Connect Tech Inc.
Industrial Strength Communications

BlueStorm/LP

Low Profile PCI
Multi-port Serial Adapter

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Limited Lifetime Warranty

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Customer Support Overview

If you experience difficulties after reading the manual and/or using the product, contact the Connect Tech reseller from which you purchased the product. In most cases the reseller can help you with product installation and difficulties.

In the event that the reseller is unable to resolve your problem, our highly qualified support staff can assist you. Our support section is available 24 hours a day, 7 days a week on our website at: www.connecttech.com/sub/support/support.asp. See the contact information section below for more information on how to contact us directly. Our technical support is always free.

Contact Information

We offer three ways for you to contact us:

Mail/Courier
You may contact us by letter at:
Connect Tech Inc.
Technical Support
42 Arrow Road
Guelph, Ontario
Canada N1K 1S6

Email/Internet
You may contact us through the Internet. Our email and URL addresses on the Internet are:

sales@connecttech.com
support@connecttech.com
www.connecttech.com

> **Note:**
> Please go to the Download Zone or the Knowledge Database in the Support Center on the Connect Tech website for product manuals, installation guides, device driver software and technical tips.
> Submit your technical support questions to our customer support engineers via the Support Center on the Connect Tech website.

Telephone/Facsimile
Technical Support representatives are ready to answer your call Monday through Friday, from 8:30 a.m. to 5:00 p.m. Eastern Standard Time. Our numbers for calls are:

Telephone: 800-426-8979 (North America only)
Telephone: 519-836-1291 (Live assistance available 8:30 a.m. to 5:00 p.m. EST, Monday to Friday)
Facsimile: 519-836-4878 (on-line 24 hours)

Introduction

Connect Tech Inc. proudly presents the BlueStorm/LP, a high-speed multi-port communication adapter for Low Profile PCI compatible computers. The BlueStorm/LP provides you with up to eight high performance serial ports with baud rates up to 1.8432 Mbps that are compatible with any standard serial communications application.

BlueStorm/LP is fully PCI 2.2 compliant (2 and 8 port models are 2.3 compliant). You simply install it into an available PCI slot in your computer and with Plug and Play installation - the hardware setup is complete.

The BlueStorm/LP is an ideal solution for multi-port serial communications in applications such as Point of Sale; Industrial Process Control, Office Automation and Data/Telecommunications. It allows easy attachment of peripherals such as barcode scanners, receipt printers, card readers, testing and monitoring equipment, modems, printers and any other device requiring serial communications.

Features

- Two, four or eight high performance asynchronous serial ports in various RS-232 and/or RS-422/485 electrical interface configurations.
- Baud rates up to 921.6 Kbps (RS-232) and 1.8432 Mbps (RS-422/485) using PCI UARTs with 64 bytes of TxD/RxD FIFO buffers.
- Supports three RS-422/485 modes: Full Duplex, Half Duplex, Multi-drop Slave.
- Each port can be configured independently (baud rate, parity, data and stop bits).
- Full modem control on all ports.
- DB-9 male fan-out cable (custom cable solutions also offered).
- Optional multi-strike surge suppression, IEC 1000-4 compatible on all signals, all ports.
- Low profile chassis bracket installed on the board with an additional standard height chassis bracket included.
- PCI 2.2 compliant - with Plug and Play installation.
- QNX 4.X/6.X, Windows XP/2000, Linux compatible (contact Connect Tech for most current list).

Your BlueStorm/LP product consists of the following components:
- BlueStorm/LP adapter
- An additional low/standard height chassis bracket (optional for some part numbers)
- DB-9 fan-out cable, approximately 12 in./30.5 cm long
- BlueStorm/LP device drivers and documentation CD

Hardware Installation

Installing the BlueStorm/LP into your system

Turn the power off to your computer and open it to expose the expansion slots (consult your system's documentation for more information about this procedure).

Choose an available PCI expansion slot, remove the expansion slot cover and insert the BlueStorm/LP adapter, pushing down gently until the board seats fully in the slot. Secure the BlueStorm/LP to the computer chassis.

