

## Part D: Hardware installation reference

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Part D contains hardware installation reference material.

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## Section 1: Hardware Installation

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### Antistatic Protection

Exercise care while handling the EasyConnection board. In particular use antistatic protection devices if available. These include :

- Antistatic work mats
- Wrist bands
- Earth straps
- Antistatic carpet spray

If antistatic protection devices are not available, observe the following procedures prior to removing or handling EasyConnection boards or the system motherboard:

- Discharge static build up from your body by touching the bare metal chassis of the system.
- Avoid using plastic chairs when working on the system.
- Move around as little as possible to avoid building up static charge.
- Make sure the power cord is plugged in and turned “off”.
- Use an antistatic bag to carry and store EasyConnection boards.
- Turn the system power off prior to installing or removing EasyConnection boards.
- Check that devices to be attached to EasyConnection serial ports are suitably earthed, correctly wired and are the correct interface voltage standard.

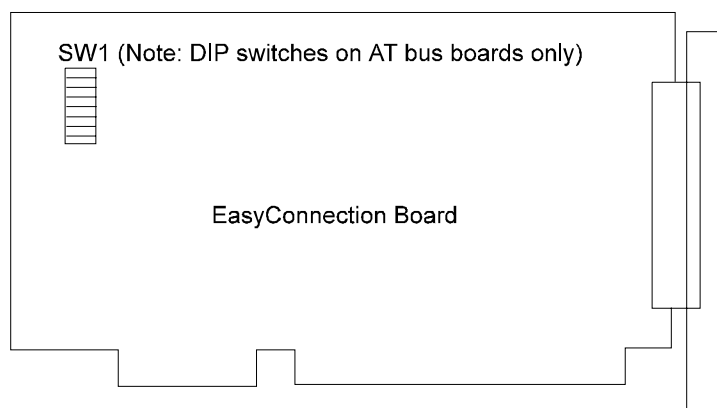
## Board Identification

The following table is a comprehensive list of both old and new EasyConnection board types. It will assist in the visual identification of boards:

Description	Packaging Label	Circuit Board	Item No.
8/64 ISA	EC 8/64-AT	ASS-ECP-AT	600041
8/64 EISA	EC 8/64-EI	ASS-ECP-EI	600043
8/64 MCA	EC 8/64-MC	ASS-ECP-MC	600042
8/64 PCI	EC 8/64-PCI	EC 8/64-PCI	600088
8/32 ISA	EC 8/32-AT	ASS-ECHAT	600037
8/32 ISA	EC 8/32-AT	EC8/32-AT	600085
8/32 MCA	EC 8/32-MC	ASS-ECHMC	600038
8/32 PCI	EC 8/32-PCI	EC 8/32-PCI	600063
RA PCI	ECRA-PCI		600102

## Installing the EasyConnection Board

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1. Ensure that the system has been shut down and the power turned "OFF".
2. Locate the correct slot for the EasyConnection board.
3. Push the board into the slot. Make sure it is securely in place.
4. Connect cable:
  - If connecting multiple modules, see Section 2, Module Assembly.
  - Connect the module to host adapter using the supplied cable.

5. If the boards have been installed in an EISA machine, observe your Hardware Vendor's procedures for configuring with the new EISA configuration diskette.
6. Boot-up the machine.
7. If installing under UNIX, you can now proceed with Port Configuration. If installing under OS/2, Linux, Windows NT, Windows 95 or DOS, proceed to the Driver Installation Instructions.

## **EISA Configuration Diskette Generation**

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To generate an EISA Configuration Diskette:

1. Highlight Customize on the Main Menu.
2. Highlight "Generate EISA/MCA Config".
3. Highlight the diskette drive required.
4. Highlight the diskette size required.
5. Insert a DOS formatted diskette into the required drive.
6. Answer "y" to the prompt, "Update configuration using the setup above?".
7. The configuration diskette file !STL0200.CFG is updated. You may now use the systems EISA/MCA configuration utility to save the board configuration.

