Siemens S7-200PLC Ethernet Adapter ES-ETH-PPI

USER MANUAL

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INDEX

Preface
Copyright Statement
Version Info3
Related Documents
Product Content4
(1)Characteristics & Technical Parameters4
(2) External Structure & Pin Definition6
(3)Inner Diagram8
(4)Parameters Setting8
(5)The usage in the LAN14
1. STEP7 Micro/WIN software setting14
2. The communication between the PC and a S7-200PLC18
3. The communication between the PC and multiple S7-200PLCs19
4. The intercommunication among the multiple S7-200PLCs25
(6) Remote communication in the internet26
1. STEP7 Micro/WIN software setting27
2. Remote communication between PC and S7-200PLC
3. Remote communication between two PCS S7-200PLCs
(7) Remote wireless communication in the 3G wireless internet
1. STEP7 Micro/WIN software setting
2. Remote wireless communication between PC and S7-200PLC40
3. Remote wireless communication between two PCS S7-200PLCs40
(8)Ordering Info41
(9) Appendix: basic knowledge of Ethernet41
1. TCP41
2. UDP4

Preface

Thanks a lot for your choosing our products.

Before you use, please be sure to read this manual carefully, you will know its powerful and perfect function and simple use.

This adapter is used for the communication between Siemens S7-200PLC and Ethernet, Internet or 3G wireless network by the programming interface (RS485 interface) of S7-200 PLC.Please use according to the manual,we won't assume any liability of property damage or personal injury due to your improper use.

We have the right to revise this maual at any time according to the needs of technology development and it won't be noticed before the revising.

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Version Info

Document Name: 《ES-ETH-PPI user manual》

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Related Documents

In order to use this adapter better, please also read the following two documents:

- 1. 《Device Manager Parameter Setting Software Manual》
- 2. 《VCOMM Virtual Serial Port Software Manual》

Product Content

1. ES-ETH-PPI 1PC
 2. RJ45 Cable 1 PC,2 M
 3.CD 1PC

(1) Characteristics & Technical Parameters

ES-ETH-PPI is the industrial product which use the Ethernet and Internet or 3G wirelss network to achieve Siemens S7-200PLC networking communication. It integrates many complex network protocols, support TCP Server,TCP Client,UDP Unicast,UDP Multicast etc many modes. It has 10M/100M adaptive Ethernet interface and 10-bit and 11-bit RS485 interface which meets Siemens technical specifications. You only need to go on simple setting and then let the S7-200PLC go on network communication.

The RJ45 port,RS485 interface and power supply port are all isolated in order to suit harsh environment in the industrial situations. Especially the isolated power supply port and each signal pin has anti-static protection and surge protection which can solve the communication port easily damaged problem for Siemens S7-200PLC.

Notice: When ES-ETH-PPI is used to communicate between PC and S7-200 PLC, you need to set the local connection as "Modem connection" in the STEP7 Micro/WIN software. When it's used to communicate between PLC and PLC, you only can use the free port RS485 communication mode, can't use Siemens PPI, multi-master PPI or advanced PPI protocol, also MPI and profibus protocol.

◆ High-speed, reliable industry standard, anti-interference design suit for the harsh

electromagnetic environment

♦ 32 bit RISC (NP7 series) ARM7TDMI 55DMIPS

- 128KB SRAM, 128KB Code + 32KB Boot
- ◆10M/100M adaptive Ethernet interface
- Support Siemens technical specifications 10-bit and 11-bit RS485 communication mode
- ♦ Support RS485 data bits 5, 6, 7, 8 settable
- Support RS485 stop bit 1, 1.5, 2 settable
- Support RS485 Parity NONE,ODD,EVEN,MARK,SPACE settable

◆Support RS485 baud rate 110~115200bps standard baud rate settable,not support 187.5Kbps baud rate

◆ Support PPI communication of RF modem and free port RS485 communication, not support advanced PPI and multi-master PPI protocol

♦ Protocols: TCP,UDP,ARP,IP,ICMP,DHCP,BOOTP,DNS

- Support Dynamic DNS
- ♦ Working mode can be chose TCP Server、TCP Client、UDP multicast and UDP unicast.
- ♦ Built-in Flash memory, can save the setted parameters
- Support Windows 95/98/ME/NT/2000/XP/2003/XP/Vista/Win7

◆RJ45 port 1500VDC electromagnetic isolated, RS485 interface 1000VDC electromagnetic isolated, power supply 1000VDC electromagnetic isolated

◆Interface protection: power supply port has the reverse polarity protection and over current protection,RS485 interface has the 500W anti-lightning surge protection and overcurrent protection; all pins and terminals have anti-static protection

- ♦24V±10% DC power supply from PLC RS485 socket,1W power
- ◆Dimension: 65mm×51mm×26mm, 35mm standard rail installation
- ◆Temperature: -40°C to +80°C (-40°F to 176°F), 5% to 95% RH



Ethernet interface: Standard RJ45 socket, automatically adapt 10M/1000M Ethernet .Use the standard network cable, not crossover cable whether you connect the switch or directly connect the PC.



The network status LED	indicator on the RJ45 socket
------------------------	------------------------------

LINK LED (LEFT,GREEN)		ACT LED (RIGHT,YELLOW)	
State	description	State	description
Light on	Network cable is connected	Flash	Sending and receiving data through
correctly, work properly.			the RJ45 port
Flash	Network cable is not plugged in, no	Extinguish	No data transceiving
	available network		

Pin	Signal name	Function	Туре	
1	Tx+	Positive phase Ethernet data sending	output	
		differential signal line		
2	Tx-	negative phase Ethernet data sending	output	
		differential signal line		
3	Rx+	Positive phase Ethernet data receiving	input	
		differential signal line		
4	Not used		-	
5	Not used		-	
6	Rx-	Negative phase Ethernet data receiving	input	
		differential signal line		
7	Not used		-	
8	Not used		-	

Ethernet interface RJ45 socket signal array

Default Button: Restore the default setted parameters. Insert the penpoint into the hole to press the button for about 1 second, the internal Flash memory parameters will restore to factory default parameters: IP = 192.168.0.250, Username = admin, Password = admin. When you forget the IP address, user name or password, you can restore to the factory default parameters, and then reset the parameters.

RS485 Interface: RS485 interface is the DB9M-pin plug which meets the Siemens S7-200 Series PLC PPI interface technical specifications, the signal array match S7-200 series PLC PPI interface, and has a 0.5 meter cable, you just simply plug the DB9M directly into the S7-200PLC PPI interface outlet.

