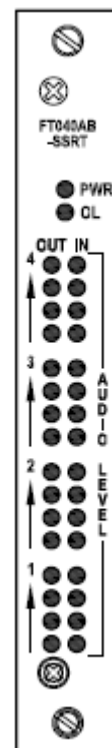
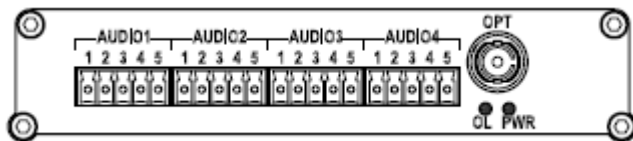




All Digital Fiber Optic Manufacturing Specialists

# Installation and Operation Manual

## FT040AF Series



### Digital Series

4-Ch Uni-directional Audio  
Fiber Optic Converter

## Models covered in this manual

### Standalone Units

#### Single-Mode Transmitters

FT040AF-SSTRSA

FT040AF-SSTRLSA

#### Single-Mode Receivers

FT040AF-SSRTSA

FT040AF-SSRTLSA

#### Multi-Mode Transmitter

FT040AF-SMTRSA

#### Multi-Mode Receiver

FT040AF-SMRTSA

### Card Modules

#### Single-Mode Transmitters

FT040AF-SSTR

FT040AF-SSTRL

#### Single-Mode Receivers

FT040AF-SSRT

FT040AF-SSRTL

#### Multi-Mode Transmitter

FT040AF-SMTR

#### Multi-Mode Receiver

FT040AF-SMRT

### **Remark:**

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

FT040AF-FSTR

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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 contain 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 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 FT040AF Series products comprise of either single-mode or multi-mode fiber optic transmitters and receivers for the optical transmission of FOUR uni-directional (Tx → Rx) audio signal on one fiber. The products work at wavelengths of 1310nm with either a 9/125um or 62.5/125um fiber for single-mode or multi-mode transmission respectively.

A 24-bit digital PCM transmission scheme is employed for analogue audio transmission. Both balanced and unbalanced audio inputs and outputs are supported.

For single-mode transmission, we also offer specifically designed products for long-haul transmissions up to 60km. These models include the letter “L” in the suffix, e.g. FT040AF-SSTRL for Tx, FT040AF-SSRTL for Rx, etc.

The FT040AF Series units are available as standalone units, which can be mounted horizontally or vertically wall-mounted on any fixture. The standalone unit comes with an external power supply FT-PA/12V, which can be powered by local 110/220V power.

The FT040AF Series units are also available as plug-in card modules installed in a 19” rack-mount chassis. Each plug-in card occupies one slot in the rack-mount chassis. The rack mount chassis has to be ordered separately, and comes with its own power supply for powering the installed card modules.

## 2.2 Models selection table

Type	Mode	Models <sup>1</sup>	Descriptions	Installation requirements	Remarks
Standalone Units	Single-Mode	FT040AF-SSTRSA	Single-mode 4 uni-directional Audio Transmitter Standalone unit	Horizontally or vertically wall-mounted Standalone unit	FT-PA/12V external power supply is included for the Standalone unit <sup>2</sup>
		FT040AF-SSTRLSA	Single-mode Long-haul 4 uni-directional Audio Transmitter Standalone unit		
		FT040AF-SSRTSA	Single-mode 4 uni-directional Audio Receiver Standalone unit		
		FT040AF-SSRTLSA	Single-mode Long-haul 4 uni-directional Audio Receiver Standalone unit		
	Multi-Mode	FT040AF-SMTRSA	Multi-mode 4 uni-directional Audio Transmitter Standalone unit		
		FT040AF-SMRTSA	Multi-mode 4 uni-directional Audio Receiver Standalone unit		
Card Modules	Single-Mode	FT040AF-SSTR	Single-mode 4 uni-directional Audio Transmitter Card Module	Housed in FT-C18 chassis <sup>3</sup>	FT-C18 chassis has to be ordered separately
		FT040AF-SSTRL	Single-mode Long-haul 4 uni-directional Audio Transmitter Card Module		
		FT040AF-SSRT	Single-mode 4 uni-directional Audio Receiver Card Module		
		FT040AF-SSRTL	Single-mode Long-haul 4 uni-directional Audio Receiver Card Module		
	Multi-Mode	FT040AF-SMTR	Multi-mode 4 uni-directional Audio Transmitter Card Module		
		FT040AF-SMRT	Multi-mode 4 uni-directional Audio Receiver Card Module		

<sup>1</sup> If the optical connector is FC type, the suffix in the model number will be “-FXX”. Eg. FT040AF-FSTR

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

<sup>3</sup> Refer to FT-C18 product manual for specifications

### (3) Installation

#### 3.1 General

All OT Systems products are thoroughly inspected, tested and securely packaged 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 shipping.

