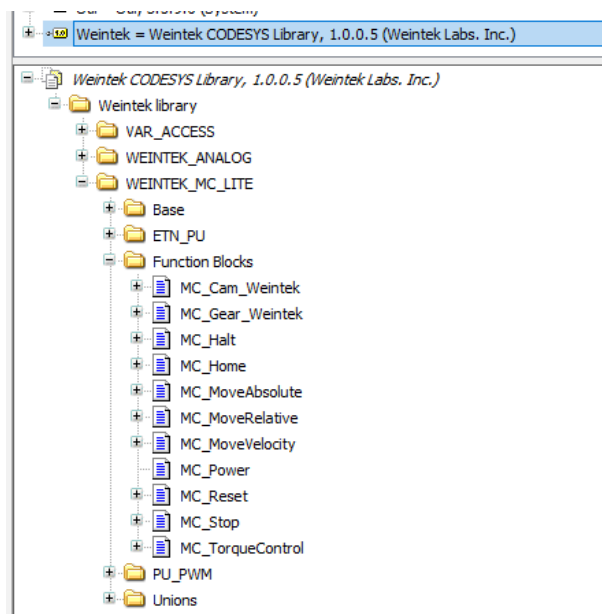
※ Function blocks that can give command to the motor can be found in Weintek_MC_LITE folder in Weintek Library.

For more information, please see the following user manual.

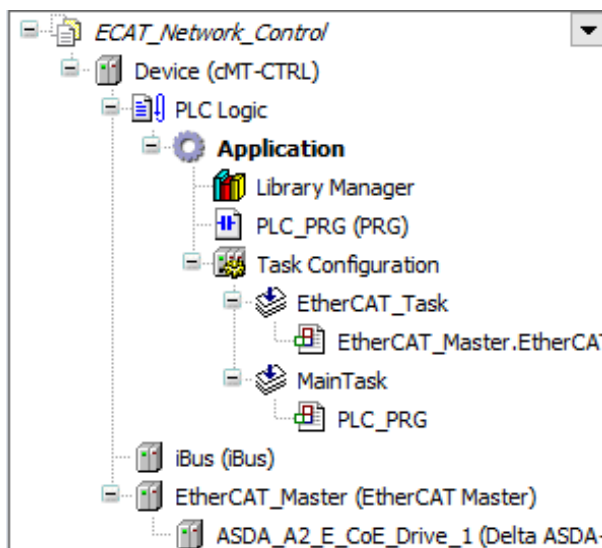
[UM018017E CODESYS Weintek Library UserManual_eng](#)

11.2 EtherCAT Driver

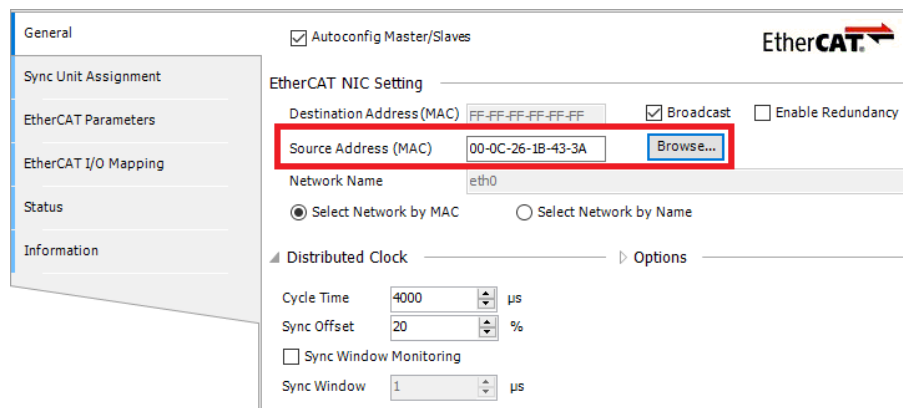
1. Add Weintek_CODESYS_Library.



