FIBER CATALOG

TEMPO®

COMMUNICATIONS

FAST. ACCURATE. RELIABLE.

COMMUNICATIONS | CABLE TV | FIBER TESTING

WELCOME TO TEMPO COMMUNICATIONS.

With over 20 years of supply to the Fiber Optic industry, Tempo Communications' fiber test products and tools have been tried and trusted by the following industrial segments: Telecoms (BT, Comcast), Avionics (Airbus, Boeing, Lockheed Martin), Petrochemical, Military (US Navy, NATO), Research and Development, Academia.

With a rich fiber heritage dating back to Rifocs and Opto-Electronics, Tempo Communications has grown into a worldwide supplier of fiber products offering a wide portfolio of tools and test equipment for the installation, maintenance and testing of fiber optic cabling systems.

Our Fiber test products and tools are selected and manufactured to Tempo Communications' rigorous design and performance criteria. Products are produced in house at our manufacturing facility in California, at our Kingfisher manufacturing facility in Australia, or sub-contract manufactured by Tempo approved and vetted quality manufacturers. Our fiber test products pass through a Tempo final check before despatch to ensure that the highest quality standard is maintained and delivered to you.

After sales support is provided out of Vista, California and by Tempo Europe Limited at Tempo's Calibration & Repair Service Centre in Cwmbran, South Wales.

PRODUCT RANGE

Our portfolio covers a range of instruments and solutions for:

Installation

Loss Measurement

Fault Finding

The range of fiber Test Instruments provided by Tempo Communications covers easy to operate and economically priced:

Fusion Splicers & Cleavers   Light Sources

Optical Time Domain Reflectometers   Live Fiber Identifiers

Optical Power Meters   Visual Fault Locators

As can be seen from above our focus is on the Physical Layer, Outside Plant products as opposed to service testing. Our philosophy being "A fully tested physical layer is the foundation for a functional service"!

This is why it is important to us to manufacture products that are easy to use and cost effective.

Included alongside these test sets are fiber stripping and preparation tools and a range of accessory items to enable you to outfit technicians performing fiber optic installation and maintenance on multi-mode and single-mode networks.

These products complete the Tempo promise of delivering quality, professional tools and test products.

CONTENTS

OPTICAL FUSION SPLICERS

Tempo Communications fusion splicers utilize two different splicing technologies in our product offering. The FSP200 is a Core Alignment based splicer and the 915FS is an Active Clad splicer.

The FSP200 Core Alignment splicer incorporates six motor technology and is the most capable splicer when splicing legacy or dissimilar fibers. This is because two motors are used to adjust the objective lenses so that the cameras are able to precisely locate the center of the core of the fiber optic cable. This is especially important with older fibers that have geometry variability such as ovality and concentricity of the core with respect to the fiber cladding. The core alignment technology is also more tolerant of contamination and will yield the lowest splice losses in adverse conditions.

The 915FS fusion splicer is an Active Clad fusion splicer and has four motors to align the fibers. No objective lens focusing is provided which is sufficient when splicing two fibers of the similar geometry. Since singlemode fibers produced in the last two decades are of remarkably consistent geometries, even between cable manufacturers, the splice loss is virtually the same as the Core Alignment splicer.

Both the Active Clad and Core Alignment fusion splicers far surpass the performance of the V-Groove technology splicers that employ only two adjustment motors.
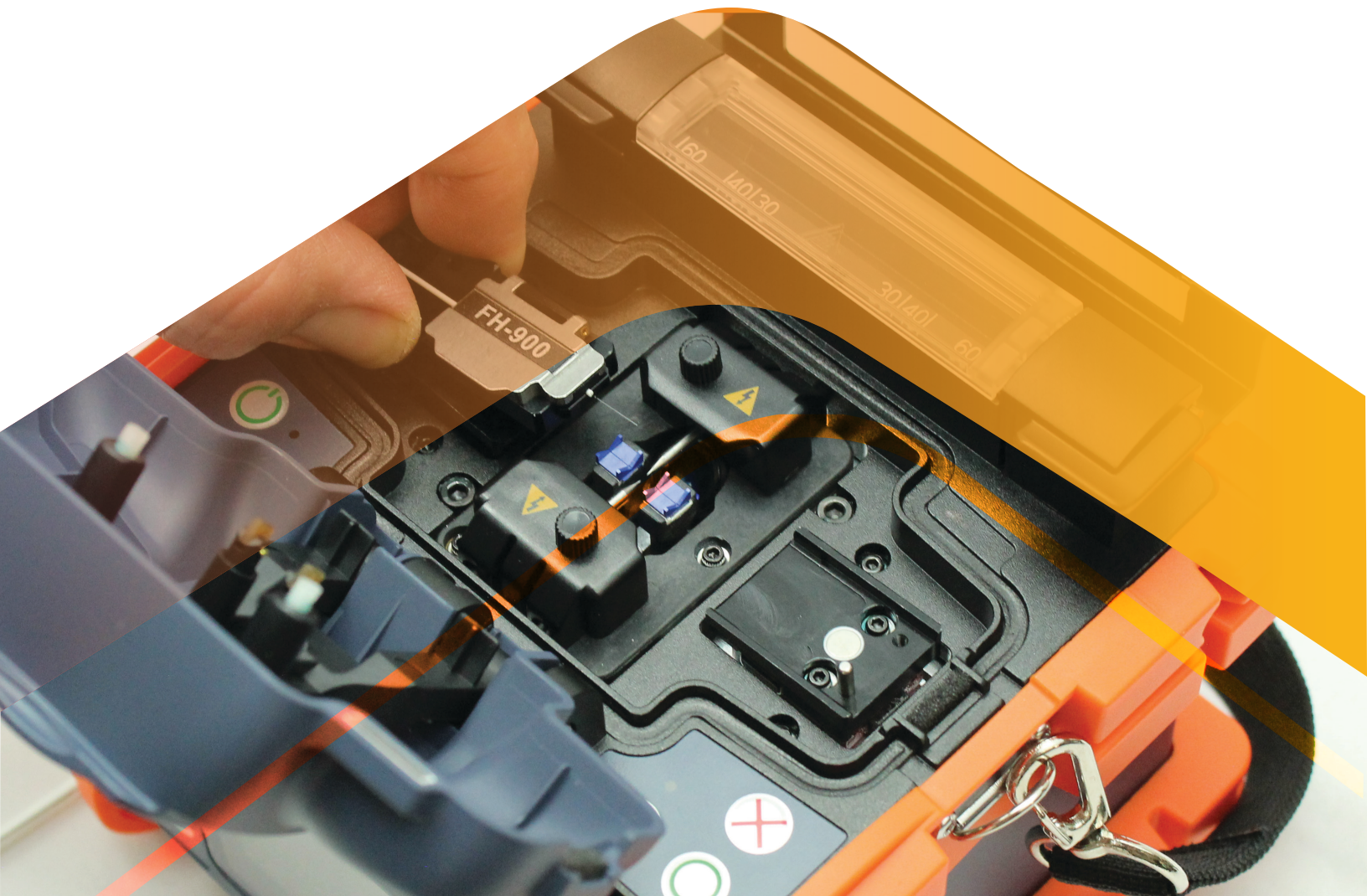
FSP200 CORE ALIGNMENT OPTICAL FUSION SPLICER

The Tempo Communications FSP200 Optical Fiber Fusion Splicer is intended to fuse two fiber optic cables, resulting in low splice loss and long-term stable splices. The FSP200 is a Core Alignment splicer that utilizes six precision motor transports.

The FSP200 fusion splicer uses a CDS (Core Detection System), which is also widely known as PAS (Profile Alignment System). The two focus cameras determine the center of the core of the two fibers, then adjusts each in the X, Y, and Z dimensions to automatically and precisely align the two fiber cores. A fusing arc is applied, which then provides the lowest loss fusion splice.

The FSP200 with PAS technology is designed for splicing singlemode and multimode fibers including DSF, NZDS and BIF.

Splices are completed in as little time as seven seconds while providing low splice losses typically of 0.01dB. The high capacity battery is capable of splicing over 200 fusion splices on one battery charge.

The intuitive user interface and IP52 rating insures that the technician able to quickly become proficient splicing in the most demanding conditions.

SCAN TO WATCH THE VIDEO

FEATURES

- True Core Alignment for Low Loss Splices
- IP52 provides resistance to dust and water ingress
- Small and lightweight for the most demanding jobs
- Loose tube fiber compatible
- Auto-Calculation of Estimated Splice Loss
- Adapters for 200/250, 900μm and 3mm fiber

SPECIFICATIONS:

Applicable Fibers	SM (G.652); MM (G.651); DS (G.653); NZDS (G.655); BIF (G.657); EDF
Fiber Cleaved Length	10mm
Cladding Diameter	80 to 150μm
Coating Diameter	100 to 1000μm
Fiber Count:	Single
Fiber Aligning Method	Core Alignment
Splice Loss (Typical)	0.02 dB (SM); 0.01 dB (MM); 0.04 dB (DS); 0.04 dB (NZDS & BIF)
Splicing Mode	60 Preset / User Definable Modes
Splice Time (Typical)	7 seconds[1]
Boot Time	5 seconds
Number of Splices Per Battery Charge	200 (including 60mm heat shrink cycle) [2]
Splice -On-Connector	SC, LC, FC, ST
Arc Calibration Mode	Automatic and Manual
Protection Sleeve Length	60mm, 40mm, Micro Sleeves
Ingress Protection(3)	IP5X (Dust); IPX2 (Water) [3]
Storage of Splice Results	5,000 Results, 100 screenshots
Drop Test	76cm on five axis

Tension Test	2N
Fiber Display Magnification	200X
Tube Heating Mode	20 Preset / User Definable Modes Adjustable 0-240 seconds
Tube Heating Time (Typical)	18 seconds[4]
Attenuator Mode	0.1 to 15 dB
Electrode Life	5,000 Splices
Display:	5.0" Color Touchscreen LCD
Connectivity	USB
Operating Conditions	Pressure: 0 to 16,404 feet (0 to 5,000 meters) above Sea Level Wind Velocity up to 15m/s Humidity: 0 to 95% Temperature: -4 to +131F (-20 to +55C)
Storage Conditions	Temperature: -40 to +158F (-40 to +70C)
Power Supply	100 to 240V AC Adapter; Li-ion Battery (4400 mAh)
Weight	3.74lbs (1.7kg) with battery
Dimensions (HxWxD)	4.9" x 4.9" x 5.3" (125 x 125 x 135mm)
Vibration Resistance	10Hz – 500Hz with a spectral density of 0.03g2/Hz
Password Protection	Yes

(1) Fast mode. (2) 90s/cycle splice time and power save functions activated. Number of cycles may vary depending on battery status and ambient operating conditions. (3) Dust resistance and rain resistance test do not guarantee that the product will not be damaged under these conditions. (4) Dependent on splice protector used and ambient conditions. Time quoted is assuming that the oven is not cold.

*Specifications subject to change without notice.

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
55500052	FSP200	Optical Fusion Splicer
55500053	FSP200-KIT1	FSP200 Fusion Splicer & Cleaver Kit
55500054	FSP200-KIT2	Contractor Fusion Splicer Kit
52080292	06811	915FS FSP200 Batt
52080896	07096	Power Supply, 915FS FSP200
52064141	01335	Splice-On-Connector Adapter (SC & LC)
52066481	02401	Splice-On-Connector Adapter (ST & FC)

PART NO.	CAT. NO.	DESCRIPTION
52063414	01329	Replacement Electrodes
52064142	01333	900μm Adapter (Pair)
52067851	03245	3mm Adapter (Pair)
52076996	05801	Loose Tube Adapter (Pair)
52064143	01332	200/250μm Adapter (Pair)
52081862	07388	Universal Adapter (Pair)
52075841	05245	Splicer Electrode Cleaner (Pair)
55500059	NA LC	North American Line cord
52066954	02571	European Line Cord
52066952	02570	UK Line Cord

915FS ACTIVE CLADDING OPTICAL FUSION SPLICER

The Tempo Communications 915FS Optical Fiber Fusion Splicer is intended to fuse two fiber optic cables, resulting in low splice loss and long-term stable splices. The 915FS is an Active Clad fusion splicer the utilizes four precision motor transports.

The 915FS fusion splicer capably aligns the two fibers in the X, Y, and Z dimensions to automatically and precisely align the two fibers. A fusing arc is applied, which then provides the lowest loss fusion splice.

The 915FS is designed for splicing singlemode and multimode fibers including DSF, NZDS and BIF.

Splices are completed in as little time as seven seconds while providing low splice losses typically of 0.01dB. The high capacity battery is capable of splicing over 200 fusion splices on one battery charge.

The intuitive user interface and IP52 rating insures that the technician able to quickly

SCAN TO WATCH
THE VIDEO

FEATURES

- Active clad technology for todays fibers
- IP52 provides resistance to dust and water ingress
- Small and lightweight for the most demanding jobs
- Loose tube fiber compatible
- Auto-Calculation of Estimated Splice Loss
- Adapters for 200/250, 900µm and 3mm fiber

SPECIFICATIONS:

Applicable Fibers	SM (G.652); MM (G.651); DS (G.653); NZDS (G.655); BIF (G.657); EDF
Fiber Cleaved Length	10mm
Cladding Diameter	80 to 150µm
Coating Diameter	100 to 1000µm
Fiber Count	Single
Fiber Aligning Method	Active Clad Alignment
Splice Loss (Typical)	0.02 dB (SM); 0.01 dB (MM); 0.04 dB (DS); 0.04 dB (NZDS & BIF)
Splicing Mode	60 Preset / User Definable Modes
Splice Time (Typical)	7 seconds [1]
Boot Time	5 seconds
Number of Splices Per Battery Charge	200 (including 60mm heat shrink cycle)[2]
Splice-On-Connector	SC, LC, FC, ST
Arc Calibration Mode	Automatic and Manual
Protection Sleeve Length	60mm, 40mm, Micro Sleeves
Ingress Protection	IP5X (Dust); IPX2 (Water)[3]
Storage Of Splice Results	5,000 Results, 100 screenshots
Drop Test	76cm on five axis

Vibration Resistance	10Hz to 500Hz with a spectral density of $0.03g^2$/Hz
Tension Test	2N
Fiber Display Magnification	200X
Tube Heating Mode	20 Preset / User Definable Modes Adjustable 0-240 seconds
Tube Heating Time (Typical)	18 seconds[4]
Attenuator Mode	0.1 to 15 dB
Electrode Life	5,000 Splices
Display	5.0" Color Touchscreen LCD
Connectivity	USB
Operating Conditions	Pressure: 0 to 16,404 feet (0 to 5,000 meters) above Sea Level Wind Velocity up to 15m/s Humidity: 0 to 95%Temperature: -13 to 122°F (-25 to 50°C)
Storage Conditions	Temperature: -40 to 140°F (-40 to 60°C)
Power Supply	100 to 240V AC Adapter; Li-ion Battery (4400 mAh)
Weight	3.3lbs (1.5kg) with battery 2.6lbs (1.2kg) no battery
Dimensions (HxWxD)	4.9" x 4.9" x 5.3" (125 x 125 x 135mm)

(1) Fast mode. (2) 90s/cycle splice time and power save functions activated. Number of cycles may vary depending on battery status and ambient operating conditions.(3) Dust resistance and rain resistance test do not guarantee that the product will not be damaged under these conditions. (4) Dependent on splice protector used and ambient conditions. Time quoted is assuming that the oven is not cold.

