Z-Light 6TX / 16TX / 26TX
Intelligent Direct Modulated
Optical Transmitter Operating Manual

Z-Band Technologies

848-B N. Hanover St., Carlisle, PA 17013
866.902.2606
www.z-band.com
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This manual is intended solely for use by purchasers of **Z-Band Technologies, LLC.** transmitters and their qualified service technicians. This document is the property of **Z-Band Technologies, LLC.** and incorporates proprietary subject material and information.   The use of all design, manufacture, reproduction, and all other rights regarding these contents in whole or part without **Z-Band Technologies, LLC.** written consent is expressly prohibited. **Z-Light® and the Z-Band logo are registered trademarks of Z-Band Technologies, LLC.**

SAFETY CONSIDERATIONS

Dangerous voltages are present within the equipment. These voltages may not be insulated and may be of sufficient strength to cause serious bodily injury if touched.   DO NOT OPEN THIS EQUIPMENT.

IN THIS REDUNDANT POWERED SYSTEM _BOTH_ AC POWER SUPPLIES MUST BE TURNED OFF/DISCONNECTED TO POWER DOWN THE UNIT.

Only qualified service personnel are to install or service the equipment. The performance and reliability of the equipment can be adversely and permanently affected by incorrect installation or servicing and the safety of the equipment operator can be compromised.   Problems caused by unqualified installation/service personnel are NOT COVERED BY WARRANTY.

WARNING: To reduce the risk of fire or electrical shock or bodily harm, do not expose this equipment to rain or moisture and DO NOT OPEN THIS EQUIPMENT.

⚠ DANGER

Visible and/or invisible Laser Radiation.
Avoid direct exposure to beam.

**Optical Output Safety****:   1310nm and 1550nm Optical Transmitter units may emit harmful invisible laser radiation. These products may emit harmful laser radiation if powered on and the optical path is exposed or the case is opened.** _**DANGER: DO NOT WORK ON THE OPTICAL PATH, CONNECTIONS, ETC WHEN TRANSMITTER POWER IS ON.**_

IMPORTANT SAFEGUARDS

Z-Band Technologies, LLC. strongly advises you to read and understand the following safety instructions prior to installing and operating this equipment.

- **Read These Instructions first:**   All safety and operating instructions should be read thoroughly and understood completely before installing or operating this equipment.   All safety and operating instructions should be retained for future reference.
- **Heed All Warnings:**   All warnings on the equipment and in this Operating Manual should be adhered to.
- **Provide Adequate Ventilation:**   Do not block or cover openings in this equipment. These are provided for ventilation and protection from overheating.   Maximum operating ambient temperature is 40°c.

- **Provide the Required Power sources:** Operate this equipment only from the type of power source indicated on the rear panel. CAUTION: For continued protection against risk of fire, replace the fuses (if necessary) with only one of the same type and rating.

- **Adequate Grounding and Power Polarization:** This equipment is equipped with polarized AC line plugs (a plug having one blade wider than the other). This plug will fit into the power outlet only one way as a safety feature. Do not defeat the safety purpose of the polarized plug.

- **INSTALLER NOTE:** This reminder is provided to call your attention to guidelines for proper grounding. Specifically the cable ground shall be connected to the building grounding system, as close to the point of cable entry as practical. The equipment enclosure ground must also be attached and a ground screw connection is provided on the rear of the equipment enclosure for this purpose.

- **Servicing:** Refer all servicing to qualified personnel. Opening or removing covers may expose dangerous voltages. THESE TRANSMITTERS DO NOT HAVE USER SERVICABLE INTERNAL PARTS – DO NOT OPEN THE TRANSMITTER CABINET. When replacement parts are required (the replaceable power supplies), make sure the service technician uses only replacement parts provided by Z-Band Technologies, LLC. (available from Z-Band Technologies-Authorized Distributors) and to SERVICE ONLY WHEN POWER HAS BEEN DISCONNECTED. Unauthorized substitutions may result in fire, electric shock, or improper operation of the unit and void all warranties.

- **Optical Output Safety: 1310nm and 1550nm Optical Transmitter units may emit harmful invisible laser radiation. These products may emit harmful laser radiation if powered on and the case is opened or the optical path is exposed. *DANGER: DO NOT WORK ON THE OPTICAL PATH, CONNECTIONS, ETC WHEN TRANSMITTER POWER IS ON.***

Laser Safety Information:

- Viewing the laser output with (or even without instruments) may pose an eye hazard.
- Laser power could be accessible if optical connector is open or fiber is broken.
- **CAUTION: Lasers may be on whenever the transmitter is powered.**
- **CAUTION: Use of controls, adjustments, and procedures other than those specified herein may result in hazardous laser radiation exposure.**
- **DANGER: 1310nm and 1550nm Optical Transmitter units may emit harmful invisible laser radiation. These products may emit harmful laser radiation if powered on and the optical path is exposed or the case is opened. *DANGER: DO***

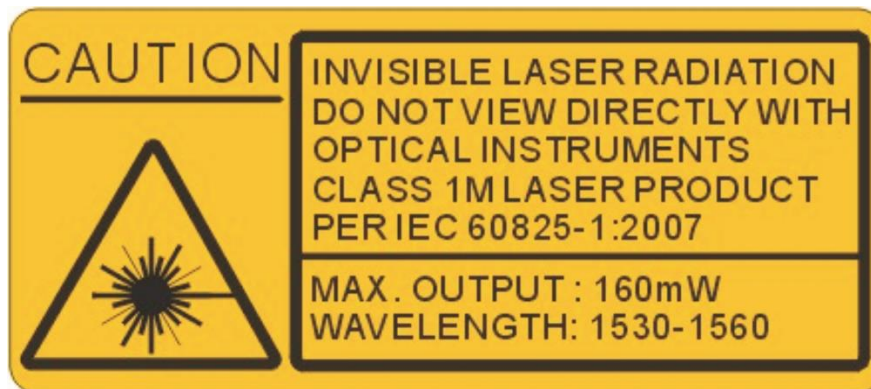*NOT WORK ON THE OPTICAL PATH, CONNECTIONS, ETC WHEN TRANSMITTER POWER IS ON.*

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Safety Reminder

⚠ **DANGER:** The transmitter emits invisible laser radiation. **AVOID DIRECT EXPOSURE TO LASER**. Never operate the unit with a broken fiber or with a fiber connector open or disconnected. Never work on the optical connections with the equipment power attached. **This unit has redundant power – BOTH supplies must be powered down.**

CAUTION | INVISIBLE LASER RADIATION DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS CLASS 1M LASER PRODUCT PER IEC 60825-1:2007

MAX. OUTPUT : 160mW
WAVELENGTH: 1530-1560

1. Overview

1.1 About This Manual

This instruction manual is a complete guide to install and operate the (1RU) **Z-Light 6TX/16TX/26TX** optical transmitter. **Please read the entire manual and understand**

the safety precautions before beginning installation.

