AIMA-FRAS OPTICAL ANALOG FORWARD RECEIVER



Product user manual



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1 About this manual

1.1 Related documentation

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

- AIMA3000 Product user manual
- AIMA ASMM Product user manual
- AIMA3000 NMS web management system product user manual
 - NMS3-EPSM Basic inventory management
 - NMS3-EPSM Basic alarm management
 - NMS3-EPSM Basic system management
 - NMS3-EPSM Basic template management

1.2 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.

1.3 Technical Support

If you need help in the process of setting up and maintaining an FPAS, 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

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.
 Note: 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 to clean 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 qualified service personnel only.

Servicing and repairs

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

3 Overview

3.1 FRAS overview

3.1.1 Product description

The Analog Forward Path Receiver - Standard (FRAS) is designed to plug into the latest generation Advanced Intelligent Multi-services Access platform - the AIMA3000.

The FRAS is available in single and dual port configurations. It incorporates a low noise front-end circuit that receives optical wavelengths from 1260 nm to 1620 nm and converts them into RF signals for Master Antenna Television (MATV), CATV, and broadband applications. The supported RF bandwidth is from 45 to 1218 MHz.

The module offers a superior frequency response with a low distortion profile and low noise characteristics.

The FRAS optical receiver module features automatic gain control (AGC), which is based on broadband detection or through optional pilot signal detection.

The RF output AGC threshold level and the slope can be managed remotely.

3.1.2 Product Key Features

- Plug-and-play AIMA3000 platform module
- Superior performance with a low noise profile and minimal distortion characteristics
- High RF output for flexible deployment
- Supports Automatic Gain Control (AGC) for a stable RF output
- Electronic slope control
- Electronic gain setting and AGC adjustable thresholds
- Broadband GaAs amplifier technology
- Support for CENELEC and NTSC standards up to 110 channels (analog and digital)
- Comprehensive status monitoring and alarm with the NMS network management software
- HMS compliant
- Remote firmware upgrade and auto upload/download of configuration files through ASMM web interface or using the NMSE
- Bulk firmware updates through the NMSE
- FCC, CE and RCM⁽¹⁾ compliant

⁽¹⁾ See Declaration of Conformity for current status.



3.1.3 Specifications

Optical performance

Optical bandwidth	1260 - 1620 nm
Optical input	-5 - +3 dBm
Optical return loss	> 60 dB
Optical connector	SC / APC ⁽¹⁾ , FC / APC, LC / APC, E2000 / APC

RF performance

RF bandwidth	45 - 1218 MHz
RF output level ⁽²⁾	40 dBmV
RF flatness	± 0.75 dB
Gain adjustment	0 - 20 dB
Slope adjustment	0 - 7 dB
ACG range (input variation)	10 dB
AGC accuracy	±0.5 dB over AGC range
RF impedance	75 Ω
RF return loss	> 16 dB
RF test point relative to RF output port	-20 ± 1 dB
RF OUT connector	GSK-type female
RF test point	Mini-SMB
Alarms and status	Front-panel LEDS, SNMP traps

Notes:

⁽¹⁾ Standard option. Contact a Technetix Sales Representative for availability of other options. ⁽²⁾ Measured in a typical system with 0 dBm optical input, 3% - 4% OMI, and dBuV=60+dBmV.

Link Performance⁽¹⁾

CNR	> 53 dB
CSO	> 65 dB
СТВ	>70 dB

General

Power supply Power consumption Operating temperature Operating humidity Storage temperature Storage humidity Dimensions (W*D*H) Weight Network management

With the FBC Module

Frequency capture range Demodulation mode Metrics and functions available Powered via AIMA3000 backplane < 12 W (without FBC module) < 17 W (with FBC module) -5 - 55°C 90% (non-condensing) -25 - +70°C 90% (non-condensing) 24.6 * 410 * 152.5 mm 0.88 kg NMSE or through ASMM's web interface

45 - 1000 MHz QAM64, QAM256 Level, SNR, MER, BER and live spectrum

Notes:

⁽³⁾ Loaded with 77 NTSC channels, measured with PBN referenced optical transmitter, 0 dBm, 3% - 4% OMI.



3.1.4 Block diagram



Figure 3-1 block diagram FRAS

Table 3-1 FRAS block diagram glossary

Parameters	Glossary RF
OPTICAL INPUT	Optical input port
ATTENUATOR	Pre-attenuator
MID AMPLIFIER	Mid-stage amplifier
SLOPE	Slope control
OUTPUT STAGE	Post-amplifier
RF OUTPUT	RF output port
RF TEST -20 dB	-20 dB RF output test port
RF DETECTOR	RF sensor
FBC	Full band capture
BIAS	Bias voltage measurement
CPU	Micro-processor
TO BACKPLANE AND COMMS	Module power and communication interface
MODULE POWER SUPPLIES	Supply bus

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A-FRAS-[W]-[X]-[Y]-[Z] Analog Forward Receiver – Standard

Options:

- W Optical input ports
 - S Single⁽¹⁾
- X FBC function⁽¹⁾
- Y Optical connector type
 - S SC/APC⁽²⁾
 - F FC/APC
 - L LC/APC
 - **E** E2000/APC

Z Bandwidth

- **1G** 45 1000 MHz (standard)
- **12** 45 1218 MHz

Notes:

⁽¹⁾ Option for FBC Management configurations only. Please omit X when selecting a model without FBC function.

 $^{\scriptscriptstyle (2)}$ Standard option. Contact a Technetix Sales Representative for availability of other options.

3.2 FRAR overview

3.2.1 Product description

The Analog Forward Receiver - Redundant (FRAR) is designed to plug into the latest generation of Advanced Intelligent Multi-services Access platform - the AIMA3000.

The FRAR is available in single port configurations. It incorporates a low noise front-end circuit that receives optical wavelengths from 1260 nm to 1620 nm and converts them into RF signals for Master Antenna Television (MATV), CATV, and broadband applications. The supported RF bandwidth is from 45 to 1218 MHz.

The module offers a superior frequency response with a low distortion profile and low noise characteristics.

The FRAR optical receiver module features automatic gain control (AGC), which is based on broadband detection. The RF output AGC threshold level and the slope can be managed remotely.

3.2.2 Product Key Features

- DOCSIS 3.1 Compatible with operating bandwidth up to 1218 MHz
- Plug-and-play with the AIMA3000 platform
- Superior performance with a low noise profile and minimal distortion characteristics
- High RF output for flexible deployment
- Supports Automatic Gain Control (AGC) for a stable RF output
- Electronic slope control
- Electronic gain setting and AGC adjustable thresholds
- Broadband GaAs amplifier technology
- Support for CENELEC and NTSC standards up to 110 channels (analog and digital)
- Comprehensive status monitoring and alarm with NMS network management software
- SCTE-HMS MIB compliant
- Remote firmware upgrade and auto upload/download of configuration files through ASMM web interface or using the NMSE
- Bulk firmware updates through the NMSE
- Fully FCC, CE, and RCM compliant

⁽¹⁾ See Declaration of Conformity for current status.

