USER MANUAL

OPTICAL TIME DOMAIN REFLECTOMETER

ANDIG SYSTEMS

USER HAND BOOK

FOR

OPTICAL TIME DOMAIN REFLECTORMETER – MODEL 1131

(DS Cat No)

Prepared & Published by

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RECORD OF CHANGES

Change Notice No.	Authority	Incorporated by "Name & Rank" in Block Letters	Initials with Date
(1)	(2)	(3)	(4)

<div style="border: 2px solid red; padding: 20px;">

SAFETY WARNING

**The voltages employed in this Equipment are
NOT high to endanger human life.**

**POWER
MUST BE SWITCHED OFF
before servicing the equipment
&
GREAT CARE
taken when making internal adjustments etc.**

</div>

FOR FIRST AID IN CASE OF
ELECTRIC SHOCK SEE OVERLEAF

FIG. 1.

FIG. 2.

FIG. 3.

1.	SWITCH OFF. If this is not possible, PROTECT YOURSELF with dry insulating material and pull the victim clear of the conductor. DO NOT TOUCH THE VICTIM WITH YOUR BARE HANDS until he is clear of the conductor, but DO NOT WASTE TIME.
2.	(a) Place the victim in the supine position. (b) Keep the air passages clear by turning the head to one side, opening the patient's mouth and clearing it of water, saline, mucus or blood, a lot of which might have accumulated in the back of the throat. (Figure 1)
3.	If the jaw is rigid try to force the mouth open by pressure on the gum behind the last molar tooth of the lower jaw. When the upper air passages are thus cleared, tilt the head backward and force the jaw forwards from the angles of the jaw in front of the ears. This would prevent mechanical obstructions to the upper air passages. (Figure 2-3)
4.	(a) Then hold the chin up and forward with one hand and pinch the nostrils of the victim with the other. (Figure 4) (b) Take a very deep breath and apply your mouth to that of the victim and blow into his mouth, until the chest of the victim moves up indicating filling of the lungs. (NEVER ALLOW THE CHIN TO SAG). (Figure 4)

FIG. 4.

| 5. | When the chest has moved up, withdraw your mouth and allow the chest to slink back. REPEAT this process every three to four seconds until the victim begins to breathe again or until he is taken over by a medical attendant. This method can be continued in an ambulance during transit of the patient from the site of accident to the nearest medical centre. |

HAVE SOMEONE ELSE AND SEND FOR A DOCTOR.

KEEP PATIENT WARM AND LOOSEN HIS CLOTHING.

DO NOT GIVE LIQUIDS UNTIL THE PATIENT IS CONSCIOUS.

WARNING

DO NOT REMOVE THE FRONT PANEL & TRY TO REPAIR THE EQUIPMENT BY ANY UNAUTHORISED PERSON SINCE LCD IS VERY SENSITIVE PART OF THE EQUIPMENT

WARRANTY WIL BE VOID INCASE OF ANY MAJOR DAMGE TO THE EQUIPMENT

This user's manual explains the features, operating procedures, and handling precautions of the 1131. To ensure correct use, please read this manual thoroughly before beginning operation. Keep this manual in a safe place for quick reference in the event that a question arises.

Notes

- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the software's performance and functionality. The figures given in this manual may differ from those that actually appear on your screen.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact ANDIG SYSTEMS
- Copying or reproducing all or any part of the contents of this manual without the permission of ANDIG SYSTEMS is strictly prohibited.

Trademarks

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• Other company and product names are trademarks or registered trademarks of their respective companies.

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Signalyser software is a proprietary software developed of ANDIG SYSTEMS.

Congratulations on being a proud holder of INDIA's 1st & Fully Indigenous OTDR. We are very proud of our efforts but will always look at user feedback to better it. Kindly do send your feedback to andigsystem@gmail.com

WARNINGS & CAUTIONS

WARNING! Do not connect the OTDR to any fiber that is not dark, or that is terminated by a device with reflectivity > -13 dB.

Please be aware of any APC connector used in the network. APC connectors are mainly used in long haul & do not produce any reflections that are seen on the OTDR Screen. APC Connectors are designed to deflect the Fresnel by 7° causing it to look as a non-reflective splice.

CAUTION!

To avoid serious eye injury, never look directly into the optical outputs of fiber optic network equipment, test equipment, patch cords, or test jumpers. Refer to your company's safety procedures when working with optical systems.

WARNING!

Use only the specified AC adapter. Use of another type of AC adapter can damage the instrument and create the danger of fire and electrical shock.
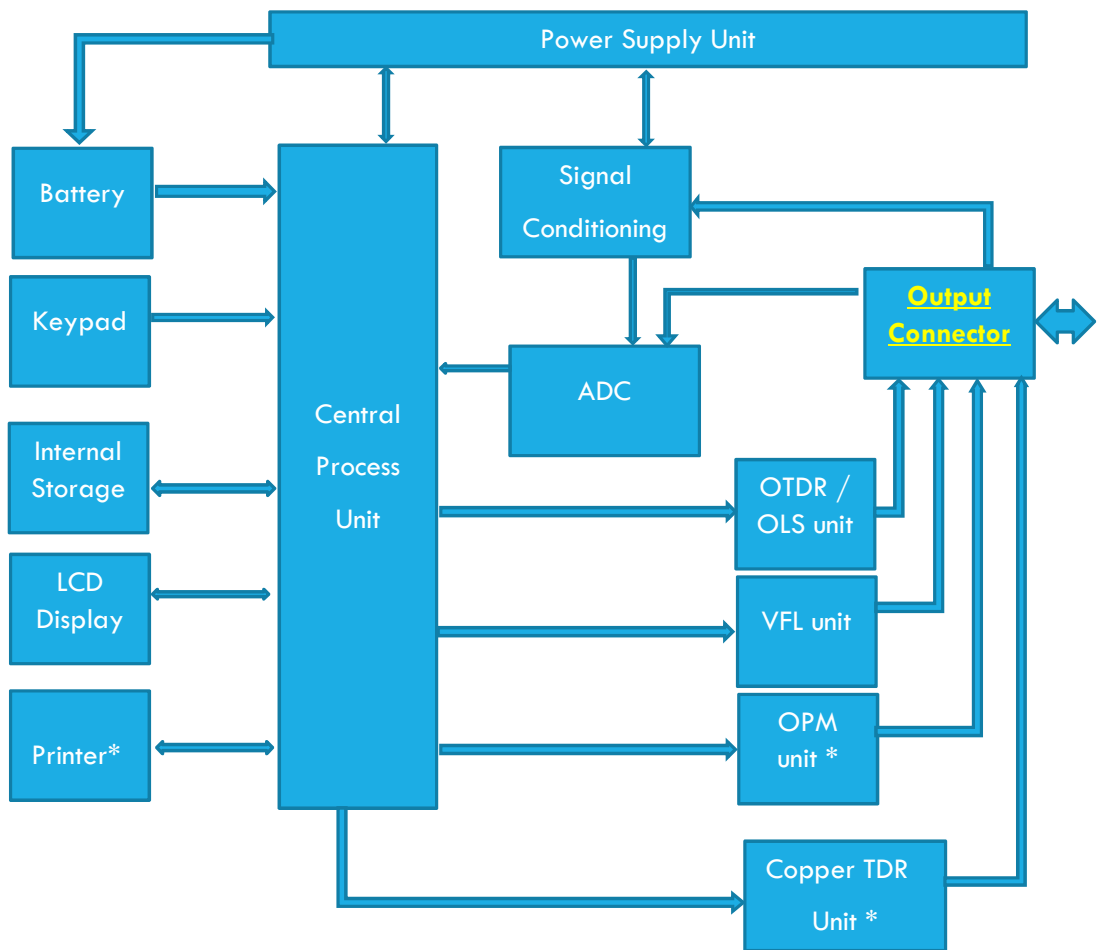
WARNING!