The FT040AF Series standalone units (Fig.3.1) can be either horizontally or vertically wall-mounted, or mounted on any fixture. The Standalone unit works with an external power supply FT-PA/12V powered by local 110/220V power.

The FT040AF Series card modules are housed inside the FT-C18 rack-mount chassis (Fig. 3.2) with an included power supply unit. The whole chassis is powered by local 110/220V power. FT-C18 is a standard 19" (483mm) rack-mount chassis which occupies 4 rack units (177.8mm) in height. Each FT040AF card module occupies one slot and a total of 18 cards can be housed inside the chassis.



Fig. 3.1 Standalone unit



Fig. 3.2 FT-C18 chassis

#### 3.2 Standalone unit installation

- Mount the standalone unit onto a fixture, (either on the wall or on a flat surface) with four screws through the holes on the mounting frame to secure it in position.
- The provided power supply 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.
- Connect all the signal inputs and outputs at the back of the unit with appropriate cables: fiber optic cable for optical link, UTP cables for audio inputs/outputs (Tx/Rx).
- 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.
- 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)].

### 3.3 Card module installation

- a) Insert the card module into the FT-C18 chassis along the top and bottom card guides of an empty slot and push the card into the multi-pin socket at the rear firmly. Secure with the provided thumb screws.
- b) Repeat the above procedure for all the rest card modules. Unused slots must be covered with blank panels provided.
- c) Connect all the signal inputs and outputs at the back of the unit with appropriate cables: fiber optic cable for optical link, UTP cables for audio inputs/outputs (Tx/Rx).
- d) Once the chassis is powered up, check that the red POWER LED on the front and back panels of the card modules are lit. If not, check the power supply cable connections between the chassis and the power supply socket. For failures of individual card's POWER LEDs, check the corresponding card modules, whether they have been inserted properly.
- e) 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
Audio	Twisted-pair cable	Screw Terminal Block

