

FIMA

DWDM / CWDM Platform

Product user manual



technetix

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Technetix Group Limited

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Product User Manual

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1 Precautions



WARNING!

This equipment is intended for indoor applications.

To prevent fire, electrical shock, or damage to the equipment, do not expose units to water or moisture.

- Ensure that the equipment is installed in a suitable environment
- The product user manual should be read and understood before the units are used

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.

Servicing

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

2 Technical support

Please contact the technical support if you have any problems during installation or maintenance.

Contact information

customer.service.vdl@technetix.com

3 Overview

3.1 About the product

The Fibre Integrated Multi Access Platform (FIMA) is a headend wavelength division multiplexer that fits in a 1RU or 4RU 19 inch chassis.

The FIMA can be configured for simple two wavelength 1310 / 1550 nm applications, four wavelengths for CWDM applications, or up to eight wavelengths for DWDM applications. In addition, multiple combinations of passive wavelength division multiplexers can be used for customised applications. The CWDM version operates in the range of 1271 nm to 1611 nm with 20 nm channel spacing.

The DWDM versions are available in 4, 8, and 16 channel configurations with 100 GHz or 200 GHz of channel spacing. The FIMA is designed with front panel access to its SC/APC (9 or 10 ports) or LC/APC (18 or 20 ports connectors), allowing for simplified operation and installation. The passive optical device uses proven Fused Biconic Taper (FBT) techniques, thin film fibre technology, and a Fibre Bragg Grating (FBG) design to minimise insertion loss and provide high wavelength isolation.

3.2 Features

- Plug-and-play FIMA platform, 1310 / 1550 nm for standard WDM applications
- High density wavelength division multiplexer with up to 16 slots
- CWDM wavelength range from 1271 nm to 1611 nm
- 1550 nm ITU grid wavelength range for DWDM applications
- Passive operation
- ITU recommended wavelengths, custom wavelengths available upon request
- Proven FBT/FBG and thin film filter designs for minimal insertion loss and high wavelength isolation
- SC/APC (9 or 10 ports) or LC/APC (18 or 20 ports) connectors in a single slot in the FIMA platform

3.3 Specifications ⁽¹⁾

Optical performance

Option		1315 nm	CWDM	DWDM (200 GHz)
Operating wavelength		1310 / 1550 nm	1270 to 1611 nm	1529.55 to 1560.61 nm
Insertion loss		< 1.5 dB	< 1.5 dB (2 channels)	< 1.4 dB (2 channels)
		N/A	< 1.5 dB (4 channels)	< 2 dB (4 channels)
		N/A	< 1.8 dB (8 channels)	< 3 dB (8 channels)
		N/A	N/A	< 4.5 dB (16 channels)
Channel spacing pass		N/A	20 nm	1.6 nm
Bandwidth		± 15 nm	≥ 13.5 nm	≥ 0.5 nm
Polarisation dependent loss		≤ 0.1 dB	≤ 0.15 dB	≤ 0.15 dB
In-band flatness		≤ 0.5 nm	≤ 0.5 nm	≤ 0.5 nm
Return loss		≥ 45 dB	≥ 45 dB	≥ 45 dB
Directivity wavelength		≥ 50 dB	≥ 50 dB	≥ 50 dB
Isolation	Adjacent	≥ 25 dB	≥ 25 dB	≥ 25 dB
	Non-adjacent	≥ 40 dB	≥ 40 dB	≥ 40 dB
Thermal stability	Wavelength	< 0.002 nm/°C	< 0.002 nm/°C	< 0.002 nm/°C
	Insertion loss	< 0.008 dB/°C	< 0.008 dB/°C	< 0.008 dB/°C

General

Operating temperature	-5 ~ 65°C
Storage temperature	-40 ~ 85°C
Chassis dimensions (W × D × H)	4U: 441.8 × 240.0 × 162.5 mm
	1U: 482.0 × 351.0 × 43.8 mm
Module dimensions (W × D × H)	171.0 × 130.0 × 24.0 mm
Chassis weight	4U: 4 kg
	1U: 3 kg
Module weight	0.5 kg