Hardware Configuration

Interrupts and Memory Address Selection

The BlueStorm/LP is a PCI card, so the host computer's BIOS will automatically set interrupts and memory addresses when you reboot after installation.

Electrical Interfaces

RS-422/485 Electrical Interface

The BlueStorm/LP RS-232/422/485 adapter supports three modes of RS-422/485 communication, as outlined below. (See Figure 1 and Figure 2 for jumper block locations.)

Full Duplex Mode

In this mode, TxD+/- & RxD+/- are being driven to a known level all the time. This mode is typically used in point-to-point situations much like RS-232. It is the default setting.

Half Duplex Mode

In this mode the TxD+/- line driver is enabled only when data is transmitted and RxD+/- is disabled when data is being transmitted. This mode is typically used in either point-to-point 2-wire connections OR in multi-drop 2-wire bus connections. This mode requires software setup in Control Panel – System – Hardware – Device Manager – Ports – CTI PCI UART. Click on Advanced under Port Settings after the driver is installed. (See Multi-drop Slave below)

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Multi-drop Slave Mode

In this mode the TxD+/- line driver is enabled only when data is transmitted and RxD+/- is enabled all the time. This mode is typically used in multi-drop 4-wire connections. This mode requires software setup in Control Panel – System Properties – Hardware - Device Manager – Ports – CTI PCI UART. Click on Advanced under Port Settings.
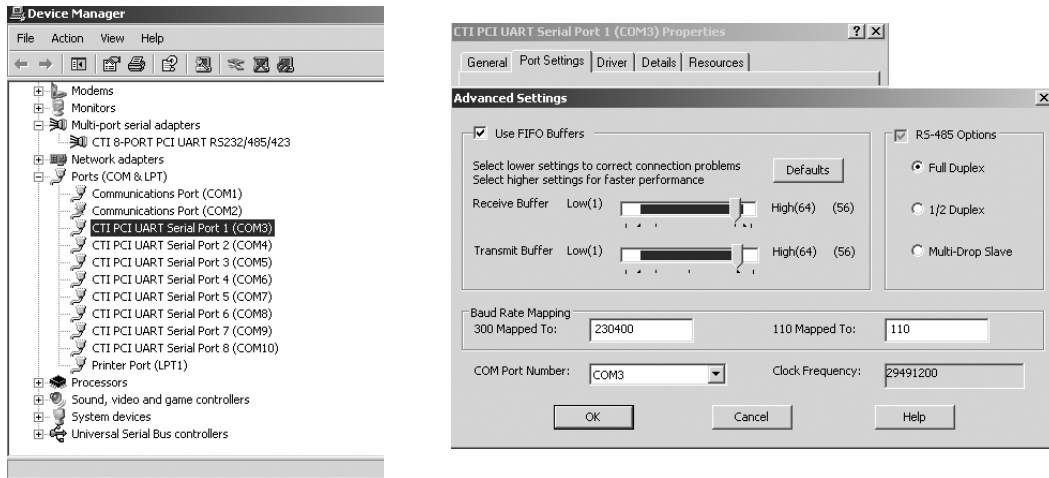
Line Bias/Termination

The RS-422/485 transceivers, both transmit and receive are optionally biased to produce a line level mark condition through jumper selectable resistors. These options are typically used in multi-drop 4-wire connections.

