

SIEMENS

通过 CP343-1 模块，如何实现 2 套 S7-300 之间的以太网通讯

Ethernet Communication By CP343-1 Between S7-300

Getting-started

(2004 年 6 月)

摘要: 本文介绍通过 CP343-1 实现 S7-300 之间的以太网通讯。

关键词: CP343-1, 以太网, S7-300

Key Words: CP343-1, ETHERNET, ISO_ON_TCP

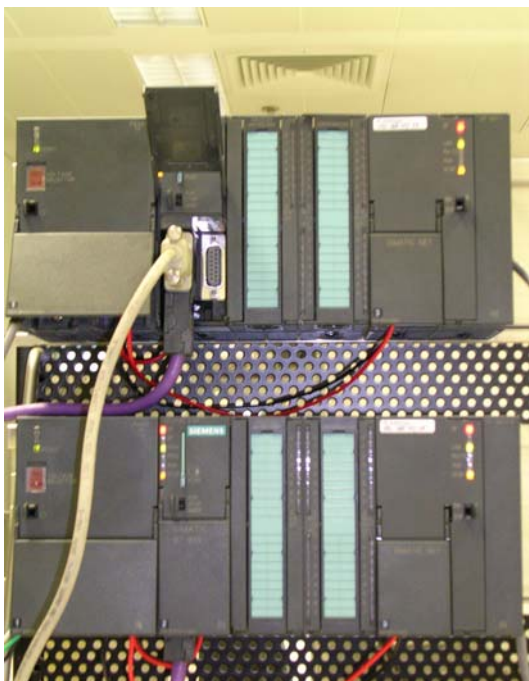
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一、硬件组态

首先搭建一套测试设备，设备的结构图如下：

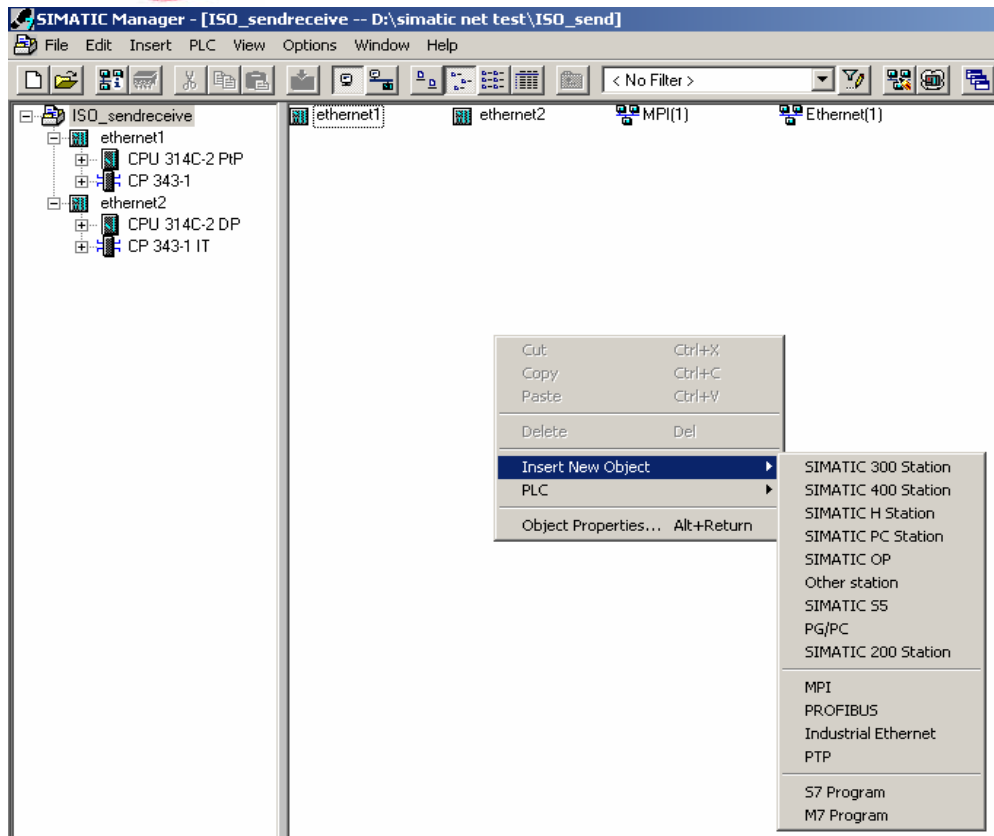
2套 S7-300 系统由 PS307 电源、CPU314C-2DP、CPU314C-2PTP、CP343-1、CP343-1 IT、PC、CP5611、STEP7 组成，PLC 系统概貌如下图：



