



# AIMA3000.FT5X

1550 nm Forward Transmitter - Externally Modulated

## Product User Manual



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## Contents

<b>1</b>	<b>About This Manual</b>	<b>5</b>
1.1	Chapter Overview	5
1.2	Related Documentation	5
1.3	Document Conventions	6
1.4	Technical Support	6
<b>2</b>	<b>Precautions</b>	<b>7</b>
<b>3</b>	<b>Overview</b>	<b>8</b>
3.1	Product Description	8
3.2	Product Key Features	9
3.3	Specifications	10
3.4	Block Diagram	12
3.5	Order Details	13
<b>4</b>	<b>Module Characteristics</b>	<b>15</b>
4.1	Module Appearance and Port Layout	15
4.1.1	Overview	15
4.1.2	Front Panel Layout	16
4.1.3	Rear Panel Layout	18
<b>5</b>	<b>Installation</b>	<b>19</b>
5.1	Preparatory Work for Installation	19
5.2	Unpacking	19
5.3	Module Installation	20
5.4	Connecting Optical Cables	21
5.4.1	Using the Sliding Fibre Guide	21
5.4.2	Using the Fibre Tray	23
5.4.3	Cleaning the Fibre Connector Ends and Front-panel Optical Ports	25
5.4.4	Connecting the Optical Fibres	26
5.5	Check Module LEDs	26
5.6	Test the Optical Output Signal	27

5.7	FT5X Initial Setup.....	28
<b>6</b>	<b>Module Configuration &amp; Alarm setup.....</b>	<b>30</b>
6.1	Port Configuration screen.....	30
6.1.1	Confirming Input Signal .....	33
6.1.2	Alarm Status Pages .....	34
6.1.3	Module operating voltage and temperature alarm .....	35
6.1.4	Module Port Alarms.....	36
6.1.5	Alarm Monitoring Configuration.....	37
6.1.6	Input / Output Status Monitoring.....	39
6.2	Logs Management.....	42
6.3	Device Upgrade.....	43
6.4	Restoring Factory Defaults .....	44
6.5	Reboot.....	45
<b>7</b>	<b>Troubleshooting.....</b>	<b>47</b>
<b>8</b>	<b>Declaration of Conformity .....</b>	<b>49</b>
<b>Appendix A: Default Alarm Limit Settings .....</b>		<b>50</b>
<b>Appendix B: Factory Default Settings.....</b>		<b>51</b>

## 1 About This Manual

### 1.1 Chapter Overview

1. About This Manual: Preface
2. Precautions
3. Overview: Application module overview, including the module features, technical specifications, and ordering information.
4. Module characteristics: The appearance of the equipment, port and introduction of other components
5. Installation procedure
6. Module Configuration & Alarms: Web management configuration instructions.
7. Troubleshooting
8. Product Warranty
9. Declaration of Conformity.

Appendix A: Default Alarm Limit Parameters

Appendix B: Factory Default Settings

### 1.2 Related Documentation

The following documents may be used in conjunction with this manual:

- Technetix.AIMA3000 - Product User Manual
- Technetix.AIMA ASMM - Product User Manual
- AIMA3000 NMS Web Management System Product User Manual
- Technetix.NMS3-EPSPM - Basic Inventory Management
- Technetix.NMS3-EPSPM - Basic Alarm Management
- Technetix.NMS3-EPSPM - Basic System Management
- Technetix.NMS3-EPSPM - Basic Template Management

### 1.3 Document Conventions

Before you use the manual, please familiarise yourself with the format used in this manual.

\*' Asterisk: Points marked with an asterisk means there is a corresponding note on the page

### 1.4 Technical Support

If you need help in the process of setting up and maintaining an FT5X, please contact Technetix's technical support staff:

#### Europe:

Technetix BV  
Kazemat 5  
NL-3905 NR Veenendaal  
P.O. Box 385  
NL-3900 AJ Veenendaal  
The Netherlands

Phone: +31 318 58 59 59

Email: [customer.service.vdl@technetix.com](mailto:customer.service.vdl@technetix.com)

## 2 Precautions



### WARNING!

**This equipment is intended for indoor applications. To prevent fire or electrical shock, or damage to the equipment, do not expose units to water or moisture.**

- You should carefully read and thoroughly understand the contents of the manual before installing and using this equipment.
- A typical connector is the SC/APC 8°. Note: An 8 ° angle polished optical connectors must be used.
- At any time, there may be dangerous voltage inside the device.
- Do not power up before the cover and the panels of the equipment are installed and the enclosure is closed

### Cleaning

Only use a damp cloth for cleaning the front panel. Use a soft dry cloth to clean the top of the unit. **DO NOT** use any spray cleaners or chemicals of any kind.

### Outage or overload requiring service and repairs

Unplug the unit and refer the servicing to Technetix qualified service personnel only.

### Servicing and repairs

**DO NOT** attempt to service this unit yourself. Refer all servicing needs to Technetix qualified service personnel only.



### WARNING!

**Exposure to class 3A laser radiation is possible. Access should be restricted to trained personnel only. Do not view exposed fibre or connector ends when handling optical equipment.**

## 3 Overview

### 3.1 Product Description

The 1550 nm Forward Transmitter - Externally Modulated (FT5X) is designed to plug into Technetix latest Advanced Intelligent Multi-services Access platform (AIMA3000). Technetix wavelength-tunable FT5X series is available in single, dual and quad transmitter variants.

This series of modules includes Monolithic Distributed Bragg Reflector (DBR) laser with a Silicon Optical Amplifier and an Indium- Phosphide (InP) Mach-Zehnder Modulator provide AIMA with a cost-effective system for 1550 nm transmissions for DWDM applications when used for optical ITU frequency grids.

Technetix AIMA3000 FT5X series transmitter is designed for multi-service operators (MSOs) to increase network capacity to satisfy an ever-growing subscriber demand for more bandwidth. The FT5X can be used with Erbium Doped Fibre Amplifiers (EDFA) in short haul Fibre-to-the-Home (FTTH) applications and medium haul set-ups with a high RF performance of up to 60 km.

All FT5X models can also be conveniently monitored and controlled through a computer connected to one of the Ethernet ports via the ASMM module. All module settings are retained in non-volatile memory to ensure trouble-free operation. Bulk updating, automatic uploading and downloading of configuration files can be done when using Technetix NMSE web-based management system.



### 3.2 Product Key Features

- Plug-and-play AIMA3000 platform module with up to 4 independent forward path transmitters
- Suitable for DWDM applications supporting ITU optical frequency grid wavelength channels 21 to 51 (1560.61 nm to 1536.61 nm)
- Tunable wavelength between channel 21 and 51 in 200 GHz increments, reducing the quantity of transmitters at different fixed wavelengths
- All-digital QAM loading from 45 MHz to 1200 MHz
- Link distance of up to 60 kilometers without any dispersion compensation required
- High-density up to 64 transmitters in a 4RU chassis
- Automatic gain control (AGC) for a consistent optical modulation index (OMI)
- Automatic laser power control for consistent optical output
- Comprehensive alarm reporting and monitoring
- Remote firmware upgrade and auto upload/download of configuration files through ASMM web interface or using Technetix NMSE
- FCC, CE and RCM <sup>(1)</sup> compliant

<sup>(1)</sup> See Declaration of Conformity for current status.

### 3.3 Specifications

#### Optical Performance

Optical wavelength <sup>(1)</sup>	Tunable/Fixed ITU DWDM Channels 21 to 51 (1560.61 nm to 1536.61 nm)
Optical outputs	1, 2, or 4
Optical output power per port	5 dBm 6 dBm (fixed wavelength only)
Optical connector	SC / APC <sup>(2)</sup> , LC / APC, FC/APC, E2000 / APC
Centre wavelength spacing	200 GHz
SBS suppression	+13 dBm

#### RF Performance

RF bandwidth	45 ~ 1200 MHz
RF flatness	± 0.75 dB
RF input return loss	> 16 dB
RF input level, nominal <sup>(2)</sup>	15 dBmV per channel
AGC range	±3 dB
RF impedance	75 Ω
Laser Input RF level test point	-20 dB ± 1 dB relative to laser input
Isolation of transmitters	> 65 dB
RF connectors	Single: 1 x GSK-type female Double: 2 x GSK-type female Quad: 4 x GSK-type female
RF test points	Single: 1 x Mini-SMB(4) Dual: 2 x Mini-SMB(4) Quad: 4 x Mini-SMB(4)
Alarms and laser status	Front-Panel LEDs, SNMP traps

#### Link Performance <sup>(5)</sup>

MER	> 38 dB
BER	< 1E-9

#### General

Power supply	Powered via AIMA3000 backplane
Power consumption	Single port: < 7.0 W Dual port: < 13.0 W Quad port: < 25.0 W
Operating temperature	0 ~ +50 °C
Operating humidity	90 % (Non-condensing)

<b>Storage temperature</b>	-25 ~ +70 °C
<b>Storage humidity</b>	90 % (Non-condensing)
<b>Dimensions (W*D*H)</b>	24.6 * 410 * 152.5 mm
<b>Weight</b>	Single: 0.80 kg Dual: 0.88 kg Quad: 1.1 kg
<b>Supported network management options</b>	Technetix NMSE or through ASMM's Web Interface

### Notes:

- (1) Tunable version. The factory default ITU optical channel is 33, and the ITU optical channel can be changed via the Web GUI.
- (2) Standard option. Contact a Technetix Sales Representative for availability of other options.
- (3)  $\text{dBuV} = 60 + \text{dBmV}$
- (4) One/Two/Four mini-SMB connectors on front panel to measure the RF input before the laser transmitter.
- (5) MER and BER are tested with 117 QAM256 (301.25 MHz ~ 997.25 MHz). All are measured with Technetix referenced optical receiver with 20 km single-mode optical fibre 0 dBm.

