

# Fiber-optic Video Format Converters

## *DATA SHEET*

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## Fiber-optic Video Format Converters

### Description

Opticis provides high-end fiber-optic video format converters such as multi-format converter, OMVC-200 and single-format converters, DVDF-200, VGDF-200, SVDF-200 and CNDF-200 to manipulate from old fashioned to leading-edge video formats in a various video system applications. Both two (2) types of converter handle DVI, VGA, Component video, S-video and Composite video as an input and convert these signals to 1-fiber DVI. All signals can be transmitted up to 500m (1,640ft) using 50µm multi-mode fiber at WUXGA (1920x1200) or 1080p, 60Hz. Especially, multi-format converter, OMVC-200 automatically detects the first incoming signal among various signals or decides a priority input by pre-programming as DVI, VGA, Component, Composite and S-Video in an order when all signals are connected and turned on.

The latest multi/single-format converters support all VESA resolutions up to WUXGA (1920x1200) at 60Hz, up to 1080p at 60Hz for Component and 480i, 576i for Composite and S-Video executing this SD signal input, NTSC/PAL (480i, 576i) to SXGA (1280x1024). The others are remained as same resolution.

The OMVC-200 can be mountable up to two (2) units and four (4) units for single-format converters in 19" 1RU rack and both two (2) types of converter installed in various places such as, a back side of display or frame by two (2) types of mounting bracket complying with VESA 75, 100 standards. The EDID in a display can be read and restored by just pressing EDID button in a front panel of OMVC-200, DVDF-200 and VGDF-200. This EDID programming feature makes the installation more easy and flexible at any variable resolution of display systems. The LED indicators are equipped for Power-on and Status (signal transmission and EDID learning for DVI and VGA) on a front panel.

Opticis converters are used for long haul video applications and special place where the optimal signal quality and electrical isolation are required and our own 1-fiber DVI receiver, DVFX-100-R is used as a pair to execute optical to electrical DVI conversion.

The line-up is composed of

- 1) Multi-format converter, OMVC-200
- 2) DVI to 1-fiber DVI converter, DVDF-200
- 3) VGA to 1-fiber DVI converter, VGDF-200
- 4) Component to 1-fiber DVI converter, CNDF-200
- 5) S-video / Composite video to 1-fiber DVI, SVDF-200

All converters are constituted of three (3) parts as follows;

- One (1) Converter unit
- One (1) 5V/3A, AC/DC power adaptor with locking type outlet (Medical grade of certification)
- Two (2) types of mounting bracket (Optional);
  - 1) Type A has female screw holes to be fixed from the outside where there are VESA standard bare holes.
  - 2) Type B has a bare hole to fix from the inside to outside where three are VEAS standard female screw holes.

## 1. Fiber-optic Video Format Converters

### 1) Key Features

- Supports all VESA resolution up to WUXGA (1920x1200) at 60Hz for DVI and VGA, up to 1080p, 60Hz for Component video, 480i and 576i for Composite video and S-Video
- Automatically detects the first incoming signal among various video sources and converts it into one (1) optical DVI output with SC termination (OMVC-200, SVDF-200)
- Be scale-up 480i and 576i to SXGA (1280x1024) for S-Video/Composite video inputs (OMVC-200, SVDF-200).
- Except the case above, it maintains input and output resolutions.
- Transmits up to 500m using 50 $\mu$ m multi-mode fiber at WUXGA or 1080p, 60Hz
- 2 units or 4 units can be mountable in 19" 1RU rack (OMVC-200, Single-format converters)
- Provides mounting bracket complying with VESA 75, 100 standards to be attached on various places (Optional – OMVC-200, Single-format converters)
- Includes one (1) +5V DC 3A power adapter (Medical grade of certification)
- Certifications: CE / FCC, Laser Safety - DVDF-200, VGDF-200. CE / FCC – OMVC-200

### 2) Applications

- Medical equipment
- Control room
- Conference room / Education
- Various application requiring long haul video applications and special place where the optimal signal quality and electrical isolation are needed

### 3) Technical Specifications

#### i) General Specifications (OMVC-200, DVDF/VGDF/SVDF/CNDF-200)

	Parameter	Specifications
Electrical	Input Signal Type	<b>DVI:</b> TMDS <b>VGA:</b> RGBHV, RGsB, RGBS <b>Composite &amp; S-Video:</b> NTSC/PAL <b>Component:</b> YPbPr
	Input Connectors	<b>DVI:</b> 24pin DVI-I <b>VGA:</b> HD15, D-sub <b>Component:</b> 3 x RCA <b>S-video:</b> Mini-DIN <b>Composite:</b> RCA

	Supporting Resolution	<b>DVI &amp; VGA:</b> VGA to WUXGA (1920 x 1200), 60Hz <b>Component:</b> 480i to 1080p, 60Hz <b>S-video &amp; Composite:</b> Up-scale 480i and 576i to SXGA (1280x1024), 60Hz
	Power Consumption	OMVC-200, DVDF-200 < 6W, VGDF/SVDF/CNDF-200 <5W
	Max. Bit rate	Max. 1.65Gbps
Optical	Output Optical Connector	SC
	Laser Diodes in Output	Multi-mode VCSEL (Vertical Cavity Surface Emitting Laser)
	Output Optical Power	< 1 dBm
Mechanical	Dimension (WDH)	Multi-format: 216 x 112 x 44mm
		Single-format: 104 x 112 x 28mm
Fiber	Optical Connector	Simplex SC connectors
	Recommended Fiber	50/125 um Multi-mode Glass Fiber