3.2.3 Specifications

Optical performance

1260 - 1620 nm **Optical bandwidth** -10 - +3 dBm **Optical input Optical return loss** > 50 dB **Optical connector** SC/APC ⁽¹⁾, FC/APC, LC/APC, E2000/APC

> 45 - 1218 MHz 40 dBmV + 0.75 dB 0 - 20 dB 0 - 7 dB 10 dB

± 0.5 dB over AGC range

Front-panel LEDS, SNMP traps

GSK-type female

Typical: < 30 ms

Mini-SMB

RF performance

Link Performance⁽¹⁾

	NTSC ⁽⁴⁾	CENELEC (42 ch) ⁽⁵⁾
CNR	> 52 dB	> 52 dB
CSO	> 68 dB	> 70 dB
СТВ	> 70 dB	>70 dB

75 Ω > 16 dB -20 + 1 dB

General

Power supply Power consumption **Operating temperature Operating humidity** Storage temperature Storage humidity Dimensions (W*D*H) Weight Network management

Powered via AIMA3000 backplane < 12 W -5 - +55 °C 90% (Non-condensing) -25 - +70 °C 90% (Non-condensing) 24.6 * 410 * 152.5 mm 0.88 kg NMSE or through ASMM's Web Interface

Notes:

⁽¹⁾ Standard option. Contact a Technetix Sales Representative for availability of other options. ⁽²⁾ Measured in a typical system with 0 dBm optical input, 3% - 4% OMI.

⁽³⁾ dBuV=60+dBmV.

⁽⁴⁾ Loaded with 77 NTSC channels, measured with an optical transmitter @ 0 dBm, 3% - 4% OMI.

⁽⁵⁾ Loaded with 42 CENELEC channels, measured with an optical transmitter @ 0 dBm, 3% - 4% OMI.



3.2.4 Order details	3	.2.4	4 O	rd	er	de	tai	ls
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A-FRAR-[W]-[Y]-[Z] Analog Forward Receiver – Redundant

Options:

- X Optical input ports
 - S Single⁽¹⁾

Y Optical connector type

- S SC/APC*
- F FC/APC
- L LC/APC
- **E** E2000/APC

Z Bandwidth

- **1G** 45 1000 MHz (standard)
- **12** 45 1218 MHz

Notes:

*Option for FBC Management configurations only. Please omit X when selecting a model without FBC function.



3.2.5 Block diagram



Figure 3-2 FRAR block diagram

Parameters Glossary OPTICAL INPUT Optical input port ATTENUATOR Pre-attenuator MID AMPLIFIER Mid-stage amplifier SLOPE Slope control OUTPUT STAGE Post-amplifier **RF OUTPUT** RF output port RF TEST -20 dB -20 dB RF output test port **RF DETECTOR** RF sensor BIAS Bias voltage measurement CPU Micro-processor Module power and TO BACKPLANE AND COMMS communication interface

Table 3-2 FRAS block diagram glossary



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 FRAS front panel layout

Table 4-1 FRAS front panel functions

ltem No.	Item	Description	ltem No.	Item	Description
1	MODE LED	Module gain control mode indicator MGC: Green light Blinking AGC: Green	6	Orange tab retaining clip	Used to plug and anchor the module. The orange tab retaining clip will pop-up after pressing the release and plug module
2	STATUS	Module working alarm indicator Normal: Green Minor alarm: Orange Major alarm: Red	7	OPT IN	Optical forward signal input port
Z	LED		8	Mounting screw	Module fastening screw
3	OPT IN LED	Optical input signal status indicator ON: Green Input signal slightly high/low: Orange Input signal too high/low: Red			
4	RF OUT LED	RF output signal status indicator ON: Green Output RF level slightly high/Low: Orange Output RF level too high/low: Red			
5	RF OUT TP	RF output test port			

4.1.3 Rear panel layout



Figure 4-3 FRAS rear panel layout

Table 4-2 FRAS rear panel functions

ltem Number	Item	Description
1	RF output port	Forward RF signal output port
2	Air vent	Air vent allowing air to flow out of the module
3	Multi-pin connector	Power supply and communication port
4	Placement pin	Used to position the module in the chassis
5	Redundancy connector	RF1 input test point

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
FRAS / FRAR 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	FRAS/FRAR module	1
2	Product user manual (CD)	1
3	Individual test sheet (Certificate of Performance)	1

5.3 Module installation

1. Gently press down the retainer clip and release the leaver



Table 5-1 Depress the 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 to the chassis's RF connectors.





CAUTION!

The module MUST be installed correctly to ensure the module's multi-pin connector and backplane are properly connected.

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 retaining clip. While pushing down on the hinged tab, the AIMA module will pair with the power bus and will lock 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 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 Fiber 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 remove the rear panel located on the back of the chassis firstly.

1. Unscrew the two thumbscrews on the rear panel.



Figure 5-3 unscrew the thumbscrews on the rear panel



2. Then, pull the panel forward.



Figure 5-4 pull the panel

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



Figure 5-5 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.



Figure 5-6 Raise the clip and insert the fibre 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)

Figure 5-7 the sliding gate

Handle

(at front)

5.4.2 Using the sliding fibre guide

All optical fibres must be organized in a tidy manner in the chassis' 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.

 When organizing 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 over and into the purposed fiber management channel, with integrated bend radius protection, and away from the sliding guide rails.



Figure 5-8 using the fibre tray



Figure 5-9 using the fibre tray

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



Figure 5-10 the chassis view

5.4.3 Cleaning the fibre connector ends and front-panel optical ports

To obtain good quality optical signal inputs, all optical fibre input ports and fibre connector ends must be carefully cleaned then inspected with a connector inspection scope to verify that there is no damage and connectors are clean.

Figure 5-11 the fibre connector ends

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

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 5-12 connecting the optical fibre

5.5 Redundancy connection (for FRAR only)

(a) Redundancy cable brace mounting hole on chassis

(b) Redundancy cable brace

(c) Redundancy cable and its brace

(d) Mounting the redundancy cable assembly to the chassis

Figure 5-13 Redundancy connection

- 1. Unfasten the screw in figure (a);
- 2. Fasten the subassemblies of redundancy cable brace in figure (b), and then insert the USB connector of the redundancy cable to it, as shown in figure (c).
- 3. Mounting the assembly of redundancy cable and its brace to the brace mounting holes on chassis by tighting the securing screw, as shown in figure (d).

5.6 Check module LEDs

When the module has been installed, and power is supplied from the chassis, the status LEDs will show a blinking green light indicating that module has started. After 15 seconds if the input signal is normal, the module STAT status LED should show a green light. The optical input indicator will show a green light. If there is no signal then the module STAT and the corresponding port status indicators will show a red light.