## **Installing ISA boards in an EISA machine**

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When installing ISA boards in an EISA machine we recommend that you configure the ISA boards using the system's EISA Configuration Utility. Hardware conflicts can then be detected and resolved easily.

The distribution diskette contains configuration files required by EISA machines to configure EISA and ISA boards, and by Microchannel machines to configure MCA boards.

Configure your EISA/Microchannel machine to recognise the installed board(s) using the respective system configuration utility. Consult your computer system manual for instructions on using the system configuration utility.

Perform the following steps to reconfigure your EISA/Microchannel machine:

1. **Power-on and boot-up** your machine using the diskette containing the system configuration utility supplied with your machine.
2. **Create working diskette copy.** If you are not using a working copy of this reference diskette, then make a working copy using the system configuration utility. Restart the machine from the working copy.
3. **Configuration file.** Use the system configuration utility to copy the appropriate configuration file from the root directory of the driver diskette.

The relevant configuration files are as follows:

!STL0200.CFG - EasyIO (ISA) in an EISA machine  
!STL0400.CFG - EC8/64-EI (EISA) in an EISA machine  
!STL0410.CFG - EC8/32-AT (ISA) in an EISA machine  
!STL0420.CFG - EC8/64-AT (ISA) in an EISA machine  
@62F9.ADF - EC8/32-MC in a Microchannel machine  
@7113.ADF - EC8/64-MCA in a Microchannel machine

4. **Save** the new configuration and exit the utility.
5. **Reboot system.** Upon reboot to the system configuration utility, the configuration file information will be updated and a valid DPRAM address and I/O address will be selected automatically from the choices available.
6. On a **EC8/64**, select 'disabled' in the interrupt field.

The following information is required during installation of the Windows NT driver:

EISA - Slot number only  
ISA/MCA - Memory or Secondary IO address,  
IO address  
IRQ (if necessary)

7. **Save** the new configuration, exit the system configuration utility, and reboot your system.

## Section 2: Module Assembly

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### The Two Connection Methods.

EasyConnection modules can be joined together in two ways. The first is to screw the end caps together, using the supplied screws in the case of two or more modules; the second is to use the mounting bracket where the module is to be joined to an earlier EasyConnection module.

Warning: Do not disconnect the panel from the host adapter if the system is switched on.

## Joining EasyConnection Modules

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It is essential that modules be securely joined before use. To join two or more EasyConnection modules, perform the following:

1. Ensure the modules are *not* connected to the host.
2. Remove the larger Phillips head screws from the plastic end panels of the two ends to be joined.
3. Carefully join the male/female interface.
4. The Phillips head screw is inserted through the non-threaded hole of the end panel, into the threaded hole of the other and secured. Repeat for other side.
5. Repeat to join a third and fourth (maximum of four) modules.

## Joining Modules with Earlier Modules

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It is essential that modules be securely joined before use. To join a module with an earlier type (those without the end cap screws), perform the following:

1. Ensure the modules are *not* connected to the host.
2. Use the joining bracket supplied with the earlier module. This bracket also serves as a wall-mount.
3. Carefully join the male/female interface.
4. Place the modules upside down on a flat work surface and lay the bracket across the two modules so that the bracket is centred on the join between the two modules.
5. Secure the bracket by screwing four phillips head screws, two per module, through the hole in the bracket, into the centre seam running down the middle of the underside of each module.

## EasyConnection Expansion

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EasyConnection supports up to four (4) modules per board, with a maximum of:

- 32 ports per EC 8/32, and
- 64 ports per EC 8/64,

with all modules fully compatible with one another. For example, 8 and 16 port DB25 modules can be connected in any combination with 8 and 16 port RJ45 modules to produce customer specific port configurations.

**Warning:** System malfunction and board damage may occur in the event that more than 4 modules per board are connected, or where the 32 port (EC 8/32) or 64 port (EC 8/64) board limit is exceeded.

Such malfunctions are likely to cause the resettable fuse to be opened. The fuse is reset by powering down the host computer, then rebooting.