* Specifications subject to change without notice.

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52064143	01332	200/250µm Adapter (Pair)
52081862	07388	Universal Adapter (Pair)
52075841	05245	Splicer Electrode Cleaner (Pair)
55500059	NA LC	North American Line cord
52066954	02571	European Line Cord
52066952	02570	UK Line Cord

915FS-KIT1 Includes: 915FS Optical Fusion Splicer and 915CL Optical Fiber Cleaver.

915FS-KIT2 Includes: 915FS Optical Fusion Splicer, 915CL Optical Fiber Cleaver, Fiber Optic Stripper, PA1171 and an extra battery.

OPTICAL FIBER CLEAVERS

Tempo Communications has a full suite of fiber optic cleavers including the FCL200, FCL100, 915CL and the 920CL. The FCL200 is the most capable cleaver in that it employs auto fiber end cut and auto blade return features. The 915CL has auto blade return with the 920CL providing the most economical alternative in the traditional cleaving footprint. The FCL100 is a low cost cleaver that is typically used in emergency situations or when cleaving field fibers when used in conjunction with mechanical connectors.

FCL200 OPTICAL FIBER CLEAVER

FEATURES

- Accurate Cleaves. Cleave multi-mode and single-mode fiber optic cables.
- Long Life. Blades rotate for longer life - over 48,000 cleaves.
- Adaptable. Supports 200um, 250um, 900um fibers, ribbon and loose tube fibers.
- Fast. For use with the 910FS, 915FS or FSP200 Optical Fusion Splicers for maximum speed and efficiency with auto return mechanism.
- Dust bin. Safely and automatically collects end cuts during the cleaving process.
- Fixed Clamp. Allows the technician to use the FCL200 as a standalone cleaver.

SPECIFICATION:

Applicable Fibers	SM (G.652); MM (G.651); DS (G.653); NZDS (G.655); BIF (G.657)
Fiber Cleaved Length	5mm to 20mm
Cladding Diameter	125µm
Coating Diameter	0.20mm, 0.25mm and 0.9mm
Fiber Count	Single and Ribbon (12)

Cleaving Angle	< 1.5°
Blade Rotation Positions	16
Blade Life	48,000 Cleaves
Weight	0.77lbs (350g)
Dimensions	2.55 x 3.85 x 2.55" (65 x 98 x 65mm)
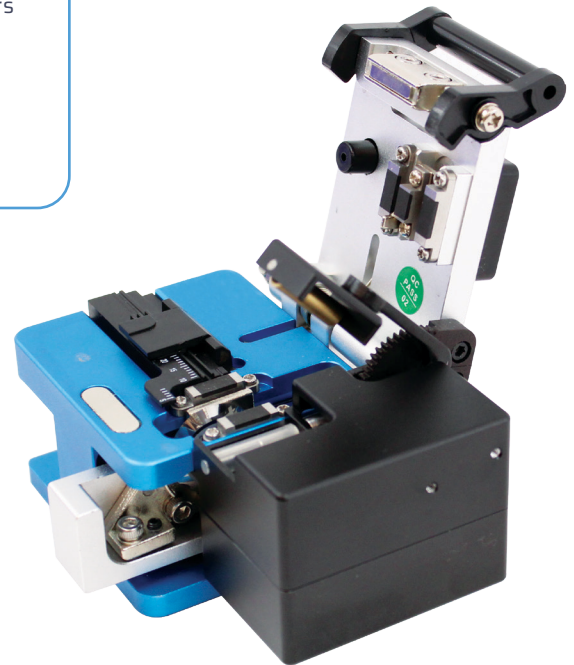
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915CL OPTICAL FIBER CLEAVER

FEATURES

- 48,000 cleaves
- Auto return of blade mechanism for fast and easy cleaves
- Cleaves singlemode and multimode fibers
- Integrated dust bin
- Prepares fibers for use in the 910FS, FSP200 and 915FS fusion splicers
- Supports 200um, 250um, 900um fibers, and loose tube fibers.
- Fixed Clamp. Allows the technician to use the 915CL as a standalone cleaver.

SPECIFICATION:

Applicable Fibers	SM (G.652); MM (G.651); DS (G.653); NZDS (G.655); BIF (G.657)
Fiber Cleaved Length	5mm to 20mm
Cladding Diameter	125μm
Coating Diameter	0.25mm and 0.9mm
Fiber Count	Single

Cleaving Angle	< 1.5°
Blade Life	48,000 Cleaves
Weight	0.56lbs (255g)
Dimensions (HXWXD)	2.29 x 2.17 x 1.89" (58 x 55 x 48mm)

920CL OPTICAL FIBER CLEAVER

FEATURES

- 48,000 cleaves
- Cleaves single-mode and multi-mode fibers
- Integrated dust bin
- Prepares fibers for use in the 910FS, FSP200 and 915FS fusion splicers
- Supports 200um, 250um, 900um fibers, and loose tube fibers.
- Fixed Clamp. Allows the technician to use the 920CL as a standalone cleaver.

SPECIFICATION:

Fiber Type	SM (G.652); MM (G.651); DS (G.653); NZDS (G.655); BIF (G.657)
Fiber Cleave Length	5mm to 20mm
Cladding Diameter	125μm
Coating Diameter	0.20mm, 0.25mm and 0.9mm
Fiber Count	Single

Cleaving Angle	< 0.5°
Blade Life	48,000 Cleaves
Weight	0.68lbs (310g)
Dimensions	2.13 x 2.28 x 2.28" (54 x 58 x 58 mm)
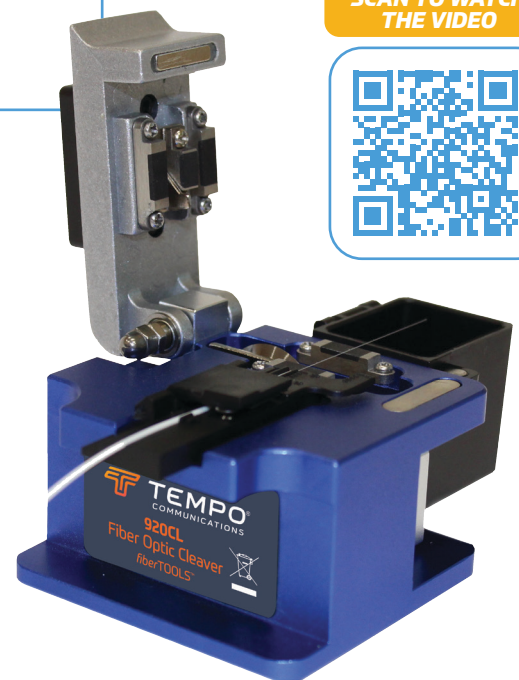
FCL100 OPTICAL FIBER CLEAVER

FEATURES

- 200, 250 & 900 micron fibers
- Cleaves single-mode and multi-mode fibers
- Prepares fibers for use with mechanical connector, fusion splicers and bare fiber adapters

SPECIFICATION:

Applicable Fibers:	125 Micron Fiber (200/250/900)
Fiber Cleaved Length:	2.0mm to 20.0mm
Dimensions:	4.88" x 0.79" x 1.57" (124mm x 20mm x 40mm)
Weight:	0.13lbs (60g)
Operating:	Spring Activated

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ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
55500055	FCL200	FCL200 Optical Fiber Cleaver
52078354	915CL	915CL Optical Fiber Cleaver
52082727	920CL	Fiber Optic Cleaver
52087221	FCL100	Field Cleaver
52082583	915CL-Blade	Cleaving Wheel (915CL)
52064145	01640	920CL & FCL200 Cleaving Wheel

PART NO.	CAT. NO.	DESCRIPTION
52078357	915CL-CLAMP	Fixed Clamp 915CL with Screw
55504666	FC920 & 200	Fixed Clamp 920CL FCL200 With Screw
52086838	04268	Replacement Screw for Fixed Clamp
55500194	BLD-01	FCL100 Blade
55500196	SPR-01	FCL100 Spring

SPLICE ON CONNECTORS

The Tempo Communications SOC can be used in any manufacturers fusion splicer as no special adapters or fixtures are required. The added benefit is that no specialized training is required.

FEATURES

- Works with all fusion splicers – no special adapters required
- Only three parts compared to competitive products that have up to eight
- No splice tray required
- Up to three splicing attempts possible
- Extended boot provides added protection and prevents Macrobends

SC/APC	SC/UPC	LC/APC	LC/UPC
SC/PC OM1	SC/PC OM4	LC/PC OM1	LC/PC OM4

ORDERING INFORMATION

CATALOG NUMBER	DESCRIPTION
SOCSCUPC-10	SC/UPC Singlemode Splice on Connector
SOCSCAPC-10	SC/APC Singlemode Splice on Connector
SOCSCPCOM1-10	SC/PC OM1 62.5µm Multimode Splice on Connector
SOCSCPCOM4-10	SC/PC OM4 50µm Multimode Splice on Connector
SOCLCUPC-10	LC/UPC Singlemode Splice on Connector
SOCLCAPC-10	LC/APC Singlemode Splice on Connector
SOCLCPCOM1-10	LC/PC OM1 62.5µm Multimode Splice on Connector
SOCLCPCOM4-10	LC/PC OM4 50µm Multimode Splice on Connector

SPECIFICATIONS

Connector Types	900 micron SC and LC (APC and UPC)
Fiber Types	Corning G.652, OM1 and OM4
Cable Types	250 and 900 micron
Insertion Loss - Singlemode	0.15dB, 0.3dB maximum
Insertion Loss - Multimode	0.1dB, 0.3dB maximum
Return Loss	(APC) : ≤ -65dB, (UPC)SM : ≤ -55dB, MM: ≤ -35dB (PC)
Number of splice attempts/ reuse cycles	Three
Boot length	130mm
Operating and Storage Temperature	-40°C to + 75°C
*Compliance	GR-326

Specifications subject to change without notice.
*Meets Telcordia GR-326-CORE pertinent ferrule geometry requirements for singlemode connectors. The Declaration of Conformity is available upon request.

OFL100 OTDR

The OFL100 OTDR enables the front-line fiber technician to quickly locate loss events in the last mile of the FTTx network. The convenient touchscreen provides an intuitive interface making it simple for even newly provisioned technicians to locate loss events such as cut fibers, contaminated or damaged connectors, and excessively bent fibers.

The Auto Mode allows the technician to initiate a measurement without adjusting any test parameters. The Expert OTDR Mode provides access to all features the savvy OTDR technician demands so they can refine measurement parameters enabling them to troubleshoot the most demanding faults. The OFL100 includes an integrated visual fault locator (VFL), stabilized light source (SLS), and optical power meter (OPM).

Results can be displayed using a traditional OTDR trace or linear map with user selectable Pass/Fail analysis. All events are measured, annotated, saved, and exported as an industry standard SOR file that is compliant to GR196 Telcordia standards. The SOR file can be imported into the Trace Viewing program where analysis can be performed, and test results can be saved as a PDF report.

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
55501331	OFL100-NA	OFL100 with North American Power Supply
55501334	OFL100-EU	OFL100 with UK and European Power Supplies
55504674	OFL100-CBL500	OFL100-NA with 500m Launch Cable OFL100-NA

FEATURES

- Easy to use one button test function. Start measurements with the push of one button.
- Auto test automatically sets test parameters for optimum test results.
- Graphical touchscreen interface is easy to read, even in high ambient light conditions.
- Measure lengths and fiber defects to quickly locate faults.
- Link Viewer annotates the entire fiber link in an easy to interpret Pass/Fail format.
- Cable acceptance reports generate customized reports that include trace signature and fiber events.
- Long life battery so you can work longer without recharging - up to 12 hour shift capable.

ACCESSORIES:

PART NO.	CAT. NO.	DESCRIPTION
55501338	OFL100-SCAPC	SC/APC Adapter
55501340	OFL100-FCAPC	FC/APC Adapter
55501527	SCAPC-LCAPC	0.5m SC/APC LC/APC Cable
55501333	OFLPS-NA	OFL100 North American Power Supply with USB Cable
55501337	OFLPS-UK	OFL100 United Kingdom Power Supply with USB Cable
55501336	OFLPS-EU	OFL100 European Power Supply with USB Cable
52068673	1.25 MM ADAPTER	1.25mm Adapter for connection to the OPM and VFL ports
55501332	OFLCC	Carry Case

OFL100 Specifications:

OTDR

Wavelength	1310/1550nm
Dynamic Range	26/24dB
Event Deadzone	2.5m
Attenuation Deadzone	8m
Measurement Ranges	500m, 1km, 2km, 4km, 8km, 16km, 32km, 64km and 100km
Pulse Widths	3ns, 5ns, 10ns, 20ns, 30ns, 50ns, 80ns, 160ns, 320ns, 500ns, 800ns, 1μs, 2μs, 3μs, 5μs, 8μs, 10μs and 20μs
Measurement Accuracy	± (1m+Sample interval+0.005%x-Test Distance)
Linearity	≤0.05dB/dB
Loss Resolution	0.001dB
Loss Threshold	0.20dB
Distance Resolution	0.001m
Refractive Index	1.00000 to 2.00000
Reflection Accuracy	±3dB
File Format	SOR compliant to Telcordia GR196
Loss Analysis	Four Point & Five Point
Laser Safety	Class 1M
Bulkhead	SC/APC (Optional LC and FC)
Trace Update Rate	3Hz

Optical Power Meter

Wavelength Range	800nm to 1700nm
Calibrated Wavelengths	850nm, 980nm, 1300nm, 1310nm, 1490nm, 1550nm, 1625nm and 1650nm
Measurement Range	+26dBm to -50dBm
Measurement Resolution	0.01dB
Measurement Accuracy	±5%
Tone Frequencies/Sensing	CW, 270Hz, 330Hz, 1kHz and 2kHz
Bulkhead	2.5mm Universal

Visual Fault Locator

Wavelength	650nm ±20nm
Output Power	<1mW
Mode of Operation	CW, 1Hz and 2Hz
Bulkhead	2.5mm Universal
Laser Safety	Class 2

Stabilized Laser Source

Wavelength	1310/1550nm
Output Power	≥ -5dBm; variable
Power Stability	CW, ±0.5dB/15 minutes after continuous on of 15 minutes
Bulkhead	SC/APC (Optional LC and FC Available)
Tone Frequencies	CW, 270Hz, 330Hz, 1kHz and 2kHz

Optical Loss Testing

Wavelength	1310nm and 1550nm
Insertion Loss Testing	Integrated OPM and SLS

RJ45 Sequence Testing

Cable Type	Straight and Interleaved (T568)

Mechanical

Display	4.3" 800x400 TFT LCD Touch-screen
Power Supply	AC to DC 100-240VAC, 50/60Hz
Power Supply Format	North America or United Kingdom and European
Battery Lifetime	>12 Hours Continuous Test
Battery	3.7V, 4Ah Li ION
Weight	<1.1lbs (<0.5kg) Including Battery
Size	6.8"x 4.3"x 1.8" (173mm x 109mm x 45mm)

Data

Internal Storage	8GB (>200,000 Curves)
Interface	USB Type C, 8GB SD Card

Environmental

Operational Temperature	-10°C to +50°C
Storage Temperature	-40°C to +70°C
Relative Humidity	0 to 95% Non-Condensing

*Specifications subject to change without notice

WARNING

930XC HANDHELD SINGLEMODE OTDR

The 930XC OTDR's utilize an easy to learn intuitive user that allows the technician to quickly locate fiber faults in FTT(x) and Point to Point networks. Both singlemode and multimode versions are available which span all of the common wavelengths used in telco and LAN installations. The 930XC-20C OTDR is the basic version that effectively measure and characterize singlemode fiber links at 1310nm and 1550nm. The 930XC-30F measures at 1310nm, 1550nm and 1625nm where the 1625nm wavelength can be used to measure live fibers without interrupting network traffic.

