

## QUICKNOTE

### SST-ESR2-CLX-RLL & SST-SR4-CLX-RLL 配置说明

#### 相关软硬件和资料

硬件	
名称	描述
ControlLogix	CPU L5555(v15.27), Ethernet module
SST-ESR2-CLX-RLL	用于 ControlLogix 系统的以太网(1 路)和串口(2 路)通讯模块
SST-SR4-CLX-RLL	用于 ControlLogix 系统的串口通讯模块(4)
软件	
Backplane Console Configuration Tool	V1.0
RSLogix5000	12,13,15 以上
RSLinx	2.42(OEM/专业版以上)

注：产品包装盒内提供 RJ45 转 DB9 的串口连接线，相关管脚定义见附录 C。

- (1) 715-0097\_\_SST Communication Module for ControlLogix.pdf, Version 1.0
- (2) 717-0039\_\_MODBUS on Ethernet TCP\_IP Protocol Reference Guide.pdf, Version 1.0
- (3) 717-0040\_\_MODBUS RTU\_ASCII Master\_Slave Protocol Reference Guide.pdf, Version 1.0

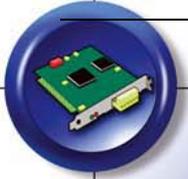


订货号：SST-ESR2-CLX-RLL



订货号：SST-SR4-CLX-RLL

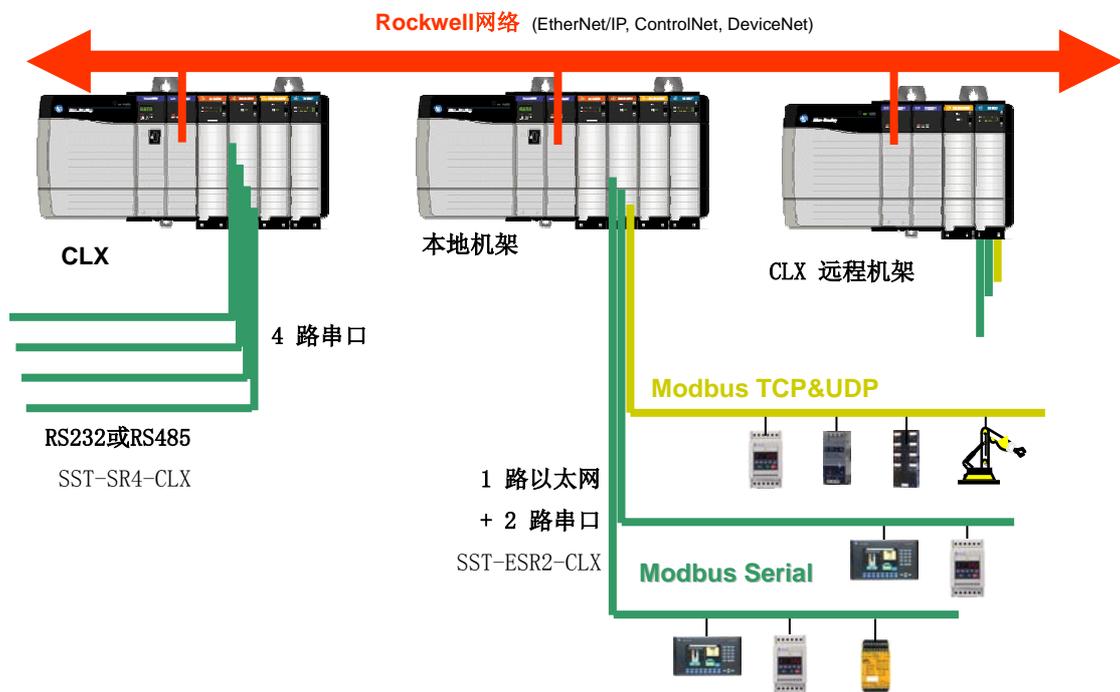
上述模块可直接在 1756 背板上实现 248 字输入/248 字输出的数据交换，如通讯数据超过限制，通过 CIP 通讯可访问模块提供的 32K 字、32K 位内部数据库，周期性读取远程节点数



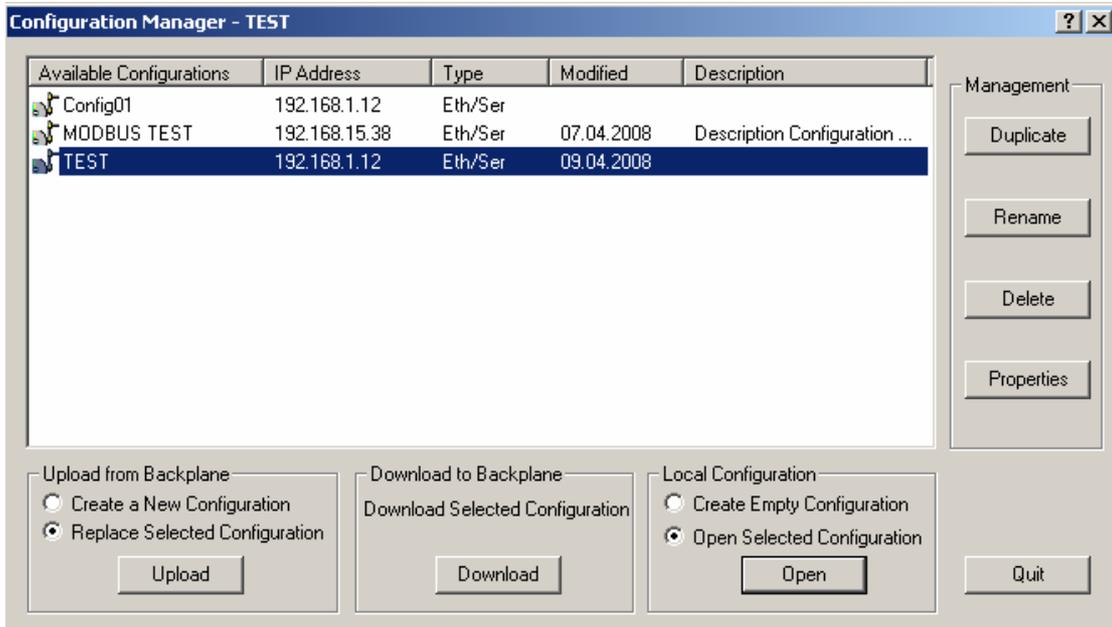
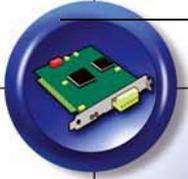
据至 CPU。

