





ED-PLC2010

User Manual

by EDA Technology Co., Ltd built: 2024-12-09

1 Hardware Manual

This chapter introduces the product overview, packing list, appearance, button, indicator and interface.

1.1 Overview

ED-PLC2010 is a programmable controller based on CODESYS. Depending on different application scenarios and user requirements, programmable logic systems with different specifications of RAM and eMMC can be selected.

- RAM can choose 1GB, 2GB, 4GB and 8GB
- eMMC can choose 8GB, 16GB and 32GB

TIP

As the CODESYS license of the product is stored in the OS by default, it is not recommended for users to flash to eMMC by themselves, and re-flashing to eMMC will result in the loss of the CODESYS license and affect the use.

ED-PLC2010 provides commonly used interfaces such as HDMI, USB, Ethernet, RS232 and RS485, and supports network access via Wi-Fi, Ethernet and 4G (optional); integrated supercapacitor backup power supply, RTC, Watch Dog, EEPROM, and encryption chip, which enhances the product's ease-of-use and reliability, and it's mainly applied to the industrial control field.

ED-PLC2010 supports the expansion of different types of I/O modules such as DI, DO, AI and AO, up to 32 I/O modules; integrated CODESYS Control runtime System, supports IEC 61131-3 programming standard and EtherCAT/Modbus TCP bus. Users can select the licenses of TargetVisu, WebVisu, Softmotion, CNC+Robotics, EtherCATMaster, Modbus TCP Master and OPC UA Server with different functions according to the actual needs.



1.2 CODESYS Software Introduction

CODESYS is a powerful industrial automation programming software, which is an open control programming platform mainly used for programming and controlling programmable logic controllers (PLC), industrial (IPC) and other devices. Its full name is "Controller Development System", which is widely used in the field of industrial automation, and is capable of realizing a variety of complex industrial control tasks, such as logic control, motion control, data processing, and so on.

CODESYS Features:

- CODESYS supports multiple programming languages, such as the five programming languages defined by the International Electrotechnical Commission (IEC) 61131 3 standard, including Ladder Diagram (LD), Function Block Diagram (FBD), Instruction List (IL), Structured Text (ST), and Sequential Function Chart (SFC).
- CODESYS has good cross-platform characteristics, it can run on many operating systems, such as Windows, Linux and so on. This cross-platform advantage allows users to choose the appropriate operating system environment for development according to actual needs.
- Provides a wealth of function libraries and function block libraries. These libraries cover a variety of functions in the field of industrial control, such as mathematical operations, communication protocol processing, motion control algorithms and so on. Users can directly call the functions and function blocks in these libraries, greatly reducing the development cycle.
- CODESYS supports a visual programming interface, which allows users to build program logic graphically. In terms of debugging, it provides powerful debugging tools, such as monitoring the values of variables online, executing the program in a single step, setting breakpoints, and so on. This enables developers to easily find and solve problems in their programs.

ED-PLC2010 supports CODESYS V3.5 SP19 and above.

1.3 Networking Application

Equipped with EtherCAT, Ethernet and RS485, RS232 interfaces, ED-PLC2010 can realize multilevel network communication, which can meet the application requirements of multiple scenarios. Typical application topology is shown below:



1.4 Packing List

- 1x ED-PLC2010 Unit
- [option Wi-Fi/BT version] 1x 2.4GHz/5GHz Wi-Fi/BT Antenna
- [option 4G version] 1x 4G/LTE Antenna

1.5 Appearance

Introducing the functions and definitions of interfaces on each panel.

1.5.1 Front Panel

This section introduces functions and definitions of front panel.



NO.	Function Definition
1	1 x red ERR indicator, which is used to see if there are any system errors.
2	1 x green RUN indicator, which is used to view the operational status of the device.
3	1 x red Power indicator, which is used to see the status of the device powering up and powering down.
4	1 x green HDD indicator, which is used to view the status of the device's eMMC read and write data.
5	1 x green IO RUN indicator, which is used to view the operational status of the IO expansion module.
6	1 x green IO SYS indicator, which is used to view the working status of the IO expansion module.
7	1 x green UDISK DETECT indicator, which is used to check the detection status of the USB flash driver.
8	1 x green ECAT indicator, which is used to check the connection status of the EtherCAT inputs
9	1 x HDMI, type A connector, compatible with HDMI 2.1 standard, resolution support 4K 60Hz.
10	1 x 10/100/1000M adaptive ethernet port, RJ45 connector, with led indicator. It can be used to access the network.
11	1 x EtherCAT OUT, RJ45 connector for connecting an EtherCAT slave.
12	2 x RS485, 6-Pin 3.5mm pitch Phoenix terminals with isolation protection, with ESD and surge protection, single signal defined as IGND/A/B.
13	2 x RS232, 6-Pin 3.5mm pitch Phoenix terminals, with ESD and surge protection, single signal defined as GND/TX/RX.
14	4 x Serial port indicators, green, for viewing the communication status of the serial port.
15	1 x green 4G signal indicator, which is used to check the status of the 4G signal.
16	1 x green UDISK BUSY indicator, which is used to check the mount status of a USB flash driver.
17	1 x red UPDATE indicator, which is used to check the status of program updates.
18	1 x red IO ERR indicator, which is used to see if there are any errors in the IO expansion module.
19	1 x Power supply module for powering the ED-PLC2010 and extended I/O modules.