如下将向您一步一步展示如何实现 2 套 S7-300 之间的以太网通讯：

第一步：打开 SIMATIC Manager，根据我们系统的硬件组成，进行系统的硬件组态，如图：

插入 2 个 S7300 的站，进行硬件组态：



分别组态 2 个系统的硬件模块：

HW Config - [ethernet1 (Configuration) -- ISO_sendreceive]

Station Edit Insert PLC View Options Window Help

(0) UR

Slot	Module	Order number	Firmware	MPI address	I address	Q address
1	PS 307 5A	6ES7 307-1EA00-0AA0				
2	CPU 314C-2 PtP	6ES7 314-6CG00-0AB0	V1.0	4		
X2	PtP	6ES7 307-1EA00-0AA0			1023	
2.2	DI24/DO16				124...126	124...126
2.3	AI5/AO2				762...767	762...765
2.4	Count				768...783	768...783
2.5	Position				784...799	784...799
3						
4	CP 343-1	6GK7 343-1EX11-0XE0	V2.0	5	256...271	256...271
5						

HW Config - [ethernet2 (Configuration) -- ISO_sendreceive]

Station Edit Insert PLC View Options Window Help

(0) UR

Slot	Module	Order number	Firmware	MPI address	I address	Q address	C
1	PS 307 5A	6ES7 307-1EA00-0AA0					
2	CPU 314C-2 DP	6ES7 314-6CF00-0AB0	V1.0	2			
X2	DP				1023		
2.2	DI24/DO16				124...126	124...125	
2.3	AI5/AO2				752...761	752...755	
2.4	Count				768...783	768...783	
2.5	Position				784...799	784...799	
3							
4	CP 343-1 IT	6GK7 343-1GX11-0XE0	V2.0	3	256...271	256...271	
5							

设置 CP343-1、CP343-IT 模块的参数，建立一个以太网，MPI、IP 地址：

HW Config - [ethernet1 (Configuration) -- ISO_sendreceive]

Station Edit Insert PLC View Options Window Help

(0) UR

1	PS 307 5A
2	CPU 314C-2 PtP
X2	PtP
2.2	DI24/DO16
2.3	AI5/AO2
2.4	Count
2.5	Position
3	
4	CP 343-1
5	
6	
7	
8	

Properties - CP 343-1 - (R0/S4)

General | Addresses | Options | Diagnostics | Addressing

Short Description: CP 343-1

S7 CP for Industrial Ethernet ISO and TCP/IP with SEND/RECEIVE and FETCH/WRITE interface, long data, UDP, TCP, ISO, S7 communication, routing, module replacement without PG, 10/100 Mbps, fixed MAC address, initialization over LAN, IP multicast, firmware V2.0

Order No./ firmware: 6GK7 343-1EX11-0XE0 / V2.0

Name: CP 343-1

Interface: Type: Ethernet, Address: 140.80.0.1, Networked: Yes

Backplane Connection: MPI address: 5

Comment:

OK Cancel Help

Slot	Module	Order No.	Firmware	MPI Address	IP Address	MAC Address
1	PS 307 5A					
2	CPU 314C-2 PtP					
X2	PtP					
2.2	DI24/DO16					
2.3	AI5/AO2					
2.4	Count					
2.5	Position					
3						
4	CP 343-1	6GK7 343-1EX11-0XE0	V2.0	5	256...271	256...271
5						

The screenshot shows the HW Config interface for an Ethernet1 configuration. A dialog box titled "Properties - Ethernet interface CP 343-1 (R0/54)" is open, showing the following settings:

- Set MAC address / use ISO protocol
- MAC address: 08-00-06-01-00-00
- IP protocol is being used
- IP address: 140.80.0.1
- Subnet mask: 255.255.0.0
- Gateway: Do not use router
- Use router (Address: 140.80.0.1)
- Subnet: --- not networked ---