5.7 Test the optical input signal

Test the optical input before configuring the module. First, confirm the optical input signal by using the optical signal power meter according to the technical specifications. This step ensures the device receives an input signal within specified -5 to +3 dBm input range. Then access the optical signal to the module, at the same time the module optical input indicator should show a green light.

5.8 Test the RF output signal

After confirming, that the module's input optical signal is within the normal range, login into ASMM's web interface to set the appropriate RF gain/slope parameters. A spectrum analyser or RF signal meter can be connected to the RF output of the FRAS or through the test point located on the front panel of the FRAS module. Make sure that the RF output does not exceed 40 dBmV for 80 channels of RF.

In order to make sure the output nonlinear performance, the total output power should not be higher than 60 dBmV.

CAUTION!

When testing the RF signal at TP port, ensure that all unused RF ports are terminated with a 75 Ω load to reduce the potential errors during testing.

6 Module configuration and alarm setup

The module's configuration settings can be managed by using a web browser and the NMSE management software. This manual only provides the information regarding the ASMM's web interface. For NMSE configuration methods please refer to the NMSE manual.

6.1 Port configuration screen

After logging in to the AIMA ASMM controller, select the **'Modules'** tab and then the **'FRAS'** to configure the FRAS module. After selecting **'FRAS'**, the **'Port'** option will appear.

System	Modules	Alarms	Logs	Upgrade					
All Modules		Module Info	rmation —	~					
0 ASMM-A	1	Model:		A-FRAS-S-S-1G		Serial No:	15058240		
1 FPAS 77CH analog	g	HW Assemi	bly No:	A05121_0		FW Part No:	S08468		
2 FPAS 歌华 signal		FW Version	c	V01.00.06					Refresh
3 FPAS QAM signal		- Configuration							
4 RFSW A-77CH B	改华	Configuration	on ——				10		
5 RFSW A-2.0 B-3.0	1	Alarm Control Enable Module Alias							Submit
6 FT3S-D-10		- Alarm Setti	nas ——						
7 FT5S-D 1-CMTS 2-	-QAM				and the second se		1000		
8 EDFA-1-15-G	2022	Parameter		Current Value	HiHi	Hi	Lo	LoLo	Deadband
9 OPSW 1-1550 2-13	310	Temperatur	re(°C)	32.7	70.0	65.0	0.0	-5.0	2.0
10 RRAS-Q 2-2.0 3-3	3.0	+12V Input	Voltage(V)	12.1	13.5	-	-	10.5	0.2
11 RT5S-D 1-2.0 2-3	3.0	+5V Input V	/oltage(V)	4.9	6.0	-		€ 4,4	0.1
12 RPAS-D 1-2.0 2-3	3.0								Submit
13 RRAS-Q 2-2.0 3-3	3.0	Commente	22						
14 FRAS-S		Commands	111		Same Barrison	and the second	en mere anne alle en a	and the second	
Port		Factory Defa	aults:	Apply	Warning: Ap	plying factory defaul	ts will erase all con	figuration and	-18
15 RFSW					values.	ry deladits. The mod	idie will leboot alter	applying delat	in .
		Reboot: Apply Warning: Rebooting the module will take approx. 20 seconds.							
PS1									

Figure 6-1 module information

On the FRAS main page, alarms, events and alarm settings for DC voltages can be toggled.

Table 6-1 Modules configuration parameters

Items	Sub items	Effect and configuration method	Configuration
Module Information	Model	-	-
	HW assembly no	-	-
	FW version firmware version	-	-
	Serial No	-	-
	FW part no firmware package number	-	-
Configuration	Alarm control	Master alarm control switch	ON/OFF
Alarm setting	Critical high		
	Alarm thresholds and parameters cannot be changed		
	Warning high		
	Warning low		
	Critical low		
	Deadband		

Select 'Port' from the left column under the FRAS to go the module's configuration page.

System	Modules	Alarms	Logs	Upgrade	1							
All Modules		Port Informa	ation —									1
0 ASMM-A		Slot: 14	Slot: 14 Module Type: FRAS-S Port: 1								Refresh	
1 FPAS 77CH analog	9											
2 FPAS 歌华 signal		Status	- Status									
3 FPAS QAM signal		Optical Inpu	t Status: 🔵	AGC Stat	us: 😁	AGC Re	eference: 85	.6dBj.	N			
4 RFSW A-77CH B-哥	次华	Configuratio	on —									
5 RFSW A-2.0 B-3.0		Input Wave	Length 131	0.00 v nm		Output 0	ain Type 1	MGC	•			
6 FT3S-D-10		Output Gair	Control 15 0	(0.0-2	0 0)dB	Slope C	ontrol	0		-7 0)dl	3	Submit
7 FT5S-D 1-CMTS 2-	-QAM								, co.o			Submit
8 EDFA-1-15-G		Alarm Setti	ngs									1
9 OPSW 1-1550 2-13	310	Input Status	Alarm enabl	eMajor ▼	AGC Status	Alarm ei	nableMajor	•				
10 RRAS-Q 2-2.0 3-3	3.0	Parameter		Current Value	HiHi	Hi		Lo	4 1	Lol	.0	Deadband
11 RT5S-D 1-2.0 2-3	.0	Optical Inpu	it Power(dBm)	-4.1	30		2.5		-5.5		-8.0	0.2
12 RPAS-D 1-2.0 2-3	3.0	RE Output F	Power(dBuV)	103.4	127 7		123.7		108.7		103.7	0.5
13 RRAS-Q 2-2.0 3-3	3.0			127712			120.1		100.1		100.1	Cubmit
14 FRAS-S												Submit
Port												
15 RFSW												
16 FT5E-S-10												
PS1												
PS2												
FAN												

Figure 6-2 port web

Im the 'Status' window the following parameters are shown:

Parameter	Description	Factory Default Setting (bold) and range if applicable
Optical input status alarm	Indicate if the optical input is within portioning threshold parameters	Enable Major Enable Minor Disable
AGC status alarm	Indicate that AGC is enabled and operating in range	Enable Major Enable Minor Disable

In the configuration screen following parameters can be configured:

Parameter	Description
Input wavelength	User configurable field to indicate at which optical wavelength the FRAS is operating on. Use to configure CWDM/DWDM systems
Output gain type	To set operational mode between Manual gain control (MGC) and Automatic gain control (AGC)
Output gain control	Set the output gain value
Slope control	RF output tilt can be set up to 7 dB slope

After selecting 'Port', the RF configuration screen will appear for the designated transmitter.

