



10G-TR-2-XFP-SFP

Bidir/dual optical to optical 10Gbps transponder

User manual

Rev. B

A large, solid green circular graphic with a white circular cutout in the center, located in the bottom right corner of the page.

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Revision history

Current revision of this document is the uppermost in the table below.

Rev.	Repl.	Date	Sign	Change description
B	A	2017-08-23	OEH	Multimode SFP+ requires Multimode pigtails
A	-	2016-04-12	OEH	Initial document

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1 Product overview

The 10G-TR-2-XFP-SFP receives, re-clocks and retransmit a bidirectional 10G optical signal (or two unidirectional ones). The product uses one XFP and one SFP+ for optical interfaces and thru those the 10G-TR-2-XFP-SFP supports both 850nm multimode and 13T, CWDM (18 channels) and DWDM (40 channels) single mode, enabling both wavelength and fiber type conversion. Note that for use with multimode SFP+, the pigtail connecting the SFP+ to the backplane needs to be multimode, with gray connectors. The XFP is always single mode, which uses blue connectors. The distance relates to obtainable maximum distance given the correct type of fiber. The module is monitored and controlled over RS422 by Multicon Gyda, enabling SNMP support. The module can also be controlled thru DIP switches on the card, and 4 LEDs will indicate the status of the module.

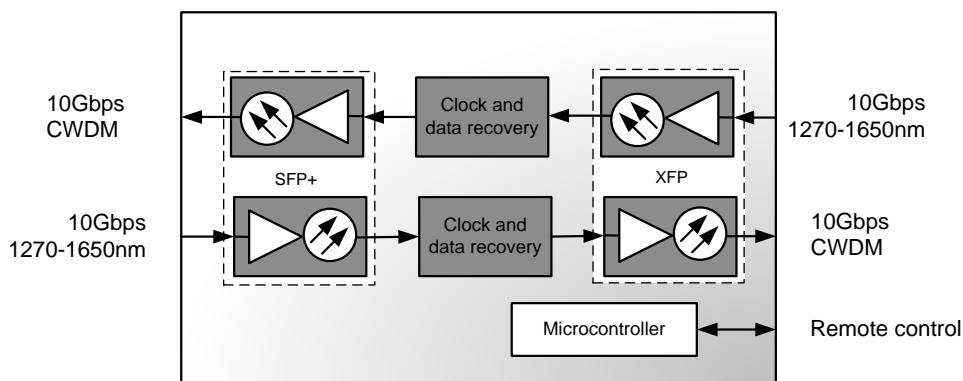


Figure 1: Block diagram of the 10G-TR-2-XFP-SFP

The figure below shows a typical setup for adding 10G switches to an optical Flashlink network. Switches already having CWDM/DWDM wavelengths can be added to a Flashlink network, without the use of the 10G-TR, but the 10G-TR also brings the optical link into the management system of the Flashlink network.

