

DATA SHEET

Two (2) PCs Switchable Dual-head DVI Optical KVM Extender, KVMX-100-TR

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Headquarters

Opticis Co., Ltd.
3F, 305, Sanseong-daero
Sujeong-gu, Seongnam-si
Gyeonggi-do, South Korea, 13354
Tel: +82 (31) 719-8033
Fax: +82 (31) 719-8032

Dual-head DVI Optical KVM Extender, KVMX-100-TR

Description

New Dual-head DVI optical KVM extender, KVMX-100-TR is designed to extend Dual DVI outputs with keyboard, mouse and bi-directional audio. But the key feature of **2:1 KVM switch function** inside KVMX-100-TR enables users to select one PC between two (2) PCs as a host.

KVMX-100-TR transmits DVI, USB HID, RS232 and bi-directional stereo audio signal up to **1.0km (3280feet)** over two (2) duplex LC single-mode fibers or **300m (985feet)** over two (2) duplex LC multi-mode fibers.

Designed for high resolution performance, it guarantees lossless image quality and no frame dropping to deliver perfect graphic data transmission up to **WUXGA (1,920x1,200)** at 60Hz.

It provides **Auto-mix EDID programming** feature that reads EDID information from both local and remote side displays and then determines the lowest resolution of them. It makes the installation of KVMX-100-TR easy and flexible at any variable resolutions.

Optionally, we could include convenient remote console switch for selecting local control or remote control.

The shipping group is as follows;

- 1) One (1) pair of Transmitter and Receiver
- 2) Two (2) +12V/3A power adaptors
- 3) User Manual

Options

- 1) Remote console switch
- 2) 19" 1RU mounting rack, mounting bracket
- 3) Duplex LC Patch Cord (Single or Multi mode glass fiber)

Features

- ◆ Switch and Control Two (2) PCs – **2:1 KVM switch function**
- ◆ Transmits DVI, USB HID, RS232 and audio signal up to 1km (3280feet) over two (2) duplex LC optical fibers.
- ◆ Supports **two (2) single-link DVI displays** up to **WUXGA (1,920x1,200)** resolution at 60Hz.
- ◆ Operates with both single and multi-mode optical fibers.
 - Up to **1.0km (3280feet)** with two (2) duplex LC single-mode fibers.
 - Up to **300m (985feet)** with two (2) duplex LC multi-mode fibers.
- ◆ **Auto-mix EDID** features
- ◆ Saves cost & installation space.
- ◆ Offers DVI, USB ports for Local two (2) displays and Keyboard/Mouse.
- ◆ Supports bi-directional stereo audio.
- ◆ Lossless Image Quality with no Frame Dropping.
- ◆ USB HID ports for keyboard and mouse
- ◆ Provides Serial Control Data: RS232C through 9 pin D-sub connector.
- ◆ Offers optional remote console switch (option)
- ◆ 19" 1RU mounting rack, mounting bracket (option)
- ◆ Size (WDH): 216mm x 112mm x 44mm
- ◆ Power supplying: +12V, 3A power adapter
- ◆ Certifications: CE / FCC

Applications

- ◆ Keyboard, mouse and video extension and routing system related with servers or PCs control.
- ◆ Digital display system integration for medical, military, aerospace, factory automation, and traffic control platforms.
- ◆ Digital FPD, PDP and projector installation in conference rooms, auditoriums and for kiosk systems
- ◆ LED signboards for large scale information display and stadiums

Absolute Maximum Ratings

| Parameter | Symbol | Minimum | Maximum | Units |
|--|-----------|---------|---------|---------------|
| Storage Temperature | T_{stg} | - 30 | + 70 | °C |
| Supply Voltage | V_{CC} | 10 | 14 | V |
| Transmitter Differential Input Voltage | V_d | - | 1 | V |
| Operating Humidity | RH | 10 | 85 | % |
| Lead Soldering Temperature & Time | - | - | - | 260°C, 10 sec |

Recommended Operating Conditions

| Parameter | Symbol | Minimum | Typical | Maximum | Units |
|--------------------------------|----------|---------|---------|---------|-------------------|
| Ambient Operating Temperature | T_A | 0 | | + 50 | °C |
| Data Output Load | R_{LD} | | 50 | | Ω |
| Power Supply Rejection (Note1) | PSR | | 50 | | mV _{p-p} |
| Supply Voltage | V_{CC} | + 11.4 | + 12.0 | + 12.6 | V |

Note1. Tested with a 50mV_{p-p} sinusoidal signal in the frequency range from 500 Hz to 500 MHz on the V_{CC} supply with the recommended power supply filter in place. Typically less than a 0.25 dB change in sensitivity is experienced.

