



PC Accessories

CLE 500

**CameraLink Extender with 2
Power Supplies & 2 MDR-26
Cables**

USER'S MANUAL

VER. G • JUN 2004

No part of this manual may be reproduced without permission

CyberResearch[®], Inc.

www.cyberresearch.com

**25 Business Park Dr., Branford, CT 06405 USA
203-483-8815 (9am to 5pm EST) FAX: 203-483-9024**

**©Copyright 2004
All Rights Reserved.**

June 2004

The information in this document is subject to change without prior notice in order to improve reliability, design, and function and does not represent a commitment on the part of CyberResearch, Inc.

In no event will CyberResearch, Inc. be liable for direct, indirect, special, incidental, or consequential damages arising out of the use of or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of CyberResearch, Inc.

Trademarks

“CyberResearch,” and “CLE 500,” are trademarks of CyberResearch, Inc. Other product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective companies.

• NOTICE •

CyberResearch, Inc. does not authorize any CyberResearch product for use in life support systems, medical equipment, and/or medical devices without the written approval of the President of CyberResearch, Inc. Life support devices and systems are devices or systems which are intended for surgical implantation into the body, or to support or sustain life and whose failure to perform can be reasonably expected to result in injury. Other medical equipment includes devices used for monitoring, data acquisition, modification, or notification purposes in relation to life support, life sustaining, or vital statistic recording. CyberResearch products are not designed with the components required, are not subject to the testing required, and are not submitted to the certification required to ensure a level of reliability appropriate for the treatment and diagnosis of humans.

Intentionally Blank

Table of Contents

CLE 500 Product Manual

- 1 Introduction - - - - - 1**
 - 1.1 CLE 500 - - - - - 1**
 - 1.2 LASER Protection- - - - - 2**
 - 1.3 System Features - - - - - 2**
 - 1.4 Technical Specifications - - - - - 3**

- 2 Installation - - - - - 4**
 - 2.1 Intended Application - - - - - 4**
 - 2.2 Small Form Factor - - - - - 4**
 - 2.3 Increased Security and Efficiency - - - - - 5**
 - 2.4 Order of Installation Events- - - - - 6**
 - 2.5 Connecting the CLE 500 system - - - - - 7**
 - 2.5.1 Fiber Cable - - - - - 7
 - 2.5.2 Digital Video Camera Side - - - - - 7
 - 2.5.3 Digital Video Frame Grabber Side - - - - - 7
 - 2.5.4 AC Power - - - - - 7

3	Regulatory & Safety	9
3.1	Safety Requirements	9
3.1.1	Symbols found on the Product	9
3.1.1.1	Class 1M LASER Labeling	9
3.1.2	Product Serial Number	9
3.1.3	Connection to the Product	10
3.2	Regulatory Compliance	10
3.3	North America	10
3.4	Australia & New Zealand	10
3.5	European Union	11
3.5.1	Declaration of Conformity	11
3.5.2	Standards With Which the Products Comply	11
3.5.3	Supplementary Information	12
4	How to Contact Us	13
4.1	Customer Support	13
4.1.1	Website	13
4.1.2	E-mail	14
4.1.3	Telephone	14
4.1.4	Fax	14
4.2	Product Support	14
4.2.1	Warranty	15
4.2.2	Our Address	15
A	Cameras and Frame Grabbers Compatibility Chart	16
B	CLE 500 Mounting Template	18

