FiberPatrol by Optellios

FVM/FVD0700 SERIES
8-BIT DIGITALLY-ENCODED FOUR (4) CHANNEL VIDEO WITH TWO (2) BI-DIRECTIONAL DATA AND TWO (2) BI-DIRECTIONAL AUDIO

Architectural & Engineering Specifications

MULTIMODE
1310/1550nm
ONE (1) FIBER.....2-4

SINGLE MODE
1310/1550nm
ONE (1) FIBER.....5-7

SINGLE MODE (EXTENDED DISTANCE)
1310/1550nm
ONE (1) FIBER.....8-10

FVM/FVD0731
8-BIT DIGITALLY-ENCODED FOUR (4) CHANNEL VIDEO WITH TWO (2) BI-DIRECTIONAL DATA AND TWO (2) BI-DIRECTIONAL AUDIO

1. ACCEPTABLE MANUFACTURER

1.1. Optellios, Inc., 2260 Cabot Blvd. West, Suite 100, Langhorne, PA 19047 USA
Telephone: 215.741.5850, Fax: 215.741.5851
Email: info@optellios.com, Internet: www.fiberpatrol.com

1.2. Substitutions: Not Permitted

1.3. All fiber optic modules shall be supplied from a single manufacturer

2. DIGITAL FIBER OPTIC FOUR (4) CHANNEL VIDEO WITH TWO (2) BI-DIRECTIONAL DATA AND TWO (2) BI-DIRECTIONAL AUDIO MULTIPLEXER / DEMULTIPLEXER

2.1. Provide digital fiber optic video and two (2) bi-directional data and two (2) bidirectional audio multiplexers and demultiplexers as required. The system shall transmit four (4) channels of high resolution real-time NTSC or PAL color video. The system shall employ 8-bit digital encoding for transmission of these signals. The system shall meet the RS-250C medium-haul standard for video transmission. The system shall provide two (2) independent, bi-directional data channels supporting RS-232, RS-422, or 2 or 4-wire RS-485 data interfaces. The system shall be transparent to all major data protocols (i.e. Manchester Encoding, Bi-Phase, NRZ, NRZI, etc.). The system shall support two (2) independent, bi-directional audio channels supporting balanced or unbalanced input and output. The system requirements shall be one (1) multimode optical fiber. The system shall have a substantially wide dynamic range as to never require optical or electrical adjustments in order to operate within the given specifications. Optical attenuators shall never be required. The system shall provide local diagnostic indicators. All modules shall be available in both card mount and surface mount versions. All modules shall have automatic resettable polymer fuses on all power rails, which shall provide for automatic reset, as well as transient suppression on all video and data input/output (I/O) connections. A short circuit in one module shall not affect the operation of other modules powered from the common power supply. All card mount modules shall have the ability to be inserted into and removed from the communication management chassis without interrupting power with no risk of damage to other modules or the communications management chassis during replacement. The card mount modules shall require only two (2) slots in the communications management chassis. The system shall have an operating temperature of -40°C to +74°C, ambient, a storage temperature of -40°C to +85°C, ambient, a relative humidity ability of 0% to 95% (non-condensing), have an option for conformal coating, and a MTBF of > 100,000 hours. The system shall exceed NEMA TS-1/TS-2 and Caltrans Traffic Signal Control Equipment Specifications for operating temperature, humidity, mechanical shock, vibration, and voltage transient protection. The system radiated emissions shall be compliant with FCC Part 15, Class B, and EN55022 specifications. The modules shall use lasers that are compliant with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations Subchapter J.

