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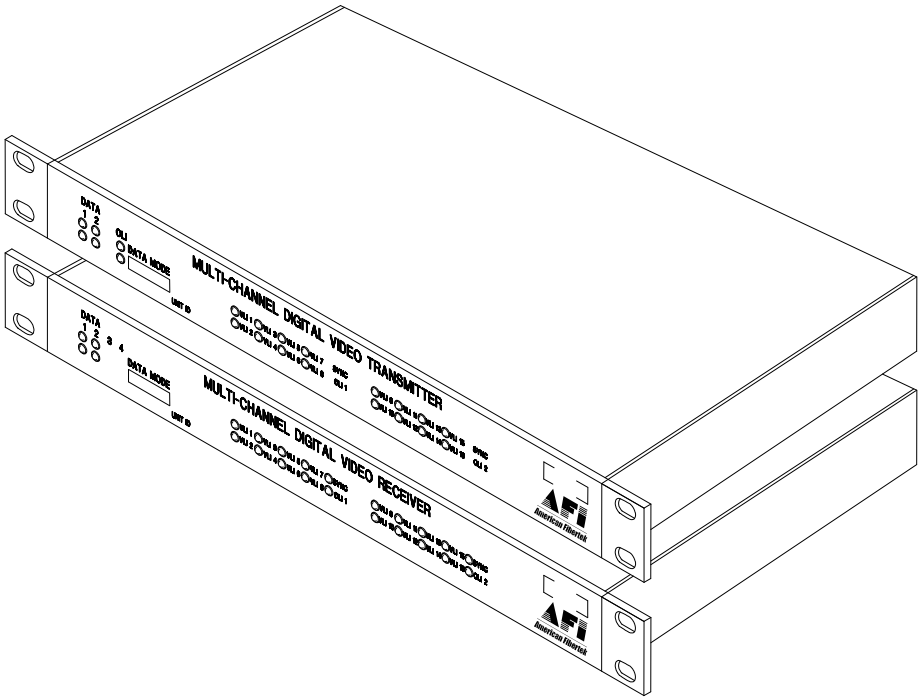

Instruction Manual

MTX-91685C
MRX-91685C
Sixteen Channel Video Multiplexer
With Two Bi-directional Data Channels

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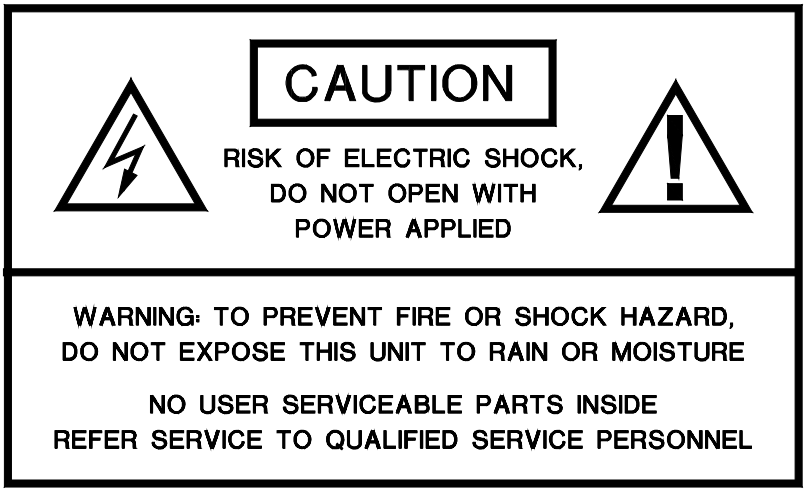

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INSTALLATION AND OPERATION INSTRUCTIONS

INTRODUCTION

Thank you for purchasing your American Fibertek Series 91685C multimode sixteen channel video multiplexer with bi-directional multi-protocol data. Please take a few minutes to read these installation instructions in order to obtain the maximum performance from this product.

FUNCTIONAL DESCRIPTION

The 91685C Series units operate as a transmitter / receiver pair for the digital transmission of sixteen simultaneous NTSC or PAL video signals along with two channels of field configurable bi-directional data over one multimode fiber optic cable. These data channels may be configured as RS485 data, RS422 data, RS232 data, or Manchester data. The RS485 channel may be configured for 2-wire (half duplex) or 4-wire (full duplex).

