



FTE-5200 Loss Test Set User's Guide

**Revision A
1/2021**

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This manual contains operation information for the Terahertz Technologies Inc., FTE-5200 Loss Test Set. This touch screen is a resistive style screen and only proper stylus devices should be used when operating this equipment.

Precautions

This Loss Test Set is an optical instrument that does emit laser radiation and though this level of radiation is not considered a danger, there are safety considerations and certain practices that should be followed.

Please read and follow all warning and caution information noted in this manual.

There are warnings, cautions and notes posted throughout this manual.

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.

Chapter 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.

The information in this chapter pertains to safety consideration of Loss Test Sets in general.

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

This document contains information 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 and cautions can result in harm to the user or damage to the instrument.

Warning

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

Warning

Never look directly into the end of a connected fiber optic cable or fiber optic interface of optical test equipment, to do so could expose the user to laser radiation and could result in 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 proper battery 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 USB Cable
- Ensure that you are using the correct charger for the local line voltage

Failure to follow these cautions statements may void the warranty of, or cause damage to this equipment.

Caution

Fiber-optic connectors are easily contaminated or damaged. The laser source connection on this Loss Test Set is physical contact type of connections and dirty or damaged connectors may impair the instruments capabilities at minimum and at worst result in the need to return the LTS to the factory for expensive repairs. Though the power meter port is not a physical connection, it is necessary as well to ensure only clean connectors are inserted into the power meter port. Poor test results and/or damage may result if proper cleaning procedures are not followed.

Caution


**Light source connections may be ordered with either UPC or APC finishes. Damage will occur to the internal ferrule and or adapter if the improper connector is used. An APC label will be affixed over the port if APC connectors are requires.

**Both APC and UPC polished connectors may be inserted in the power meter port or VFL Port.

Warning

Please read all safety information prior to using this quick start guide

3.1 Loss Test Set Quick Start Guide

Press  to turn on the FTE-5200 Loss Test Set.

Use the supplied stylus and touch the LTS icon.

Absolute Measurement

Connect fiber under test the power meter port.

Select wavelength to be measured by touching the Power Meter value in the bottom left of the power meter display the absolute power will be displayed.

Relative Power, Two Reference Cord Method

Connect first fiber to the proper port of the light source. (If the unit is a SM/MM Quad wave light source there will be two ports.) Connect the second fiber to the power meter.

Use a mating sleeve or appropriate adapter to connect the two reference cords.

Select the laser to be used by touching the source wavelength (or OFF indicator) in the tops left of the light source display.

There is no need to select the power meter wavelength as it will be automatically set once the source is detected by the power meter.

Allow the laser to warm and stabilize. Once the source is stable, touch the Reference indicator in the bottom right of the power meter display. Select Set Reference to zero the power meter.

Disconnect the two reference cords from each other.

Note

Do not remove the cable from the light source port or a new reference will be required.

Insert the fiber to be tested between the two reference cords. The resulting measurement is the loss of the fiber under test, which because the test cables were referenced out (unit zeroed) this loss measurement does not include the loss of the reference cords.

3.2 ORL Quick Start Guide (LTS Single Mode models only)

Warning

Please read all safety information prior to using this quick start guide

Caution


Fiber-optic connectors are easily contaminated or damaged. The laser source/ORL connection on this Loss Test Set is physical contact and dirty or damaged connectors may impair the instruments capabilities at minimum and at worst result in the need to return the LTS to the factory for expensive repairs. For the most precise ORL measurements, it is imperative that only clean undamaged fiber connectors be inserted into source/ORL port of this meter

Caution

**Light source/ORL connections may be ordered with either UPC or APC finishes. Damage will occur to the internal ferrule and or adapter if the improper connector is used. An APC label will be affixed over the port if APC connectors are requires.

**Both APC and UPC polished connectors may be inserted in the power meter port or VFL Port.

It is a good idea to use a test cables to minimize repeated connections to the test port when ever possible.

Press  to turn on the Loss Test Set.

Use the supplied stylus and touch the LTS icon.

Connect test cable or fiber under test to the source/ORL port.

Select the wavelength to be tested by touching the Source wavelength (or OFF indicator) in the top left of the display, below the home icon and selecting the desired singlemode wavelength.

Set to ORL mode by touching the Test/Unit Measurements in the center of the display until ORL is Displayed. Allow source to stabilize and read ORL measurement

Dear Valued Customer,

Thank you for choosing Terahertz Technologies Inc. for your fiber optic testing requirements. Our professional staff is available to answer any questions or provide assistance that you require. We at Terahertz Technologies Inc., strive to provide premier customer care and technical support by providing timely responsiveness and training. We are proud of our quality and high standards and assure you, our customer, the most user friendly and affordable fiber optic solutions to meet individual needs.

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. Loss Test Set with protective boot
2. USB 5 Volt charger and cable
3. Manual and CertSoft software on CD.
4. SC, FC and ST source adapters (No ST adapters when ordered with APC)
5. ST, FC, SC, 1.25 universal and 2.5 universal Power Meter adapters
6. 2 Stylus

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.

6.1 Loss Test Set Physical Description/Package

Instrument Enclosure

The TTI FTE-5200 Loss Test Set is packaged in a rugged 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 soft damp cloth to clean up the panels and the outside case. See the maintenance section to clean the optical connector. NEVER open the instrument for cleaning. Return to the factory for servicing if necessary.

Front Panel



Top panel

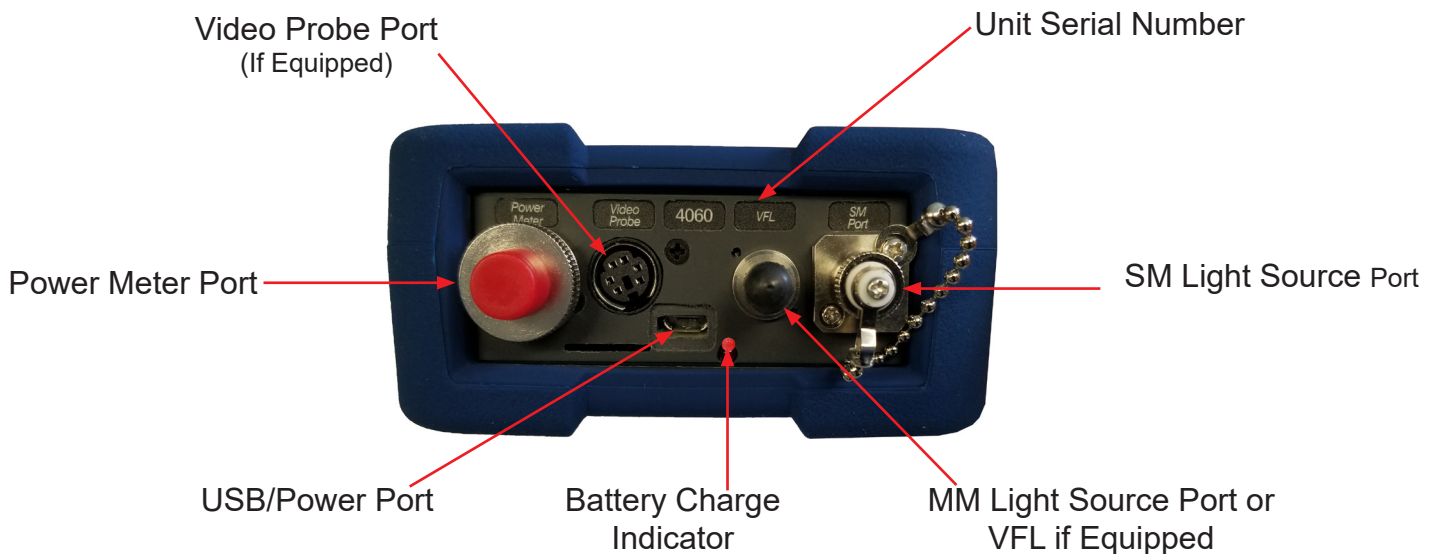


Fig 6.2

6.2 Home Screen Display

This unit is equipped with a 4" color TFT resistive touch display.