The background shows a hardware rack configuration with the following modules:

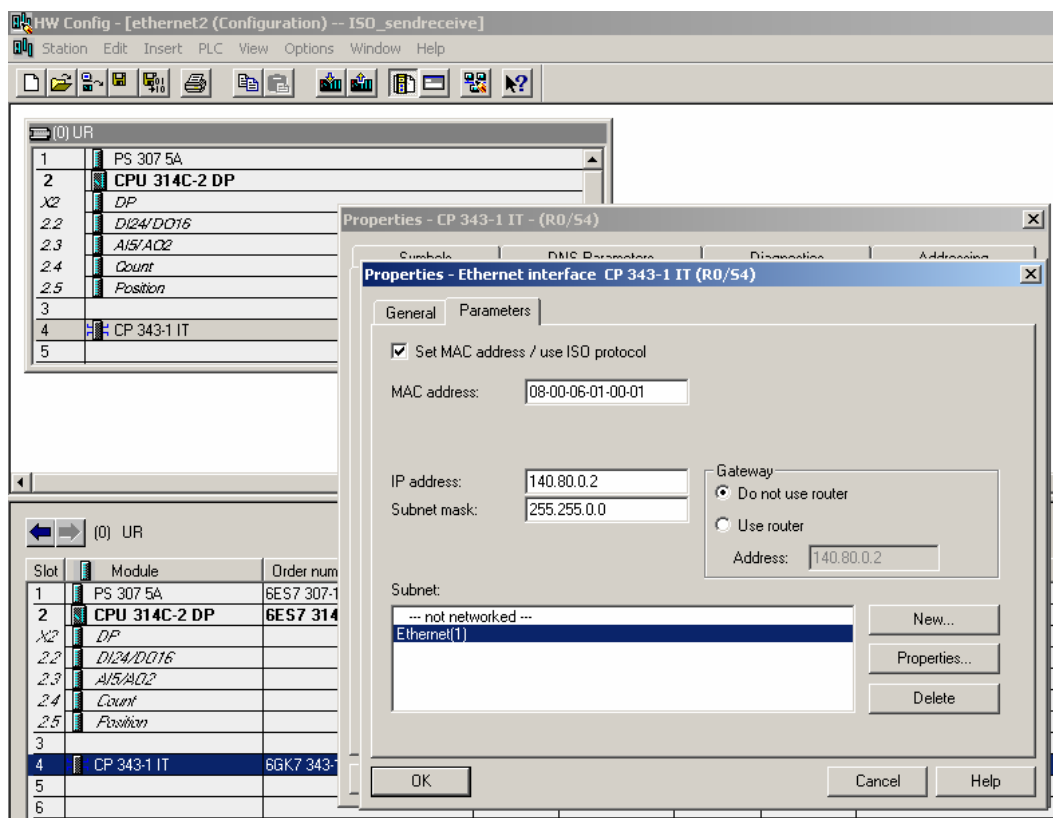
Slot	Module	Order num
1	PS 307 5A	6ES7 307-1
2	CPU 314C-2 P1P	6ES7 314
X2	P1P	
2.2	DI24/DO16	
2.3	AI5/AO2	
2.4	Count	
2.5	Position	
3		
4	CP 343-1	6GK7 343-1EX11-0XE0 V2.0 3 256...271 256...271

The screenshot shows the HW Config interface for an Ethernet2 configuration. A dialog box titled "Properties - CP 343-1 IT - (R0/54)" is open, showing the following settings:

- Short Description: CP 343-1 IT
- Order No. / firmware: 6GK7 343-1GX11-0XE0 / V2.0
- Name: CP 343-1 IT
- Interface Type: Ethernet
- Address: 140.80.0.2
- Networked: Yes
- Backplane Connection: MPI address: 3