NOTE: This unit is shipped with Data Channel 1 and Data Channel 2 in the RS485 4-wire configuration. For other configurations, please refer to the DATA CONFIGURATION section for changes to the default switch settings.

The MTX-91685 transmitter accepts up to sixteen video inputs in two groups of eight videos and multiplexes each group into a high speed serial data stream. The first group's serial data stream, along with the two forward data channels, modulates a laser at 1310nm wavelength. The second group's serial data stream modulates a laser at 1550nm. A Wave Division Multiplexer (WDM) combines these two wavelengths, along with the return data wavelength of 850nm, onto a single optical output port for connection to the fiber transmission system. Correspondingly, the MRX-91685 receiver converts the optical signal to sixteen independent video output signals and two forward data signals while transmitting the two return data channels.

The individual units may be configured for rack mounting or wall mounting depending upon the position of the included mounting hardware. Nominal dimensions of the MTX-91685C and MRX-91685C are 1 ¾ inches high by 17 inches wide by 11 ½ inches deep. When mounting hardware is included, overall width increases to 19 inches wide.

INSTALLATION

THIS INSTALLATION SHOULD BE MADE BY A QUALIFIED SERVICE PERSON AND SHOULD CONFORM TO THE NATIONAL ELECTRICAL CODE, ANSI/NFPA 70 AND LOCAL CODES.

To install the MTX-91685C or MRX-91685C it is first necessary to mount the rack flanges to the unit.

For rack mounting the ears are installed on the sides of the unit with the surfaces that have oval holes flush with the front of the unit as in Figure 1. Mount the ears with the #10 flathead screws provided. To mount in the rack cabinet, use mounting screws that are appropriate for the rack cabinet being used. When mounting the MTX-91685C or MRX-91685C in a rack configuration, it is recommended that sufficient airflow is available through the unit. This can be achieved by leaving a 1RU slot above the unit open for air movement and by leaving open space along the sides of the unit.

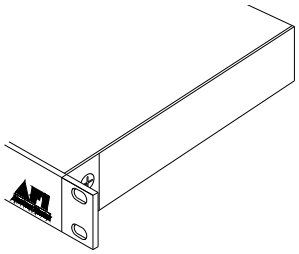


Figure 1. Rack Mount Configuration

For mounting the unit flush to a wall or other rigid surface, the ears may be installed on the sides with the oval holes flush with the bottom of the unit as in Figure 2. Mount the ears with the #10 flathead screws provided. Mount the unit to a rigid surface using #10 (5mm) screws.

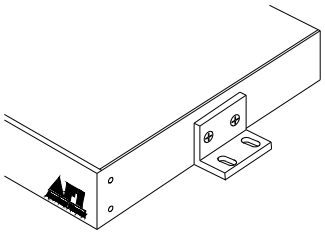


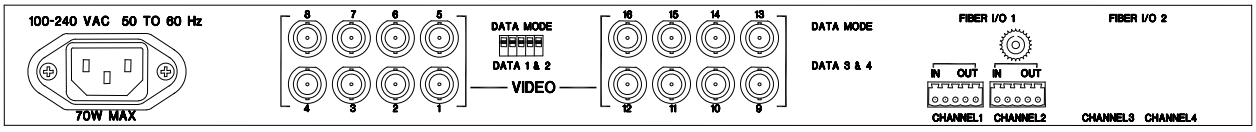
Figure 2. Wall Mount Configuration

POWER SOURCE

The internal power supply accepts universal line voltage. Any mains supply from 100 to 240 VAC, 50 to 60 Hz, may be used without modification or adjustment. A universal power connector is provided on the rear of the unit to facilitate connection to the power mains.

POWER CONNECTION

The unit is supplied with a three conductor power cord (US, UK, or Euro). The “ground” conductor is directly connected to the chassis.