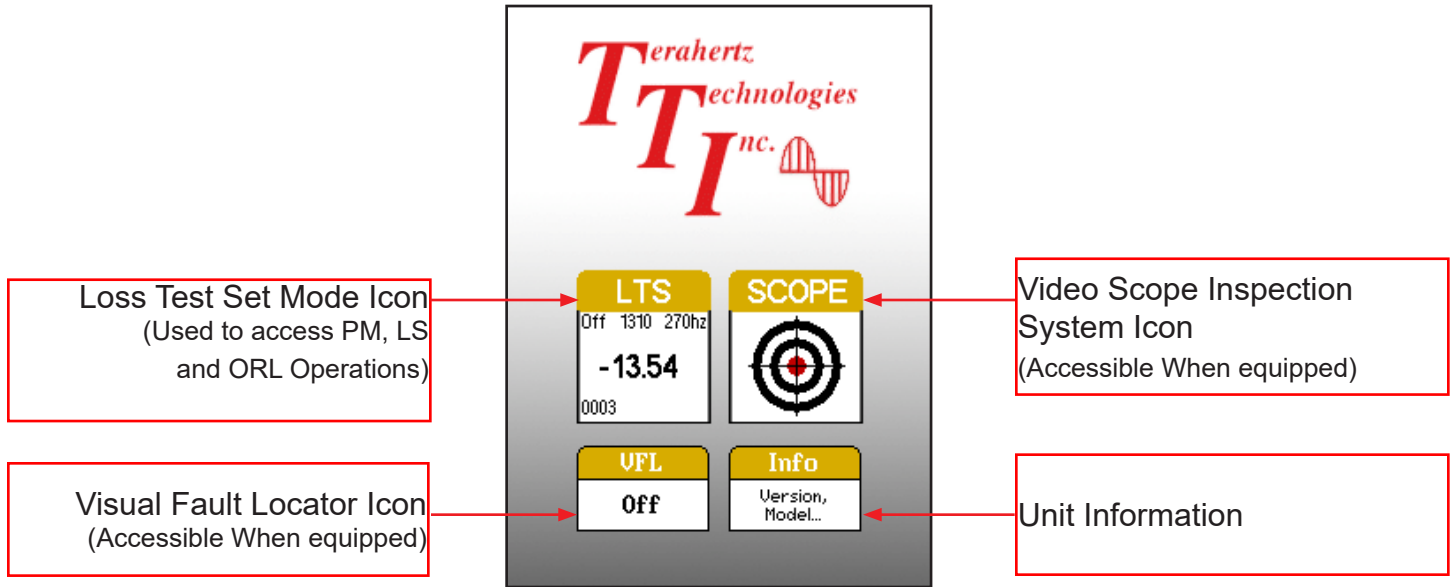


Fig 6.3

6.3 Power Requirements

The FTE-5200 Loss Test Set is equipped with a 3500mAh Li-ion battery.

The FTE-5200 Loss Test Set is supplied with is equipped with a 8000mAh Li-Poly battery. It is also supplied with a 100-240V USB power adapter with 5VDC, 2.1A output. A fully charged Li-Poly battery will typically enable approximately 12 hrs. of use and require approximately 4 hours of recharging.

6.4 Battery Replacement

The battery is not field replaceable. An RMA should be acquired and the unit must be returned to the factory for battery replacement. This Li-Poly battery pack should not be punctured, incinerated or disposed of improperly.

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 proper battery 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 USB Cable
- Ensure that you are using the correct charger for the local line voltage

Failure to follow these caution statements could cause unsafe conditions for the operator and equipment and may void the warranty.

7.1 Entering Loss Test Set

Power on the unit and touch the LTS icon on the home screen. This will afford direct access to the Loss Test Set and ORL Meter.