在 PLC 程序中，无需编写相关的通讯命令字，所有设置通过基于 Windows 的软件进行，下载配置可通过模块提供的以太网端口（仅限 ESR2）和 RSLINX 驱动。模块可放置在 1756 本地和远程机架，数量不限。

## 一、 Modbus 主站功能设置

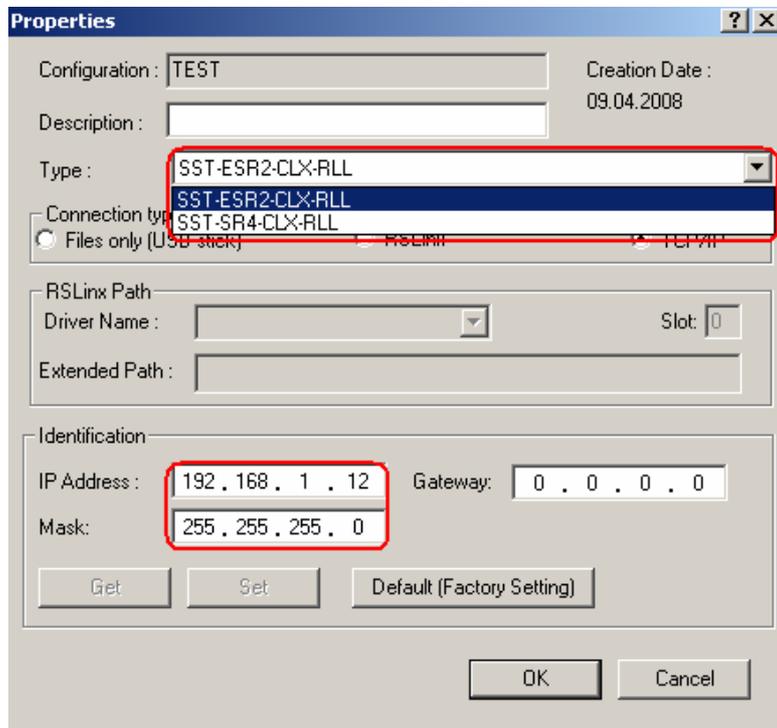


1) 安装光盘内 Console 软件并运行，在项目管理器中打开/创建/上载指定的配置。



- 项目管理器 -

创建项目：在本地配置选择 Create Empty Configuration 选项，设置配置名称、选择模块类型、连接方式



a) Console 和模块的连接方式;



ESR2 提供了 TCP/IP 连接和 RSLINX 连接，SR4 只提供 RSLINX 连接。在配置属性中，可直接通过 RSLINX 读取默认以太网 IP 地址和子网掩码（**GET 按钮**）并修改（**SET 按钮**）。RSLINX 驱动设置见附录 D，在配置属性中需选择相关的驱动名称和 ESR2/SR4 在机架上的槽位，当模块放在远程机架时亦可在扩展路径中添加 CIP 路径（详见远程机架使用说明）。

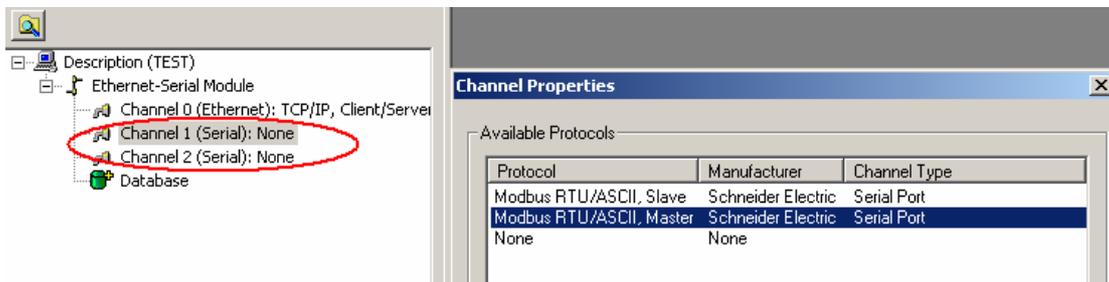
Connection type  
 Files only (USB stick)     RSLinx     TCP/IP

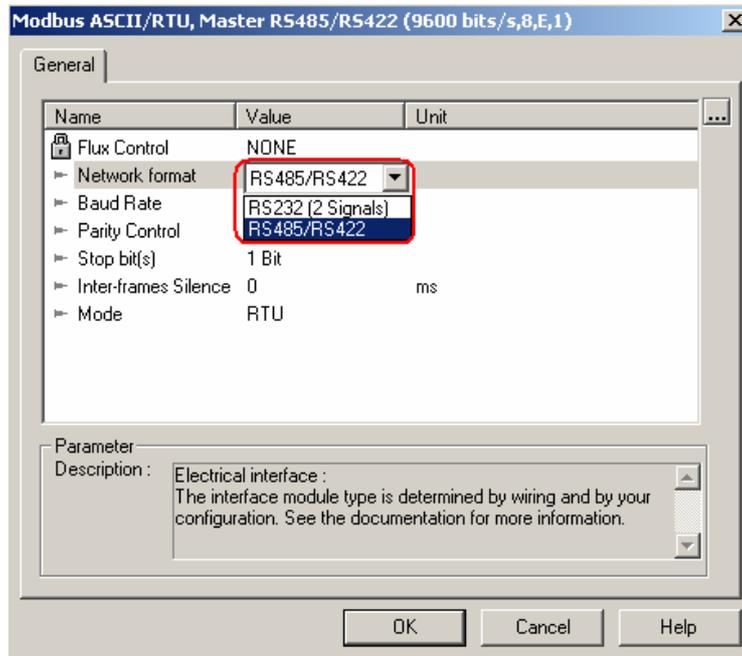
RSLinx Path  
Driver Name :     Slot:

Extended Path :

b) 在 Console 软件中，设置相关通道的通讯协议和协议参数；

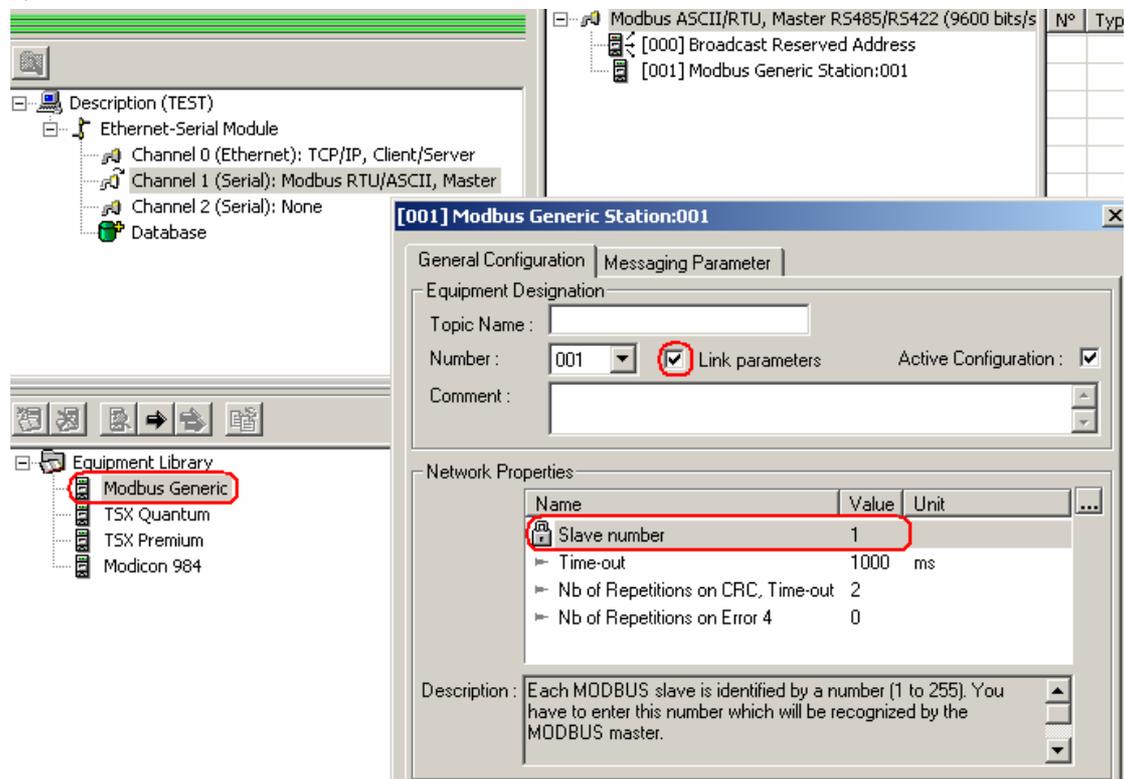
双击相关通道，选择所需功能并在弹出窗口中设置协议相关参数。



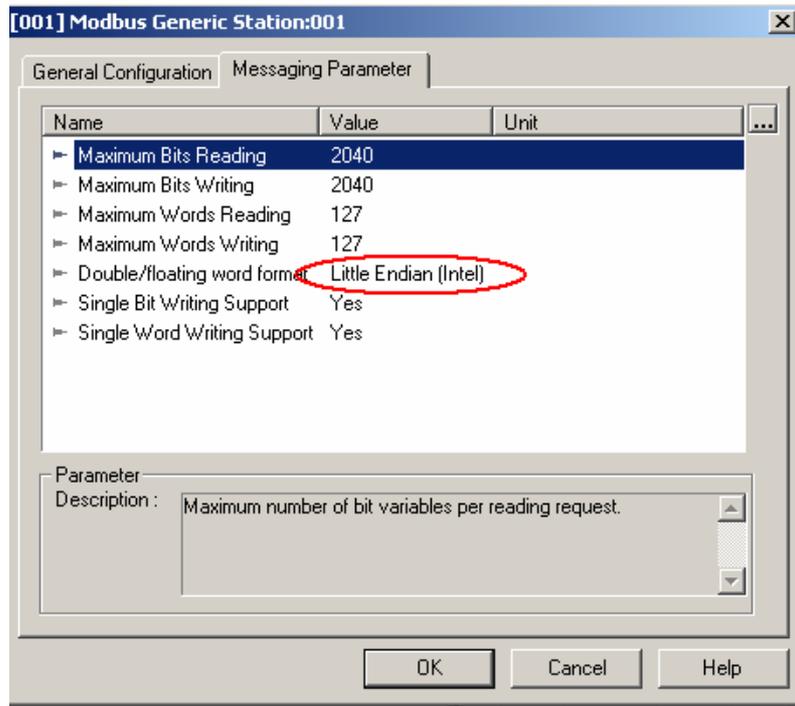
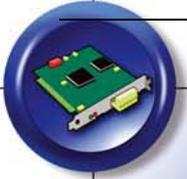


