

VersiVision
FVT1100/FVR1100 Series
Fiber Optic Video Modems
Technical Manual

Also covers FVR1100M modules

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SECTION 1 GENERAL DESCRIPTION

INTRODUCTION

This manual provides information on the installation and operation of the VersiVision FVT1100/FVR1100 Series Fiber Optic Video Modems. Section 1 contains a general description of the equipment. Section 2 contains installation instructions. Section 3 contains maintenance and troubleshooting information.

Model Number	Description
FVT1103	Transmitter; 1-channel simplex video + 1-channel return data; Multimode; ST; 3km standalone
FVT1104	Transmitter; 1-channel simplex video + 1-channel return data; Multimode; SC; 3km standalone
FVT1105	Transmitter; 1-channel simplex video + 1-channel return data; Singlemode; SC; 30km standalone

FVR1103	Receiver; 1-channel simplex video + 1-channel return data; Multimode; ST; 3km standalone
FVR1104	Receiver; 1-channel simplex video + 1-channel return data; Multimode; SC; 3km standalone
FVR1105	Receiver; 1-channel simplex video + 1-channel return data; Singlemode; SC; 30km standalone

FVR1103M	Receiver module; 1-channel simplex video + 1-channel return data; Multimode; ST; 3km; installed in Model FVC14 chassis
FVR1104M	Receiver module; 1-channel simplex video + 1-channel return data; Multimode; SC; 3km; installed in Model FVC14 chassis
FVR1105M	Receiver module; 1-channel simplex video + 1-channel return data; Singlemode; SC; 30km; installed in Model FVC14 chassis

DESCRIPTION OF EQUIPMENT

Functional Characteristics

The VersiVision FVT1100 and FVR1100 Series Fiber Optic Video Modems are used to extend a frequency modulation (FM) video signal and return data over a single fiber optic cable. These modems provide high quality transmission of one channel simplex video and one channel return data at distances to 3km using multimode fiber and distances to 30km using singlemode fiber. A BNC connector provides the copper interface for the video input/output and a DB9 connector provides the copper interface for the data input/output. RS-422, RS-485, and RS-232 data interfaces are supported. ST and SC optical connectors are standard for the fiber optic interface. The FVT1100 and FVR1100 video modems are completely compatible with NTSC, PAL, or SECAM video standards.

VERSITRON FVT1100 and FVR1100 Series Fiber Optic Video Modems utilize APC circuitry while maintaining stable optical power output. The fiber optic link established between the transmitter and receiver devices insures immunity from EMI, RFI, and ground loops. AD, Pelco, Phillips, and Vicon communication protocols are supported. The data interface is switch-selectable to assure compatibility with cameras utilizing RS-422, RS-485, or RS-232 data protocols for their PTZ (pan, tilt, zoom) features. The plug and play design of the FVT1100 transmitters and FVR1100 receivers means no user adjustments are required. LED status indicators include video sync present (VD), data transmitted (TD), data received (RD), and power on (PWR)

Physical Characteristics

The VersiVision FVT1100 transmitter and FVR1100 receiver modems are available as standalone devices for easy plug and play installation. In addition, the FVR1100 receiver modems can be ordered as circuit card modules (See Chart Above) for installation in the Model FVC14 rack-mount chassis. The 14-slot chassis fits in a standard 19" rack and is offered with either 110VAC or 220VAC power supplies. The dimensions of the FVT1100 and FVR1100 standalone devices are 7.5in (L) x 6.3in (W) x 1.2in (H).



FIGURE 1: FVT1103 and FVR1103

SPECIFICATIONS

VIDEO

Video Input:	1 volt pk-pk (75 ohms)
Bandwidth:	5 Hz – 8 MHz
Differential Gain:	<3 %
Differential Phase:	<3°
Tilt:	<2 %
Signal-to-Noise Ratio:	60dB

DATA

Data Interface RS-485, RS-232
 Data Rate 100kbps
 Bit Error Rate 10^{-9}

WAVELENGTH 1310nm Singlemode
 1310nm Multimode

NUMBER OF FIBERS 1

CONNECTORS

Optical: ST, SC
 Video: BNC
 Data: DB9F

ENVIRONMENTAL

MTBF >100,000 hours
 Operating Temp: -30°C to +50°C
 Storage Temp: -40°C to +85°C
 Relative Humidity: 0% to 95% (no condensing)
 Size: 19 x 16 x 3.2 cm
 7.5 x 6.3 x 1.2 in.