	System	Modules	Alarms	Logs	Upgrade									
All Mo	dules		Port Informa	ation —										
0 ASM	M-A		Slot: 10	Mod	ule Type: FPAS-S		Port:	1						Refresh
1 FT5)	K-Q-05			Status										
2			- Status	· status							0.000			
3			AGC Status:	AGC Status: CAGC Reference: 60.0dBµV Total Gain: 25.0dB AGC Range: +5.0 ~ -5.0 dB							5.0 dB			
4			Configuratio	on —										
5 FRX			Gain Contro	N Type	GC V		SI	ope C	ontrol	0.0	(0.0-9.0	D)dB		
6			Input Gain (0.1		
7 FRA	E-S		- mpar oam s	5011101 [5.0	10.0-10	.0)00		atpare	an oonre	10.0	(0.0-10	.0)00		Submit
8 RPA			Alarm Settin	ngs —										
9			AGC Status	Alarm en	ableMajor 🔻									
10 FP/	AS-S		Parameter		Current Value	HiHi		Hi		10	1	olo	Dead	band
Po	ort		Input Powe	r(dBul/)	60.0		110.0		107.0	85.0		2 82 0	1.0	
11 FT	5S-D-10		Output Powe	(dBuV)	60.0		125.0		122.0	95.0		92.0	1.0	
12				(dDpv)	00.0		123.0		122.0	35.0		32.0	1.0	
13 RT	5S-D-10													Submit
14 ED	FA-1-15-G		1											
15 RR	AQ-ST													
16 RR	las-Q													
PS1														
PS2														
FAN														

In the FPAS 'Port' configuration screen 'Output Gain Control', 'Slope Control', 'Input Gain Control', 'Gain Control Type', and 'Alarm Settings' become available.

Total Gain is calculated by adding the Input Gain Level and the Output Gain Level with 10 dB. AGC Range is from (10- 'Input Gain Control') to (0- 'Input Gain Control')

Table 6-2 Port configuration parameter description

6.2 Restore factory defaults

Loading factory defaults can restore the device to the original default settings.

Detailed operations:

Click **'Modules'** tab and click the module to be configured as shown in Figure 6-3. Click the **'Apply'** button under **'Factory Defaults'**. When finished, the device configuration will be reset. For more detail information, refer to the factory restore and upgrade configuration parameter table shown in Table 6-3.

System	Modules	Alarms	Logs	Upgrade						
All Modules		Module Info	rmation —							
		Model:	,	A-FRAS-S-S-1G		Serial No:	15058240			
1 FPAS 77CH analog		HW Assembly No: A05121_0 FW Part				FW Part No:	S08468			
2 FPAS 歌华 signal		FW Version: V01.00.06								Refresh
3 FPAS QAM signal										
4 RFSW A-77CH B 歌颂	¥	Configuration	on ———			2				4
5 RFSW A-2.0 B-3.0		Alarm Control Enable Module Alias								Submit
6 FT3S-D-10		- Alarm Setti	nas —							
7 FT5S-D 1-CMTS 2-Q	AM	Alurni Setu	iga				loc of	40000	200	
		Parameter		Current Value	HiHi	Hi	Lo	Lol	.0	Deadband
9 OPSW 1-1550 2-131	0	Temperatu	re(°C)	32.7	70.0	65.0	0.0		-5.0	2.0
10 RRAS-Q 2-2.0 3-3.0)	-12V Input	Voltage(V)	12.1	13.5		-		10.5	0.2
11 RT5S-D 1-2.0 2-3.0		-5V Input V	/oltage(V)	4.9		-			4.4	0.1
	1				10		10			Submit
13 RRAS-Q 2-2.0 3-3.0)									
14 FRAS-S		Commands				and the sheet			and the second	
Port		Factory Defa	aults:	Apply	Warning: App	olying factory defaul	ts will erase all con	nfigura	tion and	2
15 RFSW					values.	y deladits. The mod	die will reboot alte	appi	nny uelau	
		Reboot		Apply Warning: Rebooting the module will take approx. 20 seconds.						
PS1								and all	10 10 MA	
PS2										

Figure 6-3 Factory defaults webpage

Table 6-3 Factory default parameter table

Name	Configuration	Factory Default Value	After Software Upgrade
Alarm control	ON/OFF	ON	Same as the configuration before upgrade
Output gain type	MGC/AGC	MGC	Same as the configuration before upgrade
Output gain control (dB)	0 - 20 dB	10 dB	Same as the configuration before upgrade
Slope control	0 - 7 dB	0 dB	Same as the configuration before upgrade
Input status alarm	EnableMajor EnableMinor Disable	EnableMajor	Same as the configuration before upgrade
AGC status alarm	EnableMajor EnableMinor Disable	EnableMajor	Same as the configuration before upgrade

6.3 Reboot

The module can be rebooted remotely, see Figure 6-4.

Detailed operations:

Click the '**Modules'** tab, select the '**FRAS'**, and then click the '**Apply'** button next to '**Reboot'**. Next, click on '**Submit'** to confirm, and then the module will automatically restart. The configuration of the module will be retained after rebooting.

System	Modules	Alarms	Logs	Upgrade					
All Modules		- Module Info	rmation —						
		Model:		A-FRAS-S-S-1G		Serial No:	15058240		
1 FPAS 77CH analog		HW Assem	bly No:	A05121_0		FW Part No:	S08468		
2 FPAS 歌华 signal		FW Version: V01.00.06							Refresh
3 FPAS QAM signal									
4 RFSW A-77CH B哥	华	Configuration	on ——						
5 RFSW A-2.0 B-3.0		Alarm Cont	rol Enable	e 🔻 Mo	dule Alias				Submit
6 FT3S-D-10		- Alarm Setti	nas —						170
	QAM	Hum Sett	ingo					10000	4
		Parameter		Current Value	HiHi	Hi	Lo	Lolo	Deadband
9 OPSW 1-1550 2-13	310	Temperatu	re(°C)	32.7	2 70.0	€ 65.0	0.0	✓ -5.0	2.0
10 RRAS-Q 2-2.0 3-3	3.0	-12V Input	Voltage(V)	12.1	☑ 13.5		-	10.5	0.2
11 RT5S-D 1-2.0 2-3	.0	-5∨ Input \	/oltage(V)	4.9		-		☑ 4.4	0.1
	0.0								Submit
13 RRAS-Q 2-2.0 3-3	3.0	Commende							
14 FRAS-S		Commands	den en s		-	and the second second			
Port		Factory Def	aults:	Apply	Warning: Ap	plying factory defau	its will erase all con tule will report after	figuration and	ut.
15 RFSW					values.	ry deladits. The mot	adie will reboot alter	applying delad	
		Reboot	Reboot: Apply Warning: Rebooting the module will take approx. 20 seconds.						
PS1								nanne fol ^r ni Grae	
PS2									

Figure 6-4 Reboot webpage

6.4 Alarms monitoring

The module has detailed alarm monitoring for temperature levels, optical power input and RF output signal. All the module alarms are shown on the alarm page. If an alarm occurs, the operator can view the associated pages to find more detailed alarm information.

6.4.1 Alarm status pages

Click the **'Alarms'** tab on the top menu bar to display an overview of the alarm status for all the installed modules as shown in Figure 6-5.