FIBER CONNECTION

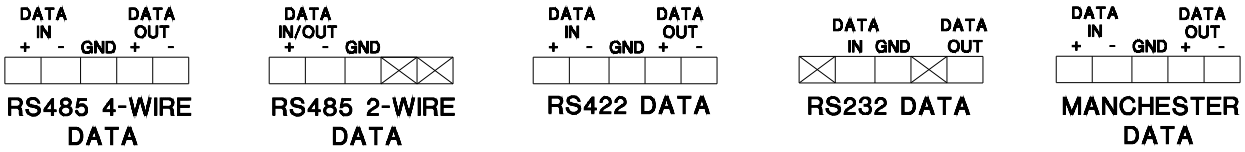
The fiber optic connection is made via a ST connector located at the back of the unit. Be sure to allow sufficient room for the required minimum bend radius of the fiber cable used.

VIDEO INPUT / OUTPUT CONNECTIONS

Video input and output connections are located on the rear of the unit. A BNC connector is provided for each channel. The video inputs are connected to an appropriate 75Ω baseband video source such as a camera or a video recorder output. The 75Ω video outputs can be looped through typical baseband video inputs of switchers, recorders and other equipment as required. For proper operation, the outputs must be terminated with 75Ω. For optimum performance the video cables should be the shortest length of coax practical.

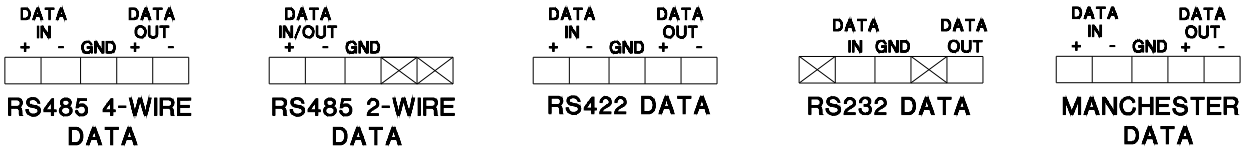
MTX-91685C DATA INPUT / OUTPUT CONNECTIONS

Data input and output connections are made via terminal blocks on the back of the unit. See the drawings below for proper orientation of the input and output connections for each of the two data channels.



MRX-91685C DATA INPUT / OUTPUT CONNECTIONS

Data input and output connections are made via terminal blocks on the back of the unit. See the drawings below for proper orientation of the input and output connections for each of the two data channels.



TYPICAL SYSTEM DATA CONNECTIONS

The connection terminalogy is based on industry standard EIA terminology for the transmission of electronic data signals. Using this terminology, the driver of an electronic signal is labeled TX or data out. Correspondingly, the receiver of an electronic signal is labeled RX or data in. Not all manufactures follow standard EIA terminology. Consult the installation instructions for your copper device if you are unsure which two wires are the drive (data out) wires and which two wires are the receive (data in) wires. Please note that Data In on the MTX-91685C becomes Data Out on the MRX-91685C after going across the fiber. The reverse flow follows the same orientation.

DATA MODE

NOTE: This unit shipped with Data Mode switches in the RS485 4-wire position.

For other configurations of data channel 1 or data channel 2, please refer to the drawing below for changes to the default switch settings. These configuration switches are located on the front of the unit and can be modified without opening the unit. Please note that switch # 1 and switch # 2 are not used and should remain in the off (up) position.

DATA SWITCH

OFF=UP ON=DOWN

1	2	3	4	5	
OFF	**OFF**	**OFF**	**OFF**	**OFF**	**RS485-4W (FACTORY SHIPPED)**
ON	OFF	ON	OFF		RS485-2W
OFF	ON	OFF	ON		RS422/MANCHESTER
ON	ON	ON	ON		RS232
CHANNEL 1		CHANNEL 2		NOT USED	

DATA TERMINATION REQUIREMENTS

RS232 Data Signals

The RS232 interface standard is a point to point transmission protocol for digital signals. It allows for a single transmitter device communicating to a single receiving device. This configuration is mirrored in the opposite direction to create one bi-directional data path. Devices using this protocol have terminating resistors built into their data path. This eliminates the need for any switch selection for termination resistors in the RS232 mode.

RS422 Data Signals

The electrical interface described in RS422 is a data transmission standard for balanced digital signals. It allows for a single transmitter device communicating to as many as 32 receiving devices. This type of data signal is well suited to systems that require data to be distributed to several points without a return data path. Several companies offer camera telemetry controllers using this data interface. Because there is only one transmitting device on the network, this one may remain active at all times. There is no need for the driver to go into a high impedance state to allow others to "talk." In most cases termination resistors are not required to be applied to RS422 data outputs. In long copper runs (over 500 feet) termination resistors may be required on data inputs to eliminate data reflections.