This manual is applicable to the Z-Light 6TX/16TX/26TX optical transmitter.
• Chapter 1 gives general information about the Z-Light 6TX/16TX/26TX optical transmitter.
• Chapter 2 describes the complete technical specifications of Z-Light 6TX/16TX/26TX.
• Chapter 3 describes the front/rear panel interfaces and menu system.
• Chapter 4 tells you how to install the Z-Light 6TX/16TX/26TX optical transmitter.
• Chapter 5 tells you the communication settings of the Z-Light 6TX/16TX/26TX.
• Chapter 6 describes maintenance and what to do in the event of problems.

1.2 Product Description

The Z-Light 6TX/16TX/26TX intelligent directly modulated optical transmitter is mainly used in 1310nm optical fiber transmission systems. It uses advanced intelligent electronic predistortion compensation technology.

The Z-Light 6TX/16TX/26TX intelligent directly modulated optical transmitter is one of the most important components used to build a CATV-HFC network. It is mainly used to transmit analog video, digital television signal, telephone voice signal and data (or compressed data) signal providing a high quality low cost transmitter solution for CATV.

Z-Light 6TX/16TX/26TX: 1310nm directly modulated optical transmitter, uses a DFB laser, the optical output power is from +6 to +15dBm.

Block Diagram
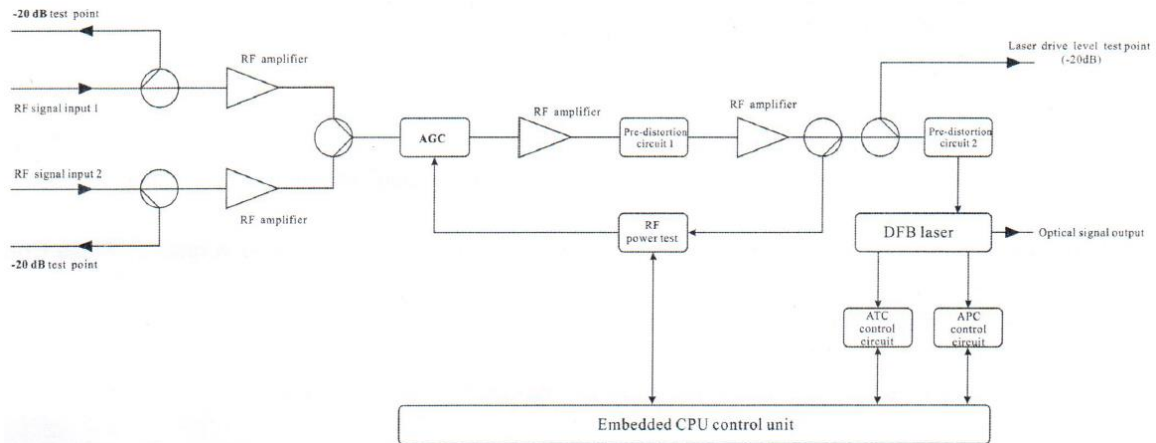
Z-Light 6TX/16TX/26TX directly modulated optical transmitter block diagram

1.3 Important Product Details and Applications

- Supports 1.2 GHz and DOCSIS 3.1
- USA technology high quality EMCORE ORTEL DFB Laser
- Dual redundant, hot swappable power supply modules (48VDC optional)
- Use in 1310nm Optical fiber transmission systems
- Building CATV HFC networks

2. Technical Parameters

| Item	Unit	Technical parameters
Optical output power	mW	6, 12, 22 mW Options
Optical wavelength	nm	1310±20
Laser type		USA technology, high quality EMCORE ORTEL DFB laser
Optical modulation mode		Direct optical intensity modulation
Optical connector type		SC/APC
Frequency range	MHz	47-870/1003/1218 (depending on selected channel load)
RF input level	dBμV	75-85 dBμV (+12 to +28dBmV)
Flatness in band	dB	±0.75

RF input impedance	Ω	75
Input return loss	dB	≥ 50
C/CSO	dB	≥ 62
C/CTB	dB	≥ 67
C/N	dB	≥ 52
AGC control range	dB	±5
MGC control range	dB	0-15
Power supply voltage	V	AC 110V-250V（50/60Hz）（hot swappable redundant-power）
Consumption	W	15
Operating temperature	°C	0 – +45　(+32 – +113°F)
Storage temperature	°C	-20 – +65　(-4 – +150°F)
Relative humidity	%	Max 95% no condensation
Dimension	mm	483（W）×380（D）×44（H）　(19in W x 15in D x 1.75in H)

Optical link carrier to noise ratio degradation table

Optical power	Optical link loss (dB)														
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
4mW	53.8	52.8	51.8	51	50.1	49.2	48.2								
6mW				53.0	52.0	51.0	50.1	49.1	48.1						
8mW					52.8	51.9	51.0	50.1	49.2	48.2					
10mW						52.9	51.9	51.0	50.1	49.1	48.2				
12mW							52.7	51.8	50.8	49.9	49.0	48.0			
14mW								52.4	51.5	50.5	49.5	48.6	47.8		
16mW									52.0	51.0	50.1	49.1	48.1		
18mW									52.5	51.6	50.6	49.7	48.7	47.9	
20mW										51.9	51.0	50.0	49.0	48.0	
22mW										52.2	51.4	50.4	49.4	48.6	47.8
24mW											51.5	50.3	49.2	48.5	47.7
26mW											51.5	50.2	49.2	48.5	47.6
28mW											51.6	50.4	49.3	48.6	47.8
31mW												51.3	50.4	49.3	48.5

3. Panel Interface and Menu System Description

3.1 Front Panel
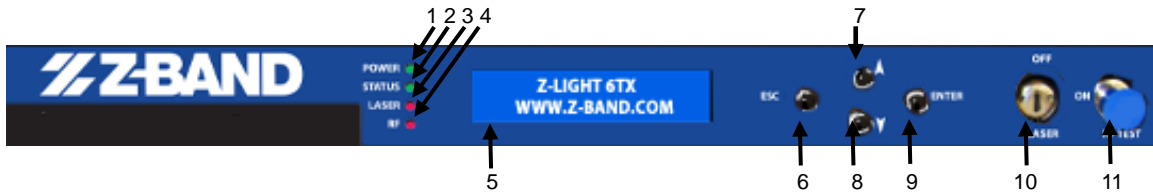
1	Power Indicator	2	Status (Run Indication)	3	Laser Status Indicator
4	RF Input Indicator	5	LCD Display	6	ESC/Cancel/Back/Exit button
7	UP button	8	DOWN button	9	Enter/Select button
10	Laser On/Off Keyswitch	11	RF input test port (-20dB compared to rear RF input ports)		