## Section 3: DIP Switch Settings

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The EasyConnection ISA boards have one eight position DIP switch (SW1) which can select 256 different primary I/O addresses when using EC8/32, and 128 different I/O addresses when using EC8/64, in the address range 200h - 3FFh.

On the EC8/32, the secondary I/O address is selected by registers in the primary address space, eliminating the need for a second DIP switch. The value for the secondary address is also in the range of 200h - 3ffh and occupies 32 bytes. The secondary address may be shared by all boards.

The EC8/32-MCA, EC8/64-PCI and EC8/64-EISA boards have no switches to configure. The EC8/64-EISA is configured by the EISA configuration utility. The EC8/32-MCA is configured by the Microchannel Configuration Utility and the EC8/64-PCI is configured by the PCI BIOS.

**Note:** Various DIP packages are used on Stallion boards. On the lever-type package, the lever is pushed in the desired direction (i.e. on or off). On the recessed variety you must press down on the desired end (on or off).

## DIP Switch Settings for EC8/32-AT

DIP Switch (SW1) No.								I/O
1	2	3	4	5	6	7	8	Address
			ON	ON	ON	ON	ON	20x
			OFF	ON	ON	ON	ON	21x
			ON	OFF	ON	ON	ON	22x
			OFF	OFF	ON	ON	ON	23x
			ON	ON	OFF	ON	ON	24x
			OFF	ON	OFF	ON	ON	25x
			ON	OFF	OFF	ON	ON	26x
			OFF	OFF	OFF	ON	ON	27x
			ON	ON	ON	OFF	ON	28x
			OFF	ON	ON	OFF	ON	29x
			ON	OFF	ON	OFF	ON	2Ax
			OFF	OFF	ON	OFF	ON	2Bx
			ON	ON	OFF	OFF	ON	2Cx
			OFF	ON	OFF	OFF	ON	2Dx
			ON	OFF	OFF	OFF	ON	2Ex
			OFF	OFF	OFF	OFF	ON	2Fx
			ON	ON	ON	ON	OFF	30x
			OFF	ON	ON	ON	OFF	31x
			ON	OFF	ON	ON	OFF	32x
			OFF	OFF	ON	ON	OFF	33x
			ON	ON	OFF	ON	OFF	34x
			OFF	ON	OFF	ON	OFF	35x
			ON	OFF	OFF	ON	OFF	36x
			OFF	OFF	OFF	ON	OFF	37x
			ON	ON	ON	OFF	OFF	38x
			OFF	ON	ON	OFF	OFF	39x
			ON	OFF	ON	OFF	OFF	3Ax
			OFF	OFF	ON	OFF	OFF	3Bx
			ON	ON	OFF	OFF	OFF	3Cx
			OFF	ON	OFF	OFF	OFF	3Dx
			ON	OFF	OFF	OFF	OFF	3Ex
			OFF	OFF	OFF	OFF	OFF	3Fx
ON	ON	ON						xx0
OFF	ON	ON						xx2
ON	OFF	ON						xx4
OFF	OFF	ON						xx6
ON	ON	OFF						xx8
OFF	ON	OFF						xxA
ON	OFF	OFF						xxC
OFF	OFF	OFF						xxE

The default I/O address of 2A0 has the following switch setting for an EC 8/32:

ON	ON	ON	ON	OFF	ON	OFF	ON	2A0
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## DIP Switch Settings for EC8/64-AT