#### Typical System Cable Connections Diagrams:

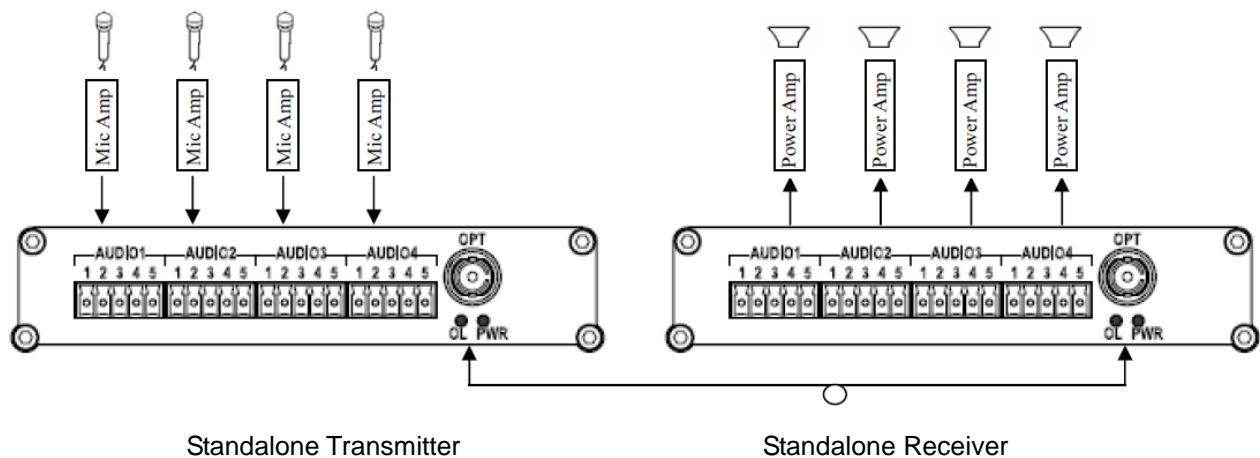
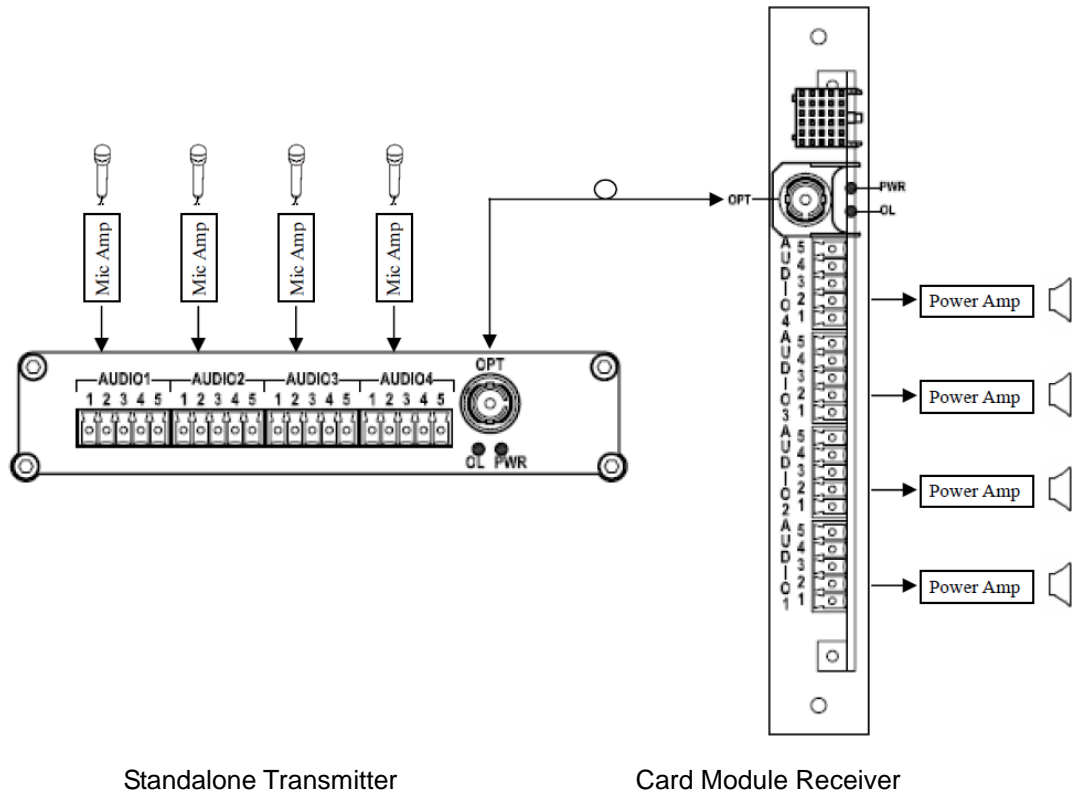