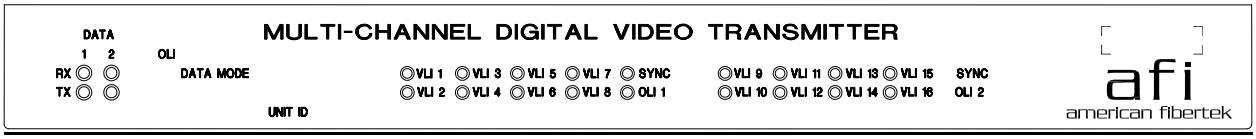
RS485 Data Signals

RS485 differs from RS422 in the ability of the transmitter devices to go into a high impedance (Hi-Z) state. This allows multiple transmitter devices to reside on the same wire pair. The software must dictate a protocol that allows one device to transmit at any one time to prevent data crashes. Data wiring can use two wires or four wires. Using two wires the system works in half duplex. This means that data is exchanged between two points sequentially. When a four-wire system is used, the system may be full duplex. In many cases the system head end controller will continuously poll data from all remote devices. The remote devices all respond back to the head end (one at a time!) as they are addressed. This property of the network rests solely in the hands of the software (firmware).

The driver chips used in RS485 communications are capable of changing into their high impedance state very rapidly. On even short lengths of wire there can exist a residual voltage after a driver circuit turns off. This can interfere with circuits that are used to detect the Hi-Z state. It is very important that the copper communications lines be terminated with resistors across the data wire pair. The best place to locate such resistors is at the furthest electrical devices at the ends of the wire pair. For instance, if several RS485 devices are connected in a daisy chain fashion, the wire connection would loop across all devices in a chain. The furthest two points in the chain would need to be terminated with a 120 ohm resistor.

MTX-91685C STATUS INDICATORS

The MTX-91685C transmitter provides the following front panel LED status indicators to aid in installation and troubleshooting:



DATA RX/TX INDICATORS

DATA RX and DATA TX indicators are provided to monitor each of the two available data channels. DATA 1 RX and TX correspond with the multi-protocol output/input of DATA CH 1. DATA 2 RX and TX correspond with the multi-protocol output/input of DATA CH 2.

DATA RX

A green LED indicator is provided to monitor the data coming in from the fiber, through the MTX-91685CC, and out onto the electrical interface. The intensity of this indicator will vary with input data patterns, however in typical applications it will cycle on and off as data is received. Data received status associated with this LED is summarized below.

DATA RX LED	Data Status
Green	Data Flow Present
Off	Data Flow Not Detected

DATA TX

A green LED indicator is provided to monitor the data coming in from the electrical interface, through the MTX-91685C, and out onto the fiber. The intensity of this indicator will vary with input data patterns, however in typical applications it will cycle on and off as data is transmitted. Data transmitted status associated with this LED is summarized below.

DATA TX LED	Data Status
Green	Data Flow Present
Off	Data Flow Not Detected

VLI 1 THROUGH VLI 16

A bi-color LED indicator is provided for the each of the sixteen video inputs to the MTX-91685C. Video status associated with each of these LED's is summarized below.

Video Presence LED	Video Status
Green	Proper Input Video Present
Red	Input Video Not Detected

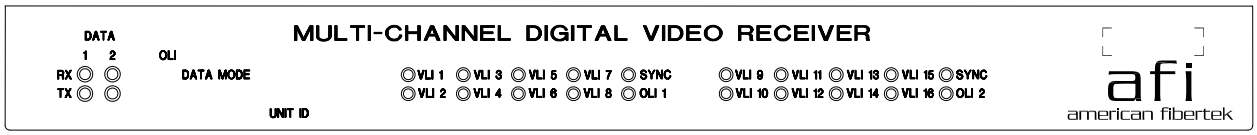
OLI

A bi-color LED indicator monitors the optical input power of the data signal that is being received at the MRX-91685C from the MTX-91685C. AC power and optical input status associated with these LED's are summarized in the following table.