Pin No.	Signal	Description	Input/output
	name		
1	NC	No use	-
2	M24V	24VDC power negative	input
3	LTG_B	RS485 signal positive	input/output
4	NC	No use	-
5	M5V	RS485 signal ground	input
6	NC	No use	-
7	P24V	24VDC power positive	input
8	LTG_A	RS485 signal negative	input/output
9	RTS_PG	RS485 communication mode selection	input
Shell	Shielding	Shield ground (chassis ground)	

The signal array of RS485 socket(DB9M pin)

RS485 communication mode selection switch: you need to set the local connection as "modem connection" in the STEP7 Micro/WIN software when you use the ES-ETH-PPI. At this time, you need to choose 11-bit or 10-bit data communication mode.

11-bit mode	8E1 communication mode with even parity, is usually used for LAN(intranet)communication.
10-bit mode	8N1 communication mode without parity, is usually used for Internet (Extranet) or 3G wireless network communication.

RS485 communication indicator: there are three LED indicators on the panel, and its working state as the following table:

Indicator	Light on	Flash	Extinguish
(Red)	Power supply normal	Fault	Fault or no power
TxD	Fault or signal polarity	Serial port is	Fault or no
(Yellow)	reversal	receiving the date	communication
RxD (Green)	Fault or signal polarity	Serial port is	Fault or no
	reversal	sending the date	communication

(3)Inner Diagram



(4)ES-ETH-PPI parameters setting

ES-ETH-PPI needs to be configured the parameters to work correctly, the configuration parameters including the network parameters, communication protocols, connection, serial port parameters; it can be very flexible to satisfy your application. Configuration parameters are stored in the Flash memory, and they can be permanently stored without loss.

Use the standard RJ45 cable to connect the ES-ETH-PPI and router or switch, at the same time make sure that the router or switch is connected to a computer in order to run the parameters setting software .You also can use a standard RJ45 cable to directly connect ES-ETH-PPI and the computer, no need crossover cable, this product has auto-polarity discrimination function for the RJ45 cable.

Plug the RS485(DB9M) of ES-ETH-PPI into the S7-200PLC RS485 socket and power on the PLC.

The same local area network (router) can connect multiple ES-ETH-PPI, but the same IP address

is not allowed, there will be conflicts if the same IP , and it only shows one of IP and abnormality.

You can press the Default button on the ES-ETH-PPI any time that could make it restore to the factory dafault.

IP=192.168.0.250, Username=admin, Password=admin

You need to check your computer's IP address and gateway address, and confirm your computer is in the normal Internet access, in the next setting, you need to set the gateway of ES-ETH-PPI as same as the gateway of computer and router, that is to say, the ES-ETH-PPI and computer are in the same subnet, all equipments in this subnet and routers have the same gateway.

Right-click Network Neighborhood> View Network Connection> Properties, then pop up "Local Area Connection Properties" window:

🕹 Local Area Connection Properties 🛛 🔹 💽				
General Advanced				
Connect using:				
VMware Accelerated AMD PCNet Ad <u>Configure</u>				
This connection uses the following items:				
PROFINET IO RT-Protocol SIMATIC Industrial Ethernet (ISO) Internet Protocol (TCP/IP) (1)				
Install Uninstall Properties				
Description (2)				
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.				
Show icon in notification area when connected Notify me when this connection has limited or no connectivity				
OK Cancel				

Select the General page; click the Properties then pop-up the following window, record the IP address and the gateway of the computer for later use:

Internet Protocol (TCP/IP) Prope	rties 🛛 🛛 🛛
General	
You can get IP settings assigned auton this capability. Otherwise, you need to a the appropriate IP settings.	natically if your network supports ask your network administrator for
Obtain an IP address automatical	y
• Use the following IP address:	
<u>I</u> P address:	192.168.1.108
S <u>u</u> bnet mask:	255.255.255.0
Default gateway:	192.168.1.1
○ O <u>b</u> tain DNS server address autor	natically
• Use the following DNS server add	tresses:
Preferred DNS server:	202 . 98 . 96 . 68
<u>A</u> lternate DNS server:	61 . 139 . 2 . 69
	Ad <u>v</u> anced
	OK Cancel

Copy the OEM Device Manager_SPCNML.rar file on the CD to your hard disk and extract it to the current folder, do not modify the folder name "OEM Device Manager_SPCNML" which store the setting software. Double click the following icon in the OEM Device Manager_SPCNML folder to run setting software:



🔀 Device Manager S	PCNML			
操作(<u>0</u>) 工具(<u>T</u>)	语言(L) 帮助(H)	7		
🔍 🔍 髎 🛗 - (S 英语(E)			
DeviceName	✓ 简体中文(<u>C</u>)	Physical Address		
	繁体中文(日)			
			Property	¥alue
			Device Name	
			MAC Address	
			IP Address	
			Serial No	
			Firmware Version	
			System Uptime	
Ready				

Change language to English: Ctrl+L and then press "E", or select the menu as the picture up

Click the Search button in the upper left corner, and then search out all ES-ETH-PPI connected to the router after a few seconds, as shown below:

Device Manager SPCN	ML			
Qperate Tools Lar	nguage Help 🕭 🗂 📼 🧿			
(1) DeviceName	IP Address	Physical Address		
ES-ETH-PPI-1#	192.168.1.250	00. £0. 0a. 02. ee. 53		
(2) (louble click			
			Property Device Vere	Value DC_DTU_DD1
			MAC Address	00. f0. 0a. 02. ee. 53
			IP Address	192.168.1.250
			Serial No	
			Firnware Version	V6.1.0SP0T050125R
			System Uptime	

Double-click the ES-ETH-PPI, pop-up dialog box, enter your user name and password to enter the setting interface. The factory default setting: Username = admin, Password = admin

Login		8
Username:	admin	
Password:	****	
Lo	Cannel	

Click "Login" to enter the configuration interface.

