MICROSENS

FlexRate Muxponder (MS430943/4M) - Quick Start Manual

Module presentation

MS430943/4M family is a one slot wide FlexRate (100G/200G) module with the following characteristics:

- Two configurable 100 Gigabit Ethernet / OTU4 client port interfaces
- Two operational modes:
  - 200G Metro Reach (MR) Transponder
  - 100G Ultra Long Haul (ULH) Transponder
- FlexRate 200G Muxponder family is composed of 2 versions:
  - Dual Fiber (MS430943M)
  - Single Fiber (MS430944M)
- QSFP28 modules for client port physical interfacing

Connectors are LC/PC.
The FlexRate client traffic type is 100GbE or OTU4.

STEP 1: plugging & configuration of the module

Insert the FlexRate module
Wait until HW/SW leds on the module are green and stable. (Around 5 min)

Configuration of the module :
1/ In case of new installation: "Restore Default Config"
On Web interface -> Select the module -> Right Click -> Configuration/Start-Up


On CLI -> configure_pm -c 'slot_number'

```
administra@noname(20000)> configure_pm -c 6
This will erase the current configuration and reset the board.
Continue ? (y/N)
```

SAFETY WARNING: By default, the line Tx and all the client ports are "In Service". It means that all Tx are power on.

2/ In case of PM replacement :
On Web interface -> Tic the parameter "Automatic Config Restore" on MGNT/Configuration menu. Wait for the Cold restart and plug the new module.
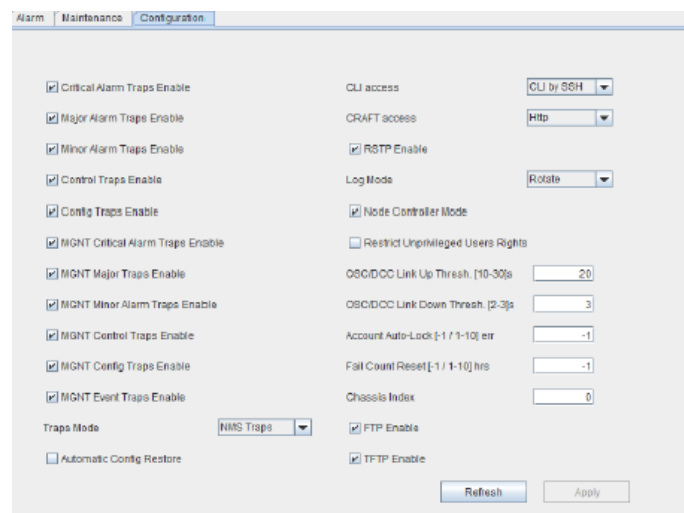
On CLI -> set_mgnt_config

```
20) Traffic Modules conf auto restore (Enable/Disable, current is Enable):
```

Wait for the Cold restart and plug the new module.

STEP 2: Module setup

Optical connection

Connect the module on line and client side with optical patchcords.
- Line side to the MUX module or Compensation Module
- Client side to the respective equipment

WARNING: Line_Tx is emitting by default, so optical power will be received from the far end module.
In order to prevent Rx damage, use LC/PC attenuator to adjust the input power, and be as close as possible of the typical value.

Mode configuration

The FlexRate Muxponder is able to work in 200G-MR or in 100G-ULH bitrate mode. By default, 200G-MR is select. If 100G-ULH mode is required, you need to modify the setting:

On Web interface -> Select the module -> Right Click -> Configuration/Other
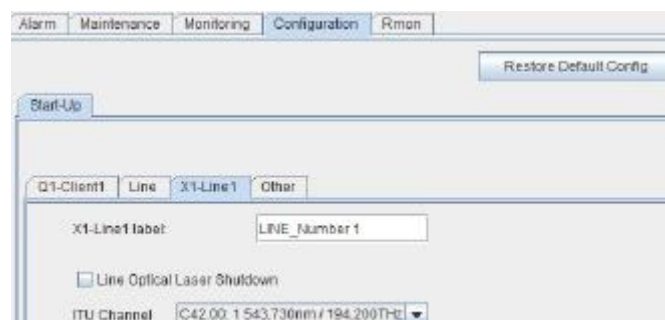