Working status alarm

Normal operation: Green Major alarm: Red

System Mo	dules Alarms	Logs Upgrade			
All Modules	Slot	Module Type	Alarm Status		
0 ASMM-A	0	ASMM-A	•		
1 FPAS 77CH analog	1	FPAS-S			
2 FPAS 歌华 signal	2	FPAS-S	•		
3 FPAS OAM signal	3	FPAS-S			
	4	RFSW	•		
4 RFSW A-77CH B部/平	5	RFSW			
5 RFSW A-2.0 B-3.0	6	FT3S-D-10			
6 FT3S-D-10	7	FT5S-D-10			
7 FT5S-D 1-CMTS 2-QAM	8	EDFA-1-15-G			
8 EDFA-1-15-G	9	OPSW			
	10	RRAS-Q			
9 OPSW 1-1550 2-1310	11	RT5S-D-10	•		
10 RRAS-Q 2-2.0 3-3.0	12	RPAS-D			
11 RT5S-D 1-2.0 2-3.0	13	RRAS-Q			
12 RPAS-D 1-2 0 2-3 0	14	FRAS-S			
42 0040 00 2 0 0 2 0 0	15	RFSW			
13 KRAS-Q 2-2.0 3-3.0	16	FT5E-S-10	•		
14 FRAS-S	PS1				
15 RFSW	PS2	PS			
16 FT5E-S-10	FAN	FAN-A	•		
PS1			Refresh		
PS2					
FAN					

Figure 6-5 Alarm status page

6.4.2 Module operating voltage and temperature alarm

Click on the corresponding module, as shown in Figure 6-6, to view the module alarm information. After clicking on the FRAS in **'Modules'** tab, the operator can view the module temperature and power supply voltage alarms. The operator can view the status indicators to check if the module is functioning properly.

The status has three conditions:

Normal: Green Minor alarm: Amber Major alarm: Red

	System	Modules	Ala	ms	Logs	Upgrade						
All M	odules		Slot1	4 FRA	S-S Alarm Statu	us						
0 ASI	MM-A		No. Alarm Type		Current Value	HiHi	Hi	Lo	LoLo	Deadband	Status	
1 FP/	AS 77CH analog	1	1	Temp	erature(°C)	32.4	70.0	65.0	0.0	-5.0	2.0	
2 FPA	AS歌华 signal		2 +12V Input Voltage(V)) 12.1	13.5			10.5	0.2		
3 FPA	AS QAM signal		3	+5V Ir	nput Voltage(V)	4.9	6.0		-	4.4	0.1	
4 RFS	SW A-77CH B哥	烨										Refresh
5 RFS	SW A-2.0 B-3.0											
6 FT3	S-D-10											
7 F15	5S-D 1-CMTS 2-	QAM										
8 ED												
9 OP		10										
10 RI	RAS-Q 2-2.0 3-3	3.0										
11 R	T5S-D 1-2.0 2-3	.0										
12 R	PAS-D 1-2.0 2-3	.0										
13 R	RAS-Q 2-2.0 3-3	1.0										
14 FF	RAS-S											
P												
15 RI												
16 FT												
PS1												
PS2												
FAN												

Figure 6-6 Module alarm status

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

6.4.3 Module Port Alarms

Click on the Module's **'Port'** label on the right column, as shown in Figure 6-7. The module's optical input status, RF output power status, input status and AGC status can be viewed from this page.

System Modules	Alar	ms Logs	Upgrade						
All Modules	- Slot1	4 FRAS-S Port 1 A	larm Status ——						
0 ASMM-A	No.	Alarm Type	Current Va	lue HiHi	Hi	Lo	LoLo	Deadband	Status
1 FPAS 77CH analog	1	Input Power(dBm)	-4.2	3.0	2.5	-5.5	-8.0	0.2	۲
2 FPAS 歌华 signal	2	RF Output Power(dBµV) 103.4	127.7	123.7	108.7	103.7	0.5	
3 FPAS QAM signal	3	Input Status	Normal	-	-		-		
4 RFSW A-77CH B-歌华	4 AGC Status		Normai	-	-	-	-	-	
5 RFSW A-2.0 B-3.0									Refresh
6 FT3S-D-10									
7 FT5S-D 1-CMTS 2-QAM									
8 EDFA-1-15-G									
9 OPSW 1-1550 2-1310									
10 RRAS-Q 2-2.0 3-3.0									
11 RT5S-D 1-2.0 2-3.0									
12 RPAS-D 1-2.0 2-3.0									
13 RRAS-Q 2-2.0 3-3.0									
14 FRAS-S									
Port									
15 RFSW									
16 FT5E-S-10									
PS1									
PS2									
FAN									

Figure 6-7 Module port alarms page

6.4.4 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, the temperature and voltage alarms are enabled. The check box \square as shown in Figure 6-8, toggles the alarms. When the check box is checked, (detection ON), the associated alarm is enabled, the text in the textbox are always grey and cannot be changed. The default alarm parameters are shown in Figure 6-8, Table 6-4 below.

Table 6-4 modules page alarms threshold parameters instruction

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

System	Modules	Alarms	Logs	Upgrade					
All Modules		Module Info	rmation —						
		Model:	3	A-FRAS-S-S-1G		Serial No:	15058240		
1 FPAS 77CH analog	6	HW Assemi	oly No:	A05121_0		FW Part No:	S08468		
2 FPAS 歌华 signal		FW Version	: 2	V01.00.06					Refresh
3 FPAS QAM signal		Configuratio							
4 RFSW A-77CH B-哥	(华	Configuration	on —						57
5 RFSW A-2.0 B-3.0		Alarm Cont	rol Enable	e ▼ Moo	dule Alias	1			Submit
6 FT3S-D-10		Alarm Setti	ngs						
7 FT5S-D 1-CMTS 2-	QAM			ne constant	1.175020		10000	100.0000	and the second
8 EDFA-1-15-G		Parameter		Current Value	HiHi	Hi	Lo	LoLo	Deadband
9 OPSW 1-1550 2-13	10	Temperatu	re(°C)	32.4	☑ 70.0	65.0	0.0	Image: Section 2.0	2.0
10 RRAS-Q 2-2.0 3-3	.0	+12V Input	Voltage(V)	12.1	13.5			10.5	0.2
11 RT5S-D 1-2.0 2-3.	0	+5V Input V	′oltage(V)	4.9				4 .4	0.1
12 RPAS-D 1-2.0 2-3	.0								Submit
13 RRAS-Q 2-2.0 3-3	0	Commande							
14 FRAS-S	I	Commands			Marging, Ap.	shipp fostory dafayılı		fourties and	
Port		Factory Den	iuns.	Apply	restore factor	v defaults. The mod	ule will reboot afte	niguration and r applying defau	It
15 RFSW					values.				
		Reboot:		Apply	Warning: Re	booting the module	will take approx. 20	D seconds.	
PS1			ŝ						
PS2									

Figure 6-8 alarm configuration

6.4.5 Input/output status monitoring

To setup Input/output status monitoring, select the associated module's **'Port'** page from the left column. The monitoring parameters are listed under **'Alarm Settings'**, click the check box 🗹 to toggle the various parameters. The monitoring thresholds can be changed. See Figure 6-9.

