CYBERDATA CORPORATION

PCI USB PlusPower Four Port Host Controller

OPERATIONS MANUAL

04-23-04

Order #	BOM #	# of 5V (020390A)	# of 12V (020392A)	# of 24V (020391A)
010653A	020420F	1	2	1
010654A	020389F	0	3	1
010655A	020387F	0	4	0
See Configuration Options at end of document				

PRODUCT DESCRIPTION

The CyberData PlusPower PCI USB card provides a simple and affordable way to add four Powered USB ports to a standard PC. With this USB upgrade, it is easy to connect devices that need more than the 500 mA of +5 volts typically supplied by a standard USB interface.

COMPATIBILITY

- IBM PC Windows 98SE, 2000, & Windows XP Compatible

- Linux compatible for systems with kernel equal or greater than 2.4.2

- Apple Computer Compatible

- Compliant with the Universal Serial Bus (USB) Specification Revision 2.0

- Compliant with Enhanced Host Controller Interface (EHCI) Specification Revision 0.95

- Compliant with Universal Host Controller Interface (UHCI) Specification Revision 1.1

FEATURES

- 4 powered-USB ports
- Plug-N-Play installation
- Two Year Warranty

OPTIONS

- Several models and voltage configuration options
- An optional +24 volt boost converter at 2.0 A for POS printer

PRODUCT COMPONENTS (Included items)

- CyberData PlusPower PCI board
- Instruction / Operations Manual (this document) (1)
- Drivers Disk.

**Figure – 1 – User Accessible Component Identification –
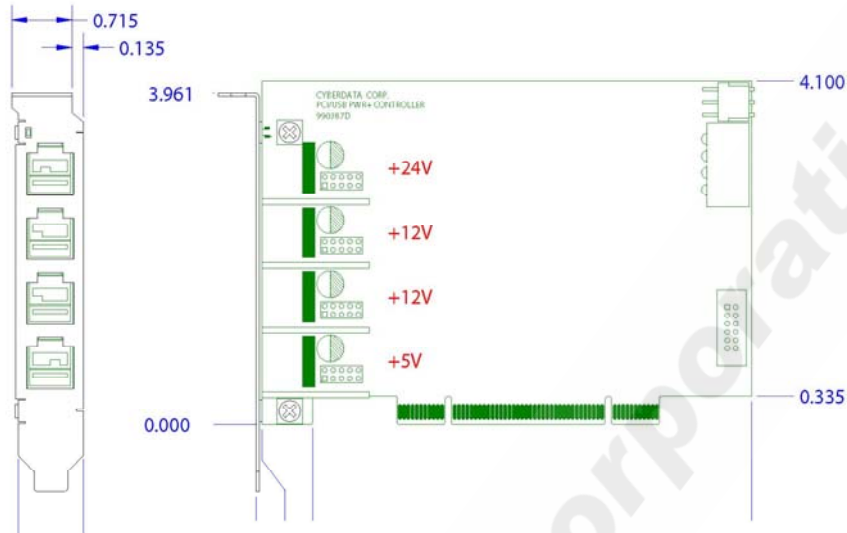Example of 010653A (See Table on First Page)**

J2 (5Volt)   J3 (12Volt)   J4 (12Volt)   J7 (24Volt)   Top
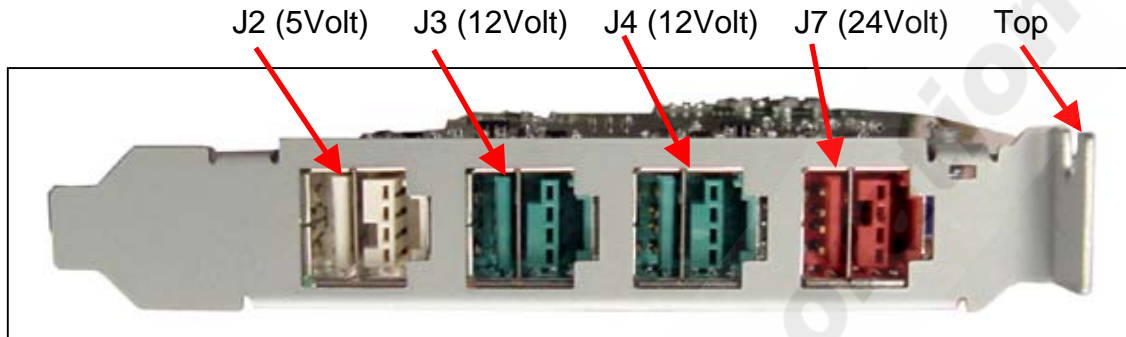
INSTALLATION