1 Introduction

Introducing the CyberResearch, Inc. CLE 500 System

1.1 CLE 500

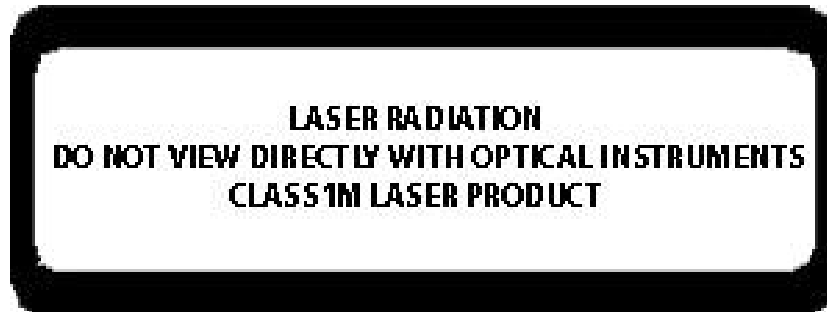
The CyberResearch, Inc. CLE 500 is a camera-link extension system. The CLE 500 system consists of a pair of components that are interconnected using a duplex multimode fiber optic cable, allowing Camera Link video support up to 500 meters (1640 feet) from the host computer. Each pair consists of a Camera side unit and a Frame Grabber side unit (both units are similar in appearance, but are labeled differently).

Figure 1.1 CyberResearch, Inc.'s CLE 500 Unit shown



1.2 LASER Protection

The CLE 500 system is designed and identified as a Class 1M LASER product.



In order to avoid possible exposure to laser energy, it is good practice to attach the fiber optic cables prior to applying power to the CLE 500. If the fiber optic cable should become disconnected, DO NOT attempt to look into the cable or the panel mounted connector.

1.3 System Features

The CLE 500 systems are designed for high-resolution camera extension applications. The ability to remotely locate the CPU away from the camera allows more control of your computer environment. It is possible to position the camera in any setting while keeping the computer secure in a remote, controlled location.

Each CLE 500 system includes the following features:

- Supports the Camera Link base configuration
- Extends digital video signals up to 500 meters (1640 feet)
- Transparent operation and functionality - no user interaction required
- Signal transmission via fiber optic cable - no RF interference
- Uses duplex multi-mode fiber, 50 or 62.5 micron, with SC-type connectors
- Units are self-contained and do not require user adjustments
- Two universal AC power Adapter provided

1.4 Technical Specifications

Each CyberResearch, Inc. CLE 500 system is designed to the following specifications:

Electrical Cable to Computer	Two 2m (6 1/2 feet) MDR-26 male-to-male cables (supplied with system)
Connectors	Frame Grabber side: MDR-26 female video input (1) Dual SC-type fiber connector (1) 2.5mm power connector (AC adapter provided and required) Camera side: MDR-26 female video output (1) Dual SC-type fiber connector (1) 2.5mm power connector (AC adapter provided and required)
Protocol	Camera Link compliant (supports base configuration)
Indicators	Two LEDs on each CLE 500 module: Loss of Signal [LOS] (red ON when no signal), near SC connector Power (green ON when power is applied)
Optical Cable	Duplex Fiber, multi-mode, 50 micron or 62.5 micron, SC-type connectors (Fiber Cable is either customer-supplied or can be ordered from CyberResearch)
Operating Temperature and Humidity	0 to 50 °C (32 to 122 °F), 5 to 95% RH, non-condensing
Housing Dimensions	Approx. 6 1/2 in x 5 1/2 in x 1-1/4 in high (165.1mm x 139.7mm x 31.75mm high) Wall-mount keyhole slot spacing: 5 inches x 5 1/2 inches
Supply Voltage	+5.0 VDC. Adapter has Universal AC Power Input
DC Current	Camera Side: 740mA; Frame Grabber Side: 900mA
AC to DC Adapter	Input: 100-240VAC, 50-60 Hz, 0.4 Amperes Output: +5VDC @ 1.6 Amperes, 2.5mm barrel plug Two included with each CLE 500 pair
LASER Output Specifications	Wavelengths are 778, 800, 825, and 850 nanometers Clock frequency range is 10MHz to 66MHz Maximum pulse width is 92 nanoseconds Maximum Laser power output in the fiber is 1.6mW

2 Installation

2.1 Intended Application

The CLE 500 from CyberResearch, Inc. permits the placement of a digital camera up to 500 meters (1640 feet) away from the controlling computer without loss of resolution. Traditional copper cables are limited to 10 meters (32.81 feet) in such applications. Each CLE 500 system consists of a pair of electronic units connected by a duplex multi-mode fiber optic cable. The Frame Grabber unit connects to the computer with a 2 meter Camera Link MDR-26 male-to-male cable and the Camera unit connects to the digital camera.