3.4 Block Diagram

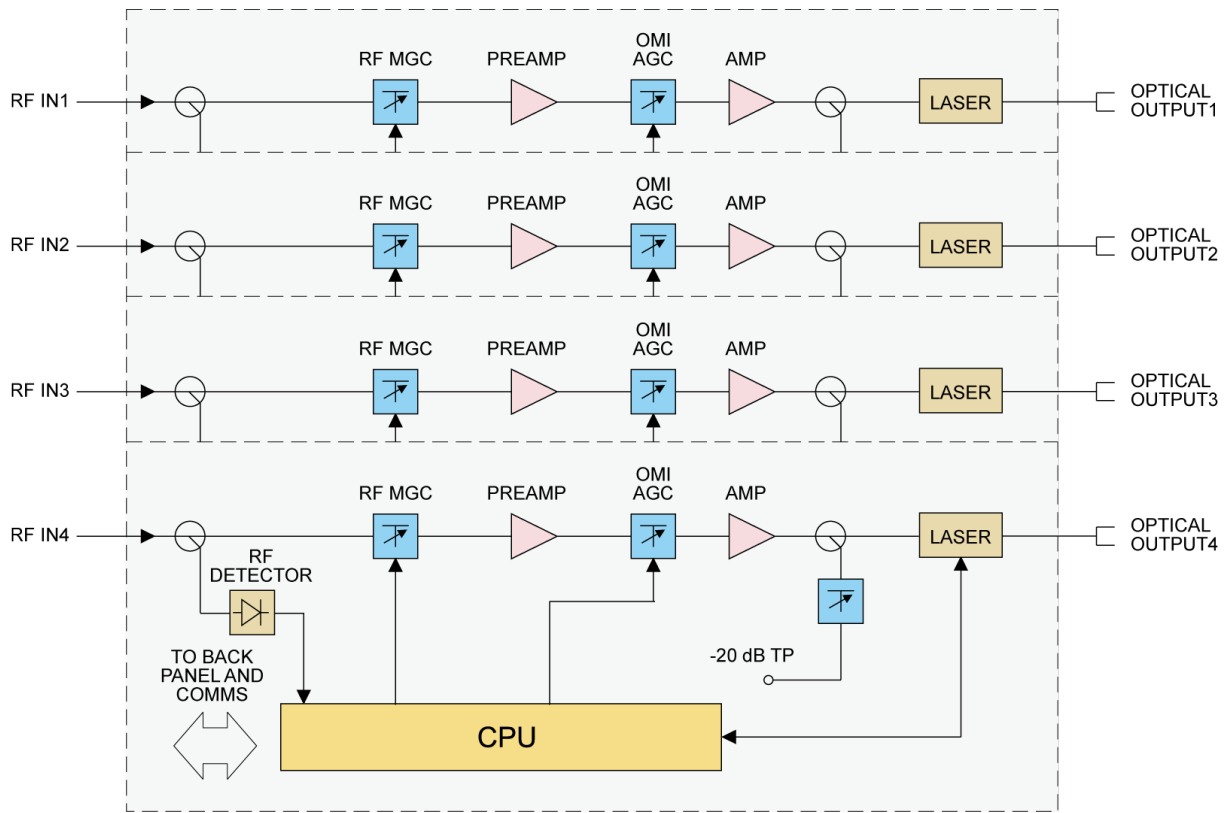


Figure 3 1 Block diagram FT5X

Table 3 1 RT5S Block Diagram Glossary

Parameters	Glossary
-20 dB TP	-20 dB Test Point
RF IN	RF Input
RF MGC	RF Input Gain
PRE AMPLIFIER	Pre-Amplifier
OMI AGC	OMI Automatic Gain Control
AMP	Output Stage Amplifier
LASER	Laser
OPTICAL OUTPUT	Optical Output
TO BACK PLANE AND COMMS	Data Bus
CPU	Central Processing Unit
RF DETECTOR	RF level detector

### 3.5 Order Details

A-FT5X-[V]-[W]-[X1X2]-[Y]-[Z]

1550 nm Forward Transmitter – Externally Modulated

**Options:**

<b>V</b>	<b>Optical Ports</b>
	<b>S</b> Single (1)
	<b>D</b> Dual (2)
	<b>Q</b> Quad (4)
<b>W</b>	<b>Optical Output Power per Port</b>
	<b>05</b> 5 dBm (3.2 mw)
	<b>06</b> 6 dBm (4 mw) (fixed wavelength only)
<b>X1X2</b> <sup>(1)(2)</sup>	<b>First Channel    Last Channel</b>
	<b>21</b> 192.1 THz (1560.61 nm)
	<b>23</b> 192.3 THz (1558.98 nm)
	<b>25</b> 192.5 THz (1557.36 nm)
	<b>27</b> 192.7 THz (1555.75 nm)
	<b>29</b> 192.9 THz (1554.13 nm)
	<b>31</b> 193.1 THz (1552.52 nm)
	<b>33</b> 193.3 THz (1550.92 nm)
	<b>35</b> 193.5 THz (1549.32 nm)
	...
	<b>51</b> 195.1 THz (1536.61 nm)
	<b>T</b> <sup>(3)</sup> Tunable
<b>Y</b>	<b>Optical Connector Type</b>
	<b>S</b> SC / APC <sup>(4)</sup>
	<b>L</b> LC/APC
	<b>F</b> FC/AP
	<b>E</b> E2000 / APC
<b>Z</b>	<b>Bandwidth</b>
	<b>12</b> 45-1200 MHz

**Note:**

(1) Default spacing is 200 GHz. For other wavelength configurations not listed, please contact Technetix.

(2) X2 used only in dual and quad transmitter version

- Dual version, X1 is first channel and X2 is the second channel
- Quad version, X1 is first channel and X2 is the fourth channel. The second and third channels are in between with default 200 GHz spacing

Examples:

Single	X1	25
Dual	X1X2	2527
Quad	X1X2	2531 (25, 27, 29, 31)

(3) When order tunable lasers, write T in X1X2 option. T will apply to all ports (1, 2 or 4).

Examples:

Tunable	X1X2	T
---------	------	---

(4) Contact Technetix Representatives for detailed optical channel information

## 4 Module Characteristics

### 4.1 Module Appearance and Port Layout

#### 4.1.1 Overview

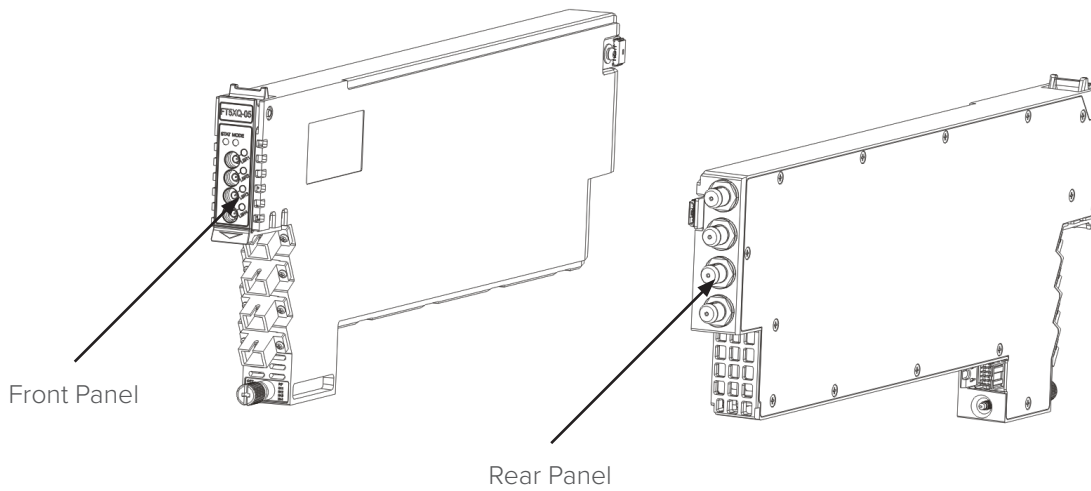


Figure 4.1 Module Appearance

4.1.2 Front Panel Layout

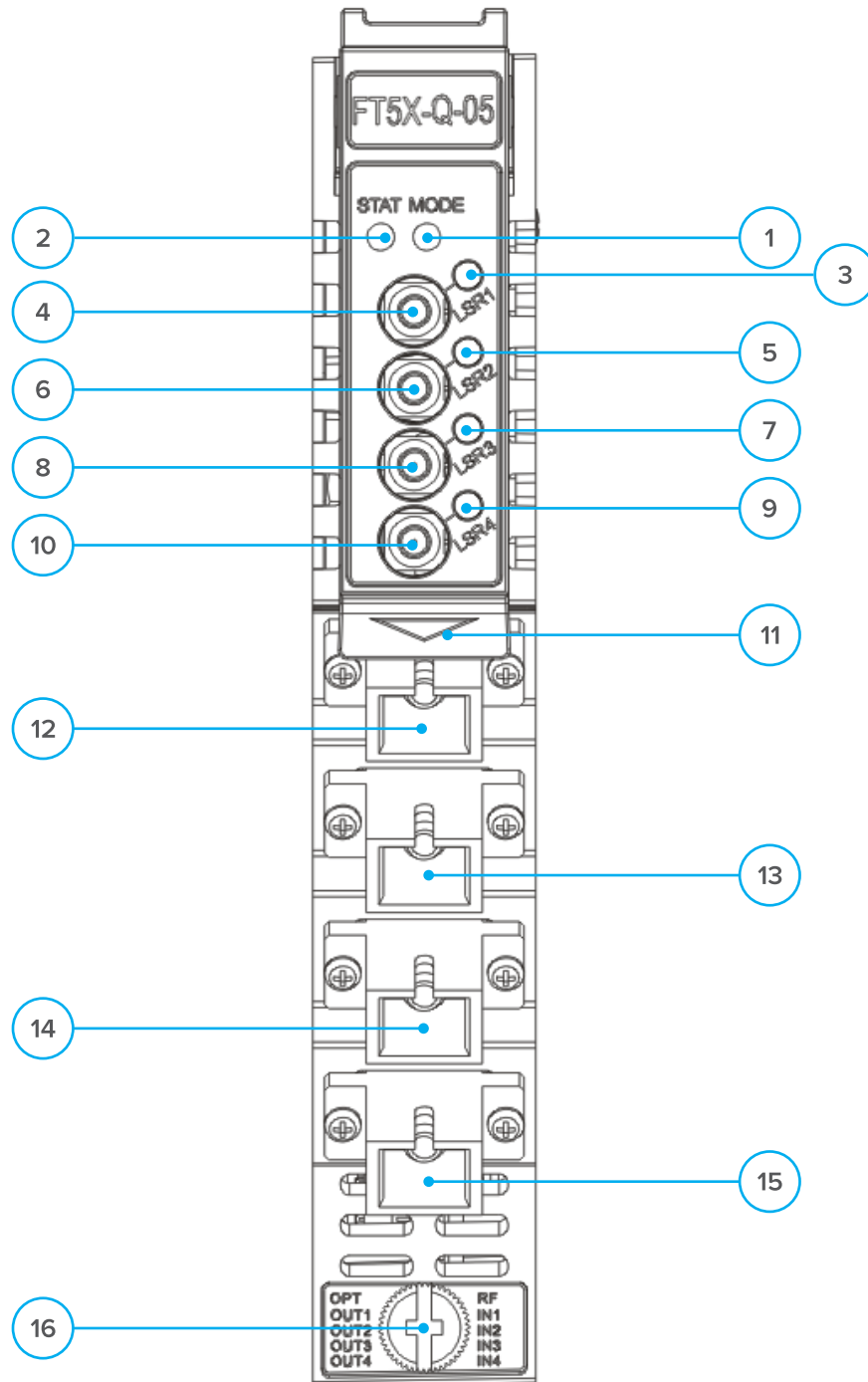


Figure 4-2 FT5X Front Panel Layout



**Table 4-1 FT5X Front Panel Functions**

Item Number	Item	Description
1	MODE LED	Module Gain Control Mode Indicator MGC: Green Light Blinking AGC: Green
2	STATUS LED	Module Alarm Indicator Normal: Green Minor Alarm: Amber Major Alarm: Red
3	LSR1 LED	Laser 1 Status Indicator ON: Green OFF: Red Major Alarm: Red
4	LSR1-TP	Laser 1 Input Test Point
5	LSR2 LED	Laser 2 Status Indicator ON: Green OFF: Red Major Alarm: Red
6	LSR2-TP	Laser 2 Input Test Point
7	LSR3 LED	Laser 3 Status Indicator ON: Green OFF: Red Major Alarm: Red
8	LSR3-TP	Laser 3 Input test point
9	LSR4 LED	Laser 3 Status Indicator ON: Green OFF: Red Major Alarm: Red
10	LSR4 -TP	Laser 4 Input Test Point
11	Orange tab-retaining clip	Used to plug and anchor the module. The tab-retaining clip will pop-up after pressing the release and plug module.
12	OPT OUT 1	Optical output 1
13	OPT OUT 2	Optical output 2
14	OPT OUT 3	Optical output 3
15	OPT OUT 4	Optical output 4
16	Mounting Screw	Module fastening screw

**CAUTION!**

“OPT OUT” emits a non-visible laser radiation when working.