1.5.2 Rear Panel

This section introduces interfaces and definitions of rear panel.



NO.	Function Definition
1	1 x Nano SIM slot, using to install a SIM card for acquiring 4G signals.
2	1 x DIN-rail bracket, install ED-PLC2010 Unit on the DIN-rail through the bracket.
3	1 x Micro-SD card slot, it supports the installation of SD card for storing user data.

1.5.3 Side Panel

This section introduces functions and definitions of side panel.





NO.	Function Definition
1	1 x Reset button, hidden button, press the button to restart the device.
2	1 x USB 2.0 port, type A connector, each channel supports up to 480Mbps.
3	2 x USB 3.0 ports, type A connector, each channel supports up to 5Gbps.
4	1 x 4G antenna port (optional), SMA connector, which can connect to 4G antenna.
5	1 x FAC RST button for restoring factory settings.
6	1 x IPADDR RST button for restoring the default IP address.

NO.	Function Definition
7	1 x UDISK RM button for safe removal of USB storage devices.
8	1 x IMP button for importing PLC programmes from a USB memory device or SD card.
9	1 x STOP/START button to start/stop the PLC when it is running.
10	1 x Wi-Fi/BT antenna port (optional), SMA connector, which can connect to Wi-Fi/BT antenna.

1.6 Button

The ED-PLC2010 device contains 6 buttons, all of which are hidden and silk-screened on the case as 'RESET', 'FAC RST', 'IPADDR RST', 'UDISK RM', 'IMP ', 'STOP START'.

Button	Function Definition
RESET	Press the button to restart the device
FAC RST	Press and hold for more than 5 seconds to restore the device to its factory settings, short press is invalid. Possible operation purpose: Delete application, delete codesys login user name and password, restore default configuration file, while RUN or ERR indicator will be off and then on.
IPADDR RST	Press and hold more than 5 seconds to restore the device IP as default IP, short press is invalid. Default IP address: 192.168.0.100 for Ethernet port and 192.168.1.100 for EtherCAT port.
UDISK RM	Press and hold for more than 1 second to uninstall the USB flash driver, wait for the indicator light 'UDISK BUSY' to go out, it means uninstallation is successful; short press is invalid.
IMP	Press and hold for more than 1 second to start importing the application from the USB stick, wait for the indicator 'UPDATE' to flash, then it means the import is successful; short press is invalid. Application placement directory: USB drive root directory "Application"
STOP START	Press and hold for more than 1 second to start/stop the programme alternately, when the programme stops running, the indicator light 'ERR' is always on; short press is invalid.

1.7 Indicator

Introducing the various statuses and meanings of indicators contained in ED-PLC2010 series device.

Indicator	Status	Description
	On	The device has been powered on.
PWR	Blink	Power supply of the device is abnormal, please stop the power supply immediately.
	Off	The device is not powered on.

Indicator Status		Description	
	On	Device is reading and writing data via eMMC	
טטח	Off	Device is not reading or writing data via eMMC	
DUN	On	Codesys runs fine	
RUN	Off	Codesys does not run fine	
EDD	On	Press and hold the 'STOP START' button to stop the programme	
	Off	No program is imported or the imported program is running normally	
	On	The user programme is running	
IO RUN	Blink	I/O expansion modules have been recognized	
	Off	I/O expansion module not recognized	
	On	I/O expansion module running error	
IO ERR	Off	I/O expansion module running normally	
	On	I/O expansion module running abnormally	
IO SYS	Blink	I/O expansion module running normally	
	Off	I/O expansion module not running	
	Blink	User programme updates	
OPDATE	Off	User programme not updated	
	On	The device has detected the USB flash driver	
UDISK DETECT	Off	The device has not detected the USB flash driver	
	On	The USB flash driver is mounted to the device	
UDISK BUSY	Off	The USB flash driver is not mounted to the device	
5047	Slow Blink	EtherCAT communication is not connected	
ECAI	Quick Blink	EtherCAT communication is connected	
10	Blink	4G connection is normal	
46	Off	4G connection is abnormal	
	On	The data transmission is abnormal.	
Yellow indicator of Ethernet port	Blink	Data is being transmitted over the Ethernet port.	
	Off	The Ethernet connection is not set up.	
Green indicator of Ethernet port	On	The Ethernet connection is in the normal state.	

Indicator	Status Description	
	Blink	The Ethernet connection is abnormal.
	Off	The Ethernet connection is not set up.
	On/Blink	Data is being transmitted.
COM1~COM4	Off	The device is not powered on or there is no data transmission.

1.8 Interface

Introducing the definition and function of each interface in the product.

1.8.1 Card Slot

ED-PLC2010 series device includes an SD card slot and a Nano SIM card slot.

1.8.1.1 SD Card Slot

The silkscreen on the case of Micro SD card slot is " ", which is used to install SD card for storing user data.

1.8.1.2 SIM Card Slot (optional)

The silkscreen on the case of Nano SIM card slot is " , which is used to install SIM card for obtaining 4G signals.

1.8.2 Power Supply Interface

The ED-PLC2010 device contains 1 power input module, including system power interface and Field power interface, with an input voltage of DC 24V (\pm 20%) and an output system current of up to 2A.