- Modbus 主站参数设置 -

c) 在设备库中选择相关从站并设置;

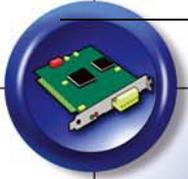


注：每个节点指定唯一设备号（**Device Number**）,Cyclic 任务设定与此相关。



- Intel/Motorola 模式设置 -

- d) Cyclic 功能设置（用于设置通讯任务，包括指定的站点、功能码、数据长度及在 LOGIX 控制器内的存储位置）；



举例：读取站号 1，功能码 3（即 40001），长度为 10 个字，数据存储与模块内数据库首地址为 2-11，对应的控制器标签为 Logix:3:I.Data[2]-[11]。设备数据地址寻址方式参见附录 B。

**Cyclic function properties**

Cyclic Function Parameters

Function Number : 2 Status Not Used

Function Type : Read

Periodic: yes Period (0-65535): 2 x100 ms

On Value Change (COS): no

Device Parameters

Device Number (0-255): 1

Device Variable Type : word

First Data Address : Generic Modbus >> 0

Number of Data in Device (1-65535): 10

Data Base Parameters

**Local:3:I.Data[2]**

I/O

CLX Input Table (2-249 Word): 2  
Local:\*I.Data[2 .. 249]

CLX Output Table (250-497 Word): 250  
Local:\*O.Data[0..247]

CLX Status Table (500-699 Word): 500  
Local:\*S.Data[0..199]

**Local:3:S.Data[0]**

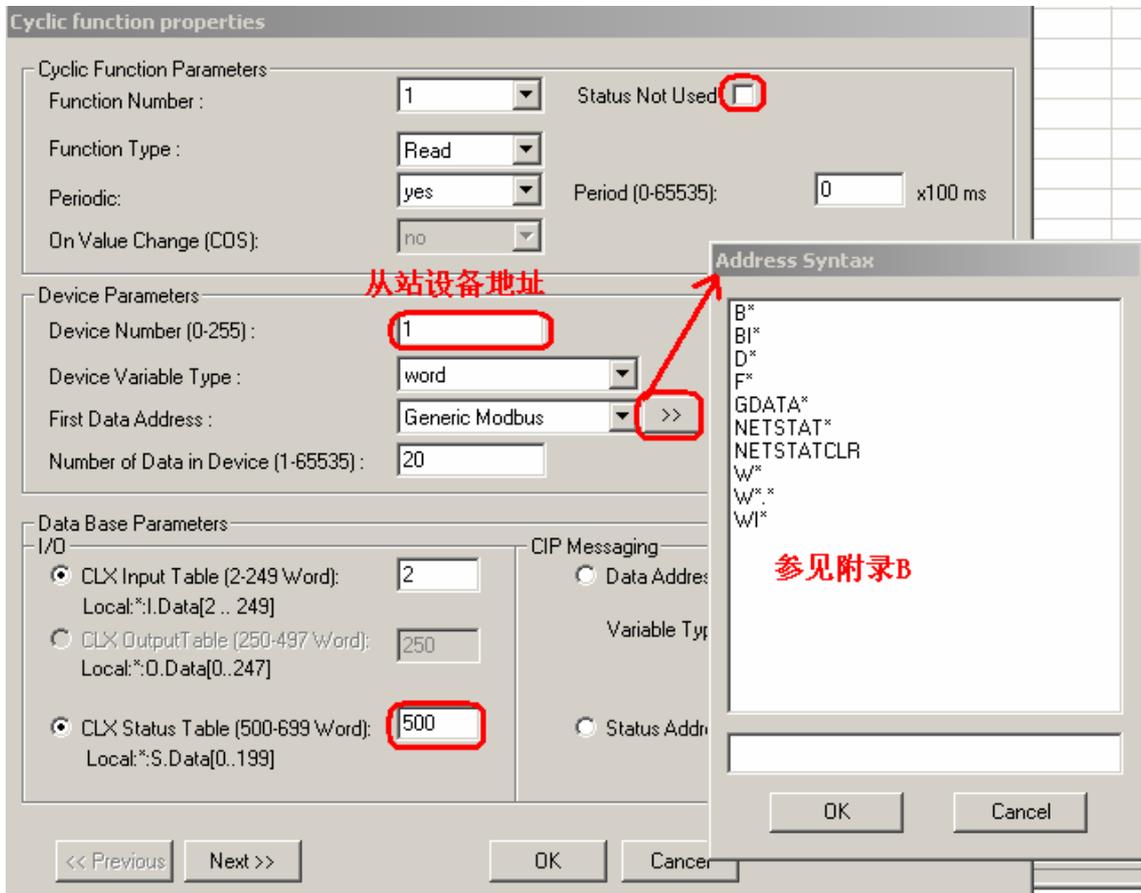
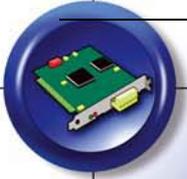
CIP Messaging

