

Part 1: Series 90-30 and Series 90-70

1. Standard RS485 port on 90-30 power supply module (GFK-0582D page 3-11)

Series 90 PLC Standard SNP Serial Port Connector Pin-Out

The figure below shows the serial port orientation and connector layout for the Series 90 CPUs, and the following table shows the pin numbering and signal assignment for these connectors.

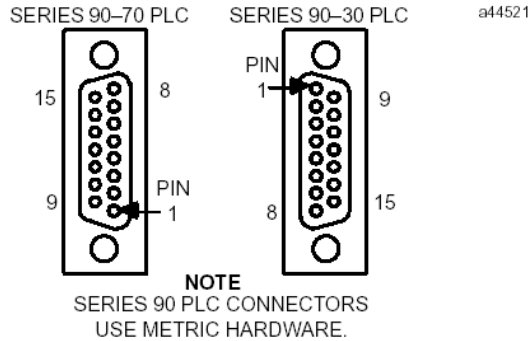


Figure 3-4. Series 90 PLC, RS-422 Serial Port Connector Configuration

Table 3-8. Pin-out for Standard SNP Serial Port Connectors

Pin Number	Signal Name	Description
1	Shield	
2		No Connection
3		No Connection
4	ATCH *	Hand-Held Programmer attach signal
5	+5V *	+5V Power for: HHP and RS-232/485 Converter
6	RTS (A)	Request To Send
7	Signal Ground	Signal Ground, OV
8	CTS (B')	Clear To Send
9	RT *	Terminating Resistor for RD **
10	RD (A')	Receive Data
11	RD (B')	Receive Data
12	SD (A)	Send Data
13	SD (B)	Send Data
14	RTS (B)	Request To Send
15	CTS (A')	Clear To Send

* Signals available at the Connector but are not included in the RS-422 specification. SD (Send Data) and RD (Receive Data) are the same as TXD and RXD (used in the Series Six PLC). (A) and (B) are the same as - and +. A and B denote outputs, and A' and B' denote inputs.

** Termination resistance for the Receive Data (RD) signal needs to be connected only on units at the end of the lines. This termination is made on the Series 90 PLC products by connecting a jumper between pins 9 and 10 inside the 15-pin D-shell with the following exception. For Series 90-70 PLCs with Catalog Numbers IC697CPU731J, and IC697CPU771G and earlier the termination for RD at the PLC is implemented by a jumper between pins 9 and 11.

2. Serial Port 1 (9 pin, RS232) and Serial Port 2 (15 pin, RS485) on CPU module

The pin assignments in the next two tables only apply to the following CPUs:

Series 90–30: CPU351, CPU352, and CPU363

Series 90–70: CPX772, CPX782, CPX928, CPX935, CGR772, and CGR935

Table 3-6. Port 1 (Non-Isolated) RS-232 Signals

Pin Number	Signal Name	Description
1 *	CTS	Clear To Send
2	TXD	Transmit Data
3	0V	Signal Ground
4	0V	Signal Ground
5	RXD	Receive Data
6	RTS	Request to Send

* See the previous figures for location of pin 1.

Table 3-7. Port 2 (Isolated) RS-485 Signals

Pin Number	Signal Name	Description
1*	Shield	Cable Shield
2	NC	No Connection
3	NC	No Connection
4	NC	No Connection
5	+5VDC	Logic Power **
6	RTS(A)	Differential Request to Send
7	SG	Signal Ground
8	CTS(B')	Differential Clear To Send
9	RT	Resistor Termination
10	RD(A')	Differential Receive Data
11	RD(B')	Differential Receive Data
12	SD(A)	Differential Send Data
13	SD(B)	Differential Send Data
14	RTS(B')	Differential Request To Send
15	CTS(A')	Differential Clear To Send

* See the previous figures for location of pin 1.