Power module port definition:

Pin ID	Pin Name	Pin ID	Pin Name
1	24V SYS	2	0V SYS
3	24V Field	4	24V Field
5	0V Field	6	0V Field
7	PE	8	PE

1.8.3 RS485/RS232 Interface

ED-PLC2010 series devices include 2 RS485 interfaces and 2 RS232 interfaces, with RS485 single interface silk-screened as "IGND/A/B" and RS232 single interface silk-screened as "GND/ TX/RX".

Pin Definition

Terminal pins are defined as follows:

	Pin ID	Pin Name
	1	RS485-2_B
	2	RS485-4_B
	3	RS485-2_A
	4	RS485-4_A
	5	IGND
	6	IGND
2 12	7	RS232-1_RX
	8	RS232-3_RX
	9	RS232-1_TX
	10	RS232-3_TX
	11	GND
	12	GND

The pin names of CM4 corresponding to RS485/RS232 interface are as follows:

Signal	CM4 GPIO Name	CM4 Pin Out
RS485-2_B	GPIO13	UART5_RXD
RS485-4_B	GPIO9	UART4_RXD
RS485-2_A	GPIO12	UART5_TXD
RS485-4_A	GPIO8	UART4_TXD
RS232-1_RX	GPIO5	UART3_RXD
RS232-3_RX	GPI01	UART2_RXD
RS232-1_TX	GPIO4	UART3_TXD
RS232-3_TX	GPI00	UART2_TXD

Connecting Cables

Schematic diagram of RS485 wires is as follows:



Schematic diagram of RS232 wires is as follows:



1.8.4 1000M Ethernet Interface

The ED-PLC2010 device includes one adaptive 10/100/1000M Ethernet port, and the silkscreen is "Ethernet". The connector is RJ45, which is used to access the Ethernet. The pins corresponding to the terminals are defined as follows:

	Pin ID	Pin Name
	1	TX1+
	2	TX1-
	3	TX2+
	4	TX2-
	5	TX3+
	6	TX3-
	7	TX4+
	8	TX4-

1.8.5 EtherCAT Interface

ED-PLC2010 series device includes one EtherCAT port, the silkscreen is "EtherCAT", The connector is RJ45, which is used to connect EtherCAT slaves.

1.8.6 HDMI Interface

ED-PLC2010 series device includes one HDMI port, the silkscreen is "HDMI". The connector is type A HDMI, which can connect to an HDMI display and supports up to 4Kp60.

1.8.7 USB 2.0 Interface

ED-PLC2010 series device includes one USB 2.0 port, the silkscreen is "Series". The connector is type A USB, which can connect to standard USB 2.0 peripherals and supports up to 480Mbps.

1.8.8 USB 3.0 Interface

ED-PLC2010 series device includes 2 USB 3.0 ports, the silkscreen is """. The connector is type A USB, which can connect to standard USB 3.0 peripherals and supports up to 5Gbps.

1.8.9 Antenna Interface (optional)

The ED-PLC2010 contains up to 2 SMA antenna ports, the silkscreens are "4G" and "WiFi/BT". They can be connected to the 4G antenna and Wi-Fi/BT antenna.

1.8.10 Local Extended IO Interface

ED-PLC2010 supports expansion of different types of I/O modules such as DI, DO, AI and AO, up to 32 I/O modules.

Model	Description
ED-EIO8XP	8-channel digital input module (PNP)
ED-EIO8XN	8-channel digital input module (NPN)
ED-EIO16XP	16-channel digital input module (PNP)
ED-EIO16XN	16-channel digital input module (NPN)
ED-EIO8YP	8-channel digital output module (PNP)
ED-EIO8YN	8-channel digital output module (NPN)
ED-EIO16YP	16-channel digital output module (PNP)
ED-EIO16YN	16-channel digital output module (NPN)
ED-EIO4YR	4-channel digital output module (Relay)
ED-EIO4ADV	4-channel analog input module (voltage), -5~5V/0~10V/-10~10V, configurable
ED-EIO4ADA	4-channel analog input module (current), 4-20mA/0-20mA, configurable
ED-EIO8ADA	8-channel analog input module (current), 4-20mA/0-20mA, configurable
ED-EIO4AD	4-channel analog input module (voltage/current mixed), -5~5V/0~10V/-10~10V/4-20mA/0-20mA, configurable
ED-EIO4DAV	4-channel analog output module (voltage), -5 ~ 5V/0 ~ 10V/-10 ~ 10V, configurable
ED-EIO4DAA	4-channel analog output module (current), 4-20mA/0-20mA, configurable
ED-EIO4RTD	4-channel RTD Module
ED-EIO4TC	4-channel TC Module
ED-EIO2HCD	2-channel High Speed Counter Module
ED-EIOPWR	Power Expansion Supply Module

Model	Description
ED-EIOTERM	Bus End Cover

1.9 Supercapacitor

ED-PLC2010 integrates a super capacitor backup power supply with the following functions:

- Power down data saving: When the PLC device suddenly loses power, the super capacitor can provide a short power support for some key circuits in the PLC. Depending on the load, it will last for about one minute if the load is small, and about 30s if the load is large. Some important data (such as the current state of the program operation, the current values of the counters and timers, etc.) can be stored in it and will not be lost due to a sudden power failure. This is critical for industrial applications that need to be able to quickly resume production processes after a power failure without losing critical information.
- Maintaining the real-time clock: The real-time clock in a device is important for functions such as recording the chronological sequence of events, and the supercapacitor can provide enough power for the real-time clock circuitry to continue to function properly for a period of time in the event of a mains power failure.
- Helping device to shut down smoothly: Supercapacitor can also help equipment to carry out some of the necessary, organized shutdown operations in the event of a power failure. It can provide energy for the PLC internal control circuits, so that the equipment can be in accordance with the pre-set program to safely shut down some of the running function modules, such as orderly shutdown of communication ports, stop the execution of some complex calculations and so on.