Caution

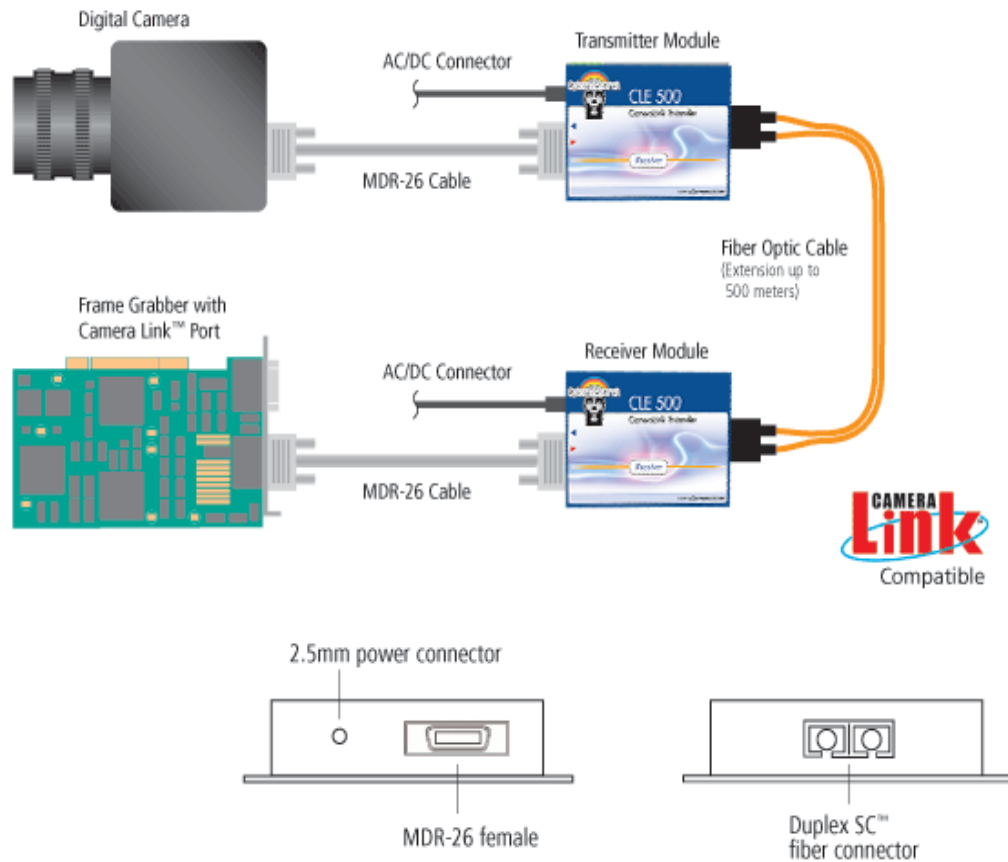
The CLE 500 is a Class 1M LASER product that emits near infrared light.

Note

The fiber optic cables should be attached to the CLE 500 prior to powering up the units.

2.2 Small Form Factor

Each CLE 500 module is wall-mountable, if desired. Mounting centers are provided with keyhole slots (Fiber cable up, MDR-26 connector and power connector down). A mounting template is provided at the end of this manual (Appendix B) for your convenience.

Figure 2.1 CLE 500 Application diagram

2.3 Increased Security and Efficiency

The ability to remote the CPU away from the camera allows more control of the computer environment. Now it is possible to position the camera in virtually any setting while keeping the computer secure in a remote location.