Data Address (700-32000) : 700  
Variable Type : word

Status Address (700-32000 Word) : 700

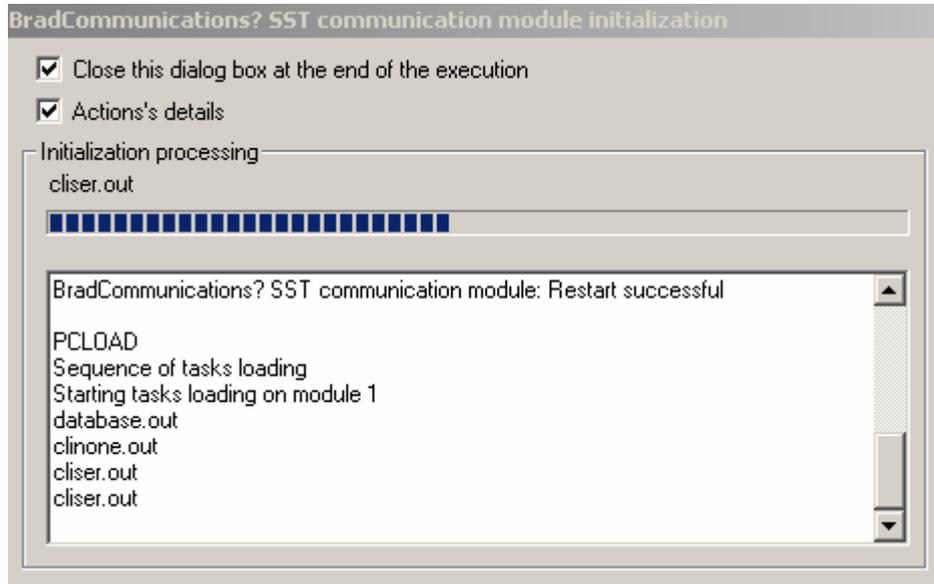
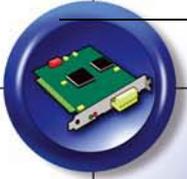
OK Cancel