TIP

The supercapacitor needs to be fully charged after the device has been powered up for at least five minutes, and a full charge ensures proper functioning.

2 Installing Components

This chapter describes how to install optional components.

2.1 Install Antenna (optional)

If the selected ED-PLC2010 series device includes 4G and Wi-Fi functions, the antenna need to be installed before using the device.

Preparation:

The corresponding antennas have been obtained from the packaging box. If there are multiple antennas, they can be distinguished by the labels on the antennas.

Steps:

1. Locate the antenna port where the antenna is to be installed, as shown in the red box in the figure below.



2. Align the ports on both sides of the device and the antenna, then tighten them clockwise to ensure that they will not fall off.

2.2 Install Micro SD Card

Preparation:

The Micro SD card has been obtained.

Steps:

1. Locate the Micro SD card slot where the Micro SD is to be installed, as shown in the red box below.



2. Insert the Micro SD card with the chip side down into the corresponding card slot, and hear a sound to indicate that the installation is complete.



2.3 Install Nano SIM Card (optional)

1. Preparation:

The 4G Nano SIM card has been obtained. Steps:

1. Locate the Nano SIM card slot where the Nano SIM card is to be installed, as shown in the red box below.



2. Insert the Nano SIM card with the chip side up into the corresponding card slot, and hear a sound to indicate that the installation is complete.



3 Installing Device

This chapter introduces how to install the device.

3.1 PLC equipment installation

When the ED-PLC2010 series device leaves the factory, the DIN-rail bracket is installed as standard by default.

Steps:

1. Face the side of the DIN-rail bracket to the rail to be installed, and the upper side of the bracket is sleeved on the upper side of the rail.



2. Press down the buckle on the lower side of the DIN-rail bracket until the bracket can be buckled on the rail, and the installation is completed.



3.2 I/O Modules Installation

The I/O modules support mounting on DIN rails.

Steps:

The following is an example of the installation of an 8-terminal module only.

1. Align the notches in the I/O module.



2. Secure the I/O module to the DIN rail by pushing the I/O module in the direction of the arrow onto the DIN pin.



4 Booting The Device

This chapter introduces how to connect cables and boot the device.

4.1 Connecting Cables

This section describes how to connect cables.

Preparation:

- Accessories such as display, mouse, keyboard, IO Expansion Modules and power adapter that can be used normally have been ready.
- A network that can be used normally.
- Get the HDMI cable and network cable that can be used normally.

Schematic diagram of connecting cables:

Please refer to **1.8 Interface** for the pin definition of each interface and the specific method of wiring.



4.2 Booting The System For The First Time

ED-PLC2010 series devices do not have a power switch. After connecting to the power supply, the red PWR lamp will light up, indicating that the device has been normally powered and the system will start.

TIP

Default username is pi, Default password is raspberry.

4.2.1 Raspberry Pi OS (Desktop)

If the Desktop version of the system is installed when the product leaves the factory, after the device is started, it will directly enter the desktop, as shown in the following figure.



4.2.2 Raspberry Pi OS (Lite)

If the Lite version of the system is installed at the factory, the default username pi will be used to automatically log in after the device is started, and the default password is raspberry. The following figure shows that the system has been started normally.



5 CODESYS Programming

This chapter introduces how to go about programming with the codesys IDE.

TIP

As the CODESYS license of the product is stored in the OS by default, it is not recommended for users to flash to eMMC by themselves, and re-flashing to eMMC will result in the loss of the CODESYS license and affect the use.

5.1 CODESYS software download and installation

TIP

The installed CODESYS IDE version needs to be 3.5.19 and above, and the PC operating system requires Windows 10 or Windows 11 (64-bit recommended).

Steps:

1. Download the installation package from the official CODESYS website, download URL : https:// store.codesys.com/de/. (https://store.codesys.com/de/)

TIP

The first time you enter the official website to download, you need to register and log in to your account.

- 2. Right-click on the downloaded installation package and run it as administrator.
- 3. Click "Install" in the installation page that opens, and just keep the default configuration during the installation process.



4. When the installation is complete, click "Finish" to close the installation page.

😸 CODESYS 64 3.5.20.10 - Ir	stallShield Wizard X
	InstallShield Wizard Completed
	The InstallShield Wizard has successfully installed CODESYS 64 3.5.20.10. Click Finish to exit the wizard.
CODESYS	Show the Windows Installer log
	< Back Enish Cancel

5.2 Obtaining and Installing Device File

Before connecting the device via CODESYS, you need to download and install the device file.

5.2.1 Get device description file

TIP

The default IP address of Ethernet port is 192.168.0.100, and the IP address of EtherCAT port is 192.168.1.100, if you need to modify, please refer to Configuring Ethernet IP.

Preparation:

- A CODESYS authorised device has been acquired.
- A working network cable has been obtained.
- A working PC has been acquired and is on the same network segment as the device.