Notes

- 1 Specific customer options are available upon request.
- 2 Insertion loss: MUX + DEMUX < 3.0 dB (4 DWDM channels 200 GHz);
MUX + DEMUX < 4.0 dB (8 DWDM channels 200 GHz);
MUX + DEMUX < 6.5 dB (16 DWDM channels 200 GHz)

3.4 Order details

Chassis

F-FCHA-[Z] FIMA platform chassis

Options

Z	Height	
	4U	4RU height chassis holding up to 16 FIMA modules
	1U	1RU height chassis holding up to 6 FIMA modules (3 modules in front and 3 modules in back)

Splitters and combiners

F-WDM[U]-[V]-[W]-[X]-[Y]-[Z] FIMA platform modules

Options

U	MUX/DEMUX ⁽¹⁾			
	M	MUX		
	D	DEMUX		
V	Channels			
	02	2 channel DWDM or CWDM		
	03	3 channel DWDM or CWDM		
	04	4 channel DWDM or CWDM		
	05	5 channel DWDM or CWDM		
	06	6 channel DWDM or CWDM		
	07	7 channel DWDM or CWDM		
	08	8 channel DWDM or CWDM		
	12	12 channel DWDM or CWDM (LC only)		
16	16 channel DWDM or CWDM (LC only)			
W	Express port using as upgrade for additional DWDM channels			
	0	None		
	E	Express port		
X	Spacing			
	C	CWDM		
	2	DWDM 200 GHz		
	1	DWDM 100 GHz		
Y	CWDM Wavelength		DWDM ITU Channel	
	1271	1271 nm	21	1560.61 nm
	1291	1291 nm	22	1559.79 nm
	-	-	-	-
	1591	1591 nm	59	1530.33 nm
	1611	1611 nm	60	1529.55 nm
Z	Optical connector			
	S	SC/APC		
	F	FC/APC		
	L	LC/APC		

Example channel range for 16 port DWDM FIMA with a starting channel:

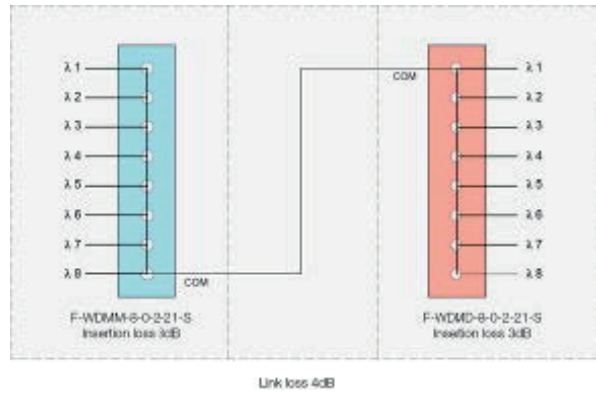
PORT 1	CH 21	192.1 THz	1560.61 nm
PORT 2	CH 23	192.3 THz	1558.98 nm
PORT 3	CH 25	192.5 THz	1557.36 nm
PORT 4	CH 27	192.7 THz	1555.75 nm
PORT 5	CH 29	192.9 THz	1554.13 nm
PORT 6	CH 31	193.1 THz	1552.52 nm
PORT 7	CH 33	193.3 THz	1550.92 nm
PORT 8	CH 35	193.5 THz	1549.32 nm
PORT 9	CH 37	193.7 THz	1547.72 nm
PORT 10	CH 39	193.9 THz	1546.12 nm
PORT 11	CH 41	194.1 THz	1544.53 nm
PORT 12	CH 43	194.3 THz	1542.94 nm
PORT 13	CH 45	194.5 THz	1541.35 nm
PORT 14	CH 47	194.7 THz	1539.77 nm
PORT 15	CH 49	194.9 THz	1538.19 nm
PORT 16	CH 51	195.1 THz	1536.61 nm
PORT C	COM		