Figure – 2 – Installing the PCI card into a standard Chassis

Power Connection Diagram *
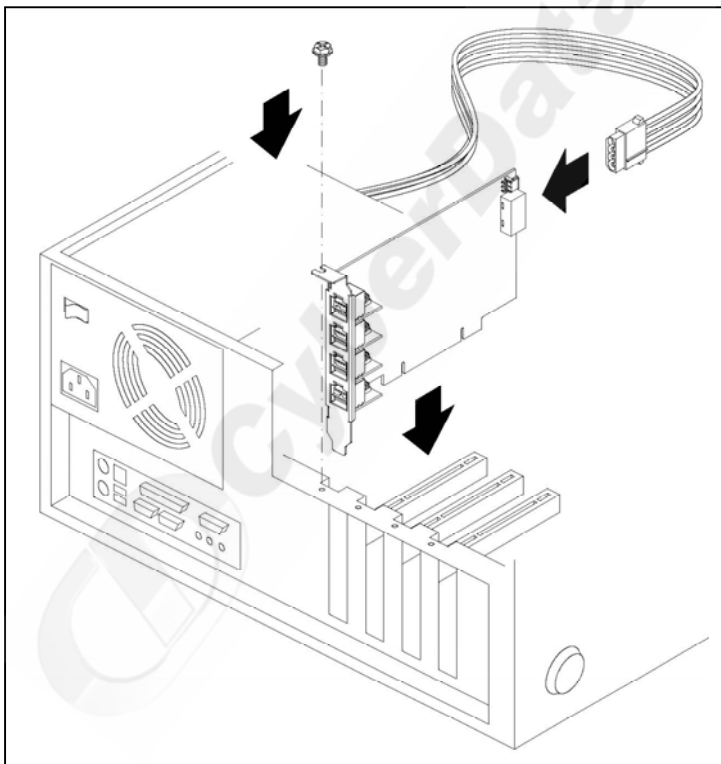
*** Please see "Powered USB Ops Manual appendix A Optiplex_030929.doc" for
installation instructions for Dell™ Optiplex PC.**

Figure – 3 – Board Layout – Plane & End views (Example)

USB PlusPower connections

The PlusPower connections are a standard USB "A" type connector with 4 extra pins designed to supply higher voltages. The "A" connector side of this product can be used, by itself, without the locking PlusPower connector being used.
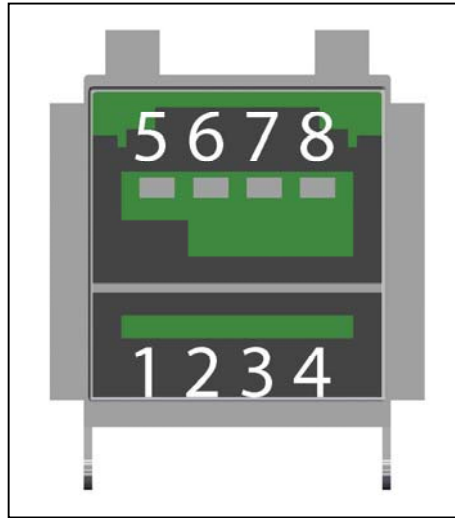
Connector Keying
The PlusPower connectors are keyed in such a way as to only allow the correct voltage cables to be installed.

Connector Keying Picture with Color Coding

Ivory	Teal	Red
5 Volt Keyed 1 A each	12 Volt Keyed 1 A each	24 Volt Keyed 2 A

USB PlusPower Connector Pin Assignments

PIN OUT

Pin	Signal	Description
1	Vbus	USB standard "A"
2	D-	USB standard "A"
3	D+	USB standard "A"
4	Ground	USB standard "A"
5	Ground	USB PlusPower
6	Vplus	USB PlusPower
7	Vplus	USB PlusPower
8	Ground	USB PlusPower
Shell	Shield	

Configuration options

The PlusPower PCI card has several different configuration versions

010653A
PCI USB+PWR HOST CONTROLLER
1 X 5V
2 X 12V
1 X 24V

010654A
PCI USB+PWR HOST CONTROLLER
3 X 12V
1 X 24V

010655A
PCI USB+PWR HOST CONTROLLER
4 X 12V

PLUSPOWER CABLE SOURCES

USB PlusPower cable parts are manufactured by FCI/Berg Electronics.
http://www.fciconnect.com/

Partial or completed cable assemblies may be ordered from CyberData or they may be procured from other sources.