- To avoid the danger of fire and electrical shock:
- Never use a voltage that is different from that for which the AC adapter is rated.
- Do not plug the unit into a power outlet that is shared by other devices.
- Never modify the power cord or excessively bend, twist, or pull it.
- Do not allow the power cord to become damaged. Do not place heavy objects on the power cord or expose it to heat.
- Never touch the AC adapter while your hands are wet.
- Should the power cord become seriously damaged (internal wiring exposed or shorted), contact the manufacturer to request servicing.

CONTENTS

" * " - indicates functionality depending upon model & option chosen

The Model 1131 OTDR can test for breaks, connections, losses, and the like. In addition, by opting for additional modules, you can use the equipment as an optical power meter & Copper Cable TDR . The optical light source & visible light source are standard features.

The OTDR runs on an AC adapter & on internal battery. The AC adapter is required to charge the internal battery.

Overview :
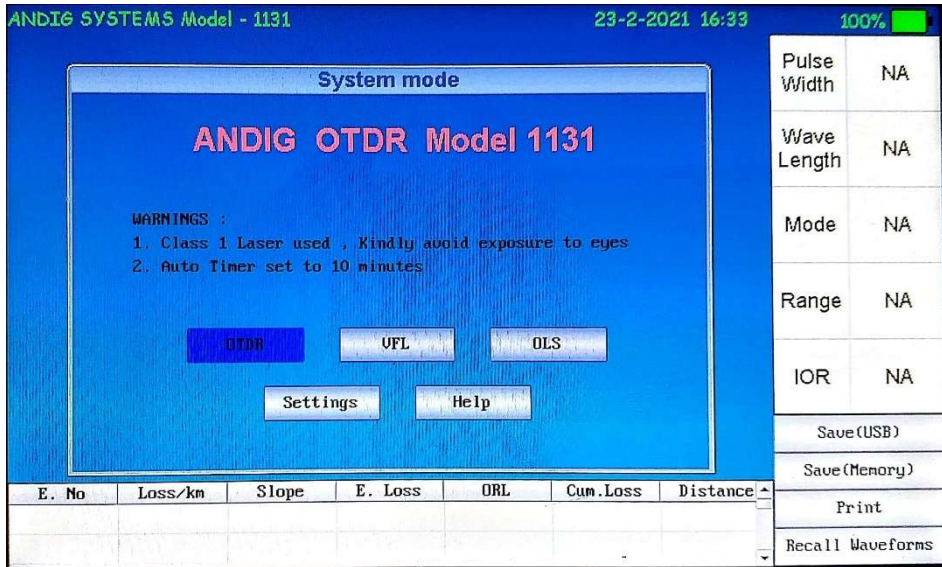
There are several types of OTDR units available for different wavelengths, dynamic ranges, and the like. You can choose the one that suits your application. Based on user input through the OTDR, the light emitter (LD; laser diode) is driven, and the generated optical pulse is emitted from the OTDR port into the optical fiber cable under measurement. The backscatter and reflected light that occur in the optical fiber cable under measurement returns to the OTDR port. The returned measurement light is received by the light detector (APD: Avalanche photodiode), read as a digital signal by the A/D section, subjected to averaging and other waveform processing, and output to the processor where the OTDR waveform is displayed.

With the light source option , based on user input through the menu, the light emitter (LD; laser diode) is driven, and CW or MODULATION light is emitted.

With the optical power option , the communication light (fiber in use) present in the optical fiber cable under measurement is detected at the OTDR on the same OTDR port or a separate port (as customised during purchase), and its power level is measured.

OPM Module:

The measurement light applied to the optical port is received by the light detector (PD: photodiode), read as a digital signal by the A/D section, and output as measured values to the mainframe where they are displayed. This is an optional & additional module that has to be specified during the purchase of the OTDR.

VFL Module:

The VFL (visible light source) module is designed to test for breaks, connections, losses, and the like in optical fiber networks. The wavelength of the visible light source is 650 nm. Upon selecting the VFL option in the main menu , the following sub menu is displayed.

The VFL output selection is via a drop down menu using the "OK" button. The modulation feature has 270 Hz, 1Khz , 2Khz & VFL blink as options.

VFL blink is set to a timer of 1 sec pulse.

Press "SCAN" to initiate the output.