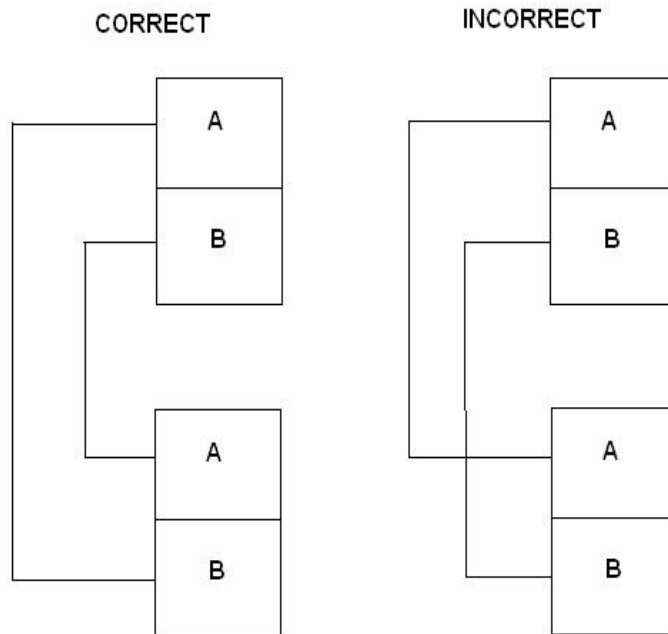
2.4 Order of Installation Events

In order to properly use the CLE 500 system, you must follow this order of events for the initial power-up.

1. Install and connect your Fiber Optic Cable between the Camera side and the Frame Grabber side modules.

Note

Be sure Fiber Optic Cable is positioned as below.



2. Connect the AC Power Adapters to both units, and plug them into a suitable power source.
3. Connect your camera to the Camera side unit, and turn it on.
4. Finally, connect the frame grabber to the Frame Grabber side unit, and start your application software last.

2.5 Connecting the CLE 500 system

All physical connections to the product use industry-standard connectors.

2.5.1 Fiber Cable

A duplex fiber optic cable must be run between the location of the Frame Grabber unit (near your CPU) and the Camera side unit (near the camera). The standard duplex multi-mode fiber cable must be 50 or 62.5 micron, terminated with an SC-type connector and no longer than 1640 running feet (500 meters). Be careful to not kink or pinch the fiber cable as it is being installed, and keep all bend radii to no less than 3 inches (76.2mm).

Connect your fiber cable to the SC-type connector on each CLE 500 pair (one Camera side and one Frame Grabber side). Dress the cable so it will not get crushed, pinched or otherwise damaged.

2.5.2 Digital Video Camera Side

The Camera side unit connects to your video camera using a MDR-26 male-to-male cable.

2.5.3 Digital Video Frame Grabber Side

The Frame Grabber side unit connects to your controlling computers Frame Grabber with an MDR-26 male-to-male cable.

2.5.4 AC Power

Separate wall-pack AC-to-DC converters are included. A power jack is provided on both units and accepts the 5VDC input. The green power LED will light when the unit is receiving power.

The DC power plug has a right-angle connector design.

The AC wall pack has a universal power rating (100-240VAC, 50-60 Hz), and also has slip-on receptacle 'fingers' for various AC power receptacles found throughout the world. Use the appropriate AC power 'fingers' for your country / location. The others are not needed.

Figure 2.2 AC Power receptacle 'fingers' included with each power supply.



3 Regulatory & Safety

3.1 Safety Requirements

3.1.1 Symbols found on the Product

Markings and labels on the product follow industry-standard conventions. Regulatory markings found on the products comply with requirements.

3.1.1.1 Class 1M LASER Labeling



3.1.2 Product Serial Number

The CLE 500 products have a unique serial number, imprinted on a small silver label that is placed on the bottom of the chassis. The serial number includes a day-code. The format for the day-code is 2-digits each for the month, the day and four digits for the year, and two or three digits for a unique unit number.