3.1.1 Indicator Description

Power Indicator (POWER)	Power on	LED Green
Status Indicator (RUN)	Running normally	LED Flashing Green
Laser Status Indicator (ON/OFF)	Laser OFF	LED Flashing Red
	Laser ON	LED Green
RF Input Indicator (RF)	No input or exceeds the normal range	LED Flashing Red
	Normal	LED Green

3.2 Rear Panel
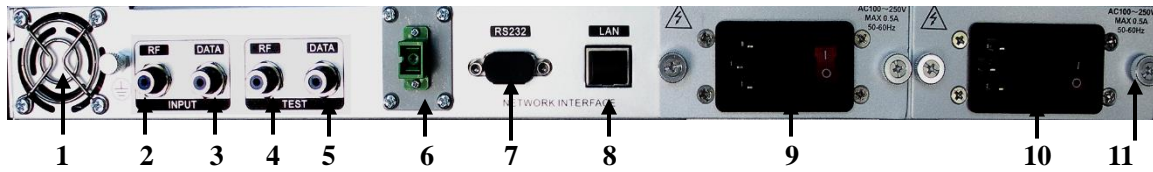
| No.	Name	Remark
1	Fan	Cooling air exhaust. Do not obstruct.
2, 3	RF/"Data" Input	RF and "Data" Input ports are both interchangeable as RF inputs
4, 5	RF/"Data" Test	RF input Test ports (-20dB compared to RF/"Data" input ports)
11	Ground Screw	Used for connecting the transmitter to building ground
6	Optical Signal Output	CAUTION - LASER: This is the optical signal output port (standard connector is SC/APC). **TURN OFF LASER OR REMOVE ALL AC POWER BEFORE ACCESSING OR CONNECTING TO THIS PORT.**
7	RS232 interface	Console: used for configuring the network management parameters.
8	LAN interface	Corresponds to IEEE802.3 10Base-T, used for network management.
9, 10	Switching Power Module	Hot pluggable, redundant 110-240VAC (50/60Hz)

3.3 Power Module

3.3.1 110-240VAC Power Module

1	Mounting screws	2	110/240VAC power cord input	3	Fuse
4	Power switch				

3.4 Menu Operation

Prior to powering on the equipment: ensure that the laser switch key is on "OFF" position before power on.   Observe all laser and electrical safety precautions before powering up the equipment.   Power on the unit.   On boot/power up the transmitter will do a self-test and display the Z-Band Technologies, LLC. Part Number, including the power output, for example: "Z-light 6TX" for a 1310nm Direct Modulated Optical Transmitter with a 6mW output.   After the unit passes self-test, rotate the key to the "ON" position which will then be shown on the display.

The main menus are only accessible when the Laser On/Off Switch has been turned on. Ensure that there are no open optical connections and observe all safety precautions then turn on the laser.   Press ENTER to see the Main Menu list.   If the LCD display turns off you may press the ESC button to turn it on again.

3.4.1 Main Menu
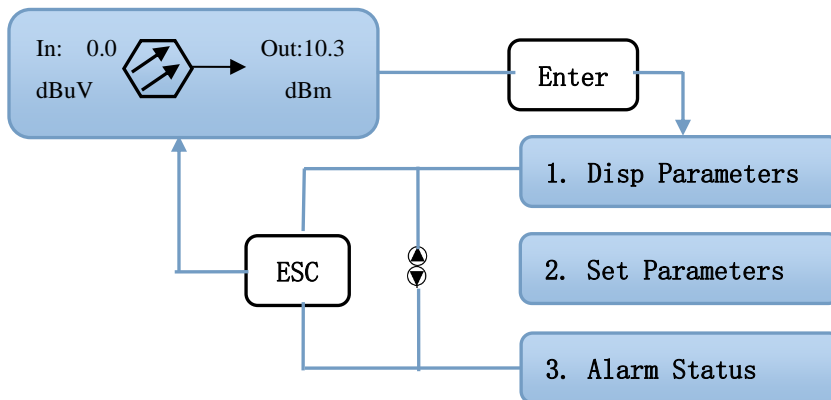
Displayed parameters	Comments
	Display when Laser is Switched ON.
1. Disp Parameters	Menu one: Display parameters
2. Set Parameters	Menu two: Set parameters
3. Alarm Status	Menu three: Alarm status