Jumper Block Settings

Figure 1: BlueStorm/LP jumper block locations 2 port models

Figure 2: BlueStorm/LP jumper block locations 4 port models

Figure 3: BlueStorm/LP jumper block locations, 8 port models

Jumper Configuration

In the following example, the four RS-422/485 ports are set as follows: port 1 is set for half duplex, port 2 is set for half duplex; port 3 is set for full duplex, and port 4 is set for multi-drop slave.
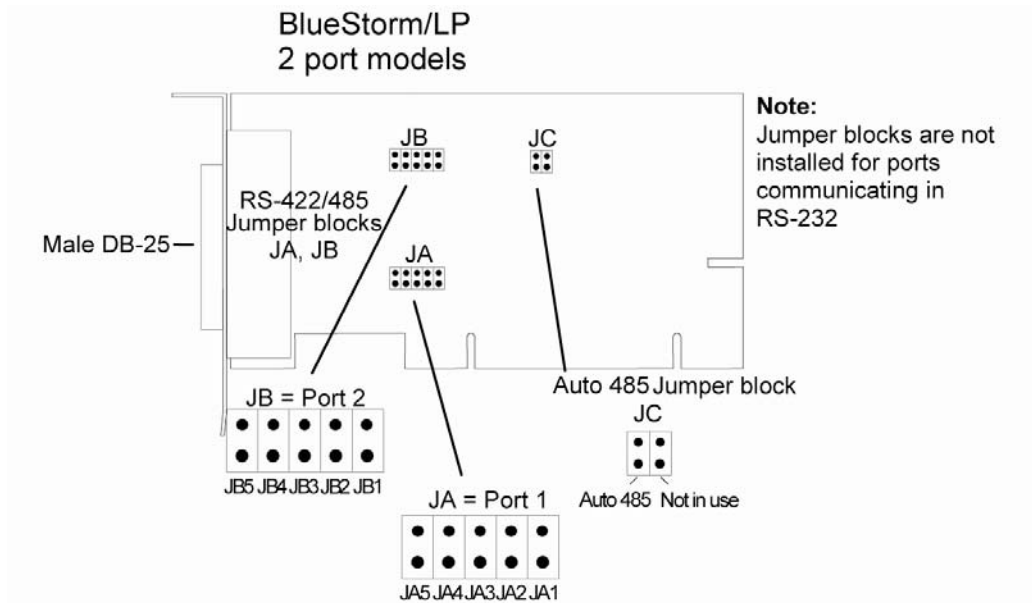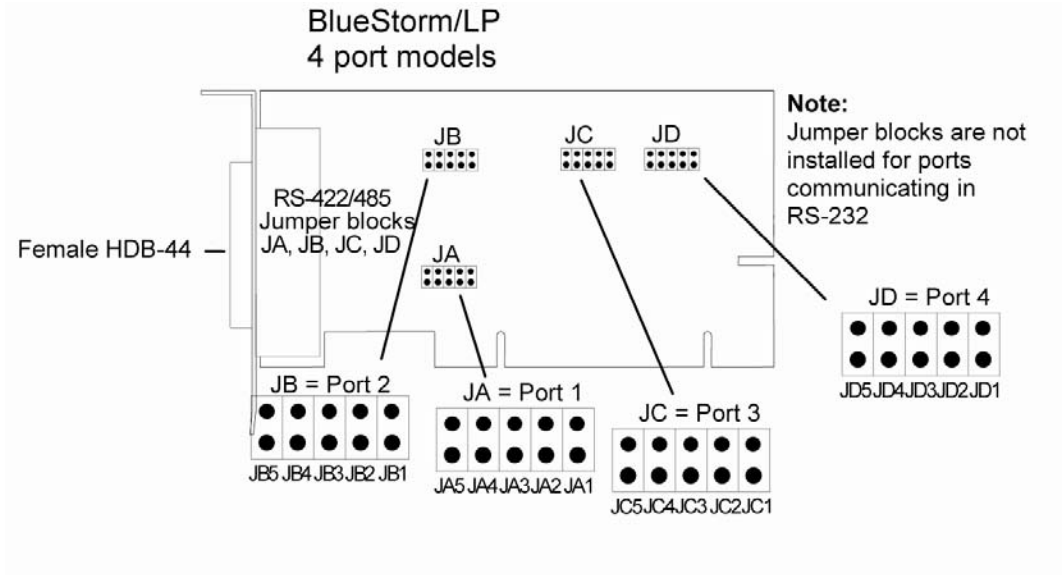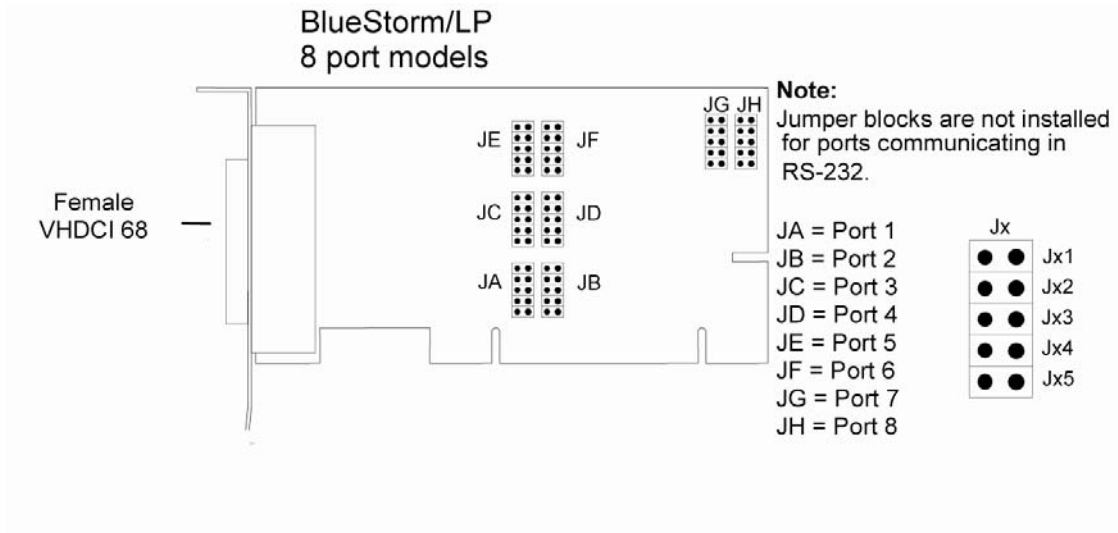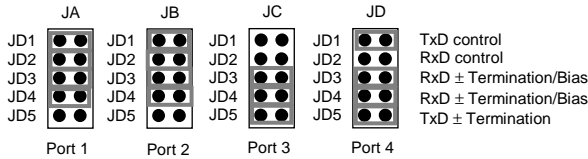