3.1.3 Connection to the Product

Connections and installation hardware for the product use industry-standard devices and methods. All wiring connections to the customer equipment is done in a fashion to minimize proprietary or customized connectors or cabling. Power connections are made with regionally appropriate power cords and approved methods.

3.2 Regulatory Compliance

The CyberResearch, Inc. CLE 500 products are designed and made in the U.S.A. The CLE 500 products have been tested by a nationally recognized testing laboratory and found to be compliant with the following standards (both domestic USA and many international locations).

3.3 North America

These products comply with the following standards:

Safety

- UL60950 : 2000
- CAN/CSA C22.2 No. 60950-00

LASER Safety

- CDRH 21CFR 1040.10
- Class 1M LASER Product
- Accession Number 0322261

Electromagnetic Interference

- FCC CFR47, Part 15, Class A
- Industry Canada ICES-003 Issue 2, Revision 1

3.4 Australia & New Zealand

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

3.5 European Union

3.5.1 Declaration of Conformity

This product complies with the requirements of the Low Voltage Directive 72/23/EEC and the EMC Directive 89/336/EEC.

3.5.2 Standards With Which the Products Comply

Safety

- IEC60950:1992+A1, A2, A3, A4, A11

LASER Safety

- IEC60825:2001 Parts 1 and 2
- Class 1M LASER Product

Electromagnetic Emissions

- EN55022: 1994 (IEC/CSP1R22: 1993)
- EN61000-3-2/A14: 2000
- EN61000-3-3: 1994

Electromagnetic Immunity

- EN55024: 1998 Information Technology Equipment-Immunity Characteristics
- EN61000-4-2: 1995 Electro-Static Discharge Test
- EN61000-4-3: 1996 Radiated Immunity Field Test
- EN61000-4-4: 1995 Electrical Fast Transient Test
- EN61000-4-5: 1995 Power Supply Surge Test
- EN61000-4-6: 1996 Conducted Immunity Test
- EN61000-4-8: 1993 Magnetic Field Test
- EN61000-4-11: 1994 Voltage Dips & Interrupts Test

3.5.3 Supplementary Information

The following statements may be appropriate for certain geographical regions and might not apply to your location.

Note

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Note

This Class A digital apparatus complies with Canadian ICES-003 and has been verified as being compliant within the Class A limits of the FCC Radio Frequency Device Rules (FCC Title 47, Part 15, Subpart B CLASS A), measured to CISPR 22: 1993 limits and methods of measurement of Radio Disturbance Characteristics of Information Technology Equipment.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

WARNING

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

4 How to Contact Us

4.1 Customer Support

Thank You to our Customers for choosing a CyberResearch, Inc. product for your application. We appreciate your business and are interested in helping you successfully use our products.

CyberResearch, Inc. is here to help you. To contact CyberResearch, Inc., use the following telephone numbers and internet-based methods.

4.1.1 Website

Check out our website for current product offerings, support information, and general information about all of the CyberResearch, Inc. we offer.

Our internet website offers product information on all current systems, including technical specification sheets and installation guides (for viewing on-line or for download), product diagrams showing physical connections, and other information you might need. We are constantly updating our website, so be sure to “refresh” your browser when visiting the CyberResearch, Inc. website to see the most up-to-date information.

Internet: www.cyberresearch.com

Note

Most online documents are stored as Adobe Acrobat “PDF” files. If you do not have the Adobe Acrobat Reader needed to view PDF files, visit www.adobe.com for this free download.

4.1.2 E-mail

CyberResearch, Inc. is staffed Monday through Friday from 9:00AM to 5:00PM, Eastern Time Zone. We will try to respond to your email inquiries promptly, using the following email addresses for your different needs:

sales@cyberresearch.com -- Sales Department - orders, questions or issues

support@cyberresearch.com -- Product support, technical issues or questions, product repairs, requests for Return Authorization, any other issue.