The output of the VFL is via a dedicated output port on the OTDR equipment.
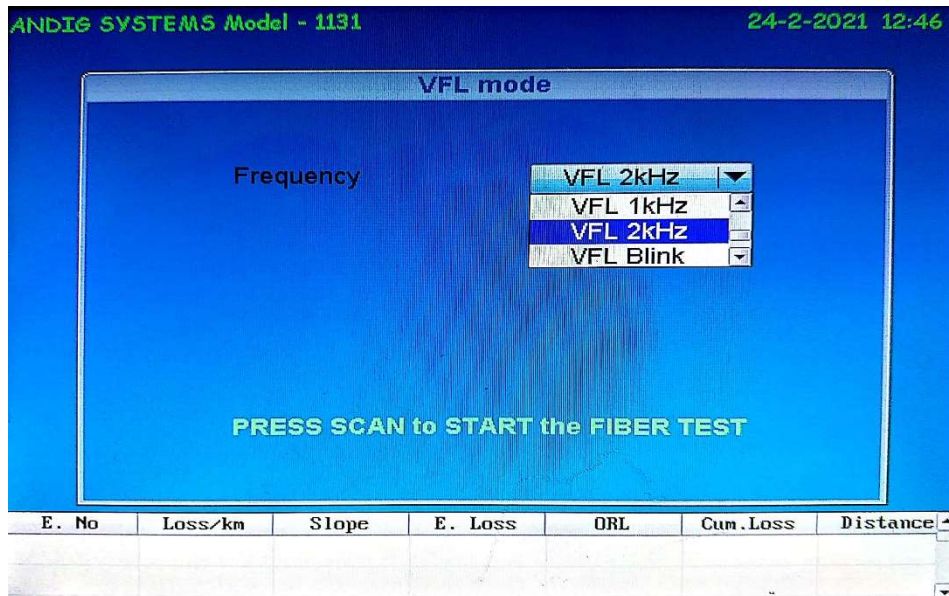
Optical Light Source:

The Lasers installed in the OTDR are also set up for further use as a optical light source with a output of around -7dBm. The OLS feature can be selected from the main menu & upon selecting the same , the following sub menu is displayed.

User can use the drop down option to select the 1310 or 1550nm lasers.

The modulation feature has 270 Hz, 1Khz , 2Khz as options
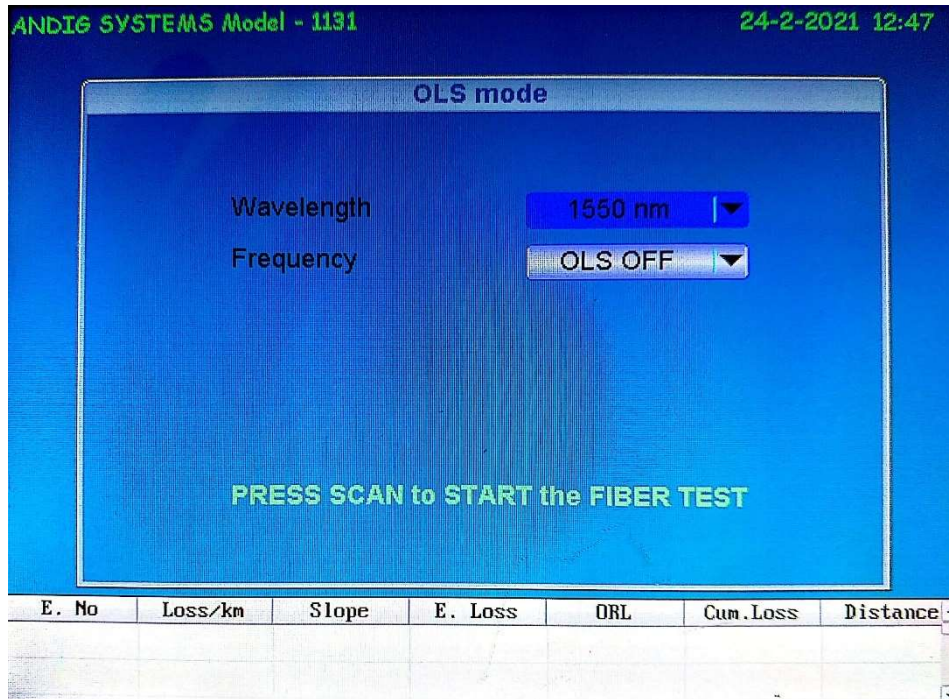
The output of the OLS is via the same OTDR output port & there are no separate / dedicated port for the same. Press "SCAN" to initiate the output.

The VFL & OLS are standard features of the Model 1131 OTDR

OTDR Features:

OTDR stands for optical time domain reflectometer. The Model 1131 displays waveforms that you can use to detect fault locations in optical fiber cables and monitor fault conditions (transmission loss, splice loss, etc.). It is mainly used in the following optical fiber cable installation and maintenance situations.

Optical Pulse Measurement :

• Averaged Measurement - A measurement in which measurements are taken several times and the measured values are averaged to display the result.

• Tabular Display of Results after Averaged Measurement - After averaged measurement is performed, the OTDR waveform is automatically analyzed, and the results are displayed in a tabular form below the waveform. Display of the Distances to Breaks after Averaged Measurement After averaged measurement is performed, the OTDR waveform is automatically analyzed, breaks (faults) are detected, and the distances to the breaks are displayed.

• Real-time Measurement - While optical pulse measurement is in progress, measured values are updated and displayed in real time.

Optical Pulse Waveform Display

• This feature zooms in and out of displayed waveforms and moves waveforms

Optical Pulse Analysis :

• Waveform Analysis

The following events can be analyzed using the 2 cursors / markers.

> • Distance
> • Splice loss
> • Loss per section of the fiber

Analysis is performed over the entire waveform or a section of the waveform using the following features.

• Up to two waveforms can be displayed simultaneously for comparison.

• The 2 way trace analysis - The waveform measured from one end of the optical fiber cable and that measured from the other end are combined to verify events that could not be detected because of dead zones.

Press the cursor key once to initiate CURSOR 1, Press it again to initiate CURSOR 2. The cursors will indicate the exact location (will also display the exact enabled the exact power if enabled during the purchase process) at the location. The difference in power & distance is displayed at the top left corner of the screen. Use the arrow keys to move the cursor right or left. Please note the CURSOR that is BLINKING is the chosen cursor. Press CURSOR button to alternate between the two.

• Event Analysis - Events are automatically detected. You cannot edit events and event lists. Adjustments to the nRef & Threshold can be made if certain events cannot be detected or when events have mimimal loss.

• Splitter Check – The data from the waveform is checked for various losses & if the option is marked " YES" (default being "NO") , then the standard losses in different types of splitters are cross referenced with the actual losses in the events & splitters are marked as a 1:2 / 1:4 / 1:8 / 1:16 /1:32 / 1:64 splitter as the case may be. This feature is an optional & an additional feature that is to be purchased during the initial purchase process.