7.2 Loss Test Set Display

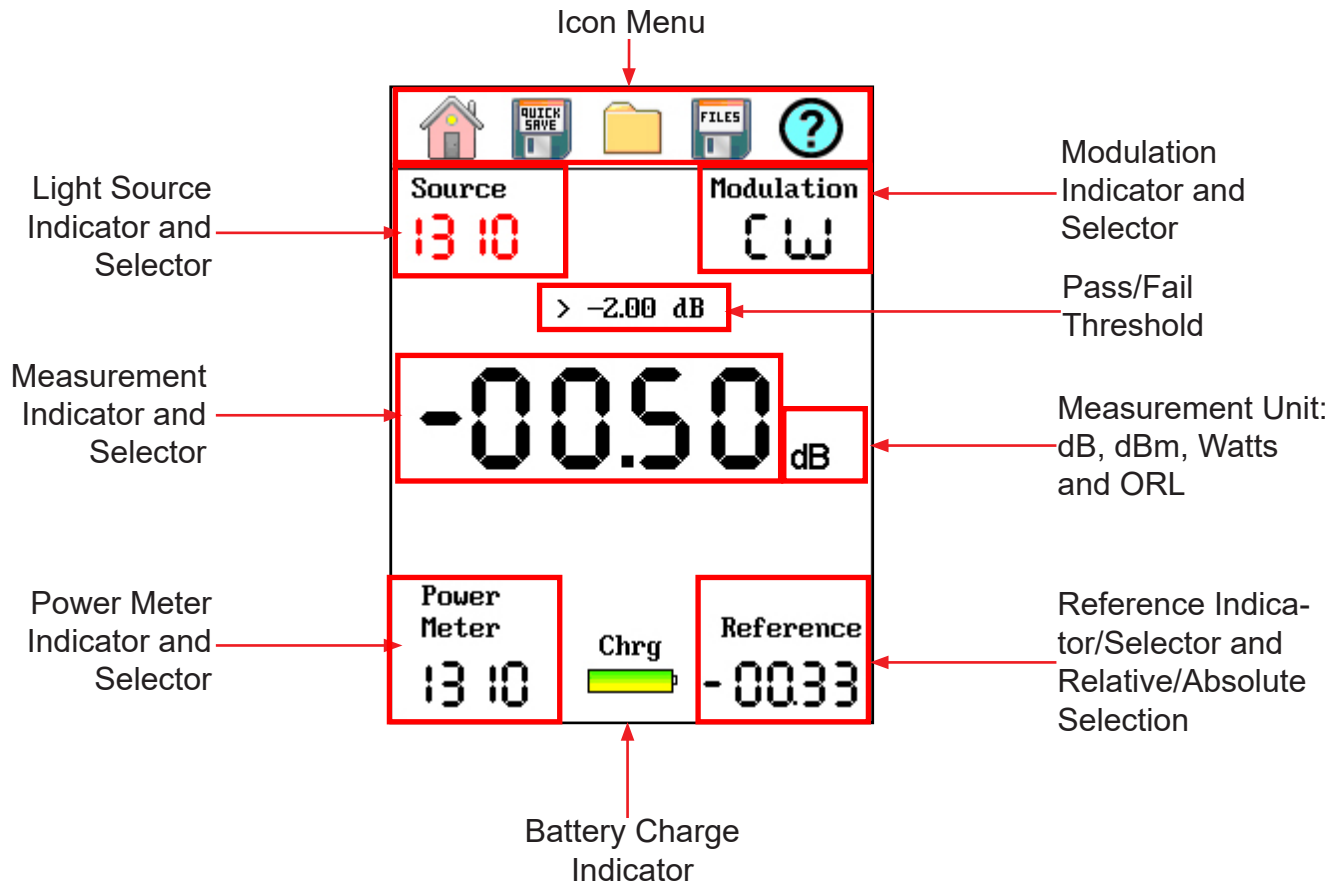


Fig 7.1

7.3 Loss Test Set Icon Menu

Home

Touch the home icon to exit the LTS/ORL function and return to the home Screen.

Quick Save

Touch Quick Save to save the current test data to a file in the active project folder with an LTS or ORL label and files will be automatically incremented to the next numbered suffix.

Project Management

Project Folder opens the project management screen. For a full description of project management operation, please refer to "Chapter 9" of this user's guide.

File Management

File Manager opens the file manager screen. For a full description of file management operation, please refer to "Chapter 10" of this user's guide.

Help

Touch the help icon to open context sensitive help information.

7.4 Parameter Settings

Set Light Source Wavelength

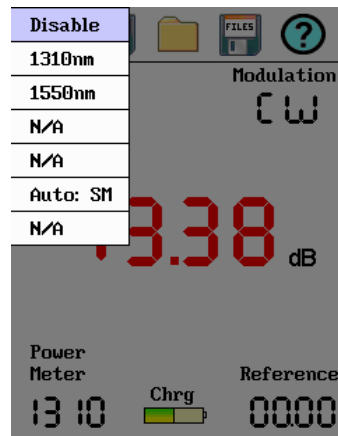


Fig 7.2

The light Source wavelength is indicated in the top left of the display. To change the wavelength, touch the indicated value and a list of available sources will be displayed. Touch the wavelength to be tested.

The available source list will most likely include one or two auto options. When auto is selected, the loss test set is placed in auto test mode. If the Loss Test Set has 1310nm and 1550nm sources, Auto SM will include these two wavelengths. The source will cycle through the two wavelengths and the power meter will respond accordingly. See section 7.5 for more information about Autotest.

Set Power Meter Wavelength

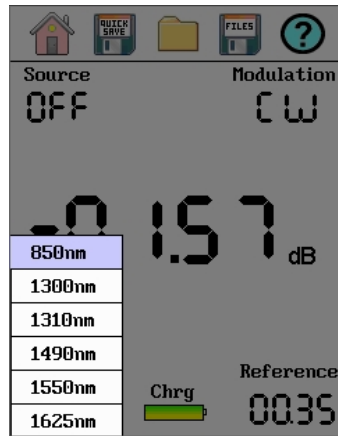


Fig 7.3

The Power Meter wavelength being tested is indicated in the bottom left of the display. To change the wavelength, touch the indicated value and a list of calibrated wavelengths will be displayed. Touch the wavelength to be tested. Available wavelengths are 850/1300/1310/1490/1550/1625nm.

NOTE:

When using compatible equipment the Auto-Wavelength feature will ensure that the power meter is set to the same wavelength as the light source.

Set Modulation Mode

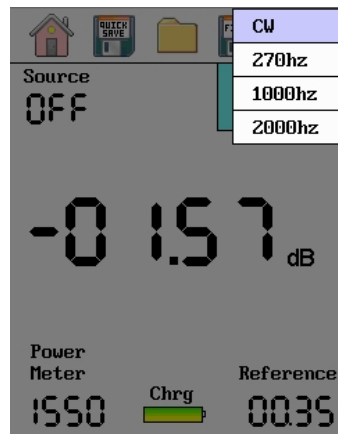


Fig 7.4

The light source may be used as a fiber identifier by using the modulation feature. To set the modulation value, touch the modulation identifier and select the desired modulation rate.

NOTE:

If operating at 270Hz, it is necessary to shut modulation off prior to changing wavelengths.

Set Power Meter Reference / Absolute Test Mode

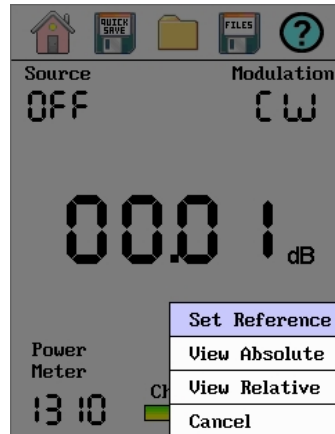


Fig 7.5

To select the test mode, either absolute or relative, touch the Reference area on the display. Select either View Absolute or View Relative measurements. When testing relative mode, this is also where the reference value is set. When the reference cable/s are in place, enter this setting area and touch Set Reference.

NOTE:

When making relative measurements with compatible equipment, it should not be necessary to set your power meter wavelength since these units have auto wavelength detection.

Power/ORL Selection, Measurement Unit and Threshold Settings

Touch the value in the center of the display/measurement area to cycle through the test modes and units of measure.

View Power or ORL

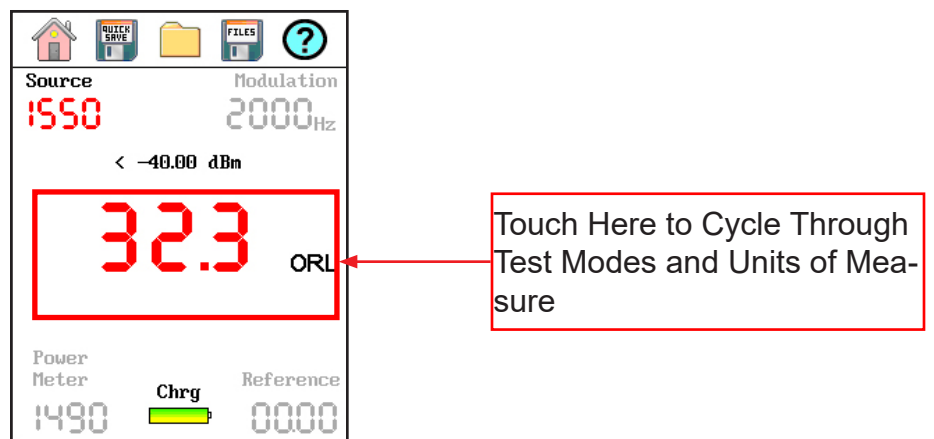


Fig 7.6

Units of Measure

There are three measurement modes, relative power, which use dB unit of measure, absolute power testing mode which uses dBm, mW, μ W or nW for its units of measure and ORL mode which is displayed in units of dBm. To set the test mode and units of measure, touch the power reading in the center of the display and cycle through the available settings.