2. Add EtherCAT_Master, EtherCAT drivers.



3. EtherCAT_Master -> Source Address(MAC):



4. EtherCAT driver settings:

(1) Process Data

Select the Outputs			Select the Inputs		
Name	Type	Index	Name	Type	Index
☒ 16#1600 1st RxPDO Mapping			☒ 16#1A00 1st TxPDO Mapping		
Control Word	UINT	16#6040:00	ModeOfOperationDisplay	SINT	16#6061:00
ModeOfOperation	SINT	16#6060:00	Status Word	UINT	16#6041:00
TargetVelocity	DINT	16#60FF:00	ActualPosition	DINT	16#6064:00
TargetPosition	DINT	16#607A:00	Velocity actual value	DINT	16#606C:00
Profilevelocity	UDINT	16#6081:00	Position demand internal value	DINT	16#60FC:00
Profile acceleration	UDINT	16#6083:00	Error code	UINT	16#603F:00
Profile deceleration	UDINT	16#6084:00			
☐ 16#1601 2nd RxPDO Mapping (exclu			☐ 16#1A01 2nd TxPDO Mapping (e		
Control Word	UINT	16#6040:00	Status Word	UINT	16#6041:00
TargetPosition	DINT	16#607A:00	ActualPosition	DINT	16#6064:00
☐ 16#1602 3rd RxPDO Mapping (exclu			☐ 16#1A02 3rd TxPDO Mapping (e		
Control Word	UINT	16#6040:00	Status Word	UINT	16#6041:00
TargetVelocity	DINT	16#60FF:00	ActualPosition	DINT	16#6064:00
☐ 16#1603 4th RxPDO Mapping (exclu			☐ 16#1A03 4th TxPDO Mapping (e		
Control Word	UINT	16#6040:00	Status Word	UINT	16#6041:00
TargetTorque	INT	16#6071:00	ActualPosition	DINT	16#6064:00
			ActualTorque	INT	16#6077:00

Select an RxPDO Mapping and a TxPDO mapping.

(2) Expert Process Data

General
Expert Process Data
Process Data
Startup Parameters
EtherCAT Parameters
EtherCAT I/O Mapping
Status
Information

Sync Manager:

SM	Size	Type
0	0	Mailbox Out
1	0	Mailbox In
2	23	Outputs
3	17	Inputs

Add Edit Delete

PDO List:

Index	Size	Name	Flags	SM
16#1600	23.0	1st RxPDO Mapping		2
16#1601	6.0	2nd RxPDO Mapping		
16#1602	6.0	3rd RxPDO Mapping		
16#1603	4.0	4th RxPDO Mapping		
16#1A00	17.0	1st TxPDO Mapping		3
16#1A01	6.0	2nd TxPDO Mapping		
16#1A02	10.0	3rd TxPDO Mapping		
16#1A03	8.0	4th TxPDO Mapping		

Insert Edit Delete Move Up Move Down

PDO Content (16#1600):

Index	Size	Offs	Name	Type
16#6040:00	2.0	0.0	Control Word	UINT
16#6060:00	1.0	2.0	ModeOfOperation	SINT
16#60FF:00	4.0	3.0	TargetVelocity	DINT
16#607A:00	4.0	7.0	TargetPosition	DINT
16#6081:00	4.0	11.0	Profilevelocity	UDINT
16#6083:00	4.0	15.0	Profile acceleration	UDINT
16#6084:00	4.0	19.0	Profile deceleration	UDINT
			23.0	

Insert Edit Delete Move Up Move Down

PDO Content (16#1A00):

Index	Size	Offs	Name	Type
16#6061:00	1.0	0.0	ModeOfOperationDisplay	SINT
16#6041:00	2.0	1.0	Status Word	UINT
16#6064:00	4.0	3.0	ActualPosition	DINT
16#606C:00	4.0	7.0	Velocity actual value	DINT
16#60FC:00	4.0	11.0	Position demand internal value	DINT
16#603F:00	2.0	15.0	Error code	UINT
			17.0	

See Axis Variable Instance Mapping_Q to add variables for output channels.