Notes

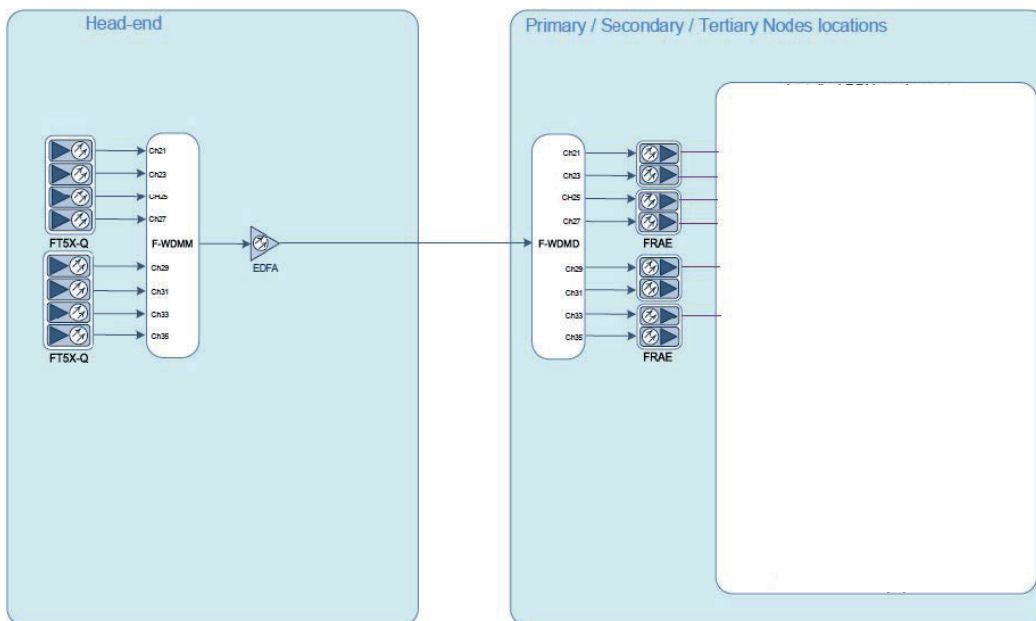
- Suggest to order Mux and Demux modules in pairs for minimum link loss.

3.5 Diagrams

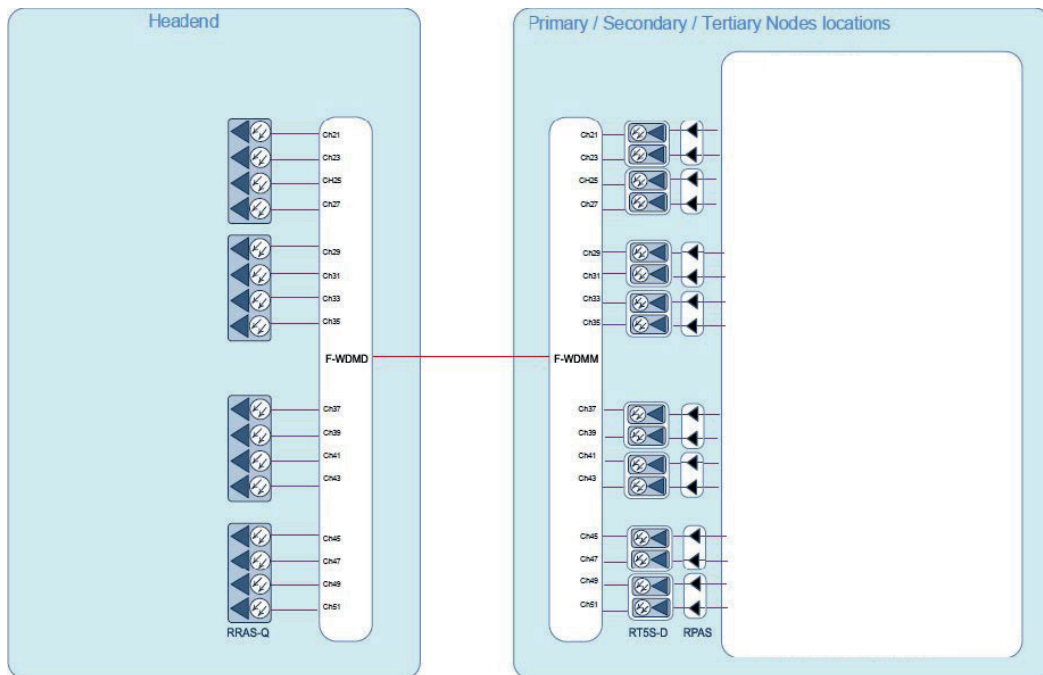
3.5.1 8 channels DWDM application diagram