4.1.3 Rear Panel Layout

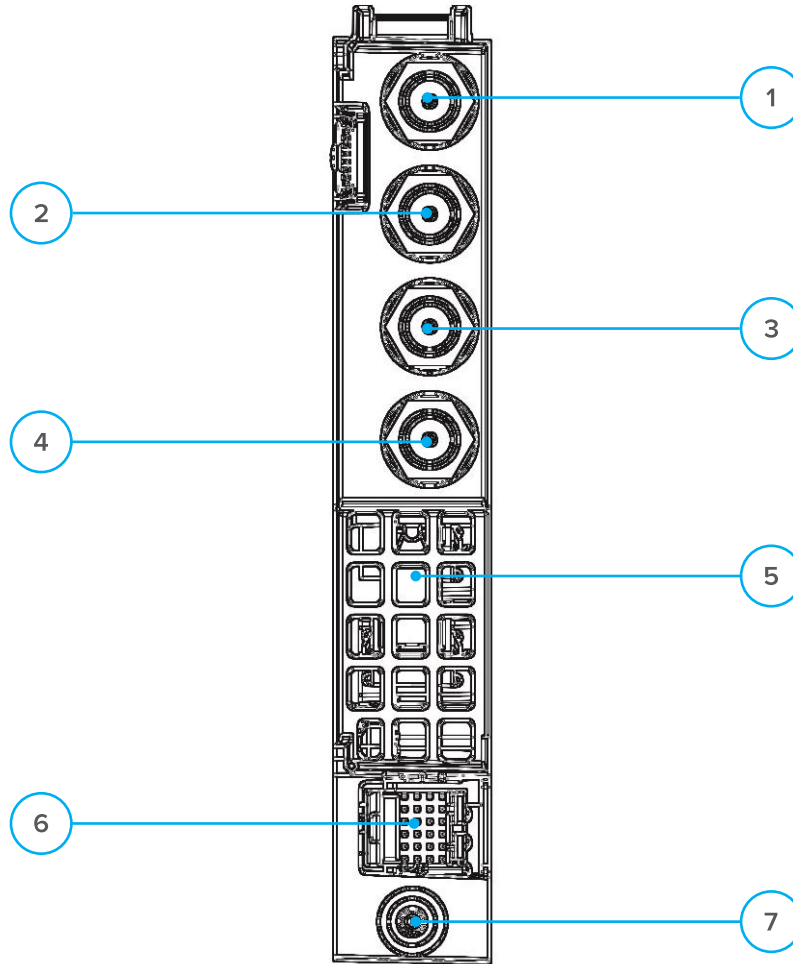


Figure 4-3 Rear Panel Layout

Table 4-2 FT5X Rear Panel Functions

Serial Number	Item	Description
1	RF IN 1	RF Input 1
2	RF IN 2	RF Input 2
3	RF IN 3	RF Input 3
4	RF IN 4	RF Input 4
5	Air Vent	Air vent allowing air to flow out of the module
6	Multi-pin connector	Power and communication port
7	Placement Pin	Used to position the module in the chassis

## 5 Installation

### 5.1 Preparatory Work for Installation

Before installing this device, you must ensure that the unit is intact and ready for installation. Unpack and check the unit: open the box to check for any damage that may have occurred during shipment. If damage is found, please contact a Technetix customer support representative.

**Necessary equipment and tools for installation:**

**Table 5-1 Necessary equipment and tools for installation**

Tools/Modules	Description
Phillips screwdriver PH1/PH2	For use with the AIMA3000 chassis
FT5X module	The module to install into the AIMA3000 chassis

### 5.2 Unpacking

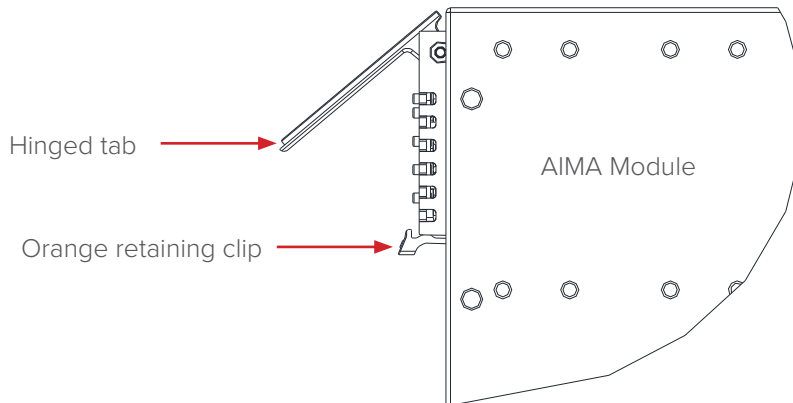
Unpack the module. Keep the packaging materials for future transport needs. Check the package manifest, record the product module type, serial number, purchase date, and any other relevant information to facilitate later management and maintenance.

**Table 5.2 Packing Manifest**

No.	Description	Qty
1	FT5X module	1
2	Individual test sheet (Certificate of Performance)	1

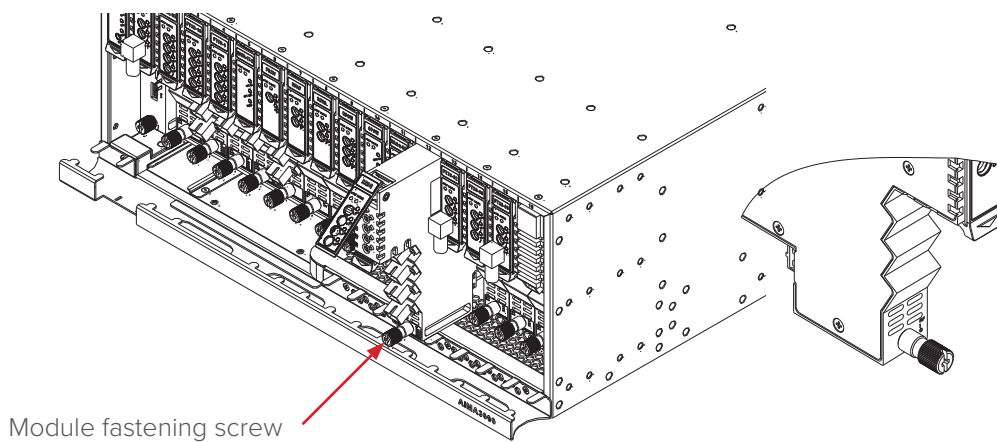
### 5.3 Module Installation

1. Gently depress the orange retaining clip and release the hinged tab



2. Hold the AIMA module casing upright, align it with the AIMA3000 slide rails for the correct slot, and insert the module until it reaches the multi-pin connector.

**DO NOT** use excessive force when inserting the module, but ensure the RF connectors at the rear of the module are securely connected with the chassis's RF connectors.



**CAUTION!**

The module **MUST** be installed correctly to ensure a proper connection of the module's multi-pin connector and the backplane.

**Tip:**

When inserting the module into the guide rails, vertically tilt the module slightly to check that the guides are properly seated on the rails. The module is guided to the correct position using the large metal fastening screw on the lower part of the front panel.

3. After the module is inserted, gently push the hinged tab until it snaps into the orange retaining clip. While ..... pushing down on the hinged tab, the AIMA module will mate with the power bus and will lock in into the chassis.

**CAUTION!**

**If force is required to insert a module, then it may not be correctly seated on the slide rails, or the mounting screw may be misaligned.**

4. When the module is fully seated within the chassis, on the bottom of the AIMA module, fasten the spring-loaded mounting screw. Only use fingers to fasten the mounting screw. DO NOT use a screwdriver.

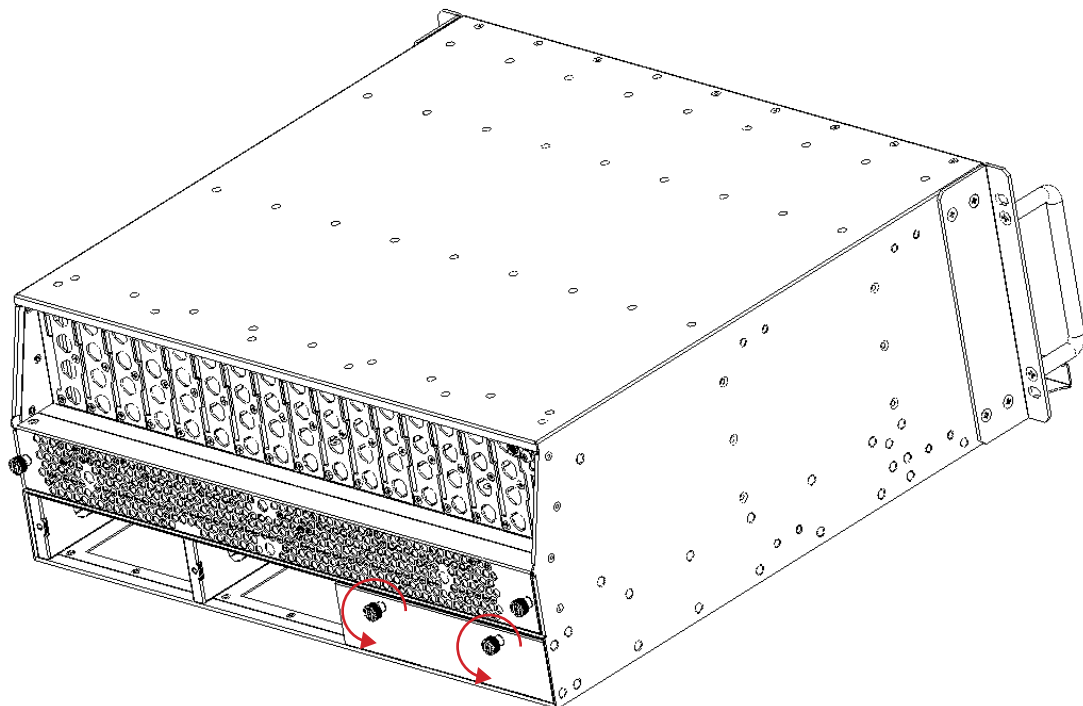
**5.4 Connecting Optical Cables**

For the convenience of the user, the AIMA3000 Chassis has a Sliding Fibre Guide to help the operator to arrange the cables. For the specific steps to connect the fibre, please refer to the instructions in section 5.4.1.