The free Trace Viewer program imports SOR files which provides the tools required to complete a comprehensive report on the the fiber measurements.

FEATURES

- 2 & 3 wavelength options available: 1310/1550nm; 1310/1550/1625nm
- Up to 35dB dynamic range on the two wavelength model Up to 38dB dynamic range on the three wavelength model
- Optical Power Meter
- Stabilised Light Source
- Visual Fault Locator
- Fiber analysis software for report generation
- Large backlight LCD colour display
- Measure length and defects of coiled fiber
- 1625nm operation for live fiber testing (30F)
- RS-232/USB interface
- NiMH batteries for 8 hours continuous use
- LinkViewer Software analysis
- Macrobend analysis

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ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
DUAL WAVELENGTH SINGLEMODE OTDR		
52067083	02610	930XC-20C Singlemode OTDR, 1310/1550nm FC/UPC
52067082	02609	930XC-20C Singlemode OTDR, 1310/1550nm SC/UPC
52067084	02611	930XC-20C Singlemode OTDR, 1310/1550nm ST/UPC
52067086	02613	930XC-20C Singlemode OTDR, 1310/1550nm FC/APC
52067085	02612	930XC-20C Singlemode OTDR, 1310/1550nm SC/APC
52067093	02620	930XC-30F Singlemode OTDR, 1310/1550/1625nm FC/UPC
52067092	02619	930XC-30F Singlemode OTDR, 1310/1550/1625nm SC/UPC
52067094	02621	930XC-30F Singlemode OTDR, 1310/1550/1625nm ST/UPC
52067096	02626	930XC-30F Singlemode OTDR, 1310/1550/1625nm FC/APC
52067095	02623	930XC-30F Singlemode OTDR, 1310/1550/1625nm SC/APC

ORDERING INFORMATION:

| 930XC OTDR ACCESSORIES		
PART NO.	**CAT. NO.**	**DESCRIPTION**
52047065	AC-ADPT-20-UNI	Universal Power Supply
52034549	AC-CONN-FC-L2	FC Connector (For UPC & APC)
52034550	AC-CONN-ST-L2	ST Connector (For UPC)
52078401	AC-CONN-SC-UPC-L2	SC Connector (For UPC & APC)
52067854	ADAPTER, OPM SC (930XC)	OPM SC Adapter
52067855	ADAPTER, OPM FC (930XC)	OPM FC Adapter
52067856	ADAPTER, OPM ST (930XC)	OPM ST Adapter
52034552	20999	NiMH Battery (9.6V)

SPECIFICATIONS:

	930XC-20C	930XC-30F
Wavelength (± 20nm)	1310/1550nm	1310/1550/1625nm
Dynamic Range [a]	35	38/37/37
Event Deadzone [b]	1.0	1.0
Attenuation Deadzone [b]	4.5	4.5
Pulsewidth (ns)	5, 10, 30, 100, 300, 1μs, 2.5μs, 10μs, 20μs	
Selectable Ranges (km)	0.3, 1.3, 2.5, 5, 10, 20, 40, 80, 120, 160, 240	
Sampling Points	16,000	
Average Time	15s/30s/1 min/2 min/3 min	
Distance Measurement Accuracy	±(1m + 5 x 10-5 x distance + sampling space)	
Connector Type	PC or APC (interchangeable FC, SC, ST)	
Reflection Detect Accuracy	±4 dB	
Attenuation Detect Accuracy	±0.05 dB/dB	
Measurement Data Storage	1,000 test curves	
Data Transmission	RS-232/USB port	
Visual Fault Locator (VFL)	3mW; 650nm	
Optical Power Meter (OPM)	InGaAs	
OPM Wavelengths	850, 1300, 1310, 1490, 1550, 1625nm	
OPM Range	+6 to -70dBm (+6 to -60dBm @ 850nm)	
OPM Display resolution	0.01dB	
OPM MOD Identification	1kHz, 2kHz	
Stabilized laser Source (SLS)	Wavelength same as selected in OTDR mode ≤ -7dBm	
Power Supply	NiMH chargeable battery/AC adapter	
Battery Life	Support over 8 hours operating on one charge or over 20 hours standby	
Operating Temperature	-10°C to 50°C	
Storage Temperature	-20°C to 60°C	
Relative Humidity	0 to 95% (non-condensing)	
Weight	1.9lbs. (0.87kg)	
Dimensions	7.7" H x 3.9" W x 2.4" L (196mm x 100mm x 64mm)	
Compliance	EAC, UKCA, CE, FCC, UL	

*Specifications subject to change without notice
[a] Using a pulse width of 20μs
[b] Using a pulse width of 5ns measuring a -45dB event

TRACE VIEWER SOFTWARE
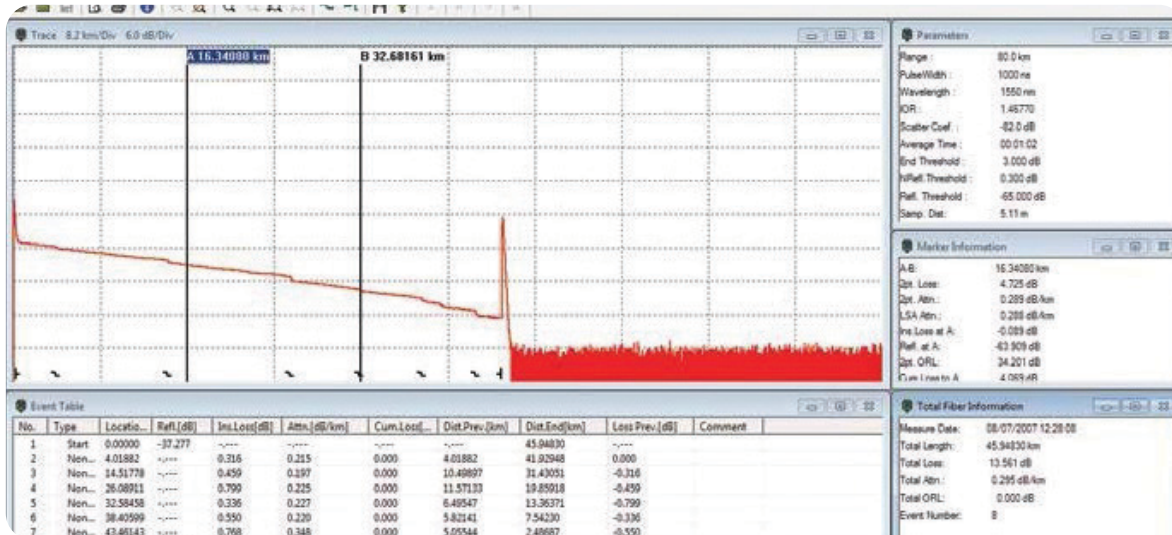
TraceViewer Software showing trace, event table, Parameters, Marker Information & Total Fiber Information.

TraceViewer with expanded trace view highlighting the benefit of Launch Cables to examine Near & Far end connectors.

LINK VIEWER SOFTWARE

LinkViewer Software showing optical events that exceed the threshold of the Fiber Under Test.
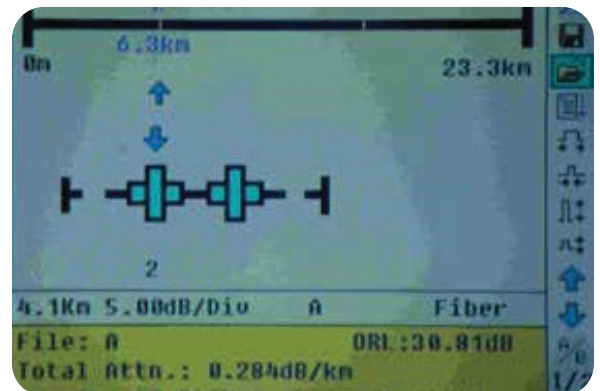
LC-500 OTDR LAUNCH CABLE 500M

Launch cables are used to reduce the effect deadzones caused by mechanical connection of the OTDR to the Fiber under Test. Constructing a backscatter trace before the Near end connector enables the technician to evaluate the connector for Insertion Loss & return Loss. Also known as a Pulse Suppressor.

LC-500 Patch Panel Matrix with 0.5m
SC/APC - SC/APC patch cable
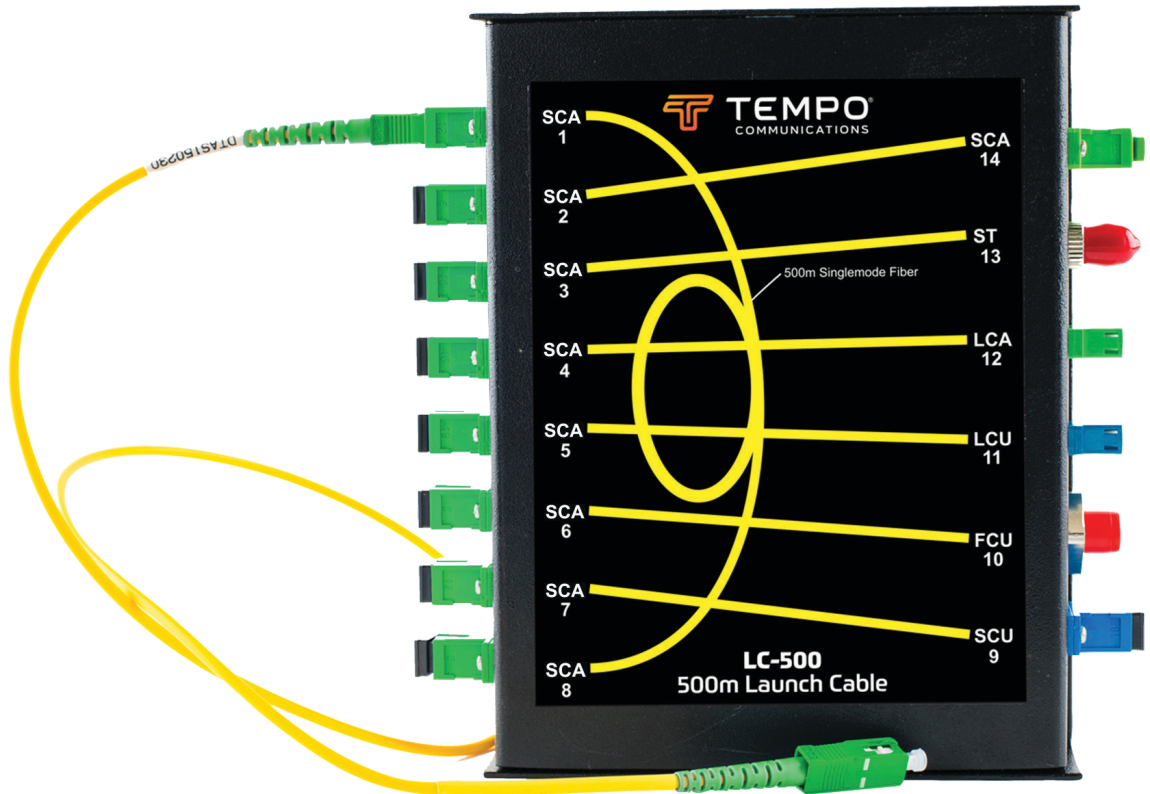
FEATURES

- Universal compact design
- Rugged construction

BENEFITS

- Troubleshoot the input connector and the initial fiber span that may be masked by the deadzone of an OTDR
- Characterise input and output connectors and the entire fiber link
- Minimise Dead zones
- Eliminate multiple patch cables

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52076057	LC-500	500M Launch Cable

FIP100 FIBER OPTIC CONNECTOR INSPECTION SYSTEM

The FIP100 is a fully automated inspection tool that provides fast and reliable analysis of fiber optic connector end faces and bulkheads. With a single button press, the FIP100 automatically focuses, captures an image of the connector endface and provides a pass/fail result. The pass/fail status of the connector is instantly reported via a red/green LED on the probe. Detailed results are shown on the iOS or Android app, which provides PDF report generation and sharing. Both apps are pre-loaded with pass/fail requirements from IEC 61300-3-35, as required by all major telecommunications service providers.

FEATURES

- Test ferrule end faces and bulkheads compliant to IEC61300-3-35
- SIngle handed, one button operation
- Auto focus, auto capture, auto test
- LED pass/fail indicator on probe
- Small form factor enables inspection of difficult to reach ports
- Create and share reports on Android and iOS devices
- IEC, IPC and user defined inspection criteria
- Wide range of adapter tips

APPLICATIONS

- Verify connector cleanliness before connecting
- Certify connector condition on installation
- Document connector damage when troubleshooting
- Inspection is an essential for proper fiber handling in all networks

SMART DEVICE APPS: FIP100

- Auto focus, auto capture and auto test functions
- IEC, IPC, industry standard, and user-defined inspection rules
- Pinch-to-zoom fiber end-face images
- Report generation
- Multi-language Graphical User Interface (GUI)
- Day/time stamped job saving
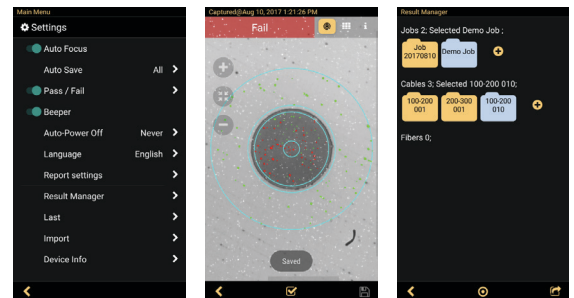
SPECIFICATIONS:

OPTICAL PERFORMANCE

Field of View (FOV) [b]	Live and Captured: 612 x 460 μm;
Manual Detection Capability (minimum)	0.25 μm
Auto Analysis Resolution	<1.0 μm
Stored [c] Image Size	2592 x 1944 (5M) pixels
End-face Illumination	Coaxial blue LED 476 nm
Maximum No Damage Live Fiber Power Level	+20 dBm

OPERATING FEATURES

WiFi Characteristics	IEEE 802.11bng
Focus	Auto-focus (≤3 sec) and manual focus
Centering	Auto-centering (<1 sec)
Button Functionality	Power On/Off (>3 secs); Capture/Analysis/Auto-save/Live
Main LED Functionality	Blue = Connected to App, Green = Pass, Red = Fail
Magnification [b]	Variable from 80X to 700X, in Live and Capture modes
Applications Compatibility	Android ≥4.0.3, iOS ≥8.1
Image Capture with Pass/Fail Analysis [c]	IEC 61300-3-35, AT&T TP-76461, IPC-8497-1, user-set criteria
Image File Format	JPEG, GIF
Image & Pass/Fail Results Storage [c]	Yes
File Storage Capacity [c]	Unlimited
Result Manager [c]	Storage, rename, delete, transfer
Reporting [c]	Built-in fillable PDF reporter
Supported Languages [c]	English, French, German, Japanese, Korean, Russian, Spanish