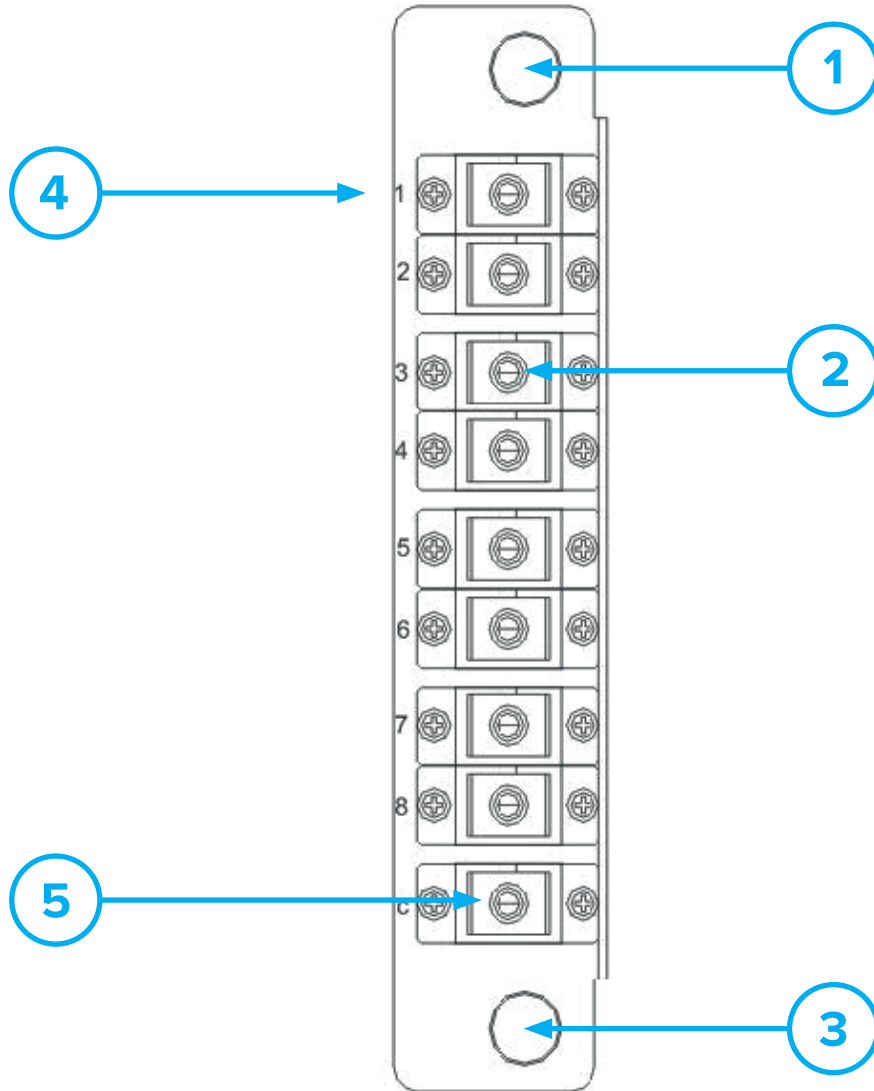
3.5.2 Application diagram for 8 downstream channel deployment



