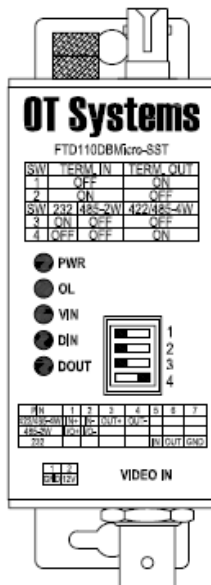




All Digital Fiber Optic Manufacturing Specialists

# Installation and Operation Manual

## FTD110DBMicro Series



### 8-bit Digital Series

1-ch Video with 1 Bi-directional Data  
Fiber Optic Converter

## Models covered in this manual

### Standalone Units

#### Single-Mode Transmitters

FTD110DBMicro-SST

FTD110DBMicro-SSTL

#### Single-Mode Receivers

FTD110DBMicro-SSR

FTD110DBMicro-SSRL

#### Multi-Mode Transmitter

FTD110DBMicro-SMT

#### Multi-Mode Receiver

FTD110DBMicro-SMR

### Compatible with the following Series:

FTD110DB

FTD110DBM

FTD110DB-XXR3

#### **Remark:**

If the optical connector is FC type, the suffix in the model number will be “-*FXX*”. Eg.

FTD110DBMicro-**FST**

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## (1) Safety Instructions

**Please be familiar with all information in this manual prior to installation and operation.**

**Note 1:** The products described each contains a Class 1 laser or LED fiber optic emitter. The following safety precautions apply.

**Warning:** Do not disconnect the fiber optic connector while the unit is powered up. Exposure to Class I invisible optical radiation is possible when the internal fiber optic connector is disconnected while the unit is powered up.

**Caution:** Any access to the controls, adjustments, or performing operations, which are other than those facilitated and/or specified may result in hazardous radiation exposure. Permanent eye damage or other bodily injuries may be resulted from such exposure even for only seconds.

**Note 2:** This assembly contains parts sensitive to damage by electrostatic discharge (ESD). ESD precautionary procedures should be applied in the course of touching, removing or inserting parts or assemblies.

## **(2) Product Overview**

### **2.1 Introduction**

The FTD110DBMicro Series products comprise of either a single-mode or multi-mode fiber optic transmitters and receivers catering for optical transmission of ONE forward (Tx → Rx) video and ONE bi-directional (Tx ↔ Rx) data signal in one fiber. The products work at wavelengths 1310nm and 1550nm with either a 9/125um or 62.5/125um fiber for single-mode or multi-mode transmission respectively.

A non-compressed 8-bit digital video transmission scheme is implemented which supports multi-systems video in NTSC, PAL and SECAM formats. Transparent data transmission is also accomplished in RS232, RS422 and RS485 formats regardless of the types of communication protocol implemented within the system. Time Division Multiplex (TDM) technique is employed for digital transmission of forward video and data; whereas optical Wavelength Division Multiplex (WDM) technique is employed for simultaneous reverse data transmission so as bi-directional data transmission is accomplished.

For the single-mode transmission, we also offer specifically designed products for long-haul transmissions up to 60km. Their model names include a letter “L” in the suffix, e.g. FTD110DBMicro-SSTL for Tx, FTD110DBMicro-SSRL for Rx, etc.

The FTD110DBMicro Series units are available as Micro unit, which can be mounted horizontally or vertically wall-mounted on any fixtures. The Micro unit comes with an external power adaptor FT-PA/12V, which can be powered by a local residential power supply outlet.

