Camera Fiber-Link
Product Manual

Part Number MAN-000004
Rev. A - August 2003

LOGICAL
SOLUTIONS

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At Logical Solutions, we do our best to provide comprehensive information with our products. In the event we have an error or oversight in this document, we're sorry, and we will do our best to address the issue in the next revision (if there is one). If you have any issues or questions about the product or this documentation, please contact our Product Support personnel. However, we cannot be held responsible for typos or unintentional omissions from this manual.

Being a technology company, we are constantly looking for innovative ways to make our products work for the advantage of our customers. It is important to use the product manual that came with your system with that product. If you have any comments or suggestions for the product, please send your comments to our Product Support or our Sales personnel. Please see *Section 4, How to Contact Logical,* on page 19.

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1 Introduction

Introducing the Logical Solutions Inc. Camera Fiber-Link System

1.1 Camera Fiber-Link Pair

The Logical Solutions Inc. Camera Fiber-Link is a Fiber-Link extension system. The Camera Fiber-Link 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 *Logical Solutions Camera Fiber-Link Unit shown*

1.2 LASER Protection

The Camera Fiber-Link system is designed and identified as a Class 1 LASER product.

The Camera Fiber-Link system design incorporates interactive circuitry to minimize the chance that a user's vision might be affected by the LASER output. The product's optical fiber control circuitry automatically limits the power output of the LASERS to less than Class 1 levels in the event the fiber optic cable is disconnected or broken. This self-limiting circuitry operates to reduce the LASER output.

Note
Safety Testing is pending

1.3 System Features

The Camera Fiber-Link 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 Camera Fiber-Link system includes the following features:

- Supports the Camera Link standard
- Extend 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
- Use duplex multi-mode fiber, 50 or 62.5 micron, with SC-type connectors
- Safe design provides automatic LASER power reduction in the event the fiber is disrupted

1.4 Hardware Features

The Camera Fiber-Link systems are self-contained and do not require user modifications. Once installed, the application simply "works" and delivers the video signal clearly and consistently.

- Enclosed metal chassis for each Camera side and Frame Grabber side unit
- One pair of Camera Fiber-Link components per video connection
- No user interaction or modification required
- Dual SC-type connector for your multimode fiber optic cable
- One Camera Link MDR-26 port for digital video signal connection
- External power jack
- 4 LASERS for transmission in each fiber
- LASERs controlled by feedback loop to prevent vision accidents
- Universal AC power Adapter provided

Both the transmit and receive untis are powered by external, universal voltage, UL listed power supplies.

1.5 Technical Specifications

Each Logical Solutions Camera Fiber-Link system is designed to the following specifications:

Electrical Cable to Computer	Two 2M (6 1/2 feet) MDR-26 male-to-male cable (supplied with system)
Connectors	**Frame Grabber side:** Camera Link MDR-26 female video input (1) Dual SC-type fiber connector (1) 2.5mm power connector (AC adapter provided and required) **Camera side:** Camera Link MDR-26 female video output (1) Dual SC-type fiber connector (1) 2.5mm power connector (AC adapter provided)
Protocol	Camera Link compliant
Indicators	Two LEDs on each Camera Fiber-Link module: Loss of Signal [LOS] (red on when no signal), near SC connector Power (green on when signal)
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 Logical Solutions)
Operating Temperature and Humidity	0 to 40 °C (32 to 122 °F), 5 to 95% RH, non-condensing
Housing Dimensions	Approx. 5 1/2 inches by 6 1/2 inches by 1-1/4 inches deep Wall-mount keyhole slot spacing: 5 inches x 5 1/2 inches
Supply Voltage	+5.0 VDC @ 600 mA Adapter has Universal AC Power Input (100-240 VAC, 50/60 Hz)
AC to DC Adapter	Input: 100-240VAC, 50/60 Hz, 0.4 Amperes Output: +5VDC @ 1.6 Amperes, 2.5mm barrel plug Logical Part Number: PWR-000004; two included with each Camera Fiber-Link pair

2 Installation

2.1 Intended Application

The Camera Fiber-Link from Logical Solutions 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 3 meters (9.84 feet) in such applications. Each Camera Fiber-Link system consists of a pair of electronic units connected by a duplex multi-mode fiber optic cable. The Frame Grabber side unit connects to the computer with a 2 meter Camera Link MDR-26 male-to-male cable (user-supplied) and the Camera side unit connects to the monitor or projector using the existing monitor cable.

Caution

The Camera Fiber-Link emits LASER Radiation in the near infrared region.
The Camera Fiber-Link is a Class 1 LASER product.