** Note that Pin 5 provides Isolated +5 VDC power (100 mA maximum) for powering external options.

3. Station Manager Port (RJ11) on CPU364/374 and CMM321/CMM742

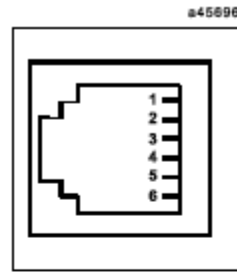


Figure B-1. Station Manager Serial Port (RS-232)

Table B-1. Station Manager Serial Port Pinouts

RJ-11 Port Pin Number	Signal	Description
1	CTS	Clear To Send (input)
2	TD	Transmit Data (output)
3	SG	Signal Ground
4	SG	Signal Ground
5	RD	Receive Data (input)
6	RTS	Request to Send (output)

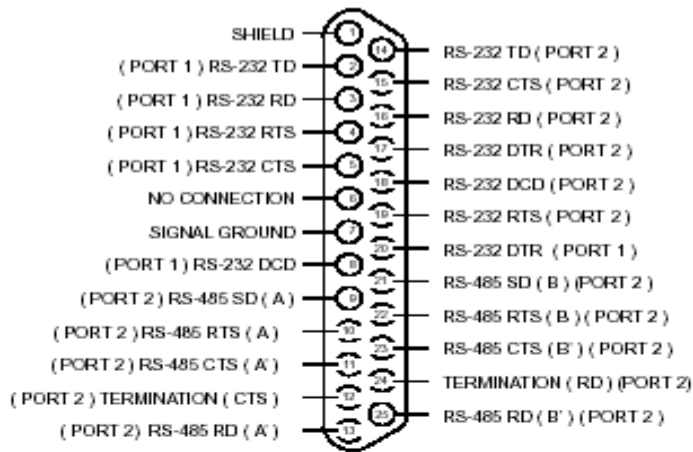
4. Station Manager Cable wiring diagram

Table B-2. Serial Cable (IC693CBL316A) Connector Pinouts

9-Pin Connector Pin Number	RJ-11 Connector Pin Number
7	1
2	2
5	3
5	4
3	5
8	6

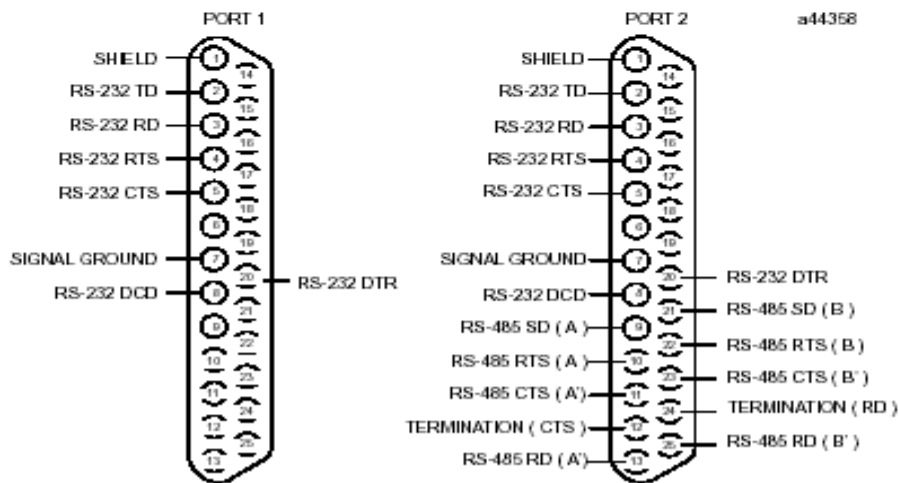
5. CMM311/PCM311 (25 pin) serial port

a44357



Single Connector End

a44358



Wye Connector End

6. CMM711 serial port

The Series 90-70 CMM has two serial ports, each of which support both RS-232 and RS-485 modes. The pin assignments of the serial ports are identical.

When using the RS-485 mode, the CMM can be connected to RS-422 devices as well as RS-485 devices.