Pass/Fail Threshold Settings

Pass/Fail thresholds are located in the center of the screen, just above the power reading. To set the desired thresholds, touch the threshold reading and use the onboard keyboard to type in the required value. Touch save when done to set the value.

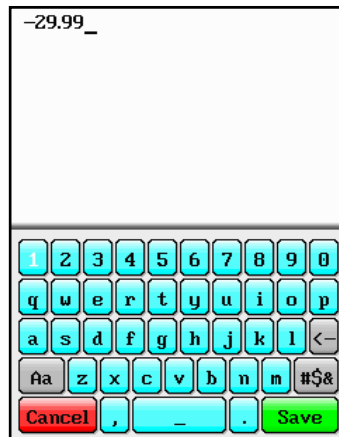


Fig 7.7

NOTE:

Do not forget to enter the negative sign prior to the dB value.

7.5 Auto Test

This feature is set while selecting the laser source. The auto test option cycles through two wavelengths to help quickly test fiber. On standard models there will be either dual SM lasers, dual MM laser or both dual SM and MM lasers available in the source selection. When an Auto selection is made under the source indicator, the two MM or SM sources will cycle and test at both wavelengths. This option can test to -36dB and has a reference of 3.00dB automatically established. If this is conducive to your testing conditions, this is a quick way to get all your testing accomplished at multiple wavelengths.

7.6 Save Loss Measurement/Power Reading

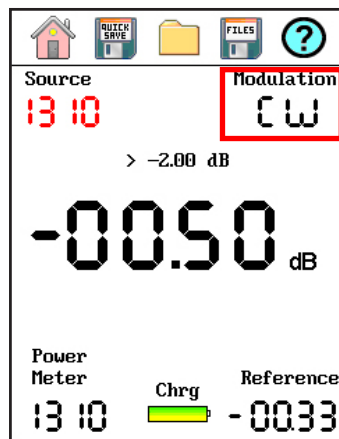
Setting Base File Name

To save the first test, go to the project folder, and create a new project or select a previously save folder by touching the folder name while it is highlighted. The file folder of this project will now be displayed. Draw down the File Menu, and touch File, Save. Enter the base file name and touch save to save the new name to the folder. Exit file management and touch Quick Save. The file saved with quick save will have a 3 digit suffix and the first file with the suffix will be 001. All files save until a new base file name is selected with have this base file name with an incremented suffix.

Save Multiple Wavelengths

To save multiple wavelengths for a fiber, simply test the fiber at the first wavelength let the value settle, then change wavelengths and let the value settle. Touch Quick Save and both measurements for that fiber will be save in the same file.

7.7 Modulation/Fiber Identifier Mode



The modulation mode may be used as a fiber identifier. To use this mode, set the modulation to the desired rate and select the desired laser source.

Caution

Fiber-optic connectors are easily contaminated or damaged. The laser source connection on this ORL meter is physical contact type of connections and dirty or damaged connectors will impair the instruments capabilities at minimum and at worst result in the need to return this test equipment to the factory for expensive repairs.

Caution

Ensure the connectors used to interface with this unit are the appropriate style UPS or APC. If the unit has APC connectors, it will be labeled directly above the adapter on the top panel.

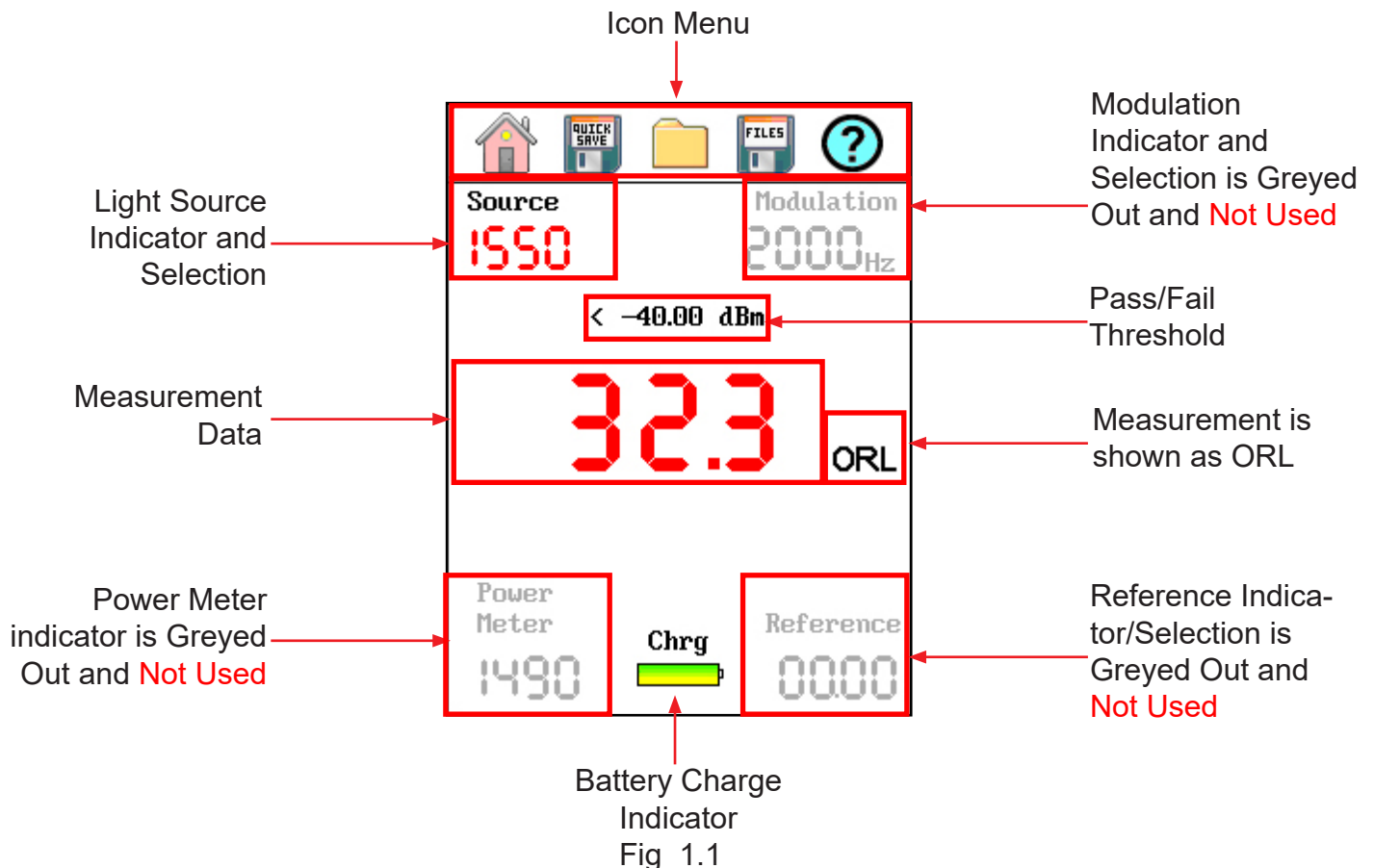
NOTE:

ORL Mode is not accessible in Loss Test Sets that do not have SM wavelength sources.

8.1 Entering ORL Mode

Enter the ORL mode by touching the measurement area (measurement data) in the center of the display to cycle through the measurement modes.

