USB22 Series

ARCNET® Network Interface Modules with USB Interface

INSTALLATION GUIDE

INTRODUCTION

The USB22 Series of ARCNET Network Interface Modules (NIMs) links Universal Serial Bus (USB) computers with the ARCNET Local Area Network (LAN). USB has become popular for connecting desktop or laptop computers to peripherals because of its very high-speed interface (up to 480 Mbps) and its convenience of a powered exterior interface with no need to open the computer.

Each USB22 includes a COM20022 ARCNET controller that can support data rates up to 10 Mbps and a microcontroller to transfer data between the ARCNET and either USB 2.0 or USB 1.1 devices. The NIM is powered from a computer USB port or a USB hub. Models exist for the most popular ARCNET physical layers.

A USB cable and a disk with software for Windows® 2000/XP is also provided. When a USB cable first connects the NIM to a Windows® 2K/XP machine and you are prompted for a driver, use the USB driver provided on the CD-ROM. Follow the instructions provided by Windows to install this driver. If Windows reports that this driver has not been tested, just select “continue” and complete the installation.

CONTEMPORARY CONTROLS®

SPECIFICATIONS

Electrical

Current demand: 400 mA (max)

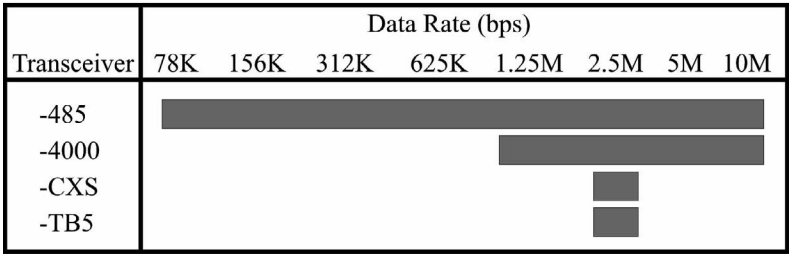
Environmental

Operating temperature: 0°C to +60°C

Storage temperature: –40°C to +85°C

Humidity: 10% to 95%, non-condensing

ARCNET Data Rates



Shipping Weight

1 lb. (.45 kg)

Compatibility

ANSI/ATA 878.1

USB 1.1 and USB 2.0

Regulatory Compliance

CE Mark

CFR 47, Part 15 Class A

LED Indicators

ARCNET Activity — green

USB — green

RJ-45 Connector Pin Assignments

	4000	485	TB5
4	Line	Line –	Line –
5	Line	Line +	Line +

(All other pins are unused.)

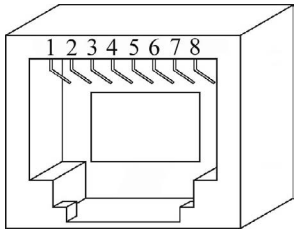


Figure 1 — RJ-45 Connector

Mechanical *(The case dimensions shown below are valid for all models.)*

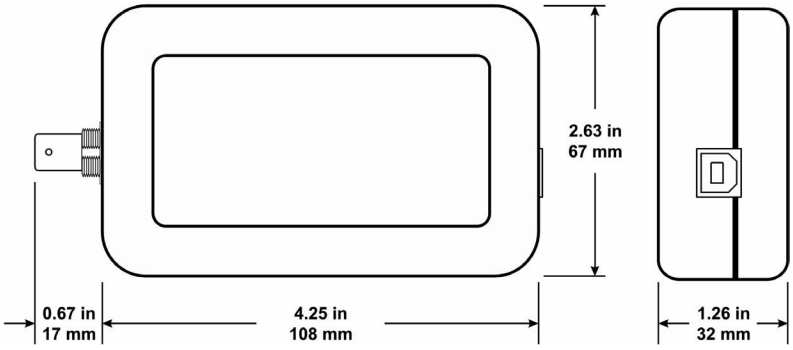


Figure 2 — USB22-CXB Dimensions

ELECTROMAGNETIC COMPATIBILITY

All USB22 models comply with Class A radiated and conducted emissions as defined by EN55022 and CFR 47, Part 15. This equipment is intended for use in non-residential areas.

Warning

This is a Class A product as defined in EN55022. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

INSTALLATION

SOFTWARE

Driver installation instructions are provided in the *readme* file located on the disk that accompanies the product.

INDICATOR LIGHTS

ARCNET: This LED will flash green in response to any ARCNET activity.

USB: This LED glows green so long as a valid active USB connection exists to an attached computer.

FIELD CONNECTIONS

The USB22 is available in four models that vary by transceiver type for connecting to an ARCNET LAN via a particular kind of cable. Each model's transceiver is identified by the suffix (-4000, -485, -CXB or -TB5) separated from the main number by a hyphen.

-CXB Coaxial Bus

Generally two types of coaxial cables are used with ARCNET**:** RG-62/u and RG-59/u. RG-62/u is recommended because it matches the 93-ohm -CXB impedance and can thus achieve the maximum 1000-foot segment distance. Although RG-59/u does not match the -CXB impedance (it is 75-ohm cable), it will still work but the segment length may be limited. Never attach coax cable directly to the USB22-CXB; always use the provided BNC "T" connector. The "T" connector allows the coaxial bus to continue as shown with device A in *Figure 3*. Apply the provided 93-ohm BNC terminator to the "T" if the USB22 terminates the coax in an end-of-line situation as shown with device B in *Figure 3*.

