FlexScan® TS100 FTTH PON Troubleshooter

One-Touch Troubleshooting

NEW

AFL FlexScan App

Google play

Available on the App Store

Features

- Locate faults in <3 seconds with the press of a button
- Displays link length, loss, ORL, and pass/fail results
- Single-ended test reduces time and cost
- Rugged, lightweight, hand-held for field use

Applications

- Troubleshoot PONs or Point-to-Point networks from one end
- Diagnose faults exceeding industry or user pass/fail limits
- Verify loss of PON splitters up to 1:64 split ratio
- Verify GPON, video and XG/XGS-PON or 10GEPON power levels
- Verify insertion loss, TX output or RX input power levels
- Pinpoint location of macro-bends or breaks

AFL's FlexScan TS100 Optical Troubleshooter is an easy-to-use, all-in-one tool for detecting, identifying, locating, and resolving single-mode optical network issues. The TS100 has auto-configured settings to quickly measure received power, link length, loss, and ORL with the push of a button. The results are displayed using colour-coded LinkMap® icons for easy analysis. The FlexScan TS100 automates testing, shortens test time, interprets results, and recommends corrective actions, improving efficiency of frontline technicians and reducing costs.

Diagnose your network in seconds: Just press Start and the TS100 immediately measures and displays received power levels when connected to a live GPON and/or 10GPON network. Within seconds, link length, loss, and ORL are displayed, along with faults exceeding industry or user-set pass/fail limits. The TS100 even recommends corrective actions based on test results making it easier for technicians to find and fix network problems.

Requires little, if any, training: Designed primarily for field technicians activating and maintaining broadband access networks, the TS100 requires minimal training and no OTDR experience. SmartAuto® auto-configures test settings and presents network test results in easy-to-understand, colour-coded icons indicating passing or failing connections, splices, and splitters.

All-in-one test capability: The FlexScan TS100 includes an integrated VFL, power meter, and light source. It can be easily paired to AFL's award-winning FOCIS family of inspection scopes, ensuring technicians have everything they need to locate and quickly resolve optical network issues. The source and power meter generate and detect fibre-identifying tones and support Wave ID insertion loss testing featuring automatic wavelength identification and synchronization.

Designed for field use: FlexScan TS100 is small 86 x 160 x 43 mm and weighs 0.4 kg. It has a large, bright indoor/outdoor touchscreen, and rechargeable battery that lasts >12 hours for all-day operation.

Multiple storing and reporting options: Results can be stored internally, saved to a USB, or wirelessly uploaded via the free FlexScan App for real-time reporting using the included TRM® 3.0 Test Results Manager software.

Convenient cost-saving kits: Bundle the FlexScan TS100 with your choice of launch cable and FOCIS Flex connector inspection probe with adapter tips for significant cost-savings!

FlexScan® TS100 FTTH PON Troubleshooter
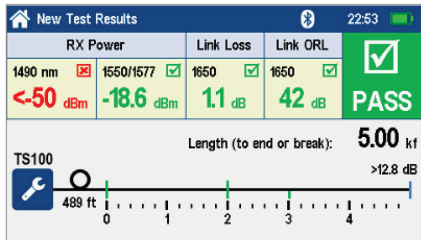
Verify RX Power, Link Length, Loss, and ORL in Seconds

Link length, loss, and ORL are critical parameters to check when verifying optical networks. Within seconds of pressing Start, FlexScan TS100 measures and reports distance, loss, and ORL to the end of a Point-to-Point network or to the first splitter in an FTTH PON. Additionally, for an in-service PON, TS100 automatically detects and measures downstream power levels.

Measurements of received power, link length, loss, and ORL may be compared to pass/fail limits to immediately identify any issues. Technicians can simply touch the failed measurement value to get information on why the measurement failed and what to do about it.
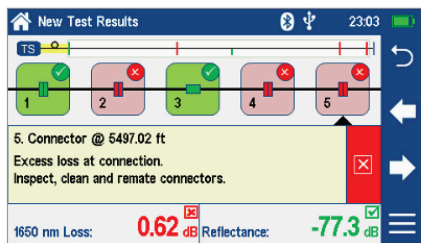
### Identifies & Locates Faults - Recommends Corrective Action

TS100 automatically detects network events such as connections, splices, splitters, and macro-bends. It displays these events with LinkMap® colour-coded icons that are easy-to-read and enable users to quickly identify faults requiring action. Touching each event icon displays its pass/fail status, location, loss, and reflectance as well as recommended corrective actions. More detail may be obtained by touching the measurement values for failing events.