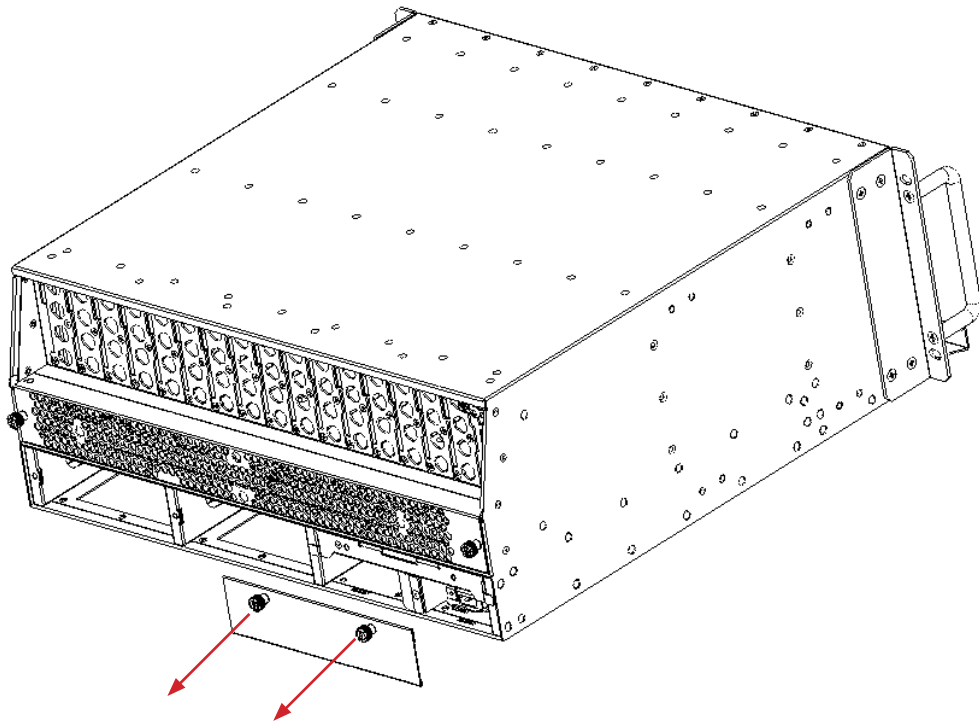
**5.4.1 Using the Sliding Fibre Guide**

The sliding fibre guide is located in the lower-left corner of the chassis if looking at the front of the chassis, and is designed to help installation of the optical fibre cabling. To access the sliding fibre guide you will need to first remove the rear panel located on the back of the chassis.

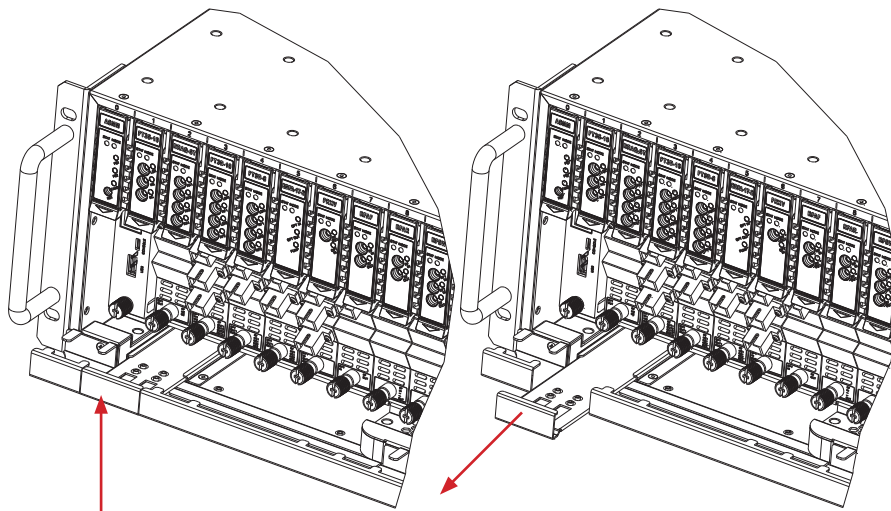
1. Unscrew the two thumbscrews on the rear panel.



2. Then, pull the panel forward.

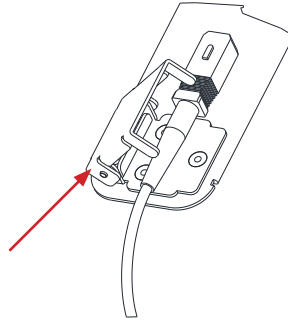


3. Then lift up the handle and slide the fibre guide out of the front of the chassis.



**DO NOT** remove the dust cap from the fibre connector until right before connecting it to the input port.

4. Raise the clip, insert the fibre connector, and then lower the clip over the connector.



When using the sliding guide, put the fibre connector in the clip and slide it in from the rear to the front, through the chassis. Ensure that the optical fibre tail does not become trapped or pulled tightly.



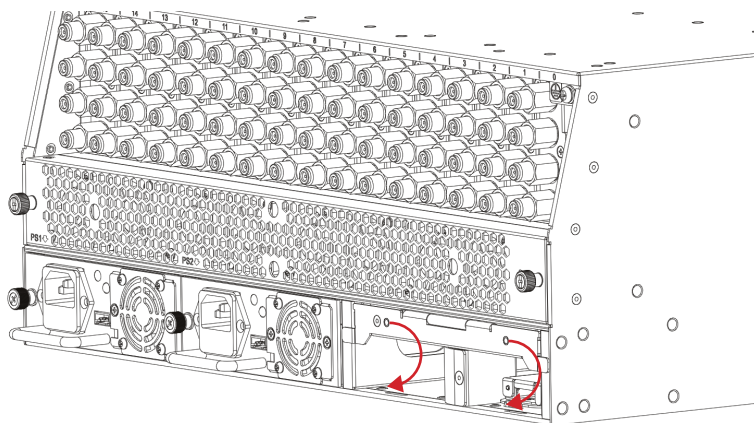
Fibre clip (at rear, for up to two connectors)

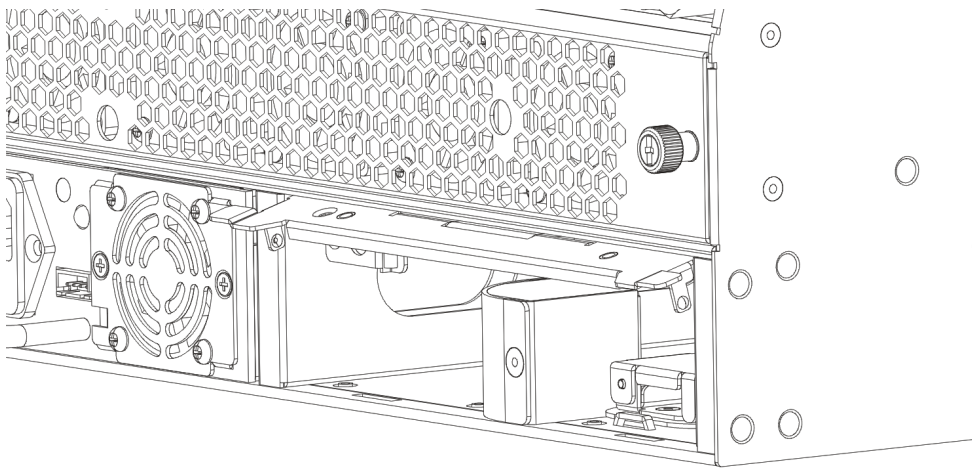
Handle (at front)

### 5.4.2 Using the Fibre Tray

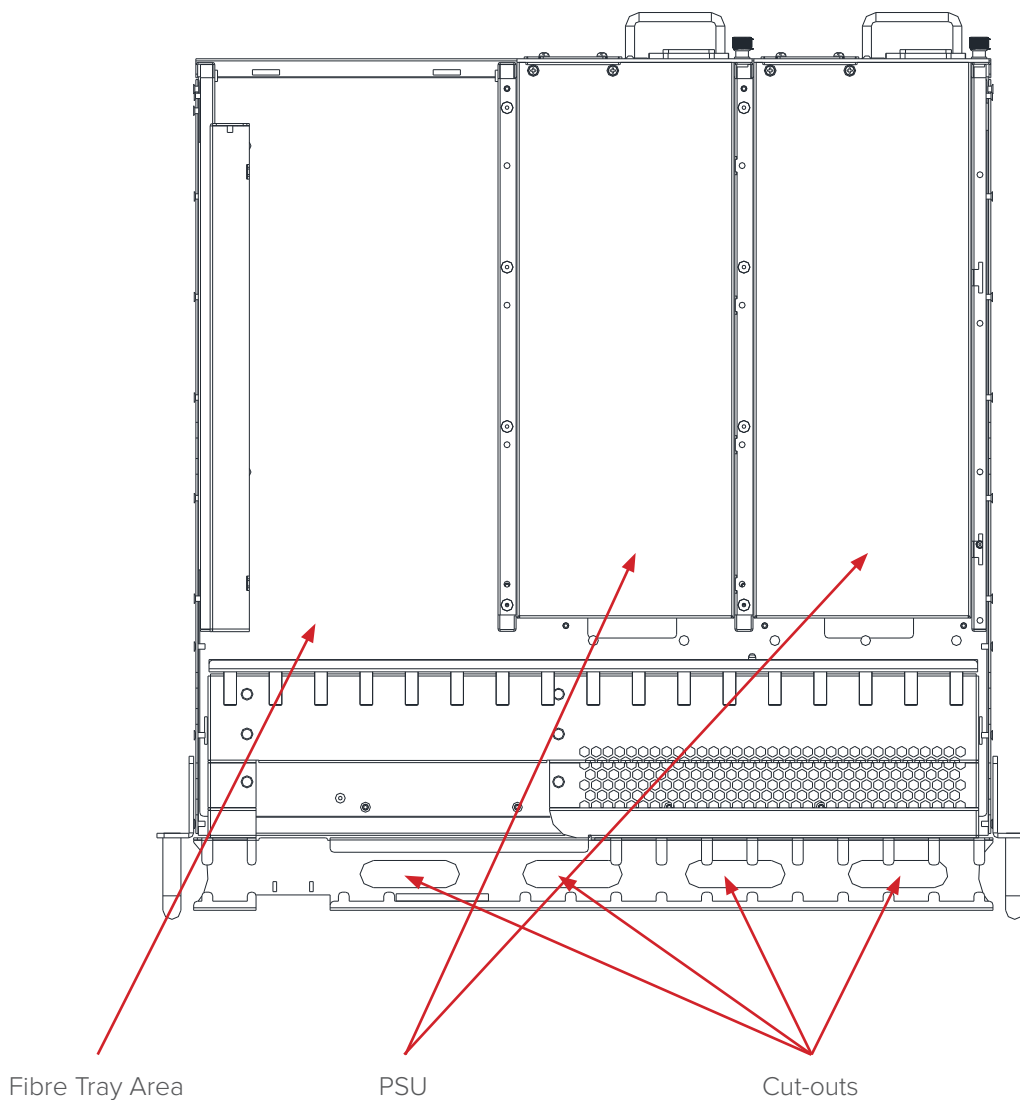
All optical fibres must be organised in a tidy manner in the chassis's fibre tray, which provides enough space for up to 64 optical fibres. This allows for easy positioning and future replacement of optical fibres. Along the front of the chassis, there are cut-outs for keeping the optical fibres in position.