For more information about the cables and connectors of PoweredUSB use the following link: **www.poweredusb.org**

OPERATION

The device is a USB EHCI/UHCI compliant Host controller conforming to the USB 2.0 specification, with the addition of the Plus Powered ports.   When installed, it is identified as a "USB Host Controller" and "USB Root Hub".

Power Management option jumper

The Controller board has jumpers JP1 and 2 that should be used to set the PCI controller for "NO PM" when using the controller with PC's that do not support PCI 2.2 or Power Management. The Jumpers are set to "2.2" if the PC does support PCI 2.2 or Power management.

Power supply

Voltage required by the circuitry of the card is supplied from the PCI connector.

Power for the PlusPower connectors are supply from a 4 pin connector located on the PCB. This connector allows a PC's Disk Drive power supply connector to provide the higher currents required by the PlusPower peripherals.

The amount of current that can be supplied by the PlusPower PCI card is dependent on the size of the power supply located in the Host PC.   If, for example, the PC has a 6 amp 12 volt supply and the PC's mother board is not using this supply for any internal uses, a total of 6 amps would be available between the two +12 volt ports.

Optional +24 Volt Integrated Power Supply

As an option, the PlusPower PCI card can be populated with an integrated +24V boost power converter. In retail applications, this port is designed to supply enough power for an Epson TM-H6000II multifunction printer.

The USB+Power PCI Host Adapter hosts a true load balanced Step-up power converter which creates +24V (+38V) from Available +5V AND +12V from the Host's Power Supply. The Voltages used for the conversion are provided through the use of a standard Hard Disk Drive style connector on the back of the Host Adapter (See Figure 2 on page 2).

This new power supply shares the power necessities of the +24V according to a set of jumpers designed to limit the intake current on both the +5V and +12V as to not shut-down the Host PC due to extreme output demands.

Of course, Hosts do have different power supplies with different available currents so the settings can potentially be custom set for a particular host/required load. Jumpers JP5(1,2,4,8) and JP12(1,2,4,8) set how much

current the step-up power supply is allowed to drain from both the +5V and +12V respectively.
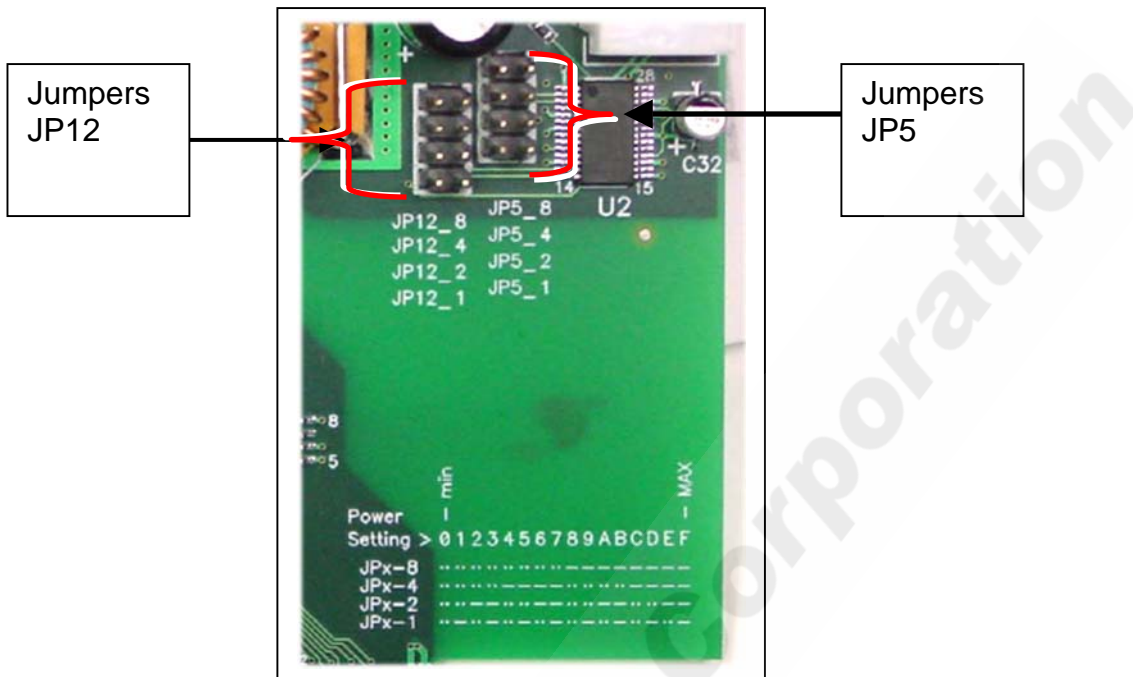
The Host Adapter is shipped with JP5_2 and JP12_2 installed which can support an Epson H6000 Printer on most Host PCs. If a particular Host has more available power or if a load is more demanding, the Jumpers can be upgraded gradually to allow for more power.