Fig. 4.1 Standalone unit to Standalone unit connection diagram

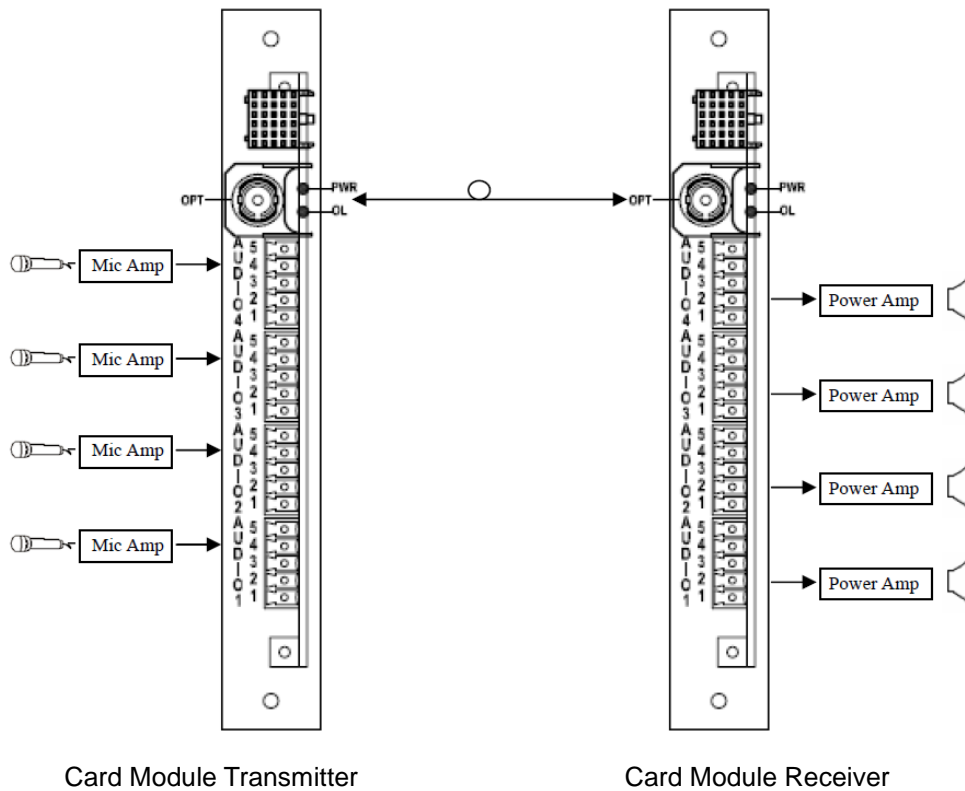




Standalone Transmitter

Card Module Receiver

Fig. 4.2 Standalone unit to Card Module connection diagram



Card Module Transmitter

Card Module Receiver

Fig. 4.3 Card Module to Card Module connection diagram

## 4.2 Audio port assignment and pin connections

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

Pin Assignment (Screw Terminal Block)	1	2	3	4	5
<b>Data format</b>					
<b>Balanced signal</b>	<b>IN (+)</b>	<b>IN(-)</b>	<b>OUT(+)</b>	<b>OUT(-)</b>	N/A
<b>Un-Balanced signal</b>	<b>IN</b>	<b>Sig. COM</b> PIN2 connect to PIN5		<b>OUT</b>	<b>Sig. COM</b> PIN4 connect to PIN5