## 2.2 Models selection table

Mode	Models <sup>1</sup>	Descriptions	Installation requirements	Remarks
Single-Mode	FTD110DBMicro-SST	Single-mode Video Transmitter & Data Transceiver Micro Unit	Horizontally or vertically wall-mounted Micro sized unit	FT-PA/12V external power adaptor is included for the Micro unit <sup>2</sup>
	FTD110DBMicro-SSTL	Single-mode Long-haul Video Transmitter & Data Transceiver Micro Unit		
	FTD110DBMicro-SSR	Single-mode Video Receiver & Data Transceiver Micro Unit		
	FTD110DBMicro-SSRL	Single-mode Long-haul Video Receiver & Data Transceiver Micro Unit		
Multi-Mode	FTD110DBMicro-SMT	Multi-mode Video Transmitter & Data Transceiver Micro Unit		
	FTD110DBMicro-SMR	Multi-mode Video Receiver & Data Transceiver Micro Unit		

<sup>1</sup> If the optical connector is FC type, the suffix in the model number will be "-FXX". Eg. FTD110DB-FST

<sup>2</sup> FT-PA/12V works under 100 -240VAC, 50/60Hz power supply

## (3) Installation

### 3.1 General

All OT Systems products are thoroughly inspected, tested and securely packed before delivery to ensure a stable, intact and trouble-free service. Please check the equipment upon receipt for any visible damage which may have been caused during transit.

The FTD110DBMicro Series (Fig. 3.1) can be either horizontally or vertically wall-mounted, or mounted on any fixtures, etc. The Micro unit works with an external power adaptor FT-PA/12V powered by a local residential power supply outlet.

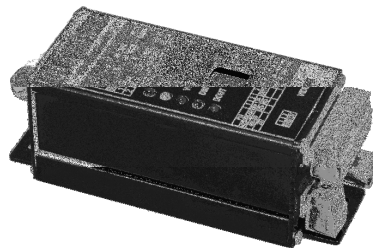


Fig. 3.1 Micro unit

### 3.2 Micro unit installation

a) Mount the clip (Fig. 3.2) onto a fixture, e.g. a plank, (either on the wall or on a flat surface) with two screws piercing through the holes on the mounting frame to secure it in position.

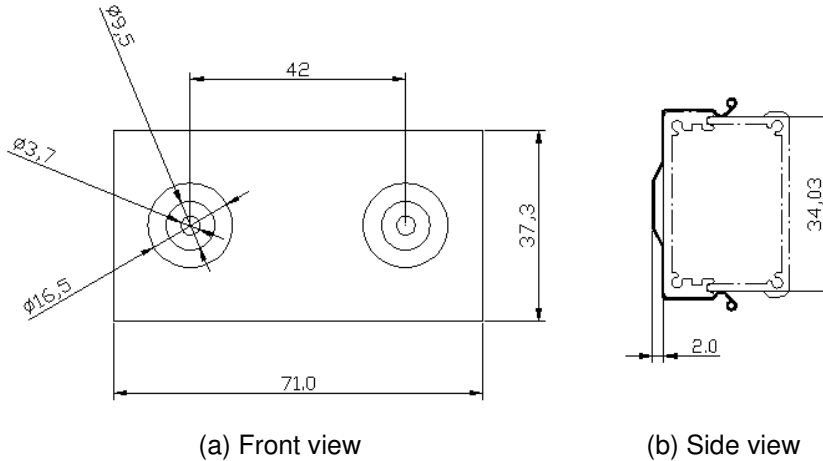


Fig. 3.2 Micro unit's clip

b) The provided power adaptor should also be mounted on the same fixture or in the proximity for connection of the supply cables to the unit, provided that an AC power supply socket is nearby for powering the adaptor.

c) Push the Micro unit into the clip to secure it in position. For details, please follow Fig. 3.3.

