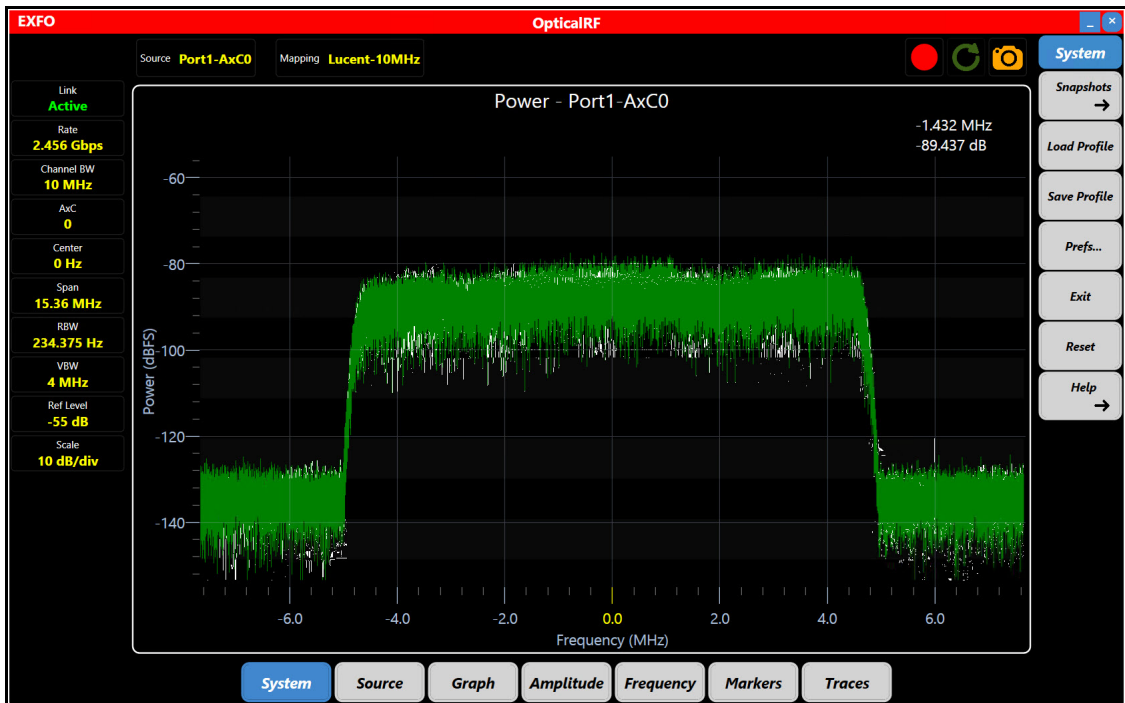


OpticalRF

Digital Spectrum Analyzer



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Units of Measurement

Units of measurement in this publication conform to SI standards and practices.

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1 ***Introducing the OpticalRF***

OpticalRF is a digital spectrum analyzer that displays power spectrum, persistence, and/or waterfall graphs derived from the IQ data carried over a CPRI link.

Additional functions include RF capture and export, real-time calculation of Error Vector Magnitude (EVM), Signal to Noise Ratio (SNR), and remote control for interference hunting and collaboration.

Technical Specifications

To obtain this product's technical specifications, visit the EXFO Web site at *www.exfo.com*.

Conventions

Before using the product described in this guide, you should understand the following conventions:



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in *death or serious injury*. Do not proceed unless you understand and meet the required conditions.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *minor or moderate injury*. Do not proceed unless you understand and meet the required conditions.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in *component damage*. Do not proceed unless you understand and meet the required conditions.



IMPORTANT

Refers to information about this product you should not overlook.

2 **Safety Information**



WARNING

Do not install or terminate fibers while a light source is active. Never look directly into a live fiber and ensure that your eyes are protected at all times.




WARNING

The use of controls, adjustments and procedures, namely for operation and maintenance, other than those specified herein may result in hazardous radiation exposure or impair the protection provided by this unit.



IMPORTANT

When you see the following symbol on your unit , make sure that you refer to the instructions provided in your user documentation. Ensure that you understand and meet the required conditions before using your product.



IMPORTANT

Other safety instructions relevant for your product are located throughout this documentation, depending on the action to perform. Make sure to read them carefully when they apply to your situation.

Safety Information

Additional Laser Safety Information

Additional Laser Safety Information

This product employs Class 1 Laser transceivers.