#### 4) Absolute Maximum Ratings (OMVC-200, DVDF/VGDF/SVDF/CNDF-200)

Parameter	Symbol	Minimum	Maximum	Units
Supply Voltage	V <sub>CC</sub>	-	+ 6.0	V
Operating Temperature	T <sub>op</sub>	0	50	°C
Storage Temperature	T <sub>s</sub>	- 30	+ 70	°C
Storage Relative Humidity	H <sub>s</sub>	10	95	%RH

#### 5) Operating Conditions

##### i) DVI Input (OMVC-200, DVDF-200)

	Parameter	Symbol	Minimum	Typical	Maximum	Units
Power Supply	Supply Voltage	V <sub>CC</sub>	-	5.0	5.5	V
	Supply Current	I <sub>TCC</sub>	-	1110	1200	mA
	Power Dissipation	P <sub>TX</sub>	-	5.55	6.6	W
	Power Supply Rejection (Note1)	PSR		50		mV <sub>p-p</sub>
TMDS	Data Input Load	R <sub>LD</sub>		50		Ω
	Graphic Supply Voltage (Note2)	GV <sub>CC</sub>	+ 3.1	+ 3.3	+ 3.5	V
	Single-Ended High Level Input Voltage	GV <sub>IH</sub>	GV <sub>CC</sub> - 0.01	GV <sub>CC</sub>	GV <sub>CC</sub> + 0.01	V
	Single-Ended Low Level Input Voltage	GV <sub>IL</sub>	GV <sub>CC</sub> - 0.6	-	GV <sub>CC</sub> - 0.4	V
	Single-Ended Input Swing Voltage	GV <sub>ISWING</sub>	0.4	-	0.6	V
	Resolution range	-	640x480	-	1920x1200	-

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

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

### **ii) VGA Input (OMVC-200, VGDF-200)**

	Parameter	Symbol	Minimum	Typical	Maximum	Units
Power Supply	Supply Voltage	V <sub>CC</sub>	-	5.0	5.5	V
	Supply Current	I <sub>TCC</sub>	-	890	950	mA
	Power Dissipation	P <sub>TX</sub>	-	4.45	5.22	W
	Power Supply Rejection	PSR		50		mV <sub>p-p</sub>
Video Input	Data Output Load	R <sub>LD</sub>		75		Ω
	Input Signal Level	RGB		0.7		V <sub>p-p</sub>
	Horizontal Frequency	HF	30	-	91	KHz
	Vertical Frequency	VH	50	-	85	KHz
	Resolution range (Note3)	-	640x480	-	1920x1200	-

Note3. Only the reduced blanking version of the 1920x1200 resolution is sampled at full bit rate.

### **iii) Component Input (OMVC-200, CNDF-200)**

	Parameter	Symbol	Minimum	Typical	Maximum	Units
Power Supply	Supply Voltage	V <sub>CC</sub>	-	5.0	5.5	V
	Supply Current	I <sub>TCC</sub>	-	810	850	mA
	Power Dissipation	P <sub>TX</sub>	-	4.05	4.68	W
	Power Supply Rejection	PSR		50		mV <sub>p-p</sub>
Video Input	Data Input Load	R <sub>LD</sub>		75		Ω
	Input Signal Level	Y		1		V <sub>p-p</sub>
		PbPr		0.7		V <sub>p-p</sub>
	Resolution range	-	480i@60	-	1080p@60	-

### **iv) S-Video/Composite Input (OMVC-200, SVDF-200)**

	Parameter	Symbol	Minimum	Typical	Maximum	Units
Power Supply	Supply Voltage	V <sub>CC</sub>	-	5.0	5.5	V
	Supply Current	I <sub>TCC</sub>	-	850	900	mA
	Power Dissipation	P <sub>TX</sub>	-	4.25	4.95	W
	Power Supply Rejection	PSR		50		mV <sub>p-p</sub>
Video Input	Data Input Load	R <sub>LD</sub>		75		Ω
	Resolution range (Note4)	-	NTSC, PAL			-

Note4. Output Resolution: 1280x1024@60Hz

### v) Optical DVI Output (OMVC-200, DVDF/VGDF/SVDF/CNDF-200)

	Parameter	Symbol	Minimum	Typical	Maximum	Units
Optical Output	Output Optical Power	$P_o$			1	dBm
	Wavelength	$\lambda$	850		990	nm
	Spectral width in RMS	$\Delta\lambda$			3	nm
	Relative Intensity of Noise	RIN		-20		dB/Hz
	Extinction Ratio	Ext	4			dB
	Rising/Falling Time	$T_{rise}/T_{fall}$			260	ps
	Jitter in p-p value	$T_{jitter}$			260	ps