General
Expert Process Data
Process Data
Startup Parameters
EtherCAT Parameters
EtherCAT I/O Mapping
Status
Information

Sync Manager:

SM	Size	Type
0	0	Mailbox Out
1	0	Mailbox In
2	23	Outputs
5	17	Inputs

Add Edit Delete

PDO List:

Index	Size	Name	Flags	SM
16#1600	23.0	1st RxPDO Mapping		2
16#1601	6.0	2nd RxPDO Mapping		
16#1602	6.0	3rd RxPDO Mapping		
16#1603	4.0	4th RxPDO Mapping		
16#1A00	17.0	1st TxPDO Mapping		3
16#1A01	6.0	2nd TxPDO Mapping		
16#1A02	10.0	3rd TxPDO Mapping		
16#1A03	8.0	4th TxPDO Mapping		

Insert Edit Delete Move Up Move Down

PDO Content (16#1A00):

Index	Size	Offs	Name	Type
16#6061:00	1.0	0.0	ModeOfOperationDisplay	SINT
16#6041:00	2.0	1.0	Status Word	UINT
16#6064:00	4.0	3.0	ActualPosition	DINT
16#606C:00	4.0	7.0	Velocity actual value	DINT
16#60FC:00	4.0	11.0	Position demand internal value	DINT
16#603F:00	2.0	15.0	Error code	UINT
			17.0	

See Axis Variable Instance Mapping_I to add variables for input channels.

(3) Startup Parameters:

General	+ Add ✎ Edit ✕ Delete ↑ Move Up ↓ Move Down
Expert Process Data	
Process Data	
Startup Parameters	
EtherCAT Parameters	
EtherCAT I/O Mapping	
Status	
Information	

Line	Index:Subindex	Name	Value	Bitlength
1	16#607F:16#00	Max profile velocity	200	32
2	16#6080:16#00	Max motor speed	200	32
3	16#6085:16#00	Quick stop deceleration	200	32
4	16#60C5:16#00	Max acceleration	200	32
5	16#60C6:16#00	Max deceleration	200	32

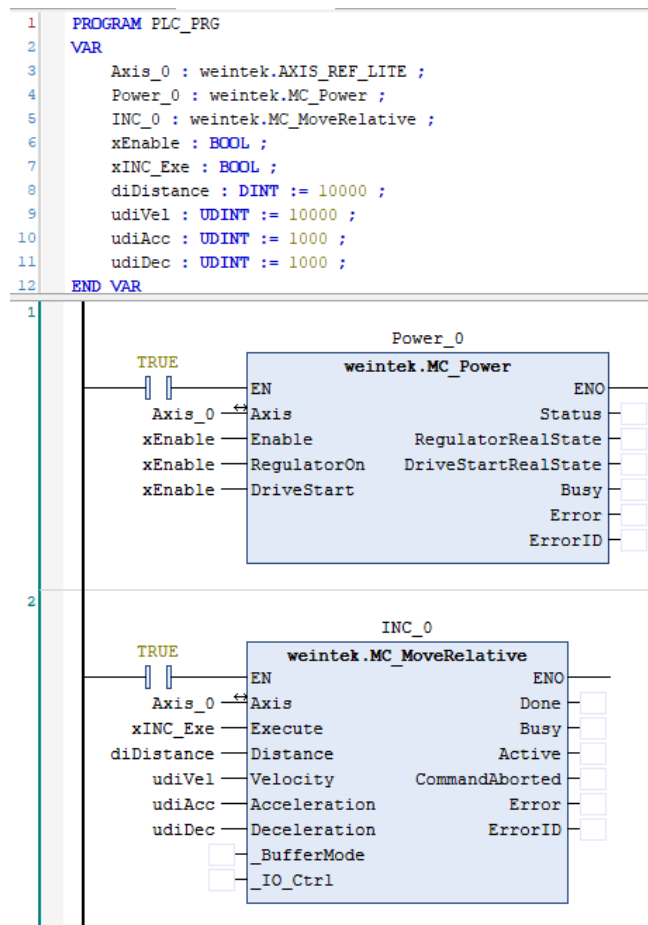
Follow the settings in the screenshot above to set initial values for checking motor rotation.