4.1.3 Telephone

Telephone Sales: Contact our expert technically-oriented Sales staff via telephone in Branford, Connecticut, at **(203) 483-8815** or if in the continental US, you may use our toll-free number **(800) 341-2525**. We're here Monday through Friday, 9:00AM to 5:00PM, Eastern Time Zone. Ask for their direct dial phone number when you call!

Telephone Product Support: Contact Product Support via telephone in Branford, Connecticut, at (203) 483-8815. The support lines are manned Monday through Friday, 9AM to 5PM, Eastern Time Zone.

International Sales: Please contact our US Sales staff in Branford, Connecticut, at **(203) 483-8815**. We're here Monday through Friday, 9:00AM to 5:00PM, Eastern Time Zone (same as New York City). If leaving a voice message, please provide a 'best time to call back' so we may reach you at your convenience.

Our switchboard attendant will direct your call during regular business hours. We have an automated attendant answering our main telephone switchboard after regular business hours and holidays. You can leave voice messages for individuals at any time. Our Sales Representatives have direct numbers to speed up your next call to us.

4.1.4 Fax

Our company facsimile number is **(203) 483-9024**. Please indicate the nature of the fax on your cover sheet, and provide return contact information.

4.2 Product Support

CyberResearch, Inc. support personnel are available Monday through Friday from 9:00AM to 5:00PM, Eastern Time Zone.

If your application might require assistance at some time outside of our normal business hours, please contact us beforehand and we will do our best to make arrangements to help you with your CyberResearch, Inc. products.

4.2.1 Warranty

CyberResearch, Inc.'s products carry a limited warranty, see page 23 for details

For specific details about the product warranties, please contact Sales.

4.2.2 Our Address

If you have any issue with the product, have product questions, or need technical assistance with your CLE 500 system, please call us **(203) 483-8815** and let us help.

If shipping something with an RMA#, or if you'd like to write us, we are located at:

CyberResearch, Inc.
25 Business Park Drive
Branford, CT

Appendix A Camera and Frame Grabber Compatibility Chart

Cameras and Frame Grabbers Tested with CyberResearch, Inc. CLE 500				
Tested Cameras				
Manufacturer	Model	Bits/pixel	Taps	Clock (Mhz)
Basler	A501k	8	1	50
Basler	L103k	8 or 10	2	20 per tap
Basler	L301KC/F	8 or 10	1	60
Basler	A202K	10	2	40
Cohu	7700	10	1	40
Cohu	7800	8	1	40
Dalsa	Dalstar DS-21-02M30	8 or 10	2	40 per tap
Dalsa	Dalstar DS-22-2M30	8 or 10	2	40 per tap
Dalsa	1m28	10	1	28
Dalsa	Piranha2 P2-2X	8 or 10	2	40 per tap
Dalsa	P2-42-06K40	8	4	40
Imperx	MDC 1004	12	2	40
JAI	CV-M7+CL	10	1	40.49
JAI	CV-M4+CL	10	1	40.49
Pulnix	PC-640CL	8	1	10 or 20
Pulnix	TMC-1000-CL	24bit RGB	3	20
Pulnix	TMC-1400-CL	8	2	50
Pulnix	TMC-4000-CL	8	2	40 per tap
Pulnix	TM6710CL	8	2	25.49
Redlake	MegaPlus II ES 11000	24bit RGB	3	25
Silicon Imaging	SI-1280	12	1	40
SVS-Vistek	SVS 085CFCL	10	1	43
Toshiba	1K-SX1	8	1	28.634

Tested Frame Grabbers	
Manufacturer	Model
Active Silicon	Phoenix PHX-D48CL
Bitflow	R3-CL
Bitflow	R3-PCI-CL13
Bitflow	R3-PCI-CL23
Bitflow	R64=PCI-CL-F
Coreco Imaging	PC-Camlink
Coreco Imaging	X64-CL Dual
Datacube	MaxRevolution V2-1000 Full
Euresys	Grablink Value
Matrox	Meteor II CL
Matrox	Helios XCL
National Instruments	NI 1428 CL