Table 6-5 port page alarms threshold parameters instruction

Parameter	Units	Critical high (HIHI)	Warning high (HI)	Normal	Warning Iow (LO)	Critical low (LOLO)	Deadband	Threshold changeable by user	Default Alarm Enable
Optical input power	dBm	3	2.5	-	-5.5	-8	0.2	Y	ON
RF output power	dBuV	127.7	123.7	-	108.7	103.7	0.5	Y	ON

System Modules	Alarms Lo	gs Upgrade					
All Modules	Port Information -						1
0 ASMM-A	Slot 14	Module Type: FRAS-S	Port: 1				Refresh
1 FPAS 77CH analog			(WORK)				
2 FPAS 歌华 signal	- Status	-			700 B.S		
3 FPAS QAM signal	Optical Input Statu	s: 🕘 AGC Stati	is: 🔵 🛛 AG	C Reference: 85	6dBµV		
4 RFSW A-77CH B 歌华	Configuration —						
5 RFSW A-2.0 B-3.0	Input WaveLength	1310.00 ▼ nm	Ou	tput Gain Type	IGC 🔻		
6 FT3S-D-10	Output Gain Contr	ol 15.0 (0.0-2		pe Control	0 (0.0	-7.0)dB	Submit
7 FT5S-D 1-CMTS 2-QAM				· · · · · · · · · · · · · · · · · · ·			Subinit
8 EDFA-1-15-G	Alarm Settings —						
9 OPSW 1-1550 2-1310	Input Status Alarm	enableMajor 🔻	AGC Status Alar	m enableMajor	•		
10 RRAS-Q 2-2.0 3-3.0	Parameter	Current Value	HiHi	Hi	Lo	LoLo	Deadband
11 RT5S-D 1-2.0 2-3.0	Optical Input Pow	er(dBm) -4.2	30	25	2 -55	✓ -8.0	0.2
12 RPAS-D 1-2.0 2-3.0	RF Output Power(dBuV) 103.3	127 7	1237	108 7	103 7	0.5
13 RRAS-Q 2-2.0 3-3.0			1-1-1-1-1-2		11-11-0-11	1 - 100.1	Submit
14 FRAS-S							Submit
Port							
15 RFSW							
16 FT5E-S-10							
PS1							
PS2							
FAN							

Figure 6-9 input/output status monitoring

Table 6-6 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	Module power-on Ppocess	All	Green slowly flashes
No alarm	Normal operation	Normal	All	Green
AM-critical-ALM	Critical alarm	Module status major alarm	STAT	Red
AM-minor-ALM	Warning alarm	Module status minor alarm	STAT	Orange
RX-critical-ALM	Input optical power major alarm	Input optical power too high/too low	STAT OPT IN	Red
RX-minor-ALM	Input optical power minor alarm	Input optical power slightly too low/too low	STAT OPT IN	Orange

6.5 Logs management

The operator can view all the alarms of the modules in the chassis on the Logs Management page. Click **'Logs'** on the top menu to enter the Logs Management page. See Figure 6-10.

System Module			A	larms	Log	js Upgrad	le			
All Lo	ogs		No.	Slot	Port	Туре	Alarm Value	State	Time	Content
			1	14	1	Input Status	Normal	Normal	2016-05-19 16:42:54	Optical Input Status Alarm
			2	14	1	Input Power	-4.3dBm	Normal	2016-05-19 16:42:54	Optical Input Power Alarm
-			3	15	в	Input Status	Fault	Critical	2016-05-19 16:42:48	RFSW Input Status Alarm
-			4	15	В	Input Level	82.2dBµV	LoLo	2016-05-19 16:42:48	RFSW RF Input Level Alarm
2			5	15	A	Input Status	Fault	Critical	2016-05-19 16:42:48	RFSW Input Status Alarm
				15	A	Input Level	82.8dBµV	LoLo	2016-05-19 16:42:48	RFSW RF Input Level Alarm
			7	15	<u></u>	Both Path Input Status	Fault	Critical	2016-05-19 16:42:47	RFSW BothInput Status Alarm
			8	15		Output Power	81.0dBµV	LoLo	2016-05-19 16:42:47	RFSW RF Output Power Alarm
-			9	14	1	Output Power	85.2dBµV	LoLo	2016-05-19 16:42:47	RF Output Power Alarm
			10	14	1	Input Status	Fault	Critical	2016-05-19 16:42:47	Optical Input Status Alarm
			1	otal Pagi	es: 9 (Current Page: 1	First Page	Page Up	Page Down Last Page	Goto: 1 Delete All

Figure 6-10 logs webpage

6.6 Device upgrade

You can upgrade the FRAS's firmware by performing the following steps:

- Click the **'Upgrade'** tab on the top menu bar
- On the left column, click the corresponding 'FRAS' that needs to be upgraded
- Click 'Choose File' button and navigate to the new firmware file
- Select the file and then click the **'Start Upgrade'** button. After the firmware has been upgraded, the FRAS module will reset and a message will appear confirming the upgrade process has been completed.
- For FBCM upgrade, open the web as below, click **'Choose File'** button at upgrade FBCM in slot x and navigate to the firmware file
- Select the file and then click the 'Start Upgrade' button. After the firmware has been upgraded, the FBCM module will reset and a message will appear confirming the upgrade process has been completed. The reset will take approx. 3.5 minutes.

System	Modules	Alarms	Logs	Upgrade	
All Modules		Upgrade FR	AS-S in slot		
0 ASMM-A			-	-	Warning: File will be uploaded, then module will reset, takes approx. 30
1 RFSW		Select File	Choose File	No file chosen	seconds. Service will not be interrupted during upgrade. Please do NOT
2 FT3S-12			Start Unora	de	power on.
3 FRAS-S-M			otart opgra		
4 RRAS-Q-M		Unana da EE	CM in alat 2		
5		- opgrade FB	CM IN SIGUS-		
6 FRAS-S		Select File	Choose File	No file chosen	Warning: File will be uploaded, then submodule will reset, takes approx.
7		Concernie	Onoose The	I to me chosen	NOT power off.
8			Start Upgra	de	
9			7		
10					
11					
12					
13 RFSW					
14					
15					
16					
PS1					
PS2					

Figure 6-11 FRAS-S-M upgrade webpage

- * The upgrade file needs to be located on a PC that is connected to ASMM
- * The web GUI above only supports the manual operation from a local PC.
- * The FRAS supports automated firmware updates and automatic backup and restore features via TFTP when managed via the NMSE management software. Please refer to the NMSE product user manual for more information.