PHYSICAL AND POWER CHARACTERISTICS

Battery Type	Li-Ion, non-replaceable by user
Maximum Charger Current Draw	1.2A, battery charge current + device consumption current
Operating Time (typical)	60 hours [d]; 8 hours continuous
Recharge Time	≤4 hours
Low-Battery Warning	Viewed on smart device
Charging LED Status; viewed on smart device	Red = Charging, Green = Fully Charged, Blinking Red/Green = Battery Fault
Power Save Features (Controlled by App)	Probe Auto-Off – disabled, 5, 10, 30, 60 minutes; Probe WiFi Not Connected – 5 minutes
AC Charger Voltage, Frequency, Current	100-240VAC, 50/60Hz, 5VDC, 2A
Charger Jack	0.9 x 3.2 mm barrel, center (tip) positive
Size (Max Diameter x Length)	Ø 40 x 226 mm (Ø 1.6 x 8.9 in)
Weight	150 g (5.3 oz)

ENVIRONMENTAL CHARACTERISTICS

Operating Temperature	0 to +50 °C; 95% RH, non-condensing
Storage Temperature	-40 to +70 °C; 95% RH, non-condensing

Notes:
a. All specifications valid at 23°C ±2°C (73.4°F ±3.6°F).
b. Viewed on Smart Device.
c. In iOS & Android Apps.
d. Operating conditions: 60 tests in 20 minutes, then auto-off; Repeat each hour

CERTIFICATIONS:

CE/UKCA	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 55011 for EMC requirements for industrial, scientific and medical equipment
	FCC	Compliant to code of federal regulations FCC 47 CFR 15 on unlicensed transmissions
RoHS	EU	Compliant to EU regulations Directive 2011/65/EU (RoHS 2) and Directive 2015/863 (RoHS 3)
Test Method	IEC	Compliant to IEC 61300-3-35 for visual inspection of fiber optic connectors and fiber-stub transceivers
	IPC	Compliant to IPC-8497-1 for cleaning methods and contamination assessment for optical assembly

ORDERING INFORMATION:

CAT NO	Description
FIP100 KIT	FIP100, power supply (NA, UK & EU), carry case, SC/UPC bulkhead tip, SC/UPC bulkhead and quick reference card.
FIP100 KIT-SC/APC	FIP100, SC/APC bulkhead tip, SC/APC bulkhead, SC/UPC bulkhead tip, SC/UPC bulkhead, power supply (NA, UK & EU) and quick reference card.
FIP100 KIT-LC/UPC	FIP100, LC/UPC bulkhead tip, LC/UPC bulkhead, SC/UPC bulkhead tip, SC/UPC bulkhead, power supply (NA, UK & EU) and quick reference card.
FIPCC	FIP100 carry case
FIPPS	FIP100 power supply with NA, EU and UK adapters
SCUPC BH	SC/UPC Bulkhead Tip
LCUPC BH	LC/UPC Bulkhead Tip
2.5MMUPC	2.5mm Universal UPC Tip
1.25MMUPC	1.25mm Universal UPC Tip
SCAPC BH	SC/APC Bulkhead Tip
LCAPC BH	LC/APC Bulkhead Tip
2.5MMAPC	2.5mm Universal APC Tip
1.25MMAPC	1.25mm Universal APC Tip
OTAP BH	OptiTap® Bulkhead Tip
LCUPC BH L60	LC/UPC Long Reach 60mm Bulkhead Tip
U60 BH	Universal 60 Degree Adapter for Bulkhead Tip
MPO BH	MPO UPC and APC Bulkhead Tip
FIPT ADAPT	Adapter for VIAVI Tips

![Tempo Communications logo] **TEMPO** COMMUNICATIONS

180XL VISUAL FAULT LOCATOR

LOCATING BREAKS AND BENDING LOSSES:

The 180XL visual fault finder is an indispensable tool for quickly identifying bending losses and breaks in optical fibers. If a fiber is bent too tightly, red laser light will be seen escaping through the jacket. Likewise, if a fiber is broken, escaping light will be visible where the break is located.

IDENTIFYING BAD CERAMIC CONNECTORS:

Ceramic connectors are easily tested using the 180XL visual fault finder. A fiber broken inside, or past, the ferrule will cause it to glow, as shown below at left. If the whole connector glows, it is definitely defective. If the end face polish of the connector is bad, light will be reflected internally, as shown below right. This will also make the ferrule glow when the 180XL is used.

Fiber broken in ferrule

Poor end face polish

FEATURES

- Continuous wave output mode for steady fault illumination
- Blinking output mode increases viewing contrast
- Easy to use "Quick Connect" interface fits all 2.5mm fiber optic connectors
- Ergonomic switch permits easy one-handed operation
- Simple, versatile, and user-friendly design
- Rugged, compact, and splash proof aluminium housing
- High output 1.0mW (0dBm) 650nm red laser
- Up to 7km range
- Two AA-size alkaline batteries provide 80 hours of continuous operation
- Nylon belt holster included

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52068671	180XL	Visual Fault Locator Kit (2.5mm UCI)
52068673	125mm ADAPTER	1.25mm adapter

SPECIFICATIONS:

Wavelength	650nm +/-10nm	Connector Interface	2.5mm Universal, Optional 1.25mm adapter
Emitter Type	Fabry Perot	Battery	AA (2)
Maximum Output Power	0dBm	Battery Life	80 Hours with 3.9Wh batteries
Typical Output Power	700µW		
Spectral Width (CPR)	<2nm	Weight	0.15lbs, (70g) (not including batteries)
Laser Classification	2	Dimensions	7.08" x 0.91" Dia (180mm x 23mm Dia)
Range	5km		
Modes of Operation	CW and 2Hz Modulation	Operating Temperature	-10 to +45C
Method of Display Operation	Red/Green LED	Storage Temperature	-40 to +70C
Fiber Type	Singlemode, Multimode	Certifications	CE, CDRH EAC, UKCA

Specifications subject to change without notice.

Macrobend easily visible in splice tray using 180XL

1.25mm Adapter

FI-100 LIVE FIBER IDENTIFIER

The Tempo Communications FI-100 fiber identifier is used to measure the approximate core power in FTT(x) and P2P networks without the need to disconnect the fiber under test. The low induced insertion loss when used with the precision adapters insures that the network equipment to go into an alarm condition due to excessive bending of the fiber. The high sensitivity detectors measure the direction of signal transport and are capable of detecting injected tones from laser sources at 270Hz, 330Hz, 1kHz and 2kHz. The FI-100 is also capable of sensing the core power in bend insensitive fiber that is being more commonly used in drop fibers in FTTH installations.

- Low insertion loss
- Easy operation
- Versatile
- Quickly identify fibers
- Tone Detect
- Signal direction indicator

FI-100 KIT contains instruction manual, sun shade, all available mandrels and carrying case.

SCAN TO WATCH THE VIDEO

SPECIFICATIONS:

Identified Wavelength Range	800-1700nm
Identified Signal Type	270Hz ±5%, 330Hz ±5%, 1kHz ±5%, 2kHz ±5%
Detector Type	1mm InGaAs
Adapter Types	Ø0.25 (Applicable for Bare Fiber and ribbon cable) Ø0.9 (Applicable for Ø0.9 Cable) Ø2.0 (Applicable for Ø2.0 Cable) Ø3.0 (Applicable for Ø3.0 Cable)
Signal Indication	Left & Right LED
Signal Direction Test Range (CW/0.9mm fiber)	-46 to 10dBm (1310nm) -50 to 10dBm (1550nm)
Signal Power Test Range (CW/0.9mm fiber)	-50 to +10dBm

Tone Detect Test Range (Average)	Ø0.9, Ø2.0, Ø3.0 -30 to 0dBm (270Hz, 1kHz)
	   -25 to 0dBm (2kHz)
	Ø0.25 -25 to 0dBm (1kHz, 2kHz)
	   -20 to 0dBm (2kHz)

Insertion Loss (Typical/ Maximum)	0.3 / 0.8dB at 1310nm 1.5 / 2.5dB at 1550nm
Battery	AAA Alkaline (2)
Operating Temperature	-10 to +60ºC
Storage Temperature	-25 to +70ºC
Dimension	196 X 30.5 X 27mm
Weight	195g
Certifications	CE, FCC, UKCA, EAC
Number of Activations	3600

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52068188	FI-100 KIT	Fiber Identifier Kit
52068108	FI-250µm/RIB	250µm Adapter
52068110	FI-100-2mm	2mm Adapter
52068111	FI-100-3mm	3mm Adapter
52068113	FI-100-Case	Soft Carry Case
52068114	FI-100-Sunshade	Sun Shade

SIMPLE FIBER
SOLUTIONS
FOR THE FIBER
TECHNICIAN.

OPTICAL POWER METERS
& LIGHT SOURCES

The OPM2XX, OPM5XX and SLS5XX provide the technician with a ruggedized tool set to accurately and quickly measure the insertion loss of singlemode and multimode fiber links.

The OPM2XX and OPM5XX measure the absolute fiber power to validate the optical loss budget in FTTX and P2P networks. All common wavelengths are supported and work in harmony with the dual and triple wavelength sources to facilitate insertion loss measurements. Tone injection is supported so that individual fibers can be identified when used with the OPM2XX, OPM5XX or FI-100.

The OPM2XX also incorporates an integrated visual fault locator for safe and quick visual identification of cut or damaged fiber, Macrobends and contaminated or damaged connectors.

The IP54 rating along with industry leading vibration and shock specifications assure the technician will complete their assigned task in even the most demanding environment.

OPM210 / OPM220 MICRO OPTICAL POWER METER

FEATURES

- Wide measurement range (+10 to -70dBm)
- High power CATV range (+26 to -50dBm)
- VFL for safe and effective fault locating
- Singlemode and multimode compatible
- Calibrated wavelengths of 850/1300/1310/1490/1550/1625nm
- 270Hz, 1kHz and 2kHz tone detect
- Auto power off

CONTENTS:

- Micro OPM with VFL
- Lanyard
- Instruction sheet
- Certificate of Conformance

SCAN TO WATCH THE VIDEO

SPECIFICATIONS:

PARAMETER	SPECIFICATIONS	
Model:	**OPM210**	**OPM220**
Measurement Range:	-70 to +10dBm (1310/1490/1550/1625)	-50 to +26dBm (1310/1490/1550/1625)
	-60 to +10dBm (850/1300)	-40 to +26dBm (850/1300)
Calibrated Wavelengths:	850, 1300, 1310, 1490, 1550, 1625nm	
Display Resolution:	0.01dB	
Accuracy*:	+/-0.25dB	
Linearity*:	+/-0.5dB (+10 to -3dBm) +/-0.1dB (-3 to -50dBm) +/-0.5dB (-50 to -70dBm)	+/-0.5dB +26 to -3dBm +/-0.1dB -3 to -50dBm
Connector:	Universal 2.5mm	
Wavelength Response:	700 - 1700nm	
Detector:	InGaAs	
Power Supply:	AAA x 2 Alkaline	
Battery Lifetime:	>60 Hours (OPM mode)	
Operating Temperature:	-10 to +50°C (<90% Relative Humidity)	
Storage Temperature:	-20 to +60°C (<90% Relative Humidity)	
VFL Wavelength:	650nm +/-20nm	
VFL Output:	≤ 1mW/ 2Hz	
VFL Range:	4km	
Size:	106 x 58 x 28mm (4.17 x 2.28 x 1.10")	
Weight:	106g (0.23lbs)	
Auto Power Off:	10 minutes of no activity	
Certifications:	CE, UKCA, CDRH	

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
55500025	OPM210	Standard Power OPM with VFL
55500026	OPM220	High Power OPM with VFL
52068673	125mm ADAPTER	1.25mm Adapter
52084662	08325	Micro OPM Carry Case

OPM510 / OPM520 OPTICAL POWER METER

FEATURES

- Wide measurement range (+6 to -70dBm)
- High power CATV range (+26 to -50dBm)
- Singlemode and multimode compatible
- Calibrated wavelengths of 850/1300/1310/1490/1550/1625nm
- 270Hz, 1kHz and 2kHz tone detect
- Auto power off

CONTENTS:

- Optical Power Meter
- SC Adapter
- Soft Carry Case
- Certificate of Calibration

3 YEAR WARRANTY

SCAN TO WATCH THE VIDEO

SPECIFICATIONS:

MODEL	OPM510	OPM520
Cal. Wavelength	850, 1300, 1310, 1490, 1550, 1625nm	
Measure range	-65 ~ +10[1] dBm	-50 ~ +27 dBm
Detector type	InGaAs	
Accuracy	±0.25dB (Typical) ±0.5dB @850nm (Typical) (Under non-saturating power levels)	
Display Resolution	0.01dB	
Functions	µW/dBm/dB(REF)/ MOD tone detection 270Hz, 1kHz, 2kHz	
Connector Type	SC (Interchangeable LC, ST, FC)	
Fiber Type	Singlemode & Multimode	
Battery Life	>70 Hours (Typical)	
Power Supply	9V 1000mAh Lithium Battery/ 9V AC adapter	
Operating Temperature	-10°C ~ 50°C	
Storage Temperature	-20°C ~70°C	
Relative Humidity	0 to 95% (Non-Condensing)	
Weight	0.68lbs (300g)	
Dimensions (H × W × T)	6.1 × 3.5 × 1.3" (155 × 88 × 33mm)	
IP Rating	IP54	
Vibration	5Hz to 150Hz, Amplitude+0.15mm	
Shock	Peak acceleration 25g at a pulse duration of 6ms	
Compliance	CE, FCC	

Note: (1) The lower limit of 850nm measurement is -60 dBm for OPM510.
Specifications subject to change without notice.
Each optical power meter is supplied with one soft carry case (CC-1), one Certificate of Conformance,
and one SC/PC adapter.

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
55500023	OPM510	InGaAs OPM +10 to -65dBm
55500024	OPM520	InGaAs OPM +27 to -50dBm

SLS520, SLS525, SLS530, SLS535 and SLS536
STABILIZED LIGHT SOURCE

FEATURES

- Dual and Triple Wavelength Laser Sources at 1310, 1490, 1550, 1625 & 1650nm
- Dual Wavelength LED Source at 850nm & 1300nm
- Accurate Insertion Loss Measurements
- Tone and Probe Fiber Networks at 270Hz, 1kHz and 2kHz
- SC, LC, FC and ST Interchangeable Bulkheads
- Ruggedized Package, IP54 compliant
- Compatible with Singlemode and Multimode Networks
- Auto Off or Continuous On Operation
- Battery or 120/240VAC Operation
- Each source is supplied with one SC/PC adapter for each bulkhead.