Optical Pulse Measurement:

The 1131 applies an incident optical pulse to the connected optical fiber cable and measures the power level of the reflected light from the different sections of the optical fiber cable such as its connections, bent sections, and the open end of the fiber. The 1131 uses the measured power level to determine the distance to the different points (splices, breaks, etc.) of the optical fiber cable and the loss and other phenomena that occur at those points.

Output Pulse going in to Fiber under test

Reflected Pulse from Fiber to OTDR

Model 1131
OTDR
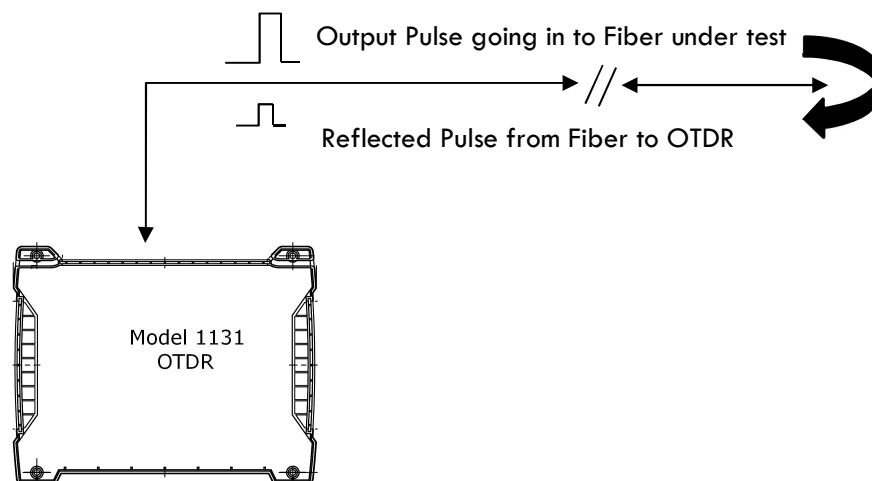
Measurement Mode :

Auto Mode - This is the recommended mode for users who are not familiar with OTDR operation. In the Auto mode, OTDR parameters such as Range, Pulse Width, and Averaging Time are set automatically. In addition, Full Auto tests always include an Event Table and Summary Page. There are measurement conditions related to measurement resolution—such distance range and pulse width—and analysis conditions related to the optical fiber cable—such as index of refraction and backscatter.

The auto mode enables the OTDR to search for events & End of Fiber by using inbuilt combinations of pulse & averaging times. The default Laser used is the 1310nm & pulse width will vary from 50ns to 500ns for a maximum distance of 20km. If the OTDR cannot find the EOF (End of FIber), it will prompt the user to go to manual mode.

Manual Mode – This is further set into

1. Real time Analysis -This is the best mode for real-time troubleshooting.
2. Manual Mode - This mode is available for experienced users. It provides the most set up flexibility. You can set Range, Pulse Width, and Averaging Time manually (Setup = Manual) etc. The user can select any of the options mentioned in the MANUAL Mode

   Averaged Measurement - Averaged measurement is effective when you want to detect reflections, splice loss, and other faint events that are

generated from connections or splice points but are buried in noise. The 1131 derives the measured data by averaging the specified number of optical pulse measurements or by averaging optical pulse measurements over the specified duration. During averaged measurement, you cannot change the measurement conditions. You cannot stop an averaged measurement before it completes. The 1131 offers upto 512K averages to be conducted which can be converted into a time scale if the user wants to customise the same.
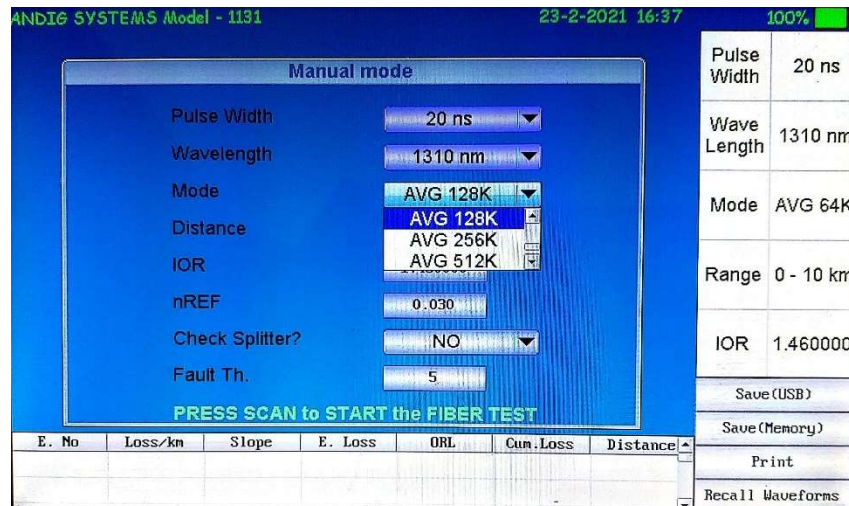
Display of the Distances to Breaks after Averaged Measurement - The 1131 can perform an averaged measurement and then automatically search for breaks (faults) in the optical fiber cable or optical line and display the distances to the breaks on the screen. If there are no faults in the middle of the optical fiber cable, the end of the cable is detected as a fault. You can specify the search wavelength or the loss level that is used to determine the end of the optical fiber cable. You can also zoom the display scale of the measured waveform and move the display position

Break (fault)