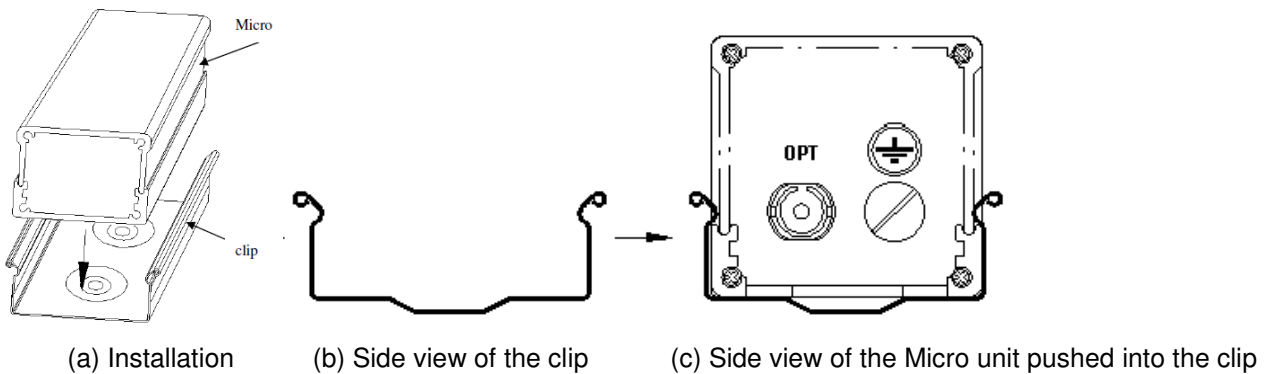


Fig. 3.3 Micro unit installation on the clip

d) Once the unit is powered up, check that the red POWER LED on the unit is lit. If not, check the power supply cable connections between the unit and the power supply socket.

e) Connect all the signal inputs and outputs at the back of the unit with appropriate cables: fiber optic cable for optical link, BNC cable for video input/output (Tx/Rx), and UTP cable for data input/output (Tx/Rx).

f) With all the signals available at the input and output ports, check the status of LEDs located on the unit. With correct status of each LED, installation is now completed [for LEDs status, see **Operational Guides** on this manual's section (5)].

## (4) Cable Connections & Setup Procedures

### 4.1 System cable connections

Signal Type	Cable Type	Connector
Optical	Single-mode or Multi-mode fiber	ST (or FC) Connector
Video	Coaxial Video Cable	BNC Connector
Data	Twisted-pair Cable	Screw Terminal Block

Typical System Cable Connections Diagram:

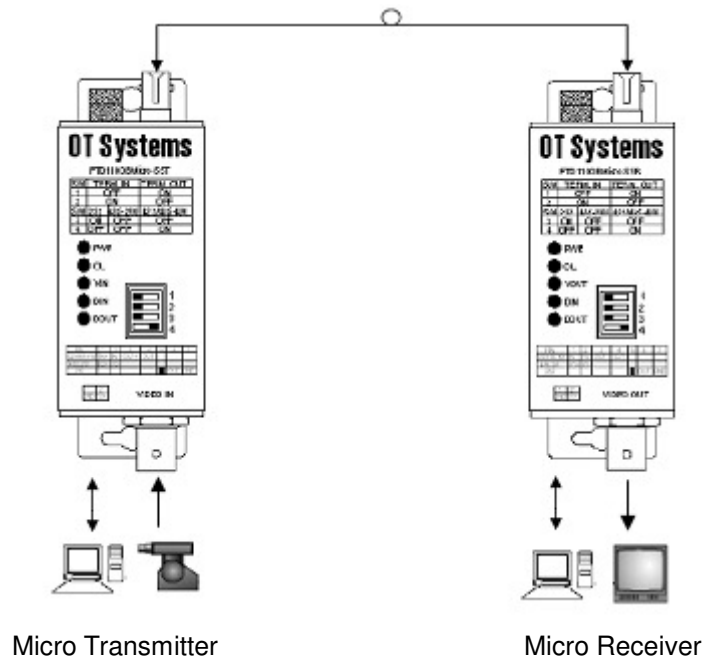


Fig 4.1 Micro unit to Micro unit connection diagram

### 4.2 Data port assignment and pin connections

For data input and output connections, please note the following pin assignment:

Pin Assignment (Screw Terminal Block)	1	2	3	4	5	6	7
<b>Data format</b>							
<b>RS422/485 (4-Wire)</b>	IN(+)	IN(-)	OUT(+)	OUT(-)	N/A	N/A	N/A
<b>RS485 (2-Wire)</b>	IN/OUT (+)	IN/OUT (-)	N/A	N/A	N/A	N/A	N/A
<b>RS232</b>	N/A	N/A	N/A	N/A	IN	OUT	Sig. COM



