

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.

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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].

Open with CODESYS Package Manager Open with
Share with Restore previous versions
Send to +
Cut Copy
Create shortcut Delete Rename
Properties

 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.)

🗊 Installation - Choose Setup Type	×				
Weintek Built-in CODESYS [2018.1.24] Please selectthe type of setup you would like to perform.	WEINTEK				
 Complete setup All package components will be installed. 					
Typical setup The most commonly used package components will be installed.					
Cancel < Back Next >	Finish				

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



🗊 Installation - Setup Completed	×
Weintek Built-in CODESYS [2018.1.24]	WEINTEK
The package has been successfully installed. Click Finish to exit the wizard or Ne the summary.	xt to see
Cancel < Back Next >	Finish

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

🗊 Installation - Summary	3
Weintek Built-in CODESYS [2018.1.24] Installation summary WEINTE	ĸ
Summary:	
■ Device description (1)	
Component/DeviceDescription/Weintek-Cortex-embedded.devdesc.xml: Ite	
۰ III. ا	
Cancel < Back Next > Finish]



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.

Setting	c	ODESYS
System setting	Activation status	Activated (QA0000021
Information	CODESYS status	start
	Application status	start
General	Login status	logout
-	Ethernet(LAN1)	
Network	IP address	192.168.2.105
() Time/Date	Subnet mask	255.255.252.0
0	Gateway	192.168.1.254
2 HMI Name	Mac address	00:0c:26:0f:e3:3b
	Version	20180516

2.2 Creating CODESYS Project

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





) New Proje	ect	
Categories	:	Templates:
Lib	raries ojects	
		Empty project HMI project Standard Standard project w
		Standard project w
A music at a		
A project co	ontaining one device, one	application, and an empty implementation for PLC_PRG
Name:	cMT3090c	
Location:	C: \Users \user \Documer	ts 🔹 🐨
		OK Cancel

 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.

Standard Project							
You are about to create a new standard project. This wizard will create the follow objects within this project: - One programmable device as specified below - A program PLC_PRG in the language specified below - A cyclic task which calls PLC_PRG - A reference to the newest version of the Standard library currently installed.							
	Device:	Weintek Built-in CODESYS (Weintek Labs., Inc.)	•				
	PLC_PRG in:	Structured Text (ST)	-				
		Continuous Function Chart (CFC) Continuous Function Chart (CFC) - page-oriented Function Block Diagram (FBD) Ladder Logic Diagram (LD) Sequential Function Chart (SFC) <u>Structured Text (ST)</u>					

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



Devices	•	Д	×
□- 👔 cMT3090c			
🖃 🚮 Device (Weintek Built-in CODESYS)			
🖮 🗐 PLC Logic			
🖹 🔘 Application			
📲 🎁 Library Manager			
PLC_PRG (PRG)			
😑 🌃 Task Configuration			
😑 🍪 MainTask			
PLC_PRG			

Device 🗙								•
Communication Settings	Scan Network	Gateway 👻	Device 👻					
Applications		_						1
Backup and Restore								
Files	-						•	
Log			Gateway-1	Gateway	-	VB		- -
PLC Settings			IP-Address:					
PLC Shell			Port:					
Users and Groups			1217					
Task Deployment								
Status								
Information								

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]*.

Select Device	×
Select the network path to the controller: Gateway-1 (scanning) CMT-00 [026A] CMT-B628-ted [0209] CMT-D6A [0241] CMT-D6A [0241] CMT-E6C6 [0243] CMT-E6C8 [025E]	Device Name: Scan network Gateway-1 Wink Driver: TCP/IP IP-Address: localhost Port: 1217
	OK Cancel

5. The project will connect the selected device.



 Gateway	
Gateway-1 👻	[0276] (active) -
IP-Address: localhost	Device Name: cMT-E33B
Port: 1217	Device Address: 0276
	Target ID: 16BF 0001
	Target Type: 4096
	Target Vendor: Weintek Labs., Inc.
	Target Version: 3.5.10.30

Note

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

 	Gateway		
Gateway-1		-	192.168.2.118 👻
IP-Address: localhost			Press ENTER to set active path
Port: 1217			



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

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

Include Comments in XML Support OPC UA Features Addlibrary placeholderin DeviceApplication (recommended, but may trigger download) Client side data layout Compatibility a work
Addibrary placeholderin DeviceApplication (recommended, but may trigger download) Client side data layout
Client side data layout
Compatibility Lavort
Optimized Layout

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

Symbols	Access Rights	Maximal	Attribute	Туре	Members	Comment
🗉 🔲 📄 Constants						
🗉 📃 📄 IoConfig_Globals						
🖮 🔽 📄 PLC_PRG						
🔽 read	*	St.		BOOL		
🐨 📝 	**>	St.		INT		
📝 🔷 write	*	St.		BOOL		

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.

Cellular Data Network I General	Time Sync /I System Setting	DST	e-Mail Remote	Recipes Security
l General	System Setting		Remote	Security
			1813	hat's mar IP2
			<u></u>	iats my m
Name	Location	Addre	ess type	Int
Local HMI	Local	cMT3	090 (768 x 102	- 24)
Weintek Built-in CODES	SYS Local	Weint	tek Built-in COI	DESYS -
	Name Local HMI Weintek Built-in CODES	Name Location Local HMI Local Weintek Built-in CODESYS Local	Name Location Address Local HMI Local cMT3 Weintek Built-in CODESYS Local Weintek	Name Location Address type Local HMI Local cMT3090 (768 x 102 Weintek Built-in CODESYS Local Weintek Built-in CODESYS

2. Open Tag Manager and click $\ref{eq: click}$, and then click [Import Tag] to import

the *.xml file built in preceding steps.

Variable List Name : TagTable		Find : Q
Symbols Data	Verifying Tags with device Import Tags	Description

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



viy Application	Variable List						
Application Tags TagTable	Name :	Name : TagTable Find : Q					
	0)	6 🏼 🖉	88 U1				
		Symbols		Data Type	Scan Rate (s)	Binary Access	Online
	EF Ta	g					
		- 🔽 Application.Pl	LC_PRG.read	BOOL	Default	FALSE	2 Nonc
		Application.PLC_PRG.test			Default	FALSE	🗶 None
		Application.Pl	LC_PRG.write	BOOL	Default	FALSE	🗶 None
			m				F
mport Status			m				Þ
mport Status Imported tag information succ 0 warning(s)	essfully.		m				•

 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

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

🛿 Add Device				×		
Name: CANbus						
Action:						
Append device Insert	t device 🔘 Plug device 🔘 Up	date device				
Enter a string for a fulltext search in all devices Vendor: (All vendors>						
Name	Vendor	Version	Description	*		
Fieldbusses				E		
CANbus	3S - Smart Software Solution	s GmbH 3.5.10.0	Needed for all field	busse		
👔 NetX CANbus	3S - Smart Software Solution	s GmbH 3.5.10.0	CANbus on a netX	device		
🗷 📴 Bedr EtherCAT						
🗄 🕮 Ethernet Adapter				-		
· · · ·				•		

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



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

Add Device				
Name: CANopen_Manager				
Action:				
Append device	O Plug device (🕥 Update device		
Enter a string for a fulltext search in all o	devices Vendo	or: <all vendors=""></all>		•
Name		Vendor	Version	Di ^
🖃 🔟 Fieldbusses				
CANopen				=
CANopenManager				
CANopen_Manager	. 3	3S - Smart Software Solutions GmbH	3.5.10.0	C/
CANopen_Manager	_FDT 3	3S - Smart Software Solutions GmbH	3.5.7.20	C/
CANopen_Manager	_SIL2 3	3S - Smart Software Solutions GmbH	3.5.10.0	C4 .
•	III			•



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

Add Device			×
Name: iR_COP			
Action:			
Append device	device 🔘 Plug devi	ce 🔘 Update device	
Enter a string for a fulltext sea	rch in all devices V	endor: Weintek Labs., Inc.	•
Name	Vendor	Version	Descriptic
Fieldbusses			
🖃 🕻 🧰 Remote Devic	e		
ir-cop	Weintek Labs., I	nc. Revision=16#00000001, FileVersion	n=1.1 Imported f

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

🚹 Add Device			×
Name: R_COP_1 Action: Append device Ins	s ert device O Plug de	vice 🔿 Update device	
Enter a string for a fulltext	search in all devices	Vendor: <all vendors=""></all>	~
Name	Vendor	Version	Description
🖃 👔 Miscellaneous			
👔 iR-AI04-TR	Weintek Labs., Inc.	Revision=16#00000003, FileVersion	1=1.4 CANopen-Module
🛛 🔟 iR-AI04-VI	Weintek Labs., Inc.	Revision=16#00000003, FileVersion	1=1.4 CANopen-Module
iR-AM06-VI	Weintek Labs., Inc.	Revision=16#00000003, FileVersion	1=1.4 CANopen-Module
🐨 🔟 iR-AQ04-VI	Weintek Labs., Inc.	Revision=16#00000003, FileVersion	1=1.4 CANopen-Module
- 👔 iR-DI 16-K	Weintek Labs., Inc.	Revision=16#00000003, FileVersion	1=1.4 CANopen-Module
	Weintek Labs., Inc.	Revision=16#00000003, FileVersion	1=1.4 CANopen-Module
- 👔 iR-DM16-P	Weintek Labs., Inc.	Revision=16#00000003, FileVersion	1=1.4 CANopen-Module
🔟 iR-DQ016-N	Weintek Labs., Inc.	Revision=16#00000003, FileVersion	1=1.4 CANopen-Module
👔 iR-DQ016-P	Weintek Labs., Inc.	Revision=16#00000003, FileVersion	1=1.4 CANopen-Module
👔 iR-DQ08-R	Weintek Labs., Inc.	Revision=16#00000003, FileVersion	=1.4 CANopen-Module
PU01-Axis 0	Weintek Labs., Inc.	Revision=16#00000003, FileVersion	=1.4 CANopen-Module
	Weintek Labs., Inc.	Revision=16#00000003, FileVersion	=1.4 CANopen-Module
PU01-Axis 2	Weintek Labs., Inc.	Revision=16#00000003, FileVersion	=1.4 CANopen-Module
PU01-Axis 3	Weintek Labs., Inc.	Revision=16#00000003, FileVersion	1=1.4 CANopen-Module

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.