Optical Pulse Waveform Display

The optical pulse applied to the optical fiber cable is reflected at different points of the optical fiber such as its connections, bent sections, and the open end of the fiber. These sections generate loss. The measured result is displayed as a waveform that has distance represented in the horizontal direction and loss level represented in the vertical direction. On the waveform, detected losses or reflections are known as events.
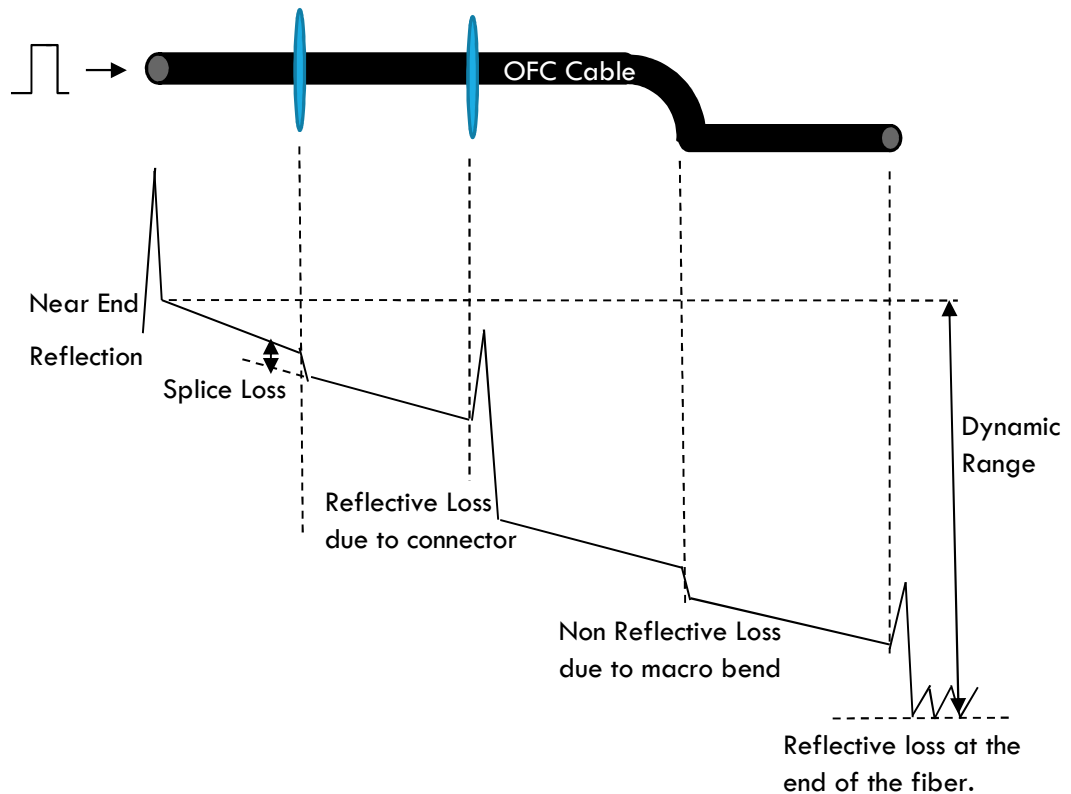
Near-end Reflection - This is the reflection that occurs at the point where the 1131 and the optical fiber cable are connected. This also includes the 1131's internal reflection. In the section where this near-end reflection is detected, even if there are other connections, the loss and reflections that occur at these points cannot be detected. This section is the near-end dead zone. When you are measuring a short distance, connect a launch fiber cable to reduce the effect of the near-end reflection.

When using an APC OTDR output connector, please note there will NO NEAR END REFLECTION DUE TO THE NATURE OF THE APC CONNECTOR.

Backscatter : When light travels through an optical fiber cable, Rayleigh scattering caused by changes in the density of materials that are smaller than the light's wavelength and inconsistencies in the fiber's composition generates loss in the optical fiber itself. The portion of the scattered light that travels in the direction opposite to the direction of propagation is known as backscatter.

Splice Loss : Because spliced sections of optical fiber cables have a great number of changes in the material's density and inconsistencies in the cable's composition, loss due to Rayleigh scattering becomes large, and splice loss occurs in these sections.

Misaligned cores is one cause of loss of light at the splice point.

Splice Loss
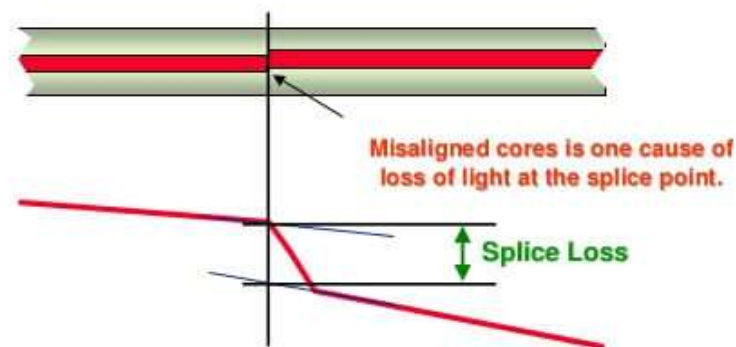
Reflection at the Connection Point of Connectors: Using a connector to connect two optical fibers is different from splicing them together in that a small gap remains between the two fibers. Because this gap has a different index of refraction, reflection occurs.

Fresnel Reflection at the Open End of the Fiber : This is the reflection that occurs at locations where the index of refraction changes (glass to air) such as where there are tears in the optical fiber cable or at the end of it. When the optical fiber cable end face is vertical, approximately 3~4% of the incident optical power is reflected.

Ghost Reflections: Sometimes you will see a Fresnel reflection where you don't expect one—usually after the end of a fiber. This usually happens when a large reflection occurs in a short fiber. The reflected light actually bounces back and forth within the fiber, causing one or more false reflections to show up at multiple distances from the initial large (true) reflection. That is, if a large reflection occurs at 1,325 feet, and there is an unexpected reflection at 2,650 feet (twice the distance to the first) and another at 3,975 feet (three times the distance to the first), then it is likely the 2nd and 3rd reflections are "ghosts."