2.2. SPECIFICATIONS

2.2.1. Video: Four (4) channels, one-way

2.2.2. Data: Two (2) independent channels, bi-directional, RS-232, RS-422, or 2 or 4-wire RS-485

2.2.3. Audio: Two (2) independent channels, bi-directional, balanced or unbalanced

2.3. VIDEO SPECIFICATIONS

2.3.1. Input / Output: 1 volt pk-pk (75 ohms)

2.3.2. Bandwidth: 5Hz – 6.5 MHz

2.3.3. Differential Gain: <2%

2.3.4. Differential Phase: <0.7°

2.3.5. Tilt: <1%

2.3.6. Signal-to-Noise Ratio (SNR): 60 dB @ maximum optical loss budget

2.4. DATA SPECIFICATIONS

2.4.1. Data Interface: RS-232, RS-422, or 2 or 4-wire RS-485

2.4.2. Data Format: NRZ, NRZI, Manchester, Bi-Phase

2.4.3. Data Rate: DC – 230 kbps (NRZ)

2.4.4. Bit Error Rate (BER): $< 1 \times 10^{-9}$ @ maximum optical loss budget

2.4.5. Operating Mode: Simplex or full-duplex

2.5. AUDIO SPECIFICATIONS

2.5.1. Encoding: 20-bit

2.5.2. Sample Rate: 48 kHz

2.5.3. Audio Bandwidth: 20 – 18 kHz @-1 dB

2.5.4. Signal – to – Noise Ratio (SNR): 85 dB

2.5.5. Dynamic Range: 85 dB

2.5.6. Total Harmonic Distortion: 0.001% @ 0 dBm output

2.5.7. Channel Crosstalk: 90 dB

2.5.8. Maximum Audio Level: +6 dBm across 600 ohms

2.5.9. Input / Output: Balanced or Unbalanced across 600 ohms

2.6. OPTICAL SPECIFICATIONS

2.6.1. Fiber Type: Multimode

2.6.2. Wavelength: 1310 / 1550nm

2.6.3. Number of Fibers: One (1)

2.6.4. Optical Emitter Type: Laser

2.6.5. Transmitter Output Power: 500µw (-3 dBm)

2.6.6. Receiver Sensitivity: 30µw (-15 dBm)

2.6.7. Optical Power Budget: 12 dB

2.7. STATUS INDICATOR SPECIFICATIONS

2.7.1. Power

2.7.2. Video Detect (4)

2.7.3. Data Transmit (2)

2.7.4. Data Receive (2)

2.7.5. Audio Detect (2)

2.8. The video multiplexer / (2) data transceiver / (2) audio transceiver and demultiplexer / two (2) data transceiver / (2) audio transceiver shall be Optellios Fiber Patrol model FVM/FVD0731. The units shall be either card mount or stand alone. Refer to contract drawings for mounting type.

REVISION HISTORY:

File Name:

FVM_FVD0731AE_REV_1.3

Date:

A & E SPECIFICATIONS

3/14/07

Comments:

A & E SPECIFICATIONS

FVM/FVD0771
8-BIT DIGITALLY-ENCODED FOUR (4) CHANNEL VIDEO WITH TWO (2) BI-DIRECTIONAL DATA AND TWO (2) BI-DIRECTIONAL AUDIO

1. ACCEPTABLE MANUFACTURER

1.1. Optellios, Inc., 2260 Cabot Blvd. West, Suite 100, Langhorne, PA 19047 USA
Telephone: 215.741.5850, Fax: 215.741.5851
Email: info@optellios.com, Internet: www.fiberpatrol.com

1.2. Substitutions: Not Permitted

1.3. All fiber optic modules shall be supplied from a single manufacturer

2. DIGITAL FIBER OPTIC FOUR (4) CHANNEL VIDEO WITH TWO (2) BI-DIRECTIONAL DATA AND TWO (2) BI-DIRECTIONAL AUDIO MULTIPLEXER / DEMULTIPLEXER

2.1. Provide digital fiber optic video and two (2) bi-directional data and two (2) bidirectional audio multiplexers and demultiplexers as required. The system shall transmit four (4) channels of high resolution real-time NTSC or PAL color video. The system shall employ 8-bit digital encoding for transmission of these signals. The system shall meet the RS-250C medium-haul standard for video transmission. The system shall provide two (2) independent, bi-directional data channels supporting RS-232, RS-422, or 2 or 4-wire RS-485 data interfaces. The system shall be transparent to all major data protocols (i.e. Manchester Encoding, Bi-Phase, NRZ, NRZI, etc.). The system shall support two (2) independent, bi-directional audio channels supporting balanced or unbalanced input and output. The system requirements shall be one (1) single mode optical fiber. The system shall have a substantially wide dynamic range as to never require optical or electrical adjustments in order to operate within the given specifications. Optical attenuators shall never be required. The system shall provide local diagnostic indicators. All modules shall be available in both card mount and surface mount versions. All modules shall have automatic resettable polymer fuses on all power rails, which shall provide for automatic reset, as well as transient suppression on all video and data input/output (I/O) connections. A short circuit in one module shall not affect the operation of other modules powered from the common power supply. All card mount modules shall have the ability to be inserted into and removed from the communication management chassis without interrupting power with no risk of damage to other modules or the communications management chassis during replacement. The card mount modules shall require only two (2) slots in the communications management chassis. The system shall have an operating temperature of -40°C to +74°C, ambient, a storage temperature of -40°C to +85°C, ambient, a relative humidity ability of 0% to 95% (non-condensing), have an option for conformal coating, and a MTBF of > 100,000 hours. The system shall exceed NEMA TS-1/TS-2 and Caltrans Traffic Signal Control Equipment Specifications for operating temperature, humidity, mechanical shock, vibration, and voltage transient protection. The system radiated emissions shall be compliant with FCC Part 15, Class B, and EN55022 specifications. The modules shall use lasers that are compliant with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations Subchapter J.