CONTENTS:
- Laser or LED
- SC Adapter
- Soft Carry Case
- Certificate of Calibration

SCAN TO WATCH
THE VIDEO

SPECIFICATIONS:

MODEL	SLS520	SLS525	SLS530	SLS535	SLS536
Center Wavelength	1310/1550nm	850/1300nm	1310/1490/1550nm	1310/1550/1625nm	
Fiber Type	Singlemode	Multimode (62.5/125)	Singlemode		
Emitter Type	FP	LED	FP		
Spectrum Width	≤ 5nm	≤ 71nm (850nm), ≤ 160nm (1300nm)	≤ 5nm		
Output Power (Max/Min)	≤ 0dBm/-1dBm	-20dBm/-21dBm	≤ 0dBm/-1dBm		
Modulation Frequency	270, 1kHz, 2kHz				
Display	LCD				
Battery Life	>20 Hours (Typical)				
Connector Type	SC/PC (Interchangeable LC ,ST, FC)				
Power Supply	9V 1000mAh Lithium Battery / 9V AC adapter				
Operating Temp.	-10°C to 50°C				
Storage Temp.	-20°C to 70°C				
Relative Humidity	0 to 95% (non-condensing)				
Weight	0.71 lbs (300g)				
Dimension (H×W×T)	6.1 × 3.5 × 1.3" (155 × 89 × 33mm)				
IP Rating	IP54				
Vibration	5Hz to 150Hz, Amplitude = 0.15mm				
Shock	Peak acceleration 25g at a pulse duration of 6ms				
Compliance	CE, FCC, 21 CFR 1040.10 (Laser)				

Specifications subject to change without notice.

Each source is supplied with one soft carry case (CC-1), one Certificate of Conformance, and one SC/PC adapter for each bulkhead.

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
55500018	SLS520	1310/1550nm Dual Laser
55500019	SLS525	850/1300nm Dual LED
55500020	SLS530	1310/1490/1550nm Triple Laser
55500021	SLS535	1310/1550/1625nm Triple Laser
55500022	SLS536	1310/1550/1650nm Triple Laser

OPTICAL POWER METER & STABILIZED LIGHT SOURCE KITS

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
55500027	SM DUAL KIT	OPM510 & SLS520
55500028	SM DUAL KIT HP	OPM520 & SLS520
55500029	MM DUAL KIT	OPM510 & SLS525
55500030	SM T PON KIT	OPM510 & SLS530
55500031	SMT 1625 KIT	SLS535 & OPM510
55500032	SMT 1650 KIT	SLS536 & OPM510
55500033	SMT PON KIT HP	SLS530 & OPM520
55500034	SMT 1625 KIT HP	SLS535 & OPM520
55500035	SMT 1650 KIT HP	SLS536 & OPM520
55500050	SMMMKIT-T	SLS520, SLS525 & OPM510
55500051	SMMMKIT-M	SLS520, SLS525 & OPM520

SMMM KIT-M

OPM AND SLS ACCESSORIES:

PART NO.	CAT. NO.	DESCRIPTION
55500048	PS-100	EXTERNAL POWER SUPPLY
55500036	CC-1	CARRY CASE, SOURCE/OPM
55500049	CC-2-3	CARRY CASE, DUAL, TRIPLE, SOURCE/OPM

T9000 SERIES POCKET OPTICAL POWER METER (OPM)

FEATURES

- 8-12 calibration λ, ±2% accuracy, ISO/IEC 17025 traceable
- Small size, easy to use, rugged & reliable
- dBm / dB / linear, 0.01 dB resolution
- Display hold & max/min recording
- Tone detection
- Multi-Fiber ID
- Interchangeable connectors

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
55505048	T9600A	General power meter for Multimode and Singlemode applications (Single fiber)
55505050	T9600A-H3B	High power meter for Multimode and Singlemode applications (Single fiber)
55505049	T9600XL-GE5	Large area detector for MPO 12f / 24f and single-fiber applications
55505292	T9600XL-SI5	Pocket Optical Power Meter for Plastic Optical Fiber (POF) applications

| MODEL	T9600A	T9600A-H3B	T9600XL-GE5	T9600XL-SI5
Detector type	InGaAs		GE (5 mm)	Si (5 mm)
Response wavelength	600 ~ 1700 nm	800 - 1700 nm	600 ~ 1650 nm	350 ~ 1100 nm
Calibration wavelengths	(see website for specifics)			
Power range	+5 ~ -60 dBm	+24 ~ -40 dBm	+10 ~ -40dBm	+5 ~-60dBm
Mid-range linearity	0.04 dB (typical)		0.06 dB (typical)	0.04 dB (typical)
Total uncertainty	0.3dB (Max)			
Wavelength sensitivity (± 30 nm)	0.2 dB (Typical)			
ID tone detection sensitivity	-50 dBm	-30dBm	-37 dBm	-45 dBm
Calibration Accuracy	±2 %			
Calibration validity	3 Years (ISO/IEC 17025)			
Resolution	0.01 dB			
Polarization sensitivity	< 0.05 dB (typical)			
Tone detection	200 ~ 2500 Hz ± 2 %			
Power	2 x AAA (LR-03) Alkaline			
Battery life	300 Hours			
Auto-off	Selectable			
Size	124 x 81 x 25 mm			
Unit weight	0.15 kg			
Shipping weight	0.5 kg			
Operating / storage temperatures	-15 to 55 / -25 to 70 °C			
Relative humidity	0 ~ 95 %			
Warranty	3 Years			

T9000 SERIES POCKET STABILIZED LIGHT SOURCE (SLS)

FEATURES

- Encircled Flux compliant modal distribution
- Rugged, drop-resistant construction
- User defeatable auto turn-off
- Excellent stability
- Lanyard, shirt pocket clip & padded pouch
- Tone generator & Multi-Fiber ID function
- Easy use TamperLock mode
- Multi wavelength AutoTest
- Interchangeable connectors

PART NO.	CAT. NO.	DESCRIPTION
55505293	T9809AM	Plastic Optical Fiber (POF) Applications
55505055	T9812A	Multimode Applications
55505054	T9822A	Singlemode Applications

Model	T9812A	T9822A	T9809AM
Output wavelength	850, 1300 nm LED	1310, 1550 nm Laser	660 nm LED
Output power	-20 dBm ±1 dB (@ 62.5/125 µm) / -22.5 dBm (@ 50/125 µm) / -32 dBm (@ 9.5/125 µm)	0dBm ± 1dB	-6 dBm ±1 dB (@ 1 mm POF) / -13 dBm ±2 dB (@ 200 µm PCF)
Short term stability (for 15 min, typical ±2 °C, after warm-up)	0.01 dB	0.04 dB	0.01 dB
Stability over temperature	0.35 dB (typical)	0.6 dB (typical)	0.35 dB (typical)
Wavelength drift	0.4nm/°C (typical)		
Mode Controlled	Mode distribution @ 50/125 µm is compliant with: IEC 61280-4-1 {Ed.1.0}, TIA/EIA 526-14A and TIA TSB-178.		
Reconnection repeatability (95% confidence)	0.05dB	0.1 dB	
Calibration validity (ISO/IEC 17025)	3 years		
Modulation	270 Hz, 1 kHz, 2 kHz ±2 %		
Multi-fiber ID	12 fibers		
Autotest	Compatible with KI Autotest power meter port & matching ⬚		
Power	2 x AAA (LR-03) Alkaline		
Battery life	Laser/LED source: 40/35 hours (typical) in Autotest		
Auto off	Selectable		
Case	Polycarbonate with captive dust cap, 2.5-meter drop tested		
Size	124 mm x 81 mm x 25 mm		
Unit weight	0.15 kg		
Shipping weight	0.5kg		
Operating / storage temperature	-15 to 55 °C / -25 to 70 °C		
Relative humidity	0 ~ 95%		
Warranty	3 years		

T2000 SERIES HANDHELD OPTICAL POWER METER (OPM)

FEATURES

- Easy to use, rugged & versatile
- 25 calibration λ, 1% accuracy ISO/IEC 17025 traceable
- Improved high power accuracy
- Autotest with up to 3 λ displayed
- Long battery life, USB external power, charges NiMH AA batteries
- Large back-lit LCD, sunlight readable
- Interchangeable connectors
- Large memory with text naming & time stamp
- KITS™ reporting software with data security
- One button memory dump to USB key
- Tone generator & Multi-Fiber ID function
- Full QA & linearity test report

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
55505051	T2600	General power meter for Multimode and Singlemode applications (Single fiber)
55505053	T2600-H5	High power meter for Multimode and Singlemode applications (Single fiber)
55505052	T2600XL-GE5	Large area detector for Multimode and Singlemode applications (MPO12/24 and Single fiber)
55505255	T2600XL-GE7	Large area detector for 16f/32f applications (MPO 12/24, plus MPO 16/32 and Single fiber)

MODEL	T2600A	T2600-HS	T2600XL-GE5	T2600XL-GE7
Detector type	InGaAs	InGaAs - High Power	GE (5 mm)	Ge (7 x 3.5 mm)
Response wavelength	600 ~ 1700 nm	800 - 1700 nm	600 ~ 1650 nm	
Calibration wavelengths	(see website for specifics)			
Power range	+10 ~-70dBm	+24 ~-60dBm	+15 ~ -40dBm	+15~-40dBm
Mid-range linearity	0.04 dB (typical)		0.06 dB (typical)	
Total uncertainty	0.3 dB (max)	0.35 dB (max)		
Wavelength sensitivity (± 30 nm)	0.2 dB (typical)			
ID tone detection sensitivity	up -50 dBm	Up to -38 dBm	-37 dBm	-30 dBm
Calibration Accuracy	1% (0.06 dB)			
Calibration validity	3 Years (ISO/IEC 17025)			
Resolution	0.01 dB			
Polarization sensitivity	< 0.05 dB (typical)			
Tone detection	150 ~ 9999 Hz ± 1 %			
Power	2x AA (LR4) Alkaline / 2x AA NiMh (rechargeable via USB)			
Battery life	Up to 1000 hours			
Auto-off	Selectable			
USB interfaces	USB-micro for power & software / USB-A for memory key			
Software	KITS (free download)			
Memory	1000 (4-✱ tests) / Unlimited on USB memory key			
Size	124 x 81 x 25 mm			
Unit weight	0.42kg			
Shipping weight	1.5kg			
Operating / storage temperatures	-15 to 55 / -25 to 70 °C			
Relative humidity	0 ~ 95 %			
Warranty	3 Years			

# T2000 **SERIES** HANDHELD STABILISED LIGHT SOURCE (SLS)

FEATURES

- Easy to use, rugged & versatile
- Long battery life, USB external power, charges NiMH AA batteries
- Interchangeable connectors
- Superior re-connection repeatability, < 0.1 dB
- Excellent stability
- Tone generator & Multi-Fiber ID function
- Multi wavelength AutoTest
- Full QA & test reports ISO/IEC 17025 traceable

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
55505070	T28010-APC	Triple Laser Source for Singlemode applications
55505059	T2803	Multimode applications
55505058	T2822	Singlemode applications
55505057	T2824	Quad Light Source for Multimode and Singlemode applications

MODEL	T28010-APC	T2803	T2822	T2824
Output wavelength	Port 1: 1310, 1550, 1625 nm Laser APC	Port 2: 850, 1300 nm LED	Port 1: 1310, 1550 nm Laser	Port 1: 1310, 1550 nm Laser / Port 2: 850, 1300 nm LED
Output power	-3 dBm ±1 dB (@ 9/125 μm)	-20 dBm ±1 dB (@ 62.5/125 μm)	0 dBm ±1 dB (@ 9/125 μm)	0 dBm ±1 dB (@ 9/125 μm for 1310, 1550nm) / -20 dBm ±1 dB (@ 62.5/125 μm for 850, 1300 nm)
Adjust output power	Adjustable over 7 dB in 0.01 dB steps			
Short term stability (for 15 min, typical ±2 °C, after warm up, ORL < -25 dB)	0.04 dB (for 1310, 1550 nm) / 0.06 dB (for 1625 nm)	0.01 dB	0.6dB	0.04 dB (typical for 1310, 1550 nm) / 0.01 dB (typical for 850, 1300 nm)
Stability over temperature	0.6 dB (typical)	0.35 dB (typical)	0.06 dB (typical)	0.6 dB (for 1310, 1550 nm) / 0.35 dB (for 850, 1300 nm)
Wavelength initial tolerance (@ 25 °C)	20 nm		20 nm	20 nm (for 1310, 1550 nm)
Spectrum width (FWHM)	3 nm (typical)		3 nm (typical)	
Wavelength drift	0.4 nm per °C (typical)			0.4 nm /°C (typical for 1310, 1550 nm) / 0.4 nm /°C (typical for 850, 1300 nm)
Reconnection repeatability (95% confidence)	0.1 dB	0.05 dB	0.1 dB	0.1 dB (for 1310, 1550 nm Laser) / 0.05 dB (for 850, 1300 nm LED)
Calibration validity (ISO/IEC 17025)	3 years			
Modulated output	270 Hz, 1 kHz, 2 kHz ± 2 %, 12 Multi-Fiber ID tones			
Autotest (not available for 470, 540 nm LED sources)	Compatible with KI Autotest power meter port & matching ⏶			
Power	Battery / External power via USB			
Battery types	2x AA (LR6) Alkaline / 2x AA NiMH AA (rechargeable via USB)			
Battery life	Laser/LED source: 90/80 hours in Autotest, typical			
Auto-off	Selectable			
Case	Polycarbonate (body) / rubber (edges & corners), moisture resistance, 1-meter drop tested			
Size	190 mm x 105 mm x 35 mm			
Unit weight	0.42 kg			
Shipping weight	1.5 Kg			
Operating / storage temperatures	-15 to 55 °C / -25 to 70 °C			
Relative humidity	0 ~ 95 %			
Warranty	3 Years			

POCKET KITS

TK038 Pocket Loss Test Kit for Singlemode & Multimode
- Fiber Optic Laser Test Source **T9822A**
- Fiber Optic LED Test Source **T9812A**
- Pocket Fiber Optic Power Meter **T9600A**
- Canvas Carrying Pouch

TK052 Pocket Loss Test Kit for Multimode
- Fiber Optic LED Test Source **T9812A**
- Pocket Fiber Optic Power Meter **T9600A**
- Canvas Carrying Pouch

TK054 Pocket Loss Kit for POF Applications
- Fiber Optic LED Test Source **T9809AM**
- Pocket Fiber Optic Power Meter **T9600XL-SI5**
- Canvas Carrying Pouch

TK056 Pocket Loss Test Kit for Singlemode
- Fiber Optic Laser Test Source **T9822A**
- Pocket Fiber Optic Power Meter **T9600A**
- Canvas Carrying Pouch

HANDHELD KITS

TK076 Advanced Test Kit for Singlemode & Multimode
- LED & Laser Quad Optical Test Source **T2824**
- Handheld Optical Power Meter **T2600**
- Padded Canvas Carry Pouch **OPT149**

TK077 Advanced Test Kit for Singlemode Applications
- Dual Laser Optical Test Source **T2822**
- Handheld Optical Power Meter **T2600**
- Padded Canvas Carry Pouch **OPT149**

TK081 Pocket Light Source and Handheld Power Meter Kit for Singlemode
- Fiber Optic Laser Test Source **T9822A**
- Handheld Optical Power Meter **T2600**
- Padded Canvas Carry Pouch **OPT149**

PART NO.	CAT. NO.	DESCRIPTION
55505064	TK038	Pocket Loss Test Kit for Singlemode & Multimode
55505062	TK052	Pocket Loss Test Kit for Multimode
55505294	TK054	Pocket Loss Kit for POF Applications
55505060	TK056	Pocket Loss Test Kit for Singlemode
55505063	TK076	Advanced Test Kit for Singlemode & Multimode
55505061	TK077	Advanced Test Kit for Singlemode applications
55505150	TK081	Pocket Light Source and Handheld Power Meter Kit for Singlemode