1. When organising the optical fibres, lift up the metal flap at the rear of the panel above the sliding guide. This will allow fibre cables to be moved away from the sliding guide rails.





2. Use the Fibre Guide Tool to organise the cables and wires in the fibre tray to prevent tangles and the blocking of the guide rails.





### 5.4.3 Cleaning the Fibre Connector Ends and Front-panel Optical Ports

To obtain a good quality optical input signal, optical fibre input ports and fibre connector ends must be carefully cleaned.

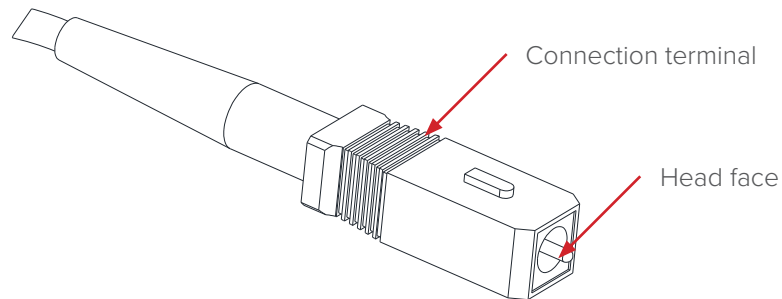


Figure 5-4

When cleaning the optical fibre-connector end, remove the dust cap and then use a lint-free cloth dampened with a static dissipative solvent to clean the angled surface. Dry the surface using a dry lint-free cloth.

To clean the front-panel optical port, use a special lint-free swab that is designed for this purpose. Dampen it with a static dissipative solvent. Apply slight pressure to the internal angled surface of the optical port, while rotating the swab 90 degrees back and forth. You may need to remove excess solvent using a dry lint-free swab. Alternatively, a cleaning pen such as the one click cleaner can be used.

SC one click cleaning pen



[www.oneclickcleaner.com](http://www.oneclickcleaner.com)

#### 5.4.4 Connecting the Optical Fibres

Carefully lift up the hinged cover of the optical input port, align the raised tab on the connector with the slot in the port. Insert the connector until the connector is securely held in place indicated by a clicking sound.

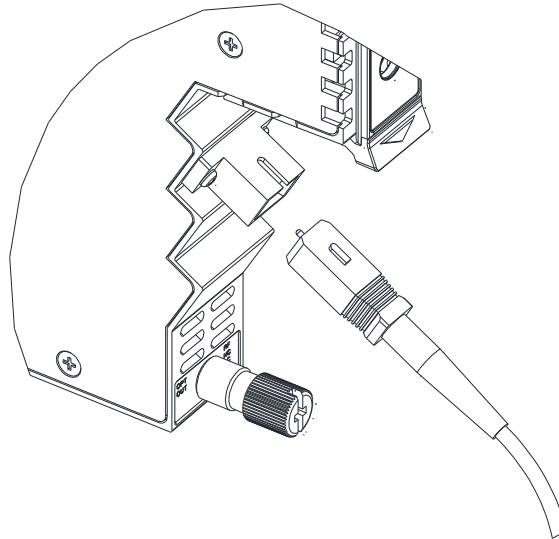


Figure 5-5

#### 5.5 Check Module LEDs

When the module has been installed, if the chassis is powered, all LED indicators on the front panel will show a blinking green light, indicating the module is initiating.

If the input signal and output signal are normal, the “STAT” LED indicator will cease to blink in about 5 seconds and remain constant green afterwards. At the same time, the “LSR” LED indicators will also remain constant green when the signals are normal.

If the RF input signal or the optical output signal is out of the expected range, the “STAT” and “LSR” LED indicator will show constant orange or red.

## 5.6 Test the RF Input Signal

After the input signal has been confirmed, the optical power of the associated optical output port should be tested. Use the optical power meter to test the output levels; the output values should be in accordance with the technical specifications.

Before testing, the optical power meter must be calibrated. Before measuring optical signals, verify the interfaces are clean and undamaged.

### **CAUTION!**

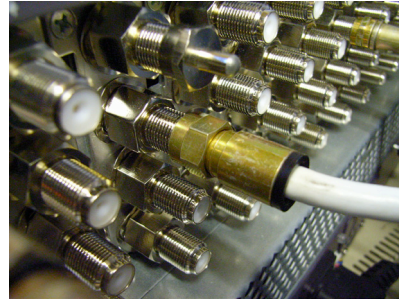
**The device output optical power measurement procedure and regular maintenance must be performed by highly trained personnel. All procedures and maintenance must be comply with the necessary safety precautions indicated with using FT5X optical transmitter module.**

### **WARNING!**

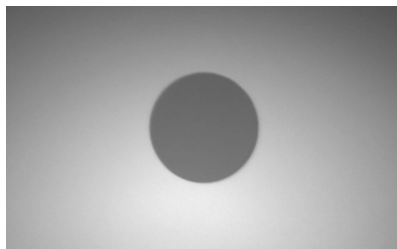
**Module emits an invisible laser when working. Avoid direct contact with the laser connector. DO NOT look directly at the fibre connector.**

5.7 FT5X Initial Setup

1. Pending finalisation of module.



2. Before installing the FT5X, check the optical output ferrule tip with a fibrescope to ensure that the connector is clean (pictured below). The cap on the optical output connector does not prevent contamination from ..... getting on to the optical connector, it prevents the laser from being emitted when laser is on and no optical patch cord is installed.



3. Next install the FT5X unit into a slot where RF input leads are connected and check the optical output power with a cleaned optical patch cord and a calibrated optical power meter. Record the optical output level. Connect a cleaned patch cord to the fibre output and to the relevant optical distribution frame (ODF) panel.
4. With a laptop connected to the ASMM module’s network or an Android device connected to the front of the ASMM module’s USB port in host mode. Select the port for the transmitter that needs to be adjusted, confirm that the “Input AGC mode” is set to “OFF”, if not change it to “OFF” and then click on “Submit” button. In addition, confirm that the “RF MGC” is set to 0.0, if not set to "0.0" and click on “Submit” button.

Configuration			
Laser Output Control	<input type="button" value="On"/>	Modulation Mode	<input type="button" value="CW"/>
Input AGC Mode	<input type="button" value="Off"/>	Wavelength Set	<input type="button" value="29"/>
RF MGC	<input type="text" value="0.0"/> (-3.0-3.0)dB	OMI Offset	<input type="text" value="0.0"/> (-3.0-3.0)dB
SBS Control	<input type="button" value="Enable"/>	<input type="button" value="Submit"/>	

5. Confirm in the management “Status” section that the RF levels for the inputs and the RF Composite Input Power are within the designated parameters.

Status			
Laser Type:	DBR	Laser Wave Length: 1554.15nm	Laser Output Status: On
Laser TEC Current:	104mA	AGC Point: 0.0dB	RF Input Power: 7.4dBmV
Laser RF Input Power:	35.5dBmV		

- Confirm that the "Alarm Control is enabled. Check the required selection and click on "Submit" to enable/disable alarms.

Configuration	
Alarm Control	Enable ▼ Tx Unit Control On ▼
Module Alias	FT5X-Q <span style="float: right;">Submit</span>

## 6 Module Configuration & Alarm setup

The module configuration settings can be configured using the web interface and Technetix NMSE (network management software). This manual only provides details on the web interface. For login details and network setup, please refer to the AIMA-ASMM user manual. If the same module is reinserted in the same slot, the ASMM will restore the previous settings if the module is set to “Auto Download” the configuration.

### 6.1 Port Configuration screen

After logging in to the AIMA ASMM controller, select the “Modules” tab and then the “FT5X” to configure one of the FT5X transmitters. After selecting “FT5X”, the “Port 1”, “Port 2”, “Port 3”, and “Port 4” options will appear.

The screenshot displays the 'Modules' configuration page for an FT5X-Q-06 module. On the left, a sidebar lists module slots from 0 to 16, with slot 14 'FT5X-Q-06' selected. The main area has tabs for 'System', 'Modules', 'Alarms', 'Logs', and 'Upgrade'. The 'Modules' tab is active, showing the following sections:

- Module Information:** Model: A-FT5X-Q-06-2935-S-12, Serial No: 201411248, HW Assembly No: A05171\_0, FW Part No: S08901, FW Version: V01.00.11. A 'Refresh' button is present.
- Configuration:** Alarm Control is set to 'Enable', Tx Unit Control is set to 'On', and Module Alias is 'FT5X-Q'. A 'Submit' button is present.
- Alarm Settings:** A table with columns: Parameter, Current Value, HiHi, Hi, Lo, LoLo, and Deadband.
 

Parameter	Current Value	HiHi	Hi	Lo	LoLo	Deadband
Temperature(°C)	30.2	<input checked="" type="checkbox"/> 70.0	<input checked="" type="checkbox"/> 65.0	<input checked="" type="checkbox"/> 0.0	<input checked="" type="checkbox"/> -5.0	2.0
+12V Input Voltage(V)	12.0	<input checked="" type="checkbox"/> 13.5	--	--	<input checked="" type="checkbox"/> 10.5	0.2
+5V Input Voltage(V)	5.1	<input checked="" type="checkbox"/> 6.0	--	--	<input checked="" type="checkbox"/> 4.4	0.1
-5V Input Voltage(V)	-5.4	<input checked="" type="checkbox"/> -4.4	--	--	<input checked="" type="checkbox"/> -6.0	0.1

 A 'Submit' button is present at the bottom right of this section.
- Commands:** 'Factory Defaults' and 'Reboot' buttons, both with 'Apply' sub-buttons. Warnings are provided for both actions.

Figure 6-1

After selecting “Port 1”, “Port 2”, "Port 3”, or “Port 4”, the RF configuration screen will appear for the designated transmitter.

The screenshot shows the RF configuration interface for a transmitter. On the left is a navigation menu with the following items: System, Modules, Alarms, Logs, Upgrade, All Modules, 0 ASMM-A, 1, 2 EDFA-1-15-G, 3, 4, 5, 6, 7 FRAE-S, 8 RT5S-D-10, 9, 10 FPAS-S, 11, 12 RRAS-Q, 13, 14 FT5X-Q-06 (selected), Port 1 (selected), Port 2, Port 3, Port 4, 15, 16 RPAS-D, PS1, PS2, and FAN.

The main configuration area is divided into four sections:

- Port Information:** Slot: 14, Module Type: FT5X-Q, Port: 1. Includes a Refresh button.
- Status:** Laser Type: DBR, Laser Wave Length: 1554.15nm, Laser Output Status: On, Laser TEC Current: 104mA, AGC Point: 0.0dB, RF Input Power: 7.4dBmV, Laser RF Input Power: 35.5dBmV.
- Configuration:** Laser Output Control: On, Modulation Mode: CW, Input AGC Mode: Off, Wavelength Set: 29, RF MGC: 0.0 (-3.0-3.0)dB, OMI Offset: 0.0 (-3.0-3.0)dB, SBS Control: Enable. Includes a Submit button.
- Alarm Settings:** Laser Output Status Alarm: enableMajor. Includes a table for alarm parameters.