The connector pin assignments for both ports of the Series 90-70 CMM are shown below:

Refer to GFK-0582D page 2-4

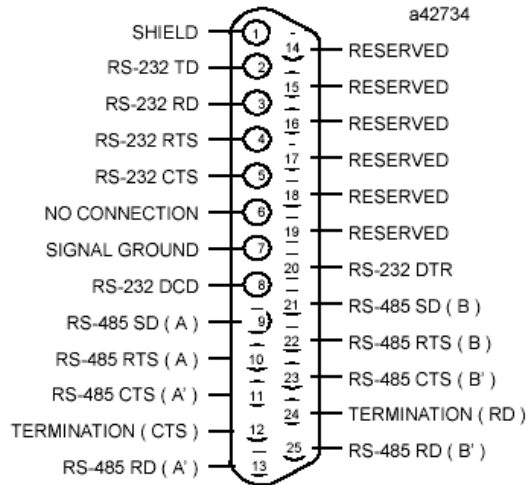


Figure 2-3. Serial Port Pin Assignments for the Series 90-70 CMM

Part 2: VersaMax CPU

1. Serial Port 1 (9 pin, RS232)

Port 1: RS-232

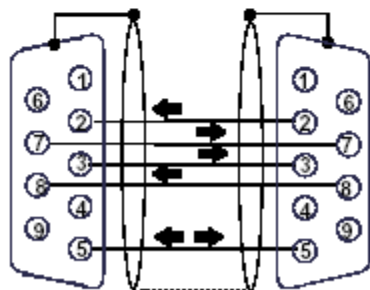
Pin Assignments for Port 1

Port 1 is an RS-232 port with a 9-pin female D-sub connector. It is used as the boot loader port for upgrading the CPU firmware. The pinout of Port 1 allows a simple straight-through cable to connect with a standard AT-style RS-232 port. Cable shielding attaches to the shell.

Pin	Signal	Direction	Function
1	n/c		
2	TXD	Output	Transmit Data output
3	RXD	Input	Receive Data input
4	n/c		
5	GND	--	0V/GND signal reference
6	n/c		
7	CTS	Input	Clear to Send input
8	RTS	Output	Request to Send output
9	n/c		
Shell	SHLD	--	Cable Shield wire connection / 100% (Continuous) shielding cable shield connection

RS232 Point to Point Connection

In point-to-point configuration, two devices are connected to the same communication line. For RS232, the maximum length is 15 meters (50ft).



PC 9-Pin Serial Port 9-pin female	CPU Port 1 9-pin male
(2) RXD	(2) TXD
(3) TXD	(3) RXD
(5) GND	(5) GND
(7) RTS	(7) CTS
(8) CTS	(8) RTS

The shield must connect to shell of connectors on both ends of the cable.

2. Serial Port 2 (15 Pin, RS485)

Port 2: RS-485

Pin Assignments for Port 2

Port 2 is an RS-485 port with a 15-pin female D-sub connector. This can be attached directly to an RS-485 to RS-232 adapter.

Pin	Signal	Direction	Function
1	SHLD	--	Cable Shield Drain wire connection
2, 3, 4	n/c		
5	P5V	Output	+5.1VDC to power external devices (100mA max.)
6	RTSA	Output	Request to Send (A) output
7	GND	--	0V/GND reference signal
8	CTSB'	Input	Clear to Send (B) input
9	RT	--	Resistor Termination (120 ohm) for RDA'
10	RDA'	Input	Receive Data (A) input
11	RDB'	Input	Receive Data (B) input
12	SDA	Output	Transmit Data (A) output
13	SDB	Output	Transmit Data (B) output
14	RTSB	Output	Request to Send (B) output
15	CTSA'	Input	Clear to Send (A) input
Shell	SHLD	--	Cable Shield wire connection / 100% (Continuous) shielding cable shield connection

Part 3: VersaMax Micro and Nano

Cable Lengths and Baud Rates

Maximum cable lengths (the total number of feet from the CPU to the last device attached to the cable) are:

Port 1 (RS-232) = 15 meters (50 ft.)

