

# FO-DVI-XX-MM Series

## User's Guide



### Models

FO-DVI-XX-MM

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## Section 1: Getting Started

### 1.1 Important Safeguards

**Please read all of these instructions carefully before you use the device. Save this manual for future reference.**

#### **What the warranty does not cover**

- Any product, on which the serial number has been defaced, modified or removed.
- Damage, deterioration or malfunction resulting from:
  - Accident, misuse, neglect, fire, water, lightning, or other acts of nature, unauthorized product modification, or failure to follow instructions supplied with the product.
  - Repair or attempted repair by anyone not authorized by us.
  - Any damage of the product due to shipment.
  - Removal or installation of the product.
  - Causes external to the product, such as electric power fluctuation or failure.
  - Use of supplies or parts not meeting our specifications.
  - Normal wear and tear.
  - Any other causes which does not relate to a product defect.
- Removal, installation, and set-up service charges.

## 1.2 Safety Instructions

- Do not dismantle the housing or modify the module.
- Dismantling the housing or modifying the module may result in electrical shock or burn.
- Refer all servicing to qualified service personnel.
- Do not attempt to service this product yourself as opening or removing housing may expose you to dangerous voltage or other hazards
- Keep the module away from liquids.
- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.
- Have the module checked by a qualified service engineer before using it again.

## 1.3 Regulatory Notices Federal Communications Commission (FCC)

This equipment has been tested and found to comply with Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

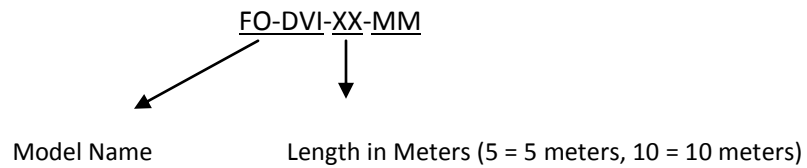
Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

## 1.4 Introduction

Avenview FO-DVI-XX-MM Series with fiber optic cable system lets you extend digital flat panel signal up to 100 meters (330 feet).

- High Speed and long distance transmission by Optical fiber
- Fully compatible with DVI Standard by DDWG
- Use of standard DVI Plug
- R, G, B, Clock signal is transmitted Optical Fiber
- Supports up to WUXGA (1920 x 1200) resolution
- DDC signal and 5V power line is transmitter by copper line
- Optical Fiber only system without DDC Corresponding to T.M.D.S Signal
- No EMI characteristics for medical instruments and airplane

## 1.5 Model Description



## 1.6 Package Contents

Before you start the installation of the converter, please check the package contents.

- DVI Optical Cable with Receiver and Transmitter
- User's Manual

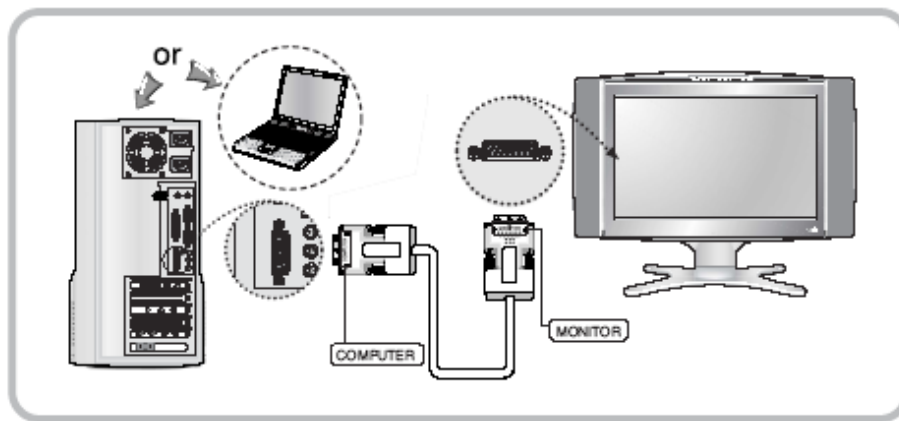
## 1.7 Before Installation

- Put the product in an even and stable location. If the product falls down or drops, it may cause an injury or malfunction.
- Don't place the product in too high temperature (over 50°C), too low temperature (under 0°C) or high humidity.
- Use the DC power adapter with correct specifications. If inappropriate power supply is used then it may cause a fire.
- Do not twist or pull by force ends of the optical cable. It can cause malfunction.



## 1.8 Installation

This product is composed of a Transmitter converting the graphic signal of a computer to optical and Optical Fiber propagating the optical signal and Receiver supplying electrical signal to monitor converted from the optical signal to electrical signal. The Transmitter should be connected to computer and the Receiver should be connected to a monitor (as shown below).