Parameter	Current Value	HiHi	Hi	Lo	LoLo	Deadband
RF Input Power(dBmV)	7.4	<input checked="" type="checkbox"/> 46.4	<input checked="" type="checkbox"/> 41.4	<input checked="" type="checkbox"/> 25.4	<input checked="" type="checkbox"/> 20.4	1.0
Laser Temperature(°C)	40.7	<input checked="" type="checkbox"/> 57.0	<input checked="" type="checkbox"/> 54.0	<input checked="" type="checkbox"/> 25.0	<input checked="" type="checkbox"/> 20.0	0.5
Laser Bias Current(mA)	68	<input checked="" type="checkbox"/> 80	<input checked="" type="checkbox"/> 75	<input checked="" type="checkbox"/> 20	<input checked="" type="checkbox"/> 15	2
Laser Case Temperature(°C)	44.1	<input type="checkbox"/> 70.0	<input type="checkbox"/> 60.0	<input type="checkbox"/> 10.0	<input type="checkbox"/> 0.0	2.0
Laser Output Power(dBm)	6.5	<input checked="" type="checkbox"/> 8.0	<input checked="" type="checkbox"/> 7.0	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 4.0	0.3

Figure 6-2

In the RF configuration screen “Laser Output Control”, “Input AGC Mode”, “Modulation Mode”, “OMI Offset”, "RF MGC”, "SBS Control", and "Alarm Settings” become available. For proper RF settings with different RF channel loads, see the example calculations shown in 6.1.1. All transmitters have independent settings and they need to be adjusted separately.

Table 6 1 Port Configuration Parameters Description

Items	Sub Items	Description	
		Effect and Configuration Method	HI
Port Information	Slot	-	-
	Module Type	-	-
	Port	-	-
Status	Laser Type	-	-
	Laser RF Input Power	-	-
	AGC Point	-	Will display the total RF power
	Laser Output Status	-	On/Off
	Laser TEC (thermoelectric) Current	-	-
	Laser RF Input Power	-	-
Configuration	Input AGC Mode	Enable AGC	ON = Automatic Gain Control OFF = Manual Gain Control
	Laser Output Control	Laser output control	On/Off
	OMI offset	Change Factory Default OMI Value based on individual needs	-3 ~ +3 dB
	Modulation Mode	Modulation mode: - CW: continuous wave, for Factory Configuration. - Modulated: modulating signal for customers. The default setting is modulated	CW/Modulated
	RF MGC	RF Gain Control	-3 ~ +3 dB
	SBS Control	SBS Enable or Disable	Enable/Disable
Alarm Settings	Critical High	Alarm level threshold, alarm parameters can be changed	
	Warning High		
	Warning Low		
	Critical Low		
	Dead Band		
	Laser Output Status Alarm		



### 6.1.1 Confirming Input Signal

Input Signal is shown as the red box in Figure 6-3:

The screenshot shows the web interface for Slot 14 (Module Type: FT5X-Q, Port: 1). The 'Status' section displays the following parameters:

- Laser Type: DBR
- Laser Wave Length: 1554.15nm
- Laser Output Status: On
- Laser TEC Current: 104mA
- AGC Point: 0.0dB
- RF Input Power: 7.4dBmV
- Laser RF Input Power: 35.5dBmV

The 'Configuration' section includes the following settings:

- Laser Output Control: On
- Modulation Mode: CW
- Input AGC Mode: Off
- Wavelength Set: 29
- RF MGC: 0.0 (-3.0-3.0)dB
- OMI Offset: 0.0 (-3.0-3.0)dB
- SBS Control: Enable

The 'Alarm Settings' section shows the Laser Output Status Alarm is set to 'enableMajor'. Below this is a table of parameters and their thresholds:

Parameter	Current Value	HiHi	Hi	Lo	LoLo	Deadband
RF Input Power(dBmV)	7.4	<input checked="" type="checkbox"/> 46.4	<input checked="" type="checkbox"/> 41.4	<input checked="" type="checkbox"/> 25.4	<input checked="" type="checkbox"/> 20.4	1.0
Laser Temperature(°C)	40.7	<input checked="" type="checkbox"/> 57.0	<input checked="" type="checkbox"/> 54.0	<input checked="" type="checkbox"/> 25.0	<input checked="" type="checkbox"/> 20.0	0.5
Laser Bias Current(mA)	68	<input checked="" type="checkbox"/> 80	<input checked="" type="checkbox"/> 75	<input checked="" type="checkbox"/> 20	<input checked="" type="checkbox"/> 15	2
Laser Case Temperature(°C)	44.1	<input type="checkbox"/> 70.0	<input type="checkbox"/> 60.0	<input type="checkbox"/> 10.0	<input type="checkbox"/> 0.0	2.0
Laser Output Power(dBm)	6.5	<input checked="" type="checkbox"/> 8.0	<input checked="" type="checkbox"/> 7.0	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 4.0	0.3

Figure 6-3

### Input Power Calculations

The relationship between input power and the number of channels:

$$\text{Per channel Power} = \text{Input Power} - 10 \cdot \text{LOG}(\text{number of channels})$$

On Figure 6-3, the interface displays the “RF Input Power” and the "RF Composite Input Power". The operator can calculate the power per channel. When the different channels and levels are configured for the FT5X, the operator can also calculate the appropriate gain adjustment to ensure the total RF power for the laser.

All alarm information is monitored by the ASMM module. If an alarm occurs, the operator can view the associated module page to find more detailed alarm information.

### 6.1.2 Alarm Status Pages

Click the **Alarms** tab on the menu bar to display an overview of the alarm status of all the installed modules as shown in **Figure 6-4** below.

The each module row has an alarm status indicator used to show:

- Normal operation: Green
- Alarms: Red











System	Modules	Alarms	Logs	Upgrade
<b>All Modules</b>				
0	ASMM-A	Slot	Module Type	Alarm Status
1		0	ASMM-A	
2	EDFA-1-15-G	1	--	--
3		2	EDFA-1-15-G	
4		3	--	--
5		4	--	--
6		5	--	--
7	FRAE-S	6	--	--
8	RT5S-D-10	7	FRAE-S	
9		8	RT5S-D-10	
10	FPAS-S	9	--	--
11		10	FPAS-S	
12	RRAS-Q	11	--	--
13		12	RRAS-Q	
14	FT5X-Q-06	13	--	--
15		14	FT5X-Q-06	
16	RPAS-D	15	--	--
PS1		16	RPAS-D	
PS2		PS1	--	--
FAN		PS2	PS	
		FAN	FAN-A	

Figure 6-4

### 6.1.3 Module operating voltage and temperature alarm

Click on the corresponding module, as shown in the following figure, to view the module alarm information. By clicking on "FT5X", under "Modules" tab, the operator can view the module temperature and power supply voltage alarms. The operator can utilise the status indicators to judge whether the module is working properly.

The status has three conditions:

- Normal: Green
- Major Alarm: Red
- Minor Alarm: Amber

The screenshot shows the 'Alarms' tab selected in the top navigation bar. On the left, a list of modules is shown, with '14 FT5X-Q-06' highlighted. The main area displays the 'Slot 14 FT5X-Q Alarm Status' table.

No.	Alarm Type	Current Value	HiHi	Hi	Lo	LoLo	Deadband	Status
1	Temperature(°C)	30.2	70.0	65.0	0.0	-5.0	2.0	●
2	+12V Input Voltage(V)	12.0	13.5	--	--	10.5	0.2	●
3	+5V Input Voltage(V)	5.1	6.0	--	--	4.4	0.1	●
4	-5V Input Voltage(V)	-5.4	-4.4	--	--	-6.0	0.1	●

A 'Refresh' button is located at the bottom right of the table.

Figure 6-5

Use the status indicators to determine if the module is working properly. If the device is replaced or reset, click on "Refresh" to refresh the alarms information.

### 6.1.4 Module Port Alarms

Click on the “Port 1”, “Port 2”, “Port 3”, and “Port 4” label under the module on the left column, as shown in **Figure 6-6**. On the module port page, the operator can view the Total Input Power, Laser Temperature, Laser Output Power, Laser Output, and the Laser bias voltage alarms:

Status has three conditions:

- Normal: Green
- Minor Alarm: Amber
- Major Alarm: Red

System		Modules		Alarms	Logs	Upgrade
All Modules						
0 ASMM-A						
1						
2 EDFA-1-15-G						
3						
4						
5						
6						
7 FRAE-S						
8 RT5S-D-10						
9						
10 FPAS-S						
11						
12 RRAS-Q						
13						
14 FT5X-Q-06						
Port 1						
Port 2						
Port 3						
Port 4						
15						
16 RPAS-D						
PS1						
PS2						
FAN						

Slot 14 FT5X-Q Port 1 Alarm Status								
No.	Alarm Type	Current Value	HiHi	Hi	Lo	LoLo	Deadband	Status
1	RF Input Power(dBmV)	7.2	46.4	41.4	25.4	20.4	1.0	Major Alarm (Red)
2	Laser Output	On	--	--	--	--	--	Normal (Green)
3	Laser Temperature(°C)	40.7	57.0	54.0	25.0	20.0	0.5	Minor Alarm (Green)
4	Laser Bias Current(mA)	68	80	75	20	15	2	Normal (Green)
5	Laser Case Temperature(°C)	44.5	--	--	--	--	--	Normal (Green)
6	Laser Output Power(dBm)	6.5	8.0	7.0	5.0	4.0	0.3	Normal (Green)

Figure 6-6

### 6.1.5 Alarm Monitoring Configuration

#### Monitoring Function ON / OFF

In Configuration section on Modules page, click Alarm Control to Enable/Disable Monitoring Function.

#### Temperature, +12V, +5V Voltage Alarm Levels Management

By default, temperature, +12 V, +5 V, - 5V voltage alarms are all set to ON. The check box  as shown in **Figure 6-7** controls the detection is set to ON or OFF. When the check box is checked (detection ON), the text in the text box will be solid black. The parameters cannot be changed. The parameters instruction is shown in **Figure 6-7**, **Table 6-2** below.

The screenshot displays the configuration page for module 14 FT5X-Q-06. The interface is divided into several sections:

- System Navigation:** A sidebar on the left lists various system components, with '14 FT5X-Q-06' selected.
- Module Information:** Displays details for the selected module:
 

Model:	A-FT5X-Q-06-2935-S-12	Serial No:	201411248
HW Assembly No:	A05171_0	FW Part No:	S08901
FW Version:	V01.00.11		
- Configuration:** Shows 'Alarm Control' set to 'Enable' and 'Tx Unit Control' set to 'On'. A 'Module Alias' field contains 'FT5X-Q'.
- Alarm Settings:** A table showing current values and thresholds for various parameters:
 

Parameter	Current Value	HiHi	Hi	Lo	LoLo	Deadband
Temperature(*C)	30.2	<input checked="" type="checkbox"/> 70.0	<input checked="" type="checkbox"/> 65.0	<input checked="" type="checkbox"/> 0.0	<input checked="" type="checkbox"/> -5.0	2.0
+12V Input Voltage(V)	12.0	<input checked="" type="checkbox"/> 13.5	--	--	<input checked="" type="checkbox"/> 10.5	0.2
+5V Input Voltage(V)	5.1	<input checked="" type="checkbox"/> 6.0	--	--	<input checked="" type="checkbox"/> 4.4	0.1
-5V Input Voltage(V)	-5.4	<input checked="" type="checkbox"/> -4.4	--	--	<input checked="" type="checkbox"/> -6.0	0.1
- Commands:** Includes 'Factory Defaults' and 'Reboot' buttons, each with a warning message:
  - Factory Defaults: Warning: Applying factory defaults will erase all configuration and restore factory defaults. The module will reboot after applying default values.
  - Reboot: Warning: Rebooting the module will take approx. 20 seconds.