How Secondary Reflections Are Generated The optical pulse that is generated from position I (fig below) in the following figure propagates in the direction of II (fig below). ↓ Light ray A that is reflected at connection II in the figure is reflected again at connection I and propagates in the direction of II (fig below) as light ray B. At this point, the 1131 detects A as an event. ↓ B is again reflected by connection II, and this generates reflected light ray C. At this point, the 1131 detects C as an event. Because the 1131 measures all the reflected light rays, A, C, and D, C is also detected as an event in the same manner that an actually generated reflection is. Therefore, while there is no actual event in this location, it appears as if an event has in fact occurred.
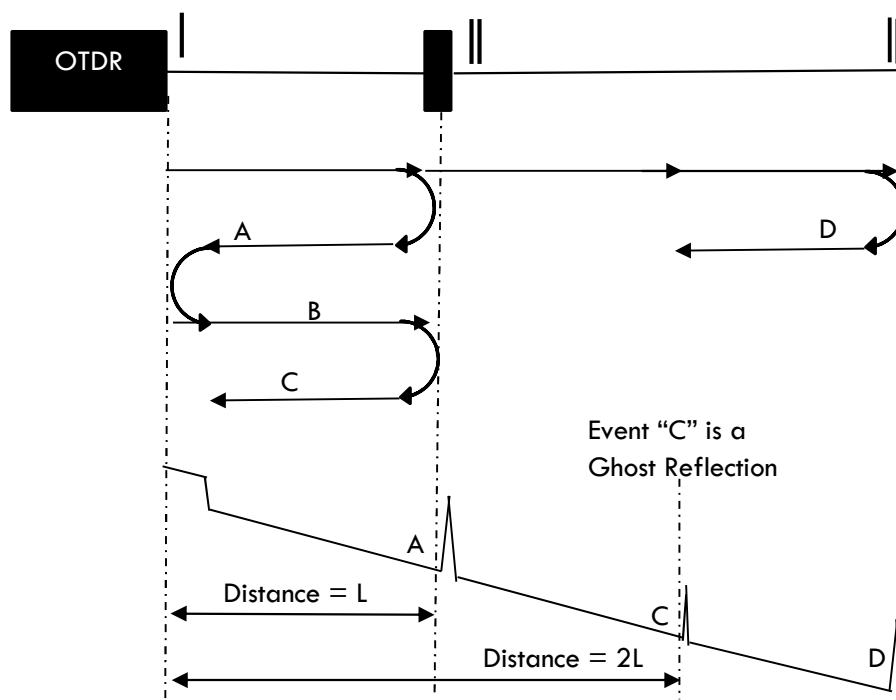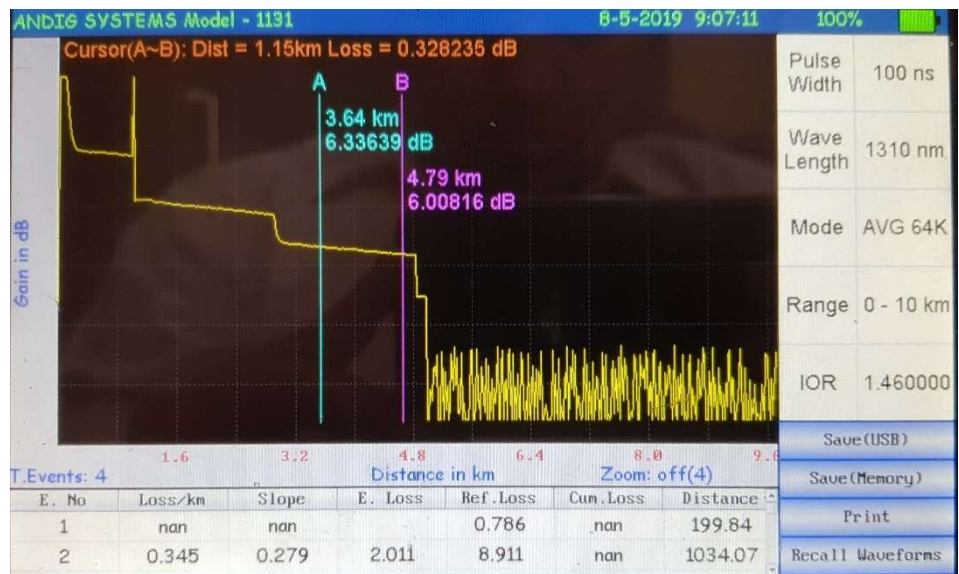
Zooming the Waveform Display Scale: You can zoom the displayed waveform in the direction of the optical power level (vertically) or in the direction of the distance (horizontally).

ZOOM WAVEFORM DISPLAY

SAMPLE WAVEFORM DISPLAY

Keypad Operations :

- MENU : Press to access the Main Menu which will let you select the AUTO , MANUAL mode & the settings menu.
- ESC : Press once to return to the previous menu. Press one or more times, depending on which menu or editor submenu is displayed, to return to the Home page.
- CUR : Press once to select Cursor A & Press again to select Cursor B. Blinking cursor is the current cursor. To shift from one cursor to the other , press CURSOR button again.
- ZOOM : To enable the zoom function on the LCD. Press Zoom once for Horizontal Zoom & Press Zoom again for Vertical Zoom. The type of zoom is indicated on the screen at the bottom of the graph as V.Zoom, which indicates VERTICAL ZOOM & H.Zoom which indicated HORIZONTAL ZOOM. Use the Up & Down arrow keys to zoom in or zoom out. When the max zoom in the particular range is reached, the system will prompt the user about the same.
- SCAN : It's the ORANGE key & Press to start the fiber test.
- ARROW : The arrow keys provide several functions as follows:
  • In the Main Menu, these keys are used to navigate menus and change setup parameters.
  • In the Trace Page, the Left and Right arrow keys are used to move cursors.
  • In the Zoom Adjust Page, these up & down keys are used to change horizontal and vertical zoom levels.
- OK : It has the functionality of the ENTER , It is used to confirm a particular selection of the menu.

Other Soft Buttons displayed on the screen :

- OTDR : To select the OTDR function
- OLS : To select the Optical Light source function which uses the Laser of the OTDR in multiple mode
- VFL : To select the VFL (650nm – red laser)function

- SETTING : The ability to set the time, date & year, LCD brightness & format the internal storage is made available in this menu.
- HELP : To access the online manual saved in the OTDR memory.

OTDR Sub Menu Soft Keys :

- AUTO : This is a 1 key operation for the inexperienced user wherein the parameters are pre-loaded & the user has to only press the " SCAN " button to obtain the fiber trace / signature. The menu shall also prompt the default loaded settings on the screen for the information of the user.
- MANUAL : The mode which gives complete control on the parameter settings such as Wavelength, Pulse Width, Averaging, Distance, IOR, Fault threshold Sampling & Minimum fault tolerance (nREF).
- PULSE WIDTH : From 5ns to 20 us depending upon the fiber length can be set.
- WAVE LENGTH : User can select the 1310nm Laser or the 1550nm Laser which are the default Lasers. The equipment can also have the 1625nm or 850 nm or 1300nm Lasers as per the specifications during the order
- MODE :
  - Real Time – For live fiber trace, the user can select the REAL TIME from the drop down sub menu of the MODE drop down options.
  - Averaging – This mode is designed for removal / suppression of noise in the signal trace so that a cleaner signature may be viewed. The user can set a minimum averaging of 8k & increase it to 512K averaging . This averaging mode, repeats the process upto 512k times for better analysis.
- DISTANCE : If the user has prior information on the fiber length, then the same can be set in the drop down menu else he may set the parameter that is appropriate.
- IOR : Can be set from 1.460000 to 1.600000 by pressing the OK button.
- nREF : This is the minimum loss threshold that the equipment needs to detect in the fiber trace. Default is set as per the pulse width but can be changed by the user as per requirement. The basic rule of the thumb is to have a lower loss detection value when the pulse widths are higher & have a higher detection value for a lower

pulse width. This is to compensate for higher noise values at lower pulse widths. User may change it from 0.001 to 1.000 by pressing OK button after highlighting the REF option.