### Balanced Audio signal connection diagram:

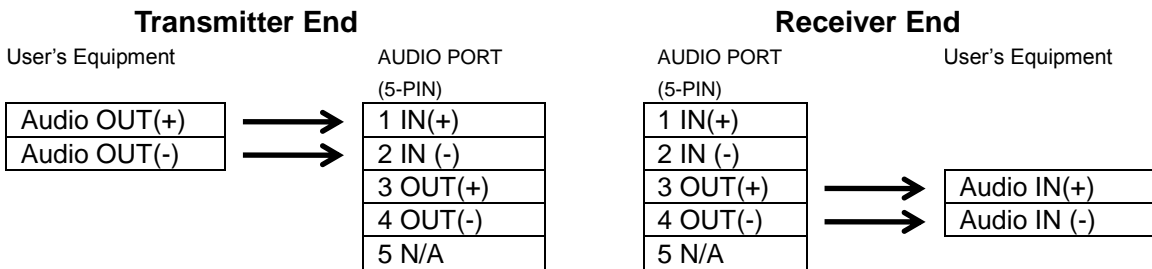


Fig. 4.4.1 Connector Pin Assignments for balanced audio signal at Audio port

### Un-Balanced Audio signal connection diagram:

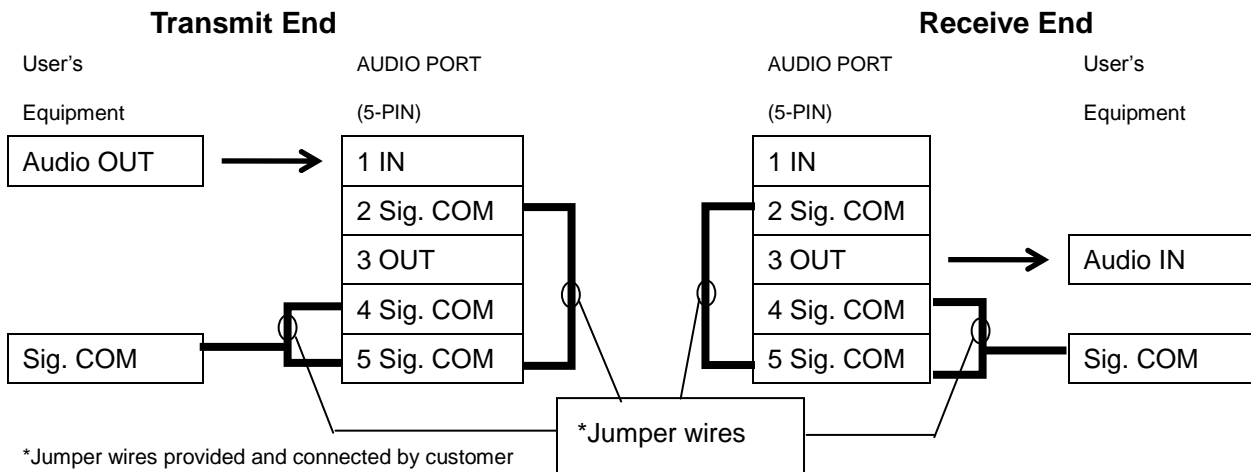


Fig. 4.4.2 Connector Pin Assignments for un-balanced audio signal at Audio port

### 4.3 Ground connection

For enhanced safety to reduce the risks of electrical shock and physical damage, caused by lightning and other power surges, as well as a connection to the surge suppression devices in the product, a screw terminal is provided on the Standalone cabinets (Fig. 4.5). It is highly recommended that the Standalone unit have good ground connections to the buildings ground in accordance with the local codes.

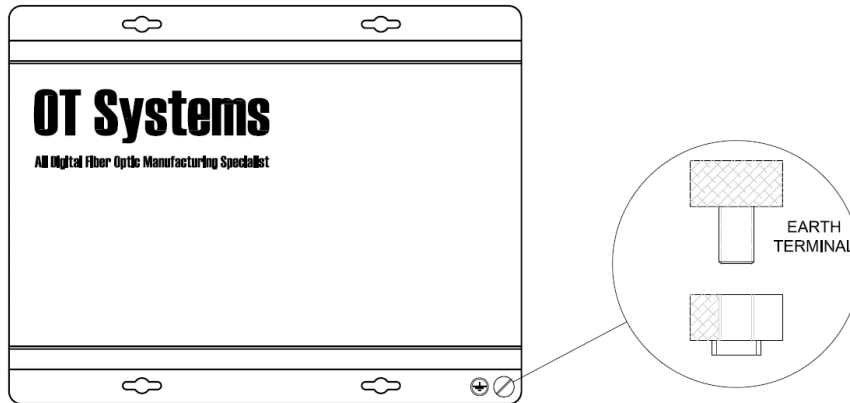


Fig. 4.5 Standalone unit earth ground terminal location

## (5) Operational Guides

### 5.1 FT040AF Series Transmitter

#### LED Indicators

Indicator	Color	Description
PWR	Red	Lit when power is supplied to the Transmitter.
OL	Yellow	N/A
Audio1 Level ~ Audio4 Level (front panel)	IN	Red a) Each audio channel has a single column of Four LEDs assigned for displaying the input or output audio levels. b) The LEDs (Input/Output) are lit in proportion to the signal strength. c) An increase/decrease of signal level of about 3dB will light up/turn off an individual LED. All LEDs will go out at or less than -16dBm, and all are lit when the level attains +6dBm or over.
	OUT	Green N/A

\* For products with uni-directional signal transmission, the OL LED on the Tx is not lit because optical signal from the Rx to the Tx is always inactive.

#### Signal Ports

OPT -	ST (or FC) Optical Connector for fiber cable connection.
AUDIO -	5-pin Screw Terminal Block for audio signal.

### 5.2 FT040AF 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.
Audio1 Level ~ Audio4 Level (front panel)	IN	Red N/A
	OUT	Green a) Each audio channel has a single column of Four LEDs assigned for displaying the input or output audio levels. b) The LEDs (Input/Output) are lit in proportion to the signal strength. c) An increase/decrease of signal level of about 3dB will light up/turn off an individual LED. All LEDs will go out at or less than -16dBm, and all are lit when the level attains +6dBm or over.

#### Signal Ports

OPT -	ST (or FC) Optical Connector for fiber cable connection.
AUDIO -	5-pin Screw Terminal Block for audio signal.