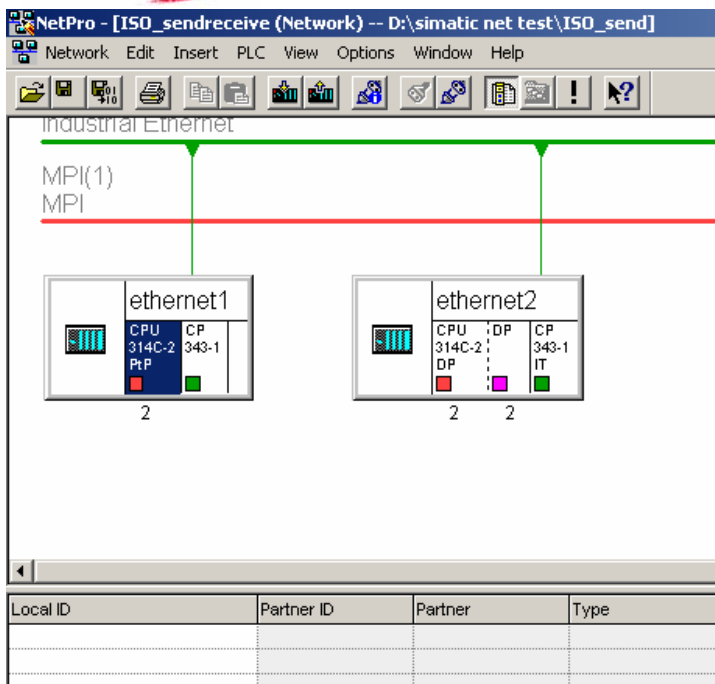
The background shows a hardware rack configuration with the following modules:

Slot	Module	Order num
1	PS 307 5A	6ES7 307-1
2	CPU 314C-2 DP	6ES7 314
X2	DP	
2.2	DI24/DO16	
2.3	AI5/AO2	
2.4	Count	
2.5	Position	
3		
4	CP 343-1 IT	6GK7 343-
5		
6		
7		
8		
9		
10		

