

MMDS Transceiver

Operation Manual



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Chapter 1. General Information

1.1 Module Features and Specifications

Category	Parameter	Description
Downstream	RF frequency	2574 ~ 2690 MHz
	IF frequency	296 ~ 412 MHz
	Noise Figure	4.0 dB typ / 5.5 dB max
	Output 3rd Intercept	24 dBm
	PCS Rejection	> 90 dB
	2.3G WCS Rejection	> 90 dB
	Image Rejection (add gain)	> 80 dB
	IF Rejection	> 80 dB
	In-band Spurious	< -80 dBm
Upstream	IF Input	12 ~ 42 MHz
	RF Output	2500 ~ 2530 MHz
	Output 1-dB Compression Point	+25 dBm typical
	Output Transmit Noise	-120 dBm/Hz typical -118 dBm/Hz max
	Output Spurious @+22 dBm Tx output	-60 dBc (in-band and out-band)
	Output Power Blanking Threshold	-45 dBm @ IF input
	TX Switch Latency	< 1.2 micro second
General	Phase Noise	-84dBc/Hz @ 1KHz -88 dBc/Hz @ 10 KHz -96 dBc/Hz @ 100 KHz
	LO Leakage at RF / IF ports	-50 dBm Max.
	LO Frequency	Downstream : 2278 MHz Upstream : 2488MHz
	LO Stability	± 10 KHz over temp.

Other feature:

1. lightning protection Ok
2. surge protection Ok
3. Transceiver sleep mode Ok

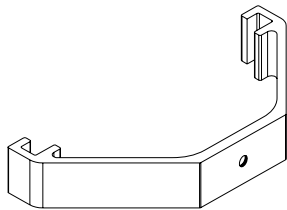
Note: Typical value @25°C, unless otherwise specified. Technical specifications are subject to change without prior notice.

Chapter 2. Installation

2.1 Step by Step Installation

2.1.1 Mounting Bracket Assembly Suite

The following hardwares are suggested for mounting the Transceiver to the pole. A set of mounting bracket, one L type screw. Please contact TSI sales department for this accessory.



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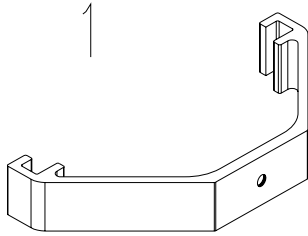


SCREW(M6*1.0)

2.1.2 Step by Step Installation

Step 1 – Attach sequence

Left to right: Bracket , Mounting screw.



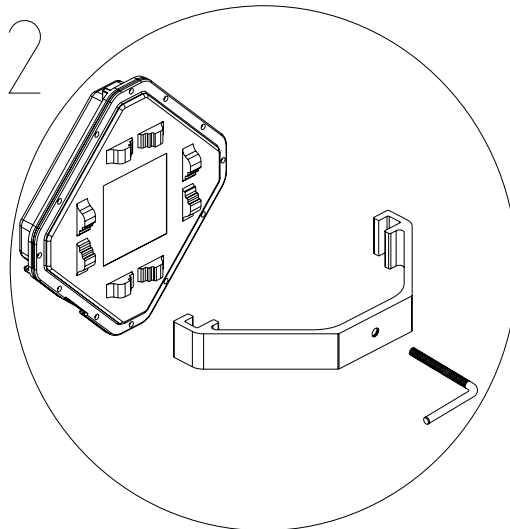
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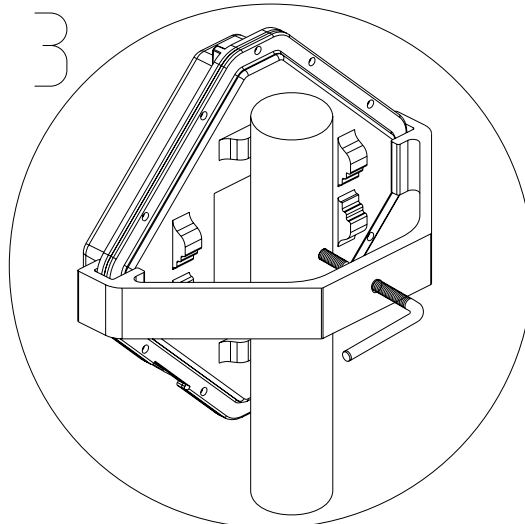
SCREW(M6*1.0)

Step 2 – How to Attach

The concave of Bracket 2 is for holding onto the pole.