- CYCLIC 功能设置-



### - Modbus 寻址 -

- e) 完成所有配置、存储并下载至模块（[初始化按钮](#) ）；  
如出现初始化失败信息，请联系技术支持。

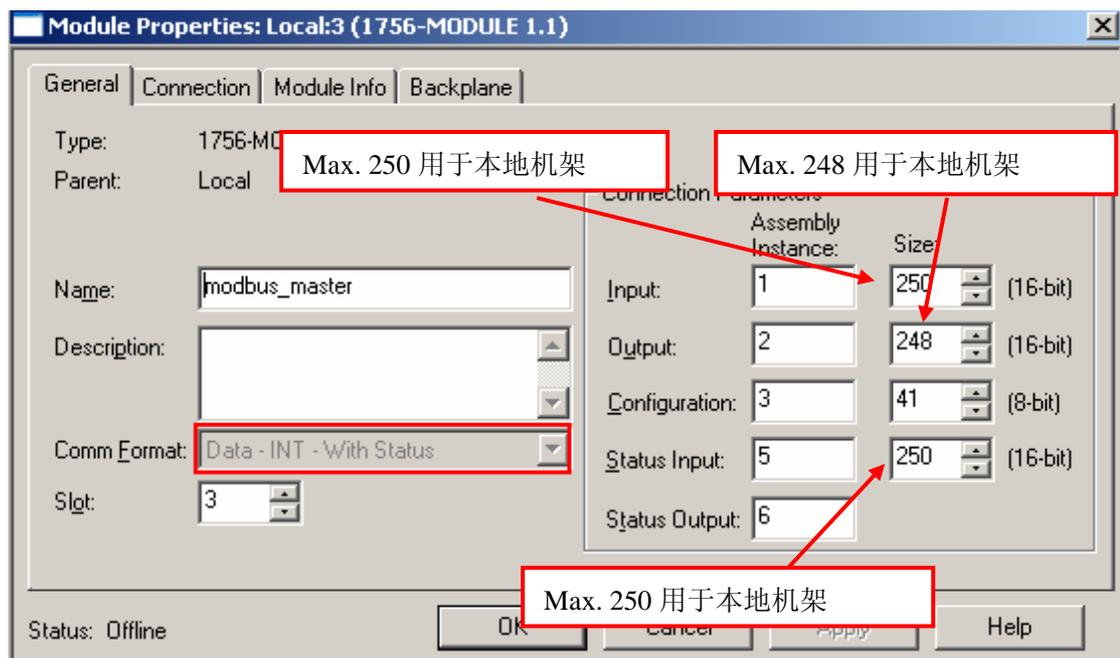


注：生成配置文件路径

**C:\Documents and Settings\All Users\Application Data\BradCommunications\SST Backplane Communication Module\config**

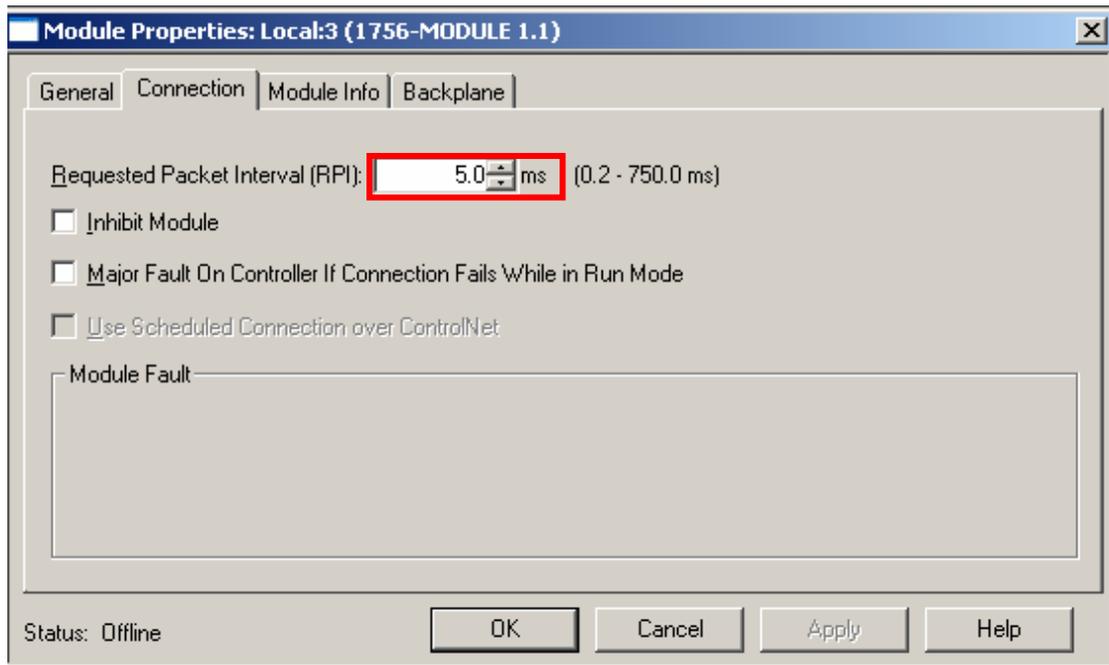
二、RSLOGIX 5000 程序中模块的配置和数据的读写。

在 IO 配置中选择相关的 1756 Module 类型，设定 ESR2 的槽位和通讯格式（建议采用 INT with Status，如涉及浮点数采集，可设置为 DINT with Status）。





注：直接数据交换方式，无需任何程序。



- RPI 参数设置 -

系统生成如下文件（I/O，配置和状态文件）。

[-] Local:1:C	{...}	{...}		AB:1756_MODUL...	
▶ [+ Local:1:C.Data	{...}	{...}	Hex	SINT[400]	ESR2 Configuration ▼
[-] Local:1:I	{...}	{...}		AB:1756_MODUL...	
▶ [+ Local:1:I.Data	{...}	{...}	Decimal	INT[250]	ESR2 Input Data
[-] Local:1:O	{...}	{...}		AB:1756_MODUL...	
▶ [+ Local:1:O.Data	{...}	{...}	Decimal	INT[248]	ESR2 Output Data
[-] Local:1:S	{...}	{...}		AB:1756_MODUL...	
▶ [+ Local:1:S.Data	{...}	{...}	Decimal	INT[250]	ESR2 Satus

注：输入数据可用范围为 Local:x:I.Data[2]-[249]，输出数据可用范围 Local:x:O.Data[0]-[247]。

上例中，输入数据显示如下：



**ModSim1**

Device Id:

Address:  MODBUS Point Type:

Length:

40001: <01266>	40014: <00000>	40027: <00000>
40002: <00000>	40015: <00000>	40028: <00000>
40003: <00000>	40016: <00000>	40029: <00000>
40004: <00000>	40017: <00000>	40030: <00000>
40005: <00000>	40018: <00000>	40031: <00000>
40006: <31539>	40019: <00000>	40032: <00000>
40007: <00000>	40020: <00000>	40033: <00000>
40008: <00000>	40021: <00000>	40034: <00000>
40009: <00000>	40022: <00000>	40035: <00000>
40010: <00000>	40023: <00000>	40036: <00000>
40011: <00000>	40024: <00000>	40037: <00000>
40012: <00000>	40025: <00000>	40038: <00000>
40013: <00000>	40026: <00000>	40039: <00000>

**Controller Tags - V16\_MOD(controller)**

Scope:  Shgw... Show All

Name	Value	Force Mask
Local:3:C	{...}	{...}
Local:3:I	{...}	{...}
Local:3:I.Data	{...}	{...}
Local:3:I.Data[0]	0	
Local:3:I.Data[1]	0	
Local:3:I.Data[2]	1266	
Local:3:I.Data[3]	0	
Local:3:I.Data[4]	0	
Local:3:I.Data[5]	0	
Local:3:I.Data[6]	0	
Local:3:I.Data[7]	31539	
Local:3:I.Data[8]	0	
Local:3:I.Data[9]	0	
Local:3:I.Data[10]	0	
Local:3:I.Data[11]	0	
Local:3:I.Data[12]	0	

注：只有 CPU 处于运行时，输出数据才有效。

如果需要通过 CIP 方式采集模块内的数据(存储于内部地址 700-32000)，在相关 Cyclic 通讯任务设置中，选择 CIP messaging 方式并在 RSLogix5000 中调用有关的例程。

CIP 通讯的例程：[C:\Program Files\BradCommuications\SST Backplane Communication Module\Ladder Sample Code For ControlLogix](#)

**Cyclic function properties**

Cyclic Function Parameters

Function Number:  Status Not Used

Function Type:

Periodic:  Period (0-65535):  x100 ms

On Value Change (COS):

---

Device Parameters

Device Number (0-255):

Device Variable Type:

First Data Address:  >>

Number of Data in Device (1-65535):

---

Data Base Parameters

I/O

CLX Input Table (2-249 Word):  Local:\*.I.Data[2..249]

CLX Output Table (250-497 Word):  Local:\*.O.Data[0..247]

CLX Status Table (500-699 Word):  Local:\*.S.Data[0..199]

CIP Messaging

Data Address (700-32000):

Variable Type:

Status Address (700-32000 Word):



### 三、模块面板显示信息

LCD 可用于了解模块与控制器底板的连接情况。LED 显示提供了 COMM/SYS/OK 三种信息。

当模块首次上电，如没有配置文件，无法自动初始化配置，屏幕显示 **OK :[no config]**。此时，OK 为常绿，COMM 为常红，SYS 为琥珀色。当 RSLOGIX5000 硬件和模块配置文件下载成功后，显示为 **COPN: [config name]**，SYS 显示为常绿。

详细资料见手册（1）P80 Table27。

### 四、网络和通讯任务诊断

Cyclic 通讯任务的监测可通过控制器内的状态标签读取状态，默认范围为 Local:x:S.Data[0]-[199]。另外，模块还提供了包括模块版本、固件版本、诊断统计值等信息。详见手册（1）P89-91，对应的状态标签为 Local:x:S.Data[200]-[249]。

上例中，通讯状态显示 Local:3:S.Data[0]:

[-] Local:3:S	{...}	{...}
[-] Local:3:S.Data	{...}	{...}
[+] Local:3:S.Data[0]	33	
[+] Local:3:S.Data[1]	0	
[+] Local:3:S.Data[2]	0	

[-] Local:3:S.Data	{...}	{...}
[+] Local:3:S.Data[0]	2	
[+] Local:3:S.Data[1]	0	
[+] Local:3:S.Data[2]	0	
[+] Local:3:S.Data[3]	0	

通讯正常为 0，具体故障代码见附录 E。

## 附录

### A. 固件版本更新 (N/A)

### B. 支持的通用 MODBUS 地址

功能码	名称	变量地址	模块数据库对应地址
1	读多个位	00001- 65536	0-65535(Bit)
2	读输入位	100001-165536	0-65535(Bit)
3	读多个数据寄存器	400001- 465536	0-65535(Word)
4	读多个输入寄存器	300001- 365536	0-65535(Word)
15	写多个位	00001- 65536	0-65535(Bit)
16	写多个数据寄存器	400001- 465536	0-65535(Word)



MODBUS Function Code	Variable Address	Addressing Used in the Backplane	
			Exchange Type
1	B0 - B65535	0 - 65535	Read bit
15	B0 - B65535	0 - 65535	Write bit
2	BI0 - BI65535	0 - 65535	Read input bit
3	W0 - W65535	0 - 65535	Read word
	W0 - W65535		Read BCD word
	D0 - D65534 F0 - F65534	0 - 65534	Read double word Read floating word
16	W0 - W65535	0 - 65535	Write word
	W0 - W65535		Write BCD word
	D0 - D65534 F0 - F65534	0 - 65534	Write double word Write floating word
4	WI0 - WI65535	0 - 65535	Read input word

- 主站支持的功能码和寻址方式 -

-

Supported Requests	Data Type in the Database	Addresses in the Database	Corresponding MODBUS Variables
Read/write bit	Bit area	0 - 32767	000001 - 032768
Read/write word	Word area	0 - 32767	400001 - 432768

- 从站数据地址范围 -

### C. RJ45/DB9 接线

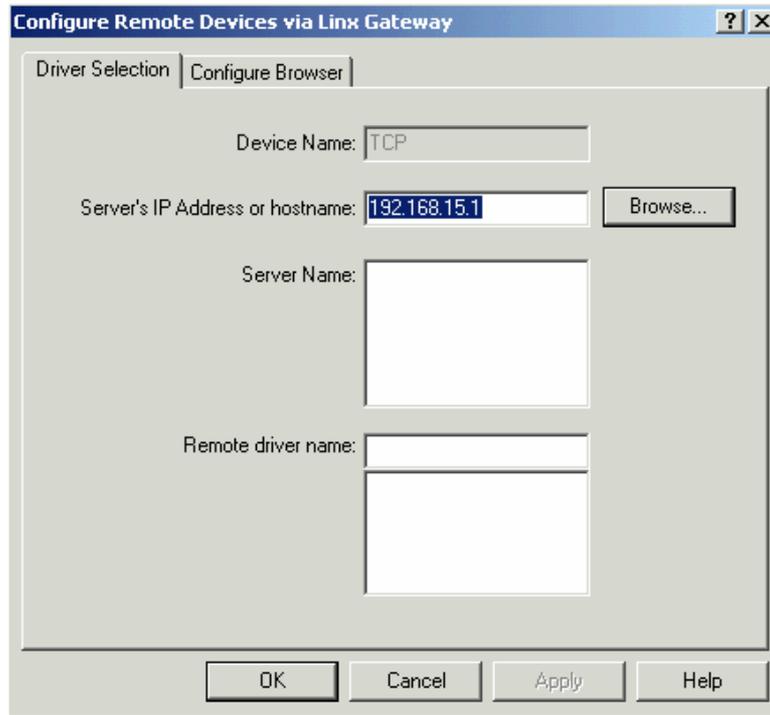
产品提供 RJ45/DB9 的连接线，可连接 RS485/422/232 信号。

RJ45	DB9	Function		
Pin #		232	485	422
1	1	N/C	TXRD +	TXD+
2	2	RXD	N/C	RXD +
3	3	TXD	N/C	N/C
4	4	N/C	N/C	N/C
5	5	GND	GND	GND
6	6	N/C	N/C	RXD-
7	7	N/C	N/C	N/C
8	8	N/C	TXRD -	TXD -
-	9	N/C	N/C	N/C
S	S	SHIELD		



## D. RSLINX 驱动配置

如 ControlLogix 机架带有以太网通讯模块，可通过背板传送配置和诊断信息。参考如下：



在 RSLINX 中选择 **Remote Device Via Linx Gateway** 驱动

## E.故障代码



Word Value	Meaning
0	No anomaly detected. The function has been properly executed.
1	Unknown function. The requested function is not supported.
2	Bad address. The address for the variable that you are soliciting is incorrect.
3	Bad data. Additional information: Function: BINBCD, BCDBIN. At least one of the values accessed is not in BCD format (0<= value <= 9999).
4	Inaccessible data.
32	Bad parameter passed to the function. Bad number of variables.
45	Communication program not resident. Initialize the Backplane before using it by calling the initialization tool, via the configuration Console.
46	Master/client function directed at a channel configured in slave/server or vice versa.
47	No Backplane.
51	Driver system problem.
66	Not enough memory.
128	Cannot open the serial port (e.g., port already opened by another application, etc.).