Figure 4: Jumper configuration example for 4 port RS-232/422/485 models

TxD Control

Install this jumper to enable the RS-485 transmitter only when sending data. This mode is useful for half-duplex operation when only one device is allowed to send data at a time. If the jumper is not installed, the transmitter will always drive the line to an idle state when not sending data.

RxD control

Install this jumper to enable the RS-485 receiver only when NOT transmitting data. This is useful for half-duplex operation to prevent the transmitting device from receiving its own data as it sends. If this jumper is not installed, the receiver is always enabled and ready to receive data.

RxD ± Termination/Bias

Install this pair of jumpers to enable a 150 ohm terminator across the RxD+ and RxD- pins for the corresponding port. A biasing network is also enabled that drives the receiver to an inactive or safe mode. The receiver can still receive data from another device and the biasing helps to prevent the reception of data generated by noise on the transmission line. The two jumpers for RxD termination/bias must be installed and removed as a pair.

TxD ± Termination

Install this jumper to enable a 150 ohm resistor across the TxD+ and TxD- pins of the corresponding port.

Auto 485 (2 port RS-422/485 models only):

Install this jumper to tri-state the RS-485 transmitters when the computer boots or is reset. Note that this jumper can be overridden by driver/software with RS-485 support. For example, the RS-485 modes in the Windows control panel will take precedence over this jumper.
Note also that Auto 485 is a single jumper. The second site is not in use. See Figure 1 for the location of this jumper.

Half Duplex and Multi-drop Slave modes require you to select the appropriate mode via software. Please refer to the readme.txt files found in the appropriate directories on the BlueStorm/LP CD.