T27600 SERIES MM & SM OPTICAL LOSS TEST SETS, (OLTS) 1-WAY

FEATURES

- Easy to use, slim, rugged & versatile
- EF compliant multimode sources
- Excellent source stability
- Large clear LCD is sunlight readable & backlit
- Large memory with Text Tag & time stamp
- One button memory dump to USB key
- KITS™ reporting software for acquisition and reporting
- AutoTest with up to 3 λ displayed
- 1 % accuracy & 31 calibrated λ, ISO/IEC 17025 traceable
- Interchangeable connectors
- Multi-Fiber ID Test tone generator / detector
- Long battery life, USB external power, charges NiMH AA batteries
- VisiTester test port intergrated VFL

PART NO.	CAT. NO.	DESCRIPTION
55505066	T27622	Optical Loss Test Set for Singlemode Applications
55505065	T27603	Optical Loss Test Set for Multimode Applications
55505056	T27624	Quad Optical Loss Test Set for Singlemode and Multimode Applications

MODEL	T27603	T27622	T27624
Detector type Response wavelength Calibration wavelengths	InGaAs 600 ~ 1700 nm (see website for specifics)		
Power range	+10~-70dBm		
Mid-range linearity	0.04 dB (typical)		
Total uncertainty	0.3 dB (max)		
ID tone detection & Autotest sensitivity (meter)	Up to -50 dBm		
Modulated output (source)	270 Hz, 1 kHz, 2 kHz ± 2 %, 12 Multi-Fiber ID tones		
Output wavelength (source)	850, 1300nm LED, Visitester	1310-1550 nm Laser,	1310-1550 nm Laser, : 850, 1300 nm LED
Adjust output power (source)	Fixed for 850,1300 nm and Visitester	Adjustable over 7dB in 0.01 steps for 1310,1550 nm . Fixed for Visitester	Adjustable over 7dB in 0.01 steps for 1310,1550 nm . Fixed for 850,1300 nm and Visitester
Short term stability for 15 min, typical ±2 ºC, after warm up, ORL < -25 dB (source)	0.01 dB (for 850, 1300 nm)	0.04 dB (for 1310, 1550 nm)	0.04 dB (for 1310, 1550 nm) / 0.01 dB (for 850, 1300 nm)
Wavelength initial tolerance @ 25 ºC (source)		20 nm	20 nm (for 1310, 1550 nm)
Wavelength drift (source)	0.4nm/ºC		
Reconnection repeatability @ 95% confidence (source)	0.05 dB (for 850, 1300 nm), 0.1 dB (for VisiTester)	0.1 dB (for 1310-1550 nm, VisiTester)	0.1 dB (for 1310-1550 nm Laser, VisiTester) / 0.05 dB (for 850, 1300 nm LED)
VisiTester laser safety	Class 1, IEC60825-2		
Accuracy (meter)	1 % (0.06 dB)		
Resolution (meter)	0.01 dB		
Tone detection (meter)	150 ~ 9900 Hz ± 1 %		
Battery life	Laser/LED source: 90/80 hours (typical) in Autotest		
Power	2x AA Alkaline, NiMH for internal charging, External power vis USB / External power via USB		
USB interfaces	USB-micro for power & software / USB-A for memory key		
Auto off	Selectable		
Memory	1,000 four ⬜ tests with date & time / Unlimited on USB		
Case	Polycarbonate (body) / rubber (edges & corners), moisture resistance, 1-meter drop tested		
Display size	74 mm x 55 mm		
Size, Unit weight, Shipping weight	190 x 105 x 35 mm, 0.42kg, 1.5kg		
Operating / storage temperatures	-15 to 55 / -25 to 70 ºC		
Warranty & Calibration validity (ISO/IEC 17025)	3 Years		

T27600 SERIES OPTICAL LOSS TEST SET
BI-DIRECTIONAL LOSS AND ORL TESTING

FEATURES

- 25% of the size / weight, 7x the battery life of competitors
- Bidirectional Autotest loss & ORL testing on one fiber
- Real time Pass / Fail display
- 8,000 fiber memory and USB Flash Drive file dump
- KITS™ reporting software
- Autotest optical power meter, >25 λ, 1 % accuracy
- Traceable calibration reports: power meter & linearity, source λ & stability
- Long battery life, USB external power, charges NiMH AA batteries
- 3 Year warranty and calibration cycle
- EF compliant multimode sources

PART NO.	CAT. NO.	DESCRIPTION
55505078	T27403LV	Two Way (bi-directional) Loss & Length Test Set for Multimode Applications; Standalone Light Source & Power Meter, VFL, tone generator / detector; can be used in Pairs
55505067	T27422LV	Two Way (bi-directional) Loss & Length Test Set for Singlemode Applications; Standalone Light Source & Power Meter, VFL, tone generator / detector; can be used in Pairs
55505079	T27424LV-APC	A Quad, Two Way (bi-directional) Loss & Length Test Set for Singlemode and Multimode Applications; Standalone Light Source & Power Meter, VFL, tone generator / detector; can be used in Pairs

MODEL	T27403LV	T27422LV	T27424LV-APC
Modulated output (source)	270 Hz, 1 kHz, 2 kHz ± 2 %, 12 Multi-Fiber ID tones	270 Hz, 1 kHz, 2 kHz ± 2 %, 12 Multi-Fiber ID tones	270 Hz, 1 kHz, 2 kHz ± 2 %, 12 Multi-Fiber ID tones
Output wavelength (source)	850-1300 nm LED APC, VisiTester	Port 1: 1310-1550 nm Laser	Port 1: 1310, 1550 nm Laser APC / Port 3: 850, 1300 nm LED APC
Adjust output power (source)	Fixed	Adjustable over 7 dB in 0.01 dB steps	Adjustable over 7 dB in 0.01 dB steps (for 1310, 1550 nm) / Fixed (for 850, 1300 nm)
Short term stability for 15 min, typical ±2 °C, after warm up, ORL < -25 dB (source)	0.01 dB	0.04 dB	0.03 dB (for 1310, 1550 nm) / 0.01 dB (for 850, 1300 nm)
Stability over temperature (source)	0.35 dB	0.6 dB (max)	0.2 dB (max for 1310, 1550 nm) / 0.35 dB (max for 850, 1300 nm)
Wavelength initial tolerance @ 25 °C (source)		20 nm	20 nm (for 1310, 1550 nm)
Spectrum width @ FWHM (source)		3 nm (typical)	3 nm (typical for 1310, 1550 nm)
Length range (2-way Autotest only)	4.5 dB @ 50 µm	27 dB	6 dB @ 62.5 µm (for 850, 1300 nm) / 30 dB (for 1310, 1550 nm)
Length accuracy (2-way Autotest only)	0.01% ± 4 meters		
Length resolutions	1 meter (0.000~9.999 Km), 10 meters (10.00~99.99 Km), 100 meters (100.0~127.9 Km)		
Loss range (2-way Autotest)	21.5 dB @ 50 µm	44 dB	27 dB @ 62.5 µm (for 850, 1300 nm) / 47 dB (for 1310, 1550 nm)
Loss repeatability & loss linearity (2-way Autotest)	0.06 dB	0.04 dB	0.06 dB (for 850, 1300 nm) / 0.04 dB (for 1310, 1550 nm)
ORL range	0 ~ 27.5 dB @ 50 µm		0 ~ >60 dB (1310, 1550 nm) / 0 ~ 30 dB @ 62.5 µm
VisiTester wavelength	650 ± 5 nm		
VisiTester laser safety	Class 1, IEC60825-2		
VisiTester power	0 dBm ± 1 dB @ SMF		
Detector type (meter) Response wavelength (meter) Calibration wavelengths (meter)	InGaAs 600 ~ 1700 nm (see website for specifics)		
Accuracy (meter)	1 % (0.06 dB)		
Mid-range linearity (meter)	0.04 dB (typical)		
Power range (meter)	+10 ~ -60 dBm (780 ~ 980, 1590 ~ 1650 nm) / +10 ~ -70 dBm (1270 ~ 1650 nm)		
VisiTester laser safety	Class 1, IEC60825-2		
Total uncertainty (meter)	0.3 dB (max)		
ID tone detection & Autotest sensitivity (meter)	Up to -50 dBm		
Resolution (meter)	0.01 dB		
Polarization sensitivity (meter)	< 0.05 dB (typical)		
Tone detection (meter)	150 ~ 9999 Hz ± 1 %		

Cont.

MODEL	T27403LV	T27422LV	T27424LV-APC
Autotest	1-way: compatible with other T23400 & T27400 models / 2-way: compatible with identical model only		
USB interfaces	USB-micro for power & software / USB-A Flash Drive		
Software	KITS (free download)		
Power Battery life Battery type	Battery / External power via micro-USB Laser/LED source: 80 hours (typical) in Autotest, Power Meter: 1000 hours (typical) 2x AA (LR6) Alkaline / 2x AA NiMH AA (rechargeable via micro-USB)		
Display size	74 mm x 55 mm high contrast LCD		
Case	Laser/LED source: 80 hours (typical) in Autotest, Power Meter: 1000 hours (typical)		
Size	190 mm x 105 mm x 35 mm		
Unit weight	0.42 kg		
Shipping weight	1.5 Kg		
Operating / storage temperatures Relative humidity	-15 to 55 / -25 to 70 °C 0 ~ 95 %		
Warranty Calibration validity (ISO/IEC 17025)	3 Years		

T23400 SERIES OPTICAL LOSS TEST SET (OLTS)
BI-DIRECTIONAL LOSS, ORL AND LENGTH

FEATURES

- 25% of the size / weight, 7x the battery life of competitors
- Bidirectional Autotest loss, ORL and length testing on one fiber
- Real time Pass / Fail display
- 8,000 fiber memory and USB Flash Drive file dump
- KITS™ reporting software
- Autotest optical power meter, >25 λ, 1 % accuracy
- Traceable calibration reports: power meter & linearity, source λ & stability
- Long battery life, USB external power, charges NiMH AA batteries
- 3 Year warranty and calibration cycle
- EF compliant multimode sources

PART NO.	CAT. NO.	DESCRIPTION
55505068	T234030LV-APC-50U	Ultra-Stable 2W Loss, Length & ORL Tester
55505080	T234220LV	Ultra-Stable 2W Loss Length ORL Tester
55505069	T234240L-APC	Ultra-Stable 2W Loss Length ORL Tester
55505151	T234100LF-APC	Ultra-Stable 2W Loss Length ORL Tester

MODEL	T234030LV-APC-50U	T234220LV	T234240L-APC	T234100LF-APC
Modulated output (source)	270 Hz, 1 kHz, 2 kHz ± 2 %, 12 Multi-Fiber ID tones			
Output wavelength (source)	850-1300 nm LED APC, VisiTester	Port 1: 1310-1550 nm Laser	Port 1: 1310, 1550 nm Laser APC / Port 3: 850, 1300 nm LED APC	1310, 1550, 1625 nm Laser APC, VisiTester APC
Output power (source)	-27 dBm ±1 dB @ 62.5 µm	-7 dBm ±1 dB @ SMF	-3 dBm ±1 dB (@ 9/125 µm for 1310, 1550 m) / -23 dBm ±1 dB (@ 62.5/125 µm for 850, 1300 nm)	-7dBm ±1 dB @ SMF
Adjust output power (source)	Fixed	Adjustable over 7 dB in 0.01 dB steps	Adjustable over 7 dB in 0.01 dB steps (for 1310, 1550 nm) / Fixed (for 850, 1300 nm)	Adjustable over 7 dB in 0.01 dB steps
Short term stability for 15 min, typical ±2 ºC, after warm up, ORL < -25 dB (source)	0.01 dB	0.04 dB	0.03 dB (for 1310, 1550 nm) / 0.01 dB (for 850, 1300 nm)	0.03 dB (for 1310, 1550 nm), 0.04 dB (for 1625 nm)
Stability over temperature (source)	0.35 dB	0.6 dB (max)	0.2 dB (max for 1310, 1550 nm) / 0.35 dB (max for 850, 1300 nm)	0.2 dB (max)
Wavelength initial tolerance @ 25 ºC (source)	20 nm	20 nm	20 nm (for 1310, 1550 nm)	20 nm for 1310, 1550 nm, 6.5 for 1625 nm
Spectrum width @ FWHM (source)	3 nm (typical)	3 nm (typical)	3 nm (typical for 1310, 1550 nm)	3 nm (typical for 1310, 1550 nm), < 1 nm (typical for 1625 nm)
Mode controlled (source)	50/125µm compliant: IEC 61280-4-1 {Ed.1.0}, TIA 526-14A & TIA TSB-178			
Length range (2-way Autotest only)	4.5 dB @ 50 µm	27 dB	6 dB @ 62.5 µm (for 850, 1300 nm) / 30 dB (for 1310, 1550 nm)	27 dB
Length accuracy (2-way Autotest only)	0.01% ± 4 meters			
Length resolutions	1 meter (0.000~9.999 Km), 10 meters (10.00~99.99 Km), 100 meters (100.0~127.9 Km)			
Loss range (2-way Autotest)	21.5 dB @ 50 µm	44 dB	27 dB @ 62.5 µm (for 850, 1300 nm) / 47 dB (for 1310, 1550 nm)	44 dB
Loss repeatability & loss linearity (2-way Autotest)	0.06 dB	0.04 dB	0.06 dB (for 850, 1300 nm) / 0.04 dB (for 1310, 1550 nm)	0.04 dB
ORL range	0 ~ 27.5 dB @ 50 µm	0 ~ 60 dB	0 ~ >60 dB (1310, 1550 nm) / 0 ~ 30 dB @ 62.5 µm	0 ~ 60 dB

Cont.

| MODEL	T234030LV-APC-50U	T234220LV	T234240L-APC	T234100LF-APC
ORL accuracy	0.2 dB			
ORL resolution	0.01 dB (@ 0 ~ 30 dB), 0.1 dB (@ 30 ~ 45 dB)	0.01 dB (@ 0 ~ 50 dB), 0.1 dB (@ 50 ~ 65 dB)	For 1310, 1550 nm: 0.01 dB (@ 0 ~ 50 dB), 0.1 dB (@ 50 ~ 65 dB) / For 850, 1300 nm: 0.01 dB (@ 0 ~ 30 dB), 0.1 dB (@ 30 ~ 45 dB)	0.01 dB (@ 0 ~ 45 dB), 0.1 dB (@ 45 ~ 60 dB)
VisiTester wavelength	650 ± 5 nm			
VisiTester power	0 dBm ± 1 dB @ SMF			
VisiTester laser safety	Class 1, IEC60825-2			
Blink rate (manual)	CW or 2 Hz			
Detector type (meter) Response wavelength (meter) Calibration wavelengths (meter)	InGaAs 600 ~ 1700 nm (see website for specifics)			
Accuracy (meter)	1 % (0.06 dB)			
Mid-range linearity (meter)	0.04 dB (typical)			
Power range (meter)	+10 ~ -60 dBm (780 ~ 980, 1590 ~ 1650 nm) / +10 ~ -70 dBm (1270 ~ 1650 nm)			
Total uncertainty (meter)	0.3 dB (max)			
Resolution (meter)	0.01 dB			
Tone detection (meter)	150 ~ 9999 Hz ± 1 %			
Autotest	1-way: compatible with other T23400 & T27400 models / 2-way: compatible with identical model only			
USB interfaces	USB-micro for power & software / USB-A Flash Drive			
Software	KITS (free download)			
Power Battery life Battery type	Battery / External power via micro-USB Laser/LED source: 80 hours (typical) in Autotest, Power Meter: 1000 hours (typical) 2x AA (LR6) Alkaline / 2x AA NiMH AA (rechargeable via micro-USB)			
Display size	74 mm x 55 mm high contrast LCD			
Case	Laser/LED source: 80 hours (typical) in Autotest, Power Meter: 1000 hours (typical)			
Size Unit weight Shipping weight	190 mm x 105 mm x 35 mm 0.42 kg 1.5 Kg			
Operating / storage temperatures Relative humidity	-15 to 55 / -25 to 70 °C 0 ~ 95 %			
Warranty Calibration validity (ISO/IEC 17025)	3 Years			

ADAPTERS

A wide range of Adapters are available to suit the different Kingfisher models and your applications. Please contact your Tempo Customer Service Representative for more information.