8.2 ORL Meter Display



8.3 Set ORL Wavelength

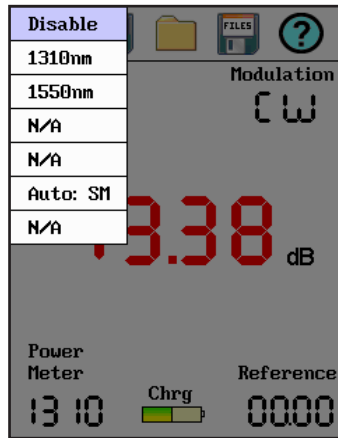


Fig 8.2

The light Source wavelength is indicated in the top left of the display. To change the wavelength, touch the indicated value below Light Source and a list of available sources will be displayed. Touch the wavelength to be tested. Available standard wavelengths for the ORL are 1310nm and 1550nm.

NOTE:

Dual wavelength autotest modes are not accessible in the ORL meter function.

8.4 ORL Pass/Fail Threshold Settings

Pass/Fail thresholds are located in the center of the screen, just above the power reading. To set the desired thresholds, touch the threshold reading and use the onboard keyboard to type in the required value. Touch save when done to set the value.

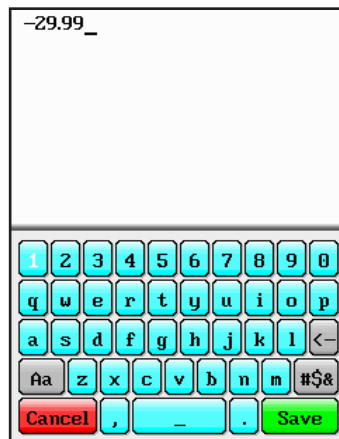


Fig 7.7

NOTE:

Do not forget to enter the negative sign prior to the dB value.

8.5 Taking ORL Measurements

Caution

Fiber-optic connectors are easily contaminated or damaged. The laser source connection on this ORL meter is physical contact type of connections and dirty or damaged connectors will impair the instruments capabilities at minimum and at worst result in the need to return this test equipment to the factory for expensive repairs.

8.6 Checking Panel Connector

Power on the unit and enter the ORL Mode. With no fiber connected to the unit, touch source selection and select 1310nm. The ORL measurement should read approximately -14.4 dB. If this measurement is off by more the +/- .5dB, attempt to clean the panel connector.

Caution

Ensure the laser is turned off prior to cleaning the optical interface. Failure to do so could cause damage to the FTE-5200 Loss Test Set

This should be done with a one-click style cleaner or foam swab. This FTE-5200 includes Video Scope capability. The optional video probe should be used to check for connector cleanliness. Once the connector is cleaned and checked, ensure there is nothing attached to the optical port and restart the 1310nm Laser and check for the -14.4 value. If a reading of -14.4 +/- .5dB cannot be attained, a user/temporary calibration feature may be used.

NOTE:

The measurement is labeled ORL for easy identification of the test being performed. ORL measurements are made in dB mode as they are measuring a loss.

8.7 Conducting an ORL Test

Caution

Fiber-optic connectors are easily contaminated or damaged. The laser source connection on this ORL meter is physical contact type of connections and dirty or damaged connectors will impair the instruments capabilities at minimum and at worst result in the need to return this test equipment to the factory for expensive repairs.

Clean connector to be attached to the ORL Meter. Insert the appropriate connector to SM port of the Loss Test Set. Touch the source identifier on the display and select the desired SM wavelength.

8.8 Save ORL Measurement

To save the first test, go to the project folder, and create a new project or select a previously save folder by touching the project name while it is highlighted. The file folder of this project will now be displayed. Draw down the File Menu, and touch File, Save. Enter the base file name and touch save. Exit file management and touch Quick Save. The files saved with quick save will have a 3 digit suffix and the first file with the suffix will be 001. All files save until a new base file name is selected with have this base file name with an incremented suffix.

9.1 Project Management Description

Project management is used to manage data and store it into project folders. Any power measurement, ORL measurement and video image may be stored into a single folder. Details about the project such as, customer, Date, Operator, and the to and from locations may be stored for each project.

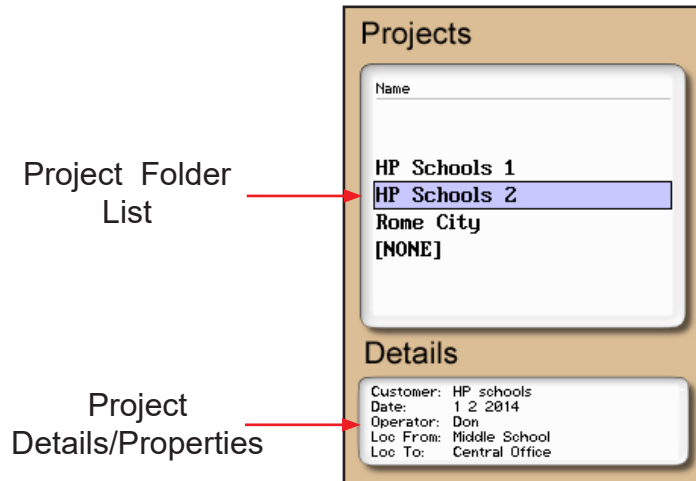


Fig 9.1

9.2 Using Project Management

Open Project Management

To open project management, on the top menu bar, select the file folder icon. The file management tab is drawn down from the top of the display. The main file menu tab includes File, Edit, View and Help.

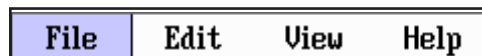


Fig 9.2

Project Management File Tab

Touch File to draw down the file tab menu. Available items are New, Open, Delete and Exit.

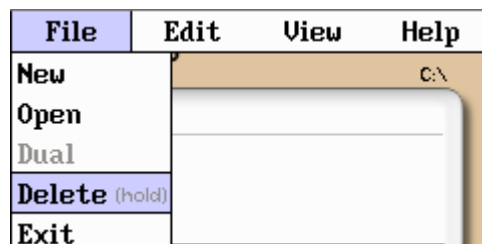


Fig 9.3

New

Select new to save a new folder. The folder naming window will open and the onboard QWERTY key board will be available. Use the touch keyboard to name the file and touch save. The folder names are limited to 16 characters. At the bottom of the display are the folder details, go to Edit and Properties to enter this details about this folder

Open

Open is not used in the power meter or ORL modes. It is used to open scope images in the Video Scope feature.

Delete

To Delete a folder, with the folder highlighted, long touch Delete. One folder at a time may be deleted but this does delete all files within that folder. Deletion is permanent so ensure you are deleting the correct information.

Exit

Touch Exit to leave project management.

Project Management Edit Tab

Touch Edit to draw down the edit menu. Available are Upload, Rename and Properties.

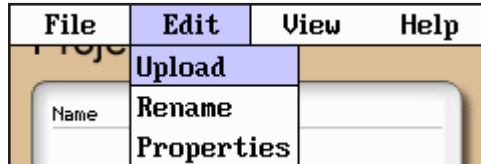


Fig 9.4

Upload

Touch Upload to transfer a folder with all its files to the CertSoft software. The FTE-5200 Loss Test Set must be connected to the computer with the USB cable.

Rename

Rename allows the highlighted folder name to be modified while maintaining all settings and associated files.