	AC Power Status	Optical Status
Green	On	Proper Optical Input Power Present
Red	On	Optical Input Not Detected
Off	Off	Check Power Supply Input

MRX-91685C STATUS INDICATORS

The MRX-91685C receiver provides the following front panel LED status indicators to aid in installation and troubleshooting:



DATA RX/TX INDICATORS

DATA RX and DATA TX indicators are provided to monitor each of the two available data channels. DATA 1 RX and TX correspond with the multi-protocol output/input of DATA CH 1. DATA 2 RX and TX correspond with the multi-protocol output/input of DATA CH 2.

DATA RX

A green LED indicator is provided to monitor the data coming in from the fiber, through the MRX-91685C, and out onto the electrical interface. The intensity of this indicator will vary with input data patterns, however in typical applications it will cycle on and off as data is received. Data received status associated with this LED is summarized below.

DATA RX LED	Data Status
Green	Data Flow Present
Off	Data Flow Not Detected

DATA TX

A green LED indicator is provided to monitor the data coming in from the electrical interface, through the MRX-91685C, and out onto the fiber. The intensity of this indicator will vary with input data patterns, however in typical applications it will cycle on and off as data is transmitted. Data transmitted status associated with this LED is summarized below.

DATA TX LED	Data Status
Green	Data Flow Present
Off	Data Flow Not Detected

VLI 1 THROUGH VLI 16

A bi-color LED indicator is provided for the each of the sixteen video outputs of the MRX-91685C. Video status associated with each of these LED's is summarized below.

Video Presence LED	Video Status
Green	Proper Output Video Present
Red	Output Video Not Detected

SYNC

A bi-color LED indicator is provided to monitor the proper serialization of the electrical video data stream through the MRX-91685C. A SYNC indicator for videos one through eight is located above the OLI 1 indicator. A SYNC indicator for videos nine through sixteen is located above the OLI 2 indicator. Sync status associated with these LED's is summarized below.

Sync LED	Sync Status
Green	Proper Data Stream Serialization Present
Red	Data Stream Serialization Not Detected

OLI 1

A bi-color LED indicator monitors the power of the optical input signal that is being received at the MRX-91685C from video channels one through eight of the MTX-91685C. AC power and optical input status associated with this LED are summarized below. Please note that data is sent to the MRX-91685C with this optical input signal.

Optical Level Indicator	AC Power Status	Optical Status
Green	On	Proper Optical Input Power Present
Red	On	Optical Input Not Detected
Off	Off	Check Power Supply Input

OLI 2

A bi-color LED indicator monitors the power of the optical input signal that is being received at the MRX-91685C from video channels nine through sixteen of the MTX-91685C. AC power and optical input status associated with this LED are summarized below.

Optical Level Indicator	AC Power Status	Optical Status
Green	On	Proper Optical Input Power Present
Red	On	Optical Input Not Detected
Off	Off	Check Power Supply Input

This unit complies with 21 CFR 1040.10 and 1040.11

LIFETIME WARRANTY INFORMATION

American Fibertek, Inc warrants that at the time of delivery the products delivered will be free of defects in materials and workmanship. Defective products will be repaired or replaced at the exclusive option of American Fibertek. A Return Material Authorization (RMA) number is required to send the products back in case of return. All returns must be shipped prepaid. This warranty is void if the products have been tampered with. This warranty shall be construed in accordance with New Jersey law and the courts of New Jersey shall have exclusive jurisdiction over this contract. **EXCEPT FOR THE FOREGOING WARRANTY, THERE IS NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE, EXPRESSED OR IMPLIED, WHICH EXTENDS BEYOND THE WARRANTY SET FORTH IN THIS AGREEMENT.** In any event, American Fibertek will not be responsible or liable for contingent, consequential, or incidental damages. No agreement or understanding, expressed or implied, except as set forth in this warranty, will be binding upon American Fibertek unless in writing, signed by a duly authorized officer of American Fibertek.

SERVICE INFORMATION

There are no user serviceable parts inside the unit.
In the event that service is required to this unit, please direct all inquiries to:

American Fibertek, Inc.
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Somerset, NJ 08873

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