Step 3 – Tighten the bracket



2.2 Connection to the Power Inserter and Cable Modem

Connections to the Transceiver are shown in diagram 2.2. Please note:

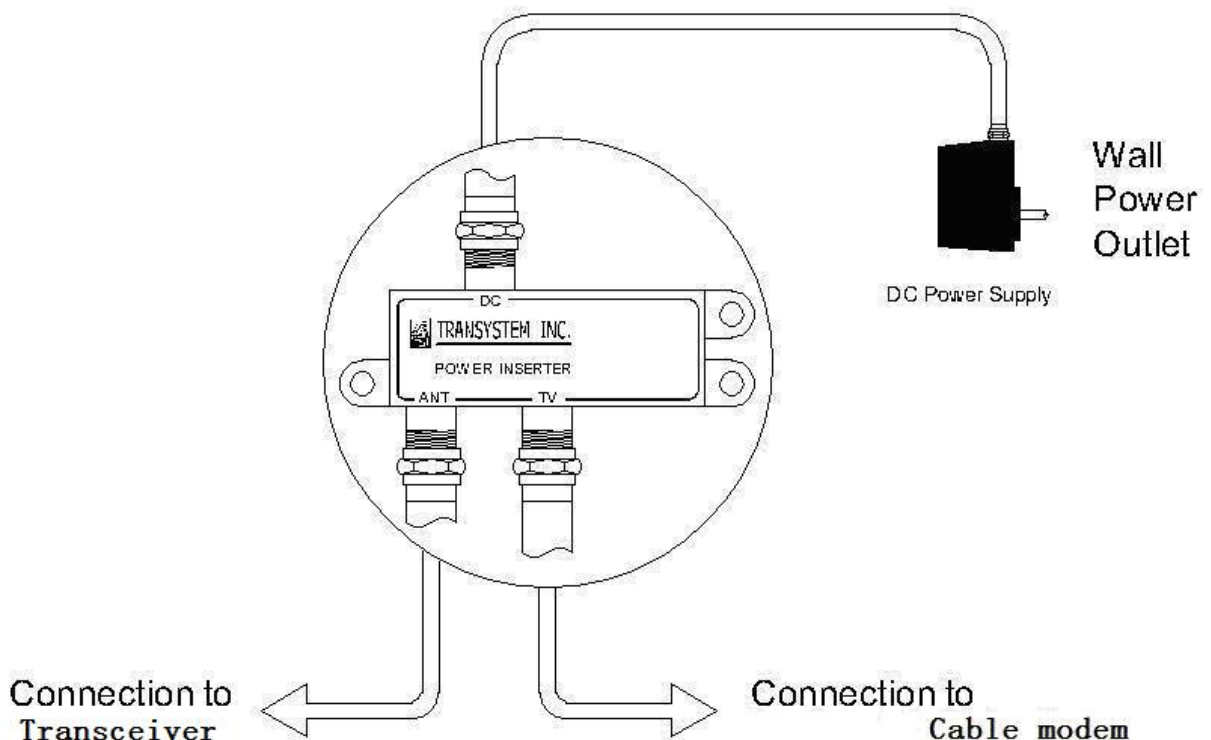
- ① The power inserter normally has 3 ports:

DC	Connect to wall adapter with RG-59 cable
ANT	Connect to the Transeiver
TV	Connect to Cable modem

VERY IMPORTANT NOTICE!