Steps:

- 1. Connect the Ethernet network port of the ED-PLC2010 to a PC computer via a network cable to power up the device.
- 2. Enter the default IP address 192.168.0.100 of the Ethernet port of ED-PLC2010 into the browser and enter "PLC Setting".
- 3. Click "[Download] Device Description File"in "Device Information" to download the corresponding device description file in ".xml" format.

PLC Setting	中文版 ENGLISH
License Management	
Backup License Restore License	
Device Info	
Firmware: Power: Standard St	
[Download] Device Description File	

TIP

Also available directly in the document ED-PLC2010 Device Description File.

5.2.2 Installing the Device File

Preparation:

- A PC with CODESYS software version V3.5 SP19 (64bit) and an IP address on the same network segment as the device.
- A working network cable has been obtained.
- One ED-PLC2010 has been licensed by CODESYS and the corresponding device file has been obtained.

Steps:

1. Double-click the CODESYS icon on the PC desktop to open the CODESYS software. Select "Tools" → "Device Repository" in the menu bar.



2. In the "Device Repository" pane, click "Install", select the device file and click "Open" to install it.

🌋 Device	Repository			×
Location	System Repository (C:\ProgramData\COD	ESYS\Devices)		Edit Locations
Installed String fo	Device Descriptions r a full text search	Vendor	<pre>cAl vendors> </pre>	Install
Name	Ver Fieldbuses HMI devices PLCs SoftMotion drives	ndor Version	Description	Uninstall Export
				Close

3. After successful installation, you can see that the device file has been added successfully in the "Device Repository".

Location	System Repository (C:\ProgramData\CODESYS\Dev	ices)			~	Edit Locations.
	(c. (+) 0g10110020 (CODES15)/DEV	(((3))				
installed D	evice Descriptions					Testell
String for a	a full text search	Vendor	<all vendors=""></all>		~	Install
Name		Vendor		Version		Uninstall
- 1	CODESYS Control RTE V3	CODESYS		3.5.20.10		Export
	CODESYS Control RTE V3 x64	CODESYS		3.5.19.50		
- 1	CODESYS Control RTE V3 x64	CODESYS		3.5.20.10		
- 1	CODESYS Control Win V3	CODESYS		3.5.19.50		
1	CODESYS Control Win V3	CODESYS		3.5.20.10		
- 1	CODESYS Control Win V3 x64	CODESYS		3.5.19.50		
🗊	CODESYS Control Win V3 x64	CODESYS		3.5.20.10		
<u>-</u>	EDATEC-117-ARM64-Linux-SM	EDA Tech	nology Co., Ltd.	3.5.19.50		
🗄 - 🔗 So	oftMotion drives					
						Details

5.3 Hardware configuration

Preparation:

- A PC with CODESYS software version V3.5 SP19 (64bit) and an IP address on the same network segment as the device.
- The device file has been installed.
- Local I/O modules have been connected to the ED-PLC2010 via E-bus contacts.
- The remote I/O module has been connected to the EtherCAT port of the ED-PLC2010 via a network cable.

5.3.1 Create a new project and connect the device

Steps:

 Power up the ED-PLC2010 and remote I/O module and open the CODESYS software on the PC. In the menu bar, select "File"-> "New Project", open the "New Project" pane, create a standard project.

管 New Proj	ect					×
Categories	raries ojects		Templates	HMI project	Standard project	Standard project w
A project co	ontaining one device	, one ap	olication, and an e	empty implemen	tation for PLC_	PRG
Name Location	Untitled1 D:\2024-work\11	2				~
				3	ок	Cancel

2. Select the device for which the device file has been installed and click OK.



3. Double left-click the device, select "Scan for Networks" on the right, then select the scanned device, and finally click "OK".

Image: Construction Image: Construction	Applications Backup and Restore Files	(2) (2)	
· 등 Sont Lax - 관리 R.C. PRG SoftMotion General Avis Pool	Select Unite Select Unite * Alge Gateway-1 (Scanning) * [] propherypi(0301.766] [] (3)	A Device Name: sappenys Device Address: 030.7064 Block driver: LCP Encrypted Communication: TLS asported Number of channels: 4 Seral number: DB3MC074350F	Tangberryps (active)
	Hide non-matching devices, filter by Target ID	(4) OK Cance	

TIP

If the device user login pop-up appears, you will need to log in with your username and password or follow the prompts to register.

6. As shown in the following figure, it indicates that the device is connected.

Devices				
Linsted7 Linsted7 Linsted7 Derice (EDATEC-117-ARM64-Linux-SM) Derice (EDATE	Communication Settings Applications Backup and Restore Files Log PLC Settings PLC Settings	Scan Network) Gateway • De	avice = Gateway Cateway Includes:	v recently (SSD) Percently respective
	LL Stein Users and Groups Access Rights Symbol Rights Software metrics for licen determination IEC Objects Task Opployment Status Information	e	Port: 1217	DeviceAddress: 30312464 Target ID: 1333 0004 Target Yuest Target Yuest Target Yuest DA Technology Co., Ltd. Target Yueston 3.3.13.50

5.3.2 Adding Local I/O and Remote I/O Modules

Steps:

1. Right-click "Device" and select "Add Device" in the menu to add the master EtherCAT Master.

ies	• a x M Device x
Untitled7	
Undeld/?	Image: The CAT Master Add Device Manne EtherCAT Image: EtherCAT
	Vendor: COCESYS Categories: Motor Version: 4.7.0.0 Order Number: Description: EtherCAT Mater Append selected device as last child of Device Image: The select another target node in the navigator while this window is open.) 3 Add Device

2. Double-click on the EtherCAT master device to set the source address (the exact name can be seen in the pc network manager).