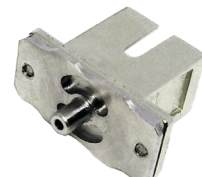| PART NO.	CAT. NO.	DESCRIPTION
55505081	OPT040	TEST SET ADAPTER, SC/ST CERAMIC SLEEVE
55505082	OPT046	TEST SET ADAPTER, SC/SC CERAMIC SLEEVE
55505253	OPT051	TEST SET ADAPTER, SC/FC CERAMIC SLEEVE
55505083	OPT076	TEST SET ADAPTER, SC/LC METAL BODY CERAMIC SLEEVE
55505084	OPT081	TEST SET ADAPTER, SC/UNIVERSAL 2.5mm CERAMIC SLEEVE
55505085	OPT085	TEST SET ADAPTER, SC/UNIVERSAL 1.25 MM CERAMIC SLEEVE
55505161	OPT200	TEST SET ADAPTER, XL- CS
55505146	OPT201	TEST SET ADAPTER, XL- SC
55505254	OPT202	TEST SET ADAPTER, XL- ST
55505301	OPT204	TEST SET ADAPTER, XL- FC
55505298	OPT224	TEST SET ADAPTER, XL- Universal 1.25mm
55505162	OPT225	TEST SET ADAPTER, XL- Universal 2.5mm
55505147	OPT226A	TEST SET ADAPTER, XL- LC
55505148	OPT227	TEST SET ADAPTER, XL- MPO12
55505160	OPT228	TEST SET ADAPTER, XL- MPO16
55505299	OPT229	TEST SET ADAPTER XL 7/8-28, POF MULTI
55505300	OPT231	TEST SET ADAPTER XL 7/8-28, HFBR
55505149	OPT233	TEST SET ADAPTER, XL - MMC, MT
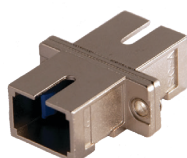
OPT040 OPT046 OPT076 OPT081 OPT085

SPECIAL LAUNCH CONDITION
OPTICAL POWER METERS & SOURCES

INSTRUMENTS DESIGNED FOR POF & FIBER OPTIC CABLE TESTING:

The Special Launch Condition Sources and Optical Power Meter XL fiberTOOLS™ are designed for the professional to perform installation and maintenance measurements on both Plastic & Glass fiber optic networks.

The instrument family consists of standard instruments for routine cable testing, through to Stabilised Light Sources with stringent Launch Conditions for the Avionics and Defence Industries and Research Laboratories.

Tempo's LED Light Sources have been manufactured with specific launch conditions to overcome the inconsistent measurements caused by standard Light Sources.

The Multimode products that have specific launch conditions are designed for greater accuracy and repeatable results.

Tempo also manufacture instruments to test POF links. POF links are being used in a number of industries particularly on short links where optical budgets aren't too tight. The automotive industry is a good example of this.

The XL fiberTOOLS™ are fully featured, general purpose fiber optic instruments and easy to operate to outfit all technicians performing fiber optic installation and maintenance.

Tempo also manufacture a range of Optical Light Sources and Power Meters with enhanced EMI performance, manufactured to Military standards, these offer the ultimate in accuracy.

Tempo's range of Optical Light Sources and Power Meters were designed specifically for: avionics, automotive, defence and research.

567XL SILICON FIBER OPTIC POWER METER (FORMERLY 557B)

FEATURES

- Absolute (dBm) & Referenced (dB) measurements
- Long battery life
- User selectable auto shut-off
- SOC interface adapts to all commonly used connectors
- Rugged and splash-proof

OPTICAL SPECIFICATIONS	
Detector Type	3 x 3.5mm Silicon
Calibration Wavelengths	650nm, 780nm, and 850nm
Power Range	+3dBm to -60dBm
Accuracy	±0.25dB
Linearity at	+3dBm to -3dBm ±0.5db -3dBm to -50dBm ±0.1db -50dBm to -60dBm ±0.5db
Resolution	0.01dB
Power Requirements	Two AA 1.5V batteries (approx. 100 hours continuous operation)
Connector Interface	SOC
Operating Temperature	-15º C to +55º C
Storage Temperature	-35º C to +70º C
Humidity	0 to 95% non-condensing
Dimensions	7.2 x 14.2 x 3.5 cm (2.8 x 5.6 x 1.4 in.)
Weight	241g (8.5 oz.)
CE	EN61010; EN50081-1:1992; EN55011,Group1, Class A EN50082-1: 1992 IEC 801-2, -3, -4
Typical Power Output (µm)	
200/230 SI Fiber	-15dBm ±0.5dB
Modulation Frequencies	270Hz, 1kHz and 2kHz
Power Requirements	Two AA 1.5V batteries (approx. 24 hours continuous operation)

573XL & 573XL-UNIV 650NM LED SOURCE FOR LARGE CORE PLASTIC AND GLASS FIBER (FORMERLY 253B-POF)

FEATURES

- Stable Calibrated output Storage
- Continuous wave and modulated output
- Easy to use
- Long battery life
- User selectable auto shut-off
- 650nm wavelength
- Rugged and splash-proof
- Fixed ST and SOC Adapter options are available

577XL M90 850nm LED SOURCE WITH M90 LAUNCH CONDITIONS (62.5/125µm FIBER)

(FORMERLY 253B-POF)

FEATURES

- Stable calibrated output
- Easy to use
- Continuous wave and modulated output
- Long battery life - approx. 24 hours
- User selectable auto shut-off
- Rugged and splash-proof
- Economically priced
- UCI Adapter options are available
- 850nm wavelength

577XL AS100 850NM LED SOURCE WITH AS-100 LAUNCH CONDITION (100/140µM FIBER)

(FORMERLY 257A-AS100)

FEATURES

- Stable calibrated output
- Easy to use
- Continuous wave and modulated output
- Long battery life - approx. 24 hours
- User selectable auto shut-off
- Rugged and splash-proof
- Economically priced
- UCI Adapter options are available
- 850nm wavelength

578XL M90 1300NM LED SOURCE WITH M90 LAUNCH CONDITION (62.5/125μM FIBER)

FEATURES

- Stable Calibrated output Storage
- Continuous wave and modulated output
- Easy to use
- Long battery life
- User selectable auto shut-off
- 1300nm wavelength
- Rugged and splash-proof
- UCI Adapter options available (options are available)

XL SERIES LED SOURCES

	573XL	577XL	578XL
Nominal	650nm	850nm	1300nm
Range (nm)	630 - 670	840 - 880	1270 - 1345
Max. spectral width (FWHM)	40nm	55nm	150nm
Stability, 1 hour	±0.05dB	±0.05dB	±0.05dB
POWER OUTPUT			
200/230μm SI MM fiber	-15dBm ***		–
100/140μm GI MM fiber	–	-20dBm**(AS-100)	-20dBm
62.5/125μm GI MM fiber**	–	-20dBm** (M90)	-20dBm** (M90)
50/125μm GI MM fiber	–		-21dBm
9/125μm SM fiber	–	–	-38dBm
Power output uncertainty	±0.5dB	±0.5dB	±0.5dB
Connector interface	SOC or ST	Universal connector interface	
Functions	MOD: Modulated output mode (270Hz, 1kHz, 2kHz) CW: Continuous Wave output mode Freq: selectable modulation frequency		
Modulation frequencies	270Hz, 1kHz, and 2kHz (±0.5%) using switch inside battery compartment		
Power requirements	Two AA-size alkaline batteries		
Battery life	> 24 hours		
ENVIRONMENT			
Operating Temperature	-15°C to 55°C		
Storage Temperature	-35°C to 70°C		
Humidity, Non-Condensing	0% to 95%		
Dimensions	7.2 x 14.2 x 3.5cm (2.8 x 5.6 x 1.4in)		
Weight	215g (7.6oz)		

* Within specified operating environment of 20°C to 25°C

** Calibrated launch level, equilibrium modal distribution

*** Calibrated launch level

560XL-EMI FIBER OPTIC POWER METER WITH ENHANCED EMI PERFORMANCE

FEATURES

- 0.01dB measurement resolution
- Multi-Wavelength Storage
- SOC interface adapts to all commonly used connectors*
- Long battery life
- Absolute (dBm) & Referenced (dB) Power measurements
- User selectable auto shut-off
- Rugged and splash-proof
- Economically priced
- Enhanced EMI performance: MIL-STD-461E, Method RS103, tested to 190 V/m
- Engineered for use in areas with high electrical interference

OPTICAL SPECIFICATIONS

Detector Type	1mm InGaAs
Calibration Wavelengths (nm)	850, 1300, 1310, 1550
Power Range	+3dBm to -60dBm
Accuracy	±0.25dB
Resolution	0.01dB
Power Requirements	Two AA 1.5V batteries (approx. 100 hours continuous operation)
Connector Interface	SOC

570XL-AS100-EMI 850/1300NM LED SOURCE WITH ENHANCED EMI PERFORMANCE

FEATURES

- Stable calibrated output
- 850nm / 1300nm wavelength LED Source
- Long battery life - approx. 80 hours
- Continuous wave and modulated output
- User selectable auto shut-off
- Supports a wide range of UCI connectors, including FC, SC, and ST
- Economically priced
- Enhanced EMI performance: MIL-STD-461E, Method RS103 tested to 200 V/m
- Easy to use
- Configured to meet AS100 launch conditions
- Rugged and splash-proof

OPTICAL SPECIFICATIONS

Detector Type	1mm InGaAs
Calibration Wavelengths (nm)	850nm, 1300nm
Power Range	820nm to 880nm; 1270nm to 1345nm
Accuracy	±0.25dB
Resolution	0.01dB
Power Requirements	Two AA size 1.5V batteries (approx. 40 hours continuous operation)
Connector Interface	UCI

580XL-EMI 1310/1550NM LASER SOURCE WITH ENHANCED EMI PERFORMANCE

FEATURES

- Stable calibrated output
- 1310nm / 1550nm wavelength Laser Source
- Long battery life - approx. 80 hours
- Continuous wave and modulated output
- User selectable auto shut-off
- Easy to Use
- Enhanced EMI performance: MIL-STD-461E, Method RS103 tested to 200 V/m
- Supports a wide range of UCI connectors, including FC, SC, and ST
- Rugged and splash-proof
- Economically priced

OPTICAL SPECIFICATIONS

Centre Wavelength	1310nm	1550nm
Range (Typical)	1280nm to 1340nm	1520nm to 1580nm
Max. Spectral Width (FWHM)	<5nm	<5nm
Stability (1 hour)	±0.05dB	±0.05dB
Typical Power Output (9/125µm)		
Minimum	-8dBm	-8dBm
Typical	-7dBm	-7dBm
Modulation Frequencies	270Hz, 1kHz and 2kHz	270Hz, 1kHz and 2kHz
Power Requirements	Two AA 1.5V batteries (approx. 80 hours continuous operation)	
Connector Interface	UCI	

ORDERING INFORMATION- XL *fiber*TOOLS™ SERIES:

PART NO.	CAT. NO.	DESCRIPTION
52058723	00025	567XL Silicon Fiber Optical Power Meter
52058784	00023	573XL 650nm LED Source with Fixed ST Connector
52061770	00598	573XL 650nm LED Source with SOC Adapter Interface
52058727	00029	577XL-AS100, 850nm LED Source with 100/400μm Launch Condition
52058726	00027	577XL-M90, 850nm LED Source with 62.5/125μm Launch Condition
52061054	00753	578XL-M90, 1300nm LED Source with 62.5/125μm Launch Condition
52060994	00244	560XL-EMI HH OPM, INGAAS, EMI SHIELDING
52060995	00245	570XL-AS100-EMI HH DUAL LED SOURCE, EMI SHIELDING
52060996	00246	580XL-EMI HH LASER SOURCE, EMI SHIELDING

SNAP ON CONNECTOR (SOC) FOR XL SERIES INSTRUMENTS

Snap On Connectors (SOC) are used on the XL Fiber Optic Power Meters and 573XL LED light source. The Snap On Connectors configure the instruments for various optical connectors. Contact Tempo Communications for other available adapters.

FC

ST

SC

T1020

T1030

T1062

UNIVERSAL CONNECTOR INTERFACE (UCI)
FOR XL SERIES INSTRUMENTS

Users will need to purchase a Universal Connector Interface (UCI) adapter for use with specific light sources. Please specify the desired connector adapter type when ordering.

FC

SC

ST

APC-108

ASC-108/C

ATS-108

FEATURES

- Our SOC and UCI adapters provide direct connectivity for Tempo Communications fiberTOOLS® to a wide range of industry-standard fiber optic connectors
- Adapter design ensures maximum accuracy and repeatability when performing critical measurements on fiber optic systems
- Easy to clean and use
- Single-mode and multimode compatible
- SOC adapters are compatible with both PC and APC interfaces
- UCI adapters feature durable phosphor bronze alignment sleeve

CONNECTOR		SOC Adapter		UCI Adapter	
DESCRIPTION		PART NO.	CAT. NO.	PART NO.	CAT. NO.
1.25 mm Quick-Connect Universal Adapter (LC, MU, etc.)		50605881	T1026	USE HYBRID CABLE	
FC		50605768	T1020	50605720	APC-108
LC		50606000	T10LC	USE HYBRID CABLE	
MIL-T-29504/4 & /5 Termini		50605898	T1038	USE HYBRID CABLE	
SC		50605751	T1062	52039964	ASC-108/C
ST		50605775	T1030	50605737	ATS-108
Versatile Link – V/Z PIN		50606048	T10ZP	USE HYBRID CABLE	
SMA 905/906		50605966	T1087	N/A	

*fiber*TOOLS™ HARD CARRY CASE

FEATURES

- Designed to hold Tempo handheld instruments and a full range of test accessories.
- Top tray holds up to 3 handheld instruments and a 180XL Visual Fault Finder
- Bottom compartment of both models stores additional instruments and test accessories
- Compact, waterproof and lockable
- Moulded from black structural foam resin

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
50606840	900B	Carry Case Ruggedised 3 Unit

SPECIFICATIONS:

Weight: 500g	
Dimensions: 380 x 185 x 180mm	

FIB-TRN FIBER TRAINER

The Tempo Communications Fiber Trainer provides a compact platform used to train fiber optic technicians. The Fiber Trainer has loss events that simulate a faulty connector, a Macrobend and a damaged fiber optic cable. The 1km fiber link provides the student technician a typical fiber link that has a fault midway. This allows the technician setup the OTDR, test and evaluate the 1km link. The two fiber spools provide sufficient fiber for fusion splicing exercises. The connectors on the ends of the fiber spools allow for convenient connections for loss testing so that the student technician can measure and validate fusion splice loss.