**4-Wire RS422/485 Full Duplex Data communication connection diagram:**

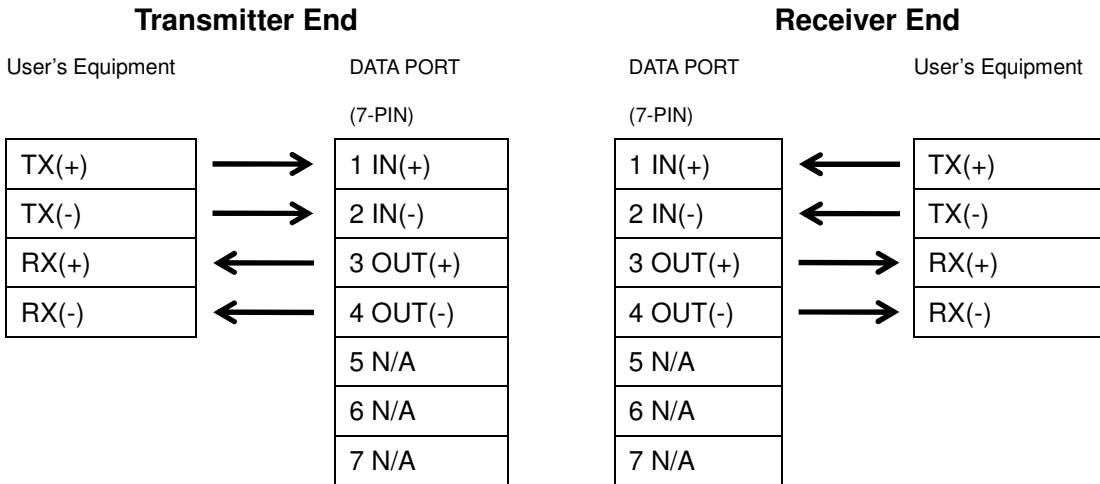


Fig. 4.4.1 Connector Pin Assignments for 4-wire RS422/485 data format at Data port

**2-Wire RS485 Half Duplex Data communication connection diagram:**

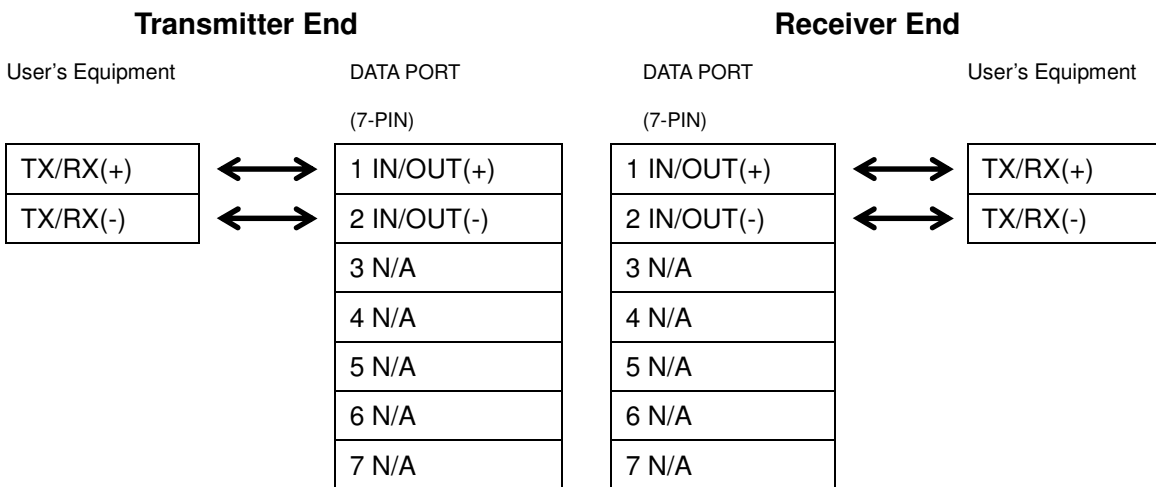


Fig. 4.4.2 Connector Pin Assignments for 2-wire RS485 data format at Data port.