(4) EtherCAT I/O Mapping:

Find	Filter	Show all		
Variable	Mapping	Channel	Address	Type
 Application.PLC_PRG.Axis_0.Mapping_Q.Obj.Controlword		Controlword	%QW0	UINT
 Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ModeOp		Modes of operation	%QB2	SINT
 Application.PLC_PRG.Axis_0.Mapping_Q.Obj.TargetVelocity		Target velocity	%QD1	DINT
 Application.PLC_PRG.Axis_0.Mapping_Q.Obj.TargetPosition		Target Position	%QD2	DINT
 Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileVelocity		Profile velocity	%QD3	UDINT
 Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileAcc		Profile acceleration	%QD4	UDINT
 Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileDec		Profile deceleration	%QD5	UDINT
 Application.PLC_PRG.Axis_0.Mapping_I.Obj.ModeOpDisp		Modes of operation display	%IB0	SINT
 Application.PLC_PRG.Axis_0.Mapping_I.Obj.Statusword		Statusword	%IW1	UINT
 Application.PLC_PRG.Axis_0.Mapping_I.Obj.PositionActual		Position actual value	%ID1	DINT
 Application.PLC_PRG.Axis_0.Mapping_I.Obj.VelocityActual		Velocity actual value	%ID2	DINT
 Application.PLC_PRG.Axis_0.Mapping_I.Obj.PositionDemandInternal		Position demand value*	%ID3	DINT

Mapping_I and Mapping_Q should be mapped to EtherCAT I/O Mapping.

5. Programming:



Function blocks MC_Power & MC_MoveRelative are needed for testing motor rotation.

Trigger “xEnable” and then trigger “xINC_Exe” to give command to the motor to perform positioning. When MC_Power.Status = FALSE, use MC_Reset function block to reset the motor and then trigger “xINC_Exe”.

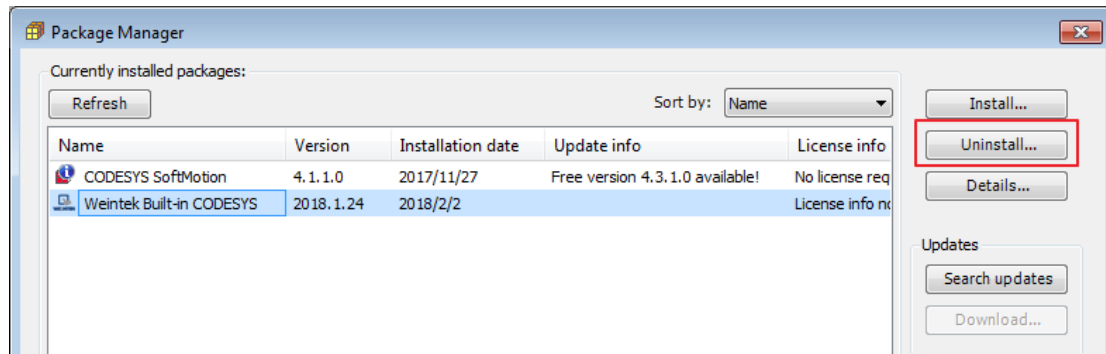
※ Function blocks that can give command to the motor can be found in Weintek_MC_LITE folder in Weintek Library.

For more information, please see the following user manual.

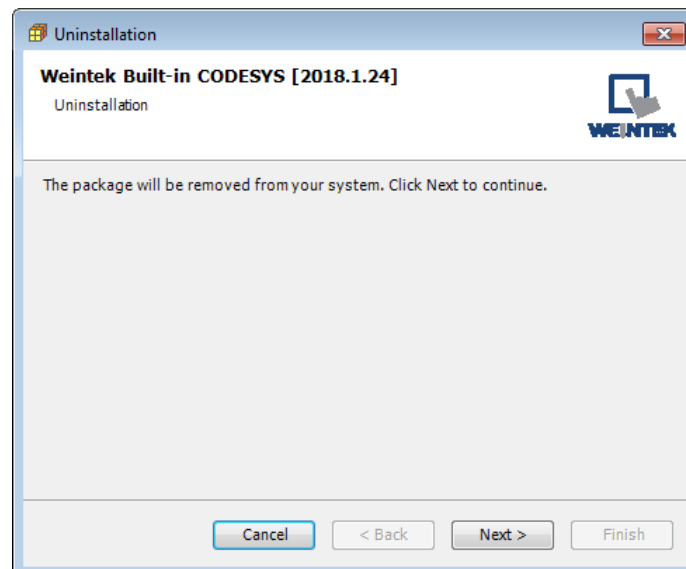
[UM018017E CODESYS Weintek Library UserManual_eng](#)