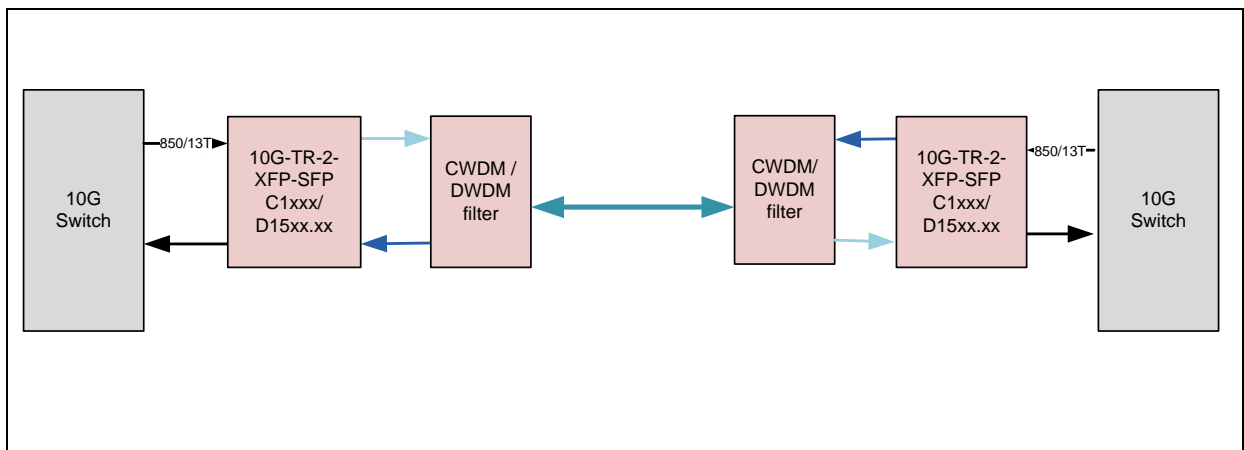


Figure 2: This figure shows a typical setup for wavelength conversion

2 Specifications

2.1 General

Power	+5V DC / 6W, max (worst case with 1.65W SFP+ and 3.5W XFP)
Control	DIP configuration and SNMP monitoring
Temperature range	0 to +40 °C
Optical transport distance	See manual for installed XFP

2.1 SUPPORTED STANDARDS

10GBASE-SR/SW/LR/LW/ER/EW/ZR/ZW 10G Ethernet,
 1200-SM-LL-L 10G Fiber Channel
 SONET OC-192 IR-2
 SDH STM S-64.2b
 SONET OC-192 IR-3
 SDH STM S-64.3b
 ITU-T G.709

2.2 OPTICAL INPUT

Number of inputs	2
Connectors	LC/UPC
Rx Sensitivity	See manual for installed XFP and SFP+
Overload	See manual for installed XFP and SFP+

2.3 OPTICAL OUTPUT

Number of outputs	2
Connector	LC/UPC
Tx optical power	See manual for installed XFP and SFP+

Optical wavelengths	850	850nm (SFP+ only, MM pigtailed needed)
	13T	1310nm
	CWDM	1270-1610nm (18 channels)
	DWDM	1530.33nm - 1561.42nm (40 channels)

3 Configuration

3.1 DIP

The correct configuration can either be set with a DIP switch or with the GYDA Control System. The layout of 10G-TR-2-XFP-SFP is shown in the drawing below with the DIP switch to the upper left position.

Switch #	Label	Function, DIP = ON	Function, DIP = OFF	Comment
1	1	Laser enable	Laser disable	
2	2			n/a
3	3			n/a
4	4			n/a
5	5			n/a
6	6			n/a
7	7			n/a
8	OVR	Override GYDA control. Configuration with DIP switch	GYDA control. Configuration with GYDA	Select configuration from GYDA

All DIP switches are off when pointing towards the release handle.