💗 cMT3090c.project - CODESYS				
<u>File Edit View Project Build Online Debug Tools Wi</u>	ndow <u>H</u> elp			
🎦 🖆 📕 😂 🗠 🗠 🏅 🗎 🗠 🗠 🖄 🛤 🕼 🛤	简, 🖞 🎬 🥵 🧐 🕞 🔳 🕯	* (] 9] 4] 4] 8 4	📈 🛒	
Devices - 4 ×	R_DM16_N CANb	us X		
CODESYS)	General	General		
III PLC Logic Application	CANbus Parameters	Network:	0	CAN
Library Manager	CANbus I/O Mapping	Baudrate (bit/s):	250000 ~	
□ 👹 Task Configuration □ 🎲 MainTask	Status			
- 셸] PLC_PRG - 페 CANbus (CANbus)	Information			
CANopen_Manager (CANopen_Manager)				
Zevices POUs				

- **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.

General	Find	Filter Show all				•			
PDOs	Variable	Mapping	Channel	Address	Туре	Unit	Description	-	
			DO byte 1	%QB0	USINT			=	
SDOs	[™] Application.PLC_PRG.x0	~⊘	Bit0	%QX0.0	BOOL			-	
	Application.PLC_PRG.x1	~⊘	Bit1	%QX0.1	BOOL				
CANopen I/O Mapping	* *		Bit2	%QX0.2	BOOL				
			Bit3	%QX0.3	BOOL				
Status	* ø		Bit4	%QX0.4	BOOL				
	*		Bit5	%QX0.5	BOOL				
Information	* ø		Bit6	%QX0.6	BOOL				
			Bit7	%QX0.7	BOOL				
	🗎 - 🍢		DO byte 2	%QB1	USINT				
			DO byte 3	%QB2	USINT			-	
	- F •								

 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].
- 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].

 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].

Devices 🗸 🗸 🗙	Device Ethernet X	Modbus_TCP_Master -
□ dMT3090_iR-ETN		· — ·
🖻 🕤 Device (Weintek Built-in CODESYS)	General	
PLC Logic		Interface: eth0
🖹 🔘 Application	Status	
📲 📶 Library Manager		O Use Operating System Settings
PLC_PRG (PRG)	Ethernet Device I/O Mapping	Ochange Operating System Settings
🖹 🎆 Task Configuration		
🖻 🍪 MainTask	Information	IP Address 192 . 168 . 2 . 144
PLC_PRG		Subnet Mask 255 . 255 . 252 . 0
Ethernet (Ethernet)		Default Gateway 192 . 168 . 1 . 254
🖃 🎬 Modbus_TCP_Master (Modbus TCP Maste		
Modbus_TCP_Slave (Modbus TCP Sla		
4		
Contraction and the second sec		

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

Network Ad	lapters		
Interfaces:			
Name	Descriptio	on IP Address	
lo		127.0.0.1	
eth0		192.168.2.73	
vnet1		10.255.255.2	
IP Address	.	192 . 168 . 2 . 73	
Subnet Ma	sk	255 . 255 . 252 . 0	
Default Ga	teway	192 . 168 . 1 . 254	
MAC Add	ress	00:0C:26:0F:E3:3B	
			OK Cancel

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.



Devices 👻 🕂 🗙	Modbus_TCP_Slave X		•
]
🖻 🕤 Device (Weintek Built-in CODESYS)	General	ModburgTCP	
PLC Logic			
🖹 💮 Application	Modbus Slave Channel	Slave IP Address:	192 . 168 . 2 . 144
📶 Library Manager		Lipit-ID [1 247]	1
PLC_PRG (PRG)	Modbus Slave Init		-
🖃 🎆 Task Configuration		Response Timeout (ms)	1000
🖻 🍪 MainTask	ModbusTCPSlave Parameters	Port	502
PLC_PRG	MadhuaTCBElava I/O Manaina		
🖃 🔟 Ethernet (Ethernet)	Modbus repsiave t/o Mapping		
🖃 🚮 Modbus_TCP_Master (Modbus TCP Maste	Status		
Modbus_TCP_Slave (Modbus TCP Sla			
	Information		
4			
Contraction and the second sec		•	4

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

dbusChannel			
Channel			
Name	Read 0x-0		
Access Type	Read Discrete Inputs (Fur	nction Code 2)	•
Trigger	Cyclic	 Cycle Time (ms) 	100
Comment			
READ Register			
Offset	0x0000		•
Length	1		
Error Handling	Keep last Value	•	
WRITE Register			
Offset	0x0000		-
Length	0		
		ОК	Cance
odbusChannel		ОК	Cance
odbusChannel Channel Name	Write 0x-0	ОК	Cance
odbusChannel Channel Name Access Type	Write 0x-0 Write Multiple Coils (Funct	OK ion Code 15)	Cance
odbusChannel Channel Name Access Type Trigger	Write 0x-0 Write Multiple Coils (Funct Cyclic	OK ion Code 15) Cycle Time (ms)	Cance
odbusChannel Channel Name Access Type Trigger Comment	Write 0x-0 Write Multiple Coils (Funct Cyclic	OK ion Code 15) • Cycle Time (ms)	Cance
odbusChannel Channel Name Access Type Trigger Comment READ Register	Write 0x-0 Write Multiple Coils (Funct Cyclic	OK ion Code 15) Cycle Time (ms)	Cance
odbusChannel Channel Name Access Type Trigger Comment READ Register Offset	Write 0x-0 Write Multiple Coils (Funct Cyclic	OK ion Code 15) Cycle Time (ms)	Cance
odbusChannel Channel Name Access Type Trigger Comment READ Register Offset Length	Write 0x-0 Write Multiple Coils (Funct Cyclic	OK ion Code 15) Cycle Time (ms)	Cance
odbusChannel Channel Name Access Type Trigger Comment READ Register Offset Length Error Handling	Write 0x-0 Write Multiple Coils (Funct Cyclic	OK ion Code 15) Cycle Time (ms)	Cance The second seco
odbusChannel Channel Name Access Type Trigger Comment READ Register Offset Length Error Handling WRITE Register	Write 0x-0 Write Multiple Coils (Funct Cyclic	OK ion Code 15) Cycle Time (ms)	Cance
odbusChannel Channel Name Access Type Trigger Comment READ Register Offset Length Error Handling WRITE Register Offset	Write 0x-0 Write Multiple Coils (Funct Cyclic	OK ion Code 15) Cycle Time (ms)	Cance

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



a command as shown below.



 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	Туре	Unit	Description
		Read 0x-0	%IB0	ARRAY [00] 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 [00] OF BYTE		Write Multiple Coils
ii *		Write 0x-0[0]	%QB0	BYTE		Write Multiple Coils
Application.PLC_PRG.write	~⊘	Bit0	%QX0.0	BOOL		0x0000

 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].
- Select [EtherCAT] » [Master] » [EtherCAT Master] and then click [Add Device].

iii Add Device						
Name: EtherCAT_Master						
Append device Insert device Plug device (🔾 Update device					
Enter a string for a fulltext search in all devices Vend	or: <all vendors=""></all>	~				
Name	Vendor	Version ^				
Hereit Miscellaneous Fieldbusses Fieldbusses Brot CANbus Brot EtherCAT Brot Master						
CXxxxx internal EtherCAT Master	3S - Smart Software Solutions GmbH	3.5.12.60				
EtherCAT Master	3S - Smart Software Solutions GmbH	3.5.10.0				
EtherCAT Master	3S - Smart Software Solutions GmbH	3.5.12.0				
EtherCAT Master	35 - Smart Software Solutions GmbH	3.5.12.60				
EtherCAT Master	3S - Smart Software Solutions GmbH	3.5.13.0				
EtherCAT Master	35 - Smart Software Solutions GmbH	3.5.14.20				
	35 - Smart Software Solutions GmbH	3 5 15 30				
EtherCAT Master SoftMotion	3S - Smart Software Solutions GmbH	3.5.10.0				

3. EtherCAT_Master can be found in Devices tree.



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





- 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].

Name	Vendor	Version
🖃 🕤 Fieldbusses		
🖻 🔐 🔐 EtherCAT		
🖮 🔐 Module		
💼 iR-AI04-TR	Weintek Labs., Inc.	0
···· 💼 iR-AI04-VI	Weintek Labs., Inc.	0
··· 🔟 iR-AM06-VI	Weintek Labs., Inc.	0
···· 🔟 iR-AQ04-VI	Weintek Labs., Inc.	0
🔟 iR-DI16-K	Weintek Labs., Inc.	0
📆 <mark>i</mark> R-DM16-N	Weintek Labs., Inc.	0
🔟 iR-DM16-P	Weintek Labs., Inc.	0
🔟 iR-DQ08-R	Weintek Labs., Inc.	0
🔟 iR-DQ 16-N	Weintek Labs., Inc.	0
🔟 iR-DQ16-P	Weintek Labs., Inc.	0
🔟 iR-PU01-P Axis 0	Weintek Labs., Inc.	0
···· \min iR-PU01-P Axis 1	Weintek Labs., Inc.	0
前 iR-PU01-P Axis 2	Weintek Labs., Inc.	0
iR-PU01-P Axis 3	Weintek Labs., Inc.	0

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

Devices 👻 🌵	🗙 📝 EtherCAT_Master 🗙 😭	Device	
Add EtherCAT Model EtherCAT Model Content Model	General Sync Unit Accionment	Autoconfig Master/Slaves	EtherCAT
Application Mill Library Manager ULC_PRG (PRG)	EtherCAT I/O Mapping	EtherCAT NIC Setting Destination Address (MAC) FF-FF-FF-FF Broadca Secure Address (MAC) P0-00-00-00-00-00 Browse	st 🗌 Enable Redundancy
Kask Configuration Section 4 Section	Status	Source Address (MAC) Order-00-00-00-00 Select Network by MAC Select Network by MAC	J
PLC_PRG 		Select Network Adapter	
≌-∭ R_ECAT (R-ECAT) □ ∭ R_DM16_N (R-DM16-N)		MAC address Name Description 000C261899E7 eth0 000C26112234 vaet1	

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	Туре	Unit	Description
*		iR_DM16_N Digital Output	%QB0	BYTE		iR_DM16_N Digital Outpu
Application.PLC_PRG.read	~ @	Bit0	%QX0.0	BOOL		
*		Bit1	%QX0.1	BOOL		
*		Bit2	%QX0.2	BOOL		
····· * ø		Bit3	%QX0.3	BOOL		
*		Bit4	%QX0.4	BOOL		
····· * ø		Bit5	%QX0.5	BOOL		
*		Bit6	%QX0.6	BOOL		
L 🍫		Bit7	%QX0.7	BOOL		
an Np		iR_DM16_N Digital Input	%IB2	BYTE		iR_DM16_N Digital Input
Application.PLC_PRG.write	۵	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		
L. 🍫		Bit7	%IX2.7	BOOL		

 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].
- Select [Miscellaneous], add the iR modules connected to cMT-CTRL01, and click [Add Device].