You must firstly click"OK" to effect the modified parameters (parameters not saved at this time) after you modify the parameters in every interface ,then click the "Apply Settings / Restart" to save parameters and restart the ES-ETH-PPI to work with the new parameters and then exit the setting software. As shown below:

Config		X
Basic Setting Network Server Channels Password Setting Apply Settings/Re: Log Out Cl se an	 Obtain automatically (2) ick here to download the tring to the hardware d restart Bac Address 00. f0. 0a. 02. ee. 53 Auto Negotiate Speed Duplex Full 	 User config IP Address 192.168.1.250 Subnet 255.255.255.0 Gateway 192.168.1.1 Preferred DNS Server 202.98.96.68 Alternate DNS Server 61.139.2.69
		Click "OK" to save the setting, but it's not download to the hardware
4 III. +	Refresh	(1) OK Close

About the parameters configuration details, please read the "Device Manager Parameters setting software manual".

After you configure the ES-ETH-PPI parameters, you need to run VCOMM virtual serial port software on the PC, simulate the ethernet interface of ES-ETH-PPI as serial port (COM port) on

the PC, then choose this serial port in the local connection of STEP7 Micro/WIN software ,as the same as you use the traditional PC/PPI programming cable.

Notice: The COM port of local connection in the "set PG/PC interface" menu of Siemens programming software STEP7 Micro / WIN can most support COM8, even though it can display above COM8, in fact it can't use.

About the detailed instructions of the VCOMM virtual serial port software, please read " VCOMM virtual Serial Port software Manual.

Siemens S7-200PLC 11-bit RS485 interface communication parameters: data bits = 8 bits, parity =

EVEN (even parity), stop bit = 1, referred to as: 8E1. This is the PLC default mode.

Siemens S7-200PLC 10-bit RS485 interface communication parameters: data bits = 8 bits, parity = NONE (no parity), stop bit = 1, referred to as: 8N1.This mode is used in the Internet communication.

S7-200PLC baud rate = 9.6Kbps or 19.2Kbps , ES-ETH-PPI does not support 187.5Kbps baud rate. Firstly please use such as PC / PPI programming cable to check the PLC baud rate, and the ES-ETH-PPI serial port parameters must be set as the same parameters with the PLC, so we set S7-200PLC baud rate as 9.6Kbps in the following examples.

Firstly set ES-ETH-PPI serial port parameters in parameters setting software , where the serial port protocol box "RS232" option is supporting RS232/RS485/RS422 communication and must ensure that this serial port parameters and the S7-200PLC RS485 interface parameters are the same, Otherwise, It can't normally communicate.

Config		8
Basic Setting Network Server Channels Channels Hostlist2 Serial Settin Connection2 Password Setting Apply Settings/Rest Log Out	Channel 2 (3) Protocol RS232 Baud Rate (5) 9600 Parity (7) EVEN (11) Enable Packing Enabl Idle Gap Time	(2) Serial Port Options V Enable (4) FIFO 8 Data Bits 8 T Flow Control (8) None Stop Bits (9) 1 T e
	Match 2 Byte Sequence SendFrameOnly	Yez Ox Ox
<	Refresh	OK Close

The application of ES-ETH-PPI is very flexible and diverse, not limited to examples described below. You can use the ES-ETH-PPI to connect the S7-200PLC to the Ethernet in order to achieve the data communication from PLC to PC,PLC to PLC, multiple PLCs to PC and among multiple PLCs etc. It can also be achieved the worldwide data communication through the Internet, or wireless data communication through wireless LAN, 3G network card, 3G router.

(5)The usage in the LAN

LAN communication generally refers to the same gateway, that is to say, the communication is among multiple Ethernet devices which are connected to a same router.

The ES-ETH-PPI communication in the LAN needs to ensure that PC, ES-ETH-PPI and routers have the same gateway, The gateway: 192.168.1.1, the computer IP address: 192.168.1.108, ES-ETH-PPI IP address: 192.168.1.250 in the following examples.

1.STEP7 Micro/WIN software setting

Select RS485 communication mode switch on the ES-ETH-PPI to "11bit", use the even parity 11 bit communication mode,then use the setting software to set ES-ETH-PPI serial port parameters as 9600bps, 8E1(8 data bits, even parity, 1 stop bit).

When the VCOMM virtual serial port software running on the PC simulate ES-ETH-PPI as the COM port on the PC, the next using is just like PC / PPI programming cable, but you should set the local connection in the "set PG/PC interface" menu of STEP7 Micro / WIN software as "modem"

Set PG/PC Interface	×
Access Path	
Access Point of the Application:	
Micro/WIN> PC/PPI cable(PPI) (Standard for Micro/WIN)	<u> </u>
Interface <u>P</u> arameter Assignment	(2)
PC/PPI cable(PPI)	P <u>r</u> operties
PC Adapter (MPI) PC Adapter (PPI) PC Adapter (PROFIBUS) PC/PPI cable (PPI) (1) (Assigning Parameters to an PC/PPI cable for an PPI Network)	Copy De <u>l</u> ete
-Interfaces Add/Remove:	Sele <u>c</u> t
Ca	ncel Help

Properties - PC/PPI cable(PPI)	Properties - PC/PPI cable(PPI)
PFI Local Connection (1) Connection to: (2) Image: Modem connection Virtual serial port Selected Port	PPI Local Connection (4) Station Parameters Address: 0
OK Default Cancel Help	OK Default Cancel Help

Click the "Communication" button to enter the communication settings, double-click "connection" to set the modem parameters.

Address	6257	PC /PPI oshle(PPI)
Local	0	无线电/射频调制解调器
Remote:	2	Connect: ES-ETH-PPI Click
PLC Type:		Double Ofek
		to Refresh
☑ Update PLC type in pro	ject	
Network Parameters		
Interface:	PC/PPI cable	
Protocol:	PPI	
Mode:	11-bit	
Highest Station (HSA):	31	
I√ Supports multiple mast	ers	

Select the "modem connection" and configure serial port parameters, choose even parity 11 bit mode.

Modem Connection		
Select a connection to a vamate station	Modem Connection Settings	
	General	
	Connections	(2)
		<u></u>
Correct Tircout:		Remove
(1) seconds		Settings
Connect Settings Cancel	Current: No Current	connection
	Default: No Default	connection <u>Set D</u> efault
Add Modem Connection Wizard	23	
Local Connection		▼ Dialing Properties
Name the connection, select a local modem, and check the	e box if you are connecting	
using a ceir phone modern.		
Trans a new most for this second in:		
(3) ES-ETH-PPI		
Select the local modem.	(5)	
(4) Radio/RF Modem	onfigure	
Radio/RF Modem	(9)	
Properties	ОК	
Com port: (6) [3]	Cancel	
<u>Baud rate:</u> (7) 9600		
Parity: (8) Even	_	
Use DCD		
(Prev	Next> Cancel	

Click "Connect" button to establish the connection.