Devices	→ ∓ X	Device EtherC/	AT_Master X		
Christer (2011):1:1:1:1:1:1:1:1:1:1:1:1:1:1:1:1:1:1	Select Network Adapter MAC address Name Des D020090007 eA1 14/031708056 sep0 16197219A766 vea0 03340745821 v3a0	Ceneral Sync Unit Assignment Overview Safety FoE Connections Log EtherCAT V/O Mapping cription	Adoconfig master/slaws EberCAT NIC Settings Destination address(MAC) FFFFFFFFFF Surveys(MAC) Network name Setert network by MAC Seter Distributed Clock	EtherET	

3. Click on the EtherCAT master device, select "Scan for Devices" in the right-click menu, and copy all devices to the project after scanning is completed.

▼ .	9 X 🖊	Device 🛛 🕤 EtherCAT	_Master X				
d7	-	eneral	Autoconfig master/slav	/#G			
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O Application	s	ync Unit Assignment	EtherCAT NIC Settings -				
Library Manager	d	verview	Destination address (MAC)	FF-FF-FF-FF-FF	Broadcast 🗌 Redundancy		
PLC_PRG (PRG)			Source address (MAC)	00-E0-99-D0-C0-97	Select		
E Task Configuration	s	afety ESoE Connections					
BetherCAT_Task	ces						
🖹 🍪 MainTask Scanne	d Devices						
PLC_PRG Devic	e name	Device type			Alias Address		
EtherCAT_Master (EtherCAT Master)	_EIOBRG_EC	EtherCAT Coupler			0		
Sottwidtion General Axis Pool	EA40C8	AnalogOutput, Curr	ent(±5V,0-10V,±10V),8Cha	annels, 16Bit(0)			
	ED_EIO4AI	A AnalogInput, Volta	ge(4~20mA/0~20mA), 4 Channel	ls, 16Bit(0)			
	ED_EI0163	W DigitalOutput, 16C	hannels, HPH(0)			_	
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4. To set up the slave, double-click on the slave, enable "Expert settings", and enable " Select DC" and "Sync0".

vices 🗸 🕂 🗍	Device BtherCAT_Mast	erED_EIOBR	G_EC X			
🗿 Untitled7		Address		Additional		
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PLC_PRG (PRG)	un Paramatere					
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🖻 😻 MainTask		Sync0				
- 쉔 PLC_PRG Ether	CAT IEC Objects	Enable Sync 0				
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EA40C8 (Analog Output, Current(±5V,0-10V,±10V), 8 Channels Infor	mation	 User-defined 		•	Shift time (µs)	
ED_EIO4ADA (Analog Input, Voltage(4~20mA)/0~20mA), 4 Char				Based on Input	Reference	
ED_ELO 16YN (Digital Output, 16 Channels, NPN)		Sync1				
A_Senais_IO_Modules_4		Enable Sync 1				
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E FA Serials IO Modules 12		> Watchdog				
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K FA Serials IO Modules 16		Comigured station a	mas (HD/0 0X0012)	value	100	· ·
K EA Serials IO Modules 17						
K EA Serials IO Modules 18		 Explicit device ident 	fication (ADO 0x0134)			
L EA Serials_IO_Modules_19		Data Word (2 Bytes)	1	ADO (hex)	164	F0 0
FA Serials IO Modules 20						,

5. Click Login and Run to connect successfully.

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C BA, Senisk JD, Modeler, JD Corrert State Operational C BA, Senisk JD, Modeler, JD Corrert State Operational C BA, Senisk JD, Modeler, JB D Startup Checking D Timeouts C BA, Senisk JD, Modeler, JB D DC Cyclic Unit Control: Assign to Local µC and Latch D C BA, Senisk JD, Modeler, JB D Watchdog D Watchdog C BA, Senisk JD, Modeler, JB Watchdog D Watchdog	K EA_Serials_IO_Modules_9	Diagnostics								
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	K EA_Serials_IO_Modules_19									
C EA_Serials_IO_Modules_19	EA Serials TO Modules 20									

5.4 Programming

The following section describes specific programming with a specific programming example.



5.4.2 Programming Example

Complete the writing and debugging of a program to flash 1 LED at 0.5 second intervals, using an 8-port I/O output module (PNP type).

Preparation:

- A new standard project has been completed.
- Hardware configuration has been completed.
- 1 x 24v compact LED has been connected to the local DO module.

Steps:

1. Confirm the address of the output point of the DO module connected to the LED, click the DO output module connected to the LED, select "ModuleI/O Mapping->Output" in the right interface, you can check the address of each output point, in the example, we use the first output point, the address is %QX18.0.