**RS232 Data communication connection diagram:**

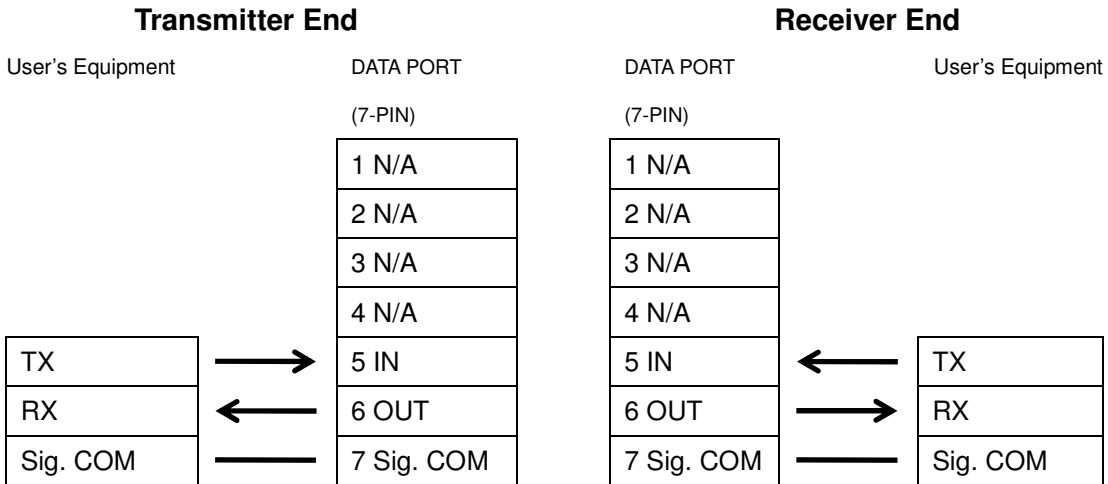


Fig. 4.4.3 Connector Pin Assignments for RS232 data format at Data port

**4.3 Dip switch setting procedures**

The only setup procedure is to select the appropriate line terminations and data transmission formats. Selections must be made by setting the dip switches (Fig. 4.5) through the access on the front panel.

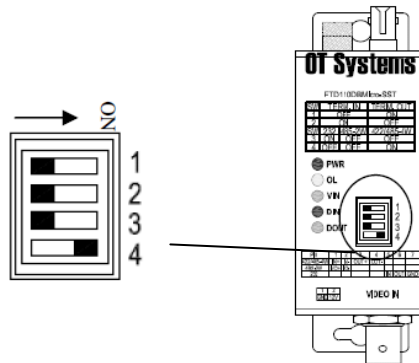


Fig. 4.5 Location of Dip Switches

**Dip switch settings for various types of data transmissions**

Function / Switch No.	Sw. 3	Sw. 4
RS485 (2-Wire)	OFF	OFF
<b>RS422/485 (4-Wire)*</b>	<b>OFF</b>	<b>ON</b>
RS232	ON	OFF

\* Factory setting [RS422/485 (4-Wire)]

**Dip switch settings for line terminations**

Line Output Termination

Function / Switch No.	Sw. 1
Line Output Terminated	ON
<b>Line Output Underterminated*</b>	<b>OFF</b>

Line Input Termination

Function / Switch No.	Sw. 2
Line Input Terminated	ON
<b>Line Input Underterminated*</b>	<b>OFF</b>

\* **Factory setting (Line Output and Line Input “Underterminated”)**

**Industrial practice for line terminations**

For RS422 4-wire communication, it is suggested to keep the input and output lines terminated in the ONE Tx to ONE Rx configuration.

For RS485 2/4-wire communication, the RS485 devices can be disabled to stay on Hi-Z state. It is very important that the data lines have to be terminated with a resistor being connected across the pair wires so as to eliminate the residual standing signal waves on the lines in the Hi-Z line condition. So, it is recommended that the lines should be terminated with the appropriate resistance. For more than one RS485 devices are connected in a daisy-chain configuration, only the farthest device of the loop, i.e. the device located at the end of the lines, should be terminated; whereas the middles ones are set to “Underterminated” status. See the figure 4.6 below for reference.