3.5.3 Application diagram for 16 upstream channel deployment

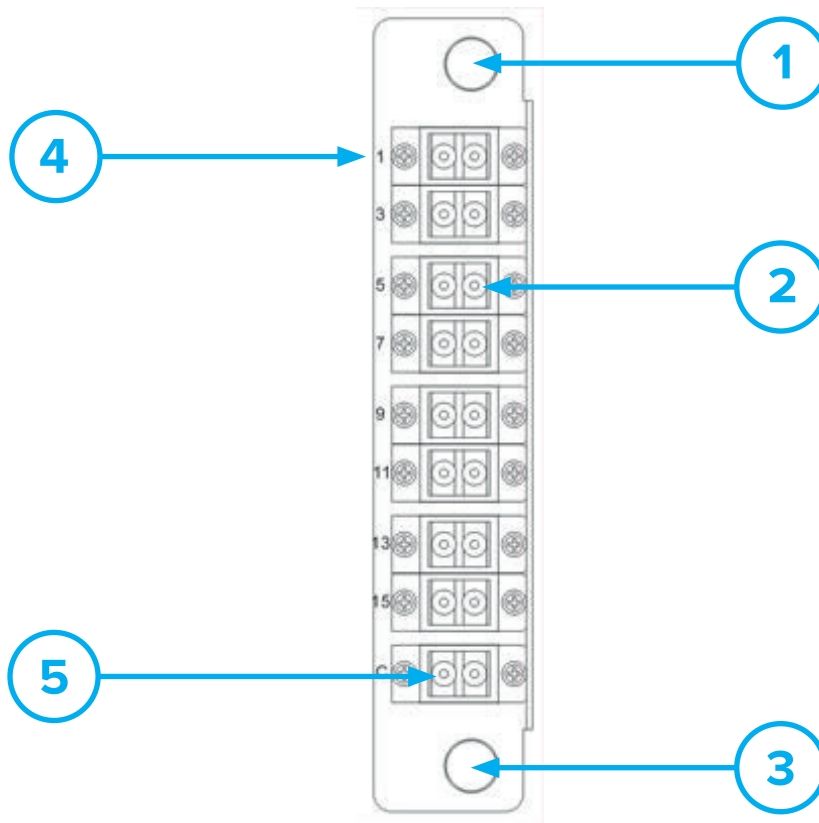


3.5.4 Front panel (for 9 port module)



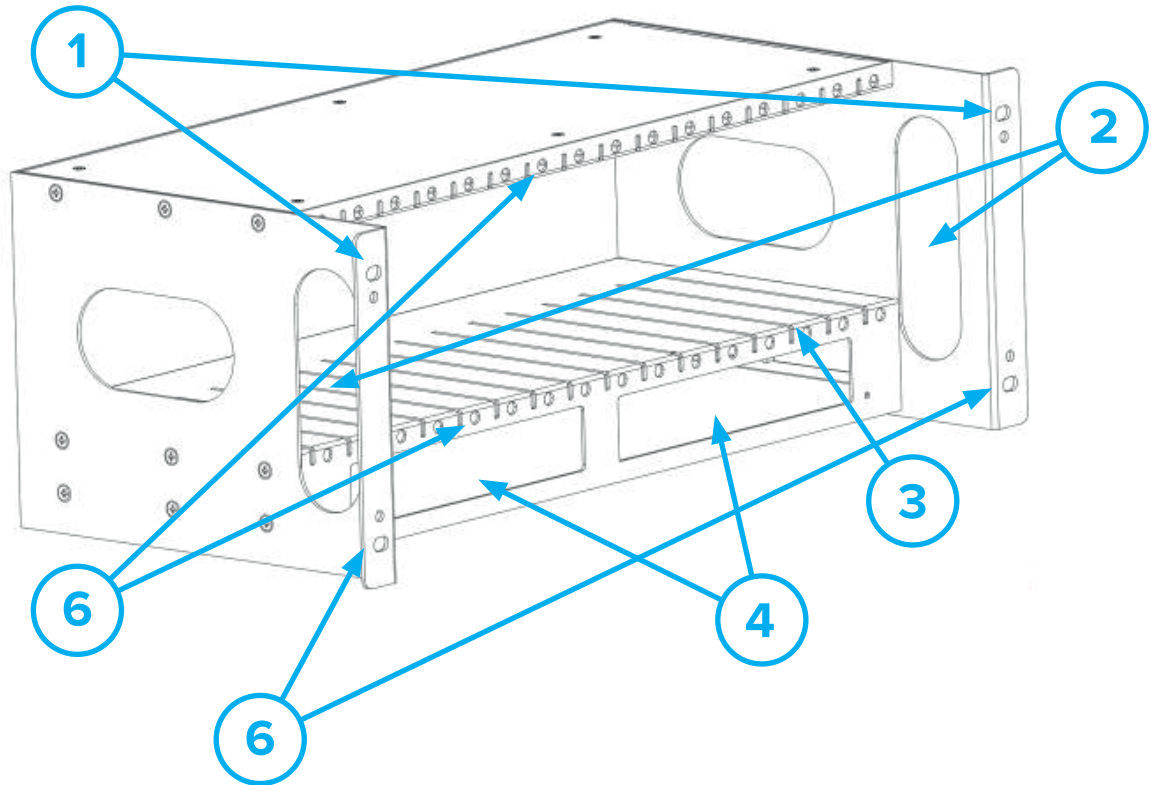
Item	Description
1	Top anchoring push pin
2	Fibre port (Port 1 will be the first channel selected on the order sheet)
3	Bottom anchoring push pin
4	Port label
5	The C port is the combined port