Note

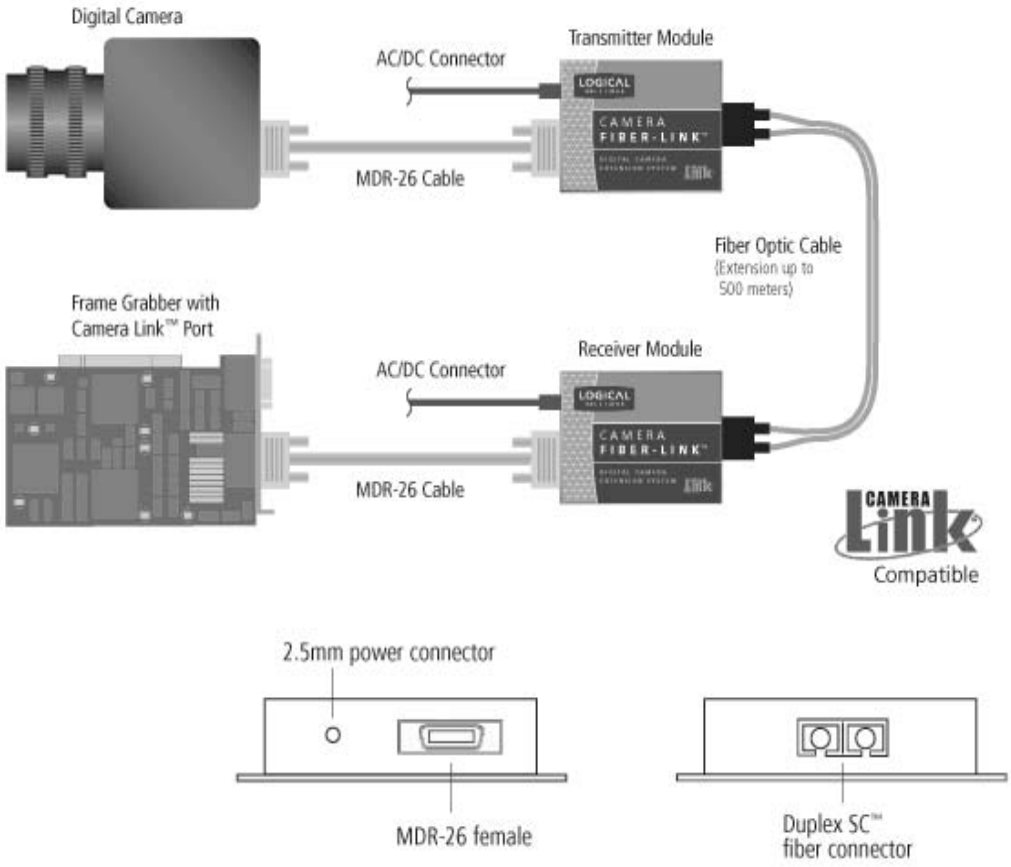
The Camera Fiber-Link contains a built-in safety circuitry to prevent hazardous LASER energy levels, however it is good practice to NOT disconnect the Fiber Cable while power is still applied, or to look into the optical connector or the cables.

2.2 Small Form Factor

Each Camera Fiber-Link 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 for your convenience.

Please note that the SC-fiber cable is located on the opposite end, than as depicted below.

Figure 2.1 *Camera Fiber-Link 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 any setting while keeping the computer secure in a remote, controlled location.