Connectors/Pinouts

Table 1: DB-25 Female Pinouts (2 port connector)

Pin No.	Port No.	RS-232 Signal	Signal Direction	RS-422/485 Signal	Signal Direction
1	2	SG	signal gnd.	SR	signal ref.
2	1	TXD	output	TXD-	output
3	1	RXD	input	TXD+	output
4	1	RTS	output	RTS-	output
5	1	CTS	input	RTS+	output
6	1	DSR	input	CTS-	input
7	1	SG	signal gnd.	SR	signal ref.
8	1	DCD	input	RXD+	input
9	2	TXD	output	TXD-	output
10	2	RXD	input	TXD+	output
11	2	RTS	output	RTS-	output
12	2	CTS	input	RTS+	output
13	2	DSR	input	CTS-	input
14		NC	no connect	NC	no connect
15		NC	no connect	NC	no connect
16		NC	no connect	NC	no connect
17		NC	no connect	NC	no connect
18		NC	no connect	NC	no connect
19	2	DTR	output	RXD-	input
20	1	DTR	output	RXD-	input
21		NC	no connect	NC	no connect
22	1	RI	input	CTS+	input
23	2	RI	input	CTS+	input
24		NC	no connect	NC	no connect
25	2	DCD	input	RXD+	input

Cable CB002 sends the signals to two DB-9 male connectors. See Table 4 for pinout details.
NOTE: This is not the pinout of DB-25 cable CB007. See Table 4 for pinout details.

Table 2: HDB-44 Pinouts (4 port connector)

Pin No.	Port No.	RS-232 Signal	Signal Direction	RS-422/485 Signal	Signal Direction
1	1	TXD	output	TXD-	output
2	1	RTS	output	RTS-	output
3	1	DCD	input	RXD+	input
4	1	RXD	input	TXD+	output
5	2	TXD	output	TXD-	output
6	2	RTS	output	RTS-	output
7	2	DCD	input	RXD+	input
8	2	RXD	input	TXD+	output
9	3	TXD	output	TXD-	output
10	3	RTS	output	RTS-	output
11	3	DCD	input	RXD+	input
12	3	RXD	input	TXD+	output
13	4	TXD	output	TXD-	output
14	4	RTS	output	RTS-	output
15	4	DCD	input	RXD+	input
16	1	CTS	input	RTS+	output
17	1	SG	signal gnd.	SR	signal ref.
18		NC	no connect	NC	no connect
19		NC	no connect	NC	no connect
20	2	CTS	input	RTS+	output
21	2	SG	signal gnd.	SR	signal ref.
22		NC	no connect	NC	no connect
23	3	CTS	input	RTS+	output
24	3	SG	signal gnd.	SR	signal ref.
25		NC	no connect	NC	no connect
26		NC	no connect	NC	no connect
27	4	CTS	input	RTS+	output
28	4	SG	signal gnd.	SR	signal ref.
29		NC	no connect	NC	no connect
30	4	RXD	input	TXD+	output
31	1	DSR	input	CTS-	input
32	1	DTR	output	RXD-	input
33	1	RI	input	CTS+	input
34		NC	no connect	NC	no connect
35	2	DSR	input	CTS-	input
36	2	DTR	output	RXD-	input
37	2	RI	input	CTS+	input
38		NC	no connect	NC	no connect
39	3	DSR	input	CTS-	input
40	3	DTR	output	RXD-	input
41	3	RI	input	CTS+	input
42	4	DSR	input	CTS-	input
43	4	DTR	output	RXD-	input
44	4	RI	input	CTS+	input

Cable CB003 sends the signals to four DB-9 male connectors. Cable CB007 sends the signals to four DB-25 connectors. See Table 4 for pinout details.