3.4.2 Display Parameters Menu


```
1.Disp Parameters  →  Enter
                              ↓

                         Laser Output:          xx.x dBm

                          Laser Bias:            xx.x mA

                          Laser Temp:            xx.x ℃

                         Tec Cooling(Amp):      -x.xx A

                         RF Chan NO:               10

                         Laser RF:              x dBuV

                         RF Ctrl Mode:            MGC        RF Control Mode:        AGC

                         MGC ATT:                X dB        AGC Ref:              x dB

                         +5V Read:              x.xx V

                         -5V Read:             -x.xx V

                         +24V Read:             xx.xx V

                         Wave Length:          xxxx.x nm

                         S/N:                  xxxx.xx.xx

                         BOX Temp:              xx.x ℃

                         IP Address:        xxx.xxx.xxx.xxx

                         Subnet Mask:       xxx.xxx.xxx.xxx

                         Net Gateway:       xxx.xxx.xxx.xxx

                         Mac:               XX-XX-XX-XX-XX-XX

                         Software Version:       VX.X
```
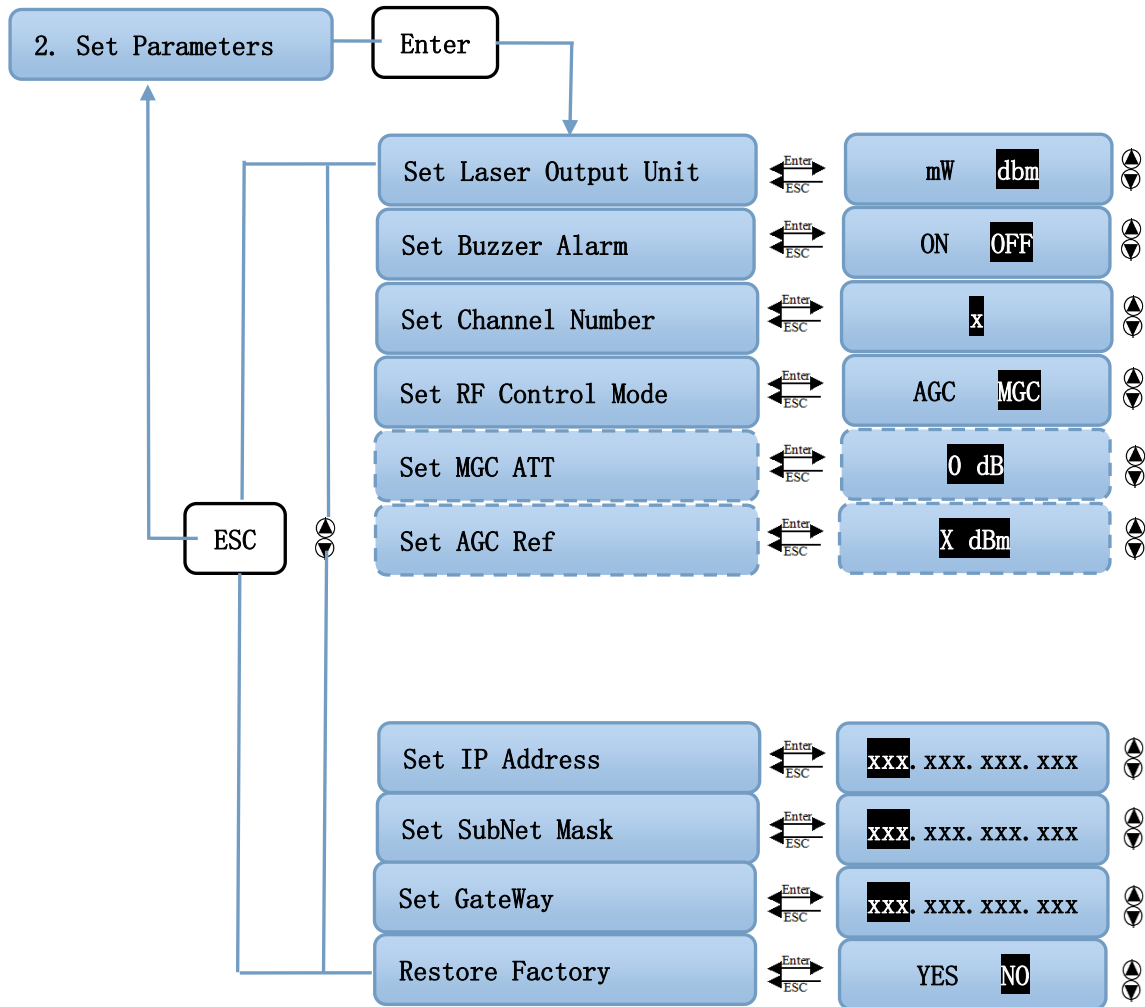
ESC

FAX: (717) 249-3253

Displayed parameters	Comments (No settings can be changed in this "View-Only" Menu)
Laser Output	Laser output optical power
Laser Bias	Laser bias current
Laser Temp	Internal Laser temperature
Tec Cooling	Thermoelectric Cooler current
RF Channel Number	Number of RF Channels being transmitted (setting this in the SET PARAMETERS menu gives better accuracy in the RF signal levels displayed).
Laser RF	Laser RF input signal level
RF Control Mode	RF control mode (either AGC or MGC)
MGC ATT	MGC attenuation (in MGC mode)
AGC Ref	AGC offset (in AGC mode)
+5V Read	+5V monitoring voltage
-5V Read	-5V monitoring voltage
+24V Read	+24V monitoring voltage
Wavelength	Laser wavelength – 1310nm
S/N	Serial number
Box Temperature	Internal temperature of the transmitter box
IP Address	Local IP Address
Subnet Mask	Subnet mask
Net Gateway	Gateway IP Address
Mac	MAC address
Software Version	Software/Firmware Version number (v1.16.1411.1 or later)

3.4.3 Set Parameters Menu

| 2. Set Parameters | → | Enter |

Set Laser Output Unit →Enter/ESC→ mW dbm ▲▼

Set Buzzer Alarm →Enter/ESC→ ON OFF ▲▼

Set Channel Number →Enter/ESC→ x ▲▼

Set RF Control Mode →Enter/ESC→ AGC MGC ▲▼

Set MGC ATT →Enter/ESC→ 0 dB ▲▼

Set AGC Ref →Enter/ESC→ X dBm ▲▼

ESC ▲▼

Set IP Address →Enter/ESC→ xxx.xxx.xxx.xxx ▲▼

Set SubNet Mask →Enter/ESC→ xxx.xxx.xxx.xxx ▲▼

Set GateWay →Enter/ESC→ xxx.xxx.xxx.xxx ▲▼

Restore Factory →Enter/ESC→ YES NO ▲▼

Displayed parameters	Comments	Remarks
Set Laser Output Unit	Set the unit of output optical power	Either mW or dBm
Set Buzzer Alarm	Turn on/off alarm buzzer	Either ON or OFF
Set Channel Number	Set the number of RF channels	Default is set, Change to actual number
Set RF Control Mode	Set the RF control mode	Either AGC or MGC
Set MGC Att	Set the ATT in MGC mode	Attenuation: adjustable range 0~20dB
Set AGC Ref	Set the offset in AGC mode	Adjustable range ±5dB
Set Local IP Address	Set the IP address	
Set SubNet Mask	Set the subnet mask	
Set GateWay	Set the gateway	
Restore Factory	Restore factory settings	

3.4.4 Alarm Status Menu

The displayed alarm content – ONLY DISPLAYED IF AN ALARM CONDITION EXISTS	Comment
RF Alarm	RF alarm
Laser Temp	Laser temperature alarm
Laser Bias	Laser bias current alarm
Laser Tec	Laser cooling current alarm
Output Alarm	Output optical power alarm
+5V Alarm	+5V alarm
-5V Alarm	-5V alarm
+24V Alarm	+24V alarm

4. Installing Z-Light 6TX/16TX/26TX Optical Transmitter

4.1 Receiving and Inspecting

As you unpack your unit, inspect the shipping container and equipment for damage. Save the shipping material for future use. If the container or the equipment is damaged, notify both the freight carrier and Z-Band Technologies, LLC.

> **CAUTION:** To protect yourself from potential injury and to protect the equipment from further damage, do NOT power up and do NOT perform any operational tests if the equipment appears to be damaged.

4.1.1 Instruments and tools

1. An optical power meter;
2. A digital multimeter;
3. A standard optical fiber test jumper (SC/APC for standard SC/APC);
4. Fiberoptic cleaning cartridge kit

4.1.2 Precautions

Heed the following precautions (as well as those detailed earlier in this manual) when working with the Z-Light 6TX/16TX/26TX.

Warning	Read the installation instructions before connecting the system to the power source.