Modem Connection	
Select	a connection to a remote station.
<u>C</u> onnect to:	ES-ETH-PPI 💌
Phone number:	
Connect <u>T</u> imeout:	90 seconds
Connect	Settings Cancel

Double-click the "Refresh" to search the PLC, and then you can find the all PLCs connected to the network, then select the PLC which you want to operate , in the next step you can upload, download the data.

Communications		Σ	3
Address Local: Remote: PLC Type:	0	PC/PPI cable(PPI) Radio/RF Modem Disconnect: ES-ETH-PPI Phone Number: CPV 222 REL 02.00 Address:3	-
 ✓ Update PLC type in project Network Parameters Interface: Protocol: Mode: Highest Station (HSA): ☐ Supports multiple masters 	Searching at 9.6 kbps Address 8 of 126 Cancel		
Set PG/PC Interface]	OK Cancel	

2. The communication between the PC and a S7-200PLC



Set the ES-ETH-PPI network parameters, the gateway of ES-ETH-PPI, PC and router must be same, the DNS server needn't to be setted because you don't use the dynamic domain name on the Internet.

Config		×
Basic Setting Network (1) Server Channels Channel2 Hostlist2 Serial Sett Connection2 Password Setting Apply Settings/Re:	Obtain automatically (2) (10)	 User config (3) IP Address 192.168.1.250 Subnet (4) 255.255.255.0 Gateway (5) 192.168.1.1
Log Out		Preferred DNS Server
	Bac Address	218.6.200.139
	00. f0. 0a. 02. ee. 53	Alternate DNS Server
	🔽 Auto Negotiate	61.139.2.69
	(6) Speed 100M 👻 (7)	
	Duplex Full 🔻 (8)	
4 <u> </u>	Refresh	(9) OK Close

The setting of ES-ETH-PPI serial port parameters is omitted here, you can see the previous description.

Set ES-ETH-PPI working mode as TCP Server, port No. = 27011, waiting for clients to connect.

Config		×
Basic Setting Network	Channel 2 (3)	(2) NetProtocol TCP 🔻
⊿ Channels	Worked As Server 👻	Active Connect ⁽⁴⁾ AutoStart 🔹
⊿ - Channel2 Hostlist2	Remote Host 0.0.0.0	Start Character Ox
Serial Settin	(1) ^{Remote Port} 0	DNS Query Period 1800 🚔
Password Setting Apply Settings/Rest	(7) Local Port (5) 27011 🚍	Flush Input Buffer
Log Out	As a Server, the Remote 1 need.	Host address and Port number not
		Flush Output Buffer
	Inactivity limeout 255	
↓ Ⅲ →	Refresh	(6) OK Close

Run the VCOMM virtual serial port software on the PC, set the simulated virtual serial port on the PC. Select VCOMM as Client mode, initiatively to connect the server-side equipment. Choose the device detector to create the virtual serial port.

Select VSPM wor	k mode
VSPM run as I	Client, support Server Device (1)
OVSPM run as S	Server, support Client Device
O UDP broadca:	st

Add a virtual serial port, the remote server IP address = ES-ETH-PPI IP address, remote server monitoring port = ES-ETH-PPI port.

Virtual Serial Info				×
TCP/IP virtual serial param				
	Serial: CO	ОМЗ	•	ω
Remo	te Server IP: 19	2.168.1.250	•	(2)
Remote S	erver PORT: 27	011		(3)
	Map mode: Cli	ient	-	
	Note:			
	OK (4)		🗙 Cancel	

Click OK and exit the software and re-run VCOMM, the client side VCOMM will take the initiative to connect the server side with IP address 192.168.1.250, port number 27011, it will create a new serial port COM3 after establishing the connection, and it will appear in the Device Manager of the Windows system, then you choose this serial port in your application software, such as STEP7 Micro/WIN.

le Virtual Se	erialVSPM run as Client,suppo	ort Server Device Ver3.	16		
Manager Co	nfig MinimizeVSPM About Exi	t			
Virtual C	Remote Server IP and PORT	State	COM->Network(Byte)	NetWork->COM(Byte)	Last State
COM3	192.168.1.250:27011	Close,0,N,0,1	0	0	TCP/IP Connected
4		III			÷.
					Standard Mod

Of course you can use ES-ETH-PPI to simulate each PLC as a COM port on the PC in order to achieve the data communication and monitoring operation between PC and multiple PLC s

3. The communication between the PC and multiple S7-200PLCs



When multiple PLCs communicate with a PC via Ethernet, you need to set every ES-ETH-PPI connected with PLC as TCP Client, set the PC as the TCP Server, let every client ES-ETH-PPI takes initiative to connect the server PC. When VCOMM Virtual Serial Port Software work as TCP Server, it allows unlimited number of connected clients.

Set the ES-ETH-PPI network parameters, the gateway of ES-ETH-PPI,PC and router must be same, the DNS server needn't to be setted because you don't use the dynamic domain name on the Internet. The picture below is a ES-ETH-PPI setted parameters, when there are multiple

ES-ETH-PPI, please note that each ES-ETH-PPI IP address must be set to the different addresses.

Config		×
Config Basic Setting Network (1) Server Channels Channel2 Hostlist2 Serial Sett Connection2 Password Setting Apply Settings/Res	Obtain automatically (2) (10) ac Address	 User config (3) IP Address 192.168.1.250 Subnet (4) 255.255.255.0 Gateway (5) 192.168.1.1 Preferred DNS Server 218.6.200.139
	00. f0. 0a. 02. ee. 53 Auto Negotiate (6) Speed 100M (7) Dupley (7) (9)	Alternate DNS Server 61.139.2.69
4 III >	Refresh	(9) OK Close

The setting of each ES-ETH-PPI serial port parameters are the same with PLC and they are omitted here, you can see the previous description.

Set each ES-ETH-PPI as the TCP Client, the remote host IP = PC IP address, host port = VCOMM software port number. That is to say, each ES-ETH-PPI have to connect to server-side VCOMM with IP = 192.168.1.108, port = 8000.