3.5.5 Front panel (for 16 port module)



Item	Description
1	Top anchoring push pin
2	Fibre port (Port 1 will be the first channel selected on the order sheet)
3	Bottom anchoring push pin
4	Port label
5	The C port is the combined port

3.5.6 Chassis



Item	Description	Quantity
1	Top anchoring points	2
2	Top cable routing slots	2
3	Module slot	2
4	Bottom cable routing slots	2
5	Bottom anchoring points	2
6	Module anchoring points	2

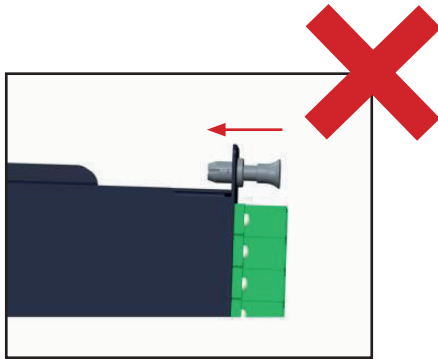
There are different chassis assembly and alignment methods for different environments. For details about assembly and alignment, please refer to 'Installation' section.

4 Installation

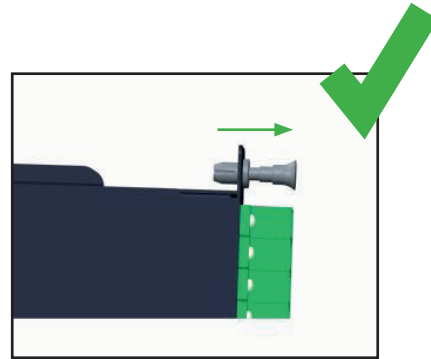


WARNING!

Before installing a module, ensure that anchoring pushpins are pulled out in the open position before placing the module in the slot.



DO NOT insert the module with the pushpin in the closed position



Insert the module with the pushpin in the open pulled position

4.1 Preparation

After ensuring that the device is undamaged and in good condition, prepare the tools and other equipment needed before installation.

On receiving your new FIMA, you should carefully unpack and examine the contents for loss or damage that may have occurred during shipping. Refer to the warranty if loss or damage has occurred. If there are any issues with your order, contact Technetix immediately.

Tools and equipment required:

Tools	Application
Phillips-head screwdriver	Assembly frame and anchor module

4.2 Installation overview

Installation directions:

1. Unpacking the equipment;
2. Mounting the chassis (two kinds of chassis assembly);
3. Anchor the module in FIMA chassis;
4. Anchor the FIMA chassis in an equipment cabinet;
5. Cable routing;
6. Tie-line method;

4.3 Unpacking the equipment

While unpacking the unit, keep the packaging for future transportation.