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		DIP Switch (SW1) No.						I/O
1	2	3	4	5	6	7	8	Address
		ON	ON	ON	ON	ON	OFF	20x
		OFF	ON	ON	ON	ON	OFF	21x
		ON	OFF	ON	ON	ON	OFF	22x
		OFF	OFF	ON	ON	ON	OFF	23x
		ON	ON	OFF	ON	ON	OFF	24x
		OFF	ON	OFF	ON	ON	OFF	25x
		ON	OFF	OFF	ON	ON	OFF	26x
		OFF	OFF	OFF	ON	ON	OFF	27x
		ON	ON	ON	OFF	ON	OFF	28x
		OFF	ON	ON	OFF	ON	OFF	29x
		ON	OFF	ON	OFF	ON	OFF	2Ax
		OFF	OFF	ON	OFF	ON	OFF	2Bx
		ON	ON	OFF	OFF	ON	OFF	2Cx
		OFF	ON	OFF	OFF	ON	OFF	2Dx
		ON	OFF	OFF	OFF	ON	OFF	2Ex
		OFF	OFF	OFF	OFF	ON	OFF	2Fx
		ON	ON	ON	ON	OFF	OFF	30x
		OFF	ON	ON	ON	OFF	OFF	31x
		ON	OFF	ON	ON	OFF	OFF	32x
		OFF	OFF	ON	ON	OFF	OFF	33x
		ON	ON	OFF	ON	OFF	OFF	34x
		OFF	ON	OFF	ON	OFF	OFF	35x
		ON	OFF	OFF	ON	OFF	OFF	36x
		OFF	OFF	OFF	ON	OFF	OFF	37x
		ON	ON	ON	OFF	OFF	OFF	38x
		OFF	ON	ON	OFF	OFF	OFF	39x
		ON	OFF	ON	OFF	OFF	OFF	3Ax
		OFF	OFF	ON	OFF	OFF	OFF	3Bx
		ON	ON	OFF	OFF	OFF	OFF	3Cx
		OFF	ON	OFF	OFF	OFF	OFF	3Dx
		ON	OFF	OFF	OFF	OFF	OFF	3Ex
		OFF	OFF	OFF	OFF	OFF	OFF	3Fx
	ON	ON						xx0
	OFF	ON						xx4
	ON	OFF						xx8
	OFF	OFF						xxC

The default I/O address of 2A0 has the following switch setting for an EC 8/64:

ON	ON	ON	OFF	ON	OFF	ON	OFF	2A0
----	----	----	-----	----	-----	----	-----	-----

## Section 4: I/O Port Pinouts

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The EasyConnection modules house female DB25 sockets or RJ45 female connectors. The port numbers are marked near their respective sockets on the module.

### Cabling Issues

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Serial devices may be attached to EasyConnection boards in various module configurations. The modules available are:

- 8 port DB25 module (RS-232)
- 16 port DB25 module (RS-232)
- 8 port RJ45 module (RS-232)
- 16 port RJ45 module (RS-232)
- 8 port DB25 dual interface module (RS-232, RS-422 and RS-485)

As additional serial ports are required, more can be added by simply attaching extra modules, allowing 8 to 64 ports per slot.

### Serial Interfaces for Asynchronous Modules

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All asynchronous modules support RS-232-D signalling. The enhanced standard removes the once imposed 50ft distance limit, though in practice, reliable operation was possible over 100 feet (30 metres) using low capacitance cable. Using very low capacitance cable (5 pF/foot) with EasyConnection means that reliable RS-232 operation is possible up to 500 feet (150 metres) at data rates up to 38.4 Kbps. This assumes that the system and the serial device are in the same building and that there is a chassis ground connection between the devices through the cable shielding.

For medium speed devices which are up to 4000 feet (1220 metres) from the host system, the Dual Interface Module should be used as it offers balanced RS-422-A and RS-485 operation as well as RS-232. The user can choose any of these standards on any port by simply wiring the cable for that standard.

**Standard Module.** EasyConnection uses RS-232 low-power ICs with high noise immunity and can drive data rates up to 145 Kbps over very low capacitance cable to 100ft (30 metres) . In many instances, this eliminates the need for a short haul modem or having to use RS-422-A converters for the serial device.