Config		×
Basic Setting Network	Channel 2 (3)	Het Protocol TCP -
Channels	Worked As Client 👻	Active Connect(4) AutoStart 👻
⊿ ~ Channel2 … Hostlist2	Remote Host 192.168.1.108	⁽⁵⁾ Start Character Ox
Serial Settir	(1) Remote Port (6) 8000 🚔	DNS Query Period 1800 🚔
- Password Setting Apply Settings/Rest	(8) Local Port 27011 🚔	Flush Input Buffer
Log Out	As Client, The Local Port isn't need, Can be setted only for identifing different devices	Flush Output Buffer
	Inactivity Timeout 🛛 255 🚔	
4	Refresh	(7) OK Close

Run the VCOMM virtual serial port software on the PC, set the simulated virtual serial port on the PC. Select VCOMM as Server (server side) mode, accept client connection. Choose the device detector to create a virtual serial port.

WORK MODE	
Select VSPM work mode VSPM run as Client, support Server Device VSPM run as Server, support Client Device (1)	
UDP broadcast	
🗸 ОК (2)	

Add a new virtual serial port, the monitoring IP address = PC IP address, client mode device try to connect the port = VCOMM software port, this is 8000.

Virtual Serial Info	
TCP/IP virtual serial param	
Serial:	СОМЗ 🖵 (1)
Select List IP:	192.168.1.108 👻 (2)
Client will connect this PORT:	8000 🔅 (3)
Map mode:	Server
Note:	
(4) 🔽 OK	🗙 Cancel
*Communication	will stop, until apply complete

Click OK and exit the software and re-run VCOMM, server side VCOMM will accept as many as client side ES-ETH-PPI connections, and it's unlimited. A new serial port COM3 will appear on the PC after the connection is established. And this serial port will also appear in the Windows System Device Manager, then you can choose this serial port in your applications,like STEP7 Micro/WIN.

le Virtual	SerialVSPM run as Server, su	upport Client Device	Ver3.16		x
Manager	Config Minimize VSPM About	Exit			
Virtual C	Local list IP and PORT	State	COM->Network(Byte)	NetWork->COM(Byte)	Last Sta
СОМЗ	192.168.1.108:8000	Close,0,N,0,1	0	0	
•		III			×.
_					

You can find the all PLCs via communication search of STEP7 Micro/WIN, as shown below.

Communications		2
Address Local: Remote: PLC Type: Update PLC type in project Network Parameters Interface: Protocol: Mode: Highest Station (HSA):	0 Searching at 9.6 kbps Address 8 of 126 Cancel	PC/PPI cable(PPI) Radio/RF Modem Disconnect: ES-ETH-PPI Phone Number: CPU 222 REL 02.00 Address:3 CPU 226 REL 01.00 Address:5
Set PG/PC Interface		OK Cancel



When multiple S7-200PLC need to exchange data each other, of course UDP multicast mode is the best working mode. Using UDP multicast can directly replace the original multi-point RS485 communication. But please notice that at this time the ES-ETH-PPI only supports S7-200PLC free port RS485 communication mode, do not support PPI,advanced PPI,Multi-master PPI communication protocol and MPI and profibus protocol.

Here We use the multicast section address 224.224.224, all modules added in the multicast group (224.224.224.224.224:27011)can send and receive data each other.

Config						23
Basic Setting Network Server	СЪ	annel 2	(3)	(NetProtoco] (4	2) L [IDP L]	•
⊿ Channels ⊿ Channel2	Da	tagram Type 📗	ulti_Cast 🔻	Accept Incoming	📝 Yes	
- Hostlist2 - Serial Settir	ໜ	P Local Port 27	'011 🚔 <mark>(5)</mark>	VDP Remote Port	27011	*
Connection2	<mark>1)</mark> ໝາ	P Net Segment 22	24. 224. 224. 224	(r)	(6)	
Apply Settings/Rest	Vs	eXostlist	UDP	UniCast Local Port	0	×
Log Uut (9)	No.	Host Addr	ess	Host Address	Port	
	0	192.168.1.108	192	. 168. 1. 110	8000	A
	1					A
	2					A
	3					A
4 III +	Red	fresh		(8) OK	Clos	e]

This mode is well suitable for upgrading the original RS485 network to Ethernet, the key of the mode is that all the ES-ETH-PPI multicast section address of the same group must keep identical to local port and remote host port number, that is to say, multicast section address and the port number is same,then these ES-THE-PPI belong to the same group, the data sent out by any one will be received by other ES-ETH-PPI of the same group, and there is no master-slave distinction. Under the Multicast mode, the ES-ETH-PPI grouping is only logic, no need physical grouping, that is to say, there can be multiple groups in the same network, they are Independent of each other.

Of course, you still need to set each ES-ETH-PPI as a different IP address, every ES-ETH-PPI serial port parameters are the same as PLC serial port parameters.

(6) Remote communication in the internet

ES-ETH-PPI can achieve the worldwide remote communication through the Internet, it will use the external network IP address of the router, the router external network address is different when the router is started every time, because the router will be randomly assigned to one IP address from the Internet when it 's powered every time, so this will result in trouble for remote communication through the Internet, There are two following methods to solve this problem:

Apply to buy a fixed IP address from the telecom, the fee will be higher.

Use the dynamic domain name resolution.you can apply for a free or paid domain name from dynamic domain name service provider, then use domain name instead of IP address; so that regardless of changes in IP address, domain name will point to IP addresses in real time, like as we usually visit the website .

Some providers such as changeip.com and other dynamic domain name (DDNS) service providers offer free and paid dynamic domain name service, you can consult them for their dynamic domain name service and charges issue. Firstly you need to apply a dynamic domain from DDNS service provider , and download the Dynamic DNS client software, run this software on the host of Server mode. After the client software has been successfully started, Server host has solved the problem of dynamic IP address. Input the dynamic domain name in the IP input box of Client remote host, set the DNS server IP address as the local DNS server IP addresses, then you can use the dynamic domain name to visit the internet.

In the following example, use our free dynamic domain name:kollew.changeip.net, use the PC in Server-side and run the dynamic domain name client software, you can also use a router with the function of dynamic domain name.

1.STEP7 Micro/WIN software setting

Select RS485 communication mode switch on the ES-ETH-PPI to "10bit", use the no parity 10 bit communication mode, then use the setting software to set ES-ETH-PPI serial port parameters as 9600bps,8N1 (8 data bits, no parity, 1 stop bit).

When the VCOMM virtual serial port software running on the PC simulate ES-ETH-PPI as the COM port on the PC, the next using is just like PC / PPI programming cable, but you should set the local connection in the "set PG/PC interface" menu of STEP7 Micro / WIN software as "modem connection" mode.