	The AC Power Supply switches must be accessible at all times, because they serve as the main disconnecting device. IN THIS REDUNDANT POWERED SYSTEM <u>BOTH AC POWER SUPPLIES MUST BE OFF/DISCONNECTED</u> TO POWER DOWN THE UNIT.
Warning	

4.2 Installation Steps Overview

1. Before installing the equipment, please read this manual carefully and install the equipment according to the manual.   **Note:** For damage caused by installation not being completed according to the manual, Z-Band Technologies, LLC. cannot be responsible and cannot supply free warranty service or free replacements.
2. Remove the device from the box; bolt it to the rack and ground reliably. (The grounding resistance must be < 4Ω).   See section 4.3 for details.
3. Use the digital multimeter to check the AC supply voltage, make sure the supply voltage complies with the requirements and the power supply switches are in the "OFF" position. Then connect the power supplies AC power cords.
4. Attach the coaxial cable and input the RF signal, turn the power supplies on and observe the front panel LED status. After the LED working status indicator turns green, the device is working normally. Turn ON the Laser Switch then press the ENTER button on the front panel to check the operating parameters.
5. Power down the entire unit.
6. Connect the optical power meter to the optical signal output end by an optical fiber test jumper.   Power up the unit, turn on the laser, then measure the optical output power. Confirm the measured optical output power and the displayed power are the same and have reached the nominal value. (Confirm the optical power meter is on 1310nm wavelength test position; the optical fiber test jumper is the correct connectorized one, SC/APC, and the connector and jumper surface has no dirt, contamination, etc). Power down the unit and then remove the optical fiber test jumper and optical power meter; connect the device to the network (see section 4.3.3). The device has then completed initial installation and debugging.

4.3 Mounting Z-Light 6TX/16TX/26TX

4.3.1 Mounting the Z-Light 6TX/16TX/26TX in the Rack

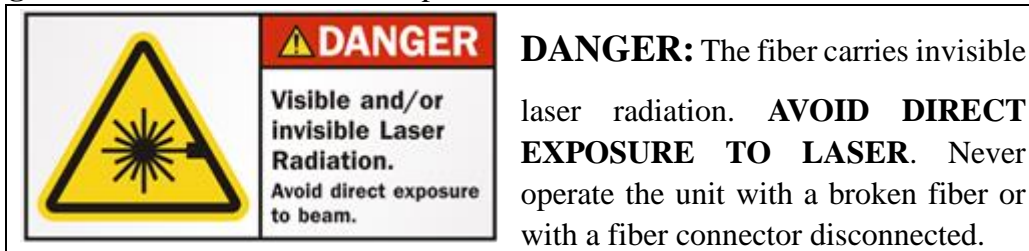Mounting the Z-Light 6TX/16TX/26TX in the standard 19 inch equipment rack:
1. Place the equipment in the rack.
2. Use four rack mounting screws through the front faceplate flange to mount the Z-Light 6TX/16TX/26TX to the rack.
3. Reliably ground the equipment. The ground terminal is on the rear panel.
4. Visually inspect each button on the front panel to ensure that it is not (accidentally during installation) been pressed and pushed slightly sideways so that it is trapped under the edge of its hole. If a button is trapped, tap the button to move it so that it is able to move freely.

4.3.2 Connecting the RF Cables

Connect the RF input cable to the rear of the Transmitter.   A -20dB RF test connector is located on the front of the transmitter.

4.3.3 Connecting the Optical Fiber Cable

Z-Light 6TX/16TX/26TX has one optical connector.

⚠ DANGER
Visible and/or invisible Laser Radiation. Avoid direct exposure to beam.

DANGER: The fiber carries invisible laser radiation. **AVOID DIRECT EXPOSURE TO LASER**. Never operate the unit with a broken fiber or with a fiber connector disconnected.

1. Verify the matched Z-Light 6TX/16TX/26TX fiber cable connector type according to the ordering information (default is SC/APC).
2. Verify that the fiber cable connector has been cleaned properly. If the fiber cable connector needs to be cleaned, follow the cleaning procedure outlined in section 6.1
3. Verify that the Z-Light 6TX/16TX/26TX optical connector has not been exposed to any contamination.   Damage to the equipment due to connector contamination is NOT covered by warranty.

> **NOTE:** Any contamination of optical connector can significantly degrade optical link performance. This degradation will most likely manifest itself as poor signal-to-noise (SNR) performance.

4.3.4 Connecting the Ethernet Cable

You can connect the Z-Light 6TX/16TX/26TX to your TCP/IP LAN network in order to monitor and control the transmitter remotely. After you complete the installation procedures described in this chapter, you can use a network management system (NMS) to monitor and control the Z-Light 6TX/16TX/26TX.

To connect the Z-Light 6TX/16TX/26TX, you must use a shielded and grounded Category 5 Ethernet cable.

To connect the Ethernet cable:

1. Connect an Ethernet cable to the transmitter's RJ-45 Ethernet port. The Ethernet port is on the rear panel of the transmitter.

2. Verify that the green Link LED is illuminated, indicating that there is a connection.

4.3.5 Connecting Power

The Z-Light 6TX/16TX/26TX is normally shipped from the factory as a 110/240VAC redundant power model. After mounting the Z-Light 6TX/16TX/26TX in a rack, follow the power connection procedure below for the model that you are installing.

It is equipped with two 110/240VAC switching power supplies that require input voltage of 110～265VAC, at 50～60Hz single phase. The AC power plugs and switches are located on the rear of the unit.

Follow all safety precautions detailed earlier in this manual. Prior to powering on the equipment: ensure that the laser switch key is on "OFF" position before power on. After the unit passes self-test, rotate the key to "ON" position according to the displayed message. Turn on the power sources (for both power supplies). It takes about 60 seconds for all systems to complete self-test and then to boot up into full operation.

5. Communication Setup

5.1 RS232 Communication Interface Description

The transmitter uses a DB9 standard connector for the Console connection/configuration, SNMP configuration, etc and the pin definitions are as follows:
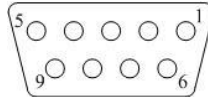

1: No Connect
2: TX
3: RX
4: No Connect
5: GND
6: No Connect
7: No Connect
8: No Connect
9: No Connect

The serial communication uses the standard NRZ form, 1 start bit, 8 data bits, 1 stop bit and the baud rate is 38400.