Connectivity

Results can be stored internally, saved to a USB, or wirelessly uploaded via the free FlexScan App to a smart device for real-time reporting using the included TRM® 3.0 Test Results Manager PC-based software. This real-time monitoring can help avoid mistakes in the field that will require future truck rolls.

FlexScan TS100 also pairs easily with AFL's award-winning FOCIS® family of connector inspection probes for fast, easy one-button-push inspection of single-fibre and/or multi-fibre connector end-faces. Inspection data can be saved with TS100 results internally or transferred for archiving.
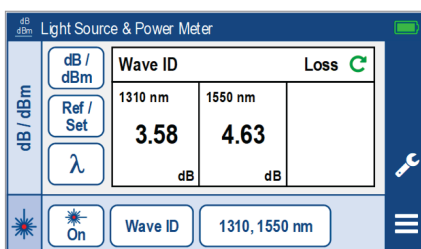
Optional PON Power Meter for GPON, Video, 10GPON

FlexScan TS100 PON Troubleshooters are available with a downstream PON power meter (P2 option) enabling users to immediately and independently verify 1490 nm GPON plus 1550 nm video or 1577 nm 10GPON (XG/XGS-PON or 10GEPON).

TS100s also include an optical light source (OLS) and optical power meter (OPM) supporting fibre-identifying tone generation and detection, as well as Wave ID insertion loss measurements. With Wave ID, the OPM auto-synchronises to a single or multi-wavelength Wave ID optical signal transmitted by another FlexScan or AFL light source. The OPM reports detected wavelengths and measures loss at each wavelength, saving significant test time and eliminating setup errors.

FlexScan® TS100 FTTH PON Troubleshooter

Specifications[a]

FlexScan TS100-60/70 models support PON and Point-to-Point network troubleshooting at 1650 nm and include optical light source (OLS), optical power meter (OPM), visual fault locator (VFL), internal results storage plus Bluetooth and USB interfaces.

MODEL	TS100-60	TS100-70
FAULT LOCATOR		
Emitter Type	Laser	
Safety Class[b]	Class I	
Fibre Type	Compatible with all G.65x single-mode fibre	
Wavelengths (nm)	1650	
Center λ Tolerance [c]	±20 nm	
Link Loss [d]	≤18 dB	≤23 dB
Test through Splitter	N/A	Up to 1:64
Test Time	Length, Loss, ORL, faults to end or Splitter: ≤3 sec Loss through Splitter: ≤40 sec (TS100-70 only)	
Index of Refraction	1.3000 to 1.7000	
Distance Resolution	0.1 m	
Distance Uncertainty e	±1.5 m	
Distance Units	m, km, ft, kft, mi (user-selected)	
Loss Resolution	0.01 dB	
Linearity	±0.05 dB/dB	
Reflectance Resolution	0.1 dB	
Reflectance Accuracy	±2 dB (-20 to -50 dB)	
Results File Format	Telcordia SR-4731 Issue 2 compatible .SOR	
Results Storage	4 GB internal memory (>5000 traces typical); External USB memory stick	
Data Transfer to PC	USB cable or Bluetooth® (option)	
Test Modes	FleXpress® Fault Locate, OLS/OPM, Inspection	
Live Fibre Protection	No TS100 damage with input power ≤ +15 dBm for wavelength(s) in range 1260 to 1675 nm	
Live Fibre Detection	Reports live fibre with input signal ≥ -35 dBm for wavelength(s) in range 1260 to 1675 nm	
PON Filter Isolation	50 dB for 1260 nm ≤ wavelength ≤1600 nm	
Live PON TS100 Test	1650 nm filtered detector	

MODEL		TS100-60/70
SPLITTER DETECTION AND LOSS MEASUREMENT SPECIFICATIONS		
Splitter Type		Up to 1:64 split ratio
Fibre length before splitter		5 km
Maximum fibre loss before splitter		2.5 dB
Minimum fibre length after splitter	1:2 splitter	25 m
	1:4 splitter	35 m
	1:8 splitter	50 m
	1:16 splitter	200 m
	1:32 splitter	300 m
	1:64 splitter	500 m