12 Removing Weintek Built-in CODESYS

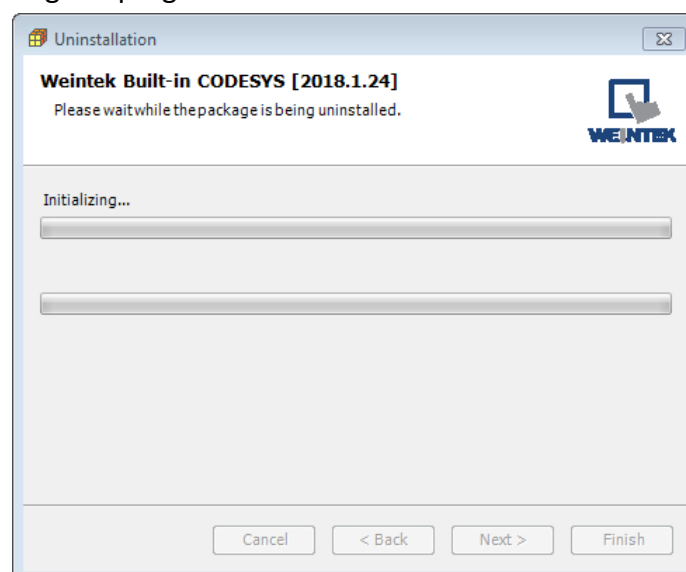
1. Click [Tools] » [Packages Manager].
2. Find Weintek Built-in CODESYS and then click [Uninstall].



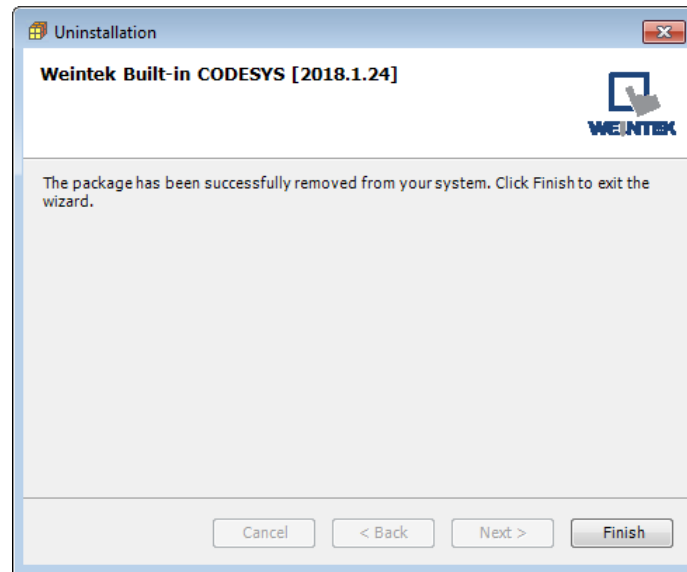
3. Click [Next] when seeing the window below.



4. Removing the program.



5. Click [Finish].



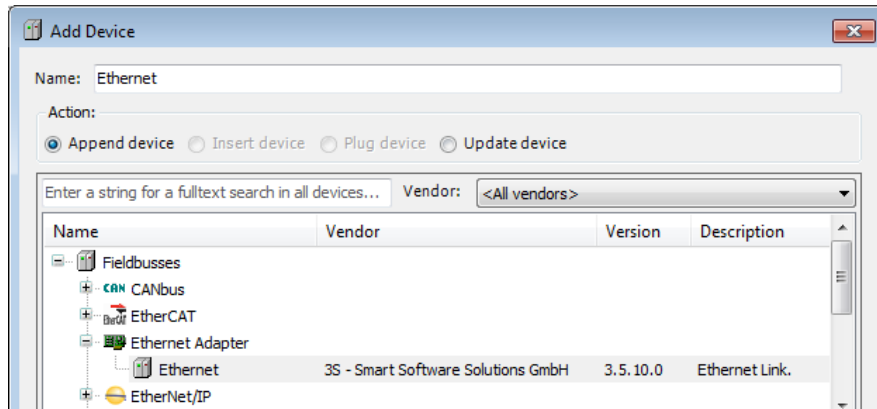
13 Frequently Asked Questions

13.1 Questions Related to IP Address

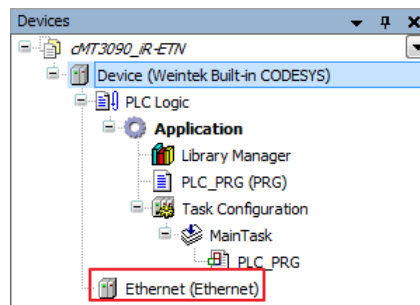
Q1. How to use static IP address for cMT CODESYS?