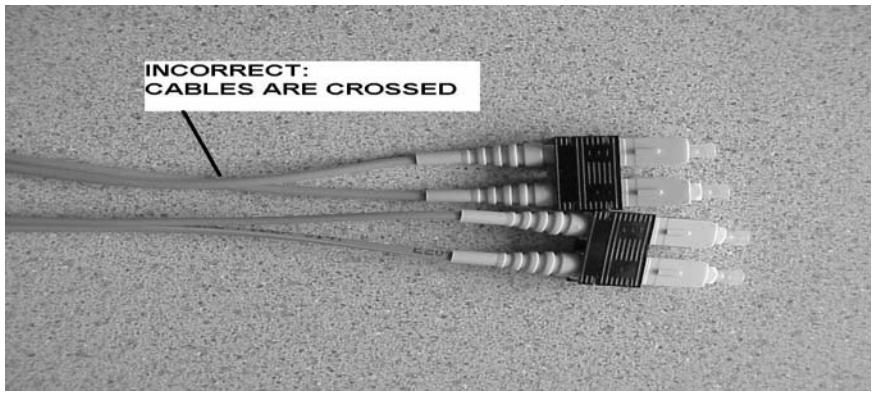
2.4 Order of Installation Events

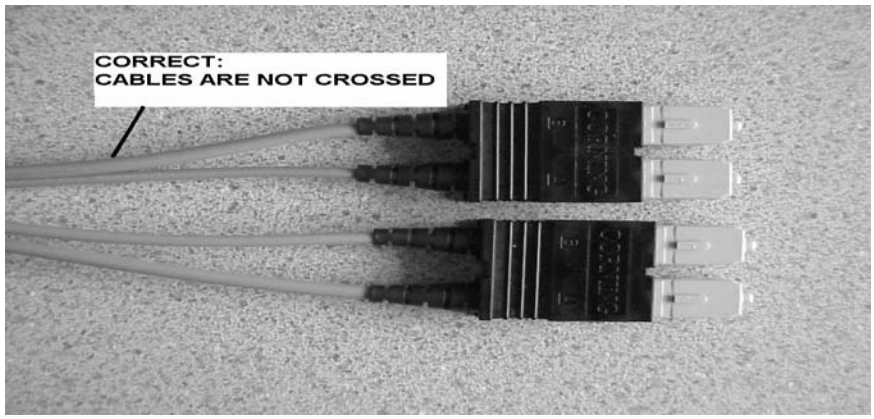
In order to properly use the Camera Fiber-Link system, you must follow this order of events for the initial power-up.

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

Note

Be sure NOT to cross over Fiber Optic Cables





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

2.5 Connecting the Camera Fiber-Link 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.

Note

The Camera Fiber-Link has a safety feature preventing signal flow if the fiber optic cable is broken or disconnected. Therefore, the fiber cable should be connected first, and left in place.

Connect your fiber cable to the SC-type connector on each Camera Fiber-Link 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 (part number PWR-000004) 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.

For Your Notes

3 Regulatory & Safety

Note: Regulatory Testing is pending at this time.

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 1 LASER Labeling

3.1.2 Product Serial Number

The Camera Fiber-Link 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 digits for a unique unit number. This serial number is also found on the original shipping carton.

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 Logical Solutions Inc. Camera Fiber-Link products are designed and made in the U.S.A. The Camera Fiber-Link 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 1 LASER Product

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

Manufacturer's Name & Address

Logical Solutions Inc.

100 Washington Street

Milford, Connecticut 06460 USA

Telephone (203) 647-8700

Product Name

- Model: Camera Fiber-Link Video Extension System

These products comply 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

- IEC60825-1/2
- Class 1 LASER Product

Electromagnetic Emissions

- EN55022: 1994 (IEC/CSPIR22: 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 exigencies du Règlement sur le matérial 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 Logical

4.1 Customer Support

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

Logical is here to help you. To contact Logical Solutions, 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 Logical Solutions 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 Logical Solutions website to see the most up-to-date information.

Internet: www.thinklogical.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

Logical Solutions is staffed Monday through Friday from 8:30AM to 5:30PM, Eastern Time Zone. We will try to respond to your email inquiries promptly, using the following email addresses for your different needs:

info@thinklogical.com -- Information on Logical Solutions and our products

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

support@thinklogical.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 Milford, Connecticut, at **(203) 647-8700** or if in the continental US, you may use our toll-free number **(800) 291-3211**. We're here Monday through Friday, 8:30AM to 5:30PM, Eastern Time Zone. Ask for their direct dial phone number when you call!

Telephone Product Support: Contact Product Support via telephone in Milford, Connecticut, at (203) 647-8700. The support lines are manned Monday through Friday, 9AM to 5PM, Eastern Time Zone.

International Sales: Please contact our US Sales staff in Milford, Connecticut, at **(203) 647-8700**. We're here Monday through Friday, 8:30AM to 5:30PM, 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) 783-9949**. Please indicate the nature of the fax on your cover sheet, and provide return contact information.

4.2 Product Support

Logical Solutions Inc.'s support personnel are available Monday through Friday from 8:30AM to 5:30PM, 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 Logical Solutions products.

4.2.1 Warranty

Logical Solutions Inc.'s products carry a one year warranty, with longer-term warranties available at time of purchase on most products. Please refer to your product invoice for your product's Warranty Terms and Conditions.

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

4.2.2 Return Authorization

If, for some reason, you need to return your Logical Solutions product to us, please get a **Return Authorization Number (RA# or RMA#)** from Logical's **Product Support** department before sending the unit in. Return Authorization must include contact information (phone preferred) in the event we have any questions.

After receiving your RA Number, please ship the unit postpaid, with the RA# prominently displayed on the shipping container.

We will contact you about your product once we determine its status.

Products received without Return Authorization and/or Contact information may require additional attention on our part that may delay any desired service or support with your system.

4.2.3 Our Address

If you have any issue with the product, have product questions, or need technical assistance with your Camera Fiber-Link system, please call us **(203) 647-8700** and let us help.

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

Logical Solutions Inc.
100 Washington Street
Milford, CT 06460 USA

For Your Notes