Check the packing list, and record the module type, serial number, and other relevant information of the product to facilitate the management and maintenance.

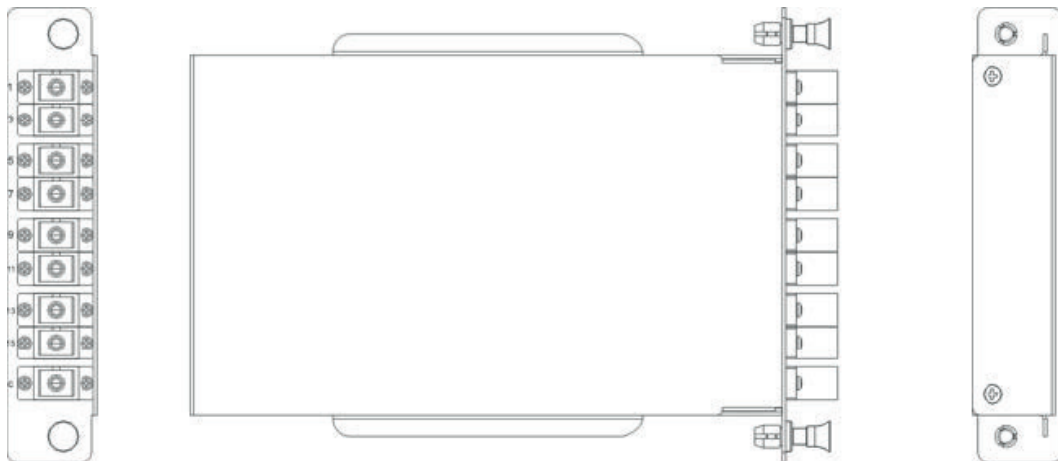
Packing list:

Item	Quantity
1: FIMA module	1
2: Certificate of Performance	1

4.4 Chassis packing list

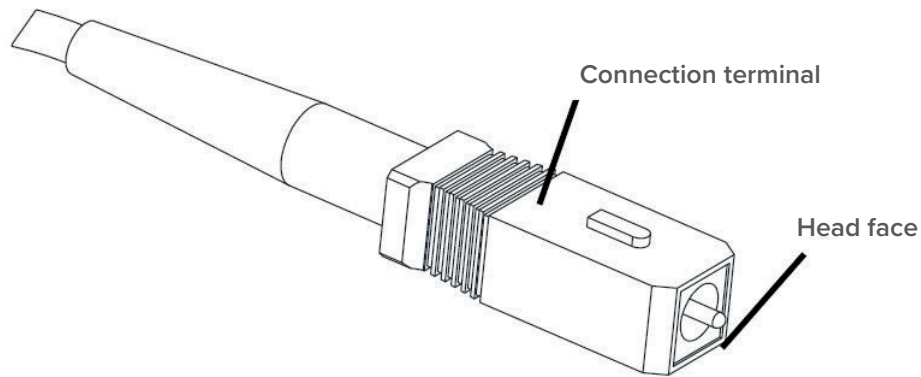
Item	Quantity
1: FIMA chassis	1
2: Chassis installation instructions	1

4.5 Module appearance



4.6 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.



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.

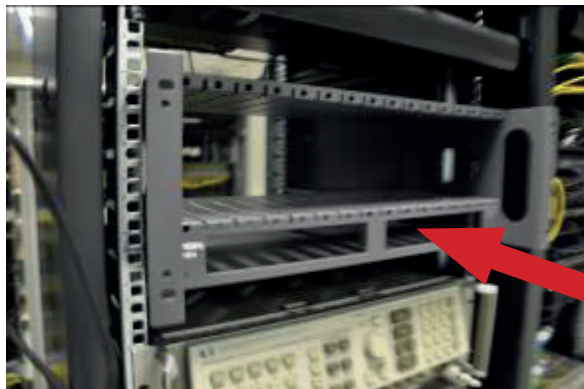
To clean the front-panel optical port, use a special lint-free swab that is designed for this purpose. Dampen it with a static dissipative solvent. Apply slight pressure to the internal angled surface of the optical port, while rotating the swab 90 degrees back and forth. You may need to remove excess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