## 5.2 Setting up PuTTY for RS232 Communication to Transmitter

PuTTY is a terminal program used to connect to your transmitter using a serial port or a USB to serial adapter which connects to the RS232 serial port on your transmitter. If you have not set up PuTTY on your Windows computer system, complete the following steps: Download the FREE version of PuTTY at http://www.putty.org/ and install it. Start the PuTTY program:
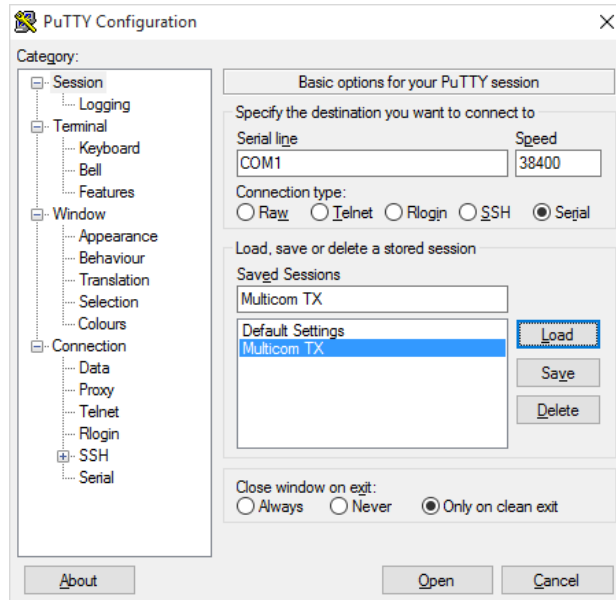
ABOVE: Then for easy use in future sessions: in the right side of the PuTTY window, type in your **Saved Sessions** name, such as "Z-Band TX" , and choose the **Serial line** (the computer serial or USB adapter port) your serial cable is installed on your computer to connect with your transmitter.   Select **Serial** in the **Connection Type.**
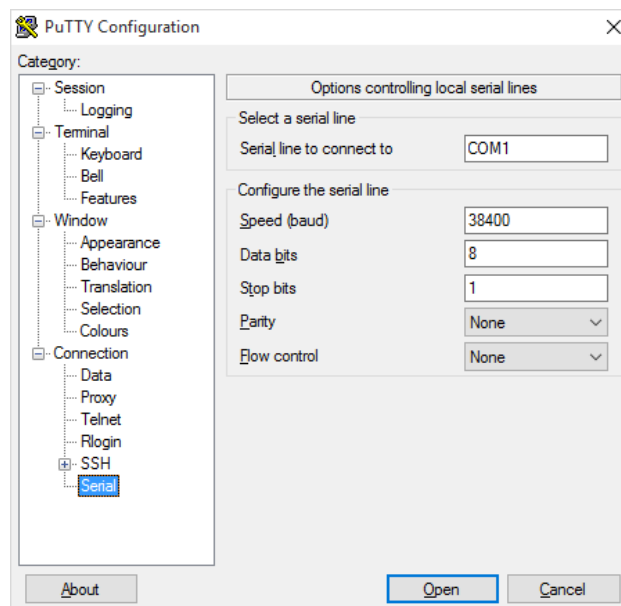
ABOVE: To configure the serial port communications settings: on the PuTTY left side menu at the bottom - click on **Serial**. Change the serial port configuration to the com port you are using, 38400-baud rate, 8 data bits, no parity bit, 1 stop bit, no data flow control.
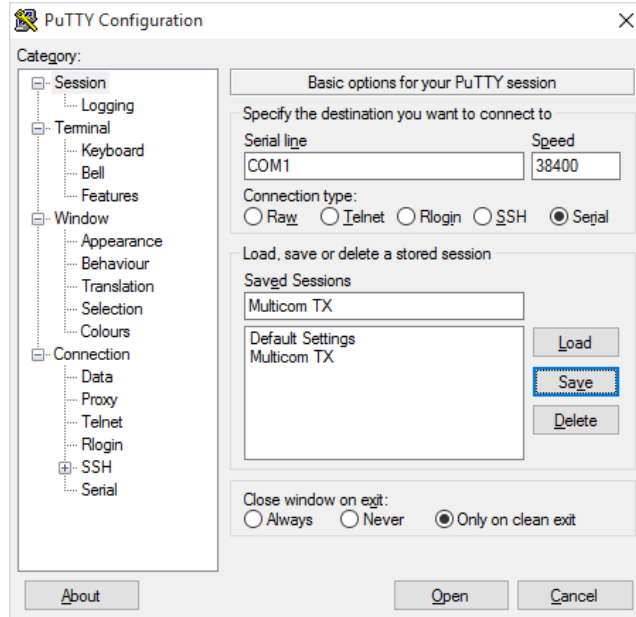
ABOVE: You can click **Session** on the left side menu at top to get back to the main menu and then click the **Save** button on the right side to save this Session configuration for future use.   Click **Open** at the bottom to start a PuTTY session.

5.3 Operating Parameters Configuration

With the transmitter power off, use the serial port cable to connect the RS232 port with the computer port.   Open PuTTY which you have already set up.   Click on the **Saved Sessions** name that you saved your configuration to and click on **Load**.   Click on **Open** to begin the session.   With the serial cable connected, turn on the transmitter power, you will see the page below.   Enter the password to login.   Z-Band Technologies, LLC.   sets up the factory default password as 123456.

After entering the password, the following screen will be displayed:

```
*******************************************
  Application For Transmitter Snmp Agent
*******************************************
V1.16.1411.1
*******************************************
Input Password:******
Login Successfull.
Trans:\>
```

You can type your commands in this page and at this command prompt, and then configure the SNMP and other operating parameters of the transmitter unit.

The system supports the following commands:

help	**List internal commands of the system;**
ethcfg	**Configure the Ethernet operating parameters;**
settrap	**Configure the host IP address of the SNMP Trap;**
community	**Configure the SNMP group name;**
Restore	**Restore the factory default values;**
setpswd	**Set the login password;**
Exit	**Log out.**

Specific command use is as follows:

help

This command shows current application program version, program name and the internal commands list of the system as follows:

```
*******************************************
  Application For Transmitter Snmp Agent
*******************************************
-------------------------------------------
V1.16.1411.1
Build time: Jun 04 2013 09:25:05
-------------------------------------------
Command list:
[help] show command help.
[ethcfg] ethernet module config
[settrap] config remote  ip list for trap pdu.
[community] config snmp community for agent .
[setpswd] set password to enter
[exit] log out.

Trans:\>
```

You can also use the "help" command to show more detailed help information for all

other commands, such as "help ethcfg", ethcfg's help information appears as follows:

```
Trans:\>help ethcfg
Examples:
\>ethcfg
show current system ethernet configs.
\>ethcfg ip addr
set local ip address, for example:
ethcfg ip 192.168.1.253
\>ethcfg msk addr
set subnet mask, for example:
ethcfg msk 255.255.255.0
\>ethcfg gw addr
set gateway address,for example:
ethcfg gw 192.168.1.1

Trans:\>
```

ethcfg

This command configures the Ethernet parameters, including IP address, subnet mask and gateway. You can refer to the help information for its using.

settrap

This command shows or modifies the host IP address list of the SNMP Trap,
IP addresses of 0.0.0.0 and 255.255.255.255 don't exist. SNMP Trap does not send to these two addresses.

community

This command configures the read-only group name and read-write group name. Use the command "community ro" to configure the read-only, and "community rw" for the read-write. For example, input "community rw public", "public" is the read-write group name. The group name for read-only and read-write are both "public" as the equipment default setting from factory.

setpswd

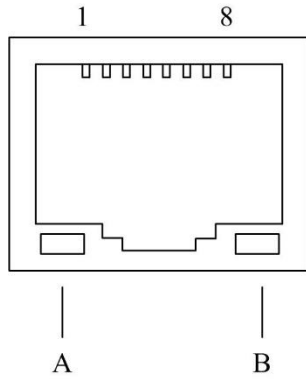This command is used to modify the login password.