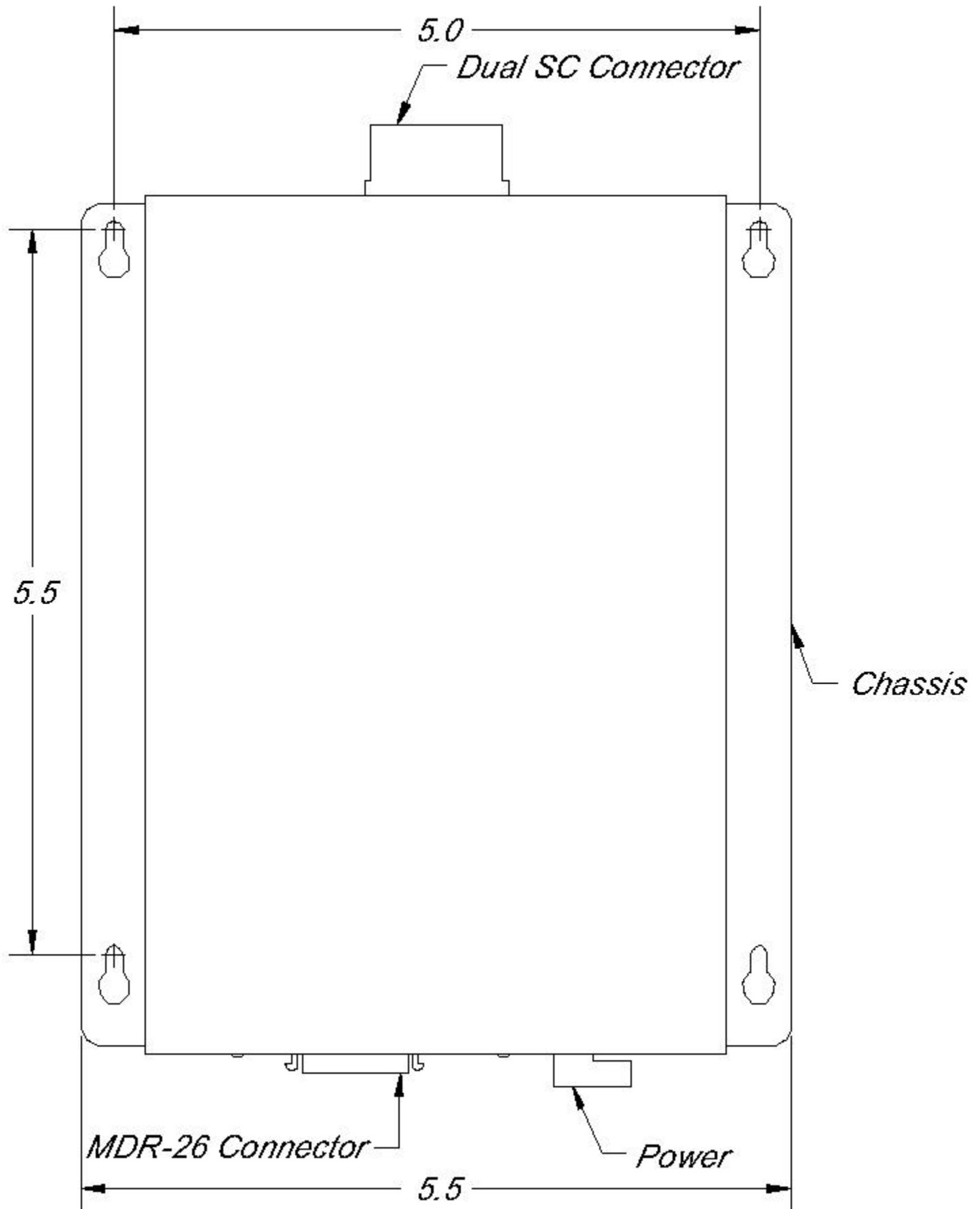
Please contact us for any updates.