Shipping Weight: <4.4kg
 Construction: Aluminum
 Finish: Black Paint

INDICATOR

Module
 Green Video Sync Present
 Red Power On
 Blue Data Transmitted/Received

OPTICAL POWER BUDGET

Fiber	Wavelength	Transmitter		Receiver		Optical Power Budget	Max Distance
		Model (s)	Output	Model	Sensitivity		
Multimode	1310nm	FVT1103 FVT1104	-10dBm	FVR1103 FVR1104	-30dBm	20dB	3km
Singlemode	1310nm/1550nm	FVT1105	-10dBm	FVR1105	-35dBm	25dB	30km

***Optical transmission distance is limited to optical loss of the fiber and additional loss caused by connectors, splices, and patch panels.**

CAUTION!

The transmitter unit contains a light-emitting diode located in the optical connector. This device emits invisible infrared electromagnetic radiation that can be harmful to human eyes. The radiation from this optical connector, if viewed closely without any protection, may cause instantaneous damage to the retina of the eye. Direct viewing of this LED should be avoided at all times.

SECTION 2 INSTALLATION INSTRUCTIONS



FIGURE 2: PSACV1 Power Supply



FIGURE 3: VCA1100 Data Cable

INSTALLATION PROCEDURE

The VersiVision FVT1100 and FVR1100 Series fiber optic video modems can be used with RS-485/RS-422 and RS-232 data protocols. Simply set the mode of operation with the internal DIP switches and then connect the signal, power supply, and fiber optic cables between the two units. There are indicator LEDs on the units for monitoring the real-time status of video, power, and data. The following instructions describe the typical installation procedure and the function of the LED indicators located on each unit.

1. Connect the video source (camera) to the video input BNC connector on the FVT1100 transmitter unit using coaxial cable.
2. Connect the video output BNC connector on the FVR1100 receiver unit to the video monitor using coaxial cable.
3. Connect the fiber optic cable between the transmitter and receiver devices.
4. See page 8 for instructions on connecting the data cable
5. Apply the power supply to both the transmitter and receiver using the PSACV1 power supply provided.
Note: If using any of the FVR1100M modules, power is provided from the integral power supply of the FVC14 chassis.
6. When the power is applied, the red POWER LED will light, indicating the presence of operating power. The green VIDEO LED and the blue DATA LED will give an indication as stated in the following page.
7. The link should now be operational.

SYSTEM DIP SWITCH SETTINGS

The data interface circuit used in this product has internal switches that are used to configure the various signal options. These are preset to RS-485 at the time of shipment. If changes are required, the positions of these switches must be changed in accordance with the following table.

Protocol	1	2	3	4
RS-485/RS-422	On	Off	Not Used	Off
RS-232	Off	On	Not Used	Off
RS-485 Bus Matching	Off	Off	Not Used	On

***Note: RS-485 Bus Matching: When the switch is on, then 120 Ohm termination is applied which matches the twisted pair cable impedance.**

SYSTEM TERMINAL BLOCK CONNECTIONS

The various input and output connections for the VersiVision FVT1100 and FVR1100 Series modems are as follows:

Video Input or Output: BNC Connectors

Data Input/Output Connector:

RS-485 2-wire

Red Wire: Signal being transmitted or received (+) over fiber

Blue Wire: Signal being transmitted or received (-) over fiber

RS-485 Connection

Camera Site

Using the VCA1100 data cable provided, plug the DB9 connector into the DB9 port on the FVT1100 transmitter. Connect the Red wire (485A) in the data cable from the FVT1100 transmitter to RS-485 (+) of the controlled unit (pan/tilt, dome), and connect the Blue wire (485B) to RS-485 (-) of the controlled unit (pan/tilt, zoom).