CAUTION!

Module will be upgraded after the firmware is uploaded. The upgrading and reboot process will take about 30s. During the upgrading, please don't power off the device and don't plug any module in the same chassis, or it may lead to upgrade fail or data sync error.

6.7 FBC Function Description (Only for FRAS-S-M)

With the optional embedded Full Band Capture (FBC) module, it enables the operator to capture and monitor the spectrum and QAM demodulation data, including level of each channel, SNR, MER, BER, constellation and so on. Operators can get the metric of each QAM channel remotely.

Via the AIMA3000 configuration system interface, click the top left **'system'**, you can see the FBC function includes three parts: Spectrum, QAM Analyzer and Constellation

6.7.1 Spectrum

Click **'spectrum'** on the left, open the spectrum interface, as Figure below.

Figure 6-12 FRAS-S-M spectrum webpage

Spectrum includes three parts: 'Spectrum', 'Select Channel' and 'Spectrum Configuration'.

For Select Channel, the items and buttons are shown as below:

- Slot means choose the slot number in the chassis, '**Port'** means choose the port number that you need to see the spectrum of the module.
- For Spectrum Configuration, the parameters and buttons are shown as below:
- Start Freq: Set the start frequency of spectrum, range is 45 1000 MHz.
- Stop Freq: Set the stop frequency of spectrum, range is 45 1000 MHz.
- Center Freq and Span: Set the center frequency and span, the center frequency is shown at the center of spectrum.
- Reference: Set the reference level of the spectrum based on the fact. And the spectrum peak need lower than the reference level so that the spectrum can be fully shown in the spectrum. The range is 10 100 dBuV.
- Scale/Div: Range is 1 10 dB.
- RBW/VBW: Auto adaptable.
- Marker1/Marker2: Two Markers can be shown in the spectrum. Set the marker frequency, the level of the marker can be shown in the spectrum. The red solid ball is the maximum level captured in realtime.
- Start: Stick 'Start' button to start capture spectrum.
- Stop: Stick 'Stop' button to stop capture spectrum.
- Choose Max/Min, and then stick 'Start' button, 3 Spectrum Lines 3, including live, max hold and min hold curves will be shown in the spectrum.
- Clear Max/Min: Clear the maximum hold and the minimum hold.

6.7.2 QAM analyser

Click 'QAM Analyser' on the left, open the QAM Analyser interface, as figure 6 - 13 below.

Figure 6 - 13 FRAS-S-M QAM analyser webpage

Product user manual AIMA-FRAS

- QAM Analyser includes a column chart, Select Channel, QAM Setting, QAM List, Restore and Backup.
- The column chart contains QAM Power, QAM SNR, QAM MER, QAM BER-Pre, BER-Post. Different column chart will be displayed after click the different items.
- For 'Select Channel', the items and buttons are shown as below:
- Slot means choose the slot number in the chassis, **'Port'** means choose the port number that you need to see the QAM column chart of the module.
- For QAM setting, the parameters and buttons are shown as below:
- Start Freq/Stop: Set the start center frequency and stop center frequency of QAM, the range is 45 1000 MHz.
- Symbol Rate: Set QAM symbol rate, the symbol rate should be the same as the QAM signal source.
- Annex: Annex A/Annex B. Annex A is European standard, Annex B American Standard. Annex should be the same as the QAM signal source.
- Modulation: Set modulation mode, 64 QAM and 256 QAM is optional.
- Stick 'Add' after set, the channel set is shown in QAM List. If the channels are not continuous, more than one segment can be added. Please note the later frequency should be higher at least 7 MHz than the current stop frequency. Stick 'Start' or refresh the web to see the column chart.
- The frequency value of each segment are displayed by a '+' button, and hidden by a '-' button.

Total:39								
Segment 1(size=2):	387.0~395.0 MHz	6.875 MS/s	AnnexA	QAM64	+		Delete	
Segment 2(size=3):	427.0~443.0 MHz	6.875 MS/s	AnnexA	QAM64	+	-	Delete	
Segment 3(size=10):	546.0~618.0 MHz	6.875 MS/s	AnnexA	QAM64	+	-	Delete	
Segment 4(size=6):	674.0~714.0 MHz	6.875 MS/s	AnnexA	QAM64	+	-	Delete	
Segment 5(size=9):	802.0~866.0 MHz	6.875 MS/s	AnnexA	QAM64	+	-	Delete	
Restore								Clear
QAM List File	Cho	ose File No file	e chosen		Rest	ore (Configuration	
Backup								
AM List Backup	Dov	vnload Configur	ation					

Figure 6 - 15 QAM list webpage

- Restore: Click 'Choose File' to find the directory where the profile is located, and then click 'Restore Configuration', you can restore the configuration.
- Backup: Click **'Download Configuration'** to download the current channel configuration.

6.7.3 Constellation

Click **'Constellation'** on the left, open the Constellation webpage as Figure 6-16 below. **'Constellation'** includes QAM Constellation, Select Channel, Cons Setting and QAM Result.

Choose the slot number and port number that you want to see the constellation of the module. Set the center frequency, symbol rate, annex and modulation mode and then stick **'Start'** button, you can see the locked constellation result. The points are increased and it will count again via sticking **'Start'** or refresh the web.

The QAM results show the RF level, SNR, MER, Pre-BER and Post-BER results.

System	Modules	Alarms	Log	js 🛛	Upgr	ade	1					
System Information				QAI	M Cons	tellati	on					
Network Configuratio	on											
SNMP Configuration				٠	*	•			*			
TFTP Server					-							
Syslog Server		. *	*		*	*	*	*	*			
User Management			10		-	-						
Date and Time			*	•	•	*		•				
				-								
Backup and Restore			192				1		1			
Reboot									~			
Additional Function			8		-	19						
							- 4					
QAM Analyzer												
Constellation			*	٠		•			-			
		1245							120			
			•		1							
		Slot 3	inel	Port	1 •							
		Freq 395. Annex Anr	0 (4 nexA ▼	45-100]	00)MHz	5	Symbol Aodulat	Rate 6. ion C	875 AM64	MS/s		Start Stop
		-QAM Result Power: 82.7	2dBµV		SNR: 3	9.5dB		MER: 3	8.7dB	Pre_BER: 1.0e-9	Post_BER: 1.0e-9	

Figure 6 - 16 constellation webpage

FBCM module factory defaults and reboot.

Factory default settings and Reboot can be operated from the main FRAS-S-M page FBCM commands.

You can apply the factory default configuration and reboot the FBCM module by clicking the associated **'Apply'** button.