- Splitter Check : Is always set to "NO"
- Fault Th : The fault threshold is the filter setting for checking the samples. Selecting a higher value is appropriate only if the distance ranges are beyond 50km trace. The default values for 1310nm is 3, while the default values for 1550nm is 5.

SOFT KEYS & FUNCTIONS (Displayed on the bottom right of the screen) :-

TO INITIATE THE USE OF THE SOFT KEYS, USER WILL HAVE TO PRESS ESC SO THAT THE Save (USB) button is highlighted.

Use of the up & down arrow keys , will select the other options in the SOFT BUTTON list.

Use of " OK " will confirm the selection.

Save (USB)   :

The user can save / transfer the fiber trace viewed to a flash drive / USB provided in the accessories. Kindly connect the USB to the USB just above the DC Jack.

Print   :

The user has the option of printing the screenshot if the printer is purchased as an additional accessory from ANDIG SYSTEMS. ANDIG uses proprietary printer hardware & hence this does not work with any standard printer. Kindly purchase the PRINTER from ANDIG only.

Save (Memory) :

The user has the option to save the screenshot in the internal memory card. The file is saved following a file naming nomenclature as "ddmmyyyyhrmmsec".

Ex: - A trace viewed on 6th May 2019 at 14:20:19 is saved as "6-5-2019 14:20:7" as seen in the file structure.

FILE TREE STRUCTURE (Shown Below):
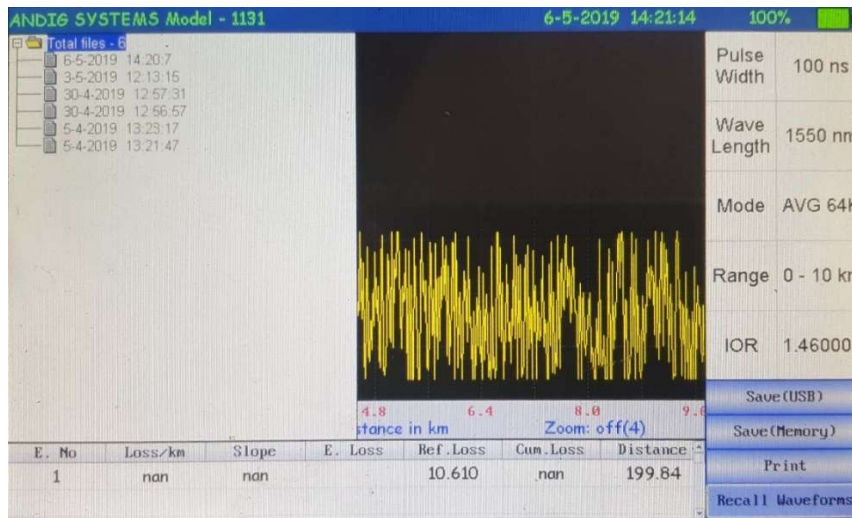
Recall Waveform / Detach Waveform :

- To recall the waveform, use the appropriate soft buttons on the bottom right of the screen using the up/down arrow keys. Please note , the equipment will store the non editable BMP (picture format) of the screenshot along with the fiber trace file.
- To recall any stored waveform on the screen to compare with the current waveform, esc from the previous menus so that the bottom right soft buttons are highlighted. The recall waveform is to be selected after selecting the appropriate file from the files saved.
- The recall waveform will change to " Detach Waveform" when you want to remove the recalled waveform.

Trace page Features   :

Scan	This is a graph of insertion loss vs. distance. The vertical axis shows loss in dBm. The horizontal axis shows distance in user-selected Distance units
Cursors	Used to measure loss, and distance. The active cursor can be moved by pressing either Left [<] or Right [>] arrow key. Press the -[Cur] key to toggle between the A and B cursors.

|	
Cursor data field	This field displays A cursor location, B cursor location, distance from A to B in user-selected Distance units, and measured loss between A and B in dBm
Wavelength field	Displays test wavelengths of the currently displayed trace. For the dual-wavelength test (VFL/1310 nm or 1310/1550 nm), press the [lambda] key to toggle between the VFL and 1310 nm test results or between the 1310 nm and 1550 nm test results respectively. Note: the Highlight box around the wavelength value indicates the currently displayed wavelength.
Battery Indicator	Displays estimated battery status as follows: Green battery icon - battery is full Charging battery icon - battery is charging Red battery icon - battery requires recharging

Settings & Help Menu

The setting menu is for

1. Setting / correcting the date - The OTDR has an internal battery & a RTC feature. Should the battery require replacemet, kindly use this setup option to set the date & time.
2. Change the brightness of the LCD of the equipment- The brightness control is set to max, kindly reduce the same to reduce the battery drain.
3. Formatting the internal memory of the equipment - The internal memory of the equipment is 1Gbps which stores the .sor files of the signal trace for recalling in the future. The equipment can store multiple file & its size can vary depending upon the datapoints.

Help Menu :

Should you misplace / damage this manual, a brief explanation is uploaded into the memory of the equipment. This 14 page document is a ready reckoner for the user & can be accessed via the HELP menu in the main menu display page as shown below.
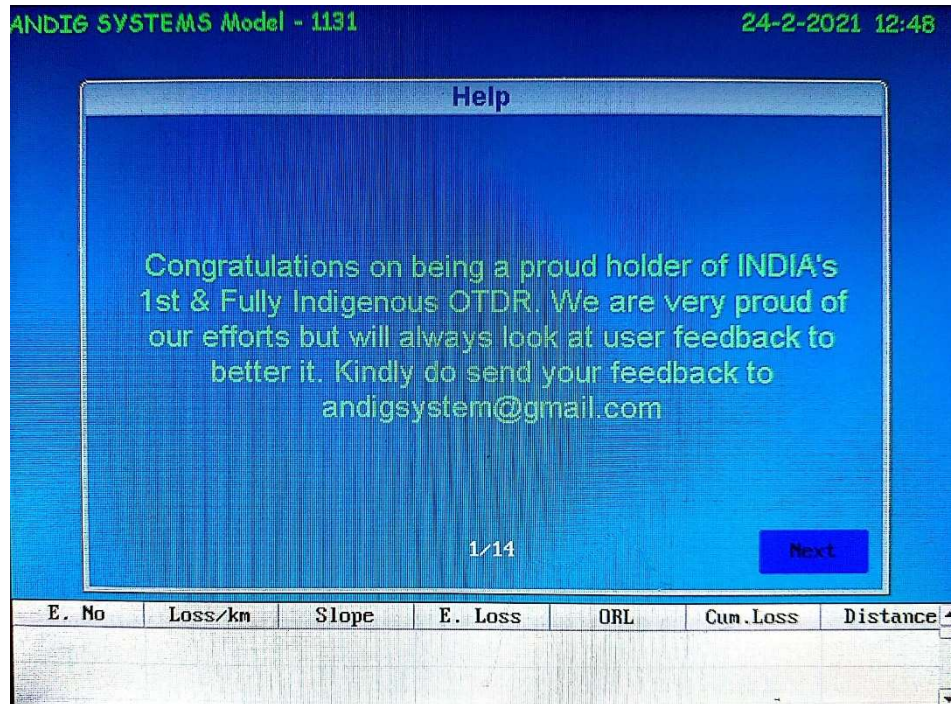
UNPACKING & REMOVAL OF PRESERVATIVES :