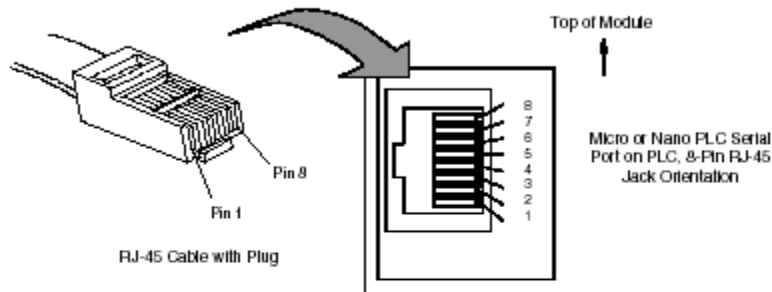
Port 2 (RS-485) = 1200 meters (4000 ft.)

Both ports support configurable baud rates from 300 to 19.2k bps.

1. Serial Port 1 (RJ45, RS232)

Port 1: RS-232

Port 1 is an RS-232 port with a 8-pin RJ-45 vertical jack. In addition to being a general serial communications port, this port is also used as the boot loader port for upgrading the PLC firmware.



Note: There is no shield or frame-ground or shield pin on this connector.

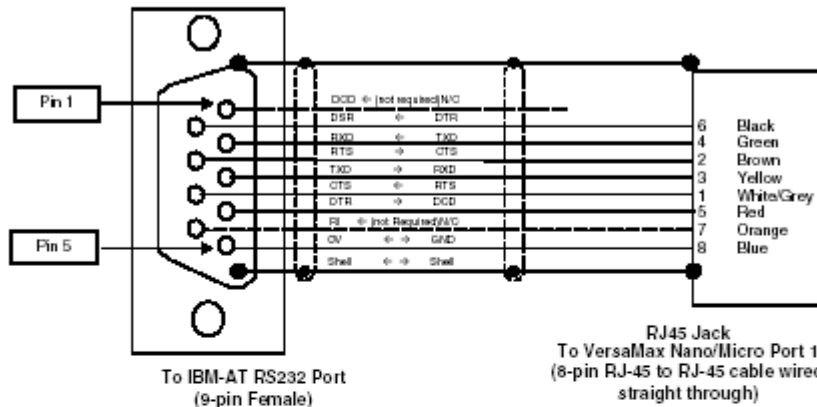
Pin	Signal	Direction	Function
1	RTS	Output	Request to Send output
2	CTS	Input	Clear to Send input
3	RXD	Input	Receive Data input
4	TXD	Output	Transmit Data output
5	DCD	Input	Data Carrier Detect input
6	DTR	Output	Data Terminal Ready output
7	+5V	Output	+5VDC output to power external protocol converters
8	GND	--	0V/Gnd signal reference

Caution: The 5VDC on pin 2 is fused internally, but the fuse is not replaceable. If the fuse blows, the RS-232 will continue to function, but the port will not provide 5VDC to external devices

Port 1 Cable Wiring to a 9-pin D-sub PC-style RS-232 Port

An RJ-45 to DB9F adapter can be used to connect Port 1 to the standard 9-pin D-Sub port found on most PCs. Programmer wiring to an RJ-45 to DB9F adapter is shown below.

For a PC that is not used as a programmer, only the Transmit, Receive, and Ground wires are needed on port 1 and Port 2.



* Dotted lines are optional wires and not required

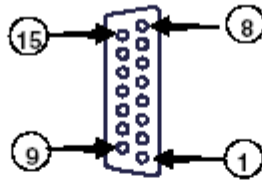
RJ45 to DB9F Adapter Wiring

The color codes shown below are standard for most RJ-45 to DB9F adapter kits, but be sure to review your kit's particular documentation. Wire the adapter kit following the pin numbers as shown.

Adapter Wire Color	DB9F pin	RJ45 pin	Micro PLC signal	DB9F (PC Serial Port) signal
n/c	1	-	n/c	DCD (in)
Green	2	4	TxD (out)	RxD (in)
Yellow	3	3	RxD (in)	TxD (out)
Red	4	5	DCD (in)	DTR (out)
Blue	5	8	Ground	Ground
Black	6	6	DTR (out)	DSR (in)
Brown	7	2	CTS (in)	RTS (out)
White	8	1	RTS (out)	CTS (in)
Orange	9	7	+5V (out)	RI (in)

2. Serial Port 2 (15 pin, 23/28 point Micro PLC)

Port 2 is an RS-485 port with a 15-pin female D-sub connector.