- a. The power inserter should be correctly connected, or the Transeiver will not operate.
 - b. Ensure that all wires and cables are hooked up before plugging into the AC adapter/power supply (i.e. you must hook up the power supply last).
- ② After connection, the F connector of Transceiver must be sealed with an asphalt sealing tape. (For details, please refer to Section 2.3 Waterproofing Connections)

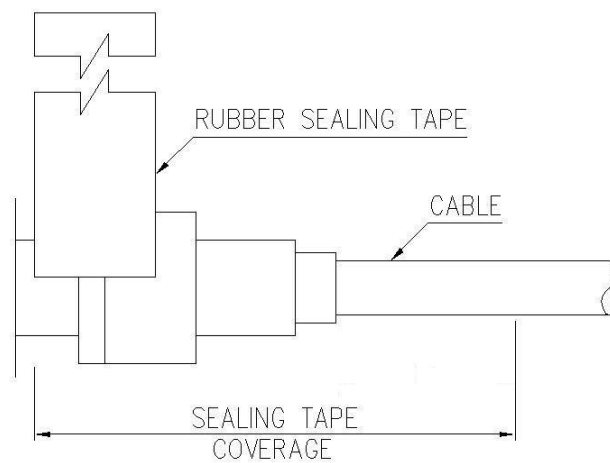
Diagram 2.2: Connection to Cable modem & Power Inserter



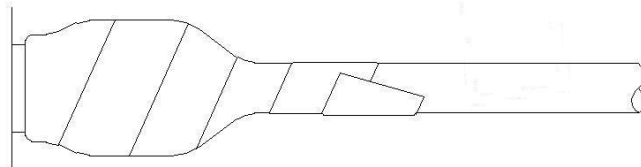
2.3 Waterproofing Connections

Water-proofing is very important during installation of Transceiver. Please use the included water-proof asphalt tape to seal off the F-connector as shown below:

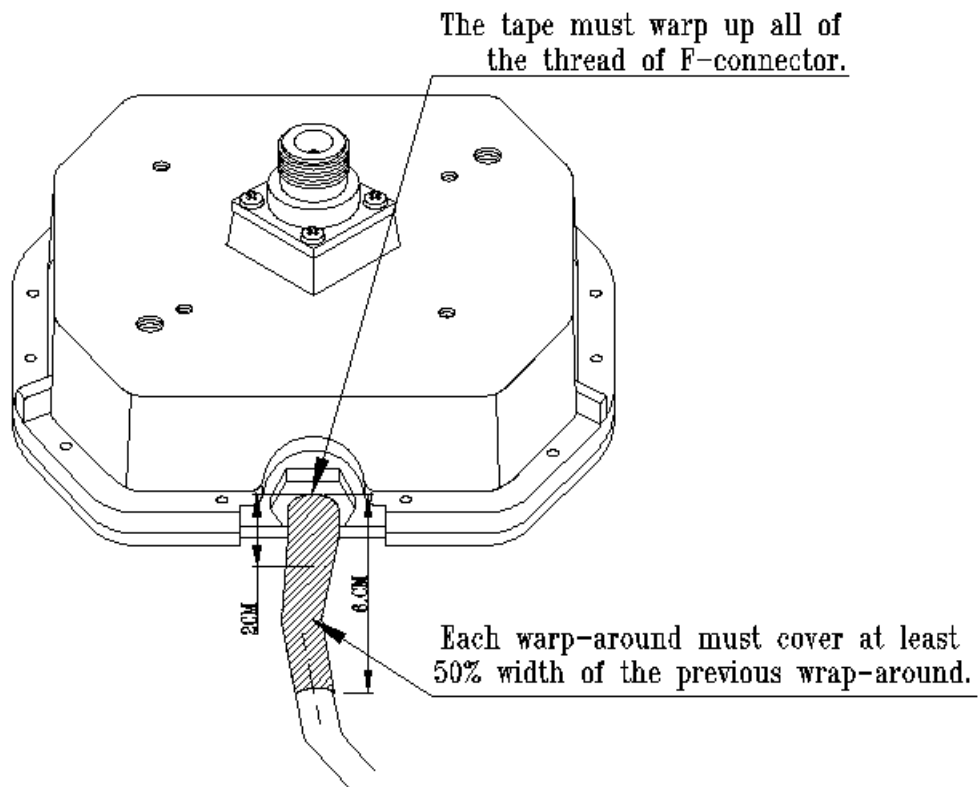
- ① After you plug in the coaxial cable into the F-connector, use the included water-proofing asphalt tape to seal off the F-connector from the bottom (i.e. the part close to Transceiver). Note that the tape must wrap up all the thread of the F-connector.