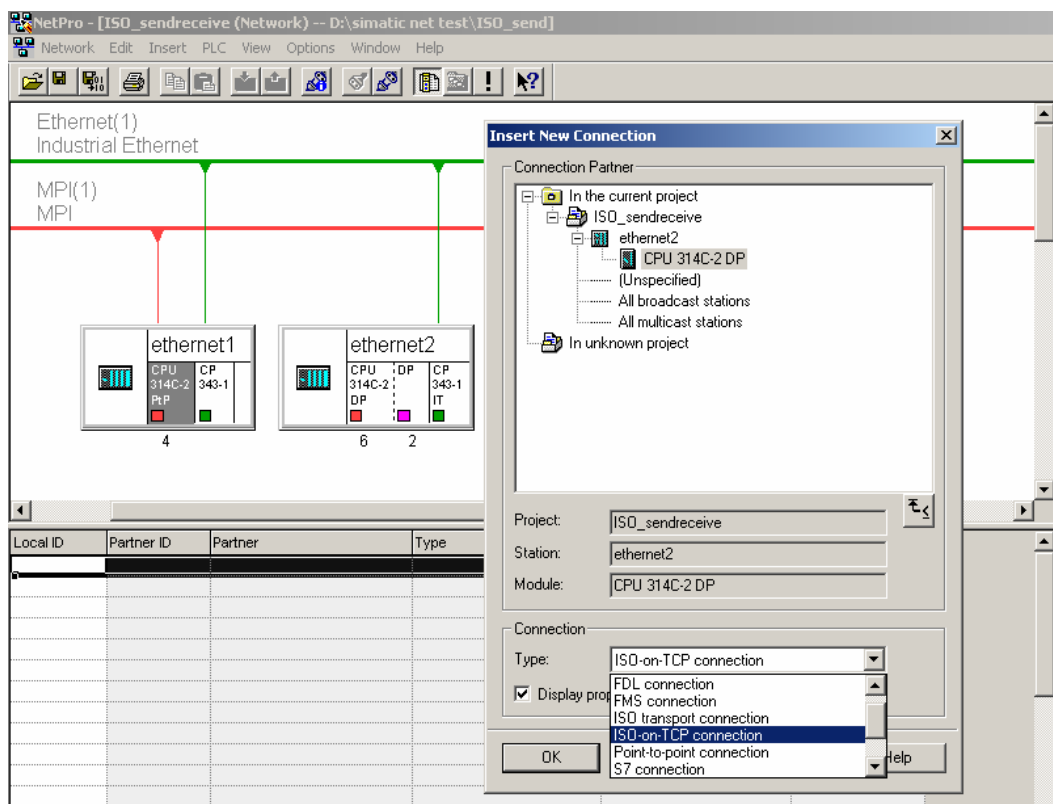


二、网络组态

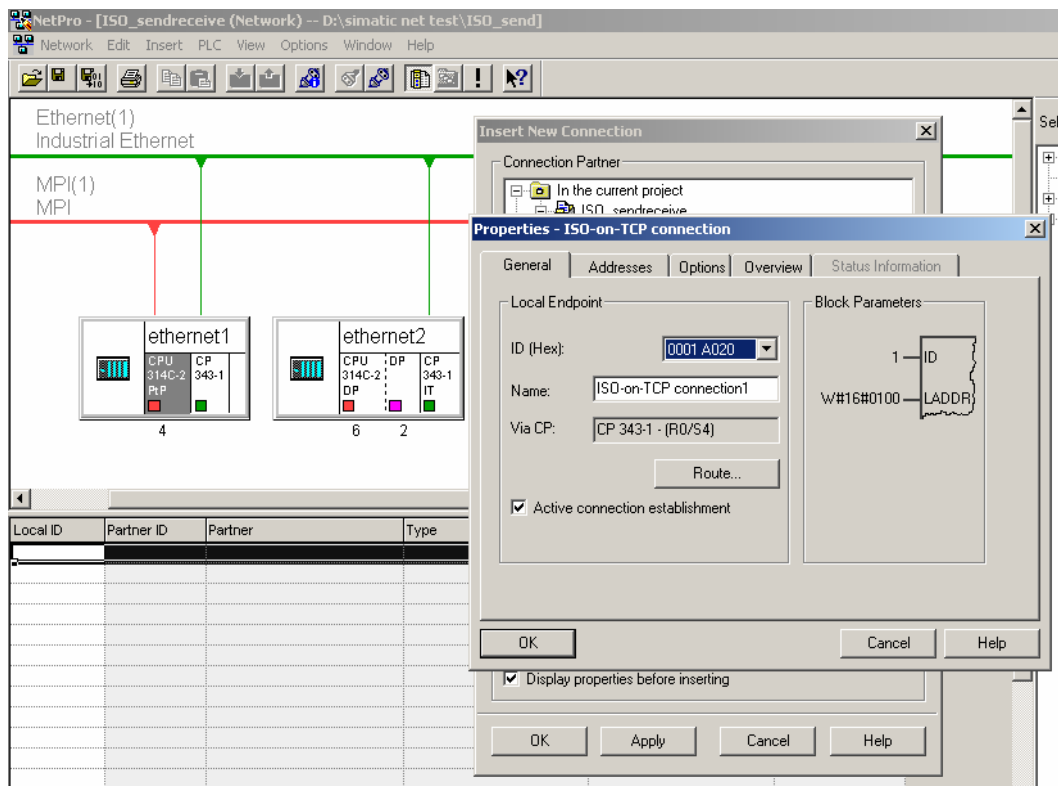
组态完 2 套系统的硬件模块后，分别进行下载，然后单击 **Network Configuration** 按钮，打开系统的网络组态窗口 **NetPro**，选中 **CPU314**，如下图：