A: Please follow these steps.

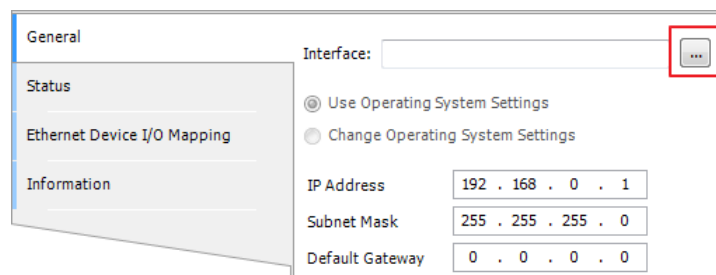
1. Right-click on “Device (Weintek Built-in CODESYS)” and select [Add Device].
2. Select [Ethernet Adapter] » [Ethernet] and then select [Add Device].



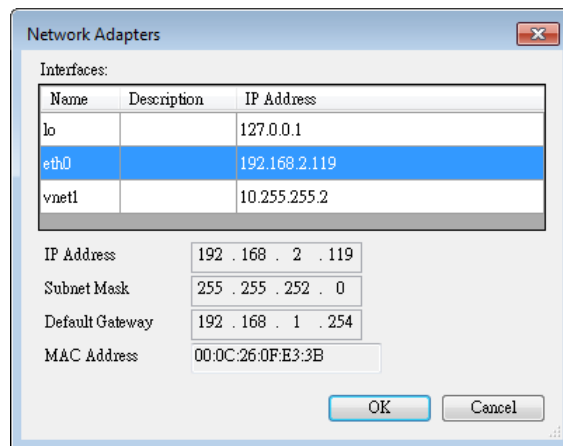
3. In Device tree find Ethernet and double click it.



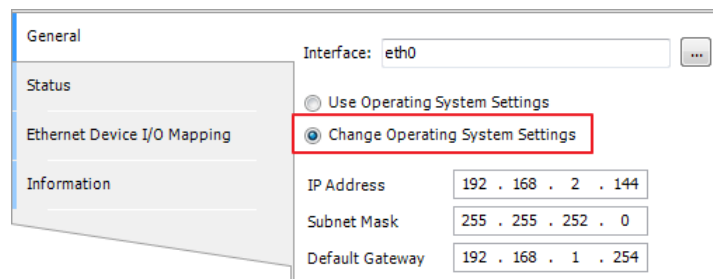
4. The following window opens, click [...] button.



5. Select “eth0”. Please see “2.2 Creating CODESYS Project” to finish CODESYS project settings before doing this step.



6. Select [Change Operating System Settings].



7. Download the project to cMT CODESYS.

Q2. Why my CODESYS Gateway shows 0.0.0.0?

A: When using static IP for cMT CODESYS, its IP address will be displayed as 0.0.0.0.

Q3. Can I use the same domain for cMT HMI's LAN 1 and LAN 2?

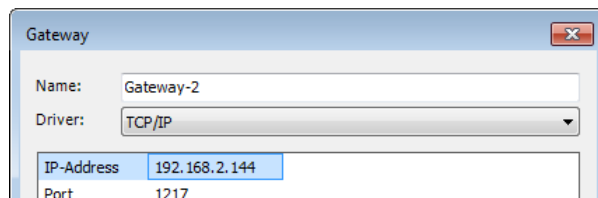
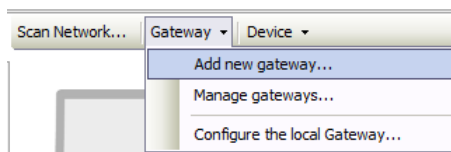
A: This is acceptable only when cMT HMI has CODESYS activated.