3.2 Multicon GYDA

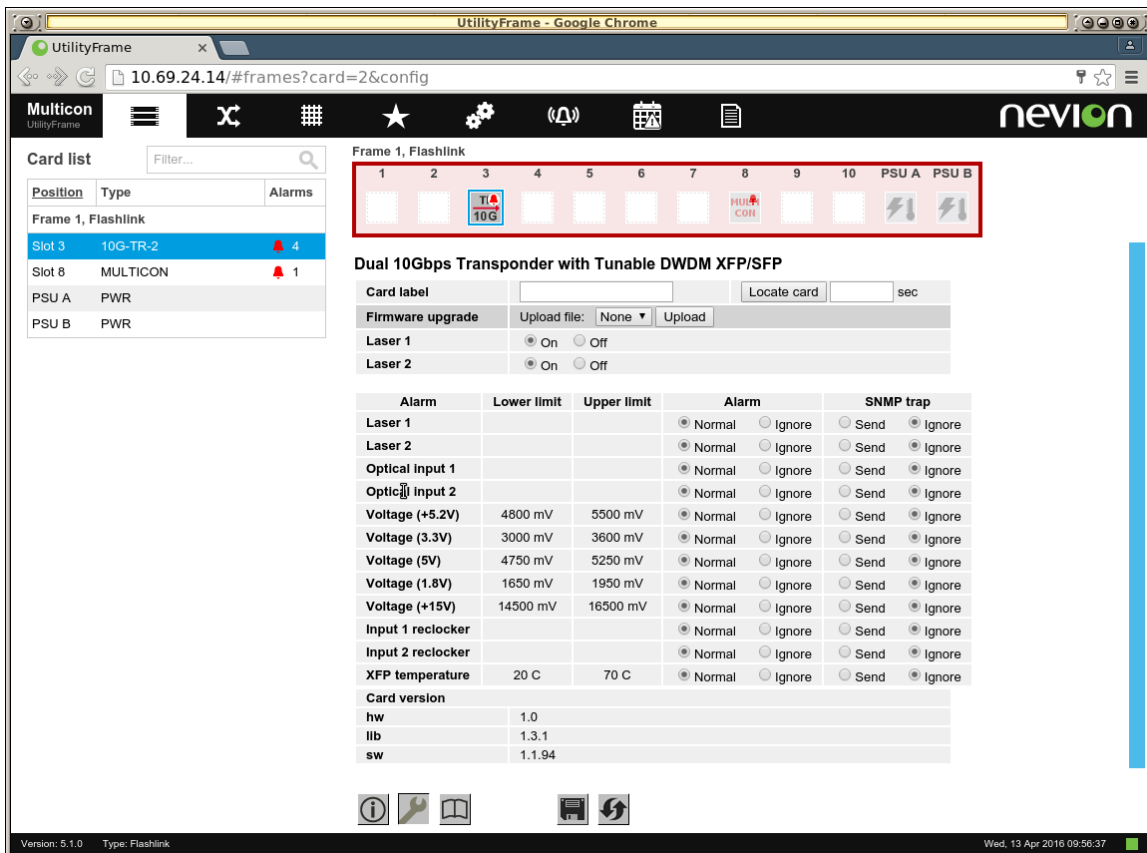


Figure 3: Multicon GYDA System Controller settings (optional)

3.3 Tunable DWDM optics

Tunable DWDM SFP+ or XFP modules need to be configured through Multicons debug terminal. See table below for Nevions DWDM channel plan:

Channel (#)	Center frequency (THz)	Wavelength (nm)
20	192.0	1561.41
21	192.1	1560.61
22	192.2	1559.79
23	192.3	1558.98
24	192.4	1558.17
25	192.5	1557.36
26	192.6	1556.55
27	192.7	1555.75
28	192.8	1554.94
29	192.9	1554.13
30	193.0	1553.33
31	193.1	1552.52
32	193.2	1551.72
33	193.3	1550.92
34	193.4	1550.12
35	193.5	1549.32
36	193.6	1548.51
37	193.7	1547.72
38	193.8	1546.92
39	193.9	1546.12
40	194.0	1545.32
41	194.1	1544.53
42	194.2	1543.73
43	194.3	1542.94
44	194.4	1542.14
45	194.5	1541.35
46	194.6	1540.56
47	194.7	1539.77
48	194.8	1538.98
49	194.9	1538.19
50	195.0	1537.40
51	195.1	1536.61
52	195.2	1535.82
53	195.3	1535.04
54	195.4	1534.25
55	195.5	1533.47
56	195.6	1532.68
57	195.7	1531.90
58	195.8	1531.12
59	195.9	1530.33

Once the correct channel number has been found in column 1, open the Multicon GYDA webpage. Find and click on the card in the frame view. The URL bar of the web browser will show the address, like so (example for frame 1, slot 3): <http://192.168.1.1/#frames?card=2>. See Figure 4.