WARNING

When the LASER LED is on or flashing, the module is transmitting an optical signal on the SFP+ transceiver ports.

Note: *Refer to the NetBlazer user guide for additional test equipment safety information and ratings.*

3 **Getting Started**

Supported Modules and Software Option

The **OpticalRF** application is supported on the following modules having the **CPRI-Spectrum** software option enabled: 720Gv2, 730Gv2, 870v2, 870Q, 880v2, 880Q, and 890NGE.

Software Installation

If the **OpticalRF** application is not already installed, refer to the platform user guide for more information on how to install this application through **Update Manager**.

Starting the OpticalRF Application

From **Mini ToolBox X**, tap the **OpticalRF** application button.

Getting Started

Connecting to the RAN

Connecting to the RAN

The NetBlazer's SFP+ P1 port is used to connect to the Radio Access Network (RAN). Supported rates are: CPRI 1.2, 2.4, 3.1, 4.9, 6.1, and 9.8 Gbit/s.



CAUTION

To prevent exceeding the maximum input/output power level, please refer to the NetBlazer technical specifications at www.exfo.com.

Plug the SFP/SFP+ transceiver into the P1 slot. Refer the NetBlazer user guide for connector/port location purposes.

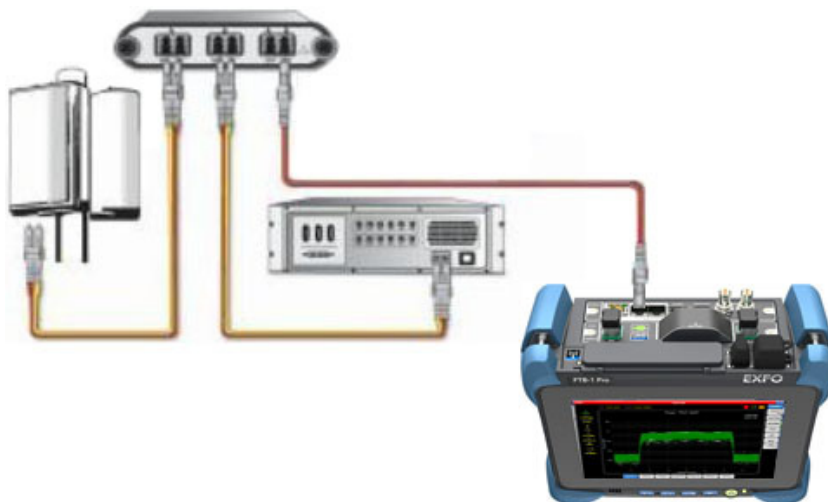


WARNING

Use only EXFO supported transceivers. Refer to the NetBlazer technical specifications at www.exfo.com for the list of supported transceivers. Using non-supported transceivers can affect the performance and accuracy of the test.

Note: *In order to avoid signal corruption issues that might affect your results, it is strongly recommended that the SFP/SFP+ inserted into the NetBlazer's SFP+ port is identical to one on the optical splitter side. Similarly, the specification of the optical splitter and optical cable should be identical to the ones used in the CPRI link.*