2. Click "PLC_PLG" to open the program writing interface, the upper side is the declaration variable area, the lower side is the main program writing area.

evices	× / 🕅	Device EtherCAT_Master ED_EIOE	RG_EC B ED_ELOSYP	H ED_EIO8XP H ED_EI	ISXN	,
Intitled7	•	1 PROGRAM PLC_PRG				1
😑 🎁 Device (EDATEC-117-ARM64-Linux-SM)		2 VAR				
🗏 🔠 PLC Logic		4 TON TIME : TON:				
😑 😳 Application		<pre>5 Light_Output : BOOL := FALSE;</pre>				
- 👔 Library Manager		6				
PLC_PRG (PRG)		7 END_VAR				
😑 🎆 Task Configuration						
- 🕸 EtherCAT_Task		(2)				
🖹 🕸 MainTask						
型 PLC_PRG (1)						100 % 🕵
EtherCAT_Master (EtherCAT Master)	B	1 TON TIME (IN := NOT TON TIME.Q.				
ED_EIOBRG_EC (EtherCAT Coupler)		2 PT := T#0.5S);				
EA40C8 (Analog Output, Current(±5V,0-	10V,±10V), 8 Channels 🛛 🖯	3 IF TON_TIME.Q THEN				
ED_EIO4ADA (Analog Input, Voltage(4~2	20mA/0~20mA), 4 Char	5 TON TIME (IN := FALSE):				
ED_EIO 16YN (Digital Output, 16 Channels	s, NPN)	6				
EA_Serials_IO_Modules_4		7 %QX18.0:= Light_Output;				
EA_Serials_IO_Modules_5						
EA_Serials_IO_Modules_6			1			
EA_Senais_IO_Modules_7		3				
EA_Senais_IO_Modules_8						
EA_Serials_IO_Hodules_9						
EA_Serials_IO_Houses_10						
EA Serials TO Modules 12						
E FA Serials TO Modules 13						
K EA Serials IO Modules 14						
K EA Serials IO Modules 15						
K EA_Serials_IO_Modules_16						
K EA Serials IO Modules 17						
K EA_Serials_IO_Modules_18						
K EA_Serials_IO_Modules_19						
K EA Serials IO Modules 20						

3. Write the program code as follows.

PROGRAM PLC_PRG VAR	sh
TON_TIME : TON; Light_Output : BOOL := FALSE;	
END_VAR	
<pre>TON_TIME(IN := NOT TON_TIME.Q,</pre>	sh
%QX18.0:= Light_Output;	

4. Once the program has been written, click Compile, and make sure the program reports no errors.

File Edit View Project Build Online Debug Iools Image: Second	<u>Window</u> <u>Help</u> 게 (日)::::::::::::::::::::::::::::::::::::	1表		T 1
Devices -	X Device Cat_Master - ED_EIOBRG_EC R ED_EIOBYP ED_EIOBXP	ED_EIO8XN	PLC_PRG X	-
Condect Condect	<pre></pre>			100 % (R)
Messages - Total 0 error(s), 0 warning(s), 46 message(s)				+ + ×
Build • O error(s)	0 warning(s) 10 46 message(s) × X			
Description		Project	Object	Position
Generate code for IOCONFIGBEFORETASK_2				
Generate code forCONVERSION_CONSTANTS_2310_GVL_INIT				
Generate code for GVL_IO_CA7DEC4D_EFB1_4A98_AF96_09C0C2281E8A_HF	.1152GVLINIT			
Generate code for IOGLOBALINIT_POU				
Generate code for PLC_PRG				
Generate global initializations				
Generate code initialization				
Generate relocations	•			
Memory usage on device, not used for licensing purposes:				
Build complete 0 errors, 0 warnings : Ready for download (2)				I

5. Click Login and download the program to the device, then click Run, you can see the LED blinking every 0.5S.

自営副員ののX 階間X M 協協な 単体	11 🐴 📾 🛅 - 🔓 🔠 Application (Device: PLC Logic) - 🧐 🔯 🌗 🖷 🔧 (디크 약크 약크 우리 수) 🛒	 √
evices	Image: Control of the contro	2.ED00N PLC_PRG X Type Value Prepar Address Comm
Burny Hanager Burny Hanager Burny Hanager Burny Hanager Burny Hanager Song Hanagar Song Hanagar Song Hanagar Burny Hanagar Song Hanaga	1 • • • • 1 • • • • • 1 • • • •	
EA_Serials_IO_Modules_15 EA_Serials_IO_Modules_16	Watch 1	100 % [
EA_Serials_JD_Modules_17 EA_Serials_JD_Modules_18 EA_Serials_JO_Modules_19 EA_Serials_JD_Modules_20	Expression Application Type Value	Prepared value Execution point

5.5 Operation and Maintenance

5.5.1 Program operation and shutdown operation

After writing the program, perform the run and stop operations as shown in the following table.

State	Operation
	1. Click the Login button in the software interface
Run the program	2. After importing the program update from the USB flash drive, press and hold the hidden button "STOP START" on the device to run the program.
	1. Click on the Stop button in the software interface
Stop the program	2. Press and hold the hidden button "STOP START" of the device, the indicator "ERR" lights up and the program stops running.