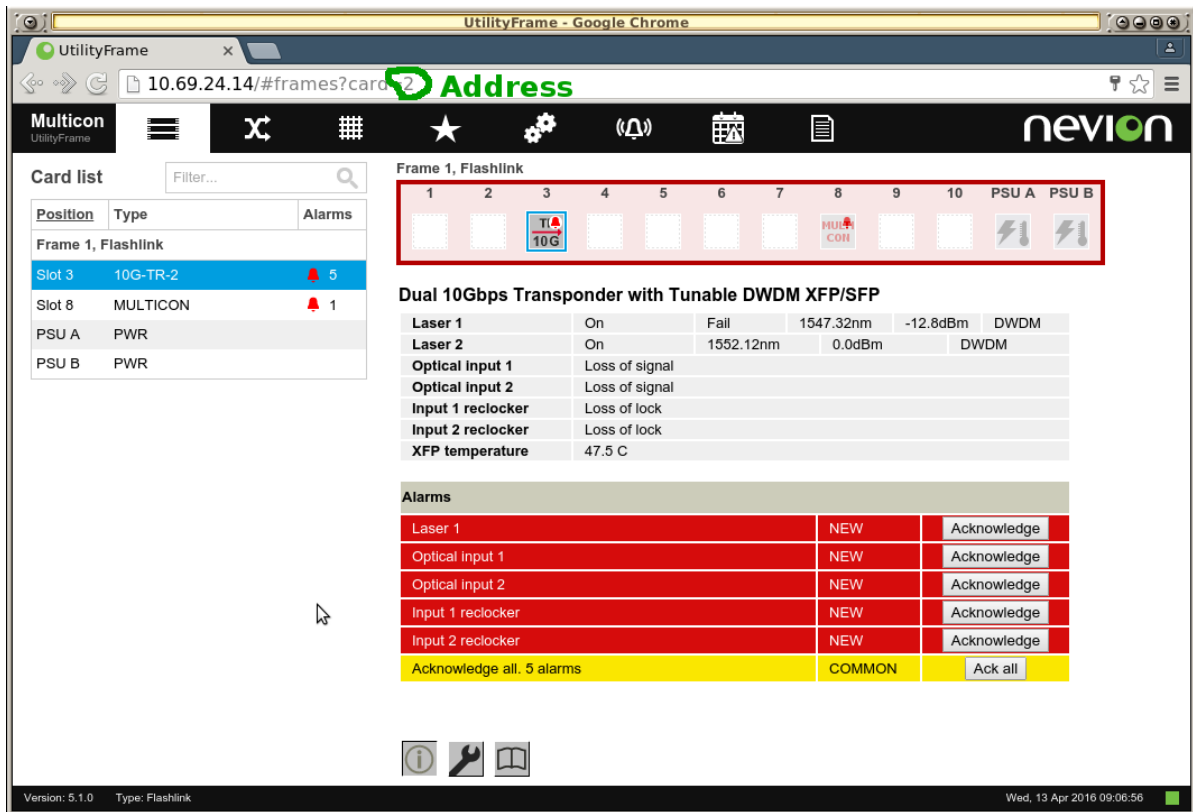


Figure 4. Multicon GUI with card address

Next, open the debug terminal (under the configuration menu, password needed). In the drop-down menu (Item numbered 1 in Figure 5) select “Flashlink RS422 Bus Protocol”. The first input field (numbered 2) is the address of the card, from the previous step (the 2 in the example about will get a 0 prepended by the GUI). The second field is Multicons address, which cannot be changed from here. The third field (numbered 3) is the command.

It’s helpful to run the command “?” first, to verify that we are communicating with the correct card. Here we see the response (minus the address) to this command (numbered 4) as:

```
10G-TR-2-TXFP-TSFP
hw rev 1.0
sw rev 1.1.94
lib rev 1.3.1
protocol ver 4.0
*A49E
```

The example given in Figure 5 sets both the SFP+ and the XFP laser wavelengths to 1561.41nm, which is channel 20, using the following commands:

```
SFP+:
cal sfp ch 20
SFP+ Response:
setting channel number 20.0 (actual 19, 192.0000THz)
lsr 1 on D 1561.42nm 0dBm ok
*E475
```


XFP:

```
cal xfp ch 20
```

XFP response:

```
cal xfp ch 20
```

```
setting channel number 20.0 (actual 7, 192.0000THz)
```

```
lsr 0 on D 1561.42nm 4dBm ok
```

```
*EE45
```

In Figure 5 the wavelengths resulting from these operations have been circled and numbered 5 for SFP+ and 6 for XFP.