Connection diagram of FO-DVI-XX-MM

Avenview FO-DVI-xx-MM is designed to self detect the resolution of the monitor and change the resolution accordingly. Follow these steps for connecting to a device:

1. Power on your display
2. Connect Transmitter to the PC and Receiver to the Display.
3. Connect the optical fiber between Transmitter and Receiver.
4. Restart the computer.

*Use the DC power adapter (optional) with correct specification. The Transmitter which is connected to a computer uses power from the computer.  
Do not twist or pull by force the both ends of the optical cable. It may cause malfunction*

## 1.9 General Troubleshooting

<b>Problem</b>	<b>Possible Solution</b>
<b>No Image</b>	<ul style="list-style-type: none"><li>• Check if the PC Power is on</li><li>• Check if connection to the computer and the monitor are correct.</li><li>• Turn the PC Power off and on again.</li></ul>
<b>Screen Defects Appear</b>	<ul style="list-style-type: none"><li>• This product supports up to UXGA resolution.</li><li>• Check the DVI connection</li><li>• Check the maximum resolution range of the graphics card.</li></ul>



## Section 2: Specifications

Item	Description
<b>Video Bandwidth</b>	1.65Gbps (Single Link)
<b>Connector</b>	DVI 24Pin Plug
<b>Power Consumption</b>	5V / 0.5A (min)
<b>Supported Resolution and Distance</b>	SXGA 1280 x 1024 @ 700 meters (2300 feet) UXGA 1600 x 1200 @ 500 meters (1650 feet) WUXGA 1920 x 1200 @ 100 meters (330 feet)

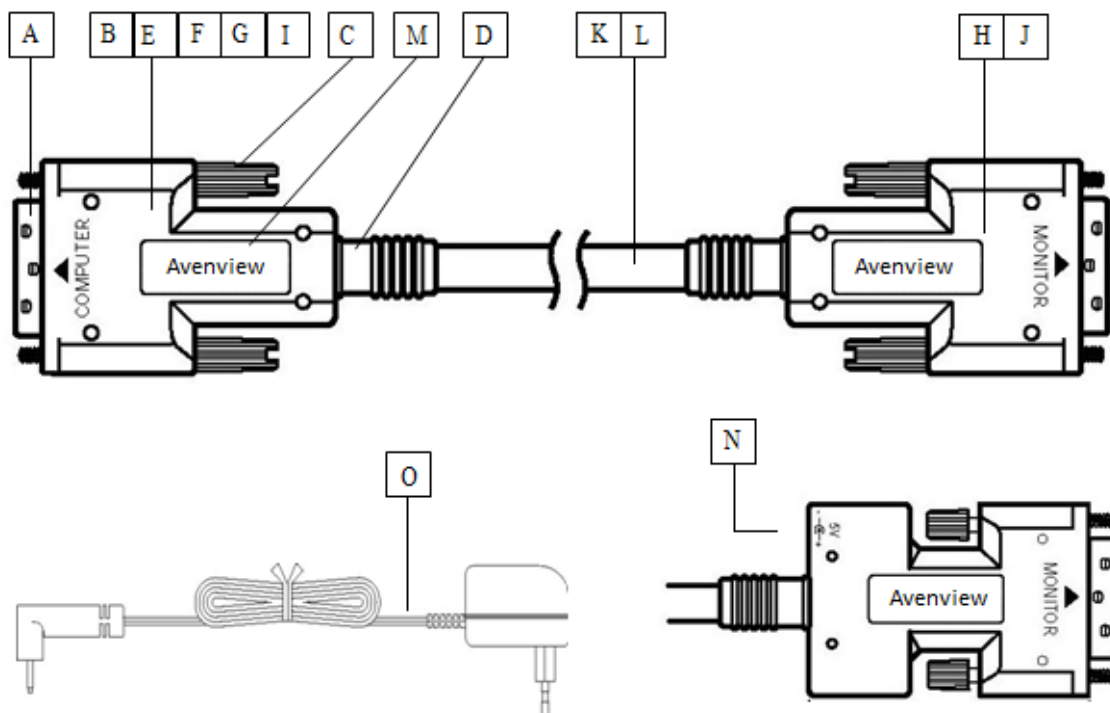
### Optical

<b>Optical Source</b>	850nm VCSEL
<b>O/E Converter</b>	PIN Photo Diode
<b>Fiber Type</b>	Multi-Mode Fiber