2.2. SPECIFICATIONS

2.2.1. Video: Four (4) channels, one-way

2.2.2. Data: Two (2) independent channels, bi-directional, RS-232, RS-422, or 2 or 4-wire RS-485

2.2.3. Audio: Two (2) independent channels, bi-directional, balanced or unbalanced

2.3. VIDEO SPECIFICATIONS

2.3.1. Input / Output: 1 volt pk-pk (75 ohms)

2.3.2. Bandwidth: 5Hz – 6.5 MHz

2.3.3. Differential Gain: <2%

2.3.4. Differential Phase: <0.7°

2.3.5. Tilt: <1%

2.3.6. Signal-to-Noise Ratio (SNR): 60 dB @ maximum optical loss budget

2.4. DATA SPECIFICATIONS

2.4.1. Data Interface: RS-232, RS-422, or 2 or 4-wire RS-485

2.4.2. Data Format: NRZ, NRZI, Manchester, Bi-Phase

2.4.3. Data Rate: DC – 230 kbps (NRZ)

2.4.4. Bit Error Rate (BER): $< 1 \times 10^{-9}$ @ maximum optical loss budget

2.4.5. Operating Mode: Simplex or full-duplex

2.5. AUDIO SPECIFICATIONS

2.5.1. Encoding: 20-bit

2.5.2. Sample Rate: 48 kHz

2.5.3. Audio Bandwidth: 20 – 18 kHz @-1 dB

2.5.4. Signal – to – Noise Ratio (SNR): 85 dB

2.5.5. Dynamic Range: 85 dB

2.5.6. Total Harmonic Distortion: 0.001% @ 0 dBm output

2.5.7. Channel Crosstalk: 90 dB

2.5.8. Maximum Audio Level: +6 dBm across 600 ohms

2.5.9. Input / Output: Balanced or Unbalanced across 600 ohms

2.6. OPTICAL SPECIFICATIONS

2.6.1. Fiber Type: Single mode

2.6.2. Wavelength: 1310 / 1550nm

2.6.3. Number of Fibers: One (1)

2.6.4. Optical Emitter Type: Laser

2.6.5. Transmitter Output Power: 500µw (-3 dBm)

2.6.6. Receiver Sensitivity: 5µw (-23 dBm)

2.6.7. Optical Power Budget: 20 dB

2.7. STATUS INDICATOR SPECIFICATIONS

2.7.1. Power

2.7.2. Video Detect (4)

2.7.3. Data Transmit (2)

2.7.4. Data Receive (2)

2.7.5. Audio Detect (2)

2.8. The video multiplexer / (2) data transceiver / (2) audio transceiver and demultiplexer / two (2) data transceiver / (2) audio transceiver shall be Optellios Fiber Patrol model FVM/FVD0771. The units shall be either card mount or stand alone. Refer to contract drawings for mounting type.

REVISION HISTORY:

File Name:

FVM_FVD0771AE_REV_1.3

Date:

A & E SPECIFICATIONS

3/14/07

Comments:

A & E SPECIFICATIONS

FVM/FVD0771-X
8-BIT DIGITALLY-ENCODED FOUR (4) CHANNEL VIDEO WITH TWO (2) BI-DIRECTIONAL DATA AND TWO (2) BI-DIRECTIONAL AUDIO

1. ACCEPTABLE MANUFACTURER

1.1. Optellios, Inc., 2260 Cabot Blvd. West, Suite 100, Langhorne, PA 19047 USA
Telephone: 215.741.5850, Fax: 215.741.5851
Email: info@optellios.com, Internet: www.fiberpatrol.com

1.2. Substitutions: Not Permitted

1.3. All fiber optic modules shall be supplied from a single manufacturer

2. DIGITAL FIBER OPTIC FOUR (4) CHANNEL VIDEO WITH TWO (2) BI-DIRECTIONAL DATA AND TWO (2) BI-DIRECTIONAL AUDIO MULTIPLEXER / DEMULTIPLEXER