Electrical Power Supply Characteristics

($T_A = 0$ °C to +50 °C, unless otherwise noted)

| Parameter | Symbol | Minimum | Typical | Maximum | Units | |
|-------------------|----------|-----------|---------|---------|-------|----|
| Supply Voltage | V_{CC} | 9.0 | 12 | 14.0 | V | |
| Supply Current | TX | I_{TCC} | 980 | 1160 | 1200 | mA |
| | RX | I_{RCC} | 850 | 880 | 910 | mA |
| Power Dissipation | TX | P_{TX} | 11.8 | 13.9 | 14.4 | W |
| | RX | P_{RX} | 10.2 | 10.6 | 10.9 | W |

DVI Electrical Characteristics

| Transmitter | | | | | | |
|-------------|---|---------------|------------------|-----------|------------------|----------|
| Parameter | Symbol | Minimum | Typical | Maximum | Units | |
| TMDS | Data Output Load | R_{LD} | | 50 | | Ω |
| | Graphic Supply Voltage (Note2) | GV_{CC} | + 3.1 | + 3.3 | + 3.5 | V |
| | Single-Ended High Level Input Voltage | GV_{IH} | $GV_{CC} - 0.01$ | GV_{CC} | $GV_{CC} + 0.01$ | V |
| | Single-Ended Low Level Input Voltage | GV_{IL} | $GV_{CC} - 0.6$ | - | $GV_{CC} - 0.4$ | V |
| | Single-Ended Input Swing Voltage | GV_{ISWING} | 0.4 | - | 0.6 | V |
| Receiver | | | | | | |
| Parameter | Symbol | Minimum | Typical | Maximum | Units | |
| TMDS | Data Input Load | R_{LD} | | 50 | | Ω |
| | Graphic Supply Voltage (Note2) | GV_{CC} | + 3.1 | + 3.3 | + 3.5 | V |
| | Single-Ended Output Swing Voltage (Note3) | GV_{ISWING} | 0.2 | - | 0.4 | V |

Note2. Graphic Supply Voltage is regulated reference voltage for signal processing in modules

Note3. TMDS outputs are coupled in AC

Optical & Electrical Characteristics

(T_{op} = 25°C)