On CLI -> set_config 'slot_number' other

```
administra@7-50(8104)> set_config 4 other
2) Module Mode ; possible values : (100G-ULH,200G-MR), current is 200G-MR
```

After this setting, the module will restart

Wavelength configuration

1/ TX Wavelenght for MS430943M Dual fiber use:

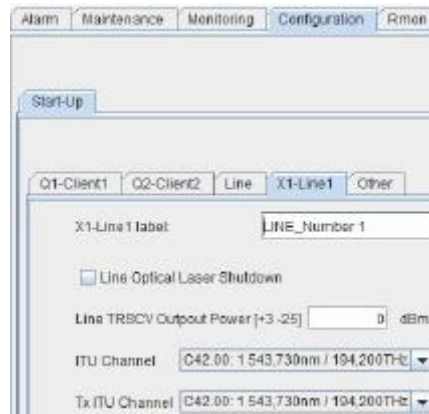On Web interface -> Select the module -> Right Click -> Configuration/X1-Line1

On CLI -> set_config 'slot_number' X1-Line1

```
administra@7-50(8104)> set_config 4 X1-Line1
2) ITU Channel ; possible values : (C13.50 ... C62.00) current is C45.00 / 1 541,349nm / 194,500Thz
```

2/ Tx/Rx Wavelength for MS430944M Single Fiber use:
The MS430944M module has a different wavelength on TX and on Rx line side to allow the single fiber transmission mode.

On Web interface -> Select the module -> Right Click -> Configuration/X1-Line1

On CLI -> set_config 'slot_number' X1-Line1

```
administra@7-50(18232)> set_config 4 X1-Line1
2) ITU Channel ; possible values : (C13.50 ... C62.00) current is C45.00 / 1 541,349nm / 194,500Thz :
3) Tx ITU Channel ; possible values : (C13.50 ... C62.00) current is C45.00 / 1 541,349nm / 194,500Thz :
```

DCC channel configuration (if necessary)
On Web interface -> Select the module -> Right Click -> /Configuration/Start-Up/Line
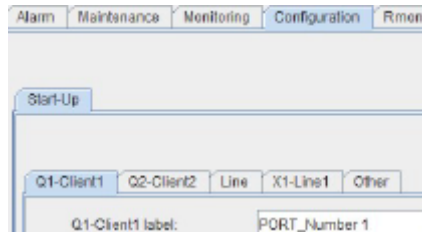

On CLI -> set_config 'slot_number' other

```
administra@IP181(24072)> set_config 3 other
1) DCC Enable ; possible values : (Disable,Enable), current is Disable :
```

Label the Client and the Line ports to make easier their identification
On Web interface -> Select the module -> Right Click -> Configuration/Qi-Client#i (and Configuration/X1-Line1)

On CLI -> set_config 'slot_number' Q1-Client1 (for client1) / set_config 'slot_number' X1-Line1

```
administra@7-50(8104)> set_config 4
Q1-Client1              Q2-Client2              X1-Line1              other
```

For unused client, it is recommended to set the client port(s) "Out Of Service" to not interfere with the management of the port(s) in service.

Client traffic type
Client physical interfacing is done through standard QSFP28 modules. Client traffic type can be set in 100 Gigabit Ethernet or in OTU4.

On Web interface -> Select the Client -> Right Click -> /Configuration/Qi-Client#i
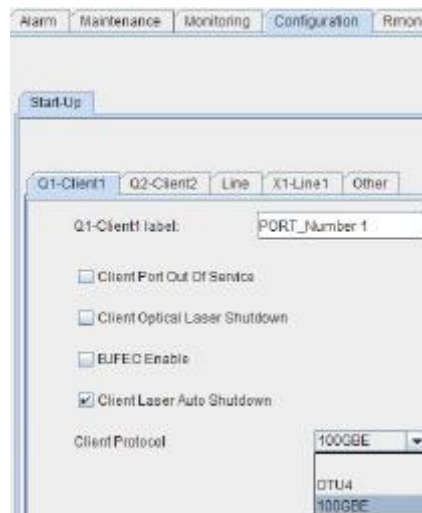
On CLI -> set_config 'slot_number' Q1-Client1 (for client1)

```
administra@7-50(8104)> set_config 4 Q1-Client1
!) Client Protocol ; possible values : (OTU4,100GBE), current is 100GBE :
```

Configuration of the line output power (MS430944M only)
For MS430944M module, the output power of the line can be modulate in the range [-25dBm;+3dBm] -> Default value is 0dBm.