Figure 6-7

Table 6-2 Modules Page Alarms Threshold Parameters Instruction

Parameter	Units	HIHI	HI	Normal	LO	LOLO	Dead Band	Threshold changeable by user	Default Alarm Enable
Temperature	°C	70	65	-	0	-5	2	N	ON
+12V Input voltage	V	13.5	-	12	-	10.5	0.2	N	ON
+5V Input voltage	V	6	-	5	-	4.4	0.1	N	ON
-5V Input voltage	V	-4.4	-	-5	-	-6	0.1	N	ON

6.1.6 Input / Output Status Monitoring

To setup Input / Output status monitoring, select the either “Port 1”, “Port 2”, “Port 3”, and “Port 4” from the left menu, and then the monitoring parameters will be listed for the designated transmitter under the “Alarm Settings” section, click on  to toggle the alarms. The customer can not change the monitoring parameters. All transmitters have independent settings and they need to be adjusted separately. See Figure 6-8.

The screenshot shows the 'Alarms' configuration page for a module in Slot 14. The left menu lists modules from 0 to 16, with '14 FT5X-Q-06' selected and 'Port 1' highlighted. The main content area is divided into four sections:

- Port Information:** Slot: 14, Module Type: FT5X-Q, Port: 1. Includes a 'Refresh' button.
- Status:** Laser Type: DBR, Laser Wave Length: 1554.15nm, Laser Output Status: On, Laser TEC Current: 104mA, AGC Point: 0.0dB, RF Input Power: 7.4dBmV, Laser RF Input Power: 35.5dBmV.
- Configuration:** Laser Output Control: On, Modulation Mode: CW, Input AGC Mode: Off, Wavelength Set: 29, RF MGC: 0.0 (-3.0-3.0)dB, OMI Offset: 0.0 (-3.0-3.0)dB, SBS Control: Enable. Includes a 'Submit' button.
- Alarm Settings:** Laser Output Status Alarm: enableMajor. Contains a table of threshold parameters.

Parameter	Current Value	HiHi	Hi	Lo	LoLo	Deadband
RF Input Power(dBmV)	7.4	<input checked="" type="checkbox"/> 46.4	<input checked="" type="checkbox"/> 41.4	<input checked="" type="checkbox"/> 25.4	<input checked="" type="checkbox"/> 20.4	1.0
Laser Temperature(°C)	40.7	<input checked="" type="checkbox"/> 57.0	<input checked="" type="checkbox"/> 54.0	<input checked="" type="checkbox"/> 25.0	<input checked="" type="checkbox"/> 20.0	0.5
Laser Bias Current(mA)	68	<input checked="" type="checkbox"/> 80	<input checked="" type="checkbox"/> 75	<input checked="" type="checkbox"/> 20	<input checked="" type="checkbox"/> 15	2
Laser Case Temperature(°C)	44.1	<input type="checkbox"/> 70.0	<input type="checkbox"/> 60.0	<input type="checkbox"/> 10.0	<input type="checkbox"/> 0.0	2.0
Laser Output Power(dBm)	6.5	<input checked="" type="checkbox"/> 8.0	<input checked="" type="checkbox"/> 7.0	<input checked="" type="checkbox"/> 5.0	<input checked="" type="checkbox"/> 4.0	0.3

Figure 6-8

Table 6 3 Port Page Alarms Threshold Parameters Instruction

Parameter	Units	HIHI	HI	Normal	LO	LOLO	Dead Band	Threshold changeable by user	Default Alarm Enable
RF Input power	dBmV	46.4	41.4	-	25.4	20.4	1	Y	ON
Laser Temperature	oC	57	54	-	25	20	0.5	Y	ON
Laser Case Temperature	oC	78	73	-	-8	-13	2.0	Y	ON
Laser Bias Current	mA	80	75	-	20	15	2	Y	ON
Laser Output Power	dBm	8	7	-	5	4	0.3	Y	ON

Module Alarm Indicator Definitions

Table 6-4 Module Alarm Indicator Definitions

Parameters (Common)	Description	Definitions	Related Indicators	Lighting Conditions
Power OFF	Power OFF	Power OFF	All	All OFF
Initiating AM	Power ON	During Module Power ON	All	Green (2 times / sec)
No Alarm	Normal operation	Normal	All	Green
AM-Critical-ALM	Critical Alarm		STAT	Red
AM-Warning-ALM	Warning Alarm		STAT	Amber
Input AGC Mode	AGC / MGC Mode Control		MODE	OFF(either port) Blinking, ON (all ports) Green always
RF-Critical-ALM	RF Input Power is too high (HiHi) or too low (LoLo).		STAT LSR1/ LSR2/ LSR3/ LSR4	Red
RF-Warning-ALM	RF Input Power is higher (Hi) or lower (Lo).		STA1T LSR1/ LSR2/ LSR3/ LSR4	Amber
Laser-Critical-ALM	Laser Temperature is too high (HiHi) or too low (LoLo).		STAT LSR1/ LSR 2/ LSR3/ LSR4/	Red
	Laser Bias Current is too high (HiHi) or too low (LoLo).			
	Laser Output Power is too high (HiHi) or too low (LoLo).			
	Laser Case Temperature is too high (HiHi) or too low (LoLo).			
Laser-Warning-ALM	Laser Temperature is higher (Hi) or lower (Lo).		STAT LSR1/ LSR2/ LSR3/ LSR4	Amber
	Laser Bias Current is higher(Hi) or lower(Lo).			
	Laser Output Power is higher(Hi) or lower(Lo).			
	Laser Case Temperature is higher(Hi) or lower(Lo).			



Laser-Output-Major-ALM	“Laser Output Status Alarm ”is set to “Enable Major”	Laser-Shutdown	STAT LSR1/ LSR2/ LSR3/ LSR4	Red
Laser-Output-Minor-ALM	“Laser Output Status Alarm ”is set to “Enable Minor”	Laser-Shutdown	STAT LSR1/ LSR2/ LSR3/ LSR4	Amber

### Module Alarm Indicator Definitions

Table 6-5 Module Alarm Indicator Definitions

Parameters (Common)	Description	Definitions	Related Indicators	Lighting Conditions
Power OFF	Power OFF	Power OFF	All	All OFF
Initiating AM	Power ON	During Module Power ON	All	Green (2 times / sec)
No Alarm	Normal operation	Normal	All	Green
Upgrading AM Firmware	AM Upgrading	Module upgrade	MODE	
AM-Critical-ALM	Critical Alarm		STAT	Red
AM-Minor-ALM	Warning Alarm		STAT	Amber
RF Critical High (RF-Major-ALM)	RF Level High		STAT	Red
RF Warning High (RF-Minor-ALM)	RF Level Low		STAT	Amber
AGC / MGC	AGC / MGC Mode Control	AGC / MGC Mode Control	MODE	MGC Blinking (1 times / sec), AGC Green always
Laser-Critical-ALM	Laser preceding stage Gain High	Laser Current High	STAT LSR	Red
Laser-Warning-ALM	Laser preceding stage Gain Low	Laser Current Low	STAT LSR	Amber
Laser-Shutdown	Laser-Shutdown	Laser-Shutdown	LSR	Red

## 6.2 Logs Management

The operator can view all the alarms of the modules in the chassis on the Logs Management page. Click “**Logs**” to enter the Logs Management page. Refer to **Figure 6-9** below:

System	Modules	Alarms	Logs	Upgrade			
<b>All Logs</b>							
No.	Slot	Port	Type	Alarm Value	State	Time	Content
1	PS2	--	Module Status	PS	Normal	2014-12-12 11:14:09	PS is inserted in sync
2	PS2	--	Module Status	PS	Warning	2014-12-12 11:14:07	PS is discovering
3	16	--	Module Status	RPAS-D	Normal	2014-12-12 11:14:07	RPAS-D is inserted in sync
4	16	--	Module Status	RPAS-D	Warning	2014-12-12 11:14:02	RPAS-D is discovering
5	14	4	RF Input Power	9.2dBmV	LoLo	2014-12-12 11:14:02	RF Input Power Alarm
6	14	3	RF Input Power	8.2dBmV	LoLo	2014-12-12 11:14:02	RF Input Power Alarm
7	14	2	RF Input Power	7.8dBmV	LoLo	2014-12-12 11:14:02	RF Input Power Alarm
8	14	1	RF Input Power	7.4dBmV	LoLo	2014-12-12 11:14:02	RF Input Power Alarm
9	14	--	Module Status	FT5X-Q	Normal	2014-12-12 11:14:02	FT5X-Q is inserted in sync
10	14	--	Module Status	FT5X-Q	Warning	2014-12-12 11:13:42	FT5X-Q is discovering

Total Pages: 54    Current Page: 1    [First Page](#)    Page Up    [Page Down](#)    [Last Page](#)   

Figure 6-9

### 6.3 Device Upgrade

#### The Module supports firmware upgrade function.

To upgrade the firmware first upload the local upgrade file, and then click **"Start Upgrade"** to begin with the upgrade process. At the same time, you will be automatically redirected to the Network Management page. The upgrade operation is then complete.

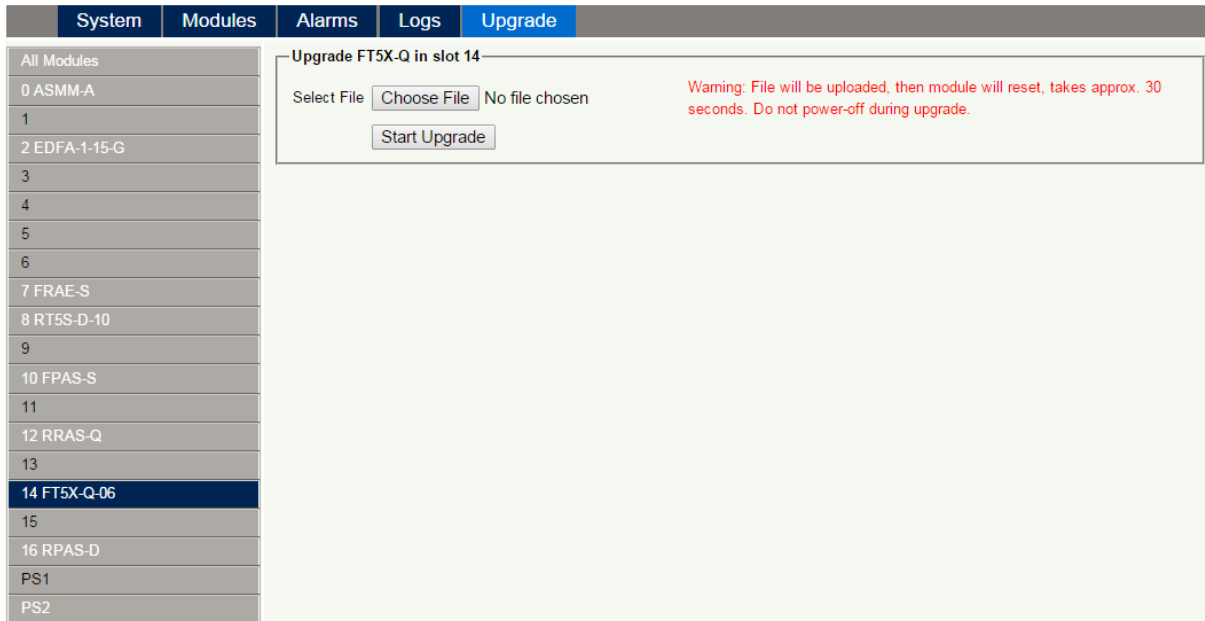


Figure 6-10

- \* The upgrade file needs to be located on the PC that is connected to the ASMM
- \* The Web GUI above only supports the manual operation from a local PC.
- \* The FT5X supports automated firmware updates and automatic backup & restore features via TFTP when managed via Technetix NMSE management software. Please refer to the NMSE Product User Manual for more information.