Set PG/PC Interface	×
Access Path	
Access Point of the Application:	
Micro/WIN> PC/PPI cable(PPI))
(Standard for Micro/WIN)	
Interface <u>P</u> arameter Assignment	(2)
PC/PPI cable(PPI)	Properties
PC Adapter (MPI) PC Adapter (PPI) PC Adapter (PROFIBUS) PC/PPI cable (PPI) (1) (Assigning Parameters to an PC/PPI cable for an PPI Network)	Copy Delete
-Interfaces Add/Remove:	Sele <u>c</u> t
	ancel Help

Properties - PC/PPI cable(PPI)	Properties - PC/PPI cable(PPI)
PPI Local Connection (1) Connection to: Modem connection Selected (2) Virtual serial port	PPI Local Connection (4) Station Parameters Address: Jimeout: Network Parameters Network Parameters Advanced PPI The rate must be the same as PLC setted Multiple master network Transmission gate: Mighest station address: 31 (6)
OK Default Cancel Help	OK Default Cancel Help

Click the "Communication" button to enter the communication settings, double-click "connection" to set the modem parameters.

Address	20150	PC /POI ashis(POI)
Local: Remote:	0	T 大线电/射频调制解调器 Double
PLC Type:		Click
☑ Update PLC type in pro	ject	
Network Parameters		
Interface:	PC/PPI cable	
Protocol:	PPI	
Mode:	11-bit	
Highest Station (HSA):	31	
I⊽ Supports multiple mast	ers	
	-1	OK Capad

Select the "Radio / RF modem" and configure serial port parameters, choose no parity 10 bit mode.

Select a connection to a remote station.	Modern Connection Settings	
9 <u></u>	General	
	Connections	(2)
ect to:		<u>A</u> dd
e number :		Bemove
act Lineout: (1) 100 seconds		Settings
Cgnnect Settings Cuncel	Current: No Current connection Default: No Default connection	Set Default
Local Connection Name the connection, select a local modem, and check using a Cell phone modem.	the box if you are connecting	ialing Properties
Type a name you want for this connection: (3) ES-ETH-PPI Select the local modem.	(5)	Cles
Iype a name you want for this connection: (3) ES-ETH-PPI Select the local modem. (4) Radio/RF Modem Properties	(5) Configure	Clos
Iype a name you want for this connection: (3) ES-ETH-PPI Select the local modem. (4) Radio/RF Modem Properties Com port: (6) Select the local modem.	(5) Configure (9) COM port Cancel	Clos
Type a name you want for this connection: (3) ES-ETH-PPI Select the local modem. (4) Radio/RF Modem Properties Com port: (6) Baud rate: (7) Baud rate: (7) Baud rate: (8)	(5) Configure (9) COM port Cancel	Clos
Type a name you want for this connection: (3) ES-ETH-PFI Select the local modem. (4) Radio/RF Modem Properties Com port: (6) Baud rate: (7) Baud rate: (7) Serity: (8) None Use BCD Use BTS/CTS	(5) Configure (9) COM port Concel	Clos

Click "Connect" button to establish the connection.

Modern Connection	
Select	a connection to a remote station.
Connect to:	ES-ETH-PPI 💌
Phone number:	
Connect <u>T</u> imeout:	90 seconds
Connect	Settings Cancel
	*
1	

Double-click the "Refresh" to search the PLC, and then you can find the all PLCs connected to the network, then select the PLC which you want to operate , in the next step you can upload, download the data.

Address Local:	0	PC/PPI cable(PPI) Radio/RF Modem
Remote:		Disconnect ES-ETH-PPI
PLC Type:		CPV 222 REL 02.00 Address:3
Vpdate PLC type in project	t	
Network Parameters	Searching at 9.6 kbps	
Interface:	Address 8 of 126	
Protocol:		
Mode:	Cancel	
Highest Station (HSA):	126	
Supports multiple masters	e	
	1	
Set DC/DC leterface	1	OK Cancel

2.Remote communication between PC and S7-200PLC



The most economical way to achieve the remote communication in the Internet between the PC and S7-200PLC is that set the ES-ETH-PPI as the client, set the PC as the server, install and run the DDNS software on the PC, and set the port mapping for PC on the router of PC side. As shown below:

Set ES-ETH-PPI network parameters, the gateway must be the same as the router connected with the ES-ETH-PPI, here you still need to properly set the IP address of DNS, different cities have different DNS Server IP, you can use all, but usually choose the local DNS, you can search these addresses from Internet, also can find them from the router which you are using.

Config		×
Basic Setting Network (1) Server Channels Password Setting Apply Settings/Rest Log Out	Obtain automatically (12)	 (2) (3) IP Address 192.168.1.250 Subnet (4) 255.255.255.0 Gateway (5) 192.168.1.1 Preferred DWS Server
	■ac Address 00. f0. 0a. 02. ee. 53 ✓ Auto Negotiate (8) Speed (9) 100M ▼ Duplex (10) Full ▼	(6) 218.6.200.139 Alternate DNS Server (7) 61.139.2.69
4 III +	Refresh	(11) OK Close

Set the serial port parameters of ES-ETH-PPI, please note that you should use 10-bit communication mode: 8 data bits, no parity, 1 stop bit, that is 8N1.

Set ES-ETH-PPI as TCP Client; remote host IP =domain name of remote PC, here is: kollew.changeip.net; host port = VCOMM software port number.

Config		X
Basic Setting Wetwork	Channel 2 (3)	(2) MetProtocol TCP -
⊿ Channels	Worked As Client 👻	Active Connect AutoStart 🔻
⊿ - Channel2 Hostlist2	Remote Host kollew.changeij	(5) Start Character Ox
Serial Sett Connection2	Remote Port (6) 8000 🚍	DNS Query Period 1800 🚔
Password Setting Apply Settings/Re	Local Port 27011 🚔	Flush Input Buffer
Log Out	As client, The local po is used for Identify d different devices only	ort the 7
		Flush Output Buffer
	Inactivity Timeout 255 🚔	
4 III →	Refresh	(7) OK Close

Input the IP address of the router in the IE browser address bar of the remote PC and then appear the router setting interface, set the port simulation for PC, as shown below. If your PC does not use the router to access Internet, then this step can be omitted.

		v	Vireless-(G Broadband	Router with
Setup	Access strictions	Applications & Gaming			
Port Range For	ward	Port Triggering	l I	DMZ	Q.
			-		
		Port	Range		
Application	Start	End	Protocol	IP Addres	s Enable

The meaning of the above settings is that when the client ES-ETH-PPI visit and access the router's external network IP address (this address is automatically resolved by the domain name, you no longer cares about its change),router will automatically transfer this visiting to the VCOMM virtual serial port software on the PC with IP address 192.168.1.108, port 8000 which is connected to the router

1

Kollew 8000 to 8000 TCP - 192.168.1. 108

After setting, click "Restart Router" button or re-power the router to work with the new parameters. Run the client software on the PC, as shown below, the domain name kollew.changeip.net has been pointed to the external network IP address of the router.