Properties

Properties is used to modify the detail information associated with a project. This information is displayed directly below the project list. The information displayed is for the project name that is located in the highlighted position.

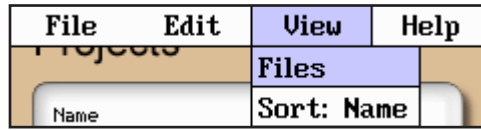


Fig 9.5

Project Management View and Help Tabs

Touch View to enter the view options. Available selections here are File and Sort: Name. Touch Help to open the onboard help text.

Files

Touch the Files tab to switch to file management vs. project management.

Sort: Name

Touch the Sort: name to sort the folders into alpha/numeric order.

10.1 File Management Description

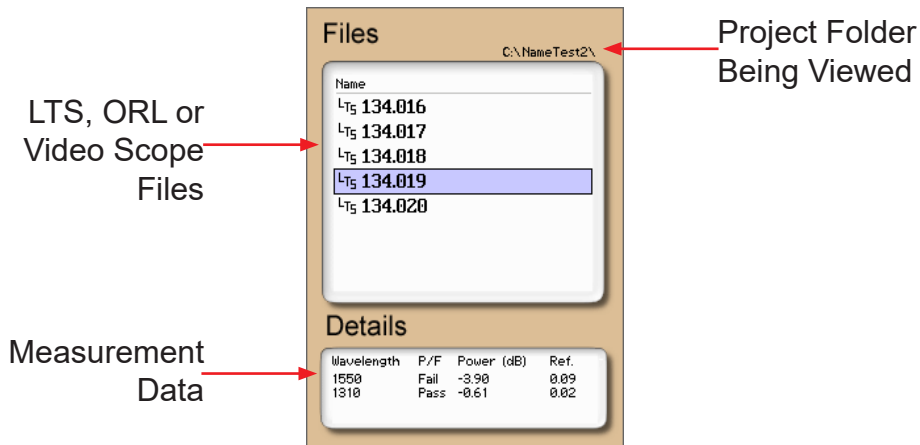


Fig 10.1

10.2 Using File Management

File Management Menu

To open file management, on the top menu bar, select the files icon. The file management tab is drawn down from the top of the display. The main file menu tab includes File, Edit, View and Help.



Fig 10.2

File Management File Tab

Touch File to draw down the file management menu. Available items are New, Open, Delete and Exit.

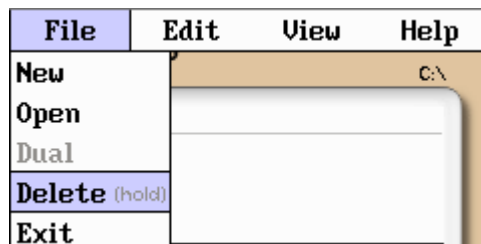


Fig 10.3

Chapter 10 File Management

New

Select save to save a new file name. The file naming window will open and the onboard QWERTY key board will be available. Use the touch keyboard to name the file and touch save. The file names are limited to 16 characters. Use this as the base file name. For example, if TEST is saved as the base file name, save the first test using the Quick Save icon and the file will be TEST.001. Using quick save again will increment to TEST.002 and so on up to TEST.999 at which time a new base name must be set.

Open

Open is not used in the power meter or ORL modes. It is used to open scope images in the Video Scope feature.

Delete

To Delete a file, with the file highlighted, long touch Delete. One file at a time may be deleted in the files tab, all files may be deleted in the project by deleting the project. Delete permanently removes files, they cannot be recovered once deleted.

Exit

Touch Exit to leave project management.

File Management Edit Tab

Touch Edit to draw down the edit menu. Available are Upload, Rename and Properties.

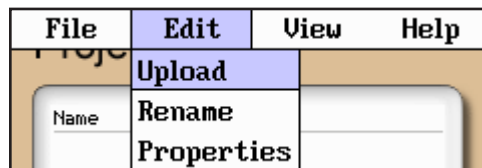


Fig 10.4

Upload

Touch Upload to transfer selected files to the CertSoft software. The file in the highlighted position is uploaded to the computer when Upload is touched. To upload multiple files, use the upload folder option in project management, this will upload all the files associated with that folder. The FTE-5200 Loss Test Set must be connected to the computer with the USB cable.

Rename

Rename allows the highlighted file name to be modified while maintaining all settings and associated files.

Properties

Properties is not available in file management.

Chapter 10 File Management

File Management View and Help Tabs

Touch View to enter the view options. Available selections here are Projects and Sort: Name. Touch Help to open the onboard help text.

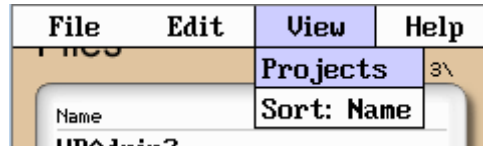


Fig 10.5

Projects

Touch the Projects tab to switch to project management

Sort: Name

Touch Sort: Name to sort the file into alpha/numeric order.

11.1 Entering Video Scope Function

To operate the video scope, from the home screen, touch the Scope icon. If a probe is not connected already, connect the VIS300 video probe to the video probe port on the top of the OTDR.