### 6) Recommended Specifications of Fiber-Optic Cable

Parameters	Conditions	Specifications
Fiber Type		50 $\mu$ m Multi-mode Graded Index Glass Fiber
Modal Bandwidth	$\lambda = 850\text{nm}$	Min. 500 MHz km
Fiber Cable Attenuation	$\lambda = 850\text{nm}$	Max. 2.5dB/km
Extension Distance		10 – 1,640ft (500 meters)
No. of Ferrules	SC	1 ferrule
Skew		Max. 0.4ns
Insertion Attenuation		Max. 0.5dB
Total Optical Attenuation	In 330 ft (100 meter) extension	Max. 1.5dB

### 7) Functions

#### i) Self-EDID Function (DVI and VGA)

The EDID in a display can be read and restored by just pressing EDID button on front panel. This Self-EDID programming feature makes the installation of OMVC-200 more easy and flexible at any variable resolution display systems.

#### ii) Auto Signal Detection

It automatically detects the first incoming signal among various signals or decides a priority by pre-programming in an order of DVI, VGA, Component, Composite and S-Video when all signals are connected at the same time.

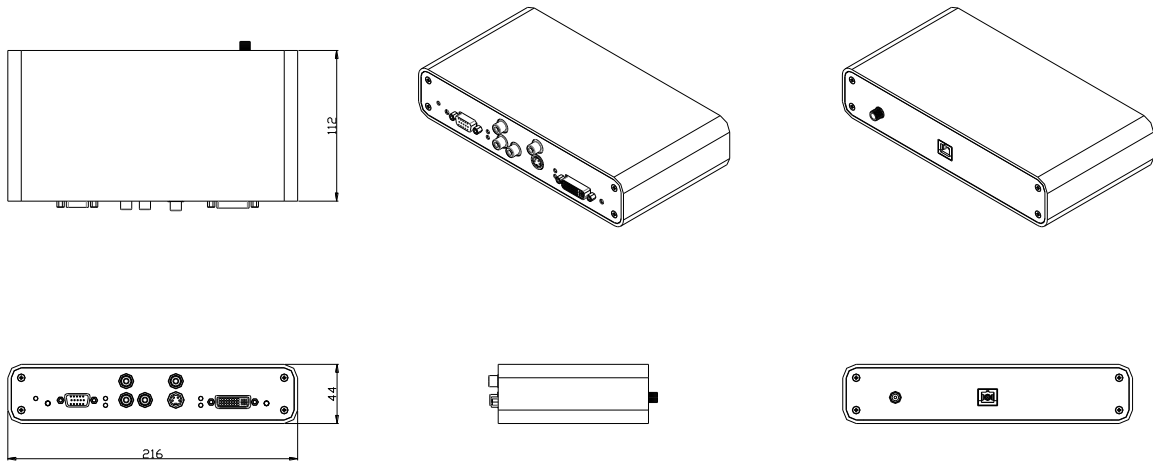
#### iii) Upscale NTSC/PAL to SXGA

It also executes an upscale NTSC/PAL (480i, 576i) to SXGA (1280x1024) for S-Video/Composite video input. The others are remained as same resolution.

## 8) Drawing Dimension [mm]

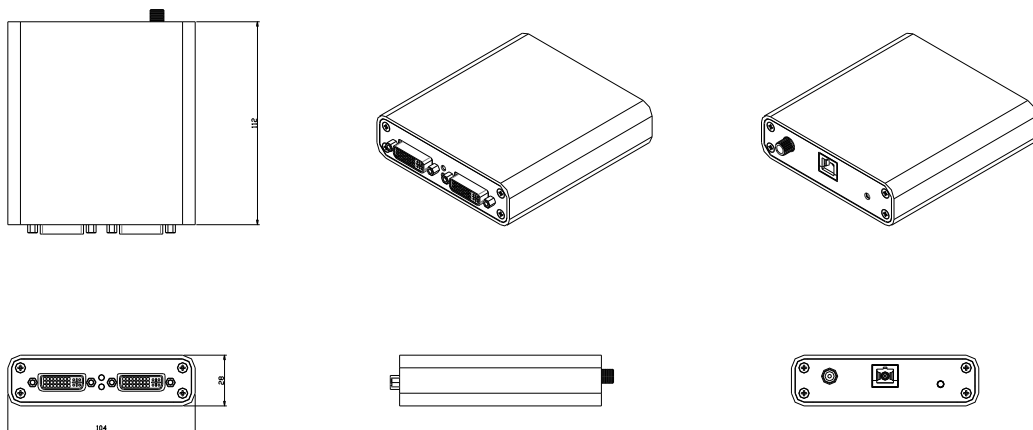
### i) Multi-format converter, OMVC-200

(WDH) = 216 x 112 x 44mm



### ii) Single-format converter, DVDF-200, VGDF-200, CNDF-200, SVDF-200

(WDH) = 104 x 112 x 28mm



## 9) Connection Diagram

The diagram shows the connection of single-format converter (VGDF-200) and 1-fiber DVI extender (Receiver; DVFX-100-RX) by one (1) SC multi-mode fiber.