13.2 Questions Related to CODESYS

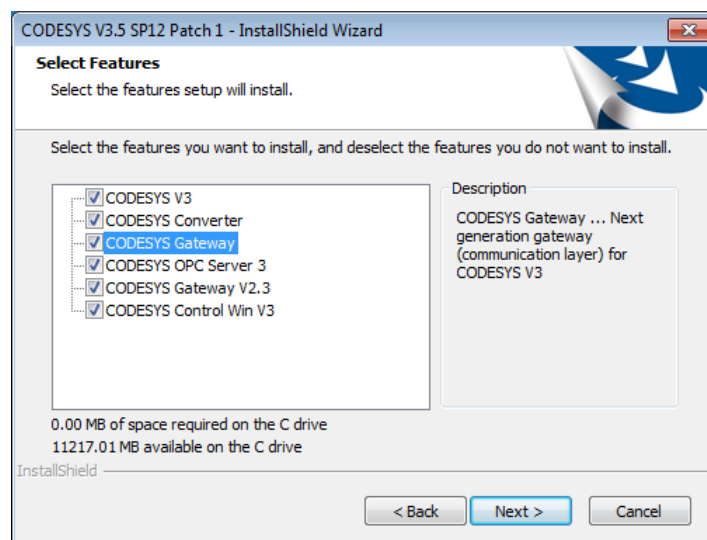
Q1. When the indicator of CODESYS Gateway lights up in red, how can I connect to the device?

A: When CODESYS Gateway is not properly started or installed, its indicator will light up in red. Please try the following 3 methods to solve this situation.

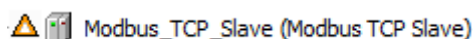
1. Click the icon of "CODESYS Gateway SysTray" in system settings and then click [Start Gateway].
2. Add new gateway and enter HMI IP.



3. Re-install CODESYS Gateway.



Q2. Why a triangle icon shows near Modbus_TCP_Slave device when I log in HMI in CODESYS software?



A: This means that HMI cannot connect Modbus TCP/IP device via CODESYS. Please check the IP settings and make sure the cable is properly connected.

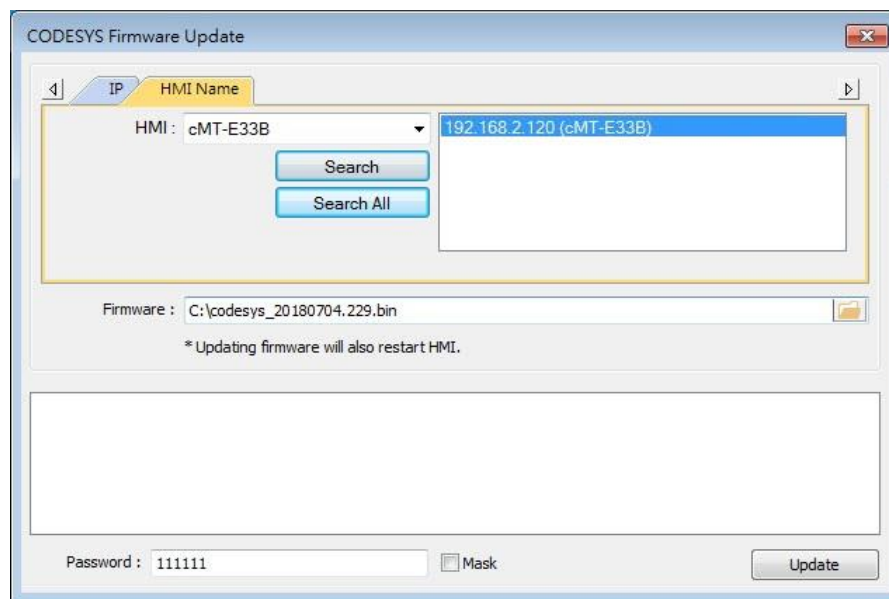
13.3 Questions Related to Downloading cMT CODESYS File

Q1. How to update CODESYS firmware?