11.2 Video Scope Display

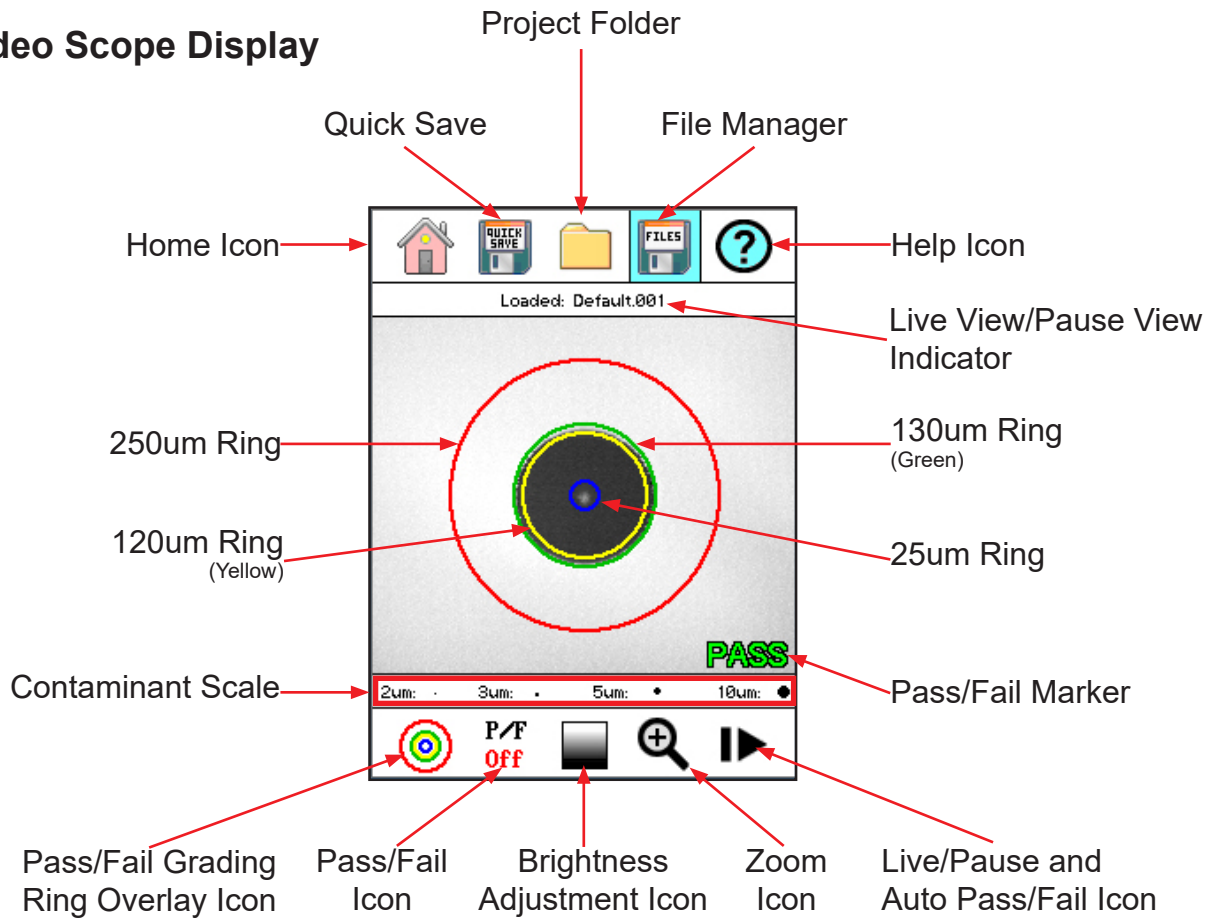


Fig 11.1

11.3 Video Scope File/help Icon Menu

The icons at the top of the display are Home, File Save, Project Management, File Management, and Help.

Home

Touch this icon to return to the Home screen.

Quick Save

Touch Quick Save icon to save the current scope image with the same base file name as the last save scope image. Scope files will be preceded by a target icon.

Project Management

Touch the project management folder and highlight the project in which the scope images are to be stored. When entering the video scope function, the active folder will be the one last used in the OTDR or LTS. For more information about the project management system, please refer to Chapter 9 of this guide.

File Management

Touch the file management icon to view a list of saved files or to open a stored image. File types are identified by the preceding icon. Trace files are indicated by a trace icon, LTS file by an LTS icon and scope files are preceded by scope (target) icon.

Help

Press the menu button, use the left and right buttons to highlight the help icon and press select to view the help information.

11.4 Video Scope Operation Icon Menu

The following functions are only available for use when the video scope is in live scan mode.

Grading Rings

Used to turn on and off the rings that indicate the IEC61300-3-35 grading zones.

Use Pass/Fail Criteria Tables from page 44 to grade the connector end face. 2, 3, 5 and 10 micron contaminant examples are displayed just below the connector image on the video scope display.

Pass/Fail Label

Used to set the pass/fail indicator by cycling through P/F (Pass/Fail) Off, P/F Man (In Red "Fail"), P/F Man (In Green "Pass") and P/F auto. To set the pass/fail indicator, touch the Pass/Fail Icon and set to: off, fail, pass and auto. Once in Auto, with the image centered as close as possible, touche the Live/ Pause - Auto Pass/Fail icon to conduct and auto test of the connector.

NOTE:

If the connector shows all red or the test fails to complete, maneuver the probe tip to allow for centering of the image and retry the test.

Brightness

Touch the Brightness icon to cycle the brightness levels for best image quality.

11.5 Video Scope Operation

To operate the video scope, touch the Scope icon on the Home Screen. If a probe is not connected already, connect the VIS300 Video Probe to the video probe port on the top of the OTDR.

Video Probe Tips

There are a number of video probe tips available. To remove a tip from the Probe, grasp the probe tip and unscrew the tip retention nut from the tip. Pull the tip straight up from the probe. To place a tip on the probe, ensure the lens is clean, slide the tip on to the end of the probe and tighten the tip retention nut. Do not overtighten the retention nut.

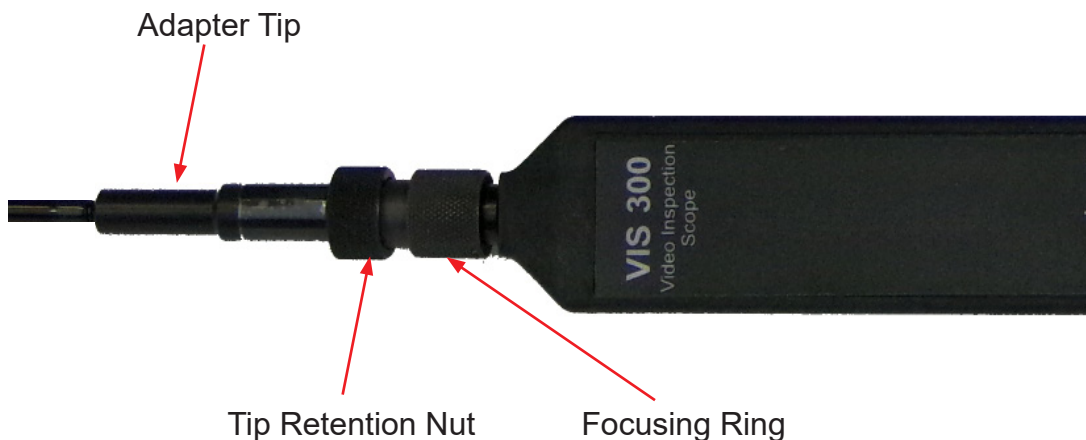


Fig 11.1

Viewing/Focusing a Connector

With the video scope turned on and the video probe plugged into the OTDR, insert a connector in to universal tip or insert the panel adapter tip into the appropriate port. The scope must be in the live scanning mode to make focus adjustments. Use the focus ring to get the connector image as sharp as possible. When using panel adapters it is possible to turn the body of the probe to while the adapter is inserted into the panel to make focus adjustments.

NOTE:

To auto center the image, touch the center of the connector image and the connector will move as close as possible to the center of the display.

Centering a Connector Image

Once the image is stable and focused, use the stylus to touch the approximate center of the connector to snap the image as close as possible to the center of the display and the center of the grading rings. It may be necessary to adjust the adapter tip if centering is not possible.

Pausing Image Scan

To freeze an image in position and focus level for inspection, Touch Live/Pause-Auto Pass/Fail Icon while in manual Pass/Fail or Pass/Fail Off mode. This will pause the image at the current position and focus level. Touch Live/Pause-Auto Pass/Fail press again to set the operational mode back to live mode for focus and position adjustments

Grading Rings

Touch the Grading Ring Icon to turn off and on the grading rings. The unit must be in live scan mode to turn the rings off or on.

Pass/Fail

Use the pass/fail criteria tables on the next page to determine if the connector passes the IEC61300-3-35 standard. There is a guide to contamination size located at the bottom of the image. To manually mark a connector as Pass or Fail, touch the Pass fail icon and cycle to the desired state. Once the pass fail status has been entered, the scan may be paused with the Live/Pause-Auto Pass/Fail icon to allow for marking the contamination points.