MODEL	TS100-60/70
VISUAL FAULT LOCATOR	
Emitter Type	Visible red laser, 650 ± 25 nm
Output Power	1.5 mW (+2 dBm ± 0.5 dB) into single-mode fibre
Safety Class [b]	Class 3A / Class 3R
Modes	CW and 1 Hz flashing
OPTICAL LASER SOURCE (OLS)	
Emitter Type	Laser
Safety Class [b]	Class I
Fibre Type	Compatible with all G.65x single-mode fibre
Wavelengths (nm)	1650
Center λ Tolerance (CW)	±30 nm
Spectral Width (FWHM)	≤5 nm
Internal Modulation	270, 330, 1000, 2000 Hz, CW, Wave ID
Wave ID	Compatible with AFL OLS/OPM
Output Power Stability	≤ ±0.5 dB
Output Power	+3 dBm ±1.5 dB
OPTICAL POWER METER (OPM)	
Calibrated Wavelengths	P1: 1310, 1490, 1550, 1577, 1625, 1650 nm P2: 1310, 1490, 1550, 1577 nm
Detector Type	P1 OPM: InGaAs P2 OPM: Filtered InGaAs (x2)
Measurement Range	+10 to -50 dBm
Linearity	1310/1490 nm: ±0.1 dB (+5 to -40 dBm); 1550/1577 nm: ±0.1 dB (+10 to -40 dBm); All: ±0.25 dB (-40 to -50 dBm)
Tone Detect Range	+3 to -35 dBm; auto-detects 270, 330, 1k, 2k Hz
Accuracy	±0.25 dB at -10 dBm
Resolution	0.01 dB
Measurement Units	dB, dBm or Watts (nW, µW, mW)
GENERAL	
Size (in boot)	86 x 160 x 43 mm
Weight	0.4 kg
Operational Temperature	-10ºC to +50ºC, 0 to 95% RH (non-condensing)
Storage Temperature	-40ºC to +60ºC, 0 to 95% RH (non-condensing)
Power	Rechargeable Li-Pol or AC adapter
Battery Life	>12 hours, Telcordia test conditions
Display	4.3 in colour touchscreen LCD, 480 x 272, backlit
USB Ports	1 host, 1 micro-USB function
Bluetooth (optional)	Compatible with Windows PC, Android, iOS

Notes:
a. All specifications valid at 25°C unless otherwise specified.
b. FDA 21 CFR 1040.10 & 1040.11, IEC 60825-1: 2014.
c. Using 10 ns pulse width.
d. Maximum link loss for which loss and distance to end or splitter can be reliably detected and measured.
e. For a 5 km link with insertion loss ≤ 4 dB and reflectance ≥ -45 dB. Excludes uncertainty due to index of refraction.

FlexScan® TS100 FTTH PON Troubleshooter

FlexScan TS100 Kit Configurations

All kits include selected FlexScan TS100 with AC charger, battery, carry strap, SC/2.5 mm connector adapters, TRM® 3.0, USB cable, and soft carry case. PLUS kits add a 150 m fibre ring, One-Click cleaner, and upgrade to TRM 3.0 Advanced software. PRO kits add a FOCIS® Flex auto-focusing connector inspection probe with IEC pass/fail analysis and two adapter tips. TS100s are manufactured with APC connectors.

Ordering Information

TS100-[MOD]-[KIT]-[Pn]-[W]-[KX] where:

[MOD]	TS100 Configuration
60	1650 nm filtered Live PON Troubleshooter; Test to Splitter
70	1650 nm filtered Live PON Troubleshooter; Test through Splitter

[KIT]	TS100 Kit Configuration/Kit Contents
BAS	Includes: TS100, soft case, TRM 3.0 Basic, USB cable[a]
PLUS	Includes: BAS kit plus 150 m fibre ring, One-Click cleaner, TRM 3.0 Advanced
PRO	Includes: PLUS kit plus FOCIS Flex with 2 adapter tips

[Pn]	Power Meter Option
P1	Broadband Power Meter
P2	Dual-wavelength Power Meter for GPON / Video / 10GPON

[W]	Bluetooth Wireless Option
W	Installed and enabled

Notes:
a. Results can be transferred from FlexScan to TRM® 3.0 using USB cable, or uploaded via Bluetooth using FlexScan App downloaded from 'Google play' or 'App Store'.
b. For additional FOCIS Flex adapter tips, see FOCIS Flex data sheet or Buyer's Guide.