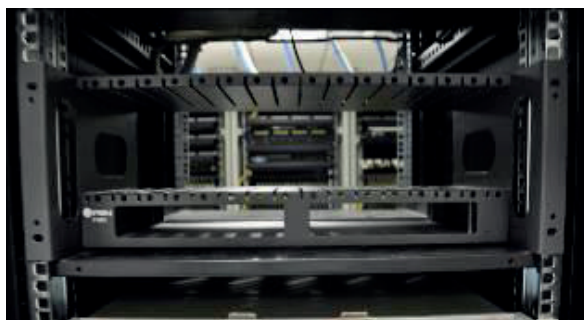
SC one click cleaning pen
(oneclickcleaner.com)

4.7 Installing the FIMA chassis inside an equipment cabinet

1. Align the chassis with the rack. Gently push the chassis in the rack.

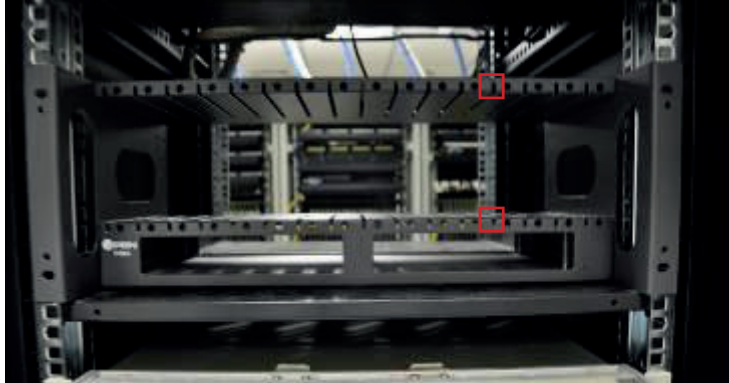


2. Using a Phillips head screwdriver, anchor the chassis to the equipment rack at the four anchor points located on the corners of the front of the chassis.



4.8 Module installation

1. Align the fins located on the top and bottom of the module with the slot on the FIMA chassis.



2. Gently push the module into the chassis.



3. Once the module is complete inside the chassis, the module can be secured by first pressing to the top anchor push-pin and then by pressing the bottom anchor push-pin.



4.9 Specifications & requirements of cable deployment

After completing all the steps above, then the fibre cables can be attached.
The fibre cables need to be deployed with consideration for the actual headend.

To ensure the routing quality, to facilitate equipment maintenance, and ease management, the cable deployment specifications and requirements are as follows:

1. The cable should be as short as possible to reduce signal line loss, should be bundled together if the cable in the same direction.
2. The angle of any bends on any wires or cables should not exceed 90 degrees. The chassis should not be overstuffed.
3. The removal of the chassis or modules should be avoided when routing cables and make a row of the high-density modules, as a bunch, as much as possible.
4. All joints must be within the visible range, the joint underground or on the up-slot channel is prohibited.
5. Different cable types have different routing methods. Fibre cables and RJ45 go underground, fibre goes up-slot channel.
6. Whenever possible, different color cables should be used to avoid confusion.
7. To avoid repeated routing which will affect the whole appearance.
8. Avoid tangles and excess winding when routing the cables and wires.
9. The tag of a bunch lines must has layering, stick correctly without exposing the white side.
10. Tighten the coupling head of all equipment.

5 Troubleshooting

Problem	Possible solutions
1. Lower levels in single output port	1. Check the connectors, make sure that it is undamaged and tighten the fibre connectors;
2. Lower levels in all output ports	2. Clean the fibre connectors and ports
3. Worse port reflection loss	3. Replace the fibre cables
4. Reduced output port isolation	4. Please contact the Technetix technical support if you cannot solve the problem
5. Worse flatness between input and output ports	

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