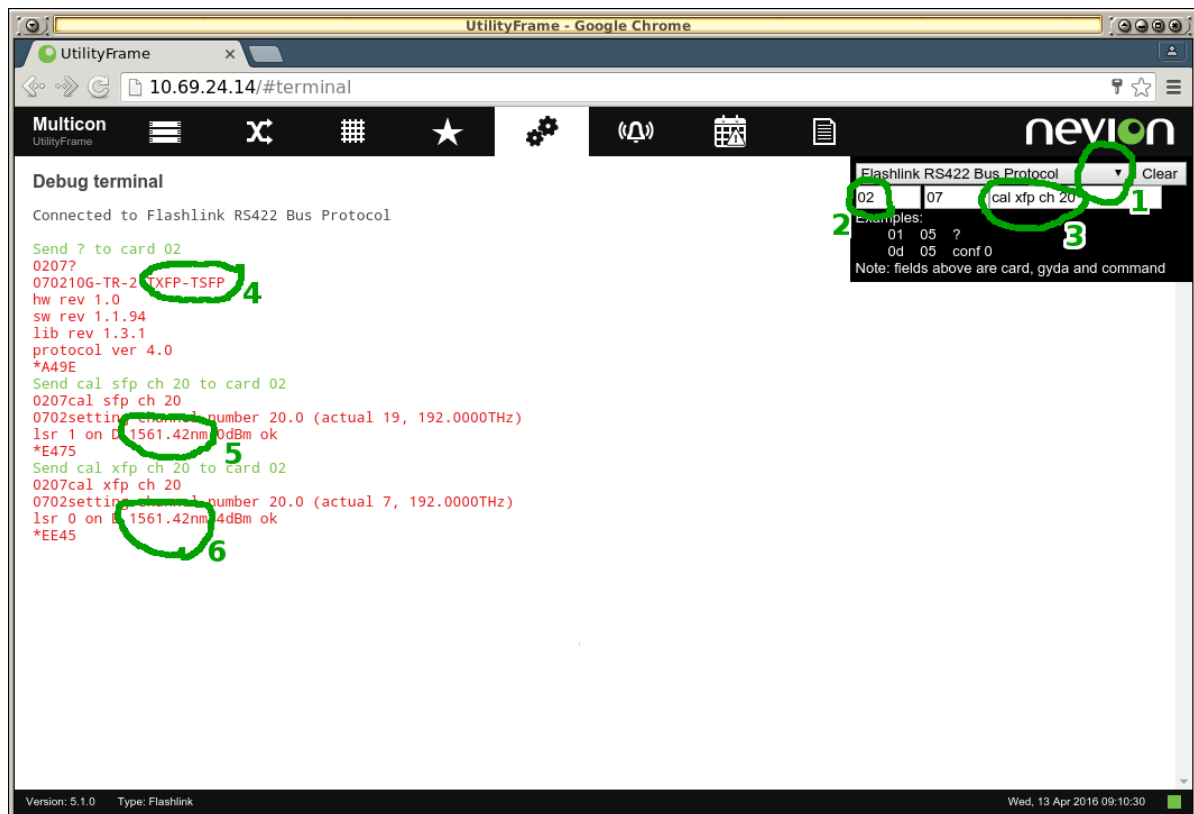


Figure 5: Tuning DWDM from debug terminal

The card can be ordered with given channels pre-configured, for convenience. Contact our sales department about this.

4 Connections

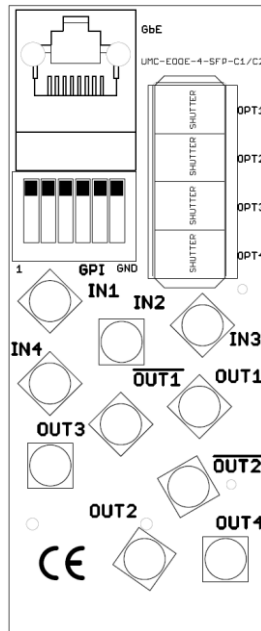


Figure 6: Connector module for 10G-TR

Terminal	Function
OPT1	XFP output
OPT2	XFP input
OPT3	SFP+ output
OPT4	SFP+ input