### Environmental

<b>Operation</b>	0° to 50°C Degree
<b>Storage</b>	-20° to 70°C Degree

## 2.1 Part List



Item	Description	Q'ty	Material
A	DVI-D Single Link 18 Plug	2	Glass filled thermoplastic UL94V-0
B	DVI Case-Top, Bottom	2	Glass filled PC UL94V-0
C	DVI Thumb Screw	4	SUM 24L+ABS
D	Stopper	2	PVC 55%
E	Epoxy Printed Circuit Board for Tx	1	FR-4, 1.5t UL94V-0
F	Optical Connector for VCSEL,PD	2	PA46 UL94V-0 + C5210
G	Optical Connector for fiber	2	PA46 UL94V-0
H	Epoxy Printed Circuit Board for Rx	1	FR-4, 1.5t UL94V-0
I	Vertical Surface Emitting Laser Diode	4	GaAs
J	Photo Detector	4	GaAs
K	4 fiber 5 copper DVI Optic Cable	1	See Section 4
L	4 fiber DVI Optic Cable	1	See Section 4
M	Label	4	Polyester-matte 3.3mil
N	DC Power Jack	2	Polyamide 6/6
O	DC Power Adaptor	1	E191362 (UL No)

## 2.2 Power Consumption and DDC Power Requirements

Power consumption of FO-DVI-xx-MM Transmitter and Receiver Module

Item	Typical	maximum	units
Transmitter	0.4	0.53	Watt
Receiver	0.5	0.56	Watt

Transmitter module of FO-DVI-XX-MM without external power supply is operated by drawing out power for DDC from the computer and receiver module of FO-DVI-XX-MM cable also utilize the DDC power delivered via copper wire.

*If graphic board of the computer does not supply over 0.6A, 5V, FO-DVI-XX-MM cable may not operate normally.*

## 2.3 Signal Pin Assignment

- Fully compatible with DVI Rev 1.0 standard
- R, G, B and Clock signals are transmitted by optical fibers.
- DDC, Hot plug detection signal and 5V power is transmitted by electrical copper wire.
- External power is not required for operation

Pin	Signal Assignment	Pin	Signal Assignment	Pin	Signal Assignment
1	T.M.D.S. Data2-	9	T.M.D.S. Data1-	17	T.M.D.S. Data0-
2	T.M.D.S. Data2+	10	T.M.D.S. Data1+	18	T.M.D.S. Data0+
3	T.M.D.S. Data2 Shield	11	T.M.D.S. Data1 Shield	19	T.M.D.S. Data0 Shield
4	No Connect	12	No Connect	20	No Connect
5	No Connect	13	No Connect	21	No Connect
6	DDC Clock	14	+5V Power	22	T.M.D.S. Clock Shield
7	DDC Data	15	Ground (for +5V)	23	T.M.D.S. Clock+
8	No Connect	16	Hot Plug Detect	24	T.M.D.S. Clock-

## 2.4 Characteristics of DVI Connector

### 2.4.1 Material

Housing	Glass Filled Thermoplastic, Black UL94V-0
Contact	Brass
Shell	Steel (Nickel Plated)

### 2.4.2 Electrical

Rated	1.5A, 40V (AC)
Contact Resistance	20 mΩ Maximum
Insulation Resistance	1000 mΩ Minimum
Dielectric withstanding Voltage	500VDC

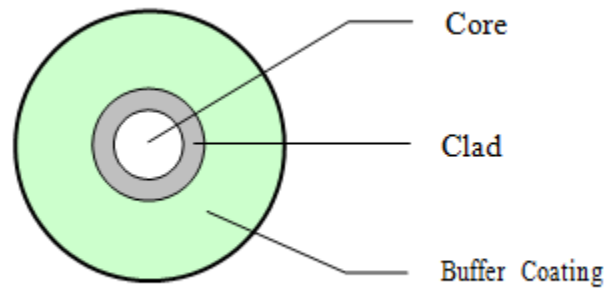
### 2.4.3 Mechanical

Mating Force	4.5Kg (10lbs) Maximum
Unmating Force	1Kg (2.2lbs) Minimum 4Kg (8.8lbs) Maximum