### 6.4 Restoring Factory Defaults

Loading factory default can restore the device to the factory default setting.

#### Detailed operations:

Click "Modules" tab and click the module to be configured as the page shown in **Figure 6-11**. Click "Apply" button in Factory Default section. When finished, the device configuration will be reset. For more detailed factory reset information, please refer to the factory restore and upgrade configuration parameters table as in **Table 6-6**.

The screenshot shows a web-based configuration interface with a top navigation bar containing 'System', 'Modules', 'Alarms', 'Logs', and 'Upgrade'. The 'Modules' tab is active, and a sidebar on the left lists various modules, with '14 FT5X-Q-06' selected. The main configuration area is divided into several sections:

- Module Information:** Displays details for the selected module: Model: A-FT5X-Q-06-2935-S-12, Serial No: 201411248, HW Assembly No: A05171\_0, FW Part No: S08901, and FW Version: V01.00.11. A 'Refresh' button is present.
- Configuration:** Includes 'Alarm Control' set to 'Enable', 'Tx Unit Control' set to 'On', and a 'Module Alias' field containing 'FT5X-Q'. A 'Submit' button is at the bottom right.
- Alarm Settings:** A table showing current values and thresholds for various parameters.
 

Parameter	Current Value	HiHi	Hi	Lo	LoLo	Deadband
Temperature(°C)	30.2	<input checked="" type="checkbox"/> 70.0	<input checked="" type="checkbox"/> 65.0	<input checked="" type="checkbox"/> 0.0	<input checked="" type="checkbox"/> -5.0	2.0
+12V Input Voltage(V)	12.0	<input checked="" type="checkbox"/> 13.5	--	--	<input checked="" type="checkbox"/> 10.5	0.2
+5V Input Voltage(V)	5.1	<input checked="" type="checkbox"/> 6.0	--	--	<input checked="" type="checkbox"/> 4.4	0.1
-5V Input Voltage(V)	-5.4	<input checked="" type="checkbox"/> -4.4	--	--	<input checked="" type="checkbox"/> -6.0	0.1

 A 'Submit' button is located at the bottom right of this section.
- Commands:** Contains two actions: 'Factory Defaults' and 'Reboot', each with an 'Apply' button. Red warning text is displayed next to each button:
  - Warning: Applying factory defaults will erase all configuration and restore factory defaults. The module will reboot after applying default values.
  - Warning: Rebooting the module will take approx. 20 seconds.

Figure 6-11

#### Note:

All the powers displayed on the webpage are total power.

**Table 6-6 Factory default and upgrade configuration parameters table**

Parameters	Conditions	Factory Default Value	After Software Upgrade
Alarm Control	Enable/Disable	Enable	Retained
Tx Unit Control	ON / OFF	ON	Retained
Laser Output Control	ON / OFF	ON	Retained
Modulation Mode	CW/Modulated	CW	Retained
Input AGC Mode	ON / OFF	OFF	Retained
OMI offset(dB)	(-3.0-3.0)	0	Retained
RF MGC(dB)	(-3.0-3.0)	0	Retained
SBS Control	Enable/Disable	Enable	Retained
Laser Output Status Alarm	Enable Major/ Enable Minor/ Disable	Enable Major	Retained

## 6.5 Reboot

The module can be made to reboot remotely.

### Detailed operations:

Click Modules tab, click the corresponding FT5X module, and click the **"Apply"** button in Reboot section. Next, click on **"Submit"** to confirm, and then the module will automatically restart. The configuration of the module will not be lost after rebooting.

The screenshot shows the configuration interface for the AIMA3000.FT5X device. The 'Modules' tab is active, and the module '14 FT5X-Q-06' is selected. The configuration panel displays the following sections:

- Module Information:** Model: A-FT5X-Q-06-2935-S-12, Serial No: 201411248, HW Assembly No: A05171\_0, FW Part No: S08901, FW Version: V01.00.11. A 'Refresh' button is present.
- Configuration:** Alarm Control: Enable (dropdown), Tx Unit Control: On (dropdown), Module Alias: FT5X-Q. A 'Submit' button is present.
- Alarm Settings:** A table with columns: Parameter, Current Value, HiHi, Hi, Lo, LoLo, Deadband.
 

Parameter	Current Value	HiHi	Hi	Lo	LoLo	Deadband
Temperature(°C)	30.2	<input checked="" type="checkbox"/> 70.0	<input checked="" type="checkbox"/> 65.0	<input checked="" type="checkbox"/> 0.0	<input checked="" type="checkbox"/> -5.0	2.0
+12V Input Voltage(V)	12.0	<input checked="" type="checkbox"/> 13.5	--	--	<input checked="" type="checkbox"/> 10.5	0.2
+5V Input Voltage(V)	5.1	<input checked="" type="checkbox"/> 6.0	--	--	<input checked="" type="checkbox"/> 4.4	0.1
-5V Input Voltage(V)	-5.4	<input checked="" type="checkbox"/> -4.4	--	--	<input checked="" type="checkbox"/> -6.0	0.1

 A 'Submit' button is present.
- Commands:** Factory Defaults: Apply button. Reboot: Apply button. Warnings are provided for both actions.

1 Click the module to be configured.

2 Click "Apply" to reboot device.

## 7 Troubleshooting

### Indicator for determining faults

If there is a fault, the operator can use the status LEDs to determine the location and condition of the fault. Please see **Table 7-1** below:

**Table 7-1 Fault Judgment Table**

Alarm Indicator status	Common Faults	Trouble Shooting
LSR1/LSR2/LSR3/LSR4 is <b>Amber</b>	Laser Temperature is higher(Hi) or lower(Lo).	Check the laser's temperature. If the temperature is normal, please contact Technetix technical support.
	Laser Case Temperature is higher(Hi) or lower(Lo).	Check the Laser Case temperature. If the temperature is normal, please contact Technetix technical support.
	Laser Bias Current is higher(Hi) or lower(Lo).	Check the laser's Bias Current. If the Bias Current is normal, please contact Technetix technical support.
	Laser Output Power is higher(Hi) or lower(Lo).	Check the laser's Output Power. If the Output Power is normal, please contact Technetix technical support.
	Laser is shutdown.("Laser Output Status Alarm "is set "Enable Minor")	Turn on the laser.
	RF Input Power is higher(Hi) or lower(Lo).	Adjust RF input signal.
LSR1/LSR2/LSR3/LSR4 is <b>red</b>	Laser Temperature is too high (HiHi) or too low (LoLo).	Check the laser's temperature. If the temperature is normal, please contact Technetix technical support.
	Laser Case Temperature is too high (HiHi) or too low(LoLo).	Check the Laser Case temperature. If the temperature is normal, please contact Technetix technical support.
	Laser Bias Current is too high(HiHi) or too low(LoLo).	Check the laser's Bias Current. If the Bias Current is normal, please contact Technetix technical support.
	Laser Output Power is too high(HiHi) or too low(LoLo).	Check the laser's Output Power. If the Output Power is normal, please contact Technetix technical support.
	Laser is shutdown.("Enable Major)	Turn on the laser.
	RF Input Power is too high(HiHi) or too low(LoLo).	Adjust RF input signal.

STAT is <b>Amber</b>	Operating environment Temperature is lower or higher.	Check the Fans, or lower the room temperature. If the temperature is normal, please contact Technetix technical support.
	+12V /+5V /-5V Input Voltage is lower or higher.	Please contact Technetix technical support.
	RF input is lower or higher.	Adjust input signal or adjust MGC to an appropriate value.
	Laser Warning ALM or Laser shutdown. ("Laser Output Status Alarm "is set "Enable Minor")	Check the laser's status.
STAT is <b>red</b>	Operating environment Temperature is too high or too low.	Check the Fans, or lower the room temperature. If the temperature is normal, please contact Technetix technical support.
	+12V /+5V/-5V Input Voltage too high or too low.	Please contact Technetix technical support.
	RF input power too high or too low.	Adjust input signal or adjust MGC to an appropriate value.
	Laser Critical ALM or Laser shutdown. ("Laser Output Status Alarm "is set "Enable Major")	Check the laser's status.



## 8 Declaration of Conformity

### According to ISO/IEC Guide 22 and EN45014

**Manufacturer's Name:** Technetix

**Manufacturer's Address:** Technetix Ltd, Innovation House, Technetix Business Park,  
Albourne, West Sussex, BN6 9EB

**Product Name:** FT5X – 1550 nm Externally Modulated Quad Transmitter

### Conforms to the following standards:

**FCC:** FCC Part 15 Subpart B: 2012

**CE:** EN 50083-2: 2012; EN 5504: 2010; EN 61000-3-2: 2006+A1: 2009+A2: 2009; EN  
55022:2010; EN 61000-3-3: 2008

**RCM:** AS/NZS CISPR22: 2009+A1: 2010 (Pending)



Appendix A: Default Alarm Limit Settings

Parameter	Units	HIHI	HI	Normal	LO	LOLO	DeadBand	Threshold changeable by user	Default Alarm Enable
Temperature	°C	70	65	-	0	-5	2	N	ON
+12V Input voltage	V	13.5	-	12	-	10.5	0.2	N	ON
+5V Input voltage	V	6	-	5	-	4.4	0.1	N	ON
-5V Input voltage	V	-4.4	-	-5	-	-6	0.1	N	ON

Appendix B: Factory Default Settings

Parameter	Units	HIHI	HI
Alarm Control	Enable/Disable	Enable	Retained
Tx Unit Control	ON / OFF	ON	Retained
Laser Output Control	ON / OFF	ON	Retained
Modulation Mode	CW/Modulated	CW	Retained
Input AGC Mode	ON / OFF	OFF	Retained
OMI offset(dB)	(-3.0-3.0)	0	Retained
RF MGC(dB)	(-3.0-3.0)	0	Retained
SBS Control	Enable/Disable	Enable	Retained
Laser Output Status Alarm	Enable Major/ Enable Minor/Disable	Enable Major	Retained