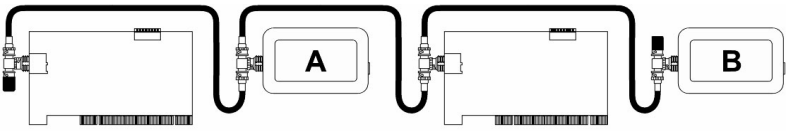


Figure 3 — Possible Connections for the USB22-CXB

-TB5 Twisted-pair Bus

The -TB5 transceiver accommodates twisted-pair cabling via a pair of RJ-45 jacks which allow the unit to be daisy-chained at any location on the bus segment Usually IBM type 3 unshielded twisted-pair cable (UTP) is used, but shielded cable (STP) can also be used to provide continuous shielding between devices.

When the USB22-TB5 is located at the end of a bus segment, Apply the provided 100-ohm terminator to the empty RJ-45 jack to match the cable impedance.

-485 DC-Coupled EIA-485

Dual RJ-45 jacks are provided for each DC-coupled EIA-485 segment. A DC-coupled segment can be up to 900 feet of IBM type 3 (or better) STP or UTP cable, and as many as 17 nodes can occupy a segment. Make sure the phase integrity of the wiring remains consistent throughout the network. All phase A signals on NIMs and hubs must connect together. The same applies to phase B. Refer to *Figure 1* for connector wiring.

Termination

When the USB22-485 is located at the end of a bus segment, apply the provided 100-ohm terminator to the empty RJ-45 jack.

Bias

Bias must also be applied to the network to prevent the differential receivers from assuming invalid logic states when the signal line is floated. Bias is provided on the USB22-485 by a set of 806-ohm pull-up and pull-down resistors. Refer to the existing NIM user manual for a discussion of bias requirements.

Ground

All devices on the segment should be referenced to the same ground potential to achieve the common mode voltage (+/–7 Vdc) required for the EIA-485 specification. A ground connection is not provided by the USB22-485. It is assumed adequate grounding is supplied by the existing equipment. Refer to the existing equipment user manual for a discussion of grounding requirements.

-4000 AC-Coupled EIA-485

The AC-coupled EIA-485 transceiver offers advantages over the DC-coupled version. No bias adjustments are needed and wiring polarity is unimportant. Much higher common mode voltage levels can be achieved with AC coupling because the transformer coupling has a breakdown rating of 1000 VDC.

However, AC-coupling also has disadvantages. AC-coupled segments are shorter (700 feet max) and are limited to 13 nodes compared to 17 for DC-coupling. Also, AC-coupled transceivers operate only at 1.25, 2.5, 5.0 and 10 Mbps, whereas DC-coupled transceivers function over all standard data rates.

Cabling rules for USB-4000 are similar to those for USB-485. Wire nodes in a daisy-chain fashion. Refer to *Figure 1* for connector pin assignments. Termination should only be applied to a device located at the two ends of the segment. Do not mix AC-coupled and DC-coupled devices on the same segment; however, bridging the two technologies is possible with active hubs that have appropriate transceivers.

NEED MORE HELP INSTALLING THIS PRODUCT?

Technical documents, software drivers and utility programs can be downloaded from **www.arccontrol.com**. When contacting one of our offices by telephone, ask for Technical Support.

Warranty

Contemporary Controls (CC) warrants this product to the original purchaser for two years from the product shipping date. Product returned to CC for repair is warranted for one year from the date the repaired product is shipped back to the purchaser or for the remainder of the original warranty period, whichever is longer.

If the product fails to operate in compliance with its specification during the warranty period, CC will, at its option, repair or replace the product at no charge. The customer is, however, responsible for shipping the product; CC assumes no responsibility for the product until it is received.

CC's limited warranty covers products only as delivered and does not cover repair of products that have been damaged by abuse, accident, disaster, misuse, or incorrect installation. User modification may void the warranty if the product is damaged by the modification, in which case this warranty does not cover repair or replacement.

This warranty in no way warrants suitability of the product for any specific application. IN NO EVENT WILL CC BE LIABLE FOR ANY DAMAGES INCLUDING LOST PROFITS, LOST SAVINGS, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT EVEN IF CC HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR FOR ANY CLAIM BY ANY PARTY OTHER THAN THE PURCHASER.

THE ABOVE WARRANTY IS IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED OR STATUTORY, INCLUDING THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE OR USE, TITLE AND NONINFRINGEMENT.

Returning Products for Repair

Before returning a product for repair, contact Customer Service. A representative will instruct you about our return procedure.

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DECLARATION OF CONFORMITY

Applied Council Directives:

Electromagnetic Compatibility Directive, 89/336/EEC Council Directive as amended by Council Directive 92/31/EEC & Council Directive 93/68/EEC

General Product Safety Directive 92/59/EEC

Standard to which Conformity is Declared

EN 55022:1995 CISPR22: 1993, Class A, Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment

EN 55024:1998, Information Technology Equipment — Immunity Characteristics — Limits and Methods of Measurement

Manufacturer:	**Authorized Representative:**
Contemporary Control Systems, Inc. 2431 Curtiss Street Downers Grove, IL 60515 USA	Contemporary Controls Ltd Sovereign Court Two, UWSP Sir William Lyons Road Coventry CV4 7EZ UK

Type of Equipment:

Industrial local area network hub

Models:

USB22-485
USB22-4000
USB22-CXB
USB22-TB5

I, the undersigned, hereby declare that the products specified above conform to the listed directives and standards.

George M. Thomas, President September, 2006