System	Modules	Alarms Logs	Upgrade					
All Modules		Module Information -						
0 ASMM-A		Model:	A-FRAS-S-M-S-1	2	Serial No:	20161200	5	
1 RFSW		HW Assembly No:	S10691_1.0/ A1.	2	FW Part No:	S08468/S	10690	
2 FT3S-12		FW Version:	√01.00.07a/√00.	00.01i				Refresh
3 FRAS-S-M				10231				
Port		Configuration						
4 RRAS-Q-M		Alarm Control Enable	Mod	ule Alias				Submit
5		- Alarm Settings						
		Alum Settings	NAME OF COMPANY	And and a second se	in war.	1.4	- Cross	from the sector of
7		Parameter	Current Value	HiHi	Hi	Lo	LoLo	Deadband
8		Temperature(°C)	32.7	70.0	€ 65.0	0.0	✓ -5.0	2.0
9		+12V Input Voltage(V)	11.9	13.5	-		☑ 10.5	0.2
10		+5V Input Voltage(V)	5.1		-		€ 4.4	0.1
11								Submit
12		Commanda						
14		Factory Defaults:	Apply	Warning: Ap	plying factory default	ts will erase all co lule will report aft	ontiguration and	lt.
15				values.	ry deladity. The moe	icie win reboot an	ter apprying delad	
16		Reboot:	Apply	Warning: Re	booting the module	will take approx.	20 seconds.	
PS1								
		FBCM Commands -		100 St. 10		2 41 1000		
FAN		Factory Defaults:	Apply	Warning: Ap restore facto values.	plying factory defaul ry defaults. The mod	ts will erase all co Iule will reboot aft	onfiguration and ter applying defau	It
		Reboot:	Apply	Warning: Re	booting the module	will take approx.	20 seconds.	

Figure 6 - 17 FBCM factory defaults and reboot webpage

Factory Defaults: After pressing 'Apply', you will be prompted 'Are you sure you want to do Factory Defaults?' press 'Yes', it will clear the spectrum configuration of FBCM and restore factory defaults. It will reboot FBCM after restoring factory defaults.

Reboot: Only reboot the FBCM module.

Additional instructions:

If there are multiple FRAS-S-M modules, the FBC port discovery time will be longer.

Refreshing each spectrum port needs two seconds. If there are multiple spectrum ports enabled, each port will be refreshed in turn, so the refreshing time will be longer. If you want to see the spectrum quickly, please disable the spectrum ports that you don't want to see.

If more than one user has access to the webpage, it may make the spectrum capture incomplete, Please press the **'start'** button if you see the incomplete spectrum.

When using the FBC function, it recommended that the RF output power of the main port is no less than 90 dBuV/ch.

6.8 Redundancy configuration and alarms (for FRAR only)

Click on **'Modules'** → **'FRAR-S'**(the module name), the port numbers and **'Redundancy'** button will appear. The port configuration pages and alarm pages are completely same to FRAS.

System Modules	Alarms Logs Upgrade								
All Modules	Redundancy Information								
D ASMM-A	Slot: 3 Module Type: FRAR-S Refresh								
1	Peer IP Address: Invalid IP Address Peer Slot: Invalid Slot Peer Serial No: N/A								
2									
3 FRAR-S	Unit Redundancy Status								
Port	Redundancy Alarm: 🧶 Redundancy Status: Redundancy Cable Not Installed								
Redundancy	- Unit Redundancy Configuration								
4									
5	Redundancy Enable Enable Work Mode								
6	Revert Enable Vait To Restore Time 10 (0-100)Sec								
7	Redundancy Alarm enableMinor Submit								
8 FT3S-S	- Dort Padundancy Information								
9	- Por recondancy information								
10 FT3S-D-10	Port Status Status Status Enable Switch Control Local Status Configuration								
11	1 Working 🔶 🔶 Enable 🔨 Local 🔻 enableMinor 🔻 enableMinor								
12	Submit								
13 EDFA-1-17-G									
14 FT5S-S									
15									
16 FRXV									
PS1									
PS2									
FAN									

Figure 6 - 18 FRAR Redundancy webpage

- Click on **'Redundancy'** on the left, the redundancy configuration page will appear.
- In the box of 'Redundancy Information', you can check not only the local module's slot number and module type, but also the peer module's IP address, slot number and serial number.
- In 'Unit Redundancy Status' box, 'Redundancy Alarm' indicator and 'Redundancy Status' show the module's redundancy status.
- You can configure the module's redundancy in the box 'Unit Redundancy Configuration':
- **(Redundancy Enable'** is for enabling or disabling the function of redundancy of this module;
- 'Work Mode' is for setting this module to work in primary or secondary mode;
- (Revert Enable' is for setting whether or not the primary path will be reconnected when its signal becomes normal.
- 'Wait to Resore Time' is the revert delay of the primary path when it becomes normal.
- **(Redundancy Alarm'** is for setting the alarm level as major, minor or disabled.
- In the box of 'Port Redundancy Information', you can enable or disable each port's redundancy, set their local status alarm level and configure the alarm level individually.
- Please click on 'Submit' to save your configurations whenever you make changes to the settings.

Click on **'Alarms'** → **'FRAR-S'**(the module name) → **'Redundancy'**, the redundancy alarm page will appear. In this page, you can see the redundancy alarm status of the module, and each port's local status and configuration status. Click on 'Refresh' to update the current alarm status.

System	Modules	Alan	ms Log	S	Upgrade						
All Modules	<u>г</u>	Slot 3	FRAR-S Redu	Indanc	y <mark>Alarm Status</mark> –						
		Peer	IP Address: Inv	s: Invalid IP Address		Peer Slot: Invalid Slot		Peer Serial No: N/A			
1		No.	Alarm Type		Current Value	HiHi	Hi	Lo	LoLo	Deadband	Status
2		1	Redundancy	Alarm	Fault	-		-		<u>.</u>	
3 FRAR-S		2	Port1 Local S	tatus	Normal	-		774	-	77 4	
Port		3	Port1 Configu Status	ration	Normal						
Redundancy			oundo		1	<u> (</u>			L	-	Defeet
4											Refresh
5											
6											
7											
8 FT3S-S											
9											
10 FT3S-D-10											
11											
12											
14 FT5S-S											
15											
PS1											
PS2											

Figure 6-19 FRAR redundancy alarm webpage

7 Troubleshooting

7.1 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 light status	Common faults	Troubleshooting		
Input optical port status is orange	Input port optical power slightly low	Clean the optical port and fiber end, measure the input optical power to ensure that the input optical power is within the normal range; If this fault still exists when the input optical power is normal, contact Technetix Technical Support Staff.		
Input optical port status is red	Input port optical power too high/too low	Measure the input optical power to ensure that the input optical power is within the normal range. If this fault still exists when the input optical power is normal, contact Technetix Technical Support Staff.		
	Input optical power abnormal	Bias current abnormal, contact Technetix Technical Support Staff.		
	Power failure			
STAT is Red		Contact Technetix Technical Support Staff.		
	Temperature too high	Reduce the room temperature. If the room temperature is normal, contact Technetix Technical Support Staff.		