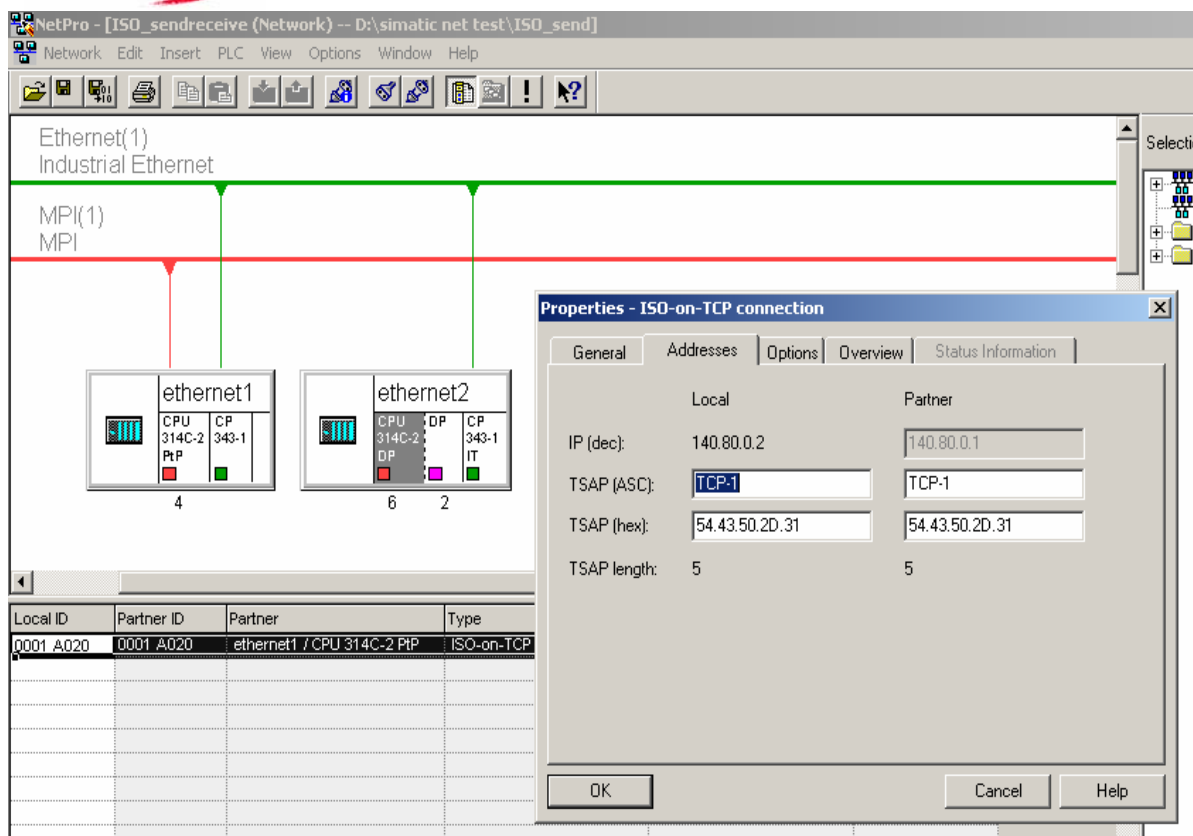


在窗口的左下部分点击鼠标右键，插入一个新的网络链接，并设定链接类型为 ISO-on-TCP connection 或 TCP connection 或 UDP connection 或 ISO Transport connection，如下图：

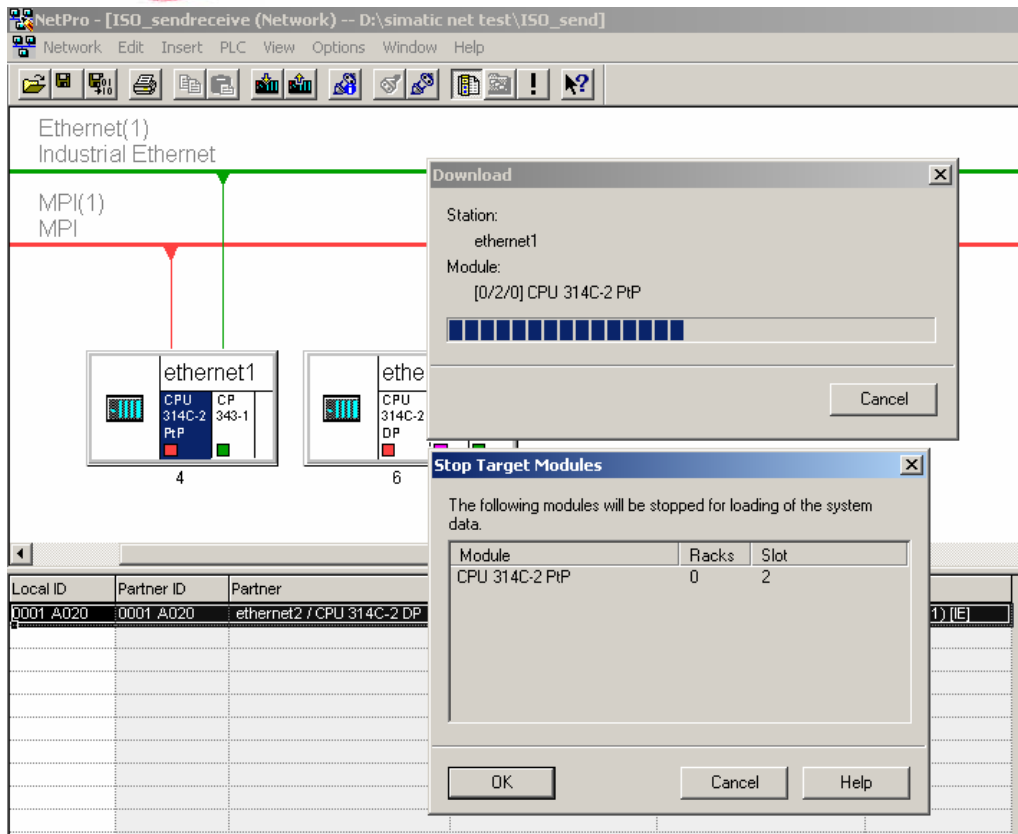


点击 OK 后，弹出链接属性窗口，使用该窗口的默认值，并根据该对话框右侧信息进行后面程序的块参数设定：





当 2 套系统之间的链接建立完成后，用鼠标选中图标中的 CPU，分别进行下载，这里略去 CPU314C-2DP 的下载图示：

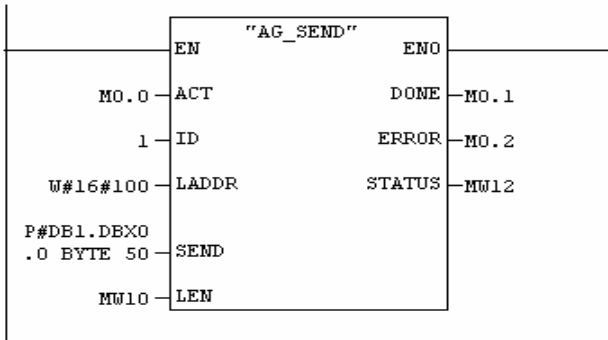


三、程序编程

到此为止，系统的硬件组态和网络配置已经完成。下面进行系统的软件编制，在 SIMATIC Manager 界面中，分别在 CPU314C-2PTP、CPU314C-2DP 中插入 OB35 定时中断程序块和数据块 DB1，DB2，并在两个 OB35 中调用 FC5（AG_Send）和 FC6（AG_Recv）程序块，如下图：

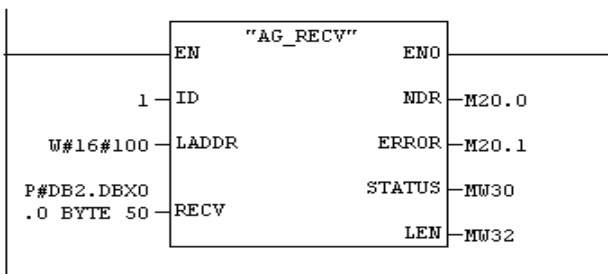
Network 2: Title:

Comment:

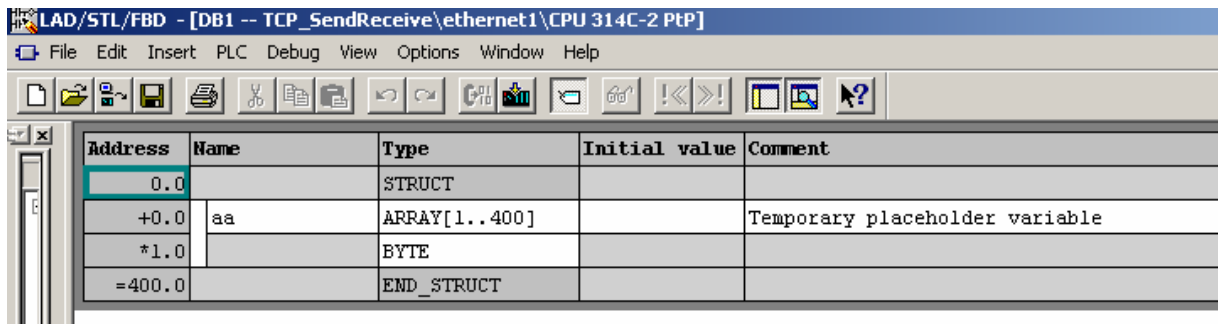


Network 3: Title:

Comment:



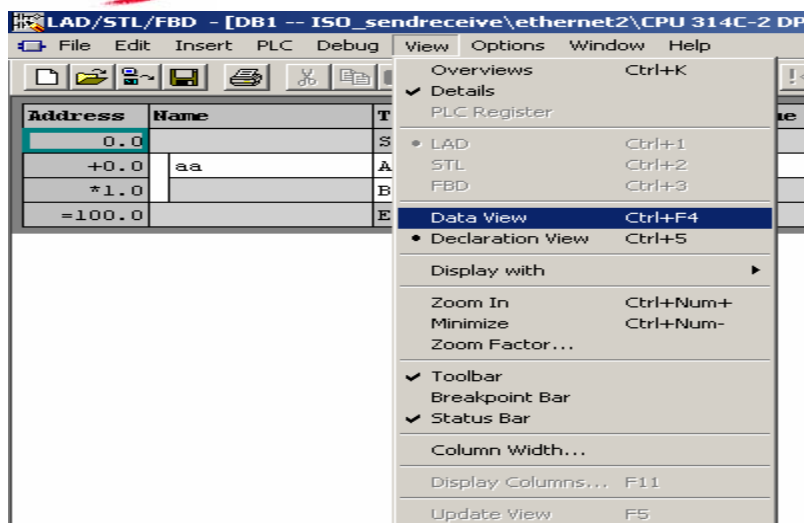
创建 DB1、DB2 数据块，如下图：



2 套控制程序已经编制完成，分别下载到 CPU 当中，将 CPU 状态切换至运行状态，就可以实现 S7-300 之间的以太网通讯了。

如下界面说明了将 CPU314C-2DP 的 DB1 中的数据发送到 CPU314C-2PTP 的 DB2 中的监视界面：

- a. 选择 Data View，切换到数据监视状态：



b. CPU314C-2DP 的 DB1 中发送出去的数据:

Address	Name	Type	Initial value	Actual value	Comment
0.0	aa[1]	BYTE	B#16#0	B#16#01	Tempo
1.0	aa[2]	BYTE	B#16#0	B#16#02	
2.0	aa[3]	BYTE	B#16#0	B#16#03	
3.0	aa[4]	BYTE	B#16#0	B#16#04	
4.0	aa[5]	BYTE	B#16#0	B#16#05	
5.0	aa[6]	BYTE	B#16#0	B#16#06	
6.0	aa[7]	BYTE	B#16#0	B#16#07	
7.0	aa[8]	BYTE	B#16#0	B#16#08	
8.0	aa[9]	BYTE	B#16#0	B#16#09	
9.0	aa[10]	BYTE	B#16#0	B#16#10	
10.0	aa[11]	BYTE	B#16#0	B#16#11	
11.0	aa[12]	BYTE	B#16#0	B#16#00	

c. CPU314C-2PTP 的 DB2 中接收到的数据

LAD/STL/FBD - [@DB2 -- ISO_sendreceive\ethernet1\CPU 314C-2 PTP ONLINE]

File Edit Insert PLC Debug View Options Window Help

Address	Name	Type	Initial value	Actual value	Comment
0.0	bb[1]	BYTE	B#16#0	B#16#01	Temporara
1.0	bb[2]	BYTE	B#16#0	B#16#02	
2.0	bb[3]	BYTE	B#16#0	B#16#03	
3.0	bb[4]	BYTE	B#16#0	B#16#04	
4.0	bb[5]	BYTE	B#16#0	B#16#05	
5.0	bb[6]	BYTE	B#16#0	B#16#06	
6.0	bb[7]	BYTE	B#16#0	B#16#07	
7.0	bb[8]	BYTE	B#16#0	B#16#08	
8.0	bb[9]	BYTE	B#16#0	B#16#09	
9.0	bb[10]	BYTE	B#16#0	B#16#10	
10.0	bb[11]	BYTE	B#16#0	B#16#11	
11.0	bb[12]	BYTE	B#16#0	B#16#00	

附录一 推荐网址

AS

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