Exit

This command is used to log out.

5.4 Remote Monitoring: SNMP

LAN communication interface:
The transmitter uses a RJ45 standard connector, the pin definitions are as follows:

```
      1          8
   ┌─────────────────┐
   │  ⊓⊓⊓⊓⊓⊓⊓⊓       │
   │                 │
   │                 │
   │   ▭  ▭       ▭   │
   └─────────────────┘
       │         │
       A         B
```

1: TX+
2: TX-
3: RX+
4: No Connect
5: No Connect
6: RX-
7: No Connect
8: No Connect
A: Green indicator flashing means that the LAN port is sending data.
B: Yellow indicator means that the network connection is normal.

SNMP General Background

Simple Network Management Protocol (SNMP) is an application layer protocol. It makes the management information and control between network devices much easier. It is part of the TCP / IP protocol. SNMP enables the end-users to manage network performance, find and solve network problems, and monitor for future network upgrades.

Management Information Base (MIB) is the organized hierarchical information set specific to each unit depending on the information and control capabilities. Use SNMP to browse and set these MIB parameters. They are composed of configurable information/variables, and identified by the object identifier.

SNMP Configuration

The IP address and gateway are shipped in the default state, you need to configure them. The configuration of initial settings can be achieved through either the RS-232

interface or the front panel keys. See section 5.3

5.5 WEB Network Management

Opening the IE browser and entering the transmitter IP address displays the following transmitter login page.   You can read the IP address from the transmitter's **Disp Parameters** LCD menu (OR set it to a new IP address from the **Set Parameters** if you have a potential IP address conflict with other devices on the same network):
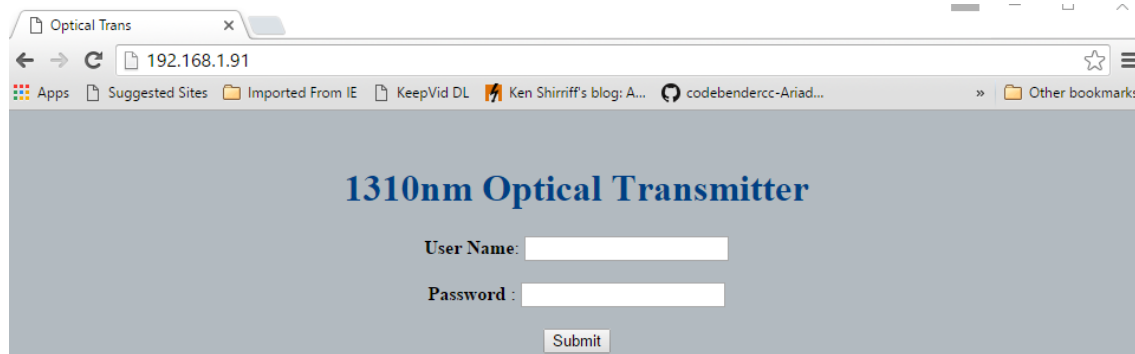
Enter the user name **admin** and password **123456** (Z-Band Technologies, LLC. factory default), to show the following interface:

1310nm Transmitter

Display Parameter

- *Disp Parameter*
- *Set Parameter*
- *Modify Password*

Item	Value
Device Name:	Optical Transmitter
Serial Number:	151103003205
Optical Power:	14.9dBm
Laser Bais:	88.0mA
Laser Temperature:	25.6¡æ
Laser TEC:	240mA
RF Level:	0.0dBuV
+5V:	4.8V
-5V:	-5.0V
+24V:	23.4V
Device Temperature:	27.0¡æ
MAC Address:	30-71-b2-40-e1-90

There are 3 sub-interfaces:

1. **Disp Parameter** interface: To display the device display menu and parameter settings.
2. **Set Parameter** interface: To set/change the device parameters.
3. **Modify password** interface: To modify the login password.

Click **Disp Parameter** to open the following interface above at any time.

This interface displays the device parameters, including optical output power, laser bias current, optical wavelength and power supply voltage, etc.

Click **Set Parameter** to open the following interface:

1310nm Transmitter

Set Parameter

- *Disp Parameter*
- *Set Parameter*
- *Modify Password*

Item	Current	New	Update
Channel Num:	10		Update
RF MODE:	MGC	MGC ▾	Update
AGC Ref:	-5dB	-5 ▾ dB	Update
MGC Ref:	20dB	0 ▾ dB	Update

Set IP Parameter

Item	Current	New	Update
Static IP Address:	192.168.1.91	.	Update
Subnet Mask:	255.255.255.0	.	Update
Default Gateway:	192.168.1.1	.	Update
Trap Address1:	192.168.1.77	.	Update
Trap Address2:	192.168.1.78	.	Update

This interface displays the current parameter values, and you can set new parameter values here. The settings will take effect after clicking the **Update** button on the right.

Item	Settings
Channel Num	Channel number
RF MODE	RF control mode: AGC/MGC
AGC Ref	AGC control range: -5 to +5dB
MGC Att	MGC attenuation: 0-20dB

Click **Modify Password** to open the following interface for modifying the User name

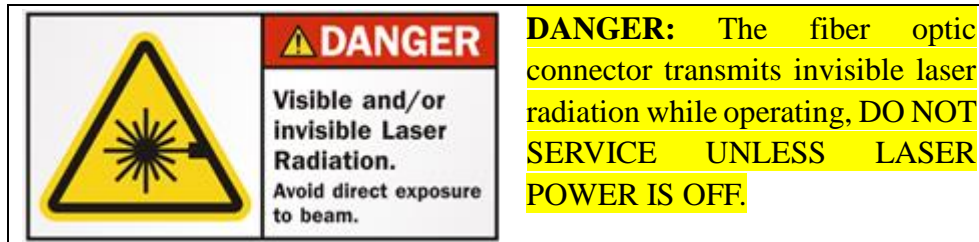(Default: admin) or the Password (Default: 123456):

Modify Login Password

New User Name   :   [   ]
New Password   :   [   ]
Confirm Password : [   ]
                    [Modify]

6. Maintenance and Troubleshooting

6.1 Cleaning Fiber Optic Connectors

DANGER: The fiber optic connector transmits invisible laser radiation while operating, DO NOT SERVICE UNLESS LASER POWER IS OFF.