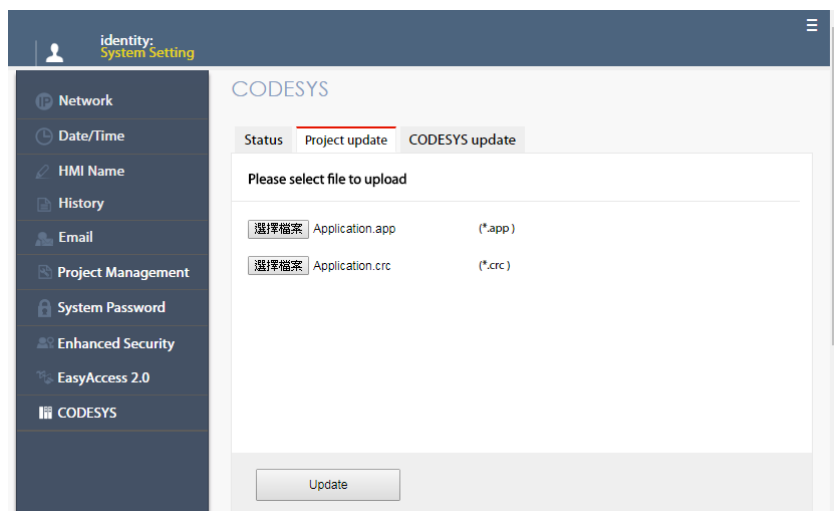
A:

There are 2 ways to update CODESYS firmware.

1. Launch Utility Manager and select cMT Series » Maintenance » CODESYS Firmware Update. Browse for the firmware file and click [Update].



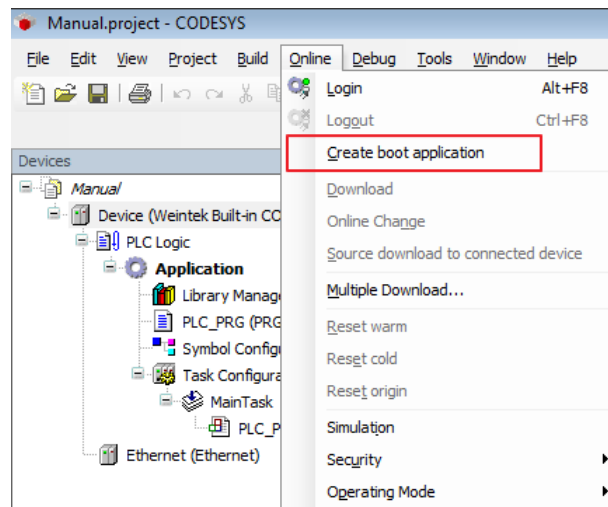
2. Enter cMT HMI's IP address in the website browser and find [CODESYS] » [CODESYS update] tab. Select the file and click [Update].



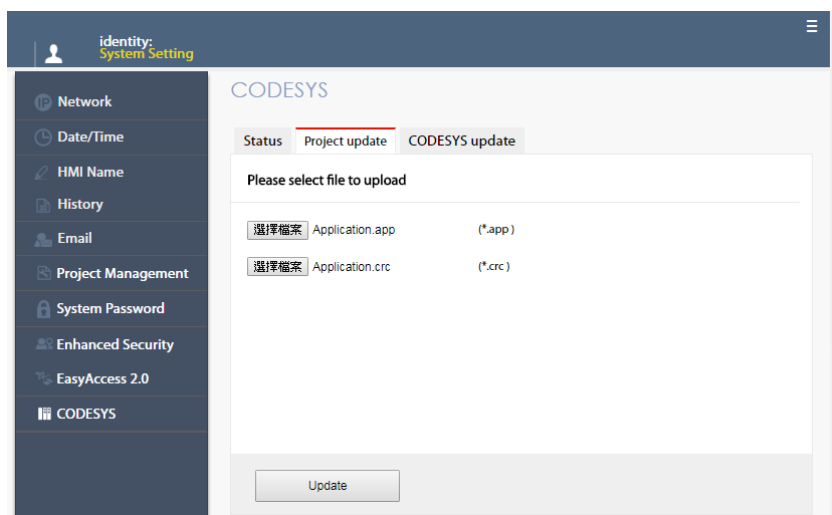
- Q2.** How to download CODESYS project using website?

A:

1. In CODESYS software select [Online] » [Create boot application]. An *.app file and a *.crc file will be generated.



2. Enter cMT HMI's IP address in the website browser and find [CODESYS] » [Project update] tab. Select the files generated in the last step and click [Update].



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