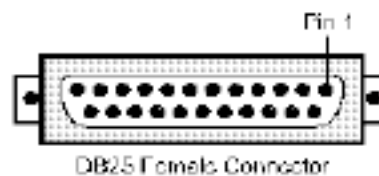
**XP Module.** The XP (Extra Performance) module incorporates UARTs capable of supporting serial speeds of 230,400 and 460,800 baud. The DB25 pinout of the XP module is identical to the standard module. Note however, that cable lengths must conform to limits in the RS-232 specification. The high speed capability is provided for the purpose of connecting high speed devices such as Terminal Adapters over short cable distances (ie. up to 3 meters). The XP module may be used with all EasyConnection host adapters and other module types and is supported by Rev 5.3 or later software drivers.

## Asynchronous Module DB25 Pinout (DTE)

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Asynchronous Module DB25 Pinout (DB25 Pinout RS-232):

1	Chassis GND
2	TXD
3	RXD
4	RTS
5	CTS
7	Signal GND
8	DCD
20	DTR

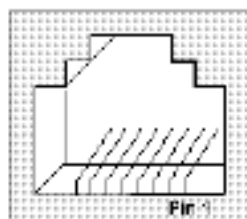


## Asynchronous Module RJ45 Pinout (DTE)

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Asynchronous Module RJ45 Pinout (RS-232):

1	DCD
2	RTS
3	Chassis GND
4	TXD
5	RXD
6	Signal GND
7	CTS
8	DTR



RJ45 Female Socket

**Note:** The 8 pin RJ45 female connector also mates with RJ11 and RJ12 males. The RJ11 has four pins and will connect with pins 3-6 on the RJ45. The RJ12 has six pins and connects with pins 2-7 on the RJ45.

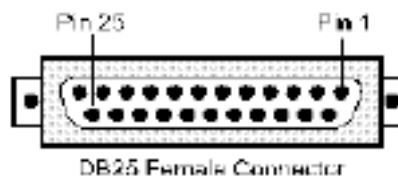
For software handshaking you can use any RJ connector. For hardware handshaking you must use an RJ12 or RJ45 connector. For modems using all of the above lines, you must use an RJ45 connector with 8 pins.

## Dual Interface Module DB25 Pinout

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Dual Interface Module DB25 Pinout (RS-232, RS-422 & RS-485)

1	Chassis GND
2	TXD
3	RXD
4	RTS
5	CTS
6	DSR*
7	Signal GND
8	DCD
15	R(B) or RX+
17	R(A) or RX-
18	CONV
19	T(B) or TX+
20	DTR
25	T(A) or TX-



DB25 Female Connector

\* Not present on XP module.

## Section 5: Cabling Diagrams

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This section illustrates common RS-232, RS-422 and RS-485 cabling.

### Common RS-232 Cables

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The following section shows common wiring configurations for both DB25 and RJ45 connectors.

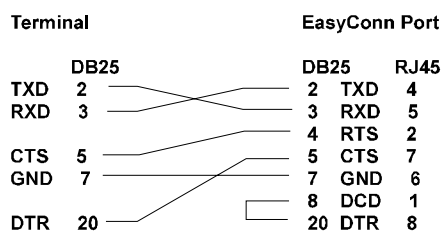
#### Asynchronous Modem Cable

Modem (DCE)		EasyConn (DTE)	
	DB25	DB25	RJ45
TXD	2	2	TXD 4
RXD	3	3	RXD 5
RTS	4	4	RTS 2
CTS	5	5	CTS 7
GND	7	7	GND 6
DCD	8	8	DCD 1
DTR	20	20	DTR 8

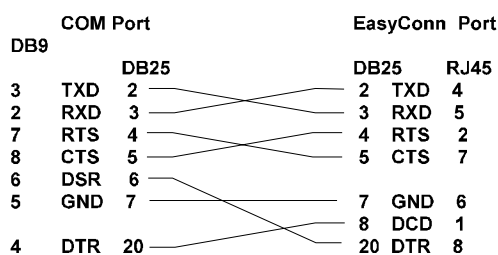
#### Software Handshaking Cable (3 Wire)

Terminal		EasyConn Port	
	DB25	DB25	RJ45
TXD	2	2	TXD 4
RXD	3	3	RXD 5
GND	7	7	GND 6
		8	DCD 1
		20	DTR 8
		4	RTS 2
		5	CTS 7