CAUTION: Remove laser power before servicing any optical connections.

Dirty optical connectors are the leading source of poor performance in a broadband optical fiber network AND CAN PERMANENTLY DAMAGE YOUR TRANSMITTER (which is NOT covered under Z-Band Technologies, LLC. warranty!).   Dirty optical connectors lead to optical signal loss and reflections, which in turn can seriously degrade signal-to-noise (SNR) performance and, in some cases, distortion performance. We recommend that you clean all mating fiber connectors before connecting them to an optical transmitter.
In addition, if you suspect that the optical connector of Z-Light 6TX/16TX/26TX may have been exposed to contamination (by a dirty fiber cable connector, for example), you should properly clean the Z-Light 6TX/16TX/26TX optical connector before connecting the optical fiber.

CAUTION: Improper cleaning of an optical connector can do more harm than good. Never spray a clean-air product onto the surface of an optical connector. Spraying air onto an optical connector can cause condensation on the connector surface, leaving water spots and trapping

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dust. Failing to wipe a connector on dry lens paper immediately after wiping on paper wet with 99%+ isopropyl alcohol can also lead to condensation on the connector. Using low-grade cleaning paper or other cloth to wipe an optical connector can leave microscopic fibers on the optical connector Surface. **NEVER USE RUBBING ALCOHOL – it is only about 75% alcohol and the water will contaminate the connectors and fiber.**

6.1.1 Cleaning Patch Cord or Pigtail Fiber Optical Connectors

CAUTION - LASER: Remove power before working on the optical connections. Observe all safety precautions. To clean optical connectors, we recommend using a fiber optic connector cleaning cartridge. In extenuating circumstances, if a cleaning cartridge is not available, follow these steps.

To clean the optical connector of a patch cord or pigtail:
1. Fold a piece of unused dry lens cleaning paper twice, for a four-ply thickness.
2. Use a drop of high-grade 99%+ isopropyl alcohol to wet part of the paper.
3. Lay the connector on the lens cleaning paper with the tip touching the paper.
4. In one continuous motion, pull the connector from the wet part of the paper to the dry part.

6.2 Troubleshooting

If there is a problem or issue, use Table 6-1 below to analyze the symptoms and potential resolutions.

Table **6-1: Failure Analysis and Troubleshooting Solutions**

Failure Observations	Failure cause	Solution
Power on, the front panel display screen and power indicator are both off.	Switching power supply couldn't start; equipment; internal DC power supply is not working.	Check if the AC power is normal (should be AC: 110V-240V). If the supply voltage is normal, it could be a failure of a switching power supply module. Please contact the dealer or our distributor in your country.
Power on; the display screen is off, only the power indicator is on.	The internal microprocessor is not working.	Please contact the dealer or our distributor in your country.
Power on; the optical output power displayed on the front panel display screen and laser status indicator are both normal, but the actual measured optical output power is low.	1. The poor quality of the test jumper. 2. The active fiber connector or adapter may be contaminated. 3. The ceramic tube in the adapter may have been broken.	1. Replace with a good quality test jumper. 2. Clean the contaminated active fiber connector or adapter. For specific cleaning methods see section 6.1. 3. Replace the damaged adapter.
After initial startup, the video image has an obvious netlike curve or large particles and/or highlights.	1. The received optical power is too high; the output level of the optical receiver module is too high and the intermodulation index of RF signal is deteriorating. 2. The RF signal input of the optical transmitter is too high; beyond the device's AGC control range, resulting in deterioration of the intermodulation index. 3. The intermodulation index of the RF signal input of the	1. Check the received optical power and make appropriate adjustments (i.e. add optical attenuation). 2. Check the input level of the optical transmitter RF signal, and adjust to the device's required input range. (RF signal input level should be 72--88dBμV). 3. Check the intermodulation index of the RF signal input of the optical transmitter and make appropriate adjustments.

	optical transmitter itself is poor.	
After initial startup, the video image has noise.	1. The received optical power is not high enough, results in decrease of C/N. 2. The RF signal level input is too low; making the modulation of the laser insufficient. 3. The C/N index of system link signal is too low.	1. Clean the active fiber connectors. For specific methods see section 6.1 2. Check the RF signal level input and adjust to the device required input range. (72--88dBμV). When the input channel number is less than 15, set to the MGC control mode. 3. Use a spectrum analyzer to check the system link C/N and make appropriate adjustments. Make sure the system link signal C/N > 51dB.
After initial startup, the video image has randomly appearing noise or bright traces.	The RF input has open circuit signal interference or strong interference signal intrusions.	1. Check if there is a strong interference signal source; reorient the receiving equipment and/or reroute cabling, if possible, to avoid the influence of strong interference signal sources. 2. Check the RF cables into the transmitter, the cable shielding or the RF connector shielding and/or if the grounding is not good. 3. Close any equipment enclosure doors tightly to ensure the best shielding; if possible
After initial startup, the video image on several channels has noise.	The C/N indexes of these channels are too low.	Check the C/N of these channels signals and make appropriate adjustments.

After initial startup, the video image has one or two horizontal bright traces.	Power supply AC ripple interference due to bad grounding of equipment cabinet or power supply.	Check the grounding of the equipment; make sure that all equipment in the distribution has been sufficiently grounded and the grounding resistance is < 4Ω.
After startup, the received optical power is unstable and has large continuous changes. The RF output signal is unstable too. But the detected optical output power of the optical transmitter is normal.	The fiber connector types may not match, maybe an APC type is connected to PC type. The active fiber connector or adapter may be seriously contaminated or an adapter has been broken.	1. Check the fiber connector type; use the APC type fiber connector to ensure the normal transmission of the optical signal. 2. Clean the contaminated active fiber connector or adapter. 3. Replace any damaged adapter.

6.3 After-Sales Service

1. When the equipment malfunctions, immediately contact your local in-country dealer or distributor or directly call our Z-Band Technologies, LLC. USA Technical Support Hotline (866) 902-2606.
2. The onsite installation, maintenance, and operation of equipment must be performed by trained professional technicians to avoid damage.
   Special notice: If the equipment has been installed, maintained, and/or changed by end users, and is damaged, Z-Band Technologies, LLC. will not be responsible for free maintenance or free replacements.

6.4 Disclaimer

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