Appendix B CLE 500 Mounting Template

Use appropriate fasteners and anchors of your choosing to mount each unit.

Note

Leave clearance (3 inch bend radius) for your Fiber Cable at top.



Product Service

Diagnosis and Debug

CyberResearch, Inc. maintains technical support lines staffed by experienced Applications Engineers and Technicians. There is no charge to call and we will return your call promptly if it is received while our lines are busy. Most problems encountered with data acquisition products can be solved over the phone. Signal connections and programming are the two most common sources of difficulty. CyberResearch support personnel can help you solve these problems, especially if you are prepared for the call.

To ensure your call's overall success and expediency:

- 1) Have the phone close to the PC so you can conveniently and quickly take action that the Applications Engineer might suggest.
- 2) Be prepared to open your PC, remove boards, report back-switch or jumper settings, and possibly change settings before reinstalling the modules.
- 3) Have a volt meter handy to take measurements of the signals you are trying to measure as well as the signals on the board, module, or power supply.
- 4) Isolate problem areas that are not working as you expected.
- 5) Have the source code to the program you are having trouble with available so that preceding and prerequisite modes can be referenced and discussed.
- 6) Have the manual at hand. Also have the product's utility disks and any other relevant disks nearby so programs and version numbers can be checked.

Preparation will facilitate the diagnosis procedure, save you time, and avoid repeated calls. Here are a few preliminary actions you can take before you call which may solve some of the more common problems:

- 1) Check the PC-bus power and any power supply signals.
- 2) Check the voltage level of the signal between SIGNAL HIGH and SIGNAL LOW, or SIGNAL+ and SIGNAL- . It CANNOT exceed the full scale range of the board.
- 3) Check the other boards in your PC or modules on the network for address and interrupt conflicts.
- 4) Refer to the example programs as a baseline for comparing code.

Intentionally Blank

Warranty Notice

CyberResearch, Inc. warrants that this equipment as furnished will be free from defects in material and workmanship for a period of one year from the confirmed date of purchase by the original buyer and that upon written notice of any such defect, CyberResearch, Inc. will, at its option, repair or replace the defective item under the terms of this warranty, subject to the provisions and specific exclusions listed herein.

This warranty shall not apply to equipment that has been previously repaired or altered outside our plant in any way which may, in the judgment of the manufacturer, affect its reliability. Nor will it apply if the equipment has been used in a manner exceeding or inconsistent with its specifications or if the serial number has been removed.

CyberResearch, Inc. does not assume any liability for consequential damages as a result from our products uses, and in any event our liability shall not exceed the original selling price of the equipment.

The equipment warranty shall constitute the sole and exclusive remedy of any Buyer of Seller equipment and the sole and exclusive liability of the Seller, its successors or assigns, in connection with equipment purchased and in lieu of all other warranties expressed implied or statutory, including, but not limited to, any implied warranty of merchant ability or fitness and all other obligations or liabilities of seller, its successors or assigns.

The equipment must be returned postage prepaid. Package it securely and insure it. You will be charged for parts and labor if the warranty period has expired.

Returns and RMAs

If a CyberResearch product has been diagnosed as being non-functional, is visibly damaged, or must be returned for any other reason, please call for an assigned RMA number. The RMA number is a key piece of information that lets us track and process returned merchandise with the fastest possible turnaround time.

PLEASE CALL FOR AN RMA NUMBER!

Packages returned without an RMA number will be refused!

In most cases, a returned package will be refused at the receiving dock if its contents are not known. The RMA number allows us to reference the history of returned products and determine if they are meeting your application's requirements. When you call customer service for your RMA number, you will be asked to provide information about the product you are returning, your address, and a contact person at your organization.

Please make sure that the RMA number is prominently displayed on the outside of the box.

• Thank You •

Intentionally Blank

CyberResearch, Inc.

25 Business Park Drive

Branford, CT 06405 USA

P: (203) 483-8815; F: (203) 483-9024

www.cyberresearch.com