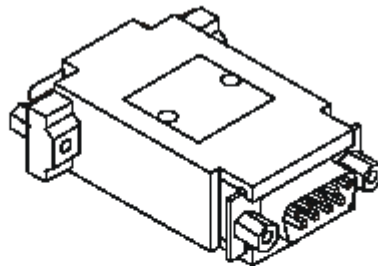


This can be attached directly to an RS-485 to RS-232 adapter (IC693ACC901 or similar).

Pin	Signal	Direction	Function
1	SHLD	--	Cable Shield Drain wire connection
2, 3, 4	n/c		
5	P5V	Output	+5VDC to power external devices (100mA max.)
6	RTSA	Output	Request to Send (A) output
7	GND	--	0V/GND reference signal
8	CTSB'	Input	Clear to Send (B) input
9	RT	--	Resistor Termination (120 ohm) for RDA'
10	RDA'	Input	Receive Data (A) input
11	RDB'	Input	Receive Data (B) input
12	SDA	Output	Transmit Data (A) output
13	SDB	Output	Transmit Data (B) output
14	RTSB	Output	Request to Send (B) output
15	CTSA'	Input	Clear to Send (A) input
Shell	SHLD	--	Cable Shield wire connection / 100% (Continuous) shielding cable shield connection

3. RS232 to RS485 Adapter

RS-232 to RS-485 Adapter



The RS-232 to RS-485 Adapter (IC200ACC415) connects a VersaMax Nano PLC or VersaMax Micro PLC to an RS-485 communications bus. It supports RS-485 multi-drop connections.

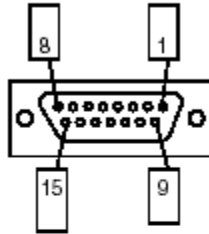
In conjunction with an RJ45 to DB9 Female cable (IC200CBL500), the adapter converts from the RS-232 (9-pin D-sub male) connector on the Nano/Micro PLC to an RS-485 (15-pin D-sub female) connector.

Two LEDs on the adapter indicate activity on the transmit and receive lines.

Power for this adapter is provided by the Micro/Nano PLC.

Adapter 15-pin RS-485 Port Connector

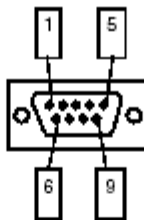
The adapter's RS-485 port is a standard SNP Port (15-pin D-sub female) connector. It supports EIA/TIA-485 (RS-485) compatible signal levels. The pin assignments of the RS-485 connector are shown below.



Adapter RS485 Port Pin Assignments

Pin	Function	Dir.	Pin	Function	Dir.
1	Shield / Frame GND	-	9	RT (RD Term)*	-
2	N/C		10	RD(A')	In
3	N/C		11	RD(B')	In
4	N/C		12	SD(A)	Out
5	+5VDC	Out	13	SD(B)	Out
6	RTS(A)	Out	14	RTS(B)	Out
7	GND	-	15	CTS(A')	In
8	CTS(B')	In	[Shell]	Frame GND	

* RT pin is connected with a 120 ohm resistor to pin 11: RD(B') to provide a simple end-of-line termination through a jumper in the backshell between pin 10 and pin 9.



Adapter RS-232 Port Pin Assignments

Pin	Signal	Dir.	Function
1	DCD	Input	(No Connect)
2	RXD	Input	Receive Data
3	TXD	Output	Transmit Data
4	DTR	Output	(No Connect)
5	GND	--	0V/Gnd signal
6	DSR	Input	(No Connect)
7	RTS	Output	Request to Send
8	CTS	Input	Clear to Send
9	+5V	Input	+5VDC power in
SHELL	SHLD	--	Cable Shield wire connection

Part 4: Series 90 Micro

There is only 15Pin RS485 port on Series 90 Micro PLC, the pin assignment is same as 9030 PLC serial port 2.