- ② The wrap up of the tape must be tight and sturdy. Each wrap-around must cover at least 50% width of the previous wrap-around.



- ③ The total width of the wrap-around is about 6cm, which corresponds to 7 to 8 rounds of tapes.



*** Warning: If you do not follow the above procedure, the Transceiver could become malfunctioning due to water leakage.**

FCC Notices

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

CAUTION: Change or modification not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION:

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

TRX-200

In-band MMDS Transceiver

Overview

TRX-200 is TSI's new generation transceiver for 2-way wireless broadband Internet application at 2574-2690 MHz band for down stream. It accepts an IF signal of 12~42 MHz from cable modem, upconverts the signal to 2500~2530MHz and transmits it back to the MMDS headend site.

With its built-in automatic on/off switch, TRX-200 will enter sleep mode to eliminate the broadband noise when there is no data packet transmission. Without exception, TRX-200 embodies the long term stability and reliability common to all TSI products.

With the integrated downconverter and upconverter, TRX-200 provides the best cost/performance solution for your 2-way MMDS operation.

Key Features

- QPSK, 16 QAM Transmission Compatible
- 256 QAM Reception Compatible
- Automatic On/Off switch
- Up to 50Km cell coverage
- Integrated dipole
- Easy installation with mesh antenna
- Low phase noise
- High frequency stability
- Low power consumption
- Meet FCC spectral mask requirement
- RoHS compliant

Application

- MMDS CPE Internet access



TRX-200

In-band MMDS Transceiver

Specifications

Downstream

RF frequency	2574 ~ 2690 MHz
IF frequency	296 ~ 412 MHz
Noise Figure	4.0 dB typ / 5.5 dB max
Output 3rd Intercept	24 dBm
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2.3G WCS Rejection	> 90 dB
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IF Rejection	> 80 dB
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Upstream

IF Input	12 ~ 42 MHz
RF Output	2500 ~ 2530 MHz
TX Switch Latency	< 1.2 micro second
Output 1-dB Compression Point	+25 dBm typical
Output Transmit Noise	-120 dBm/Hz typical -118 dBm/Hz max
Output Spurious @+22 dBm Tx output	-60 dBc (in-band and out-band)
Output Power Blanking Threshold	-45 dBm @ IF input

LO

Phase Noise	-84dBc/Hz @ 1KHz -88 dBc/Hz @ 10 KHz -96 dBc/Hz @ 100 KHz
LO Leakage at RF / IF ports	-50 dBm Max.
LO Frequency	Downstream : 2278 MHz Upstream : 2488MHz
LO Stability	± 10 KHz over temp.

Interface

RF Impedance	50 ohm
RF Connector	Integrated Dipole or N-type Female
IF Impedance	75 ohm
IF Connector	F-type Female
Input / Output VSWR	2.5 : 1

Power Supply

Voltage	+15 to +24 VDC
Power Consumption	8 Watt max.

Environment

Temperature	-30°C ~ +60°C
Humidity	100% waterproof

Physical

Dimensions	163 x 150 x 88 mm
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Accessories Options

Antenna	Corner Reflector (12dBi), Spotbeam (15dBi) Mesh Antenna (21 / 25 dBi)
Power Supply	110V/220V Adapter & Inserter

Ordering Information

TRX-200	With integrated dipole
TRX-200N	With N-type connector

Typical value @ 25°C, unless otherwise specified.
Specifications are subject to change without prior notice.
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