Cyberdata can work with OEM/VARs to find and fine-tune the particular sweet spot settings for a particular load and host. Cyberdata classifies the particular jumper settings by a two digit hexadecimal code which allows the OEM/VAR to order the board with the jumpers preset for their application.

There are some easy set points that the OEM/VAR can be experimented with. Note that changing the settings does not require shutting down the host so it is easy to change the jumpers and see how that affected the current demand on both 5 and 12V leads. Always start with the lowest setting and bring it up gradually. Starting at the highest setting can turn out to bee too high a load for the host and shut down the HOST due to an Over Current Protection (OCP). Here are some settings to try:

11 - JP5_1 and JP12_1
22 - JP5_2 and JP12_2
  Very easy on the load but provides/requires some more current.

44 - JP5_4 and JP12_4
  Works with most 250W/300W Hosts while providing plenty current.

88 - JP5_8 and JP12_8

Provides considerable output current, recommended for 350W+ Hosts

There are a number of combinations above and between these settings that can be achieved, *Please contact Cyberdata for assistance with power consumption analysis issues.*
service@cyberdata.net

Current Maximums:

Standard USB (Lower) 'A' supply:

Each lower portion of the 'A' Ports provides +5V @ 500mA.   If more than 500 mA is drawn from a port, that port goes into USB Over-current; the +5 volts is turned off, and a fault condition is reported to the host as detailed in the USB 2.0 Specifications.

PlusPower USB (Upper) supply:

Depending on which controller version is used, the ports have a maximum current capability of:

+5V Ports – 1 Amp each

+12V Ports – 1 Amp each

+24V Port - 2 Amps   (maximum one port per card)

Each +5V and +12V Plus Power port is protected with a 1 Amp PTC (Positive Temperature Coefficient) resetable fuse. The PTC may temporarily allow more that 1 Amp to be drained. Typically, a 1 Amp PTC will shut off after approximately 15 seconds drawing more than1 Amp. The PTC will turn off the power for each individual port if an unusual overload is sustained.

The +24V Port is protected by a PTC that allows 2A continuous current. This PTC will go into protection shutdown if a sustained overload is applied. For example, with a 3 amp overload, the PTC will shut down the port after approximately 30 seconds.

FOR ALL PORTS

Standard lower USB 'A' portion of the connector

This portion of the connector will not support more that 500mA, and the power will be shut down immediately if any load is greater than 500mA.

Figure – 4 – Example USB Plus Power & USB 'A' Plug-in connections
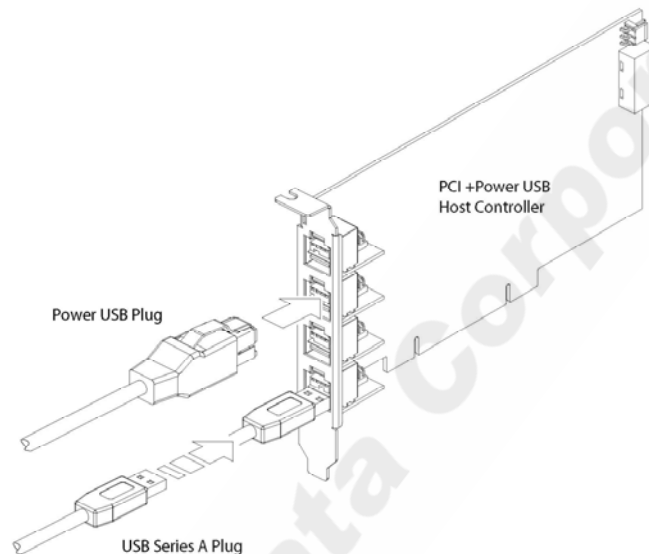
Plus Power portion of the USB connector

This portion of the connector is a little more flexible and will allow for temporary overloads. Should any Plus Power port be shorted, it is likely that the host's power supply will go into short protection mode and shut the host PC down. Depending on the duration of the short, the PC power supply may need to be turned off by unplugging the power cord for a few seconds before it can be turned on again.

LICENSE NOTE:

"The PlusPower USB controller board contains certain technology covered by a patent held by IBM Corporation. Cyberdata has obtained a license from IBM that permits Cyberdata, among other things, to make and to sell or lease products that incorporate this technology. The license also permits these products to be resold or released by any entity after they have been initially sold by Cyberdata."