Table 3: VHDCI-68 Female (8 port connector)

Pin No.	Port No.	RS-232 Signal	Signal Direction	RS-422/485 Signal	Signal Direction
1	1	TXD	output	TXD-	output
2	1	RI	input	CTS+	input
3	1	DCD	input	RXD+	input
4	1	DTR	output	RXD-	input
5	1	RTS	output	RTS-	output
6	1	DSR	input	CTS-	input
7	1	RXD	input	TXD+	output
8	1	CTS	input	RTS+	output
9	2	TXD	output	TXD-	output
10	2	RI	input	CTS+	input
11	2	DCD	input	RXD+	input
12	2	DTR	output	RXD-	input
13	2	RTS	output	RTS-	output
14	2	DSR	input	CTS-	input
15	2	RXD	input	TXD+	output
16	2	CTS	input	RTS+	output
17	1, 2	SG	signal gnd.	SR	signal ref.
18	3, 4	SG	signal gnd.	SR	signal ref.
19	3	TXD	output	TXD-	output
20	3	RI	input	CTS+	input
21	3	DCD	input	RXD+	input
22	3	DTR	output	RXD-	input
23	3	RTS	output	RTS-	output
24	3	DSR	input	CTS-	input
25	3	RXD	input	TXD+	output
26	3	CTS	input	RTS+	output
27	4	TXD	output	TXD-	output
28	4	RI	input	CTS+	input
29	4	DCD	input	RXD+	input
30	4	DTR	output	RXD-	input
31	4	RTS	output	RTS-	output
32	4	DSR	input	CTS-	input
33	4	RXD	input	TXD+	output
34	4	CTS	input	RTS+	output
35	5	TXD	output	TXD-	output
36	5	RI	input	CTS+	input
37	5	DCD	input	RXD+	input
38	5	DTR	output	RXD-	input
39	5	RTS	output	RTS-	output
40	5	DSR	input	CTS-	input
41	5	RXD	input	TXD+	output
42	5	CTS	input	RTS+	output
43	6	TXD	output	TXD-	output
44	6	RI	input	CTS+	input
45	6	DCD	input	RXD+	input
46	6	DTR	output	RXD-	input

Continued on next page

Table 3: VHDCI-68 Female (continued)

Pin No.	Port No.	RS-232 Signal	Signal Direction	RS-422/485 Signal	Signal Direction
47	6	RTS	output	RTS-	output
48	6	DSR	input	CTS-	input
49	6	RXD	input	TXD+	output
50	6	CTS	input	RTS+	output
51	5, 6	SG	signal gnd.	SR	signal ref.
52	7, 8	SG	signal gnd.	SR	signal ref.
53	7	TXD	output	TXD-	output
54	7	RI	input	CTS+	input
55	7	DCD	input	RXD+	input
56	7	DTR	output	RXD-	input
57	7	RTS	output	RTS-	output
58	7	DSR	input	CTS-	input
59	7	RXD	input	TXD+	output
60	7	CTS	input	RTS+	output
61	8	TXD	output	TXD-	output
62	8	RI	input	CTS+	input
63	8	DCD	input	RXD+	input
64	8	DTR	output	RXD-	input
65	8	RTS	output	RTS-	output
66	8	DSR	input	CTS-	input
67	8	RXD	input	TXD+	output
68	8	CTS	input	RTS+	output

Cable CB009 will send the signals to eight DB-9 male connectors. See <u>Table 4</u> for the DB-9 pinouts

Table 4: Pinouts and Control Signals for DB-9 and DB-25 Male connectors

Pin #		RS-232		RS-422/485	
DB-9	DB-25	Signal	Signal Direction	Signal	Signal Direction
1	8	DCD	input	RxD +	input
2	3	RxD	input	TxD +	output
3	2	TxD	output	TxD –	output
4	20	DTR	output	RxD –	input
5	7	SG	signal gnd.	SR	signal ref.
6	6	DSR	input	CTS –	input
7	4	RTS	output	RTS –	output
8	5	CTS	input	RTS +	output
9	22	RI	input	CTS +	input