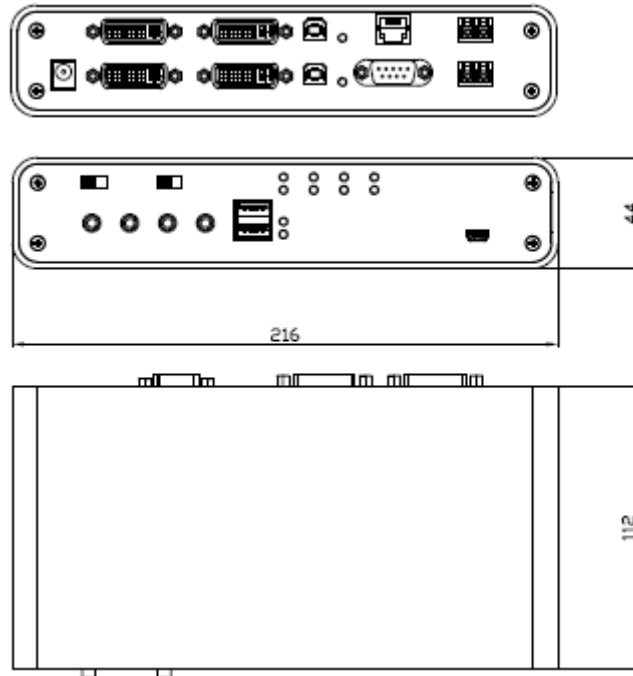
| Parameters | | Symbol | Condition | Unit | Min. | Typ. | Max. | Remark |
|------------------------------|--------------|--------------------------------|---|-----------------|--------------|---------------------|--------------|----------------------|
| Data Bit Rate | 1310 Tx | | PRBS 2 ²³ -1,NRZ | Mbps | | 1250 | | |
| | 1550 Rx | | | | | 155.52 | | |
| | 1550 Tx | | PRBS 2 ²³ -1,NRZ | Mbps | | 155.52 | | |
| | 1310 Rx | | | | | 1250 | | |
| Fiber Length 9µm core SMF | | | 10 ⁻¹⁰ BER, 155Mbps/1.62Gbps | km | 1 | | | |
| TRANSMITTER | | | | | | | | |
| Average Launched Power | | P _O | I _f =I _{BIAS} + I _{mod} /2 | dBm | -10 | | 0 | |
| Extinction Ratio | | ER | | dB | 6 4 | | | @1.65Gbps @3Gbps |
| Center Wavelength | | c | CW, @ P _{OUT} | nm | 1260 1480 | 1310 1550 | 1360 1580 | @1.31 µm @1.55 µm |
| Spectral Width | | | RMS Width | nm | | | 2.0 | RMS(-20dB) |
| Data Input Diff Voltage | | V _{IN} | | mV | 200 | | 1600 | |
| Optical Rise/Fall Time | | t _r /t _f | 20 – 80% | nsec | | | 0.26 0.26 | |
| RECEIVER | | | | | | | | |
| Sensitivity | | P _s | | dBm | | | -17 -20 | @3Gbps @1.65Gbps |
| Wavelength | 1310 1550 | | | nm | 1260 1480 | 1310 1550 | 1360 1580 | |
| Maximum Input Power | | P _{IN} | | dBm | 0 | | | |
| Data Output Diff Swing | | P _{OUT} | | dBm | 600 | | 1000 | CML Output |
| LOS Hysteresis | | | | dB | 1 | | | |
| Audio/MIC (Analog) | | | | | | | | |
| Analog Sample Rate | | F _{audio_a} | | kHz | | 48 | | |
| Input level | | A _{in} | | V _{pp} | | 0.56V _{ss} | | |
| Output level | | A _{out} | V _{pp} =3.3V/Analog | V _{pp} | | 0.65 | | |
| Input Impedance | | | | kΩ | | 25 | | |
| Output Impedance | | | | Ω | | 100 | | |

RS-232C Electrical Characteristics

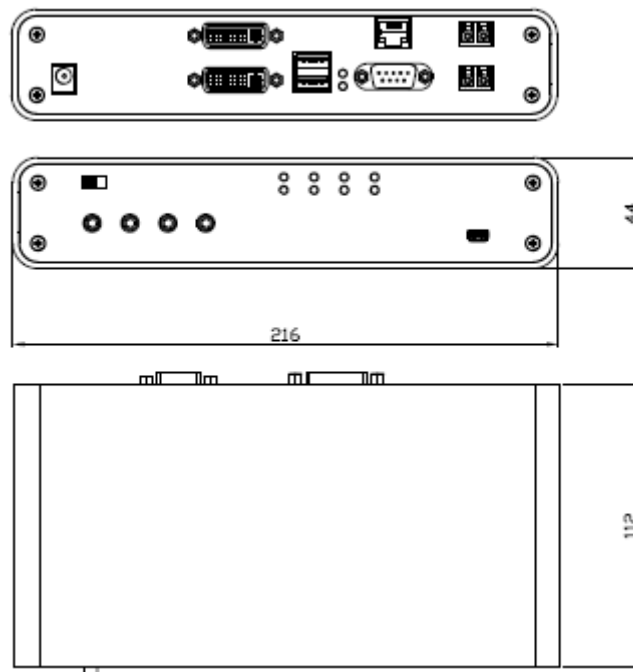
| Parameter | Symbol | Minimum | Typical | Maximum | Units |
|----------------|------------------|---------|---------|---------|-------|
| Data rate | | | | 250 | kbps |
| Input voltage | R _{in} | -25 | | 25 | V |
| Output voltage | T _{out} | | ±15 | | V |

