

# DATA SHEET

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

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## 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		$\Omega$
Power Supply Rejection (Note1)	PSR		50		mV <sub>p-p</sub>
Supply Voltage	$V_{CC}$	+ 11.4	+ 12.0	+ 12.6	V

Note1. Tested with a 50mV<sub>p-p</sub> 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	$\Omega$	
	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	$\Omega$	
	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<sub>op</sub> = 25°C)

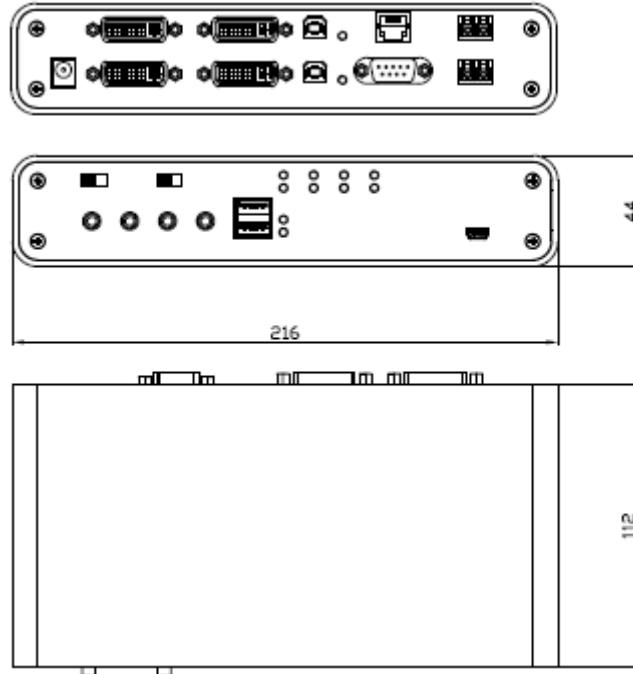
Parameters		Symbol	Condition	Unit	Min.	Typ.	Max.	Remark
Data Bit Rate	1310 Tx		PRBS 2 <sup>23</sup> -1,NRZ	Mbps		1250		
	1550 Rx					155.52		
	1550 Tx		PRBS 2 <sup>23</sup> -1,NRZ	Mbps		155.52		
	1310 Rx					1250		
Fiber Length 9µm core SMF			10 <sup>-10</sup> BER, 155Mbps/1.62Gbps	km	1			
<b>TRANSMITTER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

**RS-232C Electrical Characteristics**

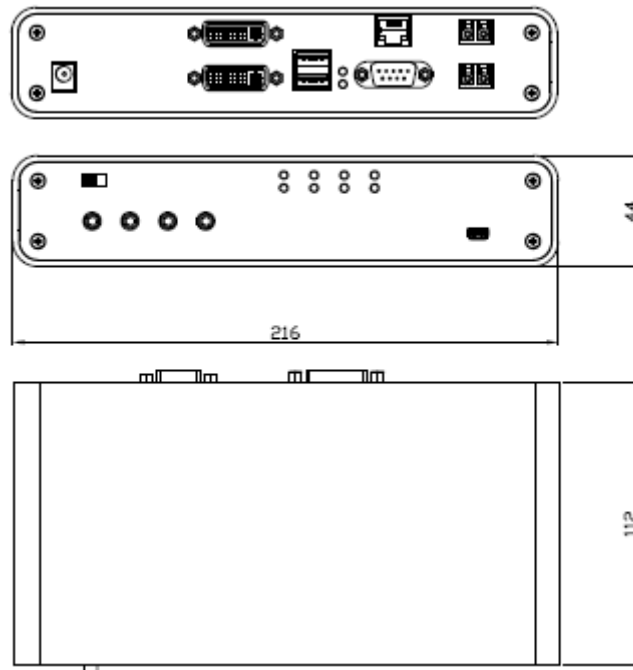
Parameter	Symbol	Minimum	Typical	Maximum	Units
Data rate				250	kbps
Input voltage	R <sub>in</sub>	-25		25	V
Output voltage	T <sub>out</sub>		±15		V

### 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
<b>Operating Test</b>	Operating at each Temperature (See Note)	* 0 ~ 50 °C (Interval: 10 °C)	30 Min (Each Temperature)	n=3	0	<b>Note:</b> Visual Test on the Display
<b>Storage Test</b>	Low Temperature	* T <sub>s</sub> = -30 °C	96 HR	n=3	0	1. TS: Storage Temperature
	High Temperature	* T <sub>s</sub> = 70 °C	96 HR	n=3	0	2. RH: Relative Humidity
	High Humidity High Temperature	* T <sub>s</sub> : 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