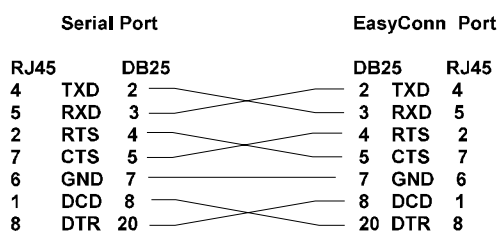
### Hardware Handshaking Cable (Wyse 60 Terminal)



### Standard PC COM Port to EasyConnection Port

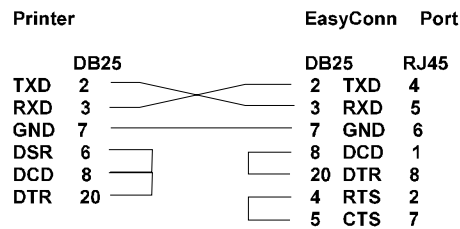


### EasyConnection Port to EasyConnection Port

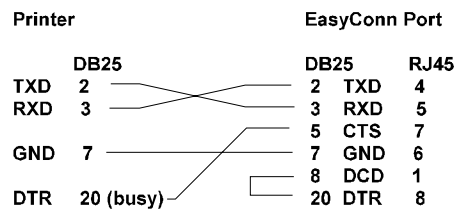


## Software Handshaking Printer Cable

Most printers use software handshaking (XON-XOFF). This cable should work with most printers.

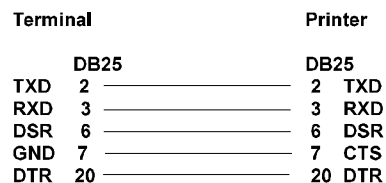


## Hardware Handshaking Printer Cable



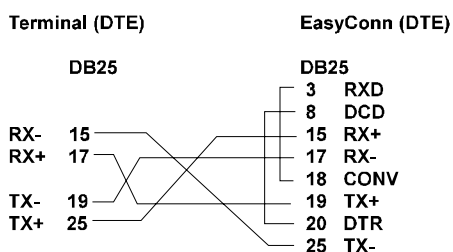
**Note:** If the terminal or printer does not use DTR (pin 20) to indicate a busy condition, substitute the correct signal on the correct pin for DTR (pin 20) on the terminal or printer end in the above diagrams. Some printers also need either or both of the signals DSR and DCD to be held high to enable the printer to receive data. This can be achieved by linking DCD and DSR to another signal on the printer, such as DTR or RTS. Make sure this signal is not used as the hardware handshaking signal.

## Wyse-60 Attached Printer Cable



## RS-422 Cable

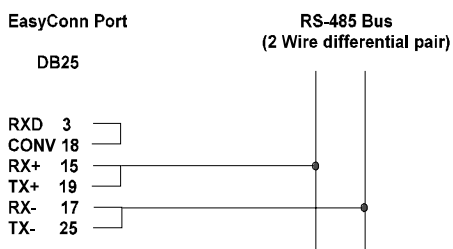
When running diagnostics on a panel that is configured for RS-422A, the loopback plug supplied with the dual interface module should be used. For outdoor installations, an extra surge protection device should be connected at both ends of the cable to guard against induced high voltages (i.e. lightning). Damage caused by incorrect wiring or induced voltages is not covered by Stallion's warranty.



## RS-485 Cable

RS-485 is an upgraded version of RS-422-A, using the same signal levels but extending the number of peripherals that a computer can interface to. Additionally, RS-485 allows for bi-directional multi-point party line communication and can effectively be used for “mini-LAN” applications eg. between point of sale terminals and a central computer.

A 2 wire party line port is wired as follows:



The EasyConnection port may be one of up to 32 transmitters and 32 receivers connected to a 2 wire differential pair.

**Note:** Cabling and bus termination must conform to EIA RS-485 standard.