- 通用故障代码 -



Word Value	Meaning
0	No anomaly detected. The function was properly executed.
1	Unknown function. The requested function is not supported.
2	Bad address. The address for the variable that you are soliciting is incorrect.
3	Bad data. Additional information: MODBUS protocol: <ul style="list-style-type: none"> <li>• Error report sent by the device.</li> <li>• An acceptable frame has been received but it does not correspond to the question. Extend the timeout.</li> </ul> Function: BINBCD, BCD BIN, READWORDBCD, WRITEWORDBCD. At least one of the values accessed is not in BCD format (0<= value <= 9999).
4	Inaccessible data. Additional information: MODBUS protocol: Error report sent by the "Device Not Ready" device.
33	Response timeout fault. Additional information: MODBUS protocol: <ul style="list-style-type: none"> <li>• No response to the request within the allotted time. Increase the timeout value.</li> <li>• Verify the wiring and the channel and slave configuration.</li> <li>• For a write: if the values are positioned in the device, verify the reception loop. Extend the timeout value.</li> </ul>
34	Parity fault during reception or control word fault (CRC16, BCC). <ul style="list-style-type: none"> <li>• Verify the channel and target device's configuration.</li> <li>• Verify wiring (RC at end of line for RS485).</li> </ul>
36	Device not configured. Define the device in the Console and restart the Backplane.
43	MODBUS protocol. Slave status unknown, as no exchange has occurred since the program was started.

- 协议相关故障信息 -

F. 浮点数的采集

1) 设定模块为双字类型



ModSim1

Device Id: 1  
MODBUS Point Type: 03: HOLDING REGISTER

Address: 0001  
Length: 200

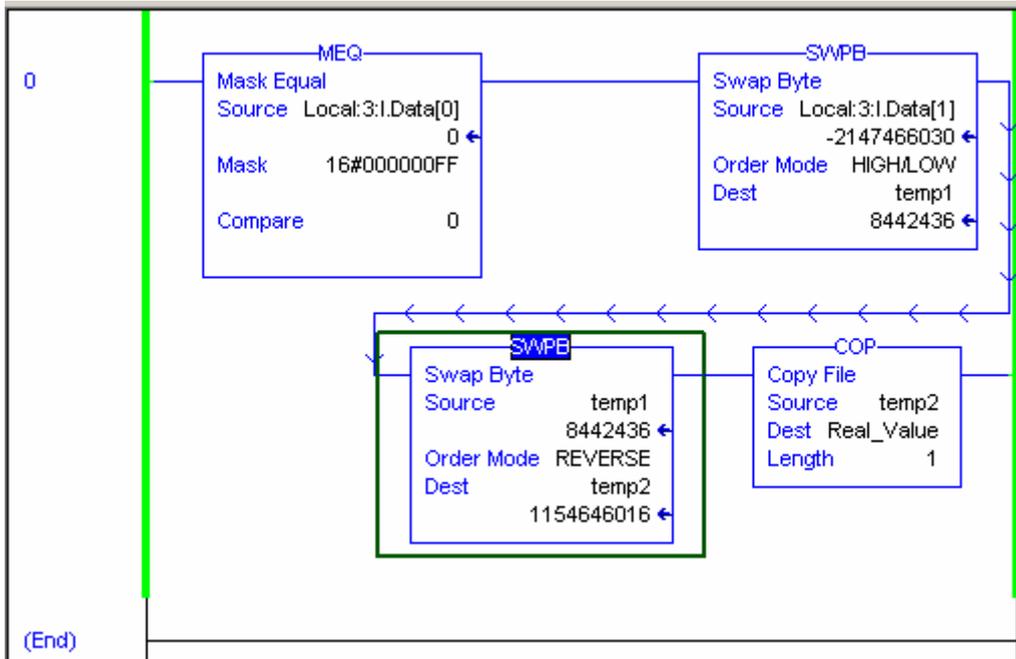
40001: 1665.0000	40011: 0.0000	40021: 0.0000
40002: 0.0000	40012: 0.0000	40022: 0.0000
40003: 0.0000	40013: 0.0000	40023: 0.0000
40004: 0.0000	40014: 0.0000	40024: 0.0000
40005: 0.0000	40015: 0.0000	40025: 0.0000
40006: 0.0000	40016: 0.0000	40026: 0.0000
40007: 0.0000	40017: 0.0000	40027: 0.0000
40008: 0.0000	40018: 0.0000	40028: 0.0000
40009: 0.0000	40019: 0.0000	40029: 0.0000
40010: 0.0000	40020: 0.0000	40030: 0.0000

Controller Tags - example\_DINT(controller)

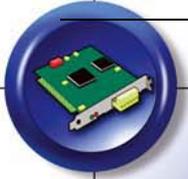
Scope: example\_DINT

Name	Value
Local:3:C	(...)
Local:3:I	(...)
Local:3:I.Data	(...)
Local:3:O	(...)
Local:3:S	(...)
Local:3:S.Data	(...)
Real_Value	1665.0
temp1	2150468
temp2	1154490368

## 2) IEEE 转换



## 3) 通讯任务：采集从站 1# 的 32 位浮点数



**Cyclic function properties**

Cyclic Function Parameters

Function Number : 3 Status Not Used

Function Type : Read

Periodic: yes Period (0-65535): 2 x100 ms

On Value Change (COS): no

---

Device Parameters

Device Number (0-255): 1

Device Variable Type : 32 bits IEEE floating

First Data Address : Generic >> 0

Number of Data in Device (1-65535): 2

---

Data Base Parameters

I/O

CLX Input Table (2-249 Word): 2  
Local\*:I.Data[2..249]

CLX Output Table (250-497 Word): 250  
Local\*:O.Data[0..247]

CLX Status Table (500-699 Word): 500  
Local\*:S.Data[0..199]

CIP Messaging

Data Address (700-32000): 700  
Variable Type : word

Status Address (700-32000 Word): 700

<< Previous    Next >>    OK    Cancel

作者	版本	日期	内容
Linda Shan	1.0	2008.04	基本功能

**Woodhead 技术支持联络:**

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