FlexScan Port & Inspection Tip Configuration

[KX]	TEST PORT	FIBRE RING END A	FIBRE RING END B	PORT INSPECTION TIP	PATCHLEAD INSPECTION TIP
KS01	SCA	SCA	SCA	SCA	Uni 2.5 mm Angled
KS02	SCA	SCA	SC	SC	Uni 2.5 mm
KS03	SCA	SCA	LC	LC	Uni 1.25 mm
KS04	SCA	SCA	LCA	LCA	Uni 1.25 mm Angled
KS05	SCA	SCA	ST	ST	Uni 2.5 mm
KS06	SCA	SCA	SC	SCA	Uni 2.5 mm Angled

For other kit configurations contact AFL Australia/New Zealand. Inspection tips only included with PRO kits. Additional tips required where hybrid fibre rings are used (sold separately)

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Test Management and Reporting Software

DESCRIPTION	AFL NO.
TRM 3.0 with Basic License (OTDR Trace/OLTS Viewer, Batch Editor and Reports), USB delivery (included with all FS200 kits)	TRM3-BASIC
TRM 3.0 upgrade from Basic to Advanced License, USB delivery	TRM3-UPGRADE
TRM 3.0 upgrade from Basic to Advanced License, email delivery	TRM3-UP-EMAIL
FlexScan App (Android Google Play)	Free Download

Recommended Products

FOCIS Flex and FOCIS Lightning (Multi-Fibre) Connector Inspection
- Self-contained, tether-free, hand-held inspection solution
- Auto-focus and auto-centering for fast, easy inspection
- IEC, IPC and user-defined pass/fail analysis
- FOCIS Lightning: extremely fast multi-fibre auto-analysis for datacom and telecom inspection applications

Fujikura Optical Fibre Identifier
- Works on all fibre types including BIF
- Trigger lock, positive stop for optimum detection
- Integrated optical power meter

Qualifications

CATEGORY	REGULATION/STANDARD	QUALIFICATION
CE Marking	EU	Compliant to relevant EU Directives on health, safety, and environmental protection, and certified with CE marking
Safety/EMC/EMI	IEC	Compliant to IEC 61010-1 for safety requirements for electrical equipment
	EN	Compliant to EN 61010-1 for safety requirements for electrical equipment
	IEC	Compliant to IEC 61326-1 for EMC requirements for electrical equipment
	EN	Compliant to EN 61326-1 for EMC requirements for electrical equipment
	EN	Compliant to EN 55011 for EMC requirements for industrial, scientific and medical equipment
	Telcordia	Compliant to GR-196-CORE 4.5.1 for requirements on electromagnetic interference
	FCC	Compliant to code of federal regulations FCC 47 CFR 15 on unlicensed transmissions
	FDA	Compliant to code of federal regulations FDA 21 CFR 1040.10 and 1040.11 on laser products
	IEC	Compliant to IEC 60825-1 for safety of laser products
RoHS	EU	Compliant to EU regulations Directive 2011/65/EU (RoHS 2) and Directive 2015/863 (RoHS 3)
Test Method	TIA	Compliant to TIA-568.3-D for test and measurement requirements for premises optical fibre cabling and components
	IEC	Compliant to IEC 11801 for test and measurement requirements for optical fibre cabling for use within premises
	EN	Compliant to EN 50173 for test and measurement requirements for optical fibre cabling for use within premises
	AS/NZS	Compliant to AS/NZS 3080 for test and measurement requirements for optical fibre cabling for use within premises
	TIA	Compliant to TIA-526-7 for test procedures for installed optical fibre cable plant
	TIA	Compliant to TIA-526-14 for test procedures for installed optical fibre cable plant
	IEC	Compliant to IEC 14763-3 for systems and methods for the inspection and testing of installed optical fibre cabling
	AS/NZS	Compliant to AS/NZS 14763.3 for systems and methods for the inspection and testing of installed optical fibre cabling
	IEC	Compliant to IEC 61280-4-1 for test procedures for installed optical fibre cable plant
	IEC	Compliant to IEC 61280-4-2 for test procedures for installed optical fibre cable plant
Generic Requirement	Telcordia	Compliant to GR-196-CORE for generic requirements for OTDR-type equipment
	Telcordia	Compliant to SR-4731 Issue 2 for OTDR data format
	IEC	Compliant to IEC 61746-1 for requirements on calibration of OTDR

Contact AUSSales@AFLglobal.com to schedule a demonstration or learn how to buy.

Visit www.AFLglobal.com/Test to learn more about FlexScan TS100 Troubleshooters.

International Sales and Service Contact Information available at www.AFLglobal.com/Test/Contacts