Connection Diagram

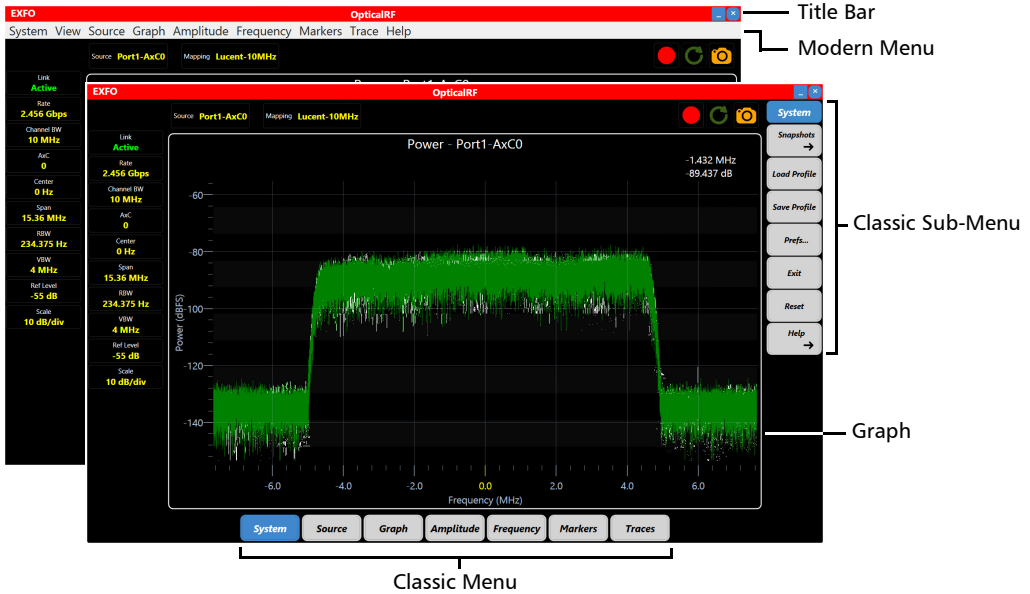


To Connect to the RAN:

1. Install an optical splitter as follows. If an optical splitter panel is already installed in the CPRI link, skip to next step.
 - 1a. Lock down the sector to be tested.
 - 1b. Insert an optical splitter panel (recommend RRH to port A and BBU to port B).
 - 1c. Unlock the sector.
2. Connect the NetBlazer to the optical splitter panel as follows:
 - 2a. To display the uplink, connect the A side of the splitter's AB port to the RX SFP+ P1 port of the NetBlazer (generally marked with an in arrow).
 - 2b. To display the downlink, connect the B side of the splitter's AB port to the RX SFP+ P1 port of the NetBlazer (generally marked with an in arrow).

4 Graphical User Interface Overview

This chapter describes the OpticalRF graphical user interface.



Title Bar

Displays OpticalRF related information and allows to minimize, maximize, and close the application.

Modern Menu, Classic Menu, and Classic Sub-Menu

The OpticalRF can be configured to use either the classic (default) or modern view.

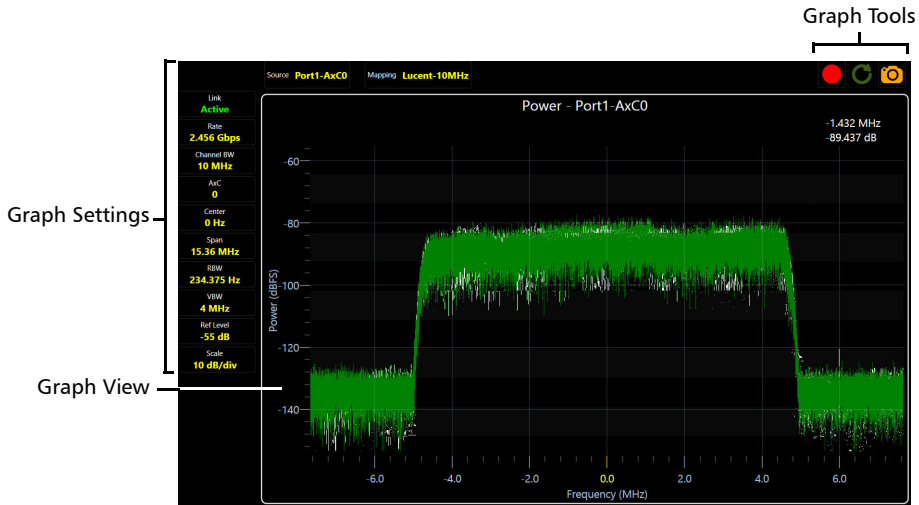
- The classic view has larger menus and is more suited to touch screen operation. Selecting an item from the classic menu affects the content of the sub-menu displayed on the right.
- The modern view is better suited to traditional mouse and keyboard operation.

To switch from one view to the other:

- 1.** For classic view, tap **System, Prefs...**, select **Modern**, and tap **Done**.
OR
- 2.** For modern view, tap **System, Preferences**, select **Classic**, and tap **Done**.

Note: *Some menu contents differ between **Classic** and **Modern** views. In this user guide, the **Classic** menu is used by default unless otherwise specified.*

Graph



Graph Settings

The graph settings is a live area allowing to set/change values by tapping on individual fields.

- **Source** indicates and allows to select the source of the graph, either the live test port (Port1-AxCn) or a file (**File1** or **File2**).
- **Mapping** indicates and allows to select a configuration file defining the parameters used by the application to decode and display the RF data. Refer to *Mapping* on page 20.

Graphical User Interface Overview

Graph

- **Link**¹ indicates either if traffic is present on the input port (**LossOfSignal** or **Active**) or **RateScan** while detecting the signal rate when **Link Rate** is set to **Auto**. Tapping on this field displays the SFP information.
- **Rate**¹ indicates and allows to select the CPRI link rate. Refer to *Link Rate* on page 20.
- **AxCn** indicates and allows to select the Antenna System Container (AxC) to monitor.
- **Channel BW** indicates the channel bandwidth based on the selected mapping. Refer to *Mapping* on page 20.
- **Center** indicates and allows to select the center frequency. Refer to *Center* on page 26.
- **Span** indicates and allows to select the frequency span. Refer to *Span* on page 26.
- **RBW** indicates and allows to select the resolution bandwidth. Refer to *RBW* on page 26.
- **VBW** indicates and allows to select the video bandwidth. Refer to *VBW* on page 26.
- **Ref Level** indicates and allows to select the position of the power maximum value on the screen. Refer to *Ref Level* on page 25.
- **Scale** indicates and allows to select the spacing between power values on the screen. Refer to *Scale* on page 25.

1. Only available when the graph is from a live input source.






Graph View

A traditional graph displaying amplitude against frequency for Spectrum, Waterfall, or Persistence type.

The following actions are available when right-clicking on a graph:

- **Barriers** mark indicates the upper and lower frequencies of the signal as defined by the mapping file. Refer to *Barrier* on page 23.
- **Grid** displays the grid lines. Refer to *Grid* on page 23.
- **Snap Marker** finds a peak close to the current cursor location on the screen. Move the cursor close to the desired peak, right click, select **Snap Marker**, and the marker number.
- **Enable Zoom** enables the capability to zoom the graph. Refer to *Enable Zoom* on page 24.
- **Crosshairs** draws a set of crosshairs on the screen centred on the cursor. Refer to *Crosshair* on page 23.
- **UnZoom** clears the zoomed view. Refer to *UnZoom* on page 24.
- **Type** allows to select the graph type. Refer to *Type* on page 22.
- **Close View**, close the current graph view. Only available when more than one graph is displayed.
- **Move View** allows to move any graph on the screen. Right-click on the graph, select **Move View**, and tap on the blue positioning bars where the graph will be moved in relation with the other graph(s). Only available when more than one graph is displayed.

Graph Tools

Icon	Description
	Record the trace Record a trace file to be replayed later. Refer to <i>Record</i> on page 21.
	Load and replay Loads and replays a previously recorded graph. Refer to <i>Playback</i> on page 21.
	Take screen snapshot Takes and saves screen shots of values/graphs that can be viewed later. The icon briefly displays the number 1 to indicate a screen shot has been taken. Refer to <i>Snapshots</i> on page 15.
	Maximize current view This icon is displayed when multiple graphs are available on the screen. To view any of the individual graphs, select the graph then tap this icon. Double-clicking a desired graph also maximize its view.
	Show all views This icon is displayed when multiple graphs are available while only one is displayed (maximized) and allows to return to multiple graphs view. Double-clicking on the graph also returns to multiple graphs view.

5 *Using OpticalRF*

This section describes each item of the OpticalRF application menus.

System

Snapshots

- **Snap** allows to take and save screen shots of values/graphs that can be viewed later. The camera icon briefly displays the number **1** to indicate a screen shot has been taken. It is also possible to do a snapshot using the camera icon (**Take Screen Snapshot**) (refer to *Graph Tools* on page 14).

Screen shot images are saved in JPEG (.jpg) format in the Documents\OpticalRF\ScreenCapture folder. File names start with SC followed by the date, an underscore, time, and 3-digit number (e.g. SC20160819_084539_695.jpg).

- **View** allows to open a previously saved screen shot. Tap **View**, select a file, and tap **OK**.
- **Back** closes the **Snapshots** sub-menu.

Load Profile

Allows to open a previously saved configuration profile.

Tap **Load Profile**, select a previously saved configuration file, and tap **OK**.

Save Profile

Allows to save the display settings that can be loaded later. This can save time by loading potentially complex screen configurations like multiple graphs and control panes.

Tap **Save Profile**, enter the name of the file or select an existing file, and tap **OK**.

Prefs.../Preferences...

Allows to switch from Classic view to Modern view and vice-versa. Refer to *Modern Menu, Classic Menu, and Classic Sub-Menu* on page 10.

Exit

Closes the OpticalRF application.

Reset

Returns the system to its factory default settings when the application is restarted.

Tap **Reset** and **Yes** to confirm; the OpticalRF returns to default settings once the application is closed and restarted.

Help

Note: For modern view the help is available as an independent tab (see Help on page 32).

- **View Help** opens the OpticalRF application help information.
- **Report** allows to generate a test report.
 - **Job Information** parameters are used to identify the source of the report and are not mandatory. Enter the following job information if required: **Job ID**, **Contractor Name**, **Customer Name**, **Operator Name**, **Circuit ID**, and **Comment**. Up to 30 characters are allowed for each parameter at the exception of Comment for which 256 characters are allowed.
 - **Generate** creates, saves, and opens the report in PDF format.

Reports are saved in PDF format in the Documents\OpticalRF\Reports folder. File names start with OpticalRFReport followed by the date, an underscore, and the time (e.g. OpticalRFReport_20160819_102314.pdf).
 - **Send** uploads the report to EXFO Connect Server.
 - **Close** exits the report window.
- **About** displays the version of the OpticalRF application.
- **Back**, only available with classic view, closes the **Help** sub-menu.

View

Note: The *View* menu is only available with the modern view.

Trace Config

Allows to overlay Maximum, Minimum, Real-Time, and Average spectra. See *Traces* on page 30.

Marker Config

Allows to define up to five optional markers that can be used to track frequency offsets on the spectrum. See *Markers* on page 27.

Ref Level

Sets the position of the power maximum value on the screen. See *Ref Level* on page 25.

Scale

Sets the spacing between power values for the power spectrum. See *Scale* on page 25.

Center

Sets the center frequency for the currently displayed spectrum. See *Center* on page 26.

Span

Sets the frequency span of the currently displayed spectrum. See *Span* on page 26.

Full Span

Returns the currently displayed spectrum span to maximum value. See *Full Span* on page 26.

VBW

Modifies the Video Bandwidth. See *VBW* on page 26.

Layout

Allows to change the resolution of the **Modern** menu graph settings and all opened pop-up windows. This can be useful when operating the system remotely on a different resolution screen.

Tap **View**, **Layout**, and select the desired setting: **Extra_Large**, **Large**, **Normal**, **Small**, or **Extra_Small**.

All Controls

Displays all control pop-up windows: **Traces**, **Markers**, **RefLevel**, **Scale**, **Center**, **Span**, **VBW**, and **CalLevel**.

Source

Allows the configuration of **Port1-AxCn**, **File1**, or **File2** spectrum source.

Configure

Select the port or file to be configured: **Port1-AxCn (P1)**, the live port), **File1 (F1)** or **File2 (F2)**.

Calibrate

Allows to set the dBm scale (to the left of the power graph) to accurately reflect the power of the signals being displayed. Only available with **File1 (F1)** and **File2 (F2)** sources.

Link Rate

Allows to select the CPRI link rate: **Auto**, **Rate2 - 1.228 Gpbs**, **Rate3 - 2.456 Gpbs**, **Rate4 - 3.072 Gpbs**, **Rate5 - 4.915 Gpbs**, **Rate6 - 6.144 Gpbs**, or **Rate7 - 9.830 Gpbs**. **Auto** automatically detects the CPRI link rate; the discovered link rate is displayed once detected.

AxC

Allows to select the Antenna System Container (AxC) to monitor.

Mapping

In order to extract RF data from a CPRI data stream, information for the specific manufacturer's equipment is required. OpticalRF configuration files list various parameters used by the application to decode and display the RF data.

OpticalRF configuration files contain information on frequency, bandwidth, and other information required to decode the spectrum from the CPRI stream.

Record

Records graphs that can be replayed later. Record is only available when using the live source port.

Tap **Record** then either use the auto-generated name or enter a new one, select the record duration in milliseconds (16, 32, ..., 2048), and tap **OK**.

Recording are saved in the proprietary .iqs format to the Documents\OpticalRF\IqsTraces folder. File names start with the date, an underscore, and the time (e.g. 20160819_084539.iqs).

Note: *It is also possible to start a record using the **Record the trace** icon. Refer to *Graph Tools* on page 14.*

Playback

Allows to associate a previously recorded data (iqs file) to **File1** or **File2**. Only available when **Source > Configure** is set to **F1 (File1)** or **F2 (File2)**.

Tap **Configure**, select **File1** or **File2**, tap **Playback**, select an iqs file, and tap **OK**.

Graph

Source

Indicates and allows to select the source of the graph, either the live test port (**Port1-AxCn**) or a file (**File1** or **File2**). Selecting the live input source for the graph to be displayed automatically set the **Source** to **P1 (Port1-AxCn)** allowing its configuration.

Type

Allows to select the graph type or a combination of graph types. Each type supports a different aspect of signal analysis.

- **Spectrum:** The power magnitude of the input signal is displayed across the set frequency range.
- **Waterfall:** Spectrogram giving a visual representation of frequency in the X axis against time in the Y axis. It is useful for seeing small changes in signal amplitude as well as picking out intermittent interferers.

To the top left of the graph, there is a scale indicating the power values related to each color on the waterfall.

To the right of the color chart is the current **Refresh** value setting in milliseconds (ms). The refresh rate sets the period between lines being added to the top of the waterfall. Reducing the period has the effect of speeding the waterfall up and can be useful when monitoring for short period interferers. Tap on this field to select a new value.

Moving the cursor over the waterfall displays at the top right of the screen the frequency offset at the current location. This gives a quick frequency reading for the current location and allows identifying short period or intermittent interferers.

- **Persistence:** Power magnitude is plotted against frequency, with color denoting the percentage of time a plot point is placed at the current location.

New

It is possible to display multiple live or recorded graphs on the same screen. This can be useful when comparing a live graph against saved examples, or inspecting different aspects of the same source.

To add a new graph:

1. Select **New** from the **Graph** menu.
2. Select the **Type: Spectrum, Waterfall, or Persistence**.
3. Select the **Source**, either the live test port (**Port1-AxCn**) or a file (**File1** or **File2**).
4. Tap **OK**.
5. Tap on a blue positioning bars where the new graph will be inserted in relation to the other graph(s).

Note: A new button **Show all views / Maximize current view** is displayed. Refer to Graph Tools on page 14.

Grid

Displays the grid lines when enabled (**On**).

Barrier

Barrier, when enabled (**On**), marks the upper and lower frequencies of the signal as defined by the mapping file. Only available with spectrum graph.

Crosshair

Draws a set of crosshairs on the screen centred on the cursor. Values for frequency and power are displayed at top right of the screen.

Enable Zoom

Enables the capability to zoom the graph. Once enabled, point and drag the mouse pointer over the graph region to be zoomed. Only available with spectrum graph.

UnZoom

Clears the zoomed view.

Close All

Closes all graphs. Tap **Close All** and **Yes** to confirm.

Note: *To close a single graph, right-click on the graph and select **Close View**.*

Amplitude

The spectrum graph can be set to display the aspect of the signal to observe. OpticalRF monitors 100% of the signal allowing to zoom in to inspect a smaller frequency band or shift the graph down to see a spike.

Full Scale

On sets the currently displayed spectrum's amplitude to maximum (**dBFS**).

Off disables the full scale (**dB**).

Ref Level

Ref Level sets the position of the power maximum value on the screen.

This has the effect of moving the base of the graph vertically on the screen.

Scale

Scale sets the spacing between power values for the power spectrum. This has the effect of condensing or expanding the graph vertically on the screen.

Frequency (Freq)

Center

Center sets the center frequency for the currently displayed spectrum.

Span

Span sets the frequency span of the currently displayed spectrum. It has the effect of expanding or contracting the width of the graph.

Full Span

Full Span returns the currently displayed spectrum span to maximum value.

VBW

VBW modifies the Video Bandwidth. Reducing the bandwidth smooths the waveform and produces a thinner trace by decreasing the amount of noise. This is useful when identifying a weak interferer which would otherwise be lost in the noise.

RBW

RBW (Resolution Bandwidth) balances the amount of detail against the scan speed of the signal. On a signal that takes time to settle, increasing the resolution bandwidth allows faster resolution.

Markers

Up to five optional markers can be used to track frequency offsets on the spectrum. Only available with Power Spectrum graphs.

Configure

The **Configure** sub-menu is only available with the modern view and allows the configuration of the following marker parameters: **Marker**, **Frequency**, **Active**, **Ref**, **Go Peak**, and **Next Peak**.

Marker	Frequency MHz	Active	Ref	Go Peak	Next Peak
1	0.06	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Show Marker Table

Marker

Classic view: Selects a marker number: **1** to **5**.

Modern view: Displays the marker number: **1** to **5**.

Active

Classic view: Activates/deactivates the selected marker: **On/Off**. When activating a new marker, a magenta marker arrow will appear on the graph at frequency zero (0.0 MHz).

Modern view: Activates/deactivates the corresponding marker.

Freq / Frequency

Classic view - Freq: Sets the frequency of the selected marker.

Modern view - Frequency: Sets the frequency of the corresponding marker. Setting the frequency of a marker automatically activates this marker.

Reference / Ref

Classic view (Reference) / Modern view (Ref): Selects the marker to be used as the reference in the marker table. See *Table / Show Table* on page 29.

Goto Peak / Go Peak

Classic view (Goto Peak): Moves the selected marker to the point of greatest amplitude.

Modern view (Go Peak): Moves the corresponding marker to the point of greatest amplitude.

Next Peak

Classic view: Moves the selected marker to the next peak on the spectrum graph.

Modern view: Moves the corresponding marker to the next peak on the spectrum graph.

All Off

Deactivates all markers.

Table / Show Table

Classic view (**Table**) and Modern view (**Show Table**): Displays the marker table as follows:

Number	Active	Frequency	Power	Δ Power	Δ Frequency	Marker
1	Yes	0.45 MHz	-69.292 dB	12.424 dB	2.580 MHz	Marker 1
2	Yes	0.87 MHz	-74.883 dB	6.833 dB	3.000 MHz	Marker 2
3	Yes	-3.21 MHz	-89.770 dB	-8.053 dB	-1.080 MHz	Marker 3
4	Yes	-2.13 MHz	-81.717 dB	0.000 dB	0.000 MHz	Marker 4
5	Yes	0 MHz	-35.911 dB	45.806 dB	2.130 MHz	Marker 5

The following information is displayed for each marker:

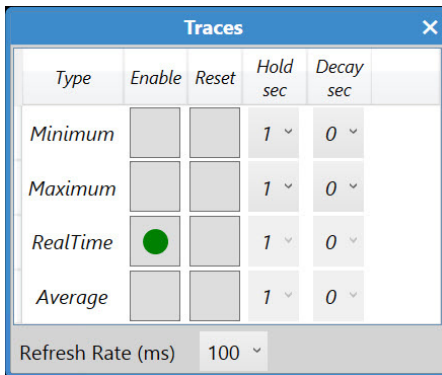
- **Number** indicates the marker number.
- **Active** indicates that the marker is activated (**Yes**) or not (**No**).
- **Frequency** indicates the current frequency value.
- **Power** indicates the current power values.
- **Δ Power** indicates the difference between the power value of the reference marker and the power value of this marker.
- The **Δ Frequency** displays the difference between the frequency of the reference marker (see *Reference / Ref* on page 28) and the frequency for this marker

Traces

The OpticalRF can display more than just the default real-time spectrum. It is possible to overlay Maximum, Minimum, Real-Time, and Average spectra. Only available with **Spectrum** graph type.

Configure

The **Configure** sub-menu is only available with the **Modern** view and allows the configuration of the **Minimum**, **Maximum**, **RealTime**, and **Average** trace parameters.



Trace

Allows to select any combination of the following trace value to be displayed on the graph: **RealTime**, **Maximum**, **Minimum**, and **Average**.

To overlay other trace values on the graph:

1. Select either **RealTime**, **Maximum**, **Minimum**, and/or **Average**.
2. Tap the **Enable** button.
3. Repeat above steps to overlay additional trace values.

Enable

On indicates that the current selected Trace overlay is displayed on the graph.

Off indicates that the current selected Trace overlay is not displayed on the graph.

Refresh Rate

Sets the millisecond interval between the graph being redrawn on the screen: **0, 25, 50, 100, 200, 500, or 1000**.

Hold Time / Hold

The **Hold** control allows to modify the period of time plotted values are held on the graph before being allowed to **Decay**. The **Hold** and **Decay** setting allow intermittent signals to be seen more clearly, or low amplitude signals to be resolved when in the presence of more powerful ones. Only available for **Maximum** and **Minimum** traces.

Decay Time / Decay

The **Decay** control allows to modify the period of time over which the plotted values fade. Only available for **Maximum** and **Minimum** traces.

Reset

Reset clears and restarts the spectrum.

All Off

All Off deactivates all spectra (**Minimum, Maximum, RealTime, and Average**).

Help

Note: *For classic view the help is available under **System**.*

See *Help* on page 17 for more information.

6 Quick Test Setup Procedure

The following procedure is a simple test sequence using a live source and the **Classic** menu.

To setup a quick test:

1. Connect the NetBlazer to the radio access network (RAN). Refer to *Connecting to the RAN* on page 6.
2. Start the **OpticalRF** application.
3. Select the **Source** menu and click **Configure**, and select **Port1-AxCn (P1)**.
4. From the **Source** menu, tap **Link Rate**, and select either the link rate or **Auto** for automatic detection. The **Link** icon from graph settings displays **Active** if the link rate is active and matches the selection; **RateScan** indicates that the unit is scanning to discover the link rate when **Auto** is selected.
5. Select **Mapping** from the **Source** menu and select the desired configuration file for the system under test. OpticalRF configuration files contain information on frequency, bandwidth and other information required to decode the spectrum from the CPRI stream.
6. To select a different AxC container, tap **AxC** from the **Source** menu and select the desired AxC container. The number of available CPRI AxC containers in a frame vary depending on the selected link speed and mapping.
7. Tap **Type** from the **Graph** menu and select the desired graph type.
8. Tap **Full Scale** from the **Amplitude** menu to center the spectrum. Use **Ref Level** and **Scale** and their sliders to manually fine tune the spectrum.
9. Tap **Full Span** from the **Freq/Frequency** menu to display the full spectrum on the screen.

Quick Test Setup Procedure

Now that the graph is visible on the screen, it is possible to set a marker to show values of the highest amplitude peak on the graph.

- 10.** Tap **Marker** from **Markers** menu and select one of the five available markers.
- 11.** Tap **Active** from the **Marker** menu to activate the selected marker. A small magenta marker will appear on the graph at frequency zero (0.0 MHz).
- 12.** Tap **Goto Peak** from the **Marker** menu and the marker pointer will automatically seek the greatest amplitude point on the display.
- 13.** Tap **Next Peak** moves the current marker to the next highest peak on the graph.

Traces can be record to be replayed later.

- 14.** Tap **Record** from the **Source** menu, and tap **OK** to start recording.

7 Troubleshooting

Solving Common Problems

Before calling EXFO's technical support, please read the following common problems that can occur and their respective solution.

Problem	Possible Cause	Solution
Input signal not received or not compatible.	There is a configuration mismatch between the inserted SFP/SFP+ and the rate selected in OpticalRF.	Ensure that the SFP/SFP+ is supporting the rate used by OpticalRF.
	The SFP/SFP+ is not compatible with the OpticalRF.	Ensure to use a compatible SFP/SFP+. Refer to www.exfo.com .

Troubleshooting

Contacting the Technical Support Group

Contacting the Technical Support Group

To obtain after-sales service or technical support for this product, contact EXFO at one of the following numbers. The Technical Support Group is available to take your calls from Monday to Friday, 8:00 a.m. to 7:00 p.m. (Eastern Time in North America).

Technical Support Group

400 Godin Avenue
Quebec (Quebec) G1M 2K2
CANADA

1 866 683-0155 (USA and Canada)
Tel.: 1 418 683-5498
Fax: 1 418 683-9224
support@exfo.com

For detailed information about technical support, and for a list of other worldwide locations, visit the EXFO Web site at www.exfo.com.

If you have comments or suggestions about this user documentation, you can send them to customer.feedback.manual@exfo.com.

To accelerate the process, please have information such as the name and the serial number (see the product identification label), as well as a description of your problem, close at hand.

Transportation

Maintain a temperature range within specifications when transporting the unit. Transportation damage can occur from improper handling. The following steps are recommended to minimize the possibility of damage:

- Pack the unit in its original packing material when shipping.
- Avoid high humidity or large temperature fluctuations.
- Keep the unit out of direct sunlight.
- Avoid unnecessary shocks and vibrations.

8 *Glossary*

Acronym List

?	Help
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A

AxC	Antenna System Container
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B

BBU	Base-Band Unit
BW	Bandwidth

C

CPRI	Common Public Ration interface
------	--------------------------------

D

dB	Decibels
dBFS	Decibels relative to Full Scale

E

EVM	Error Vector Magnitude
-----	------------------------

F

FCC	Federal Communications Commission
-----	-----------------------------------

Glossary

Acronym List

G

Gbps	Gigabit per second
GUI	Graphical User Interface

H

Hz	Hertz
----	-------

I

ID	Identification
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical & Electronics Engineers

M

MHz	Mega Hertz
-----	------------

N

NATO	North Atlantic Treaty Organization
------	------------------------------------

R

RAN	Radio Access Network
RBW	Resolution Bandwidth
Ref	Reference
RF	Radio Frequency
RRH	Remote Radio Head
RX	Receive

S

SFP	Small Form Factor Pluggable
SNR	Signal to Noise Ratio

U

USA	United States of America
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V

VBW	Video Bandwidth
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