Housing Description - The equipment is housed in a plastic fluted case which has white coloured foam around the inside to protect the equipment from damage during storage / transit. The equipment is in a sturdy box with handle & locking mechanism as shown below.

There is no hardware or software installation to be done by the user.

Equipment ready to use directly from the box after unpacking

Equipment Front View	**Equipment with protective Case & accessories on the side**
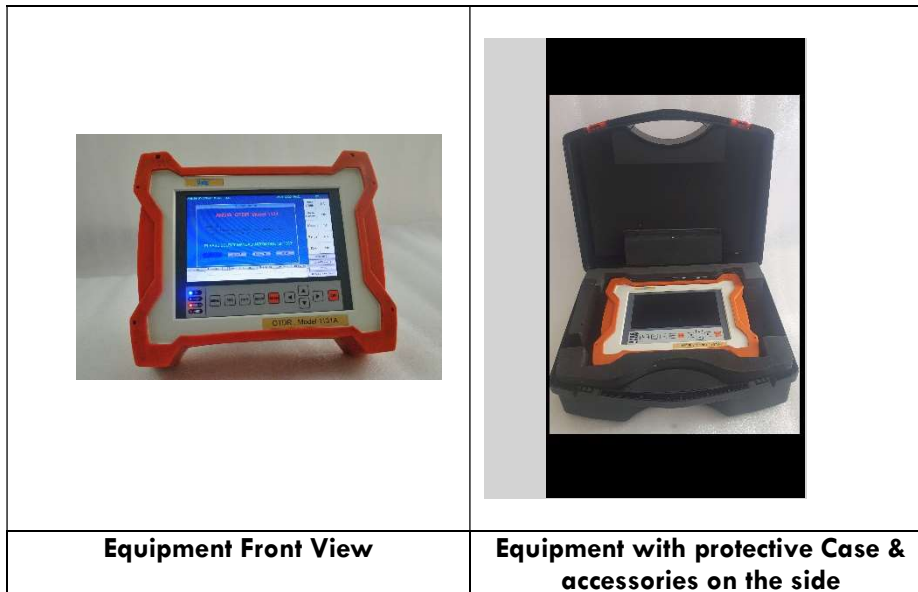
a. Open the fluted plastic packing box to reveal content inside. The Contents are
   i. OTDR – 1no
   ii. AC DC Adapter (10V/ 3 Amp) – 1no
   iii. Operation Manual – 1no
   iv. Launch Cable – 500mtrs
   v. USB – 2 nos

Preservatives - The equipment does not use any preservatives. However, we request you to kindly handle the equipment with care.

PREPARATION FOR USE & INSTALLATION PREFERENCES

Initial Preparation - The equipment is easy to use & does not require any installation. It is ready to use directly from the after unpacking.

- Remove Equipment form the protective case.
- Turn on the equipment & check if battery is sufficiently charged, else use the adapter to charge the equipment.
- Connect the Fiber under test to the OTDR output port.
  - Select OTDR module
  - Select Auto / Manual Mode
  - Press " SCAN" to start the test

"ANDIG" Model 1131 is pre-calibrated at factory. No field calibration is required.

https://www.andigsystems.co.in   28

Cleaning Tips

Clean Test Cables and FUT

Connector end faces must be kept free from dirt or other contaminates to ensure accurate measurements and operation. It is important to keep connectors on the launch and receive cables and those on the Fiber Under Test (FUT) clean. Follow your company's approved cleaning procedures.

Cleaning the Optical Ports

CAUTION! Before conducting the following procedures be sure to have the otdr turned OFF.

To access the SM or MM OTDR Port
Rotate the adapter base counterclockwise approximately four times.

Pull the adapter directly out away from the universal adapter mount.

To access the VFL Port

Unscrew the adapter counterclockwise and pull the adapter straight out to expose the ferrule.

Cleaning the Exposed Ferrule (two methods)

I. Cleaning Procedure

Lean a can of FCC2 back (30°), press the button on FCC2 to fill the well.

Dip a CCTP stick into the well of the FCC2 to dampen the tip with optical cleaning fluid.

Place the damp tip over the ferrule to be cleaned.

Rotate the tip clockwise 10 revolutions while applying varying pressure to create a gentle pumping action where the tip contacts the ferrule.

Discard the CCTP stick after using both tips.

II. If using lint-free optical cleaning pads and isopropyl alcohol

Be sure to use 99% IPA that has not been contaminated.

Dampen the wipe with the alcohol and gently wipe the exposed ferrule. Then dry the ferrule using a new optical wipe.

Cleaning the adapters

Use a can of filtered compressed air (held vertically), blow out any contaminants from the adapter.

Once completed, replace the adapter over the ferrule, centering it onto the alignment pin.

Tighten the adapter base.

Warranty

ANDIG SYSTEMS warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies to sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period.

Kindly contact us   080 -23378976.

A Return Authorization (RA) number must be issued before any product is returned to Andig Systems. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification.

Andig Systems specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages.

Andig Systems' total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

The minimum turn around time for repairs is 15 working days.

Calibration and Repair Services

Andig Systems offers repair and calibration services for the products we sell. Andig Systems also provides NABL tracability for the calibration certification for most products.

Andig Systems recommends that annual calibrations be performed to verify meter performance and accuracy.