Control Site

Using the VCA1100 data cable provided, plug the DB9 connector into the DB9 port on the FVR1100 receiver. Connect the Red wire (485A) in the data cable from the FVR1100 receiver to RS-485 (+) of the controlling unit (Keyboard Controller, Matrix, DVR), and connect the Blue wire (485B) to RS-485 (-) of the controlling unit (Keyboard Controller, Matrix, DVR).

RS-232

Green Wire: Signal being transmitted out over fiber

Yellow Wire: Signal being received in from fiber

Purple Wire: Ground

RS-232 Connection

Camera Site

Using the VCA1100 data cable provided, plug the DB9 connector into the DB9 port on the FVT1100 transmitter. Connect the Yellow wire (232T) in the data cable from the FVT1100 transmitter to the RS-232 port of the controlled unit (pan/tilt, zoom). The Purple wire (GND) is used for ground connection.

Control Site

Using the VCA1100 data cable provided, plug the DB9 connector into the DB9 port on the FVR1100 receiver. Connect the Green wire (232R) in the data cable from the FVT1100 receiver to the RS-232 port of the controlling unit (Keyboard Controller, Matrix, DVR). The Purple wire (GND) is used for ground connection.

INDICATOR LEDs

The stand-alone units have integral LEDs that are used to monitor the state of the unit. There is one video LED, one power LED, and one data LED on each unit. One, labeled as “Power (or PWR)”, lights when operating power is present. Another, labeled as “Video (or VID)”, lights when the video input/output signals are detected. The other one, labeled as “TD or RD”, blinks at the rate of the operating data.

TRANSMITTER and RECEIVER

Power: ON: (Red) indicates that correct power has been applied

Transmitter:

Video: OFF: Indicates no video detected on input BNC connector
(No Video present on input BNC)

ON: (Green) Indicates video detected on input BNC connector
(Video present on input BNC connector)

Data: OFF: Indicates no data detected on the transmit data cable

Blinking: (Blue) Indicates data transmitted at the rate of the operation data.

Receiver:

Video: OFF: Indicates no video detected on output BNC connector
(No video present on output BNC)

ON: (Green) Indicates video detected on output BNC connector
(Video present on input BNC)

Data: OFF: Indicates no data detected on the receive data cable

Blinking: (Blue) Indicates data received at the rate of the operation data.

SECTION 3 TROUBLESHOOTING

OPTICAL FIBER

The VersiVision FVT1100 and FVR1100 Series fiber optic video modems are available for applications using multimode or singlemode optical fibers. Please be certain that the correct size and type of the fiber is being used for the particular mode transmitter/receiver combination.

Also be certain that the attenuation and bandwidth of the fiber optic cable being used is within the range of the system's loss budget specifications.

GENERAL

Any dirt or dust may easily pollute or block the fiber from accepting or radiating light. Therefore, please try to keep the optical connector clear and always use the dust caps whenever the connector is exposed to air. It is suggested that the tip of the optical connector should be carefully cleaned with a lint-free cloth moistened with alcohol from time to time.

The status of any of the VIDEO LED should provide the first clue as to the origin of any operational failure. If the VIDEO LED on the receiver unit is off, it usually means that the fiber is broken or has too much attenuation.

Next, be certain to check all connections and assure that inputs and outputs are not intermixed and the transmitter and receiver are not connected incorrectly.

DATA LINK

Even when installed exactly as directed, it is possible that the data function may fail to operate properly. If these problems occur, first check the data cable, then check that the data cable connector is firmly inserted into the data interface. Finally, swap the Red Wire (Transmit +) and Blue Wire (Transmit -) pins and then do the same for the Red Wire (Receive +) and Blue Wire (Receive -) pins. Make sure to do this on both the transmitter and receiver units.

RS-485 Pin Definition:

The RS-485(+) (Red Wire) should be connected to Pin 5 of the DB9F connector, while the RS-485(-) (Blue Wire) should be connected to Pin 4 of the DB connector. (The pin numbers are embossed on the connector).

RS-232 Pin Definition:

The RS-232R (Green Wire) should be connected to Pin 1 of the DB9F connector while the RS-232T (Yellow Wire) should be connected to Pin 2 of the DB connector, and the GROUND (Purple Wire) should be connected to Pin 3 of the DB connector.