There are 2 serial ports on 23/28 point Series 90 Micro PLC, we can gain level 4 access right through port 1, while only can gain level 2 access right through port 2.

Part 5: PacSystem PLC RX7i

Refer to GFK-2222 chapter 11

Port 1

Port 1 is RS-232 compatible and optocoupler isolated. It has a 9-pin, female, D-sub connector with a standard pin out. This is a DCE (data communications equipment) port that allows a simple straight-through cable to connect with a standard AT-style RS-232 port.

Port 1 RS-232 Signals

Pin Number	Signal Name	Description
1*	NC	No Connection
2	TXD	Transmit Data
3	RXD	Receive Data
4	DSR	Data Set Ready
5	0V	Signal Ground
6	DTR	Data Terminal Ready
7	CTS	Clear To Send
8	RTS	Request to Send
9	NC	No Connection

* Pin 1 is at the bottom right of the connector as viewed from the front of the module.

Port 2

Port 2 is RS-485 compatible and optocoupler isolated. Port 2 has a 15-pin, female Dsub connector. This port does not support the RS-485 to RS-232 adapter (IC690ACC901). This port does not supply +5V volts, therefore RS-485 to RS-232 conversion requires a converter that is self-powered. This is a DCE port.

Port 2 RS-485 Signals

<i>Pin No.</i>	<i>Signal Name</i>	<i>Description</i>
1*	Shield	Cable Shield
2	NC	No Connection
3	NC	No Connection
4	NC	No Connection
5	NC	No Connection
6	RTS(A)	Differential Request to Send
7	0V	Signal Ground
8	CTS(B')	Differential Clear To Send
9	RT	Resistor Termination
10	RD(A')	Differential Receive Data
11	RD(B')	Differential Receive Data
12	SD(A)	Differential Send Data
13	SD(B)	Differential Send Data
14	RTS(B')	Differential Request To Send
15	CTS(A')	Differential Clear To Send

* Pin 1 is at the bottom right of the connector as viewed from the front of the module.

Port 3

Port 3, the station manager port, is RS-232 compatible and isolated. Port 3 has a 9-pin, female, D-connector. This is a DCE port that allows a simple straight-through cable to connect with a standard AT-style RS-232 port. This port contains full use of the standard RS-232 signals for future use with point-to-point protocol (PPP).

Station Manager RS-232 Signals

Pin Number	Signal Name	Description
1*	DCD	Data Carrier Detect
2	TXD	Transmit Data
3	RXD	Receive Data
4	DSR	Data Set Ready
5	0V	Signal Ground
6	DTR	Data Terminal Ready
7	CTS	Clear To Send
8	RTS	Request to Send
9	RI	Ring Indicator

* Pin 1 is at the bottom right of the connector as viewed from the front of the module.

Serial Cable Lengths and Shielding

The connection from a CPU serial port to the serial port on a computer or other serial device requires a serial cable. This connection can be made with the IC690ACC901 cable kit or you may build cables to fit the needs of your particular application. Maximum cable lengths (the total number of feet from the CPU to the last device attached to the serial cable) are:

Port 1 (RS-232) = 15 meters (50 ft.) – shielded cable optional

Port 2 (RS-485) = 1200 meters (4000 ft.) – shielded cable required

Port 3 (RS-232) = 15 meters (50 ft.) – shielded cable optional

Serial Port Baud Rates

<i>Protocol</i>	<i>Port 1 (RS-232)</i>	<i>Port 2 (RS-485)</i>	<i>Station Mgr (Port 3) (RS-232)</i>
RTU protocol	1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K, 115.2K	1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K, 115.2K	not supported
Firmware Upgrade via WinLoader	1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K, 115.2K	Not supported	not supported
Message Mode	1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K, 115.2K	1200, 2400, 4800, 9600, 19.2K, 38.4K, 57.6K, 115.2K	not supported