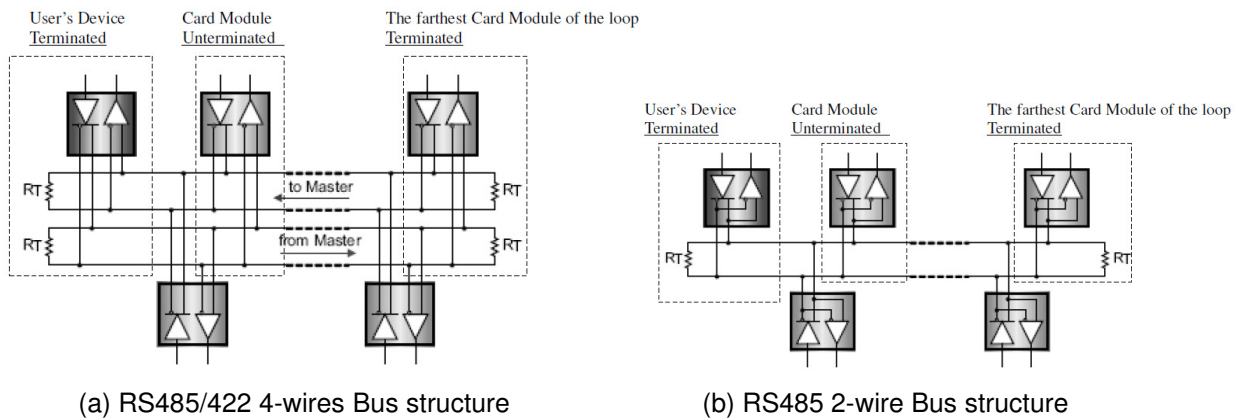


Fig. 4.6 Termination of different Bus structures

**4.4 Ground connection**

For enhanced safety precautions to reduce the risks of human hazards and physical damages caused by lightning and other power surges, in addition to the incorporation of the surge protective devices into the products, a screw is provided on the Micro cabinet (Fig 4.7) for proper earth connection. It is highly recommended that the Micro unit must have good ground connections made to the system earthing terminals in accordance with the local safety practice.

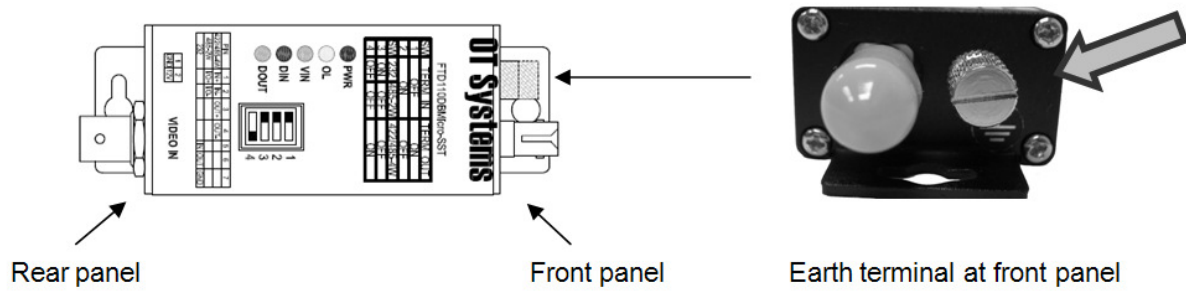


Fig. 4.7 Micro unit earth terminal location

## (5) Operational Guides

### 5.1 FTD110DBMicro Series Transmitter

#### LED Indicators

Indicator	Color	Description
PWR	Red	Lit when power is supplied to the Transmitter.
OL	Yellow	Lit when optical signal from receiver to transmitter is active.
VIN	Green	Lit when video signal is fed into the VIDEO IN connector.
DIN	Red	Blinks when input data is available at Tx.
DOUT	Green	Blinks when output data is available at Tx.

#### Signal Ports

OPT -	ST (or FC) Optical Connector for fiber cable connection.
VIDEO IN -	BNC Video Connector for video signal input.
DATA -	7-pin Screw Terminal Block for data signal.
12VDC	2-pin Screw Terminal Block for power connection.