## (6) Specifications

PARAMETERS	MODELS*		
	FT040AF-SSTR(RT)SA FT040AF-SSTR(RT) (Single-Mode)	FT040AF-SSTR(RT)LSA FT040AF-SSTR(RT)L (Single-Mode)	FT040AF-SMTR(RT)SA FT040AF-SMTR(RT) (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>AUDIO</b>			
Channel / Connector	4 / 5-pin Screw Terminal		
Direction	Uni-directional (Forward)		
Input Level / Impedance	0dBm(normal), 10K ohms, Balanced or Unbalanced		
Audio bandwidth	20Hz~20KHz		
Output Level	+4dBm		
SNR	>66dB		
<b>POWER</b>			
Power consumption	12VDC @ 4.8W		
Power Supply	Standalone unit: FT/PA12V DC Adaptor Card module: Powered by FT-C18 chassis		
Connector (Standalone unit)	2-pin Screw Terminal		
<b>PHYSICAL</b>			
Weight (Kg)	Standalone unit: 0.62      Card module: 0.22		
Dimensions (W x H x D) (mm)	Standalone unit: 156 x 30.5 x 223 (MAX) Card module: 148 x 20.4 x 213 (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 "-FCX". Eg. FT040AF-FSTR

## (7) Drawings

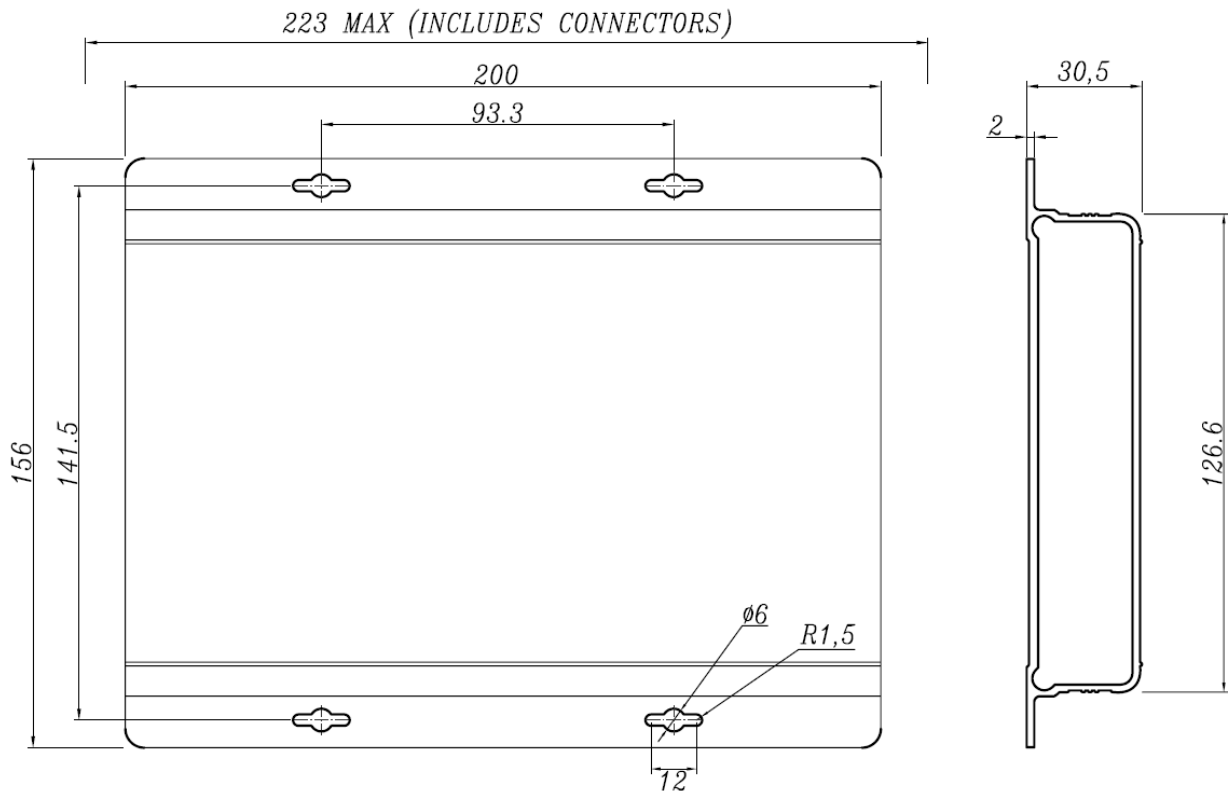


Fig. 7.1 Dimensional drawings of Standalone unit (mm)

## (8) Warranty Information

All OT Systems products are subject to a 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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