) Dat	a / Info	ormation	openera			
DN:	S Domains	DNS Group:	s IP History IP Del	ectors	DNS Records		
	ID	Host	Domain Name	Туре	Address	Last Modified	-
	5896798	ftp	Tiny.changeip.net	A	183.37.69.214	2010-12-4 10:40	
	5896799		Tiny.changeip.net	MX	Tiny.changeip.net.	2010-12-4 10:40	
	5896800		Tiny.changeip.net	MX	Tiny.changeip.net.	2010-12-4 10:40	
۲	5896801	0	kollew.changeip.net	A	183.37.69.214	2010-12-4 10:41	
	5896802	www	kollew.changeip.net	A	183.37.69.214	2010-12-4 10:41	H
	5896803	ftp	kollew.changeip.net	A	183.37.69.214	2010-12-4 10:41	
	5896804		kollew.changeip.net	MX	kollew.changeip.net	. 2010-12-4 10:41	
	5896805		kollew.changeip.net	MX	kollew.changeip.net	. 2010-12-4 10:41	
_							

Run the VCOMM virtual serial port software on the PC, set the simulated virtual serial port on the PC. Select VCOMM as Server mode, accept client connections. Choose to use the device detector to create a virtual serial port.

WORK MODE
Select VSPM work mode VSPM run as Client, support Server Device VSPM run as Server, support Client Device (1)
UDP broadcast
ОК (2)

Add a new virtual serial port, the monitoring IP address = PC IP address, client mode device try to connect the port = VCOMM software port, this is 8000.

Virtual Serial Info	
TCP/IP virtual serial param	
Serial	COM3 🕶 (1)
Select List IP	: 192.168.1.108 ▼ (2)
Client will connect this PORT	8000 (3)
Map mode	: Server
Note	:
(4) V OK	🗙 Cancel
*Communication	will stop, until apply complete

Click OK and exit the software and re-run VCOMM, the server VCOMM will wait the connection of client ES-ETH-PPI, then it will create a new serial port COM3 after establishing the connection, and it will appear in the Device Manager of the Windows system, then you choose this serial port in your application software, such as STEP7 Micro/WIN.

(A) Ma	Virtual Se anager Co	rialVSPM run as Server,su nfig MinimizeVSPM About I	ipport Client Device Ver: Exit	3.16		X
V	'irtual C	Local list IP and PORT	State	COM->Network(Byte)	NetWork->COM(Byte)	Last Sta
C	DM3	192.168.1.108:8000	Close,0,N,0,1	0	0	
			III			E.
_						

You can also set the ES-ETH-PPI as the server, set VCOMM as the client, but the router connected with ES-ETH-PPI need to have the DNS function, or you can use a PC connected to the router which is connected with the ES-ETH-PPI to run the peanut shell software to resolve the domain name. When the VCOMM software work as the client, you also could input the domain name directly in the remote server IP address, support DNS resolution.

Of course you can use multiple ES-ETH-PPI to simulate multiple PLC as multiple COM port on the PC (set the connection with multiple different ports), in order to achieve the data communication and control operation of the PC and multiple PLC respectively.



Two pcs S7-200PLC can achieve remote communication on the Internet via the ES-ETH-PPI, you need a router which supports dynamic domain name (DNS), in order to avoid the high cost of fixed IP address from the local telecom, and this router is very common now, please notice the instructions on the package when you purchase it.

Please notice that when the two PLCs are communicated via ES-ETH-PPI, you only can use the RS485 free port communication protocol,not support PPI, advanced PPI, multi-master PPI protocol, MPI and PROFIBUS protocol.

Use two pcs ES-ETH-PPI to connect with two pcs S7-200PLC, the switch of communication mode select 11 or 10 bit, it depends on the free port RS485 protocol communication parameters which are setted in your PLC.

11-bit mode: 8 data bits, even parity, 1 stop bit (8E1)10-bit mode: 8 data bits, no parity, 1 stop bit (8N1)

set one of ES-ETH-PPI as client, set the other ES-ETH-PPI as server, the router of server side needs to have the DNS function, and can normally run the domain name on this router, as shown below.

Enter the dynamic DNS setting interface of router, input the user name and password of the Dynamic DNS which you applied, as shown below, then you can find our domain name kollew.changeip.net is connected successfully.

Dynamic DNS Settings				
Service Provider	Disabled	×		
* Required	Disabled			
	changeip.com			
	dyndns.org no-ip.org tzo.com]		

Click "Restart Router" button or re-power the router to work with the new parameters.

Similarly, when two pcs ES-ETH-PPI go on external network communication, you need to set the port simulation on the router connected with the server ES-ETH-PPI, input the IP address of router in the IE browser of PC connected with this router and then enter the virtual server setting interface of the router.

Port Range Forv	vard	Po	ort Triggering	1		DMZ	 Qo
			Port	Range			117
Application	Start		End	Proto	col	IP Address	Enable
Kollew	27011	to	27011	Both	•	192.168.1. 251	V

The server port = local port of server ES-ETH-PPI; IP address = IP address of server ES-ETH-PPI; Select the "Enable", click "Save" button to save these configured parameters.