## 2.5 Characteristics of FO-DVI-XX Cable

### 2.5.1 Optical Fiber Construction and Characteristic

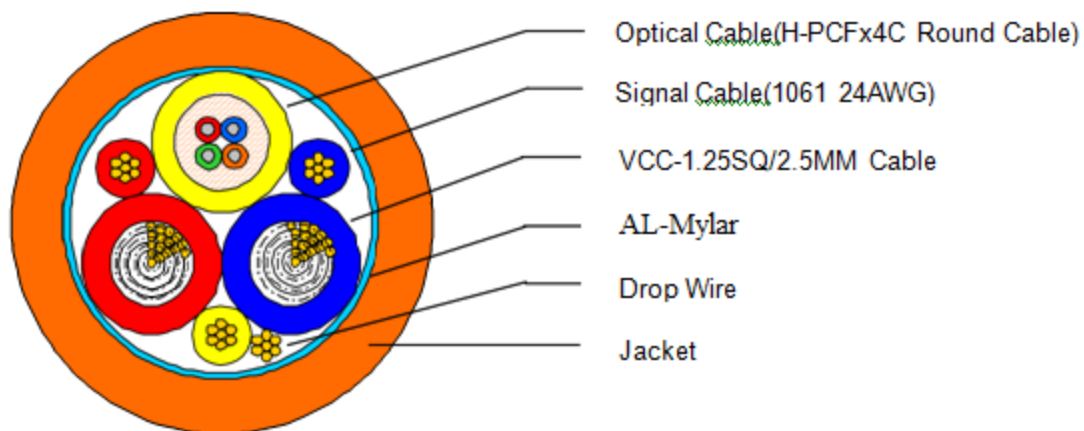
The construction of the buffered optical fiber shall be in accordance with Figure 1 and Table 1 below:



Item	Description	
Fiber Type	Hard Plastic Clad Silica Optical Fiber(H-PCF)	
Index Profile	Semi Graded	
Core	Material	GeO <sub>2</sub> doped Silica glass
	Diameter	φ200±5um
	Non-circularity	Less than 6%
Cladding	Material	Fluoroacrylate
	Diameter	±225±5um
	Concentricity	Less than 6um
Buffer Coating	Material	Acrylate
	Diameter	φ0.5±0.03mm

## 2.6 FO-DVI-XX Cable Construction

The construction of 4 Optical Fibers and 4 Copper wires cable shall be in accordance with Figure and Table below:



The Dimension of FO-DVI-XX-MM Cable		
Items	Uni	Specification
DVI Cable Make-up	-	Layer Stranding
Drain Wires (Size/Stranded)	mm(AWG)	-0.203/7 (24)
AL-Mylar Screen Shield	-	A helically
Cable Outer Diameter	mm	7.40±0.20
Jacket Color	-	FR-PVC(Orange)
Cable Marking	-	If need

## 2.7 Physical Interconnect Specification

### 2.7.1 Mechanical Characteristics

Item	Test Condition	Requirements
Vibration	ANSI/EIA-364-28, Condition III Method 5A, 15 minute/axis	No discontinuity at 1us or longer (each contact) when continuity is tested per ANSI/EIA-364-46
Mechanical Shock	ANSI/EIA-364-27 Condition A (specified pulse)	No discontinuity at 1us or longer (each contact) when continuity is tested per ANSI/EIA-364-46
Durability	ANSI/EIA-364-09 Automatic cycling to 100 cycles Rate: 100±50 cycles per hour	Low Level contact resistance per ANSI/EIA-364-23 10 mΩ maximum change from initial per contact pair
Mating & Un-mating Forces	ANSI/EIA-364-13 Insert and extract at a speed of 25mm/minute	Un-mating force: 1 kg force minimum, 4 kg force maximum Mating force: 4.5 kg force maximum
Cable Pullout Force	Test for cable strain relief & termination integrity. Cable subjected to 11.3 kg(25.0 lbs) static load for one minute while monitoring continuity. Isolate	No discontinuities greater than 1 us

## 2.7.2 Connector Electrical Characteristics

Item	Test Condition	Requirements
Contact Resistance	ANSI/EIA-364-23	20mΩ, maximum, initial per contact mated pair 10mΩ, maximum change from original per contact mated pair
Shell Resistance	ANSI/EIA-364-06A-83 Contact resistance measured from receptacle shell leg to plug cable braid. Test current = 100mA; Test Voltage = 5V DC open circuit maximum	50mΩ, maximum initial 50mΩ, maximum change from original
Dielectric Withstanding Voltage	ANSI/EIA-364-20 Test voltage 500V DC ± 50V Method C, unmated and un-mounted Barometric pressure of 15 psi	No Flash-over, No Spark-over, No Excess Leakage, No Breakdown
Insulation Resistance	ANSI/EIA-364-21 Test voltage 500V DC ± 50V Method C, unmated and un-mounted	1GΩ minimum between adjacent contacts and contacts and shell
Contact Current Rating	ANSI/EIA-364-70, TP-70 55°C, maximum ambient 85°C, maximum temperature change	1.5A minimum
Applied Voltage Rating		40V AC(ms) continuous maximum, on any signal pin with respect to the shield
Electrostatic Discharge	IEC 801-2 Test un-mounted from 1kV to 8kV in 1kV steps using 8mm ball probe	No evidence of discharge to contacts. Discharge to the shell is acceptable.



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