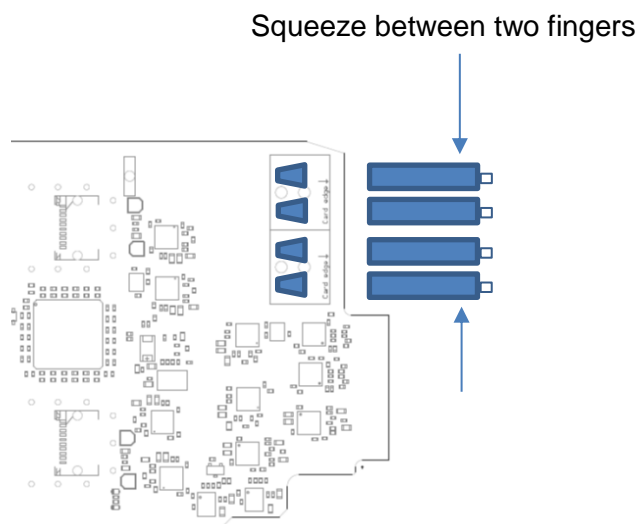


Figure 1. Getting LC connectors into correct position.

If any problems with entering the backplane adapter should occur, the connectors' position should be corrected by the method shown above before a new attempt.

4.1 Mounting the connector module

The details of how the connector module is mounted, is found in the user manual for the sub-rack frame FR-2RU-10-2.

This manual is also available from our web site:

<http://www.nevion.com/>.

5 Operation

The status of the module can be monitored in two ways.

1. Multicon GYDA System Controller (optional).
2. LED's at the front of the sub-rack.

The LED's are mounted on the module itself, whereas the GYDA System Controller is a separate module giving detailed information on the card status.

5.1 Front panel – Status monitoring

The status of the module can be easily monitored visually by the LED's at the front of the module. The LEDs are visible through the front panel as shown in the figure below.

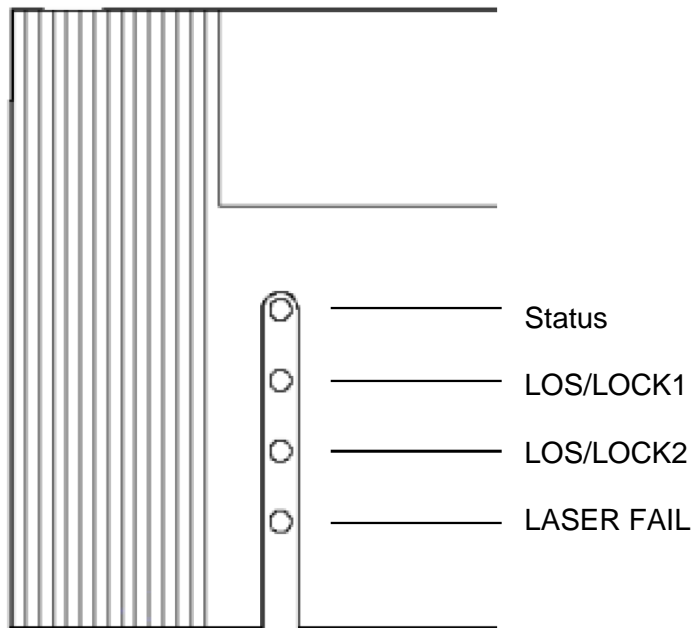


Figure 7: The 10G-TR has 4 LED's each showing a status.

Diode \ State	Red LED	Yellow LED	Green LED	No light
Status	Module is faulty, or module is initializing.	N/A	Module is OK Module power is OK	Module has no power
LOS/LOCK1	No input signal on XFP input	Channel is not in lock or unsupported format.	Channel is in lock and supported format.	N/A
LOS/LOCK2	No input signal on SFP+ input	Channel is not in lock or unsupported format.	Channel is in lock and supported format.	N/A
LASER FAIL	One or both lasers are faulty	One or both lasers are turned off	Both lasers are turned on	N/A

Table 1: LED states and what they mean

5.2 Multicon Gyda

With the optional Multicon GYDA System Controller the module can be monitored for multiple alarms such as signal lock/loss etc.