Note: If the system is still not working after examining the above possibilities, please contact our Customer Service Department for further assistance.

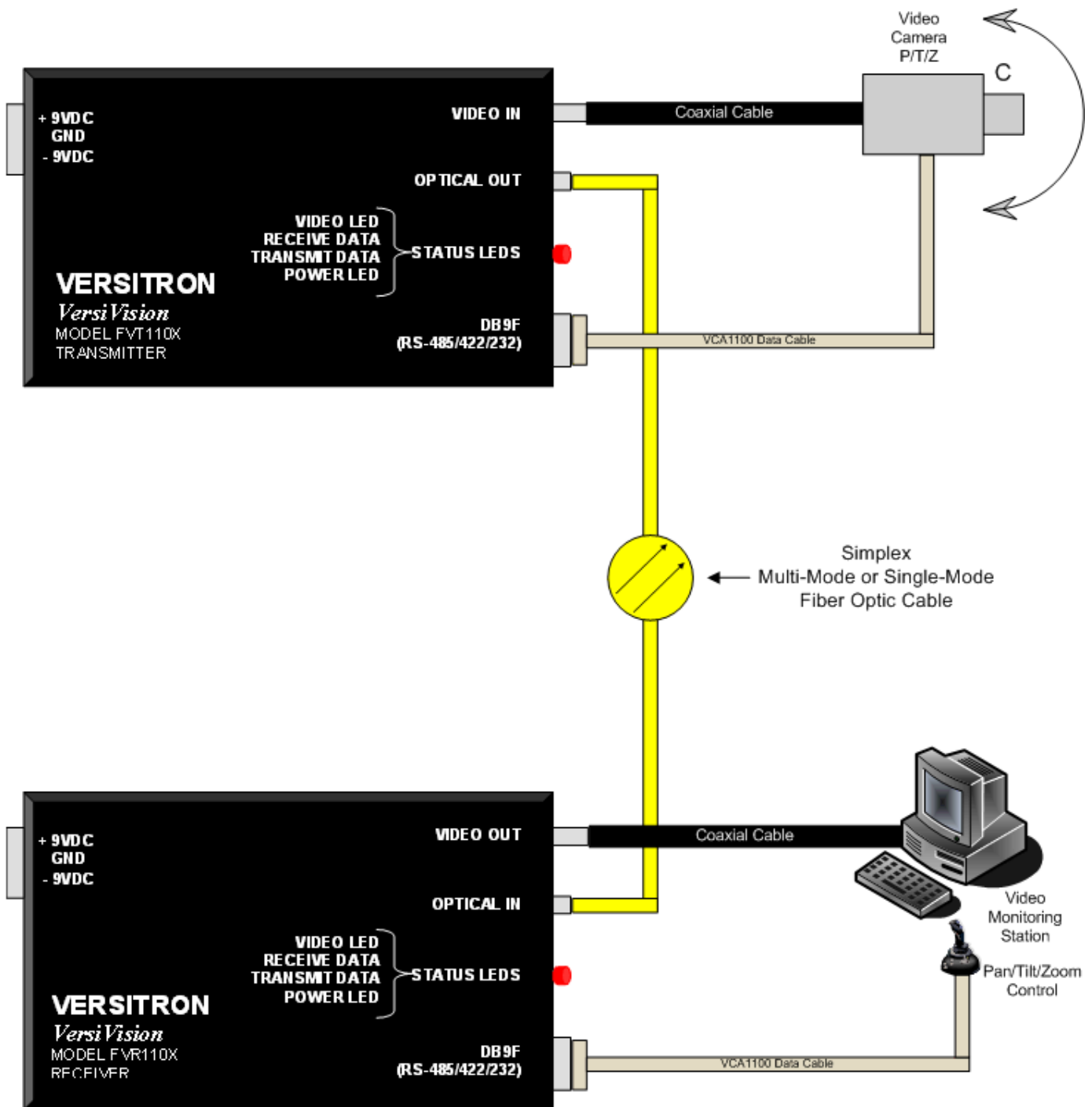


FIGURE 4:
VersiVision FVT110x/FVR110x
 Connection Layout