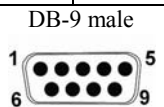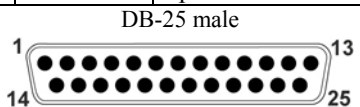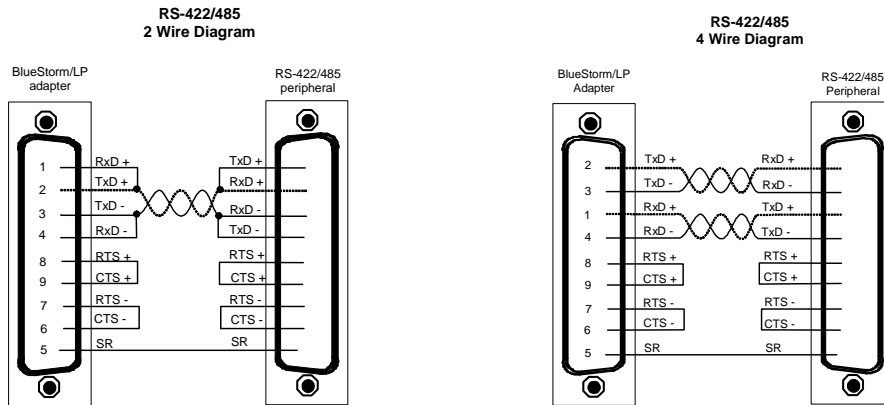| DB-9 male	DB-25 male
1 ●●●●● 5 6 ●●●● 9	1 ●●●●●●●●●●●●● 13 14 ●●●●●●●●●●●● 25

Figure 5: RS-422/485 Wiring Diagrams

Software Installation

The BlueStorm/LP provides support for QNX, Linux, Windows 2000/XP/XPe and Windows NT. Please refer to the readme.txt files found in the appropriate directories on the BlueStorm/LP CD. These files contain technical tips or release notes concerning installation and configuration of the device driver. For further information concerning software installation of BlueStorm/LP products please visit the Connect Tech website at www.connecttech.com.

If you are interested in a device driver for an operating system not listed please contact the Connect Tech Sales Department.

Windows XP Installation

The following instructions outline how to install the BlueStorm/LP to a computer running Windows XP. If you did not receive the Windows XP driver on your BlueStorm/LP driver CD, please go to the Download Zone of the Support Center on the Connect Tech website for product manuals, installation guides, device driver software, diagnostic utilities and updates.

After installing the BlueStorm/LP adapter in your computer system turn on your system and the Found New Hardware Wizard will appear.

1. Insert the BlueStorm/LP CD into your drive. Choose what you want the wizard to do by selecting Install from a list or specific location (Advanced). Select Next.
2. Choose Select removable media (floppy, CD-ROM) and Include this location in the search and type D:\Drivers\Win2K-XP, where D is the drive letter of your CD ROM. Now select Finish.
3. The Found New Hardware Wizard will repeat steps 3 through 5 to complete the installation of the serial ports. Please follow the on-screen instructions. Installation is complete when no more dialogue boxes appear.

You can now verify the presence of BlueStorm/LP serial ports in your system by going to Start - Control Panel – System Properties – Hardware - Device Manager – Multi-port serial adapters.
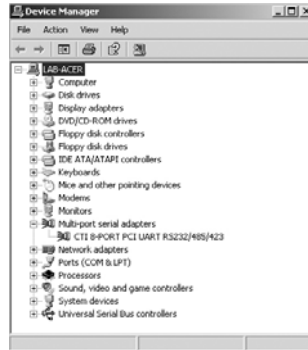
Specifications

Operating Environment

- Storage temperature: -55° C to 125° C
- Operating temperature: 0° C to 70° C
- Humidity: 95% non-condensing

PC Bus Interface

3.3V or 5V (2 and 8 port models) or 5V (4 port model) PCI bus. The BlueStorm/LP can ship with low and standard profile brackets.

Dimensions

Low profile form factor - PCI 2.2, MD1 compliant

Communications

Baud Rates

RS-232: 50 bps – 921.6 Kbps
RS-422/485: 50 bps – 1.8432 Mbps

Connectors

DB-9 male fan-out cable (custom cable solutions also offered)

Surge Suppression

IEC 1000-4-3 compatible on all signals, all ports

Regulatory Approvals

FCC Class A, Part 15; ICES-003,   (EN 55022, EN55024)

Software Compatibility

Windows 2000/XP, Windows NT, QNX 4, QNX 6. (Check the download zone or contact Connect Tech for the most up-to-date list)