Drawing of transmitter and receiver

Dimension [mm]



Transmitter



Receiver

DVI Pin Description

| Pin | Symbol | Functional Description |
|-----|-----------------|--|
| 1 | CH2- | TMDS Data Signal Channel 2 Negative |
| 2 | CH2+ | TMDS Data Signal Channel 2 Positive |
| 3 | GND | TMDS Data Signal Channel 2 Shield |
| 4 | | |
| 5 | | |
| 6 | DDC Clock | DDC Clock line for DDC2B communication |
| 7 | DDC Data | DDC Data line for DDC2B communication |
| 8 | N.C. | |
| 9 | CH1- | TMDS Data Signal Channel 1 Negative |
| 10 | CH1+ | TMDS Data Signal Channel 1 Positive |
| 11 | GND | TMDS Data Signal Channel 1 Shield |
| 12 | | |
| 13 | | |
| 14 | 5 V | 5 V Input for Transmitter from Host 5 V Output for Monitor from Receiver |
| 15 | GND | Ground |
| 16 | Hot plug Detect | Signal is driven by monitor to enable the system to identify the presence of a monitor |
| 17 | CH0- | TMDS Data Signal Channel 0 Negative |
| 18 | CH0+ | TMDS Data Signal Channel 0 Positive |
| 19 | GND | TMDS Data Signal Channel 0 Shield |
| 20 | | |
| 21 | | |
| 22 | GND | TMDS Clock Signal Shield |
| 23 | CLK+ | TMDS Clock Channel Positive |
| 24 | CLK- | TMDS Clock Channel Negative |

Note: Channels 3, 4 and 5 dual-link data signal pins are not used

RS-232C Pin Description

| Pin | Symbol | Functional Description |
|-----|-------------------------------|--|
| 1 | Received Line Signal Detector | Connected with Pin4 & Pin6 in module |
| 2 | RD | Data Receive: Uplink \leftrightarrow Downlink |
| 3 | TD | Data Transmit: Uplink \leftrightarrow Downlink |
| 4 | Data Terminal Ready | Connected with Pin1 & Pin6 in module |
| 5 | GND | Signal Ground |
| 6 | Data Set Ready | Connected with Pin1 & Pin4 in module |
| 7 | Request To Send | Connected with Pin8 in module |
| 8 | Clear To Send | Connected with Pin7 in module |
| 9 | NC | |

Connection tips:

- 1) Connection of PC-to-PC: Cross connection of pins 2 and 3 between two PCs.
- 2) Connection of PC-to-Device: Straight connection of pin 2:2 and pin 3:3

Reliability Test

Opticis utilizes three types of test criteria for a reduction of variability and a continuous improvement of the process by its FEMA (Failure Mode and Effective Analysis) program.

- 1) Mechanical test (vibration, shock)
- 2) Temperature & humidity tests
- 3) EMI test (CE)

Temperature & Humidity Test Data

| Heading | Test | Conditions | Duration | Sample Size | Failure | Remarks |
|-----------------------|--|---------------------------------------|------------------------------|-------------|---------|---|
| Operating Test | Operating at each Temperature (See Note) | * 0 ~ 50 °C (Interval: 10 °C) | 30 Min (Each Temperature) | n=3 | 0 | Note: Visual Test on the Display |
| Storage Test | Low Temperature | * T _s = -30 °C | 96 HR | n=3 | 0 | 1. TS: Storage Temperature |
| | High Temperature | * T _s = 70 °C | 96 HR | n=3 | 0 | 2. RH: Relative Humidity |
| | High Humidity High Temperature | * T _s : 40 °C * RH: 95% | 96 HR | n=3 | 0 | |

EMI Test Data

EMI: Meet CE class A

| STANDARDS | | CONDITIONS |
|---------------------|--|--------------|
| EN 55 022 (CISPR22) | CE (Conducted Emission) & RE (Radiated Emission) | Meet Class A |