Devices v A X		Add Device			×
Add_CTRL Add_CTRL CTRL Device (dMT-CTRL)	Module Parameters	Name: R_DM16_N_1 Action:			
C Logic Application	Module I/O Mapping	Append device In	sert device 🔘 Plug de	evice OU	pdate device
- Dibrary Manager	Status	Enter a string for a fulltext	search in all devices	Vendor:	<all vendors=""> ~</all>
Task Configuration	Information	Name	Vendor	Version	Description
PLC_PRG		R-AI04-TR	Weintek Labs., Inc.	1.0.0.0	4 × Temperature Input , RTD/Thermocouple, Consu
			Weintek Labs., Inc. Weintek Labs., Inc.	1.0.0.0 1.0.0.0	4 × analog Input, 16 bit, ±10V × ±20mA × 1-5V × 4 Analog,4 × Input 16bit, 2 × Output 12bit, ±10V ×
			Weintek Labs., Inc. Weintek Labs., Inc.	1.0.0.0	4 × analog output, 12 bit, ±10V × ±20mA × 1-5V × 16 Points Digital Input, Consumption(5V)-83mA/0.41
		1 R-DM16-N	Weintek Labs., Inc.	1.0.0.0	8 Points Digital Input,8 Points Sink Type Digital Outp
		- 10 R-DM16-P - 11 R-DQ08-R	Weintek Labs., Inc. Weintek Labs., Inc.	1.0.0.0	8 Points Digital Input,8 Points Source Type Digital OL 8 Points Relay Output, Consumption(5V)-220mA/1.1
			Weintek Labs., Inc.	1.0.0.0	16 Points Sink Type Digital Output, Consumption(5V)
			Weintek Labs., Inc.	1.0.1.0	1-Axis Motion Controller (PA/PB), 1-Encoder (A/B/Z),

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



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

Module Parameters	Find	Filter SI	now all			-	
Module I/O Mapping	Variable	Mapping	Channel	Address	Туре	Unit	Description
Hoddle t/o Happing			INO	%IB2	BYTE		24Vdc Source/Sink Input
Status	Application.PLC_PRG.read	~	BITO	%IX2.0	BOOL		
	· · · · · · · · · · · · · · · · ·		BIT1	%IX2.1	BOOL		
Information			BIT2	%IX2.2	BOOL		
			BIT3	%IX2.3	BOOL		
			BIT4	%IX2.4	BOOL		
			BIT5	%IX2.5	BOOL		
			BIT6	%IX2.6	BOOL		
			BIT7	%IX2.7	BOOL		
	ė- *		OUTO	%QB0	BYTE		24Vdc Sink Output
	Application.PLC_PRG.write	*	BITO	%QX0.0	BOOL		
	*		BIT1	%QX0.1	BOOL		
			BIT2	%QX0.2	BOOL		
	🍫		BIT3	%QX0.3	BOOL		
	**		BIT4	%QX0.4	BOOL		
	5		BIT5	%QX0.5	BOOL		
	*		BIT6	%QX0.6	BOOL		
	*		BIT7	%QX0.7	BOOL		

 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].

ame Ethernet 1			
Action			
Append device 🔘 Insert devi	ice OPlug device OUpdate device		
String for a full text search	Vendor <all vendors=""></all>		
Name	Vendor	Version	Description
Fieldbuses			
CANbus			
Brow EtherCAT			
Ethernet Adapter			-
Ethernet	35 - Smart Software Solutions GmbH	3.5.10.0	Ethernet Link.
Ethernet	3S - Smart Software Solutions GmbH	3.5.15.0	Ethernet Link.
	3S - Smart Software Solutions GmbH	3.5.16.0	Ethernet Link.
\cdots 🔟 Ethernet			

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



- 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].
- Click [Fieldbuses] » [Ethernet/IP] » [Ethernet/IP Scanner] » [Ethernet/IP Scanner], and then select [Add Device].



Name EtherNet_IP_Scanner				
Action				
○ Append device ○ Insert device	🔵 Plug device 💿 U	pdate device 🗌 Upda	ite same devid	es in project
String for a full text search	Vendor	<all vendors=""></all>		~
Name	Vendor		Version	Description
🖃 🖬 Fieldbuses				
🖹 👄 EtherNet/IP				
🗉 - 👄 EtherNet/IP Local Ada	pter			
EtherNet/IP Scanner				
🔛 🛗 EtherNet/IP Scanr	ner 3S - Smart Soft	tware Solutions GmbH	3.5.10.30	EtherNet/IP S
EtherNet/IP Scan	ner 3S - Smart Soft	tware Solutions GmbH	3.5.15.20	EtherNet/IP S

- 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].
- 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 <u>iR-ETN EtherNet/IP Connection Guide</u>.

Name IR_ETN Action Append device Insert device Plug d	levice 🗿 l	Jpdate device 🗌 Update si	ame devices in project
String for a full text search	Vendor	<all vendors=""></all>	~
Name	Vendor		Version
EtherNet/IP EtherNet/IP Remote Adapter Image: Im	3S - Sma	rt Software Solutions GmbH	Major Revision=16#1,
Generic EtherNet/IP device	3S - Sma Weintek	rt Software Solutions GmbH Labs., Inc.	4.1.0.0 Major Revision=16#1,
ir.etn	Weintek	Labs., Inc.	Major Revision=16#

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

Vetwork Ad	lapters		
Interfaces:			
Name	Descripti	on IP Address	
lo		127.0.0.1	
eth0		192.168.2.73	
vnet1		10.255.255.2	
IP Addres	S	192.168.2.73	
Subnet Ma	ask	255 . 255 . 252 . 0	
Default Ga	ateway	192 . 168 . 1 . 254	
MAC Add	ress	00:0C:26:0F:E3:3B	
			OK Cancel

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



evices	👻 🕂 🗙 🖉 ENIPScannerSei	rviceTask 🚮 Ethernet	Device	ir_etn 🗙	EtherNet_IP_Scanner
EthernetIP	;) General	Address Settin	ıgs —		
Application	Connections	IP address	192 . 168	3.3.212	EthorNot/ID
Library Manager	Assemblies				Etherited in
Task Configuration	User-Defined Paramet	ers Electronic Key	ing —		
EtherNet_IP	ssk _Scanner.IOCyc Log	Compatibi	ility check		
EtherNet_IP	_Scanner.Servic EtherNet/IP I/O Mapp	ing Vendor ID	1596	🕑 Check match	
😑 😻 MainTask		Device type	12	🛃 Check match	
PLC_PRG	EtherNet/IP IEC Object	Product code	1794	🕑 Check match	
EtherNet IP Scanner (Et	herNet/IP Scan	Major revision	1	🛃 Check match	
R_ETN (R-ETN)	Information	Minor revision	1	Check match	

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
з	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	Туре	Unit	Description
🗏 🔤 Exlusive Owner						
🚔 🍫		slot 1 DM 16-N DI	%IB0	BYTE		New Help String
Application.PLC_PRG.read	~	Bit0	%IX0.0	BOOL		
¥ø		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
🚔 🍢		slot 1 DM16-N DO	%QB0	BYTE		New Help String
Application.PLC_PRG.write	~	Bit0	%QX0.0	BOOL		
* ø		Bit1	%QX0.1	BOOL		
* @		Bit2	%QX0.2	BOOL		
* ø		Bit3	%QX0.3	BOOL		
* @		Bit4	%QX0.4	BOOL		
**		Bit5	%QX0.5	BOOL		
* @		Bit6	%QX0.6	BOOL		
		Bit7	%QX0.7	BOOL		
<u>نه</u>		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 <u>UM018013E iR-Axxx-VI UserManual eng.pdf</u> for information on wiring when using iR-AI04-VI,iR-AM06-VI,iR-AQ04-VI modules.

Please see <u>UM018014E iR-Axxx-TR UserManual eng.pdf</u> 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.

File	Edit View	Online	Tools	Help											
		14 1	∎ ∓	Û	13	Ī	<u>+</u>	t It		0000	3				
Projec	t Window				ð×	IO /	Module	s Add	lress Map	Parameter	Po	wer Information			
\sim	iR-FTN (1	92.168.1.37	n.												_
	🚺 #1: iR	-AQ04-VI				Ch	annel Na	une				Modbus Mapping	Online Value	Project Value	
	#2: iR	-Al04-VI				~	#1: iR-	AQ04-V	1						
	il #3: iR	-AI04-TR					Pr	oduct Co	ode			0x7530			
							Fir	mware F	Revision			0x7531			
							Ha	ardware l	Revision			0x7532			
							Po	wer Con	sumption			0x7533			
							Po	int of Di	gital Input			0x7556			
							Po	int of Di	gital Outp	ut		0x7557			
						1							-	-	

3. Enter the parameters as shown below.

Channe	l 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 +10V	
	Output Mode #2	0x4e22		±57	
	Output Mode #3	0x4e23		1-57 ±20mA	
	Output Scale Range Upper Limit #0	0x4e24		4-20mA	
	Output Scale Range Upper Limit #1	0x4e25		32000	
	Output Scale Range Upper Limit #2	0x4e26		32000	
	Output Scale Range Upper Limit #3	0x4e27		32000	

4. Download the project to finish setting parameters.



File Edit View Online Tools Help				
🗎 🗄 🖪 🖪 🖪 🗄 🖬				
Project Window 🗗	X Download Permater	Davis Information		
EI	107 Modules Kaaress Map Palameter	rower information		
#1: iR-ACOM-VI	Channel Name	Modbus Mapping	Online Value	Project Value
#1: IR-AQ04-VI	Point of Digital Output	0x7557	0	
#3: iR-Al04-TR	Number of Analog Input	0x7558	0	
	Number of Analog Output	0x7559	4	
	Analog Output Error Mode #0	0x1815[0]	Error value	Error value
	Analog Output Error Mode #1	0x1815[1]	Error value	Error value
	Analog Output Error Mode #2	0x1815[2]	Error value	Error value
	Analog Output Error Mode #3	0x1815[3]	Error value	Error value
	Analog Output Error Value #0	0x1819	0	0
	Analog Output Error Value #1	0x181a	0	0
	Analog Output Error Value #2	0x181b	0	0
	Analog Output Error Value #3	0x181c	0	0
	Output Mode #0	0x4e20	1-5V	1-57
	Output Mode #1	0x4e21	±10V	±10V ·
	Output Mode #2	0x4e22	±10V	±10∀
	Output Mode #3	0x4e23	±10V	±10∀

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]

Devices 👻 🕈	X Modbus_TCP_Slave X					
	General General Modbus Slave Channel Modbus Slave Channel Modbus Slave Init Modbus TCPSlave Branneters Modbus TCPSlave Branneters Sature Jaformation X V	Line Access Type	WRITE Offset	Default Value	Length	Comment
		Move up Move down	New	Delete		Edit
Initialization Value	Write Multiple Re	egisters (Function Co	ode 16)	×		
RegisterOffset	20000			~		
Length	1					
Initialization Value	1					
Comment	iR-ETN Module 1.	parameter 1				
		ОК	Canc	el		

Find iR-ETN Modbus Address Mapping table in these user manuals: For analog modules see <u>UM018013E iR-Axxx-VI UserManual eng.pdf</u> For temperature module see <u>UM018014E iR-Axxx-TR UserManual eng.pdf</u>

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



CODESYS.

Exporting PLCopenXML from EasyRemoteIO:

- 1. Open EasyRemoteIO » [File] » [Export PLCopen XML].
- Select Modbus_TCP_Master device, open Project tab » [Import PLCopenXML File].

Ele Edit View Project Build Online Debug Tools Window	Help								
🎦 🚅 📓 🖆 🗠 🕹 🏗 🖉 🎽 📾 👘 👘	ĵi⊞i o ;o) → ₌ ≪ic≡		≡\$ ¢ ≋ ≡						
a									
Devices - # ×	Modbus_TCP_Slave	iR_ETN_	192_168_1_37_ ×						
DIC Logic Application	General	Line	Access Type	WRITE Offset	Default Value	Length	Commer ^		
Library Manager		1	Write Single Register (Function Code 06)	16#0x17d4 (=6100)	0	1			
PLC_PRG (PRG)	Modbus Slave Channel	2	Write Single Register (Function Code 06)	16#0x273d (=10045)	0	1			
🖻 🧱 Task Configuration	Mardhura Claura Tath	3	Write Single Register (Function Code 06)	16#0x04b0 (=1200)	0	1			
🖻 🎲 MainTask	Modbus Slave Inic	4	Write Single Register (Function Code 06)	16#0x4e20 (=20000)	17	1			
PLC_PRG	Modbus TCPSlave Parameters	5	Write Single Register (Function Code 06)	16#0x4e21 (=20001)	1	1			
🖹 🚮 Ethernet (Ethernet)		6	Write Single Register (Function Code 06)	16#0x4e22 (=20002)	0	1			
Modbus_TCP_Master (Modbus TCP Master)	ModbusTCPSlave I/O Mapping	7	Write Single Register (Function Code 06)	16#0x4e23 (=20003)	0	1			
Modbus_TCP_Slave (Modbus TCP Slave)		8	Write Single Register (Function Code 06)	16#0x4e24 (=20004)	32000	1			
IR_ETN_192_168_1_37_ (Modbus TCP Slave)	Status	9	Write Single Register (Function Code 06)	16#0x4e25 (=20005)	32000	1			
< >		10	Write Single Register (Function Code 06)	16#0x4e26 (=20006)	32000	1			
Powiere M Modules	Information	11	Write Single Register (Function Code 06)	16#0x4e27 (=20007)	32000	1			
		12	Write Single Register (Function Code 06)	16#0x4e28 (=20008)	33536	1			
POUs 👻 🕂 🗙	×		13 Write		Write Single Register (Function Code 06)	16#0x4e29 (=20009)	33536	1	
= 🔄 ETN_AIO_Config 🔹		14	Write Single Register (Function Code 06)	16#0x4e2a (=20010)	33536	1			
Project Settings		15	Write Single Register (Function Code 06)	16#0x4e2b (=20011)	33536	1			
		16	Write Single Register (Function Code 06)	16#0x4e2c (=20012)	5	1			
		17	Write Single Register (Function Code 06)	16#0x4e2d (=20013)	5	1	~		
		<					>		
		M	love up Move down	New	Delete		Edit		
				-					

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]







Index:Subind	ex	Name		AccessType	Туре	Default	^
± 16#1003		Pre-defined e	rror field				
16#1005:	16#00	COB-ID SYNC		RW	UDINT	16#0000080	
16#100C:	16#00	Guard Time		RW	UINT	16#00	
- 16#100D:	16#00	Life Time Fact	or	RW	USINT	16#00	
± 16#1010		Store Parame	ters				
16#1011		Restore defa	ult parameters				
16#1014:	16#00	COB-ID EMCY		RW	UDINT	\$NODEID+16#80	
16#1015:	16#00	Emergency In	hibit Time	RW	UINT	16#00	
± 16#1016		Consumer hea	artbeat time				
16#1017:	16#00	Producer hear	rtbeat time	RW	UINT	16#00	
± 16#1029		Error behavio	r object				
± 16#1400		RxPDO 1 com	m. parameter				
± 16#1401		RxPDO 2 com	m. parameter				
16#1402		RxPDO 3 com	m. parameter				
± 16#1403		RxPDO 4 com	m. parameter				
± 16#1404		RxPDO 5 com	m. parameter				
± 16#1405		RxPDO 6 com	m. parameter				~
lame:	iR-COF	^o Module 1 regist	er				
ndex:	16#30	00	Bit length:	16			
SubIndex:	16#1		Value:	1			

Find iR-COP Address Mapping table in these user manuals: For analog modules see <u>UM018013E iR-Axxx-VI UserManual eng.pdf</u> For temperature modules see <u>UM018014E iR-Axxx-TR UserManual eng.pdf</u>

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

9.2.4 Using CODESYS to Set Channels (iR-ECAT)

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

Devices - 4 >	EtherCAT_Master	Device	R_DM16_N	👔 ir_ecat 🗙 🕛 P	LC_PRG	
Add_EtherCAT Device (dMT-CTRL)	General	💠 Add	🖉 Edit 🔀 Delete			
E PLC Logic	Process Data	Line	Index:Subindex	Name	Value	Bitlength
- Q Application		- 1	16#800F:16#01	Output behaviour On error	255	16
Library Manager	Startup Parameters	- 2	16#800F:16#02	Substitute Value	0	16
PLC_PRG (PRG)		· 3	16#F030:16#00	download slot cfg	3,0,82,3,0,0,53,6,0,0,38,4,0,0	112
= ga Task Configuration = ga MainTask	EtherCAT I/O Mapping					
型 EtherCAT_Master.EtherCAT_Task 到 PLC_PRG	Status					
iBus (iBus)	Information					
EtherCAT_Master (EtherCAT Master)						
E _ [] IR_ECAT (R-ECAT)						
IR_DM16_N (IR-DM16-N)		-				
🔟 IR_AI04_TR (R-AI04-TR)						



ndex:Subindex	Name	Flags	Туре	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 C	hannel 0 Output Mode				
Index: 16# 80	010 🖨 Bitlength: 1	.6		*	ОК
SubIndex: 16# 1	🔶 Value: 1	L		÷	Cancel

3. 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

1. [Modbus_TCP_Slave] » [Modbus Slave Channel] » [Add Channel]

ModbusChannel		×
Channel		
Name	IR-ETN AI Channel 0	
Access Type	Read Input Registers (Function Code 4) $\qquad \qquad \lor$	
Trigger	Cyclic V 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 <u>UM018002E iR-ETN UserManual eng.pdf</u> for information on:

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

 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
з	AI_Channel_0 : INT ;
4	AO_Channel_0 : INT ;
5	END_VAR
_	
1	AO_Channel_0 := AI_Channel_0

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

.

General	Find	Filter Show a	II		•		
Modbus Slave Channel	Variable	Mapping	Channel	Address	Туре	Unit	Description
	Application.PLC_PRG.AI_Channel_0	~ >	IR-ETN AI Channel 0	%IW0	ARRAY [00] OF WORD		Read Input Registers
Modbus Slave Init	E Application.PLC_PRG.AO_Channel_0	~ >	iR-ETN AO Channel 0	%QW0	ARRAY [00] OF WORD		Write Multiple Registers
Modbus TCPSlave I/O Mapping							
Status							
Information							

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



9.3.2 Reading / Writing iR-COP 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.



 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	Iter Show all			
Status	Variable	Mapping	Cha	annel	Address	Туре	
Status	🗄 🦄 COP_AI_Channel_0	×.	Anal	log Input-16Bit : iR_AI04_VI	%IW0	WORD	
Information	🖷 - 🍫		Anal	log Input-16Bit : iR_AI04_VI	%IW1	WORD	
	1 🗄 🐐		Anal	log Input-16Bit : iR_AI04_VI	%IW2	WORD	
	😟 - 🎭		Anal	log Input-16Bit : iR_AI04_VI	%IW3	WORD	

- When finished, click [Online] » [Login] to download the project to CODESYS.
- 9.3.3 Reading / Writing iR-ECAT 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 list of iR-ECAT » [EtherCAT I/O Mapping] tab and configure the settings.

CANopen-Module I/O Mapping	Find		Filter Show all	-		
Status	Variable	Mapping	Channel	Address	Туре	
	🗄 🦓 COP_AI_Channel_0	×.	Analog Input-16Bit : iR_AI04_VI	%IW0	WORD	
Information	😐 🍬		Analog Input-16Bit : iR_AI04_VI	%IW1	WORD	
	🚊 🧤		Analog Input-16Bit : iR_AI04_VI	%IW2	WORD	
	🗎 - 🍫		Analog Input-16Bit : iR_AI04_VI	%IW3	WORD	

 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	Find Filte	r Show all				- 🕂 Add FB for IO Channel.			
Modulo I/O Manaina	Variable	Mapping	Channel	Address	Туре	Unit	Description		
House to Happing	Application.PLC_PRG.CTRL_AI_Channel_0	۵.	AIO	%IW1	INT		Analog Input 0		
Status			AI1	%IW2	INT		Analog Input 1		
· · · · · · · · · · · · · · · · · · ·	*		AI2	%IW3	INT		Analog Input 2		
Information	*		AI3	%IW4	INT		Analog Input 3		
	Application.PLC_PRG.CTRL_AO_Channel_0	~⊘	AO0	%QW0	INT		Analog Output 0		
	L		AO1	%QW1	INT		Analog Output 1		

4. 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.	0	<u>.</u>	
-------------------------------------	------------	----------	---	---	----------	--

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.



VAR Analog_Read:Modbus pData:POINTER TO E Data:UDINT; MB_Command: Modbus END_VAR	Request; NYTE := ADR(Data) Command;	;						
Analog_Read								
TRUE	ModbusR	equest						
	EN	ENO						
Modbus_TCP_Slave —↔	slave	xBusy -						
	xExecute	xDone -						
-	xAbort	xError -						
	usiUnitID	xAborted -						
MB Command -	ModbusCommand	ModbusError -						
pData -	pSendData							
pData —	pRecvData							

3. 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 "<u>Analog Module Manual</u> <u>Chapter 8</u>" 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.



PROGRAM PLC_PRG VAR		
pData:POINTER Data:UDINT; Size:UINT:=4; Analog_Read:CI	TO BYTE := ADR(Data); A405.SDO_READ;	
	Jacobar David	
TDUE	Analog_Read	1
I NOL	CIA405.SDU_READ	
	EN ENC	
-	NETWORK CONFIRM	-
-	ENABLE ERROR	H
_	TIMEOUT ERRORINFO	-
	DEVICE	
	CHANNET.	
	INDEX	
	INDEA	
	SUBINDEX	
pData —	DATA	
Size —	DATALENGTH	

3. 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 "<u>Analog Module</u>
 <u>Manual Chapter 9</u>" 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.



PROGRAM PLC_PRG VAR Analog_Read:EI pData:POINTER Data:UDINT; Size:UDINT:=4;	C_CO_SdoRead; TO UDINT := A	DR(Data);
END_VAR		
	Analo	g_Read
TRUE	ETC CO	SdoRead
	EN	ENO
	xExecute	xDone -
-	xAbort	xBusy -
-	usiCom	xError -
-	uiDevice	eError -
	usiChannel	udiSdoAbort -
	wIndex	szDataRead -
- T-	bySubindex	
	udiTimeOut	
pData —	pBuffer	
Size —	szSize	

3. 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 by SubIndex.

9.4.4 cMT-CTRL01

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



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



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



PI VI EI	PROGRAM PLC_PRG VAR Analog_Read:ibus.iBus_Reg_Read; END_VAR								
П		Analog_	Read						
	TRUE	ibus.iBus Reg Read							
	I I	EN	ENO						
		Execute	Done	-					
		Device Slot	Busy	-					
	— —	ModuleID	Active	-					
		Address	Error	_					
			ErrorID	-					
			Data	-0					

- 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 "<u>Weintek Library User</u>





10 Starting iR Motion Control Module

10.1 Motion Control Module Wiring

Please see <u>UM019004E iR-PU01-P UserManual eng.pdf</u> 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.
- Go to [Library Manager] » [Add library] and add Weintek_CODESYS_Library V1.0.0.3.
- The Function Blocks for writing parameters to iR-PU01P are placed in the ETN_PU folder.



ີ່ Weintek = Weintek CODESYS Library, 1.0.0.3 (Weintek Labs. Inc.)
Weintek CODESYS Library, 1.0.0.3 (Weintek Labs. Inc.)
🖹 🗀 Weintek library
🗉 🗀 WEINTEK_ANALOG
🗉 🧰 Base
🗉 🗀 Base
ETN_PU_AddPosition_Unit
ETN_PU_Axis_Setting
ETN_PU_DI_Filter
ETN_PU_DI_Setting
ETN_PU_DO_Abort_Option
ETN_PU_DO_Setting
ETN_PU_Home_Setting
ETN_PU_Max_Setting
ETN_PU_Motion_Config
ETN_PU_Motion_DIO_Setting
ETN_PU_Pulse_Method
ETN_PU_Pulse_Out_Unit
ETN_PU_PWM_Setting
ETN_PU_SDO
🗉 💼 Function Blocks

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

Devices 👻 🖗 🗙	Ethe	ernet 🕤	Modbus_TCP_Slave	PLC_PRG X	Library Manager						-
Add CPU, AV Constant Sector (Constant) Constant Constant Constant Sector (Constant) Constant Sector		FROEMA FEC, VAR ETH_FO_ ETH_FO_ ETH_FO_ XER = 1 RE_VAR TRUE Modbus_TC	JPRG TR_0: weintek. TR_2: weintek. TR_2: weintek. NCOL ; xExe Exe 0 Azii 4 Pul: P_Slave Mod	LTH_PU_Fulse_Dethod TTH_PU_False_Det_Data TTH_PU_False_Det_Data TTH_PU_False_Dethod ETH_PU_False_D ETH_PU_False_D ETH_PU_False_D extense se_Locyton_Method bus_Slave	Method ENO Busy - Done - Error -	ETN_FU_FN_0.Done	ETE JU_FR_1 wintek.ETE F0_Pulse_Out Lescite Atia Atia Ations_Provide Mose_Provide Mose_Provide Att_Provide Ref_Provide Modes_Slave	t_Onit ENO Busy - Done - Error -	ETH_PU_FB_1.Dons- 0- 200000- 20000- 20000- Bodbus_TCP_Slave-	500 % ETX_50_FP_2 weated.TTY_70 Marg.5 Execute Asis Marg.Fort10_Valocity Marg.Fort10_Valocity Marg.Notc2 Sector Marg.Acceleration Modbus_Slave	etting ENO- Busy- Error

 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

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





Index:Subin	dex	Name					AccessType	Туре	^
16#5501	:16#00	Axis 0 Pulse	Input N	1ethod* : PU		RW	USINT		
16#5502	:16#00	Axis 0 Digita	Input	Polarity : PU		RW	UDINT		
± 16#5503		Axis 0 Digita	Input	Function					
± 16#5504	ł	Axis 0 Digita	Input	Filter					
± 16#5510	1	Axis 0 Digita	Outpu	t					
16#5511	:16#00	Axis 0 Pulse	Output	Method* : P	U01_Axis_0		RW	USINT	
16#5512	:16#00	Axis 0 Digita	Outpu	t Polarity : P	U01_Axis_0		RW	UDINT	
± 16#5513	1	Axis 0 Digita	Outpu	t Function					
± 16#5514	ł	Axis 0 Digita	Outpu	t abort conn	ection option				
± 16#551A	ι	Axis 0 PWM	Output	settings					
16#5520		Axis 0 Axis S	ettings	0					
16#5521		Axis 0 Axis S	ettings	1					
16#5528		Axis 0 Additi	onal po	sition module	range				
16#5529		Axis 0 Additi	onal ho	me offset					
± 16#5530		Axis 0 Gear I	Motion	Settings					
16#5540		Axis 0 CAM I	Notion S	Settings					
<								>	
	Unkno	we Object							
anie:	UNKNO	whobject							
idex:	16#0		÷	Bit length:	8	-			
ubIndex:	16#0		_	Value	0				

See <u>UM019004E iR-PU01-P UserManual eng.pdf</u> 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.

10.2.3 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]

Add_EtherCAT ■- Device (dMT-CTRL)	General	🕂 Add	📝 Edit 🔀 Delete	☆ Move Up ♣ Mor	ve Down
e- PLC Logic e- Optimization	Process Data	Line	Index:Subindex	Name	Value
- mil Library Manager - mil PLC_PRG (PRG)	Startup Parameters		10000000000	aominina sint cig	10120101010
🖹 🌃 Task Configuration 🖹 🎯 MainTask	EtherCAT I/O Mapping				
一 therCAT_Master.EtherCAT_Task 一 但 PLC_PRG	Status				
iBus (Bus)	Information				
EtherCAT_Master (EtherCAT Master)					
R_ECAT (R-ECAT)					
PU01_Axis_0 (R-PU01-P Axis 0)					



n davi Cubin dav	Name	Elage	Tune	Def 6
ndex:Subindex		riags	iype	Dei
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 A	xis 0 Pulse Input Method*			
Index: 16# 5	501 🖨 Bitlength: 8	ŧ	0	К

See <u>UM019004E iR-PU01-P UserManual eng.pdf</u> 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.



2. Add motion control channels and NMT network management channels.



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

1	DECEDEN DIC DEC		. 50
1 2 3 4 5 6 7 8	FROMEW FILTERS VAR ETH_FU_FR_0 : weintek.ETN_FU_Fulse_Nethod : ETN_FU_FR_1 : weintek.ETN_FU_Fulse_Out_Unit : ETN_FU_FR_2 : weintek.ETN_FU_Max_Setting : state : BOOL : Auts_0 : weintek.MIS_REF_LITE : Forme 0 : weintek.MIS_REF_LITE :		
9	xEnable 0 : BOOL :		
10	WNMT Management : WORD :		
11	END_VAR		100 % 🙉 🗸
		A . V	
- 1	FTN PU FB 0	FTN DII FR 1	FTN PH FB 2
	TRUE weintek FTN DU Dulse Method	weintek FTN DI Dalee Oat Unit	weintek PTN DI Max Sett
	EN ENO	EN ENO	EN EN
	xExe Execute Busy	ETN PU FB 0.Done Execute Busy	ETN PU FB 1.Done Execute
	0 Axis Done -	0 Axis Done -	0 Axis
	4 Pulse Input Method Error	1 Encoder Increments Error	100000 Max Profile Velocity
	4 - Fulse Output Method	1 - Motor Revolution	2000000 - Max Motor Speed
	Modbus_TCP_Slave	1 Motor_Shaft_Revolution	20000 - Max_Acceleration
		1 - Driving_Shaft_Revolution	20000 - Max_Deceleration
		1 Feed	Modbus_TCP_Slave Modbus_Slave
		1 Shaft_Revolution	
		Modbus_TCP_Slave Modbus_Slave	
2			
	Power 0		
	TRUE waintak MC Power	MIN/P	
	EN ENO	EN ENO	
	Axis 0 - Axis Status -	2	
	xEnable 0 Enable RegulatorRealState -		
	xEnable_0 — RegulatorOn DriveStartRealState -		
	xEnable_0 - DriveStart Busy -		
	Error -		
	ErrorID -		

 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	Туре	Unit	Description
	Application.PLC_PRG.Axis_0.Mapping_	I.Reg 🐐	Axis_0	96EW 1	ARRAY [011] OF WORD		Read/Write Multiple Registers
Modbus Slave Init	Application.PLC_PRG.Axis_0.Mapping_	Q.Reg 👋	Axis_0	%QW0	ARRAY [011] OF WORD		Read/Write Multiple Registers
	Application.PLC_PRG.wNMT_Managem	ient 🍞	NMT management	%QW12	ARRAY [00] OF WORD		Write Multiple Registers
ModbusTCPSlave Parameters							
ModbusTCPSlave I/O Mapping							
Status							
Information							

 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.



Add library 🗙 Delete library 🔄 Properties 🗃 Details 🔤 Pla
Name
🐨 👓 3SLicense = 3SLicense, 3.5.10.0 (3S - Smart Software Solutions Gm
BreakpointLogging = Breakpoint Logging Functions, 3.5.5.0 (3S - Sr
IODrvEtherCAT = IODrvEtherCAT, 3.5.10.0 (3S - Smart Software S
⊡ • 🐨 IoStandard = IoStandard, 3.5.10.0 (System)
····◆ Standard = Standard, 3.5.9.0 (System)
😟 👓 🚥 Weintek = Weintek CODESYS Library, 1.0.0.3 (Weintek Labs. Inc.)
Weintek CODESYS Library, 1.0.0.3 (Weintek Labs. Inc.)
🖹 🧰 Weintek library
E C WEINTEK_ANALOG
🖻 🚞 Base
ETN_PU
MC_Cam_Weintek
MC_Gear_Weintek
MC_Halt
MC_Home
MC_MoveAbsolute
MC_MoveRelative
MC_MoveVelocity
MC_Power
MC_Reset
IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII

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.



1	PROGRAM PLC_PRG							
2	VAR							
3	<pre>Axis_0 : weintek.AXIS_REF_LITE ;</pre>							
4	Power_0 : wein	tek.MC_Power	;					
5	xEnable_0 : BO	OL;						
6	END_VAR							
1								
	Power_0							
	TRUE weintek.MC Power							
		EN	- ENO					
	Axis_0 →	Axis	Status -					
	xEnable_0	Enable	RegulatorRealState -					
	xEnable_0	RegulatorOn	DriveStartRealState -					
	xEnable_0	DriveStart	Busy -					
			Error -					
			ErrorID -					

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

General	Find	Filter Show all		•		
PDOr	Variable		Mapping	Channel	Address	Туре
1003	Application.PLC_PRG.Axis	0.Mapping_Q.Obj.DO_B0	~	Axis 0 DO byte 0 : PU01_Axis_0	%Q80	USINT
SDOs	H - 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	۰,	Axis 0 Target velocity : PU01_Axis_0	%QD1	DINT
	Application.PLC_PRG.Axis	0.Mapping_Q.Obj.TargetPosition	*	Axis 0 Target position : PU01_Axis_0	%QD2	DINT
Status	B - Application.PLC_PRG.Axis	0.Mapping_Q.Obj.ProfileVelocity	*	Axis 0 Profile velocity : PU01_Axis_0	%QD3	UDINT
	Application.PLC_PRG.Axis	0.Mapping_Q.Obj.ProfileAcc	۰,	Axis 0 Profile acceleration : PU01_Axis_0	%QD4	UDINT
Information	B - Application.PLC_PRG.Axis	0.Mapping_Q.Obj.ProfileDec	*	Axis 0 Profile deceleration : PU01_Axis_0	%QD5	UDINT
	Application.PLC_PRG.Axis	_0.Mapping_I.Obj.DI_B0	~ *	Axis 0 DI byte 0 : PU01_Axis_0	%IB0	USINT
	H - W 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	96IW1	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
	H Application.PLC_PRG.Axis	0.Mapping_I.Obj.PositionDemandInterna	i 🍞	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	96IW9	UINT
	🖹 🦄 Application.PLC_PRG.Axis	_0.Mapping_I.Obj.AddPositionActual	~	Axis 0 2nd additional position actual value : PU01_Axis_0	%ID5	DINT

 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.



Add library X Delete library Properties 📵 Details 🔤 Pla
Name
3SLicense = 3SLicense, 3.5.10.0 (3S - Smart Software Solutions Gm
BreakpointLogging = Breakpoint Logging Functions, 3.5.5.0 (3S - Sm
IODrvEtherCAT = IODrvEtherCAT, 3.5.10.0 (3S - Smart Software S
👜 🚥 🚾 IoStandard = IoStandard, 3.5.10.0 (System)
Standard = Standard, 3.5.9.0 (System)
Weintek = Weintek CODESYS Library, 1.0.0.3 (Weintek Labs. Inc.)
Weintek CODESYS Library, 1.0.0.3 (Weintek Labs. Inc.)
🖻 🧰 Weintek library
E WEINTEK_ANALOG
🐨 🧰 Base
Function Blocks
B B wa a with t
B B we ust
MC Power
und reset
1

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.



1	PROGRAM PLC_PRG							
2	VAR							
3	<pre>Axis_0 : weintek.AXIS_REF_LITE ;</pre>							
4	Power_0 : weintek.MC_Power ;							
5	xEnable_0 : BOOL ;							
6	END_VAR							
1								
-	Power 0							
	weintek.MC_Power							
	EN ENO							
	Axis_0 Axis Status							
	xEnable_0 — Enable RegulatorRealState -							
	xEnable_0 — RegulatorOn DriveStartRealState -							
	xEnable_0 - DriveStart Busy -							
	Error							
	ErrorID -							

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

Variable	Mapping	Channel	Address	Туре	Unit	Description
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.DO_B0	*	PU01_Axis_0 Axis 0 DO byte 0	%-Q80	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	%Q81	USINT		PU01_Axis_0 Axis 0 Mode of operation
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.Controlword	*	PU01_Axis_0 Axis 0 Controlword	%QW1	UINT		PU01_Axis_0 Axis 0 Controlword
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.TargetVelocity	*	PU01_Axis_0 Axis 0 Target velocity	%QD1	DINT		PU01_Axis_0 Axis 0 Target velocity
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.TargetPosition	*	PU01_Axis_0 Axis 0 Target position	%QD2	DINT		PU01_Axis_0 Axis 0 Target position
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileVelocity	*	PU01_Axis_0 Axis 0 Profile velocity	%QD3	UDINT		PU01_Axis_0 Axis 0 Profile velocity
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileAcc	*	PU01_Axis_0 Axis 0 Profile acceleration	%QD4	DINT		PU01_Axis_0 Axis 0 Profile acceleration
Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ProfileDec	۵.	PU01_Axis_0 Axis 0 Profile deceleration	%QD5	DINT		PU01_Axis_0 Axis 0 Profile deceleration
B- 🍫		PU01_Axis_0 Reserved	%QD6	DINT		PU01_Axis_0 Reserved
÷.**		PU01_Axis_0 Reserved	%QD7	DINT		PU01_Axis_0 Reserved
# * Application.PLC_PRG.Axis_0.Mapping_I.Obj.DI_B0	۵.	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	۵.	PU01_Axis_0 Axis 0 Mode of operation display	%185	USINT		PU01_Axis_0 Axis 0 Mode of operation display
# * Application.PLC_PRG.Axis_0.Mapping_I.Obj.Statusword	۵.	PU01_Axis_0 Axis 0 Statusword	%JW3	UINT		PU01_Axis_0 Axis 0 Statusword
# * Application.PLC_PRG.Axis_0.Mapping_I.Obj.PositionActual	۰,	PU01_Axis_0 Axis 0 Position actual value	%iD2	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	%iD3	DINT		PU01_Axis_0 Axis 0 Velocity actual value
# * Application.PLC_PRG.Axis_0.Mapping_I.Obj.PositionDemandInternal	۰.	PU01_Axis_0 Axis 0 Position demand internal value	%JD4	DINT		PU01_Axis_0 Axis 0 Position demand internal value
Application.PLC_PRG.Axis_0.Mapping_I.Obj.DO_Status_80	*	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_80	*	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	%IW11	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	%ID6	DINT		PU01_Axis_0 Axis 0 2nd additional position actual value
⊕- * ≱		PU01_Axis_0 Reserved	%ID7	DINT		PU01_Axis_0 Reserved
🚊 🏘		PU01_Axis_0 Reserved	%ID8	DINT		PU01_Axis_0 Reserved

 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.



	🎦 Add library 🗙 Delete library 🛛 😁 Properties 🔞 Details 🔤 Place						
	Name						
	🖼 🚥 3SLicense = 3SLicense, 3.5.10.0 (3S - Smart Software Solutions Gmbł						
	🕮 - 🕬 BreakpointLogging = Breakpoint Logging Functions, 3.5.5.0 (3S - Sma						
	IODrvEtherCAT = IODrvEtherCAT, 3.5.10.0 (3S - Smart Software S						
	🖬 🚥 IoStandard = IoStandard, 3.5.10.0 (System)						
	Standard = Standard, 3.5.9.0 (System)						
	Weintek = Weintek CODESYS Library, 1.0.0.3 (Weintek Labs. Inc.)						
	Weintek CODESYS Library, 1.0.0.3 (Weintek Labs. Inc.)						
	🗏 🛄 Weintek library						
	MC_Cam_Weintek						
	MC_Gear_Weintek						
	🕮 📄 MC_Halt						
	MC_Home						
	MC_MoveAbsolute						
	MC_MoveRelative						
	MC_MoveVelocity						
2. Add the m	otion control module.						
	🖮 🚮 Device (cMT-CTRL)						
	🚊 🗐 PLC Logic						
	🖻 🙆 Application						
	Library Manager						
	□ 🎯 Main Lask						
	····世 PLC_PRG						

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.

iR_PU01_P (iR-PU01-P)

🖻 👚 👔 iBus (iBus)



1	PROGRAM PLC_PRG								
2	VAR								
3	<pre>Axis_0 : weintek.AXIS_REF_LITE ;</pre>								
4	Power_0 : wein	Power_0 : weintek.MC_Power ;							
5	xEnable_0 : BC	IOL ;							
6	END_VAR								
1									
		Power_0							
	TRUE	wein	ntek.MC Power						
		EN	- ENO						
	Axis_0 —↔	Axis	Status -						
	xEnable_0	Enable	RegulatorRealState -						
	xEnable_0	RegulatorOn	DriveStartRealState -						
	xEnable_0	DriveStart	Busy -						
			Error -						
			ErrorID -						

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

ameters Find Filter Show all - 🕂 Add FB for IO Channel 🔭 Go to Instance							
VO Mapping	Variable	Mapping	Channel	Address	Туре	Unit	Description
, yo mapping	Application.PLC_PRG.Axis_0.Mapping_I.Obj.DI_B0		DI byte 0	%IB4	USINT		Digital Input
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.ModeOpDisp	*	Mode of operation display	%I85	SINT		Mode of operation displa
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.Statusword	*	Statusword	%JW3	UINT		
tion	Application.PLC_PRG.Axis_0.Mapping_I.Obj.PositionActual	*	Position actual value	%ID2	DINT		
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.VelocityActual	*	Velocity actual value	%ID3	DINT		
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.PositionDemandI	internal 🐐	Position demand internal value	%ID4	DINT		
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.DO_Status_80	~ *	DO status byte 0	%1820	USINT		
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.CAP_Status_B0	~•	Capture status byte 0	%IB21	USINT		
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.ErrorCode	*	Error code	%JW11	UINT		
	Application.PLC_PRG.Axis_0.Mapping_I.Obj.AddPositionActu	al 🍞	2nd additional position actual value	%ID6	DINT		
			Reserved	%ID7	UDINT		
			Reserved	%ID8	UDINT		
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.DO_B0	*	DO byte 0	%Q80	USINT		Digital Output
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.ModeOp	~•	Mode of operation	%Q81	SINT		
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.Controlword	*	Controlword	%QW1	UINT		
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.TargetVelocity	*	Target velocity	%QD1	DINT		
	Application.PLC_PRG.Axis_0.Mapping_Q.Obj.TargetPosition	۵.	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		
	10		Reserved	%QD6	UDINT		
	L. Sp		Reserved	%QD7	DINT		

 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].

Ethernet (Ethernet)
 Modbus_TCP_Master (Modbus TCP Master)
 Modbus_TCP_Slave (Modbus TCP Slave)

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



 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 "<u>iR-PU01-P User</u> <u>Manual</u>" for detailed information.

10.4.2 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_PU01_P].

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



PROGRAM PLC_PRG								
pData:POINTER TO BYTE := ADR(Data);								
Data:UDINT;	Data:UDINT;							
Size:UINT:=4;								
PU_Read:CIA405	S.SDO_READ;							
END_VAR								
1	PU_F	lead						
TRUE	TRUE CIA405, SDO READ							
	EN	- ENO						
-	NETWORK	CONFIRM	-					
-	ENABLE	ERROR	-					
	TIMEOUT	ERRORINFO	-					
	DEVICE							
	CHANNEL							
	INDEX							
	SUBINDEX							
pData —	pData DATA							
Size —	DATALENGTH							

3. 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 "<u>iR-PU01-P User</u>
 <u>Manual</u>" 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].

EtherCAT_Master (EtherCAT Master)

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



PROGRAM PLC_PRG VAR									
PU Read:ETC CO SdoRead;									
pData:POINTER TO UDINT := ADR(Data);									
Data:UDINT;									
Size:UDINT:=4;									
END_VAR									
	PU_1	Read							
TRUE	TRUE ETC CO SdoRead								
	EN	ENO-							
	xExecute	xDone -							
	xAbort	xBusy -	-						
	usiCom	xError -	-						
_	uiDevice	eError							
	usiChannel	udiSdoAbort -	-						
	wIndex	szDataRead -							
	bySubindex								
	udi TimeOut								
pData	pBuffer								
Size -	ezSize								
5126	52312C								

3. 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 <u>User Manual</u>" for detailed information.

10.4.4 cMT-CTRL01

1. Download and install the cMT+CODESYS Package.





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



- 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.



CAN_Network_Control
🖮 🔟 Device (Weintek Built-in CODESYS)
🖹 🗐 PLC Logic
🖻 🧔 Application
📲 🎁 Library Manager
PLC_PRG (PRG)
🖹 🎆 Task Configuration
🖮 🎲 MainTask
PLC_PRG
🖹 🚮 CANbus (CANbus)
🖃 🕤 CANopen_Manager (CANopen_Manage
ASDA_A2_Drive (ASDA-A2 Drive)

3. CANbus -> Baudrate settings:

General	General		
CANbus Parameters	Network:	0	CAN
CANbus I/O Mapping	Baudrate (bit/s):	250000 ~	
Status			
Information			

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

- **4.** CANopen driver settings:
 - (1) Node ID

General	General	
PDOs	Node ID: 11	CANopen
SDOs	Enable Expert Settings	
CANopen Parameters	Enable Sync Producing	
CANopen I/O Mapping	▷ Nodeguarding	
Status	Checks at Startup	
Information		

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.

iname	Object	Bit lengt
2 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
I6#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	🕨 Add SDO 📝 Edit 🗙 Delete 🕆 Move Up 🔍 Move Down						
PDOs	Line	Index:Subindex	Name	Value	Bit length			
	1	16#607F:16#00	Max profile velocity	200	32			
SDOs	2	16#6080:16#00	Max motor speed	200	32			
	3	16#6085:16#00	Quick stop deceleration	200	32			
CANopen Parameters	4	16#60C5:16#00	Max acceleration	200	32			
	5	16#60C6:16#00	Max deceleration	200	32			
CANopen I/O Mapping								
Status								
Information								

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	Туре
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	۵۵	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	۵۵	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.



Weintek = Weintek CODESYS Library, 1.0.0.5 (Weintek Labs. Inc.)
Weintek CODESYS Library, 1.0.0.5 (Weintek Labs. Inc.)
🖹 🧰 Weintek library
🕮 🚞 WEINTEK_ANALOG
🕮 🚞 Base
🗐 🧰 Function Blocks
MC_Gear_Weintek
I MC_Halt
⊯ 📄 MC_Home
MC_MoveAbsolute
MC_MoveRelative
MC_MoveVelocity
MC_Power
🕮 📄 MC_Reset
⊯ 📄 MC_Stop
MC_TorqueControl
🖲 🗀 PU_PWM
🗄 🛅 Unions

2. Add EtherCAT_Master, EtherCAT drivers.



3. EtherCAT_Master -> Source Address(MAC):

General	☑ Autoconfig Master/Slaves	Ether CAT.
Sync Unit Assignment	EtherCAT NIC Setting	
EtherCAT Parameters	Destination Address (MAC) FF-FF-FF-FF-FF-FF 🔽 Broadcas	t 🗌 Enable Redundancy
EtherCAT I/O Mapping	Source Address (MAC) 00-0C-26-1B-43-3A Browse	
	Network Name eth0	
Status	Select Network by MAC Select Network by Name	
Information	✓ Distributed Clock ▷ Options	
	Cycle Time 4000 🖨 µs	
	Sync Offset 20 🗣 %	
	Sync Window Monitoring	
	Sync Window 1 🛊 µs	