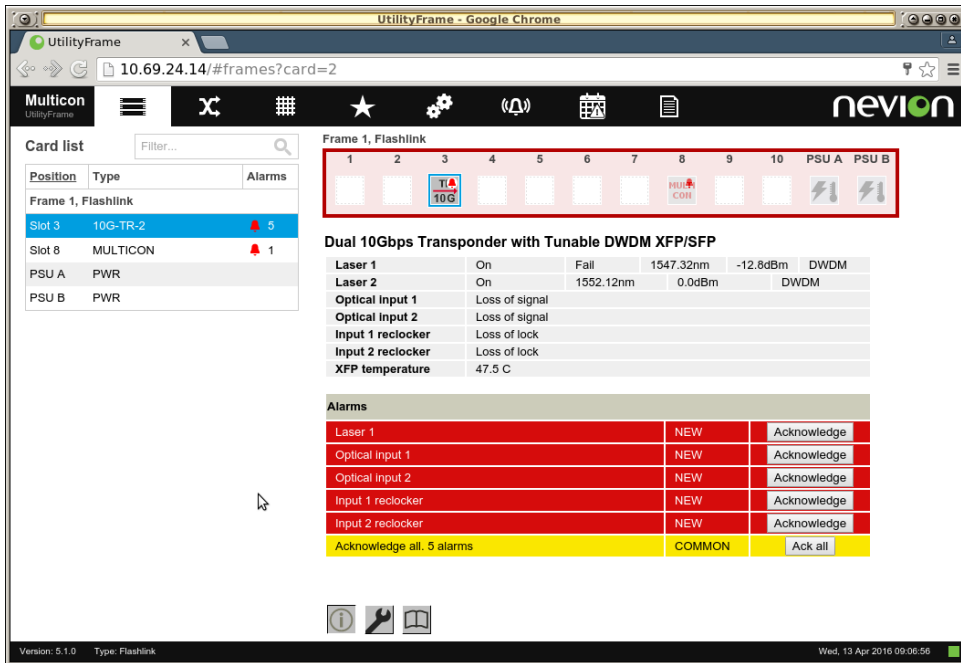


Figure 8: info page example of 10G-TR-2-XFP-SFP.

In Multicon, Laser 1 and Optical Input 1 both refer to the XFP side, while Laser 2 and Optical Input 2 refer to the SFP+ side (see Figure 1 and table on page 10).

5.3 GPIO connector

GPIO functions:

Pin number (from the right)	Dir.	Name	Activated (GND)	Deactivated
1	OUT	Status	Card ok	XFP or SFP missing, bad PSU or temperature alarm
2	OUT	LOCK1	XFP input ok	XFP input missing, XFP missing or not a valid 10Gbps signal
3	OUT	LOCK2	SFP+ input ok	SFP input missing, SFP+ missing or not a valid 10Gbps signal
4	OUT	LSR	XFP or SFP+ Laser failed	Both lasers ok
5	IN	LSR1	XFP laser disable	XFP laser enable
6	IN	LSR2	SFP+ laser disable	SFP+ laser disable

General environmental requirements for Nevia equipment

1. The equipment will meet the guaranteed performance specification under the following environmental conditions:
 - Operating room temperature range: 0°C to 40°C
 - Operating relative humidity range: <90% (non-condensing)

2. The equipment will operate without damage under the following environmental conditions:
 - Temperature range: -10°C to 55°C
 - Relative humidity range: <95% (non-condensing)

Product Warranty

The warranty terms and conditions for the product(s) covered by this manual follow the General Sales Conditions by Nevia, which are available on the company web site:

www.nevia.com

Appendix A Materials declaration and recycling information

A.1 Materials declaration

For product sold into China after 1st March 2007, we comply with the “Administrative Measure on the Control of Pollution by Electronic Information Products”. In the first stage of this legislation, content of six hazardous materials has to be declared. The table below shows the required information.

組成名稱 Part Name	Toxic or hazardous substances and elements					
	鉛 Lead (Pb)	汞 Mercury (Hg)	鎘 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr(VI))	多溴联苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
10G-TR-2-XFP-SFP	○	○	○	○	○	○
O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.						
X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.						

This is indicated by the product marking:



A.2 Recycling information

Nevion provides assistance to customers and recyclers through our web site <http://www.nevion.com/>. Please contact Nevion’s Customer Support for assistance with recycling if this site does not show the information you require.

Where it is not possible to return the product to Nevion or its agents for recycling, the following general information may be of assistance:

- Before attempting disassembly, ensure the product is completely disconnected from power and signal connections.
- All major parts are marked or labeled to show their material content.
- Depending on the date of manufacture, this product may contain lead in solder.
- Some circuit boards may contain battery-backed memory devices.