2.1. Provide digital fiber optic video and two (2) bi-directional data and two (2) bidirectional audio multiplexers and demultiplexers as required. The system shall transmit four (4) channels of high resolution real-time NTSC or PAL color video. The system shall employ 8-bit digital encoding for transmission of these signals. The system shall meet the RS-250C medium-haul standard for video transmission. The system shall provide two (2) independent, bi-directional data channels supporting RS-232, RS-422, or 2 or 4-wire RS-485 data interfaces. The system shall be transparent to all major data protocols (i.e. Manchester Encoding, Bi-Phase, NRZ, NRZI, etc.). The system shall support two (2) independent, bi-directional audio channels supporting balanced or unbalanced input and output. The system requirements shall be one (1) single mode optical fiber. The system shall have a substantially wide dynamic range as to never require optical or electrical adjustments in order to operate within the given specifications. Optical attenuators shall never be required. The system shall provide local diagnostic indicators. All modules shall be available in both card mount and surface mount versions. All modules shall have automatic resettable polymer fuses on all power rails, which shall provide for automatic reset, as well as transient suppression on all video and data input/output (I/O) connections. A short circuit in one module shall not affect the operation of other modules powered from the common power supply. All card mount modules shall have the ability to be inserted into and removed from the communication management chassis without interrupting power with no risk of damage to other modules or the communications management chassis during replacement. The card mount modules shall require only two (2) slot in the communications management chassis. The system shall have an operating temperature of -40°C to +74°C, ambient, a storage temperature of -40°C to +85°C, ambient, a relative humidity ability of 0% to 95% (non-condensing), have an option for conformal coating, and a MTBF of > 100,000 hours. The system shall exceed NEMA TS-1/TS-2 and Caltrans Traffic Signal Control Equipment Specifications for operating temperature, humidity, mechanical shock, vibration, and voltage transient protection. The system radiated emissions shall be compliant with FCC Part 15, Class B, and EN55022 specifications. The modules shall use lasers that are compliant with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations Subchapter J.

2.2. SPECIFICATIONS

2.2.1. Video: Four (4) channels, one-way

2.2.2. Data: Two (2) independent channels, bi-directional, RS-232, RS-422, or 2 or 4-wire RS-485

2.2.3. Audio: Two (2) independent channels, bi-directional, balanced or unbalanced

2.3. VIDEO SPECIFICATIONS

2.3.1. Input / Output: 1 volt pk-pk (75 ohms)

2.3.2. Bandwidth: 5Hz – 6.5 MHz

2.3.3. Differential Gain: <2%

2.3.4. Differential Phase: <0.7°

2.3.5. Tilt: <1%

2.3.6. Signal-to-Noise Ratio (SNR): 60 dB @ maximum optical loss budget

2.4. DATA SPECIFICATIONS

2.4.1. Data Interface: RS-232, RS-422, or 2 or 4-wire RS-485

2.4.2. Data Format: NRZ, NRZI, Manchester, Bi-Phase

2.4.3. Data Rate: DC – 230 kbps (NRZ)

2.4.4. Bit Error Rate (BER): $< 1 \times 10^{-9}$ @ maximum optical loss budget

2.4.5. Operating Mode: Simplex or full-duplex

2.5. AUDIO SPECIFICATIONS

2.5.1. Encoding: 20-bit

2.5.2. Sample Rate: 48 kHz

2.5.3. Audio Bandwidth: 20 – 18 kHz @-1 dB

2.5.4. Signal – to – Noise Ratio (SNR): 85 dB

2.5.5. Dynamic Range: 85 dB

2.5.6. Total Harmonic Distortion: 0.001% @ 0 dBm output

2.5.7. Channel Crosstalk: 90 dB

2.5.8. Maximum Audio Level: +6 dBm across 600 ohms

2.5.9. Input / Output: Balanced or Unbalanced across 600 ohms

2.6. OPTICAL SPECIFICATIONS

2.6.1. Fiber Type: Single mode

2.6.2. Wavelength: 1310 / 1550nm

2.6.3. Number of Fibers: One (1)

2.6.4. Optical Emitter Type: Laser

2.6.5. Transmitter Output Power: 1000µw (-0 dBm)

2.6.6. Receiver Sensitivity: 5µw (-23 dBm)

2.6.7. Optical Power Budget: 23 dB

2.7. STATUS INDICATOR SPECIFICATIONS

2.7.1. Power

2.7.2. Video Detect (4)

2.7.3. Data Transmit (2)

2.7.4. Data Receive (2)

2.7.5. Audio Detect (2)

2.8. The video multiplexer / (2) data transceiver / (2) audio transceiver and demultiplexer / two (2) data transceiver / (2) audio transceiver shall be Optellios Fiber Patrol model FVM/FVD0771-X. The units shall be either card mount or stand alone. Refer to contract drawings for mounting type.

REVISION HISTORY:

File Name:

FVM_FVD0771-XAE_REV_1.3

A & E SPECIFICATIONS

Date:

3/14/07

Comments: