Installation document OTDR MT9085 series, Anritsu



Description

Handheld optical time domain reflectometers (OTDRs) from the Anritsu ACCESS Master MT9085 series with an 8-inch touchscreen, for measuring and analysing fibre optic links. In Fiber Visualizer mode, events such as splices, connectors, splitters and the fibre end are shown as icons with distance, loss and a Pass/Fail assessment. In OTDR (Standard) mode you analyse the trace yourself using cursors and an event table. The OTDR also has a built-in optical light source (OLS) and optical power meter (OPM); a visual fault locator (VFL) is optional. Further on in this document only the abbreviations are used; all terms and abbreviations are explained under Terminology at the end of this document. This document applies to all models in the table below; operation, housing, battery and software are identical, only the wavelengths and measurement ports differ. Cleaning and maintenance and the safety instructions can also be found at the end.

Brand

Anritsu

Contents

OTDR MT9085 with SC/APC measurement connector (on the MM/SM models, measurement port 2 with SC/PC connector)	1x
Protector with carrying strap (B0584A)	1x
Battery (Z0921A)	1x
AC adapter (Z1625A)	1x
Power cord	1x
Quick User's Guide MT9085 (W3974AE)	1x
CD with Operation Manual (Z1991A)	1x

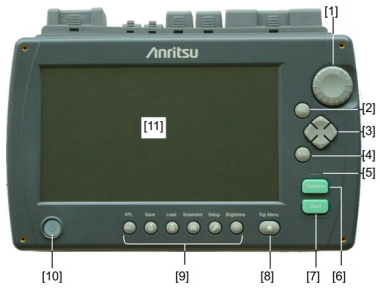
Differences per model

Item	Model	Measurement port 1	Measurement port 2	Additional function
M10000001 M10000613* M10300001*	MT9085A-053	1310/1550 nm	-	-
M10000527	MT9085B-053	1310/1550 nm	-	-
M10000164	MT9085C-053	1310/1550 nm	-	-
M10000429	MT9085A-057	1310/1550/1625 nm	-	Detecting macrobends
M10000478	MT9085B-057	1310/1550/1625 nm	-	Detecting macrobends
M10000504	MT9085C-057	1310/1550/1625 nm	-	Detecting macrobends
M10000162	MT9085B-058	1310/1490/1550/ 1625 nm	-	PON networks and macrobends
M10000519	MT9085B-055	1310/1550 nm	1650 nm	Measuring on an active network
M10000161 M10000612*	MT9085A-063	1310/1550 nm	MM 850/1300 nm	Multimode measurement
M10000582	MT9085B-063	1310/1550 nm	MM 850/1300 nm	Multimode measurement

The A, B and C versions work the same way; they only differ in measurement range (dynamic range), with C having the largest range. The exact dynamic range is stated in the datasheet of the item.

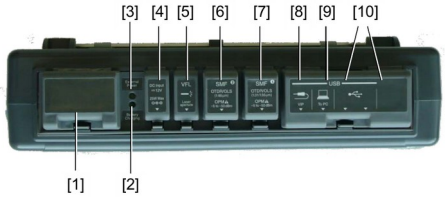
* Second-hand device; the supplied contents may differ.

Front view



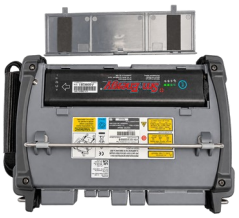
[1] Rotary knob: turn = arrow keys, press = Enter.
[2] ESC: closes a settings screen or cancels the input.
[3] Arrow keys: up, down, left and right.
[4] Enter: opens a settings screen or saves the input.
[5] LED: flashes when the OTDR emits laser light.
[6] Realtime: starts a continuous (realtime) measurement.
[7] Start: starts an averaging measurement (see Terminology).
[8] Top Menu: opens the main menu.
[9] Shortcut keys: VFL (only with optional VFL), Save, Load, Screenshot, Setup, Brightness.
[10] Power button: green = on, flashing orange = charging, orange = standby.
[11] Touchscreen.

Top view

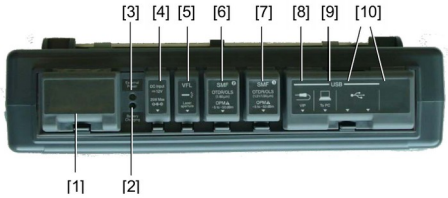


[1] Optional OPM: connection for an optional OPM; replaces the standard OPM.
[2] Battery Charging: lights up green while the battery is charging.
[3] External Power: lights up when the AC adapter is connected.
[4] DC Input: connection for the AC adapter.
[5] VFL: port for the optional visual fault locator.
[6] OTDR/OLS 2: measurement port 2, only on the MT9085B-055 (1650 nm) and the MM/SM models.
[7] OTDR/OLS 1: measurement port 1, singlemode (OTDR, OLS, OPM).
[8] USB VIP: for an inspection microscope (VIP).
[9] USB To PC: connection to a PC (internal memory as a drive).
[10] USB: for a USB stick.

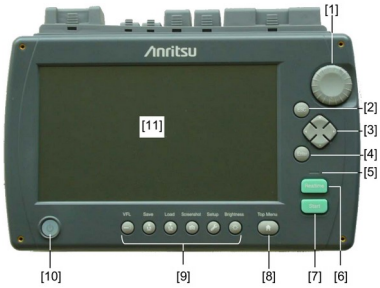
All models: commissioning and measuring



1. Remove the battery compartment cover, click the battery into place with the indicator facing outwards and close the cover.

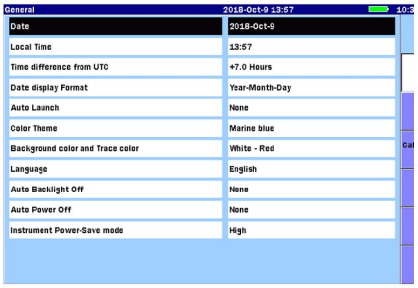


2. Connect the AC adapter to DC Input [4] and plug it into the wall socket. External Power [3] lights up; while charging, Battery Charging [2] lights up green and the power button flashes orange. The battery is full when Battery Charging goes out (after approx. 6 hours). Charge at 5 to 30 °C.



3. Press the power button [10]. After start-up, the main menu (Top Menu) appears. The power button lights up green when the OTDR is switched on.

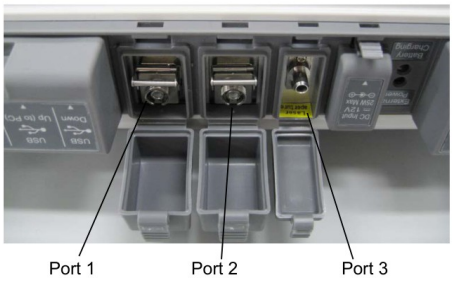
All models: commissioning and measuring



4. Press the shortcut key Setup and tap General. Here you can set, among other things, the date and time, the language, the colour theme, the start-up screen (Auto Launch) and automatic switch-off of the backlight and the OTDR. Press ESC to go back.



5. Check that there is no light on the fibre. Clean the connector of the fibre to be measured with a one-click cleaner or a Cletop S: press the ferrule against the cleaning surface and wipe in one direction. Do not use a used cleaning surface.

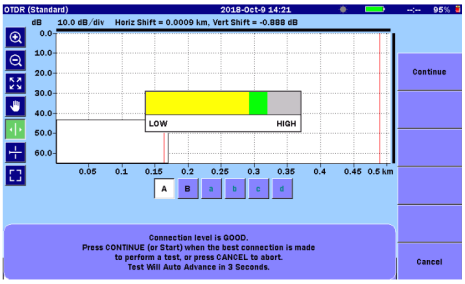


6. Open the dust cap of measurement port Port 1 and connect the cleaned fibre. On all models, Port 1 is the singlemode measurement port. Port 2 is only present on the MM/SM models (multimode) and the MT9085B-055 (1650 nm); how to measure with it is described further on in this document for the model concerned. Port 3 is only present if the OTDR has a VFL.

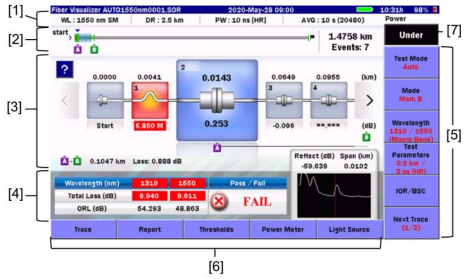
All models: commissioning and measuring



7. Press Top Menu and tap Fiber Visualizer. The Top Menu key always takes you back to the main menu. Only on the MM/SM models is there a Select SM/MM button at the bottom right for choosing between singlemode and multimode. If your OTDR has a separate connection for an optional OPM ([1] in the top view), the main menu shows Loss Test Set instead of Power Meter.

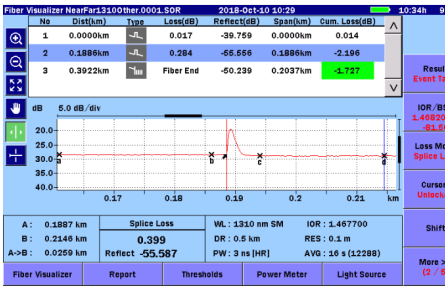


8. Press Start. If Connection Check is on, the OTDR first checks the connection. If it is green, the measurement starts automatically after 3 seconds. If it is red or yellow: disconnect the fibre, clean the connector, reconnect and tap Continue or press Start.

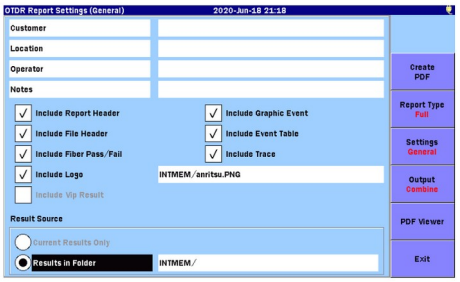


9. After the measurement the results screen appears: [1] the measurement settings, [2] a schematic view of the fibre, [3] the events as icons with distance and loss (events above the Pass/Fail threshold are red), [4] per wavelength the total loss, the ORL and the Pass/Fail result, [5] the softkeys, [6] the extended softkeys and [7] the power and loss of the OPM. Select an event by tapping it, with the rotary knob or with the arrow keys. Tap ? for an explanation and a possible cause.

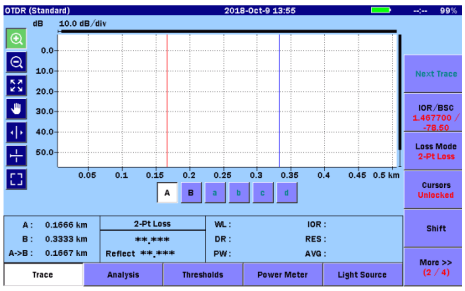
All models: commissioning and measuring



10. Tap Trace to view the trace and the event table of the measurement. Fiber Visualizer at the bottom left takes you back to the icons.

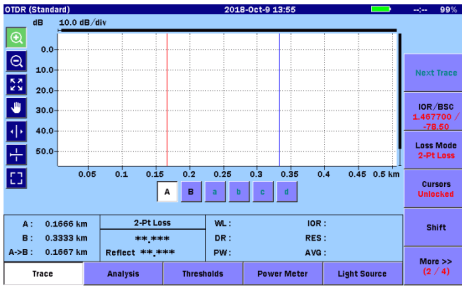


11. Tap Report, select Full (multi-page report) or Simple (single-page report) under Report Type and tap Create PDF to create a PDF report.

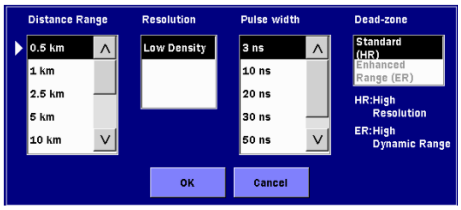


12. To define the measurement settings yourself, tap OTDR (Standard) in the main menu.

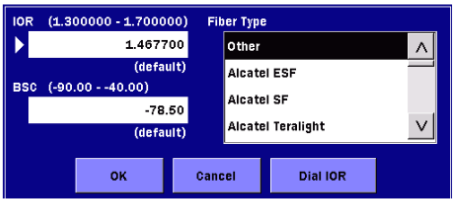
All models: commissioning and measuring



13. Tap Test Mode and select Auto (distance range and pulse width are selected automatically) or Manual. Tap Wavelength and select one wavelength or All (all wavelengths of your model; see the overview Differences per model).

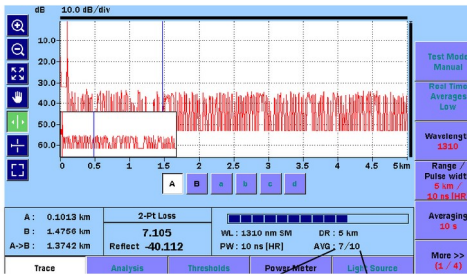


14. With Manual: tap Range/Pulse width and select the distance range, the resolution, the pulse width and the dead zone mode; confirm with OK. Tap Averaging and set the number of averages or the measurement time.

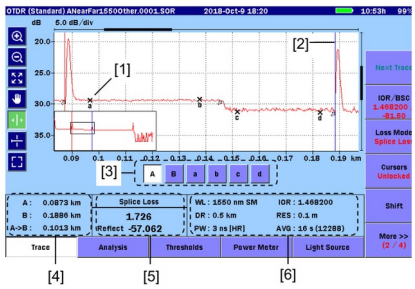


15. Tap More and then IOR/BSC. Select the fibre type; the corresponding index of refraction (IOR) and backscatter coefficient (BSC) are filled in. Confirm with OK.

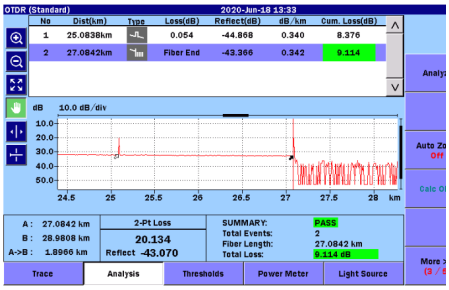
All models: commissioning and measuring



16. Press Start for an averaging measurement. After the connection check (see step 8) a progress bar appears and the LED on the front flashes. For a continuous measurement press Realtime; stop it with Realtime or ESC.

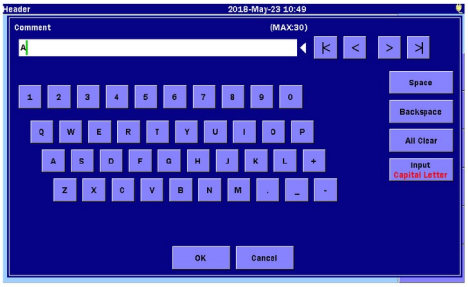


17. After the measurement the screen shows: [1] the buttons for cursor A and B and markers a to d, [2] the active cursor, [3] a marker, [4] the distance to cursor A and B and the distance between A and B, [5] the loss and reflectance according to the selected Loss Mode and [6] the measurement settings. Select the cursor with A or B (or with Enter) and move it with the rotary knob; the distance and loss between A and B are updated immediately.

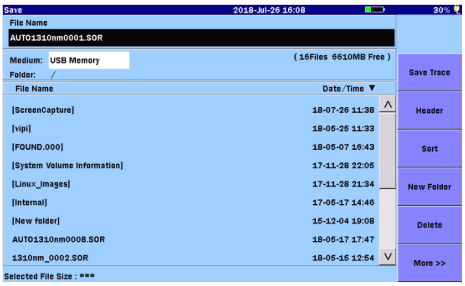


18. Tap Analysis for the event table showing for each event the distance, type, loss, reflectance, dB/km and cumulative loss. Values above the Pass/Fail thresholds are red; the thresholds are set via Thresholds.

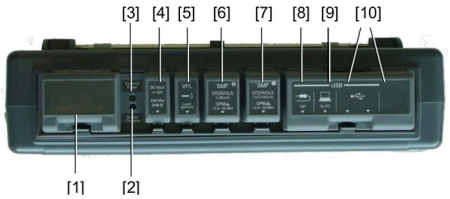
All models: commissioning and measuring



19. Press the shortcut key Save to save a measurement. Tap the File Name field and enter a file name.



20. Select the storage medium (internal memory or a USB stick in the USB port) and the folder, and tap Save Trace. The measurement is saved as a .SOR file; a Fiber Visualizer measurement at several wavelengths as a .ZIP file.



21. To transfer measurements to a PC: connect the USB To PC port [9] to the PC with a USB cable; the internal memory appears as a drive on the PC. Safely eject the drive on the PC before disconnecting the cable. Copying to a USB stick [10] is also possible via Save > More > Copy and Paste.

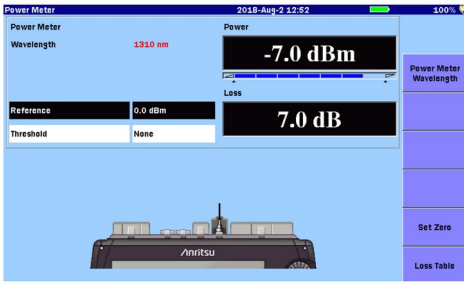
All models: commissioning and measuring



22. OLS: press Top Menu and tap Light Source. First disconnect the fibre from any link that is in use; the light of the OLS can disrupt traffic and damage receivers.

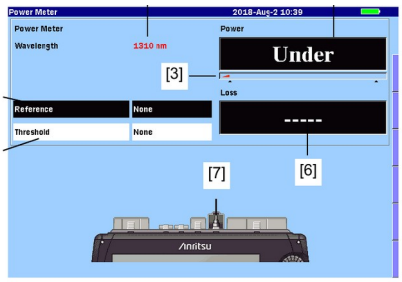


23. Connect the fibre to the measurement port indicated by the port indicator [2] on the screen. Select the wavelength with Wavelength and CW, 270 Hz, 1 kHz or 2 kHz with Modulation. Switch the laser on or off with Light Source; while it is emitting, the LED on the front flashes.

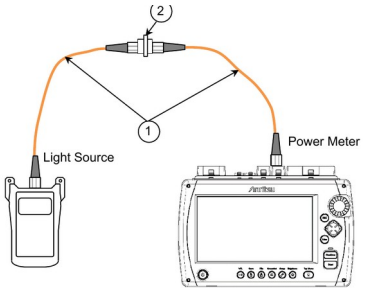


24. OPM: press Top Menu and tap Power Meter (if your OTDR has a connection for an optional OPM, this is called Loss Test Set). Close the dust cap of the measurement port, tap Set Zero and wait until the zero calibration is complete.

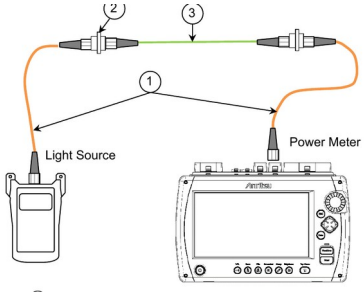
All models: commissioning and measuring



25. Select the wavelength with Power Meter Wavelength and connect the fibre to be measured to the measurement port indicated by the port indicator [7]. The measured power appears in dBm; [3] indicates the power level and [6] shows the loss as soon as a reference has been set. Never input more power than indicated on the measurement port (max. +10 dBm).

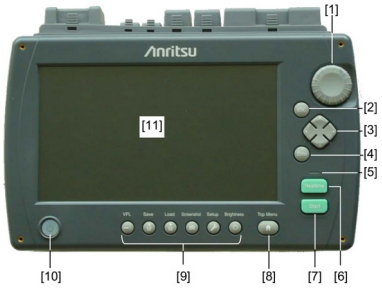


26. Loss measurement: connect an external light source to the OPM using patch cords [1] and a connector [2], set both to the same wavelength and tap Reference and then Paste the Power. The loss is then 0.00 dB.



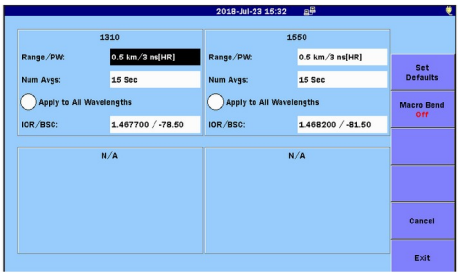
27. Set a Pass/Fail threshold via Threshold. Disconnect the patch cord on the OPM side (not on the side of the external light source), connect the link to be measured [3] between the patch cords [1] using connectors [2], tap Loss Table and then Add to save the measurement. The Loss Table can be saved as a .csv file.

All models: commissioning and measuring

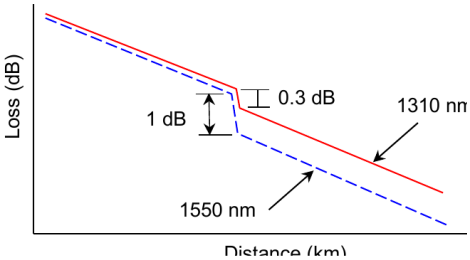


28. Disconnect the fibre and put the dust cap back on the measurement port. Then press the power button and tap Yes to switch off the OTDR.

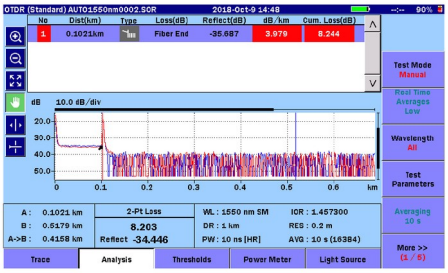
Models with 1625 nm (MT9085A-057, MT9085B-057, MT9085B-058, MT9085C-057): detecting macrobends



1. A macrobend (a bend in the fibre that is too sharp) causes more loss at a longer wavelength than at a shorter one. By measuring at several wavelengths, the OTDR detects macrobends automatically. In OTDR (Standard), tap Wavelength and select All. With Test Mode Manual, you set the measurement settings per wavelength via Test Parameters.

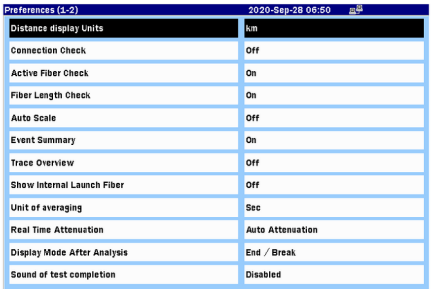


2. In the Test Parameters screen, tap Macro Bend and set it to On. The difference in loss between the wavelengths above which an event counts as a macrobend is set via Thresholds under Macro Bend.

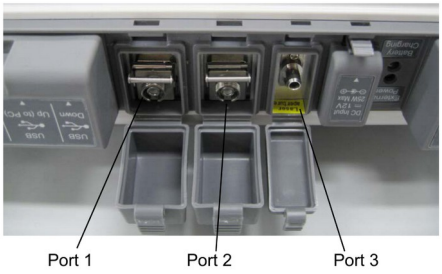


3. Press Start. The OTDR measures the wavelengths one after the other, from the shortest to the longest. An event whose loss difference exceeds the threshold is marked with an M after the loss value in the event table.

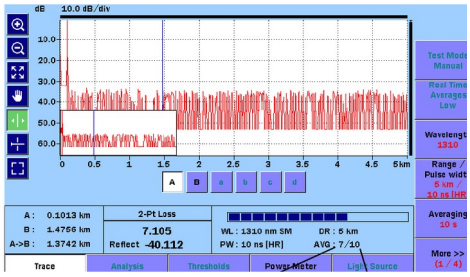
MT9085B-055 (M10000519) only: measuring on an active network



1. Note: on an active network, measure only via measurement port 2 at 1650 nm. Never use measurement port 1, the OLS or the OPM on an active network: test light at 1310/1550 nm can disrupt traffic and damage the receivers at the other end. Therefore switch on Active Fiber Check (Setup > Preferences (1-2)): the OTDR then checks before each measurement whether there is traffic on the fibre and aborts the measurement if there is.

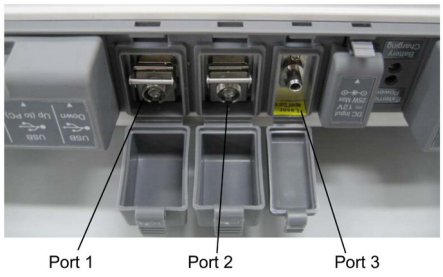


2. In addition to measurement port 1 (1310/1550 nm), this OTDR has a measurement port 2 (Port 2) for 1650 nm with built-in filters. Connect the fibre to measurement port 2 to carry out maintenance measurements on an active network.

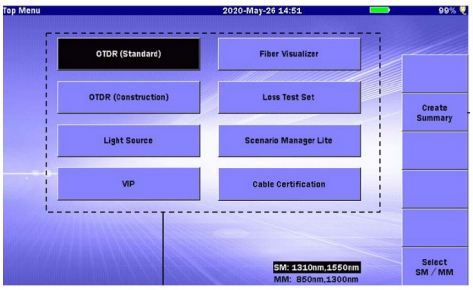


3. In OTDR (Standard), select 1650 nm under Wavelength and start the measurement. Further operation is the same as for a normal OTDR measurement.

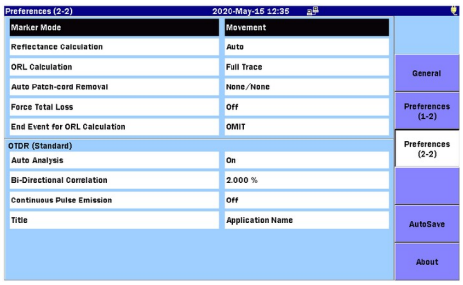
MM/SM models only (MT9085A-063, MT9085B-063): multimode measurement



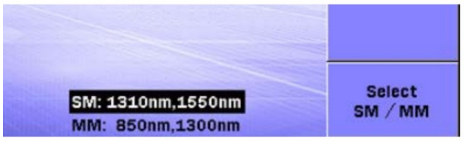
1. In addition to measurement port 1 for singlemode (1310/1550 nm), these OTDRs have a measurement port 2 for multimode (850/1300 nm) with SC/PC connector.



2. In the main menu, select MM under SM/MM and connect the cleaned multimode fibre to measurement port 2. For a singlemode fibre, select SM and use measurement port 1.

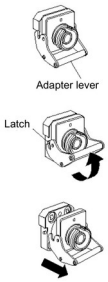


3. Press Setup, tap Preferences (2-2) and set the core diameter of the fibre under Multimode fiber under test: 50/125 µm or 62.5/125 µm. Further operation is the same as for a singlemode measurement.

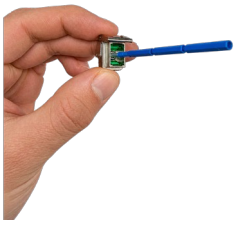


4. You measure either singlemode via measurement port 1 or multimode via measurement port 2 at a time, not both simultaneously. At the bottom right of the main menu you can see which wavelengths belong to the selected port. The OPM does not work via the multimode port.

Cleaning and maintenance



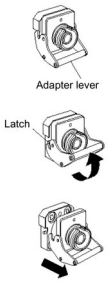
1. Clean the measurement port if the measurement remains unstable or the connection check does not turn green with a clean fibre. Check that the OTDR is not emitting light. Lift the adapter lever until it clicks; you can then pull the adapter out of the adapter holder.



2. Once the adapter is out of the adapter holder, clean it with an adapter cleaner. You may use alcohol for this, but always refit the adapter dry.



3. Clean the ferrule in the measurement port with a one-click cleaner: place the cleaner straight onto the ferrule and push it in until it clicks.



4. Refit the adapter: slide it straight into the measurement port and fold the adapter lever back until the lock clicks, without scratching the end face of the ferrule. Then close the dust cap.

Terminology	
Active network	Network with traffic; only measure at 1650 nm (MT9085B-055).
BSC	Backscatter coefficient; required for reflectance and ORL.
Event	Splice, connector, splitter or fibre end on the trace.
IOR	Index of refraction; determines the distance.
Macrobend	Bend that is too sharp; more loss at 1625 nm than at 1310 nm.
Averaging measurement	Average of many pulses; less noise (Start key).
MM	Multimode: core 50 or 62.5 µm, via measurement port 2.
Zero calibration	Setting the OPM to zero with the dust cap closed (Set Zero).
OLS	Optical light source: built-in light source.
OPM	Optical power meter: built-in power meter.
ORL	Optical return loss: reflected light in dB.
OTDR	Optical time domain reflectometer.
Passive network	Network without traffic; all other measurements are done on this.
Pass/Fail	Assessment against a threshold (Threshold); Fail is shown in red.
Realtime measurement	Continuous measurement without averaging (Realtime key).
SM	Singlemode: core approx. 9 µm, via measurement port 1.
VFL	Visual fault locator: optional red laser (Port 3).
VIP	Video inspection probe: inspection microscope (USB VIP).

Safety

Laser light	Never look into the measurement port or into the end of a connected fibre, not even with a magnifier or microscope: the OTDR emits invisible laser light (laser class 1 and 1M according to IEC 60825-1). The optional VFL is laser class 3R; never look directly into the red laser. If the LED on the front does not light up while the laser is on, do not use the OTDR and have it checked.
Active network	Do not measure on an active network, except with the MT9085B-055 via measurement port 2 at 1650 nm. With Active Fiber Check (Setup > Preferences (1-2)) the OTDR aborts the measurement if there is traffic on the fibre.
Fibre and measurement port	Always clean the connector before connecting; dirt can damage the measurement port and disrupt the measurement. Do not bend the fibre more sharply than a radius of 30 mm. Never input more optical power than indicated on the measurement port.
Battery	Only use the specified battery and insert it with the correct polarity; a wrong battery or a battery inserted the wrong way round can explode. Do not short-circuit the battery terminals, do not disassemble the battery and do not expose it to heat or fire, not even when disposing of it.
Battery fluid	Leaking battery fluid is toxic; do not touch it. In case of contact with the eyes (do not rub) or after swallowing, rinse immediately with clean water and consult a doctor. Rinse skin or clothing thoroughly with clean water.
Power supply	Only use the supplied Anritsu AC adapter and the supplied earthed power cord, in an earthed wall socket. Unplug the power cord from the wall socket before removing dust around the power connection.
Placement and use	Place the OTDR in a stable position so that it cannot fall over and the power button remains accessible. Keep the ventilation openings clear. Do not use the OTDR near corrosive gases such as hydrogen sulphide or hydrogen chloride. In a residential environment the OTDR may cause radio interference.
Repair and calibration	Do not open the OTDR and do not remove any covers: there are high-voltage parts inside. Only have repairs and calibration carried out by Anritsu or an authorised Anritsu representative. If the calibration seal is broken, performance is no longer guaranteed.