For MS430943M output power value, you can refer to the table in STEP 3.

On Web interface -> Select the Line -> Right Click -> Configuration/X1-Line1

On CLI -> set_config 'slot_number' Q1-Client1 (for client1) / set_config 'slot_number' X1-Line1

```
administra@7-50(8104)> set_config 4 X1-Line1
5) Line Trscv Outpout Power ; possible values : (-25.0 ... 3.0) : current is -5.0 dBm :
```
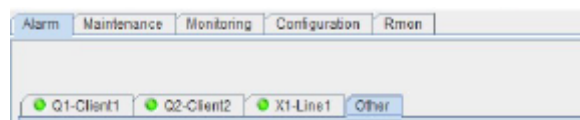
STEP 4: End of installation

Leds status
Verify that all the led are green or unlighted (in case of port Out Of service).

Alarms status
Check that no alarm is present on line side and on each client In Service.

On Web interface -> Select the module -> Right Click -> Alarm (for Qi-Client#i and X1-Line1)

On CLI -> get_alarm 'slot_number' S1-Client1 (for client1 and Line)

```
administra@7-50(18232)> get alarms 4 Q1-Client1
```
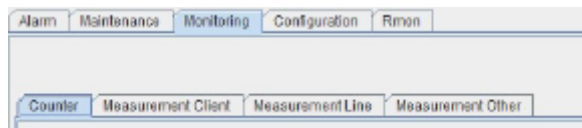
Power Monitoring

Check that input/output power on line side and on each client In Service and verify it is in the correct range.

Adjust the input power if necessary with LC/PC attenuator, in order to be as close as possible of the typical value.

(See following table for module characteristics)

	Tx Pout (dBm)			Rx Sensitivity (dBm)			OSNRmin	OSNR EOL
	Min	Typ	Max	Min	Typ	Max		
MS430943M								
200G-MR	-	0	-	-25	-15	-5	25dB	21dB
				-15	-13	-9	21dB	
100G-ULH	-	0	-	-25	-15	-5	25dB	12.5 dB
				-15	-13	-9	12dB	
MS430944M								
200G-MR	-25	-	3	-25	-15	-5	25dB	21dB
				-15	-13	-9	21dB	
100G-ULH	-25	-	3	-25	-15	-5	25dB	12.5 dB
				-15	-13	-9	21dB	

On Web interface -> Select the module -> Right Click -> Monitoring/Counters (for Qi-Client#i and X1-Line1)
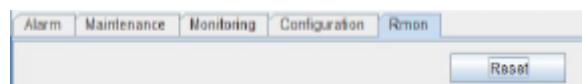

On CLI -> get_measurement 'slot_number' X1-Line1 (for Line)

```
administra@7-50(18232)> get_measurements 4 X1-Line1
```

Remote Network Monitoring (Rmon) on Ethernet client

Open the Monitoring window to display the counters of the Ethernet traffic on each port In Service. Check no error is present.

On web interface -> Select the module -> Right Click -> Rmon (for Qi-Client#i)

On CLI -> get_counters 'slot_number' Q1-Client1 (for client1)

```
administra@7-50(18232)> get_counters 4 Q1-Client1
```

FEC Correction rate
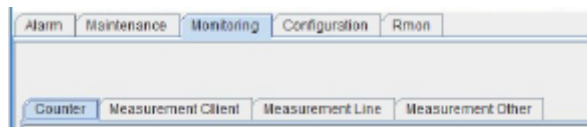Verify on Line side the Pre-SD FEC Errors rate.

1/200G Mode
This should be below <1×10^{-2} to assure a proper transmission without uncorrected errors

2/100G Mode
This should be below <1×10^{-3} to assure a proper transmission without uncorrected errors

On Web interface -> Select the module -> Right Click -> Monitoring/Counter

On CLI -> get_counters 'slot_number' X1-Line1