FOT-5205
Hand Held DWDM Channel Checker
User's Guide

Revision A
1/2018

Section   Table of Contents   PAGE

| Section | Table of Contents (Continued) | PAGE |

Section 1   Using This Manual

This Manual contains information for the Touch Screen Hand Held DWDM Channel Checker. This equipment is touch screen capable and also has a hard keypad for operation. Note that there are a few operations that are only accessible with touch screen operation.

This user's guide is written primarily using the touch screen operation with occasional mention of the hard key equivalents

There are warnings, cautions and notes as described below displayed throughout this manual. Please follow all warnings and cautions for your safety and the protection of the equipment.

Warning

A warning alerts to situations that could cause personal injury.

Caution

A caution alerts to situations that may cause damage to the equipment or produce poor testing conditions resulting in inaccurate test results.

Note

A special annotation that will assist the user with operational features.

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Section 2   Safety

Section 3 of this manual is a quick start guide. Prior to using the quick start guide or operating the equipment in any way, it is highly suggested the user reads all safety information.

This product has been designed and tested in accordance with the Manufacturer's safety standards, and has been supplied in a safe condition.

Below are warnings that must be followed by the user to ensure safe operation and to maintain the product in a safe condition. Failure to follow these safety warnings, can result in damage to the instrument or harm to the user.

Warning
Personnel should always be aware when working with fiber optic test equipment that active fibers may be present and therefore infrared optical energy may be present.

Warning
Never look directly into the end of a connected fiber optic cable or fiber optic adapter of test equipment, to do so could expose the user to laser radiation and could result in sever personal injury.

Warning
To Prevent Fire or Shock Hazard:

➢   Do not install battery types other than those specified by the manufacturer
➢   Do not use the charger without the batteries installed
➢   Do not expose the battery charger to rain or excessive moisture
➢   Do not use the AC adapter when there are signs of damage to the enclosure or cord
➢   Ensure that you are using the correct charger for the local line voltage
➢   Do not use any other charger than the one provided with this instrument.

Section 2   Safety

Failure to follow these cautions may damage the equipment and void the warranty.

Caution

Fiber-optic connectors are easily contaminated or damaged. The connection to the DWDM Channel Checker is a physical contact type of connection and dirty or damaged connectors may impair the instruments capabilities at minimum and at worst result in the need to return the DWDM Channel Checker to the factory for expensive repairs. Prior to making any connection to the unit, ensure that all proper cleaning procedures have been followed.

Use UPC Finish Connectors Only!

Caution

The DWDM Channel Checker has two ports, a low power and high power port. The low power port is designed for maximum power of -10dBm per channel and a maximum composite power of +22dBm. The high power port is designed for a maximum of +10dBm per channel and a maximum composite power of +29dBm. If unsure of the power level, it is best to start in high power mode and use the designated high power port. Please refer to Section 8.1 of this manual for instructions on setting the power level.

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Section 3   Quick Start Guide

Quick Start Guide

Press [⏻] to turn on the DWDM Channel Checker

Operation

The port/power setting dialog will be displayed, it indicates the current power setting and which port should be used at that setting. Touch any button or the screen to close this dialog. There are two testing ports, low is for testing up to -10dBM and high for testing up to +10dBm. For accurate readings, it is necessary to use the propter port with the proper setting.

If the power is not set to he desired level, enter the menu and select power to change the power level as required.

Icon Menu

To enter menu, either press the [Menu] button or use the stylus to pull the icon menu up from the bottom of the screen.

Available icons:

[?]   Help displays an on board explanation of features, functions and operations.

[▮▮]   Bar graph, touching this icon returns the user to the bar graph.

[💾]   File icon, touching this icon will brings the user to the file management menu.

[⚙]   Settings icon, touching this icon brings the user to the OSA and general settings menus.

[▦]   Table icon, this is used to open the table display of data.

Note

Most features of the DWDM Channel Checker are accessible with either the touch screen or the hard buttons on the keypad. This quick start will primarily focus on the touch screen.

Caution

Fiber-optic connectors are easily contaminated or damaged. The connection to the DWDM Channel Checker is a physical contact type of connection and dirty or damaged connectors may impair the instruments capabilities at minimum and at worst result in the need to return the DWDM Channel Checker to the factory for expensive repairs. Prior to making any connection to the unit, ensure that all proper cleaning procedures have been followed.

Use UPC Finish Connectors Only!

Section 3   Quick Start Guide

Caution

The DWDM Channel Checker has a low power and high power port. The low power port is designed for maximum power of -10dBm per channel and a maximum composite power of +22dBm. The high power port is designed for a maximum of +10dBm per channel and a maximum composite power of +29dBm. If unsure of the power level, it is best to start in high power mode and use the designated high power port. Please refer to section 8.1 of this manual for instructions on setting the power level.

Attached the fiber to be tested to the appropriate optical port. (-10dBm or +10dBm)

Note

On start-up, there is a short warm-up period before the OSA can scan. The scan indicator is in the bottom right of the display. It shows, yellow, red and green. Yellow is warming up, red is ready to scan and green is scanning. This indicator may be use with the stylus to start and end a scan.

Scan

Once the unit is ready to scan, touch the scan indicator or the scan button on the keypad to start the scan.

To stop a scan, touch the scan indicator or press the scan button again.

Cursor Movement/Selection:

To move the cursors touch the screen and the active will snap to that location and moving the stylus up or down on the display will drag the cursor as desired.

Note

Touching the left hand channel number bar is a quick method to switch to the table display and touching the left most channel number bar on the table display will revert back to the graph display. Therefore, it is necessary to stay clear of this area when manipulating the cursors with the touch screen.

To change the active cursor, touch the red or blue cursor points on the right side of the display. The one outlined in black is the active cursor. (A/B button on the keypad)

Auto Test/Zoom: (Keypad only)

The AutoTest button automatically zooms to active channels. This is the first channel starting at channel 1 that is higher than -45dBm in low power mode (-25dBm in high power mode) and setting that as the first channel in the visible range and then starting at the last channel and working backwards to find the last channel that meets the same criteria and setting it as the last channel in the visible range. This button toggles this feature on and off.
To set the zoom range, go to Menu, touch the Settings icon and set Zoom Range as desired.

Please review the remainder of this user's guide for full instructions on using the DWDM Channel Checker

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Section 4 Introduction

The Hand Held DWDM Channel Checker offers a full featured analysis of DWDM systems in a truly hand held portable package. DWDM optical levels in the C-band (1527.9-1565.9 nm or 196.2 - 191.45 THz) may be measured with a resolution of 0.01nm, and measurement levels range from +10 to -50dBm.   Parameter settings to optimize the resolution, number of channels displayed, power levels displayed or set the first channel to match the system under test allows for easy and accurate analysis of DWDM scans. Channel spacing may be set at 50 or 100 GHz. This unit has super fast acquisition time of two scans per second. The information may be viewed in graph mode or table mode with a pass/fail feature on the 4 inch color TFT Display.   The DWDM Channel Checker is designed with solid state optics and no fragile or moving parts to keep the unit field friendly. There is storage for up to 1000 tests and the test may be viewed and printed with the included CertSoft software for fast and easy reporting. These units are housed in a rugged enclosure with robust protective boot, are designed to withstand the rigors of field use and are extremely user friendly.

Section 5   Preparation For Use

5.1 Inspection

Before shipment, this instrument was inspected and found to be in perfect working order and free of defects.

The shipping carton contains the following:
1.   Hand Held DWDM Channel Checker, with protective boot and 4-AA NiMH batteries installed
2.   Universal AC/DC charger with interchangeable mains
3.   USB cable
4.   CD with CertSoft software and user's manual
5.   Set of interchangeable adapters, SC and FC, for each OSA port.

5.2 Identification and Configuration

The instrument's Model/Part Number, Serial Number and Date of Manufacture are indicated on a label located on the back of the unit. The instrument's history is filed at the factory by model/part number and serial number. The unit's serial number is also located on the top plate just above the USB Port.
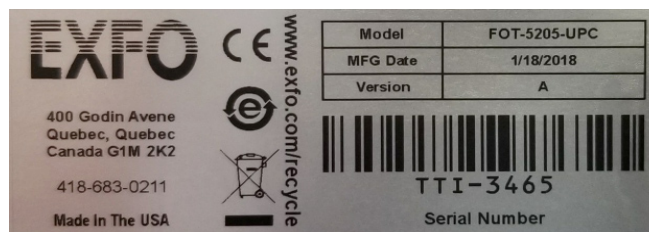
Fig 5.1

5.3 Power Requirements

The FOT-5205 is equipped with a 100-240V-0.4A input and 9V, 0.67A, center positive output universal AC/DC battery charger. This charger is supplied with interchangeable mains for US, Great Britain, Europe and Australia The unit is shipped with 4-AA NiMH batteries (2500mA hours).   Depending on usage, fully charged battery pack will typically enable approximately 4 hrs. of use. Fully discharged batteries require 6 - 8 hours of recharging.

To replace the batteries, remove the unit from the protective boot by pulling the bottom of the boot down and back allowing the bottom of the unit to be lift out. The battery door is located on the back side of the unit. Replace the batteries with only high quality AA NiMH batteries.   If you install NiMH batteries that are dead or less than 1 volt each, charge these batteries for one (1) hour before using the FOT-5205. For proper maintenance, batteries require a monthly recharge.

Warning

To Prevent Fire or Shock Hazard:

> ➢   Do not install battery types other than those specified by the manufacturer
>
> ➢   Do not use the charger without the batteries installed
>
> ➢   Do not expose the battery charger to rain or excessive moisture
>
> ➢   Do not use the AC adapter when there are signs of damage to the enclosure or cord
>
> ➢   Ensure that you are using the correct charger for the local line voltage
>
> ➢   Do not use any other charger than the one provided with this instrument.

Failure to follow these caution statements may void the warranty of this equipment.

Section 6   Physical Description

The DWDM Channel Checker is packaged in a rugged aluminum housing which is further protected with a rubberized boot. Although the front panel is weather resistant, care must be taken to avoid liquids and contaminants around the fragile optical and electrical connectors, and the glass display. Use a mild cleaning agent and damp soft cloth to clean up the panels and the outside case. See the maintenance section for notes to clean the optical connector. NEVER open the instrument for cleaning. Return to the factory for servicing if necessary.

Front Panel
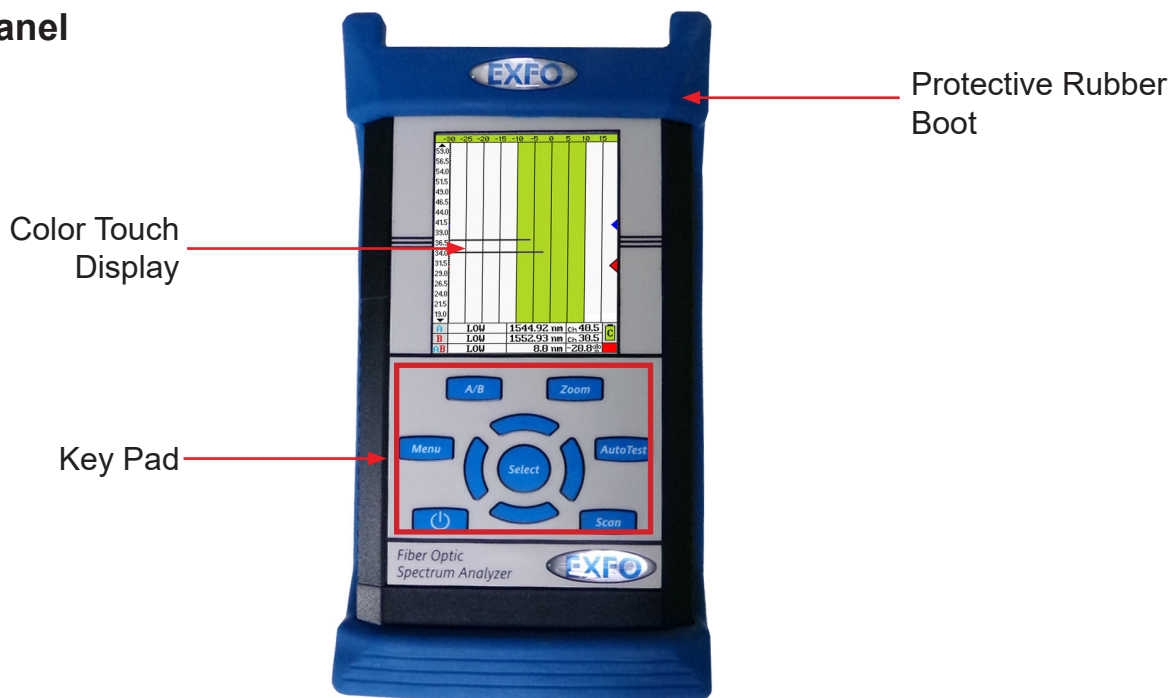
Fig 6.1

Top Plate
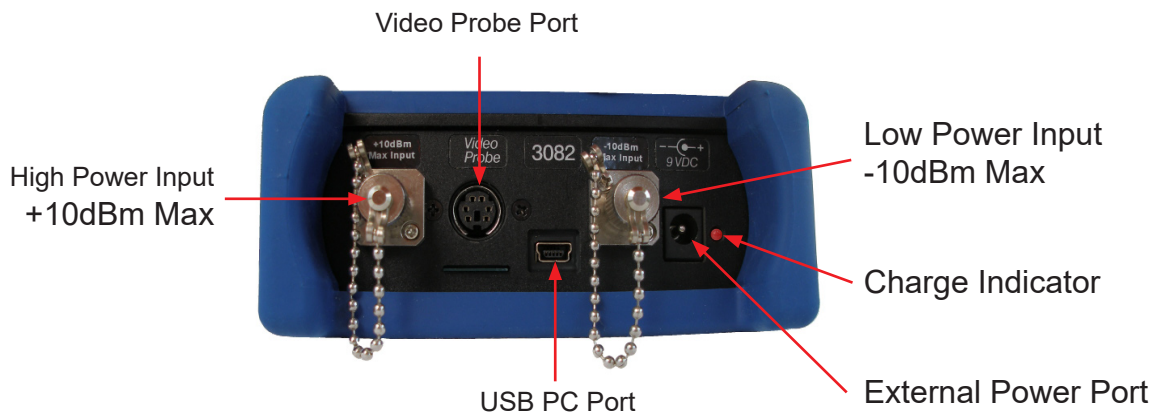
Fig 6.2

Section 7   User Interface

7.1 Keypad

(keypad function only)

Power button turns the unit On and Off.
(Hold for 1 second)

Keypad

Fig 7.1

Scan button starts or stop a scan, and resets the table of data.

(keypad function only)

The AutoTest button automatically zooms to active channels.

Toggles the icon menu open and closed on the bottom of the display

Toggles between "A" and "B" as the active cursors.

(keypad function only)

The zoom button toggles between zoom out (all 18 channels) and zoomed in (The range of channels selected in the settings screen).

Only active in the menu mode. Used to make selections of highlighted items.

LRUD (Left-Right-Up-Down) buttons to are used to move the active cursor in scan mode and move through menu selections in menu mode.
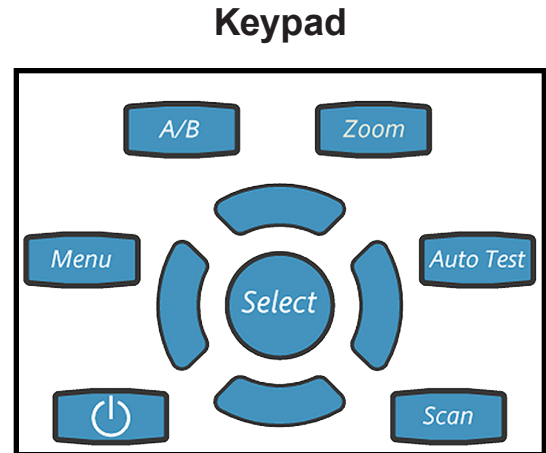
Section 7   User Interface

7.2 Touch Display

Graph Mode

Touch top dBm scale above the first column to toggle between High and Low Power

Touch channel number column to toggles between graph and table

Touch anywhere in the bottom two rows left of the battery and scan indicators to open the icon menu
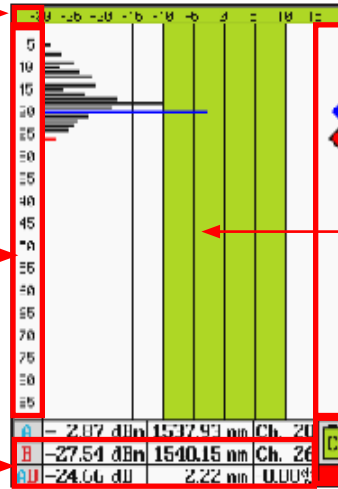
Touch the last column in the graph to toggles between A and B cursors

Touch anywhere in the main graph area to move the active cursor

The area around the scan activity indicator toggles the scan mode on and off

Fig 7.2

Table Mode

Touch top (green) scale above the first column to toggle between High and Low Power

Touch the left most channel number column to toggle between graph and table modes

Touch anywhere in the bottom two rows left of the battery and scan indicators to open the icon menu

Note

Active Cursor is can only be selected with the keypad button in the table mode

Touch anywhere in the channel/value columns in the main table to snap the active cursor to that channel number

The area around the scan activity indicator toggles the scan mode on and off

Fig 7.3

Note

Touch screen descriptions for Parameter, File Management and Scope screens will be covered in their individual sections.

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Section 7   User Interface

7.3 Icon Menu

Movement between screens and functions is accomplished through a set of icons located in a menu that is accessed by touching the bottom of the display or pressing menu button. To remove the menu from the bottom of the display, either select an icon, touch the display above the menu or press the menu button.
or press the menu button.

To use the Icon menu, touch to the left or right of the highlighted icon in the center to move the icons left or right. The left and right buttons may also be used to move the icons. With the desired icon highlighted, touch it or press the select button.

Icon Display
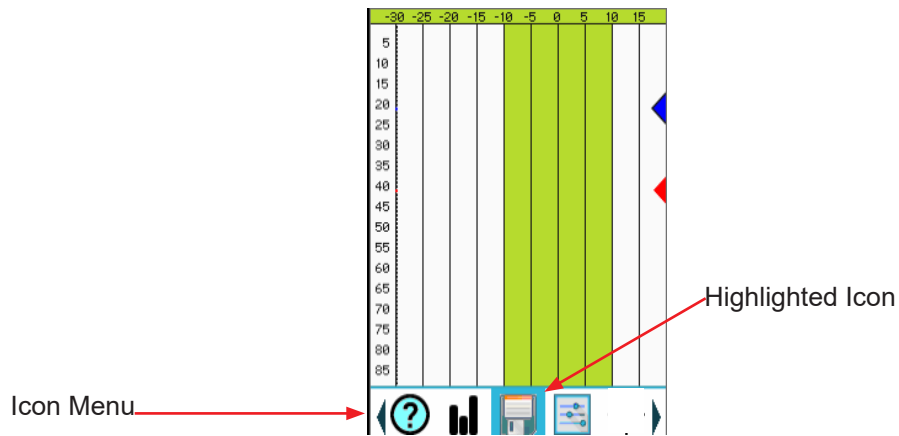
Fig 7.4

Icon Descriptions

Below is a list of the icons found in the icon menu with a brief description of each. More detailed explanations will be found in later in this user's guide.

⑦	Help	Help displays an on board explanation of features, functions and operations. Use left and right buttons on keypad to move through pages and Menu to close
▮▮	Bar Graph View	Touching this icon returns the user to the bar graph.
💾	File Mgt.	File icon, touching this icon will brings the user to the file management menu.
⚙	Settings	Settings icon, touching this icon brings the user to the OSA and general settings menus.
▦	Table View	Table icon, this is used to open the table display of data.

Section 8   Setting Test Parameters

8.1 Settings Screens

To ensure the most accurate and usable information is derived from the OSA, it is necessary to set the testing and equipment parameters prior to starting a scan.

Test Parameters parameters may be set at the time of use or they may set and stored for later use. These test configurations are stored in file management.

To set testing parameters and general equipment settings use the settings screen. To access the settings screen, open the icon menu, highlight the settings icons and touch it or press select.

OSA and General Settings Pages

Fig 8.1

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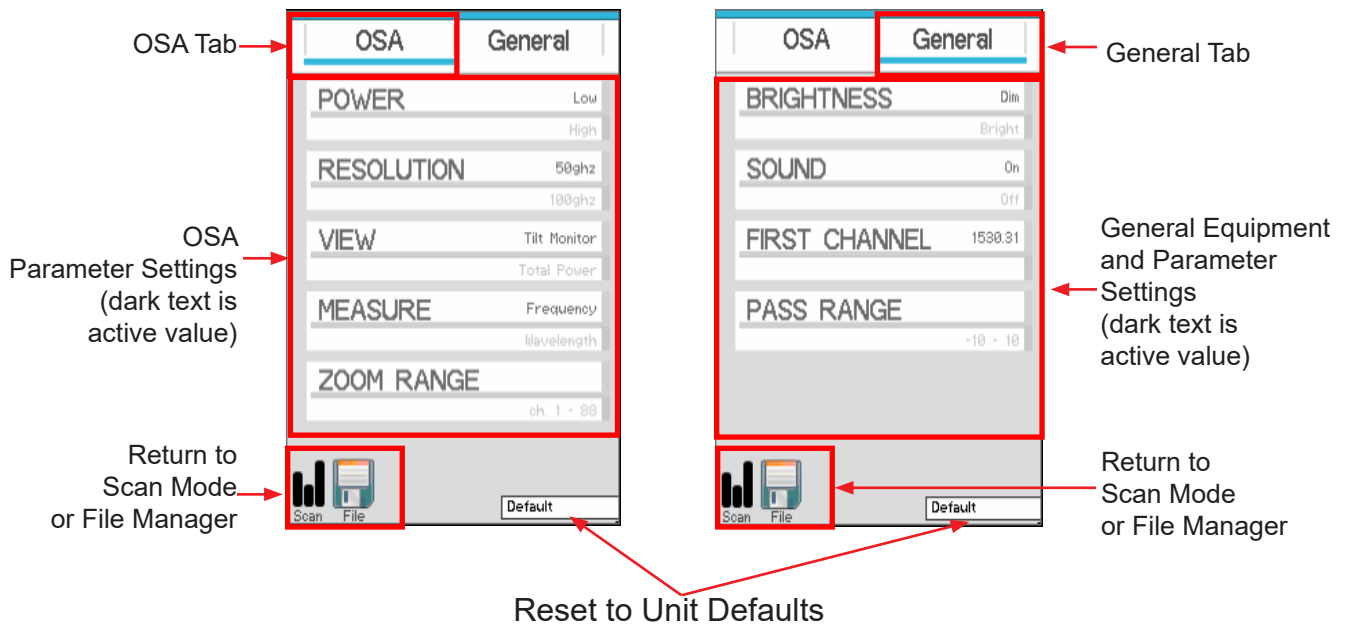
Section 8   Setting Test Parameters

Note
The directional buttons and the select button are not operational in the settings screen.

To select a parameter to be modified, touch it on the display and that parameter setting screen will be displayed.

Parameter Settings Screens

There are two types of parameter screens. The first, as typified by the power setting screen below offers a selection of two item. Select the desired value and touch save. The second type is one were numeric values are selected. These may have one or two values to be entered. If as on the zoom range display below, two values are needed, there will be two tabs, such as begin and end tabs with this parameter. Use the up arrow above the digit or the down arrow below the digit to set the value. If necessary select the second tab and set the second value. Touch save to set the values and return to the settings display.

<table>
<tr><td align="center">Power Screen</td><td align="center">Zoom Range Screen</td></tr>
</table>
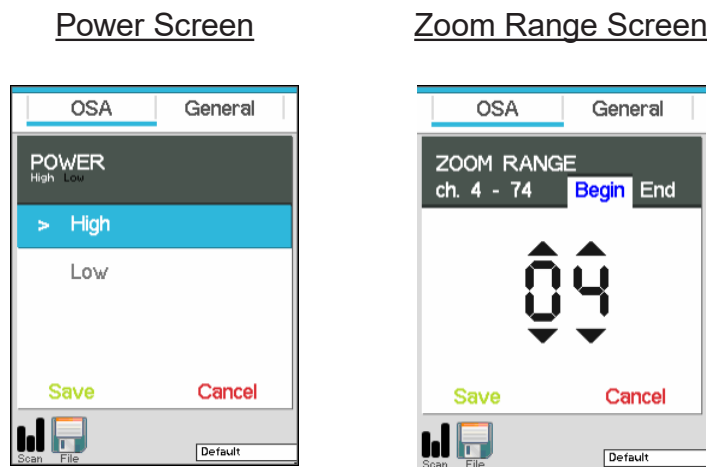
Fig 8.2

8.2 OSA Parameter Tab

Power Level

The DWDM Channel Checker has two optical ports, a low power and high power port. The low power port is designed for maximum power of -10dBm per channel and a maximum composite power of +22dBm. The high power port is designed for a maximum of +10dBm per channel and a maximum composite power of +29dBm. Upon starting the DWDM Channel Checker the switch Port dialog will be displayed which indicates the power setting. If the desired power level is indicated connect the fiber under test to the port shown and touch the screen or press the select button to clear the dialog box. If the wrong power level is indicated, touch screen to remove then open the icon menu and select the settings icon. Touch the power setting, in the power parameter screen, select the desired power and touch save, then touch the scan icon in the bottom left of the display to return to the graph screen.

Note
The Power may also be changed quickly by touching the green dBm scale at the top of the display to toggle between high and low power

Section 8   Setting Test Parameters

Resolution

The Channel analyzer allows the user to set the resolution to 50 GHz (0.4 nm) or 100 GHz (0.8 nm) per channel, or High and Low resolution respectively.   At 100 GHz spacing the user may also select the in grid, (whole channel) or off grid (half channel) data to be displayed. The in grid (whole channel) setting is "100GHz A" and the off grid (half channel) setting is "100GHz B".

NOTE
The first channel will be the firsts channel as established by the first channel setting in the general tab of the settings screen.

View Setting

The view setting sets the view of the scan to total power or tilt monitoring. Total power is the power being introduced to the fiber. Tilt monitoring is used for both power tilt and gain tilt as describe below. In the tilt monitoring setting, there will be a liner regression line on the display and the value associated with that regression line is displayed in the bottom right cell.

To display the tilt monitor, enter the settings screen by bringing up the icon menu and touching the settings icon. Touch the view setting and select tilt monitor. The tilt monitor is now turned on for power and gain tilt.

Power Tilt
Power Tilt, is displayed as a linear regression line overlaid on the graph and as a numeric indicator in the bottom right of the display. This reading only factors in the channels that are greater than the minimum power level of the scale. This can be used to assist with balancing the power of DWDM system. The flatter (more level) the line, or the closer to zero the power tilt number the more balanced the power between channels.

Gain Tilt
Gain Tilt, is displayed as a liner regression analysis of change in power between the overlapping channels overlaid on the graph comparing two scans. This reading only factors in the channels that are greater than the minimum power level of the scale. This is useful when balancing gain from EDFA systems.

NOTE
Gain Tilt is a comparison of two scans. See below for dual scan operation procedures.

NOTE
All the scan data on the display is the data associated with the primary trace.

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Section 8　　Setting Test Parameters

There are two methods to display dual scans for a Gain Tilt comparison

<u>With New Scan</u>

Use a scan that has just been acquired using the Scan button. After a scan has been taken, bring up the icon menu and select the file management icon. Make sure the OSA tab is highlighted and touch above blue highlighted center point to move up through the file list and below to move down the list. With the desired scan highlighted, touch the compare icon and the saved OSA scan will be displayed on the screen with the scan that was just acquired. Please refer to Section 10 for more information on using the file manager. Gain Tilt only measures those channels that meet the minimum value of the displayed scale.

<u>With Saved Scans</u>

The second method is to use the gain tilt, is to use two scans that have already been stored. To do this, enter the file manager as described and with the OSA tab highlighted select the primary scan to be used. Touch the file name while it is highlighted to open it or use the select button on the keypad. (Do not use the select icon on the file management screen.) Enter file management again and with OSA tab highlighted, move the file to be compared to the highlighted bar and touch the compare icon. The primary trace will be the first one selected.

To exit the gain tilt mode, open a different scan file or start a new scan. To exit the gain/power tilt modes and return to the total power mode, enter the icon menu select the view parameter, select total power and save.

Measurement

Depending on the system, channels my be listed in wavelength or frequency. To accommodate this, the DWDM Channel Checker may be set to display in nanometers (nm) for wavelength or terahertz (Tz) for frequency. To change these settings, pull up the icon menu and touch the settings icon. Touch the measure setting, choose frequency or wavelength then touch save.

Zoom

The zoom button is used to zoom in on a specific set of contiguous channels. If the set of channels to be viewed is channel 20 to 50 for instance, this feature allows the user to set this range and by pressing the zoom button on the keypad, show only those channels. To set the zoom span, pull up the icon menu and select the setting screen. Touch the zoom setting and with the begin tab highlighted, use the up and down arrows on each digit to set the first channel to be viewed. To set the last channel, highlight the end tab and set this channel in the same manner as the beginning channel. Touch save and touch the scan icon to return to the graph screen.

<u>NOTE</u>
The Zoom feature is limited to maximum of 88 channels. When setting the zoom channels

Section 8   Setting Test Parameters

8.2 General Parameter Tab

Brightness
Depending on working conditions, a lower level of light may be best for optimal viewing of the OSA. Use this brightness setting to toggle between dim and bright settings. To set the brightness level, enter the settings screen by bringing up the icon menu and touching the settings icon. Touch the general tab and then touch the brightness setting, select dim or bright as desire then touch save.

Sound
The sound setting toggles the keystroke speaker on and off. To set the sound on or off, enter the settings screen by bringing up the icon menu and touching the settings icon. Touch the general tab and then touch the sound setting, select on or off as desired and then touch save.

First Channel

Operating systems my have different numbering schemes for their channels. By default 196.29 THz (1527.99 nm) is assigned to channel number 1, and, depending on the resolution setting, The channel numbers increase from there in 50 GHz (0.4 nm) or 100 GHz (0.8 nm) steps. To help sync the DWDM Channel Checker with these systems, it is possible to set the first channel to match that of the system being tested. To set the wavelength or frequency of the first channel, enter the settings screen by bringing up the icon menu and touching the settings icon. Touch the general tab and then first channel. Use the stylus to raise and lower the wavelength/frequency to match that of the system channels, save and touch the scan icon in the bottom left of the display to return to the graph screen.

> ## NOTE
> It's important to note that this prevents reading channels below the established first channel.

Pass Range

For a quick indication of passing channels, the pass range may be set to highlight the power level on the display for a passing channel. Set this range so that channels meeting the passing criteria, fall into the green shaded area of the dBm scale. To set the pass range, enter the settings screen by bringing up the icon menu and touching the settings icon. Touch the general tab and then pass range. Touch the Min tab and use the up and down arrows for each digit to set the minimum acceptable power for a channel. Touch the Max tab and set the maximum acceptable power for a channel in the same method. Touch save to return to the general tab in the settings screen and touch the scan icon in the bottom left of the display to return to the graph screen.

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9.1 Start-up

Press and hold the power button for one second to start the DWDM Channel Checker.   Upon start up the unit will display a notice indicating the current power setting and direct the user to connect to the high or low power ports. If the incorrect power is set, follow the instructions in this guide to change the power level. (Section 8.1)

Power Level Indicator

Low Power	High Power

Low Power Port →

-10dBm max Per-channel Power Input

The device is set to Low Power
Please connect to the indicated port

High Power Port ←

+10dBm max Per-channel Power Input

The device is set to High Power
Please connect to the indicated port
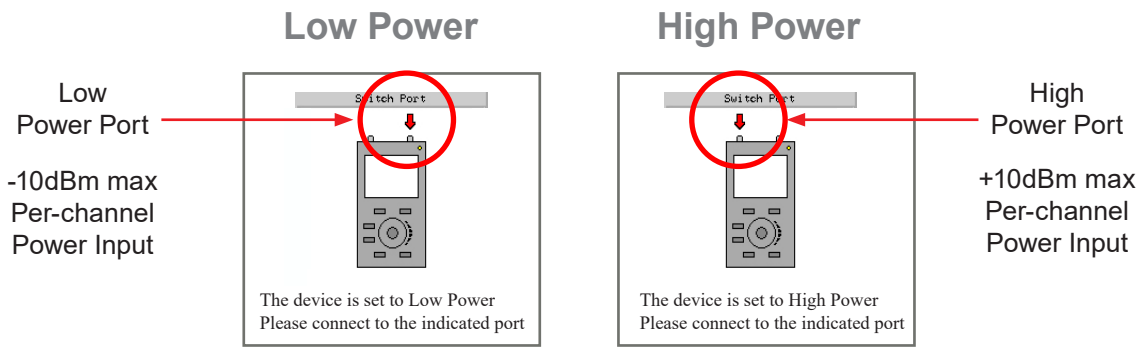
Fig 8.3

Touch anywhere on the display or press the select button to remove the power level indicator from the display.

Warm-up
There is a warm-up stage for the DWDM Channel Checker. The yellow indicator in the bottom right corner of the display indicates the unit is in warm-up mode. When the indicator turns red the unit is ready to scan and a green indicator shows the unit is scanning.

9.2 Connecting Fiber

It is suggested that a test cable be used between the fiber under test and the DWDM Channel Checker. This reference fiber should be approximately on meter in length and have minimal loss. The reference cable should be only be removed from the unit when necessary. Limiting removal and termination of connectors to the unit will extend the live span of the connector, eliminating down time and costly repairs. The FOT-5205 Hand Held OSA is manufactured with either UPC or APC interfaces. Use of the appropriate connectors required to ensure proper operation. Insertion of incorrect connectors will cause damage and require returning the equipment to the factory for repair.

Caution

Fiber-optic connectors are easily contaminated or damaged. The connection to the DWDM Channel Checker is a physical contact type of connection and dirty or damaged connectors may impair the instruments capabilities at minimum and at worst result in the need to return the DWDM Channel Checker to the factory for expensive repairs. Prior to making any connection to the unit, ensure that all proper cleaning procedures have been followed. Only use appropriate connects styles!

Caution

The DWDM Channel Checker have two ports, a low power and high power port. The low power port is designed for maximum power of -10dBm per channel and a maximum composite power of +22dBm. The high power port is designed for a maximum of +10dBm per channel and a maximum composite power of +29dBm.   If unsure of the power level, it is best to start in hi power mode. For more information, please refer to the Power Level paragraph in this section of the User's Guide.

9.3 Taking Scans

Scanning
There is a short warm-up period for the DWDM Channel Checker This is indicated by the scan indicator in the bottom right of the display. Yellow is warming-up, red is ready to scan and green is scanning.

Once all the parameters have been set, the scan button may be press or the scan indicator may be used on the touch screen to start a scan. Pressing the scan button or touching the scan indicator a second time will stop the scan.

AutoTest
The autotest button automatically zooms to active channels. This is the first channel starting from channel 1 that is higher than -45dBm in low power mode (-25dBm in high power mode) and sets that as the first channel in the visible range and then starting from the last channel and working backwards to find the last channel that meets the same criteria and sets it as the last channel in the visible range. This button toggles this feature on and off, and sets the span for the current scan or any scan to follow, until it is pressed a second time. Stored scans will not take the autotest settings from another stored scan, but the setting from a stored scan can be uses on new scans.

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Section 9 Operation

Using Stored Configurations

Test configurations are stored in the file management screen. To use a stored configurations, pull up the icon menu and select the file management icon. Touch the Config tab, from the file list highlight the desired configuration and press select on the keypad or touch the configuration name while highlighted. Scans will now use the established parameters from the active configuration. See section 10.2 for instructions on saving a test configuration.

9.4 Viewing OSA Scans

Graph Display

dBm Scale

"A" Cursor

Channel Number Scale

"B" Cursor

Channel Pass Zone

"A" Cursor Channel Power, Wavelength/Frequency and Channel Number

"B" Cursor Channel Power, Wavelength/Frequency and Channel Number

Power and Wavelength/Frequency Deviation Between "A-B" Channels
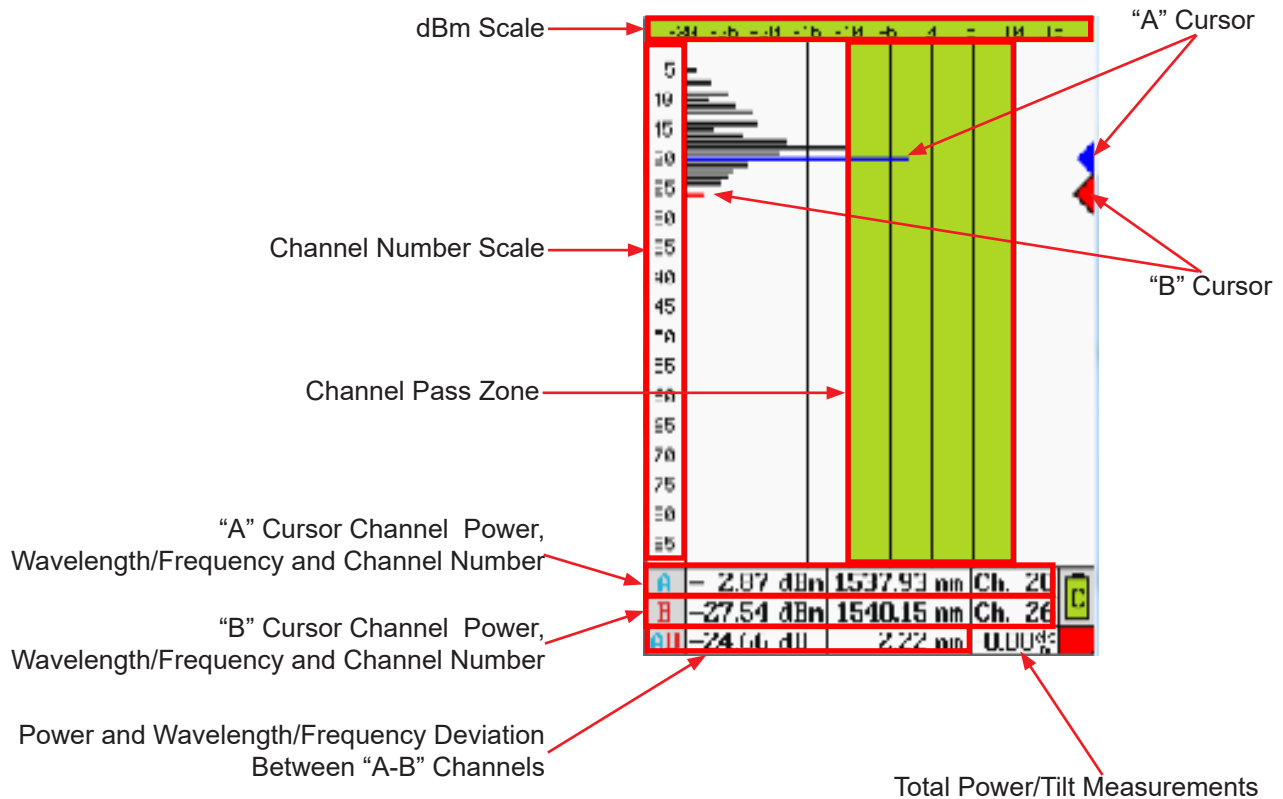
Total Power/Tilt Measurements

Fig 9.1

Section 9 Operation

Graph Information

<u>dBm Scale</u>
The dBm scale at the top of the page indicate -50 to 0 dBm when in Low power mode and -30 to +20 dBm in high power mode. This scale allows for a quick estimate of a channels power, for a highly accurate indication of power use the "A" and "B" cursors.

<u>Channel Scale</u>
The channel scale displays the channel numbers that may be viewed. The scale is normally 1-88 but may be changed if the first channel feature is used. The first channel setting eliminates the number of channels bypassed from the total number, and shifts the scale accordingly. This scale is also modified when Zoom or AutoTest are selected. It shifts the number of channels as selected with the zoom feature. If zoom was set to see only channels 51-60, it would only display those ten channels.

<u>Channel Pass Zone</u>
This green highlighted area of the display assist with quick evaluation of channels for pass/fail state. Set this scale with the pass range setting under the general tab of the settings screen.

<u>Cursor Data Information</u>
Channel power, wavelength/frequency and the channel numbers for selected channels are displayed in the data section at the bottom of the display.

<u>"A" to "B" Cursor Relational Data</u>
The bottom row of the data section indicates the deviation of power and wavelength/frequency between the "A" and "B" cursors.

<u>Total Power/Tilt Measurements</u>
The total power or tilt information is displayed in the bottom right most cell of the OSA's measurement table and graph screen.

9.5 Cursor Movement

The "A" and "B" cursors may be moved with the touch screen or the up and down buttons on the keypad.

Set Active Cursor
The cursor to be moved must be set as the active cursor. This is indicated with a black outline around the cursor point on the right side of the display. To set the active cursor, touch anywhere in the right most column of the graph that contains the cursor points or press the A/B button on the keypad. Either method will toggle between the cursors.

Cursor Movement
To move a cursor, touch anywhere between the channel number column and the cursor point column and the active cursor will snap to the channel selected. To slide the cursor up and down on the display, touch the display and slide the stylus up and down to drag the cursor to the desired position/channel number. The up and down buttons on the keypad will move the cursors as well.

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Section 9 Operation

9.6   OSA Table View

Using the Table display offers all the same information as the graph view in a tabular format. Touching any channel value field will snap the active cursor to that channel number, or the stylus may be moved up and down the columns to drag the active cursor.

Note
To toggle between the graphical view and the table view touch the left most channel number column.

Channel Numbers

"A" Cursor

"B" Cursor

"A" Cursor Channel Power, Wavelength/Frequency and Channel Number

"B" Cursor Channel Power, Wavelength/Frequency and Channel Number

Power and Wavelength/Frequency Deviation Between "A-B" Channels

Total Power/Tilt Measurements
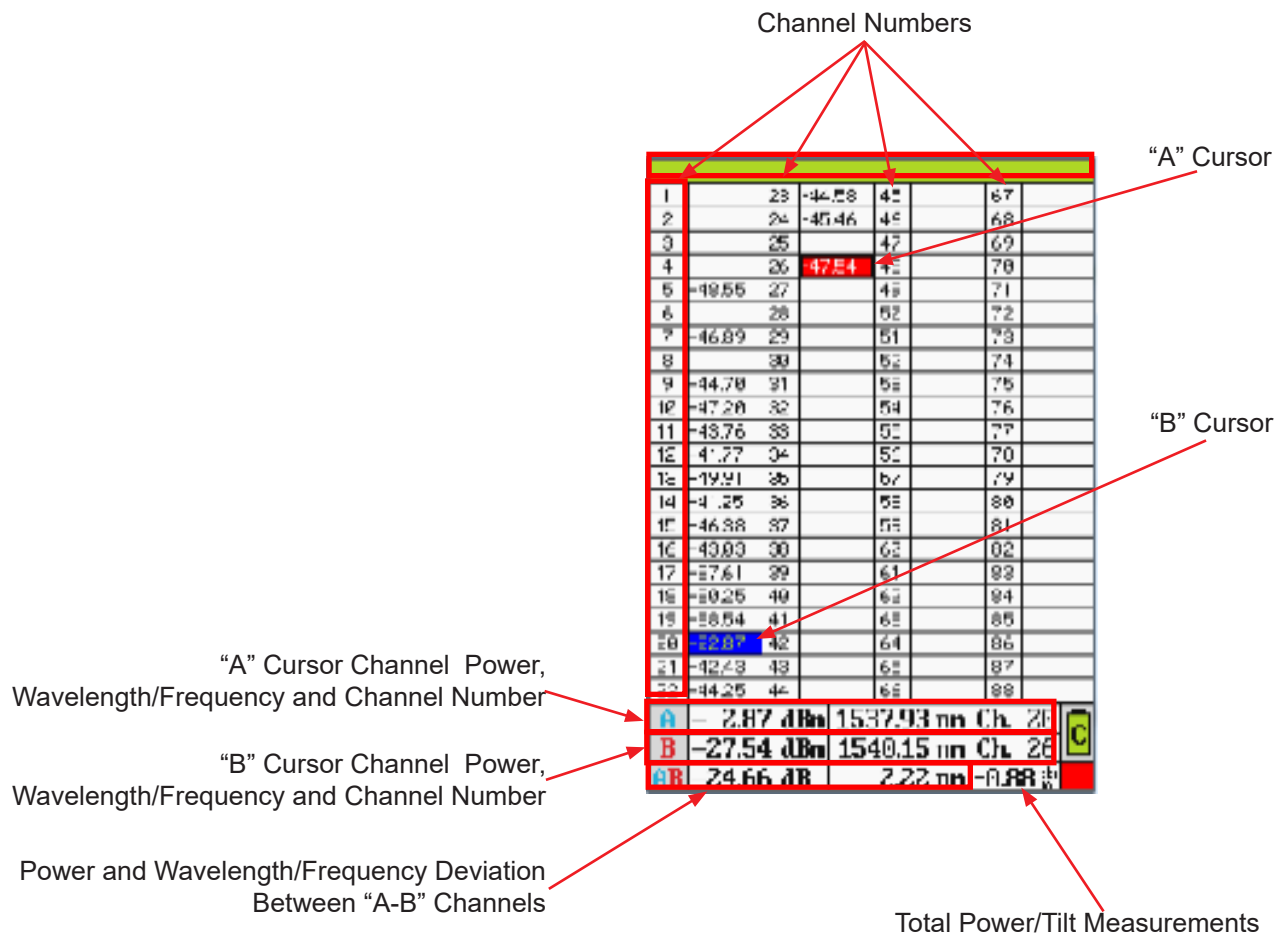
Fig 9.2

Note
Channels that pass based on the pass range setting will have dBm values displayed in green.

Section 10   File Management

File Management is accessed through the icon menu. To open the file management screen, bring up the icon menu, highlight the file management icon and press select on the keypad or touch the file icon on the display.

10.1 File Management Display

Main File Management Screen (OSA Folder)

Scan Preview

File Operation Icons

File List

Folders

Save Button

Return to Icon Menu

Fig 10.1

Configuration Screen

Configuration Folder Open with
Parameters Preview at the Top
of the Display

Fig 10.2

Section 10   File Management

10.2 Saving files

Saving OSA Files

To save an OSA scan, open file management, ensure the OSA tab is highlighted and touch save. The file naming screen with the onboard key will be displayed. The name of the last file saved during a session will be the default name a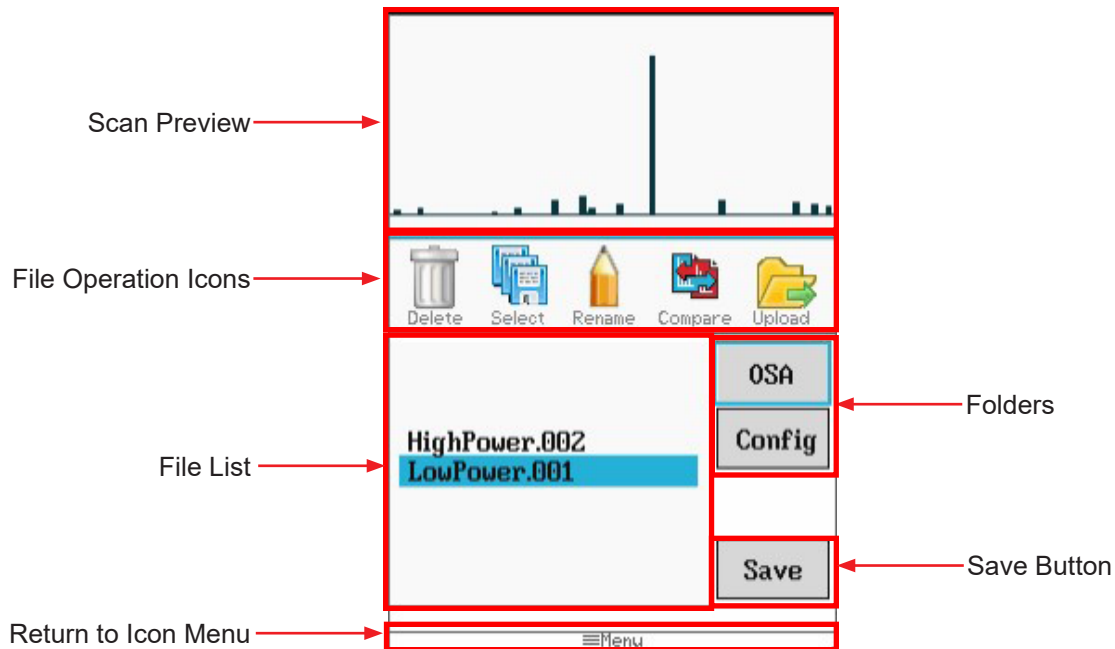nd anytime the unit is powered on the default name reverts to "default" Use the onboard QWERTY keyboard to name the file and touch save.

Saving Configurations

At any time the current parameters may be save as a testing configuration. To create a set of parameters, use the settings screen and set all the testing parameters to the desired values. Open the file management screen, highlight the Config tab and touch save. Name the configuration as required and touch save.

10.3 File Operations

Marking Files For Batch Operations

Multiple files may be uploaded (copied) to a computer, or deleted at a time. To mark the files for these operations, highlight a file to be included in the operation and touch the select icon. The highlighted filename will now be displayed in red and the next file will be in the highlighted position. Continue marking (selecting) file by touching the select icon. To skip files simply move down the file list until the next file to be marked is highlighted and touch select again. The select icon is a toggle and to unmark a file, place it in the highlighted position and touch select icon again and it will be unmarked. Once the files are selected touch the icon for the delete or upload functions.

Note: If files have been marked for batch processing, only the marked files are process not the highlighted file as in single file processing. (The last file in a list may be marked when in the highlighted position)

Section 10   File Management

Deleting Files

To delete a single file, with the file name in the highlighted position, touch the delete icon. To delete a group of files, select the files as noted in batch processing and touch the delete icon.

Note
Once the delete icon is selected, file are immediately deleted and they may not be recalled.

Rename Files

To rename a file, position the file to the highlighted position and touch the rename icon. Use the QWERTY keyboard to name the file as desired and touch save.

Compare Files

The compare files feature is used as described in Gain Tilt function and to simply overlay one scan to another. The primary scan is the first scan on the graph. This scan will determine the parameters and the data listed will be that of the primary scan. The primary scan is displayed in black and the secondary scan is displayed in pink. New scans that have just be acquired but not saved may be used as the primary scan. Once the scan has been acquired, open file management, with OSA tab highlighted, highlight the file to be used as the secondary file and touch the compare icon.   If the View is set to total power the scans are just in comparison mode with the primary scan information. If the view parameter is in Tilt Monitor mode the gain tilt regression line will be displayed.

Upload Files

The upload files icon is used to send files to the computer for use with the CertSoft software suite. One or more files may be uploaded at a time. Use the select icon feature to select multiple file or have the file to be uploaded in the highlighted position. With the OSA connected to the computer with the USB cable, and the CertSoft software running, touch the upload icon and the files will transfer to the selected folder on the computer.

Note: Config files cannot be transferred to the CertSoft software.

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Section 11   Maintenance

11.1 Battery Replacement

To replace the batteries, remove the OSA from the protective boot by pulling the bottom of the boot down and back allowing the bottom of the unit to be lift out. The battery door is located on the back side of the unit. Replace the batteries with only high quality AA NiMH batteries. Spare battery packs are available with a charging unit for extended battery operation. If you install NiMH batteries that are dead or less than 1 volt each, charge these batteries for one (1) hour before using the OSA. For proper maintenance, batteries require a monthly recharge.

Warning

To Prevent Fire or Shock Hazard:

> ➢　　Do not install battery types other than those specified by the manufacturer
> ➢　　Do not use the charger without the batteries installed
> ➢　　Do not expose the battery charger to rain or excessive moisture
> ➢　　Do not use the AC adapter when there are signs of damage to the enclosure or cord
> ➢　　Ensure that you are using the correct charger for the local line voltage
> ➢　　Do not use any other charger than the one provided with this instrument.

Failure to follow these caution statements may void the warranty of this equipment.

Note
For maintenance, batteries require a monthly recharge.

11.2 Calibration and Verification

Periodic verification of the DWDM Channel Checker is recommended to ensure that your instrument remains within specification. Although not imperative, we recommend a calibration and verification once a year to make certain the instrument is functioning properly and performing to its rated specifications. Consult the factory for service.

11.3 DWDM Channel Checker Adapter Replacement

The DWDM Channel Checker is supplied with two easily interchangeable adapters per port, SC/FC. To change an adapter, remove the two screws that hold the adapter in place, pull the adapter straight up from ferrule. It is suggested that you clean the exposed ferrule with appropriate cleanser and lint free wipe anytime you replace the ferrule.

Note
In order to maintain a low loss fiber connection, care should be taken to adequately clean the ferrule of any connector to be connected to the OSA.   In the event that the port needs to be cleaned, first step is to be certain the instrument is off. We suggest the use of isopropyl alcohol and foam swabs specifically designed for cleaning connectors accepting 2.5mm ferrules.

Note
When replacing the adapter with one that does not have a chained protective cap, use the small screw in place of the larger screw that retains the end of the chain to the adapter base.

Section 12   Specifications

DWDM Channel Analyzer Specifications	
Wavelength Range	96 Channel 196.2 THz - 191.45 THz (1565.9 nm to 1527.9 nm) Channel 14.5-62 48 Channel 191.5 Thz - 196.2 THz Channel 15-62
Channel Spacing	96 Channel 50GHz or 100GHz 48 Channel 100 GHz
Wavelength Accuracy	±0.1nm
Channel Power Range	+10dBm to -50dBm
Absolute Accuracy	±1 dB
Max Composite Power	+28 dBm
PDL	±0.15dB
Optical Rejection Ratio	40dBc (@50GHz)
Measurement Time	< 1/2 Second
Readout Resolution	0.01dB
Return Loss	>40dB
Optical Interface	Universal UPC or APC Adapters (FC/SC)
Graphical Display	bar graph and table view
Display	4 in. Touch color TFT
Dimensions	7.62" L x 3.88" W x 1.56" H (194mm L x 99mm W x 40mm H
Weight	1.6 lbs
Battery	Rechargeable NiMH - 4 hours operating time
Power	100-240 universal US, GB, EU, AU Mains
Operating Temperature	-10°C to 50°C
Storage Temperature	-20°C to 60°C
Accessories Included	Universal power supply with mains for US, UK, CE and AU. Interchangeable FC and SC adapters, CertSoft Software Suite, USB cable, manual on CD and rubber boot

Specifications are subject to change without notice

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Section 13   Warranty and Repair

13.1   Warranty Information

This product, including all mechanical, electrical, and optical parts and assemblies are unconditionally warranted to be free of defects in workmanship and material for a period of one (1) year from the date of delivery.

This warranty does not apply to expendable parts such as batteries or optical panel connectors, nor to any instrument or component which has been subjected to misuse, alteration, or fiber connector damage. It is the customer's responsibility to understand all the instructions and specifications prior to operating this instrument. This warranty does not extend to any loss or damage consequent to the failure of the warranted product.

13.2   Repair Information

If repair is required, simply call the factory for return instructions and a return authorization number (RMA).

Section 14   Trouble Shooting Guide

Symptom	Possible Cause	Solution
LCD dark	Power not on	Press ON/OFF key
	Batteries require recharging	Recharge batteries
	Batteries are missing, in backwards or need replacement	Check polarity, replace batteries, or contact factory for servicing
LCD white	Power cycled too quickly	Turn off wait 10 seconds – turn on
Instrument locked Up	Unexpected Operational Mode	Turn off (hold ON/OFF button in for 1 second) wait 10 seconds – then depress On/Off again button to turn the unit on.
Activity indicator does not change to standby or active mode	Power cycled too quickly	Turn off wait 10 seconds – turn on
Low or no power being displayed	Defective cord or dirty connector	Replace or clean cord
	Fiber Output port requires cleaning	Clean and inspect port
	Angle polish mated with UPC polish	Examine connector ends for damage. Use UPC Connectors ONLY!
USB hookup to PC not functioning properly	USB baud rate not set properly or too quick for computer	Set port baud rate properly or decrease Baud rate in instrument and certification software
	PC drivers not set properly	Un-install & re-install certification software and drivers

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Section 15   Version Control

Through a program of continuous improvement, we upgrade the features and performance of the instrument in an on going process. The instrument firmware version is accessible at "turn-on" on the bottom right-hand corner of the display. The version changes and approximate release dates are as follows.

V1.1.3.2 – 1/2018 - Original release