4. EtherCAT driver settings:



(1) Process Data

Select the Outputs			Select the Inputs		
Name	Туре	Index	Name	Туре	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#1A01 2nd TxPDO Mapping (e	
16#1601 2nd RxPDO Mapping (exclu			Status Word	UINT	16#6041:00
Control Word	UINT	16#6040:00	ActualPosition	DINT	16#6064:00
TargetPosition	DINT	16#607A:00	🗌 16#1A02 3rd TxPDO Mapping (2	
16#1602 3rd RxPDO Mapping (exclu			Status Word	UINT	16#6041:00
Control Word	UINT	16#6040:00	ActualPosition	DINT	16#6064:00
TargetVelocity	DINT	16#60FF:00	Velocity actual value	DINT	16#606C:00
16#1603 4th RxPDO Mapping (exclu			16#1A03 4th TxPDO Mapping (<u>a</u>	
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	Sync Manager:	🕂 Add 📝 Edit 🗙 Delete	
Expert Process Data	SM Size Type	PDO List:	
	0 0 Mailbox Out	Index Size Name Flags	SM
Process Data	1 0 Mailbox In	16#1600 23.0 1st RxPDO Mapping	2
	2 23 Outputs	16#1601 6.0 2nd RxPDO Mapping	
Startup Parameters	3 17 inputs	16#1602 6.0 3rd RxPDO Mapping	
EtherCAT Parameters		16#1400 17.0 1st TxPDO Mapping	3
		16#1401 6.0 2nd TXPDO Mapping	5
EtherCAT I/O Mapping		16#1A02 10.0 3rd TxPDO Mapping	
		16#1A03 8.0 4th TxPDO Mapping	
Status			
Information			
	PDO Assignment (16#1C12):	🖶 Insert 📝 Edit 💥 Delete 🕆 Move Up 👙 Move Down	
	▼ 16#1600	PDO Content (16#1600):	
	16#1601 (excluded by 16#1600)	Index Size Offs Name	Type
	16#1602 (excluded by 16#1600)	16#6040:00 2.0 0.0 Control Word	UINT
	16#1603 (excluded by 16#1600)	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 Profile velocity	UDINT
		16#6083:00 4.0 15.0 Profile acceleration	UDINT
		16#6084:00 4.0 19.0 Profile deceleration	UDINT
		23.0	

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

eneral	Sync Manager:	🖶 Add 📝 Edit 🔀 Delete
opert Process Data	SM Size Type 0 0 Mailbox Out	PDO List: Index Size Name Flags SM
rocess Data	1 0 Mailbox In 2 23 Outputs	16#1600 23.0 1st RxPDO Mapping 2 16#1601 6.0 2nd RxPDO Mapping
artup Parameters	3 17 Inputs	16#1602 6.0 3rd RxPDO Mapping
therCAT Parameters		16#1400 17.0 1st TxPDO Mapping 3
herCAT I/O Mapping		16#1A02 10.0 3rd TxPDO Mapping
tatus		16#1A03 8.0 4th TxPDO Mapping
formation		
	PDO Assignment (16#1C13):	of Insert I Edit × Delete ↑ Move Up → Move Down
	PDO Assignment (16#1C13): ☑ 16#1A00	
	PO0 Assignment (15#1C13): ♥ 16#1A00 □ 16#1A01 (excluded by 15#1A00) □ 16#1A02 (excluded by 15#1A00)	
	PD 0 Assignment (16#1C13); I 16#1A00 16#1A01 (excluded by 16#1A00) 16#1A02 (excluded by 15#1A00) 16#1A03 (excluded by 15#1A00)	Intert [2]Edit X Deleta № Move Do PD0 Content (16#1A00): Index Size Offs Name Type 15#5061:00 1.0 6.0 ModeOPperationDipplay SINT 15#5061:00 2.0 1.0 Status Word UNT
	PD0 Assignment (16#1C13): I 16#1A01 (excluded by 15#1A00) I 16#1A02 (excluded by 15#1A00) I 6#1A03 (excluded by 15#1A00)	Insert Edit Delete Move Up Move Down PD0 Content (16#1400): File File
	PD0 Assignment (16#1C13); v 16#1400 16#1403 (excluded by 16#1400) 16#1402 (excluded by 16#1400) 16#1403 (excluded by 16#1400)	Insert Z Edit > Delcta % Move Dip Move Down PD0 Content (16#1A00): Top 0.0 Mode0/OperationDisplay Start 1664051:00 2.0 1.0 9.0 Mode0/OperationDisplay Start 186404:100 2.0 1.0 Startur Word UNT 158454:00 2.0 1.0 Startur Word UNT 158456:00 4.0 3.0 ActualPoint Valenty Word DNT 158456:00 DNT
	PD0 Assignment (16#1C13): () 16#1400 16#1401 (excluded by 15#1400) 16#1402 (excluded by 15#1400) 16#1403 (excluded by 15#1400)	Insert ∠Edt > Move Up & Move Down PDD Content (15#1A00): Index Size Offs Name Type Index Size Offs Name Type Size Offs Size Type 15#5405:100 1.0 0.0 ModeOfOparationDisplay SINT Size Type 15#5406:100 2.0 1.0 Satus Word UNT Size DNT 15#5406:100 4.0 3.0 Actualization DNT Size DNT 15#5660:00 4.0 7.0 Velocity actual value DINT Size DNT

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	Line	Index:Subindex	Name	Value	Bitlength	
	<u> </u>	16#607F:16#00	Max profile velocity	200	32	
Process Data	- 2	16#6080:16#00	Max motor speed	200	32	
	3	16#6085:16#00	Quick stop deceleration	200	32	
Startup Parameters	- 4	16#60C5:16#00	Max acceleration	200	32	
	5	16#60C6:16#00	Max deceleration	200	32	
EtherCAT Parameters						
EtherCAT I/O Mapping						
Status						
Information						

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	Туре
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].

🗊 Package Manager					×
Currently installed packages:			Sort by: Name	•	Install
Name	Version	Installation date	Update info	License info	Uninstall
CODESYS SoftMotion	4.1.1.0	2017/11/27	Free version 4.3.1.0 available!	No license req	Details
🚇 Weintek Built-in CODESYS	2018.1.24	2018/2/2		License info no	Decanon
					Updates Search up dates Download

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

Uninstallation	×						
Weintek Built-in CODESYS [2018.1.24] Uninstallation	WEINTER						
The package will be removed from your system. Click Next to continue.							
Cancel < Back Next >	Finish						

4. Removing the program.

Uninstallation	23				
Weintek Built-in CODESYS [2018.1.24] Please wait while the package is being uninstalled.					
Initializing					
Cancel < Back Next >	Finish				



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].

Add Device				
ame: Ethernet				
Action:				
💿 Append device 💿 Inser	t device 💿 Plug device 💿 Update device			
Enter a string for a fulltext sea	arch in all devices Vendor: <all vendors=""></all>			•
Name	Vendor	Version	Description	-
🖂 🗐 Estatevene				
				=
CAN CANbus				E
				E
CAN CANbus CAN CAN	35 - Smart Software Solutions GmbH	3.5.10.0	Ethernet Link.	

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

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

General	Interface:				
Status	Operating S	ystem Settings			
Ethernet Device I/O Mapping	Change Operating System Settings				
Information	IP Address	192 . 168 . 0 . 1			
	Subnet Mask	255 . 255 . 255 . 0			
	Default Gateway	0.0.0.0			

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

Name	Descriptio	on	IP Addre	222		
lo			127.0.0.1			
eth0			192.168.	2.119		
vnet1			10.255.2	55.2		
IP Address		192 .	168 . 2	. 119	1	
Subnet Mas	k	255 .	255 . 25	2.0	1	
Default Gate	eway	192 .	168 . 1	. 254	1	
MAC Addre	226	00:0C	:26:0F:E3	:3B		

6. Select [Change Operating System Settings].

General	Interface: eth0		
Status	Use Operating	System Settings	
Ethernet Device I/O Mapping	Change Operat	ing System Settings	
Information	IP Address	192 . 168 . 2 . 144	
	Subnet Mask	255 . 255 . 252 . 0	
	Default Gateway	192 . 168 . 1 . 254	

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.

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

	Scan Ne	twork	Gateway		Device 👻	
	۱		Ad Mi Co	dd n anag onfig	ew gateway ge gateways gure the local Gateway	
Gateway	/					×
Name: Driver:	Gat TCI	teway-2 P/IP				 •
IP-Ad	dress	192.168.2	2.144			

3. Re-install CODESYS Gateway.

CODESYS V3.5 SP12 Patch 1 - InstallShield Wizard	
Select Features Select the features setup will install.	
Select the features you want to install, and deselect th CODESYS V3 CODESYS Converter CODESYS OPC Server 3 CODESYS Gateway V2.3 CODESYS Control Win V3	e features you do not want to install. Description CODESYS Gateway Next generation gateway (communication layer) for CODESYS V3
0.00 MB of space required on the C drive 11217.01 MB available on the C drive InstallShield	
< Ba	nck Next > Cancel

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

△ 🕤 Modbus_TCP_Slave (Modbus TCP Slave)

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.

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

DDESYS Firmware	Update		
HMI:	cMT-E33B Search Search Al	 ▼ 192.168.2.120 (cMT-E33B) I 	
Firmware :	C:\codesys_20180704.229.b * Updating firmware will also re	in estart HMI.	(<u></u>
Password : 111	111	Mack	Index

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

identity: System Setting	
Network	CODESYS
Date/Time	Status Project update CODESYS update
🖉 HMI Name	Please select file to upload
History	
See Email	選擇檔案 Application.app (*.app)
Note: Management	選擇檔案 Application.crc (*.crc)
System Password	
Enhanced Security	
EasyAccess 2.0	
	Update

Q2. How to download CODESYS project using website?

A:

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

💗 Manual.project - CODESYS		
<u>File E</u> dit <u>V</u> iew <u>P</u> roject <u>B</u> uild	<u>O</u> nlii	ne <u>D</u> ebug <u>T</u> ools <u>W</u> indow <u>H</u> elp
🎦 🚔 🖪 🕼 🗠 🔏 🗎	СŞ	Login Alt+F8
	Сğ	Logout Ctrl+F8
Devices		Create boot application
🗏 🗿 Manual		Download
i Device (Weintek Built-in CC		Online Change
		Source download to connected device
Application		
🔤 🎁 Library Manage		Multiple Download
PLC_PRG (PRG		<u>R</u> eset warm
Symbol Configure Symbol Configure Task Configure		Res <u>e</u> t cold
		Rese <u>t</u> origin
		Simulation
Ethernet (Ethernet)		Sec <u>u</u> rity
		Operating Mode

 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].

identity: System Setting	≡
Network	CODESYS
Date/Time	Status Project update CODESYS update
🖉 HMI Name	Please select file to upload
History	
🔝 Email	選擇檔案 Application.app (*.app)
Project Management	選擇檔案 Application.crc (*.crc)
System Password	
Enhanced Security	
EasyAccess 2.0	
	Update

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