Set the parameters of server ES-ETH-PPI as below:

onfig		5	×
Basic Setting Network (1) Server Channels Channel2 Hostlist2 Serial Sett	Obtain automatically (2)	 Ø User config (3) IP Address 192.168.1.251 Submet (4) 255.255.0]
Connection2 Password Setting Apply Settings/Res Log Out	(10) Bac Address 00. f0. 0a. 02. ee. 53	Gateway (5) 192.168.1.1 Preferred DNS Server 218.6.200.139	
	✓ Auto Negotiate (6) Speed 100M ▼ (7) Duplex Full ▼ (8)	Alternate DNS Server 61.139.2.69]
4 III ->	Refresh	(9) OK Close	

Config		×
Basic Setting Network	Channel 2 (3)	WetProtocol TCP -
∠ Channels	Worked As Server 👻	Active Connect ⁽⁴⁾ AutoStart 🔹
⊿ - Channel2 Hostlist2	Remote Host O	Start Character Ox
Serial Sett	(1) ^{Remote Port} 0	DNS Query Period 1800 🚔
Password Setting Apply Settings/Re:	Local Port (5) 27011 🚔	Flush Input Buffer
Log out (1)		
		Flush Output Buffer
	Inactivity Timeout 🛛 😂	
	Set local port	
4 <u> </u>	Refresh	(6) OK Close

Set the parameters of client ES-ETH-PPI as below:

Config		X
Basic Setting Network (1) Server Channels Password Setting Apply Settings/Rest Log Out	 Obtain automatically (12) ac Address 00. f0. 0a. 02. ee. 53 Auto Negotiate (8) Speed (9) 100M Duplex (10) Full 	2) Vser config (3) IP Address 192.168.1.250 Subnet (4) 255.255.255.0 Gateway (5) 192.168.1.1 Preferred DNS Server (6) 218.6.200.139 Alternate DNS Server (7) 61.139.2.69
•	Refresh	(11) OK Close

Basic Setting Network Server	Channel 2 (3)	WetProtocol TCP +
 Channels Channel2 Hostlist2 Serial Sett 	Worked As Client - Remote Host kollew.changei	Active Connect AutoStart • Start Character Ox DNS Query Period 1800
- Password Setting Apply Settings/Re Log Out	Local Port 0 (8) As client, The local pis used for Identify different devices on	Flush Input Buffer port the ly Flush Output Buffer
	Inactivity Timeout 255	
(<u> </u>	Refresh	(7) OK Close

Please note that you need to properly set the DNS server of the client ES-ETH-PPI, input the domain name kollew.changeip.net in the remote host IP box, host port is the port number of server ES-ETH-PPI. So that when the client ES-ETH-PPI connect the domain name of Internet, it will automatically connect to the Internet address (the external network IP address) of the server-side router, the router automatically transfer to the server module, achieve the remote communication from S7-200PLC's serial port to another S7-200PLC's serial port.

(7) Remote wireless communication in the 3G wireless internet

Using the wireless Internet platform of telecom, all the Ethernet to Serial port modules can be very convenient to achieve wireless communication, that is to say, you can use the wireless router to achieve the wireless communication in the LAN, you can also use the 3G router , 3G network card to achieve the worldwide Internet wireless communication. As long as any places where the wireless Internet is available, then the wireless communication between the S7-200PLC and PLC can be achieved, which has extended a broader application range.

In fact when you use wireless communication, the setting method is almost as same as the previous introduction., only 3G router, wireless network card of different manufacturers may have some differences in the usage, so please read the corresponding product manual. When the ES-ETH-PPI works as the server, it is best to use the 3G router with the function of dynamic domain name to connect the ES-ETH-PPI.

User should pay an attention on that the current TD-SCDMA 3G Mobile and China Unicom's WCDMA 3G network card are using a private network IP address, this can only be used as a client, can not be accepted as a client server. and Telecom's CDMA2000 EVDO 3G network card is using a public network IP address, and this can be used as server or client to use.

The following are programs of wireless communication in the Internet wireless network platform. The both parties of communication can be both 3G wireless network, but also one is 3G wireless network, the other is the wired Internet.

1.STEP7 Micro/WIN software setting

When 3G etc other wireless network work as the external network communication, STEP7 Micro / WIN software settings are the same as the introduction of previous(6) -1 article. So please choose the no parity 10 bit communication mode of "Radio / RF modem "connection.

Of course, the mode switch on the ES-ETH-PPI need to select "10bit".



3. Remote wireless communication between two PCS S7-200PLCs



(8)Ordering Info

Product Name: Siemens S7-200PLC Ethernet Adapter Model: ES-ETH-PPI

Appendix: basic knowledge of Ethernet

(9) Appendix: basic knowledge of Ethernet

TCP / IP transport layer provides two common agreements of TCP and UDP, the two protocols provide the transmission mechanism of TCP / IP network applications. TCP provides a guaranteed and reliable information transmission, and UDP use non-guaranteed and non-reliable method to transmit information.

1.TCP mode

TCP is a guaranteed connection based protocol, before transmitting, the equipment must first establish duplex connection, disconnect after data transfer is complete. Sending the data need to receive confirmation of the host then continue sending data, if not received confirmation of the host or data error, need a certain number of retransmissions. In this way it will be additional traffic, so slowly than UDP.

TCP communications, including the client (Client) and server (Server), the client take the initiative to connect to the server, the server can only be a passive client connections, once establish the connection, the client and server can be duplex data transfer at any time.

Our Ethernet to serial communication module using TCP mode including: TCP Server, TCP Client.

TCP Server (TCP Server) mode:

When the module works in the TCP Server mode, it does not take the initiative to connect to other devices, but listening on local port, and wait for client connections, if the client can establish a connection then will go on the duplex communications.

TCP Client (TCP Client) mode:

When the module works in the TCP Client mode, it will take the initiative to connect the setted TCP server in advance, if the connection is not successful, it will continue to attempt to reconnect, once

the connection success the server will go on the duplex data communications.

2.UDP mode

UDP protocol is unreliable connectionless protocol, data transmission is not required to establish a connection, do not need to receive confirmation form the host for data transmission, so the UDP protocol does not guarantee the data sent to the target host packets are received correctly, for high reliability requirements of the occasion can use the higher level of communication protocol to ensure data is correct.

UDP is a relatively simple way of communication, it will not increase too much extra traffic, it can communicate faster than the TCP to provide real time communication. UDP does not need the server and client, both parties are on equal communication.

Our Ethernet to serial communication module using UDP mode including: UDP Uni_Cast, UDP Multi_Cast.

UDP unicast (UDP Uni_Cast) mode:

Module in the UDP Uni_Cast mode, it can be point to point duplex data transmission, although it can send data to several other hosts, but only one host can send data to the module back .

UDP Multicast (UDP Multicast) mode:

The modules in the network use the multicast ID is one between 224.0.0.0-239.255.255.255 address as its multicast group address, all the modules in the multicast network can be duplex data transfer, and no master slave distinguish. This mode is easy for old RS485 network upgrade to Ethernet.