## 5.2 FTD110DBMicro Series Receiver

### LED Indicators

Indicator	Color	Description
PWR	Red	Lit when power is supplied to the Receiver.
OL	Yellow	Lit when optical signal from transmitter to receiver is active.
VOUT	Green	Lit when video signal is available at the VIDEO OUT connector.
DIN	Red	Blinks when input data is available at Rx.
DOUT	Green	Blinks when output data is available at Rx.

### Signal Ports

OPT -	ST (or FC) Optical Connector for fiber cable connection.
VIDEO OUT -	BNC Video Connector for video signal output.
DATA -	7-pin Screw Terminal Block for data signal.
12VDC	2-pin Screw Terminal Block for power connection.

## (6) Specifications

<b>PARAMETERS</b> \ <b>MODELS*</b>	<b>FTD110DBMicro-SST(R)</b> (Single-Mode)	<b>FTD110DBMicro-SST(R)L</b> (Single-Mode)	<b>FTD110DBMicro-SMT(R)</b> (Multi-Mode)
<b>OPTICAL</b>			
No. of Fiber / Connector	1 / ST(or FC)	1 / ST(or FC)	1 / ST(or FC)
Wavelength	1310/1550 nm	1550/1310 nm	1310/1550 nm
Optical Power Budget	17 dB	24 dB	23 dB
Max Distance	40 km	60 km	4 km
<b>ELECTRICAL VIDEO</b>			
Channel / Connector	1 / BNC		
System	PAL, NTSC, SECAM		
Bandwidth	6.5 MHz		
Input/Output Impedance	75 Ohm		
Input/Output Level	1.0 Vp-p typical		
Differential Gain	< 1% typical		
Differential Phase	< 1° typical		
SNR	>60dB		
<b>DATA</b>			
Channel / Connector	1 / 7-pin Screw Terminal		
Direction	Bi-directional (Duplex)		
Electrical Format	RS232, RS422, RS485 (2-wire, 4-wire)		
Transmission Rate	0~256 Kbps		
<b>POWER</b>			
Power consumption	12VDC @ 2.4W		
Power Supply	FT/PA12V DC Adaptor		
Connector (Micro unit)	2-pin Screw Terminal		
<b>PHYSICAL</b>			
Weight	0.1 kg		
Dimensions (W x H x D)	36.2 x 35 x 101 mm (MAX)		
<b>ENVIRONMENTAL</b>			
Operating Temperature	-40°C ~ +75°C		
Storage Temperature	-40°C ~ +85°C		
Relative Humidity	0 ~ 95% non-condensing		
<b>MTBF</b>	>100'000 Hours		

\* If the optical connector is FC type, the suffix in the model number will be "-FXX". Eg. FTD110DBMicro-FST

## (7) Drawings

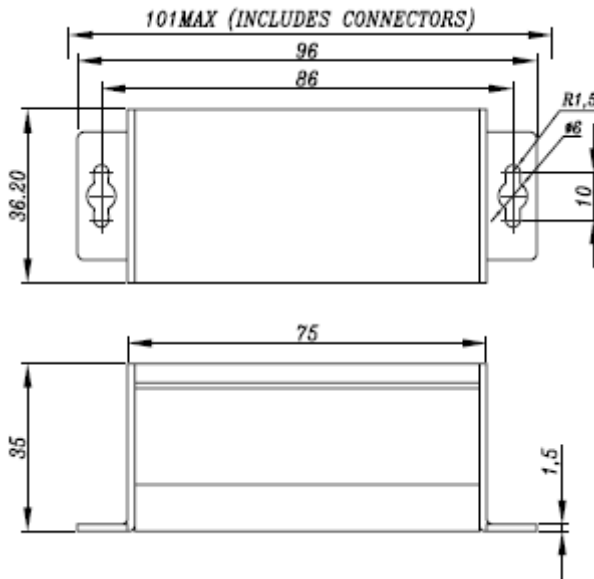


Fig. 7.1 Dimensional drawings of Micro unit (mm)

## (8) Warranty Information

All OT Systems products are subject to limited life-time warranty offered by the company in normal circumstances. Please refer to the OT Systems Products Warranty Statement for details. Access to the statement is available in our company website at [www.ot-systems.com](http://www.ot-systems.com).

## (9) Contact Information

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