5.5.2 Importing a USB flash drive user program

Preparation:

- Completed writing the program and compiled it without errors.
- Obtained a USB flash drive for normal use

Steps:

1. To export the application, select "Online" -> "Create Boot Application" in the main menu.

🚔 🖬 🚔 🗠 🖂 🛦 🖻 🛍 X 🥰	Login (1) Alt+F8	Application (Device: PLC Logic) 👻 🥨 🖕 = 😤 🗔 🕾 🔄 🕾 🔄 🖓 😓	
00	Logout Ctrl+F8		
	Create Boot Application (2)		
ces	Download	DE ENERGALMASTER - ED_EIOBRG_EC II ED_EIOBRP II ED_EIOBRN E PLC_PRG X	
1 Untitled7	Online Change	RUGRAR FLC_FRG	
Device (EDATEC-117-ARM64-Linux-SM	Source Download to Connected Device		
PLC Logic	MINI D. J. J.	IME : TON;	
Application	Multiple Download	Output : BOOL := FALSE;	
Library Manager	<u>R</u> eset Warm	AR .	
PLC_PRG (PRG)	Res <u>e</u> t Cold		
Task Configuration	Reset Origin		
EtherCAT_Task	Simulation		
= S MainTask	Security		
PLC_PRG	Occurring Made		100 %
EtherCAT_Master (EtherCAT Mas	Operating Mode	IME (IN := NOT TON_TIME.Q,	
ED_EIOBRG_EC (EtherCAT C	Assign Server Applications on Download	PT := T#0.55);	
EA40C8 (Analog Output, Curr	ent(±5V,0-10V,±10V), 8 Channels 🗄 3	IP TON_TIME.O THEN	
ED_EIO4ADA (Analog Input, V	/oltage(4~20mA/0~20mA), 4 Char 5	TON THE (N := FALSE):	
ED_EIO 16YN (Digital Output,	16 Channels, NPN) 6	END IF	
EA_Serials_IO_Modules_4	□ 7		
EA_Serials_IO_Modules_5	8	%QX18.0:= Light_Output;	
EA_Serials_IO_Modules_6			
EA_Serials_IO_Modules_7			
EA_Serials_IO_Modules_8			
EA_Serials_IO_Modules_9			
EA_Serials_IO_Modules_10			
EA_Serials_IO_Modules_11			
EA_Serials_IO_Modules_12			
EA_Serials_IO_Modules_13			
K EA_Serials_IO_Modules_14			
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K EA_Serials_IO_Modules_16			
K EA_Serials_IO_Modules_17			
K EA_Serials_IO_Modules_18			
K EA_Serials_IO_Modules_19			
F FA Controls TO March Inc. OR			

- 2. "Application.app" and "Application.crc" files are generated by default, choose to customize the path where they are stored.
- 3. Format the USB flash drive and create a folder named "Application" in the root directory, copy the "Application.app" and "Application.crc" files to the "Application" folder.
- 4. Insert the USB flash drive into the USB 3.0 port of the device, at this time, the indicator of "UDISK DETECT" and "UDISK BUSY" will be always on, indicating that the device has recognized the USB flash drive.
- 5. Press and hold the hidden button "STOP START" of the device, if the device has a program running at this time, it will stop running and the indicator "ERR" will be always on. At this time, Press and hold the "IMP" button again, the indicator "UPDATE" will flash once, indicating that the program has been updated. Press and hold the button "STOP START" again, the indicator "ERR" will go out, and the program imported from the USB flash drive will start to run normally.
- 6. To uninstall the USB flash drive, press and hold the "UDISK RM" button, wait for the "UDISK BUSY" indicator to go out, then unplug the USB flash drive from the device, and the USB flash drive import program will end.

TIP

The hardware configuration of the imported program and the hardware configuration of the device must be the same when importing a program from a USB flash drive, otherwise an error will occur during importing and the indicator "IO ERR" will be always on.

6 Configuring System

This chapter introduces how to configure system.

TIP

As the CODESYS license of the product is stored in the OS by default, it is not recommended for users to flash to eMMC by themselves, and re-flashing to eMMC will result in the loss of the CODESYS license and affect the use.

6.1 Finding Device IP

Finding Device IP

6.2 Remote Login

Remote Login

6.3 Configuring Storage Devices

Configuring Storage Devices

6.4 Configuring Ethernet IP

Configuring Ethernet IP

6.5 Configuring Wi-Fi (Optional)

Configuring Wi-Fi

6.6 Configuring Bluetooth (Optional)

Configuring Bluetooth

6.7 Configuring 4G (Optional)

Configuring 4G

6.8 Configuring RTC

Configuring RTC

sh

6.9 Configuring Serial Port

This chapter introduces the configuration method of RS232 and RS485.

6.9.1 Installing picocom tool

In the Linux environment, you can use the picocom tool to debug the serial ports RS232 and RS485.

Execute the following command to install the picocom tool.

sudo apt-get install picocom

6.9.2 Configuring RS232

ED-PLC2010 series includes 2 RS232 ports with their corresponding COM ports and device files, as shown in the table below:

Number of RS232 Ports	Corresponding COM Port	Corresponding Device File
2	COM1, COM3	/dev/com1, /dev/com3

Preparation:

The RS232 ports of ED-PLC2010 has been connected with external device.

Steps:

1. Execute the following command to open the serial port com1, and configure the serial port baud rate to 115200.

picocom -b 115200 /dev/com1

2. Input commands as needed to control external device.

6.9.3 Configuring RS485

ED-PLC2010 series includes 2 RS485 ports with their corresponding COM ports and device files, as shown in the table below:

Number of RS485 Ports	Corresponding COM Port	Corresponding Device File
2	COM2, COM4	/dev/com2, /dev/com4

Preparation:

The RS485 ports of ED-PLC2010 has been connected with external device.

Steps:

1. Execute the following command to open the serial port com4, and configure the serial port baud rate to 115200.

picocom -b 115200 /dev/com2

2. Input commands as needed to control external device.