Marking Points of Contamination

To mark the points of contamination the unit must be in paused mode. Pick up the contamination marker by using the stylus and touching the contamination sample size that is required. Touch the image to place the marker. The marker may be fine-tuned with the stylus to cover the contamination point on the image to be marked. Once the marker is positioned properly, touch the area just below the image that states "Place marker, touch here to apply" to lock the marker in place. Repeat this as necessary to mark all the points that need to be indicated for the pass/fail status. At this point the image should be saved.

NOTE:

Marking the points of contamination should be done last, just before saving the image. Once the unit is returned to live mode the markers are removed.

Auto Pass/Fail

Once the image has been centered as close as possible in the grading rings, set the P/F icon to Auto and touch Live/Pause-Auto Pass/Fail icon. The video scope will evaluate the image and grade it with Pass or Fail. Contamination will be displayed on the image.

Exiting Video Scope Operation

Touch the Home icon to return to the home screen.

11.6 Pass/Fail Criteria Tables

Fiber End Face Criteria Table for Angled PC Polished Connectors

Zone	Description	Diameter	Allowable Scratches (Width)	Allowable Defects (Diameter)
A	Critical Zone	0 μ m to 25 μ m	$\leq 4\mu$ m	None
B	Cladding Zone	25 μ m to 120 μ m	No limit	No Limit < 2 μ m 5 from 2 μ m to 5 μ m None > 5 μ m
C	Adhesive Zone	120 μ m to 130 μ m	No limit	No limit
D	Contact Zone	130 μ m to 250 μ m	No limit	None $\geq 10 \mu$ m

Fiber End Face Criteria Table for Ultra PC Polished Connectors

Zone	Description	Diameter	Allowable Scratches (Width)	Allowable Defects (Diameter)
A	Critical Zone	0 μ m to 25 μ m	None	None
B	Cladding Zone	25 μ m to 120 μ m	No limit $\leq 3\mu$ m None > 3 μ m	No Limit < 2 μ m 5 from 2 μ m to 5 μ m None > 5 μ m
C	Adhesive Zone	120 μ m to 130 μ m	No limit	No limit
D	Contact Zone	130 μ m to 250 μ m	No limit	None $\geq 10 \mu$ m

Fiber End Face Criteria Table for SM PC Polished Conn. (Single Mode Fiber, RL \geq 26 dB)

Zone	Description	Diameter	Allowable Scratches (Width)	Allowable Defects (Diameter)
A	Critical Zone	0 μ m to 25 μ m	2 \leq 3 μ m None > 3 μ m	2 \leq 3 μ m None > 3 μ m
B	Cladding Zone	25 μ m to 120 μ m	No limit $\leq 3\mu$ m None > 3 μ m	No Limit < 2 μ m 5 from 2 μ m to 5 μ m None > 5 μ m
C	Adhesive Zone	120 μ m to 130 μ m	No limit	No limit
D	Contact Zone	130 μ m to 250 μ m	No limit	None $\geq 10 \mu$ m

12.1 VFL Safety

Caution

This Visual Fault Locator is classified as a Class II laser system and must be used with all commensurate safety precautions. Never view the light emanating from the fiber directly. Place a white piece of paper at the end of the fiber and look for the presence of a red spot on the paper.



12.2 VFL Description

The Visual Fault Locator emits visible (red) light at the 650 nm wavelength. Its intended function is to allow an operator to identify the exact location of a break, micro bend, or other discontinuity in a fiber optic cable. As the radiation is visible, light emanating from a break or micro bend enables the user to locate the exact position of a fault even at very short distances that would not be detectable by conventional means such as an Optical Time-Domain Reflectometer, (OTDR). It is also useful for identifying a particular fiber in a cable by exciting the fiber to be located with visible radiation.

12.3 VFL Operation

The Visual Fault Locator is access from the Home screen.

The fiber to be tested is connected to the VFL port of the OTDR by means of a standard 2.5 mm fiber optic connector. The source may be used in one of its two modes, Modulated or Continuous. In the modulated mode the laser is turned on and off at a 6 Hz rate. The laser is on for approximately one third of the cycle. This mode is helpful in permitting the user to identify the source radiation in the presence of high levels of ambient light. It also aids in conserving battery life.



The usable range for fault location depends on many factors, the type of fiber, the type of cable, the overall loss.

To activate the VFL, tap the VFL icon to cycle through the available states of off, Continuous and Modulated.

Chapter 13 Specifications

Power Meter	
Power Meter Detector Type	InGaAs
Power Meter Dynamic Range	+5 to -77 dB (CATV +25 to -57 dB)
Auto Test Range	0 to -36 dB
Calibrated Wavelengths	850, 1300, 1310, 1490, 1550, 1625 nm
Units of Measurement	dBm, dB, mW, μ W, nW
Resolution	0.01dB
Power Measurement Uncertainty	± 0.18 dB under reference conditions, ± 0.25 dB from 0 to -65 dBm, ± 0.35 dB from 0 to +5 dBm and from -65 to -77 dBm
Modulation Modes Detected	CW, 270 Hz, 1000 Hz, 2000 Hz
Light Source	
Laser Output Power	0 dBm, 1mw
Output Stability	$\pm .05$ dB / 24 hrs @ constant temp., $\pm .02$ dB/C temperature coefficient
Laser Wavelengths Provided*	850, 1300, 1310, 1490, 1550 and 1625nm (± 20 nm)
Transmitted Modulation Modes	CW, 270 Hz, 1000 Hz, 2000 Hz
Laser Safety Classification	Class I safety per FDA/CDRH and IEC-825-1 regulation
Spectral Width	<3nm typ.
Optical Return Loss Meter	
Optical Return Loss Dynamic Range	0-55 dB
ORL Wavelengths	Source Wavelengths (SM ONLY)
Optical Return Loss Accuracy	± 1 dB @ -40db reflection
Resolution	0.01 dB
General Specifications	
Display	4 in Color TFT
Storage Locations	5000
Battery/Operating Time	Li-ion / 6 hrs typ.
Power Requirements	Micro USB 5V 1.2A
Operating Temperature Range	-10 to 45 C
Dimensions (w/o rubber boot)	6.25" L x 4.125" W x 1.875" H (159mm L x 105mm W x 48mm H)
Weight	1.5 lbs,
Accessories Provided	FC, ST, SC adaptors for both Power Meter and Light Source and 1.25mm and 2.5mm universal adapters for the Power Meter, rubber boot, battery, 110V micro USB charger, USB Cable, PC application software, manual on CD

* Light source wavelengths present are determined by the LTS configuration

Visible Fault Locator		
Emitter Type	Laser Photo diode 1100 - 1700nm InGaAs -70- +9dBm with interchangeable FC Adapter	<div style="text-align: center;"> Laser Safety </div> <div style="display: flex; justify-content: space-around; align-items: center;">  <div style="text-align: center;"> CLASS 2 LASER PRODUCT </div>  </div>
Wavelength	650nm \pm 5nm	
Connector Type	2.5mm Universal	
Output Power	1mW Max.	

TTI reserves the right to change specifications without notice.

14.1 Repair Information

If repair is required, Please call the factory at 1-315-736-3642 for return instructions and a Return Materials Authorization (RMA) number.

14.2 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.

15.0 Version Control

Through a Program of continuous improvement, upgrades of the features and performance of this instrument are an on going process. The instrument firmware version is accessible in the lower right corner of the home screen. The version changes and approximate release dates are as follows.

V1.0.0.1 02/2020 - Original release