Learning Components:

- Fiber Optic Basics
- Cleaning and Inspection
- Visual Fault Locating
- Fiber Optic Loss Testing
- Fusion Splicing & Fiber Dressing
- Optical Time Domain Reflectometers

LEARNING INSTRUMENTS

915CL

MSS100

PA1822

TCDCS

TCCPS

OPM210

SLS520

915FS

OFL100

Optional Instruments

CAT. NO.	DESCRIPTION
FI-100-KIT	Fiber Identifier Kit
LC-500	500m Launch Cable, Singlemode
SLS525	850/1300nm Dual LED

Available Kits

CAT. NO.	DESCRIPTION
JTK-PA	Pre-Apprentice Kit
JTK-T	Trainer Kit
JTK-SP	JTK-T & 915FS-KIT1
JTK-OFL	JTK-T & OFL100-NA
JTK-FULL	JTK-T & 915FS-KIT1 & OFL100-NA

Ordering Information

CAT. NO.	DESCRIPTION
FIB-TRN	Fiber Trainer
SPC01	Fiber Trainer Consumable Kit (Not included with FIB-TRN)
OPM210	Standard Power OPM with VFL
OFL100-NA	OFL100 with North American Power Supply
SLS520	1310/1550nm Dual Laser
915FS-KIT1	915FS Fusion Splicer & Cleaver Kit
PA1171	Pro Grip Fiber Stripper
PA1511	Kevlar Cutter
PA1175	Pro Grip Cutter
REEL-CLN	Opti-Clean Reel Cleaner
FIP100 KIT	Fiber Inspection Probe Kit
DFE100	Drop Fiber Enclosure Kit, 2 PORT
SOCSCUPC-10	SOC SCUPCSMF 10 Pack
2.5 SWAB	2.5mm Cleaning Swabs, 100 Pieces
TCLTH	Tablecloth
PA1822	Cable Slitter
MSS100	Midspan Slitter
TCCPS	Slit and Ring Stripper
TCDCS	Drop Cable Stripper
SD6-in-1	Six in one screwdriver

Pre-Apprentice Kit Contents (JTK-PA)

CAT. NO.	DESCRIPTION
PA1822	Cable Slitter
PA1511	Kevlar Cutter
PA1177	3 In 1 Fiberoptic Stripper
PA1179	Cable Cutter
MSS100	Midspan Slitter
TCCPS	Slit and ring Stripper
TCDCS	Drop Cable Stripper
SD6-in-1	6 in 1 Screwdriver

Trainer Kit Contents (JTK-T)

CAT. NO.	DESCRIPTION
FIB-TRN	Fiber Trainer
SPC01	Consumable Kit
JTK-PA	Pre-Apprentice Kit
REEL-CLN	Reel Cleaner
2.5 SWAB	2.5mm Cleaning Swabs (100)
OPM210	Optical Power Meter

Specifications

CONNECTOR INTERFACES:	SC/UPC (3) SC/APC (2)
FIBER:	G.652 Ultra
WEIGHT:	3.73 lb (2.14 kg)
DIMENSIONS:	12.2 x 9.0 x 4.1" (310 x 229 x 104mm)

SPC01 CONSUMABLE KIT

The Consumable Kit items are used in conjunction with the Fiber Trainer, providing the necessary cables, cleaning supplies and supplementary items to perform the experiments during the hands on portion of the learning modules.

Note that each Fiber Trainer requires one Consumable Kit.

SPC01 Consumable Kit Contents:

- 50 Pack of Cleaning Swabs
- 100 Pack of Cleaning Wipes
- Fiber Disposal Unit
- Cleaning Fluid
- Safety Glasses
- 50 Pack of Fusion Splice Sleeves
- Two SC/UPC Bulkheads
- Two 15m Pigtail (900 micron)
- One SC/APC to SC/APC 3mm, 0.5m Cable
- Three SC/UPC to SC/UPC 3mm, 0.5m Cable
- One Sharpie Pen
- Two SC/UPC to SC/UPC 3mm, 5m Cable
- One SC/APC to SC/UPC 3mm, 1m Cable

Ordering Information

CAT. NO.	DESCRIPTION
SPC01	Fiber Trainer Consumable Kit (Not included with FIB-TRN)

PROGRIP 5-IN-1 FIBER OPTIC STRIPPER

FEATURES

- Precision ground stripping cavities for:
  – 2.0 - 2.4mm outer jacket
  – 2.0 - 3.0mm loose tube
  – 2.8 - 3.0mm outer jacket
  – 900µm buffer insulation
  – 900/125µm and 250/125µm
    buffer/acrylate
- Factory calibrated
- Dual-durometer ProGrips for improved comfort and control

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52055935	PA1171	Pro-Grip Stripper, 5-in-1 Fiber Optic

SPECIFICATIONS:

Weight: 140g
Dimensions: 173mm

PROGRIP 3-IN-1 FIBER OPTIC STRIPPER

FEATURES

- Precision ground stripping cavities for:
  – 2.0mm outer jacket
  – 900µm buffer insulation
  – 250/125µm buffer/acrylate
- Factory calibrated
- Dual-durometer ProGrips for improved comfort and control

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52055938	PA1177	Pro-Grip Stripper, 3-in-1 Fiber Optic

SPECIFICATIONS:

Weight: 130g
Dimensions: 160mm

MIDSPAN SLITTER

FEATURES

- The Mid Span Slitter is an efficient and indispensable tool for fiber optic cable termination.
- The sharp blade is made of super-alloy, suitable for longitudinal stripping of outdoor optical loose tube cable.
- The stripping opens the tube on upper and lower sides for easy access of the fiber.
- The Mid Span Slitter comes with 4 groove diameters. Select the proper groove, put in the loose tube, press the blade into the tube coating, close and clamp the two half grooves, and move the blade along the tube to strip.

BENEFITS

- Small, light weight design for maximum portability
- Simple operation without any adjustments
- Provides easy access to fiber
- Super-alloy blade ensures precision and continued sharpness after multiple uses
- Four groove diameter options:
  (Ø 1.5~Ø 1.9mm) / (Ø 2.0~Ø 2.4mm) / (Ø 2.5~Ø 2.9mm) / (Ø 3.0~Ø 3.3mm)

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52076413	MSS100	Midspan Slitter

SPECIFICATIONS:

Weight: 30g
Dimensions: 50 x 40 x 25mm

ECONOMY KEVLAR® CUTTER

FEATURES

- Cut protective Kevlar® strands in fiber optic cable
- Hard-chromed serrated edges to easily cut through Kevlar®
- Comfortable handles with large finger openings

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52051283	PA1511	Kevlar® Cutter

SPECIFICATIONS:

Weight: 60g
Dimensions: 197mm

ALSO SEEN IN THE HAND TOOLS CATALOG

LIFETIME WARRANTY

ECONOMY FIBER OPTIC STRIPPER

FEATURES

- Pre-calibrated and factory set to ensure precision
- Rubber dipped handles
- Lock closure for safety and transport
- Strips 2.0 to 3.0mm fiber jacket, 900μm buffer and 125μm acrylate
- Spring loaded closure with distance stops

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52050605	PA1162	Stripper Fiber Optic 3-Level

SPECIFICATIONS:

Weight: 86g
Length: 127mm

UNIVERSAL SLITTER

FEATURES

- Strips and slits 4.5-25mm diameter Round Cables
- Precision stripping and slitting of rubber, PVC, nylon and most insulation materials
- Adjustable depth of cut
- Circumferential, longitudinal and spiral cuts
- Cable is supported during use
- Cable support arm edge is used to pry off thick insulation
- Laser-trimmed, stainless-steel blade for long use
- A perfect tool for mid-point taps
- Spare blade included

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52050604	PA1822	Cable Slitter 4.5-25mm Inch Clamshell
52050563	PA2109	Replacement Blade (Qty 2)

SPECIFICATIONS:

Weight 7 oz. (200g)
Length 5.7" (145mm)

ROUND CABLE CUTTERS

FEATURES

- To cut fiber outer cable jacket
- Cuts solid or stranded cable up to AWG 6
- Precise and effortless cuts
- Round cutting form minimises cable deformation
- Both are ideal for UTP and Coax, RG58, RG59 and RG6/6Q; Use PA1175 for RG7 and RG11

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52055936	PA1175	Pro-Grip Cutter, Contour Cable Cutter
52055940	PA1179	Pro-Grip Cutter, Dual Contour Cable Cutter

POCKET PROBE PICK

FEATURES

Probe pick for pulling wire, slicing, stripping cable and cleaning debris off terminal panels. Small and lightweight. Pen-sized with clip for carrying in pocket.

- Spudger tip
- Wire hook
- Wire stripper and slitting tooth
- Non-conductive scraping tip

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52049188	PA1915	Pocket Probe Pick/Blister

SPECIFICATIONS:

Weight: 3oz. (86g)
Dimensions: 6.5" (166mm)

RING AND SLIT STRIPPER

FEATURES

- Ring and Slit stripping for 1.2mm – 6.4mm fiber optic cables
- Easy fast adjustment for various cables diameters
- Ring Blade Kit TCCPS-RING-2 contains one blade, knob and pin
- Slit Blade Kit TCCPS-SLIT-2 contains one blade, lever and screw

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52085475	TCCPS	Cable Slit and Ring Stripper

SPECIFICATIONS:

Weight: 0.05lbs (22g)
Dimensions: 2.87" (72.9mm)

DROP CABLE STRIPPER

FEATURES

- Strips 8.1mm drop cables
- Provides midspan slit operation for 8.1mm drop cables
- Easy secure operation for quick stripping
- Replacement Blade Kit TCDCS-2 contains six individual blades

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52086521	TCDCS	Drop Cable Stripper

SPECIFICATIONS:

Weight: 0.15lb (68g)

Dimensions: 3.26" (82.8mm)

MULTI BIT DRIVER

FEATURES

- Versatile multi-bit screwdriver, 6 tools in one
- Precision machined, hardened steel bits
- High-grade, rust resistant, chrome-plated finish
- Soft, cushioned grip for extra comfort and torque
- Lifetime limited warranty

**Note: This is not an insulated tool

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52024842	SD-6-1	Multi Bit 6-in1 Driver

SPECIFICATIONS:

Weight: 0.188 kg

Dimensions: Nutdriver 1/4" and 5/16"

PA1180 NEEDLE NOSE PLIERS

FEATURES

- Needle-nose with knurled surface for gripping, wrapping and looping
- Side cutter for AWG 19-26 copper
- Non-slip grips for precision control
- Stripping cavity for AWG 22 wire
- Crimp capacity:
  - UR: AWG 19-26
  - UY: AWG 22-26
  - UG: AWG 19-26

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52055941	PA1180	NEEDLE NOSE PLIERS

SPECIFICATIONS:

Weight: 0.15lb (68g)

Dimensions: 3.26" (82.8mm)

TCEXT INSERTION & EXTRACTION TOOL

The Tempo Communications TCEXT is used to remove and connect LC, SC and similar connectors into bulkheads where the technician's fingers may not fit especially as is the case in congested cabinets.

FEATURES

- Secure clamp to insert and remove LC and SC connectors from bulkheads in high density cabinets
- Ergonomic and lightweight design promotes precise alignment of connectors

LIFETIME WARRANTY

SCAN TO WATCH THE VIDEO

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
55500944	TCEXT	LC/SC Connector Extraction Tool

BARE FIBER ADAPTER

FEATURES

- Popular SC type connector with PC ferrule
- Easy to clean
- Smooth fiber feed
- Temporarily connect to fiber under test
- 900 micron buffer compatible

SPECIFICATIONS:

Ferrule diameter	2.5mm		Buffer diameter	250-900um
Capillary diameter	Nominal -0 / +10um		Fiber strip length	40mm

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52080175	BFA-1	Bare fiber Adapter Kit

FIBER OPTIC SCRIBE

FEATURES

- Pen-type scribe with screw-in non-reversible carbide tip
- Wedge shaped tip
- Pocket-clip
- Stainless steel barrel

SPECIFICATIONS:

Weight	2oz (57g)
Length	5.25" (197mm)

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52050965	PA1922-1	Fiber Optic Carbide Scribe

FIBER TOOL KITS

The Tempo Communications Fiber Optic Tool Kits provides four kit options to satisfy varying tasks that the fiber optic technician may encounter. The tool kits contain all the common tools required to effectively and safely complete the job in an efficient manner.

Each tool kit is supplied in a rugged carry case to safely keep all tools organized for easy storage and retrieval for use. Extra pockets are incorporated to hold accessories and other tools. The FTK-B, Basic tool kit provides a variety of cutters, strippers and common handtools that the typical technician would use in their day to day activities. The FTK-P, Pro tool kit adds the 180XL visual fault locator for safe and quick visual identification of cut or damaged fiber, Macrobends and contaminated or damaged connectors.

The FTK-PP, Pro Plus tool kit adds the OPM210 optical power meter/visual fault locator to the FTK-B. This enables the technician to visually locate fiber and connector faults and to measure the absolute power in fiber networks.

The FTK-T, Termination kit provides all of the tools needed to quickly and effectively terminate fiber optic cables. The 915CL and 180XL are the key components along with a fiber stripper, side cutter and Kevlar shear.

FTK-B BASIC TOOLS KITS

A basic tool kit allows the technician cut, strip and prepare fiber optic cables for termination.

INCLUDES

- Kevlar Cutter
- 3-in-1 Fiber Optic Stripper
- Universal Slitter
- 6-in-1 Multi Tool
- Long Nose Pliers
- Fiber Optic Tool Case
- Side cutters
- Drop Cable Stripper
- Mid Span Slitter
- Ring and Slit Stripper

FTK-P PRO TOOLS KIT

Same tools as the FTK-B but with a 180XL Visual Fault Locator (VFL) to visually locate faults and two fiber cleaning pens.

INCLUDES

- Kevlar Cutter
- 3-in-1 Fiber Optic Stripper
- Universal Slitter
- 6-in-1 Multi Tool
- Visual Fault Locator
- Long Nose Pliers
- Fiber Optic Tool Case
- Side cutters
- Drop Cable Stripper
- Mid Span Slitter
- Ring and Slit Stripper
- 2.5mm Fiber Cleaning Pen
- 1.25mm Fiber Cleaning Pen

FTK-PP PRO PLUS TOOLS KIT

Same tools as the FTK-B but with a OPM210 which has an Optical Power Meter (OPM) and Visual Fault Locator (VFL). The OPM can be used to measure optical power, perform loss testing and to sense tones present on the fiber. The VFL can be used to visually locate faults and to test mechanical connectors.

INCLUDES

- Kevlar Cutter
- 3-in-1 Fiber Optic Stripper
- Universal Slitter
- 6-in-1 Multi Tool
- OPM210
- Long Nose Pliers
- Fiber Optic Tool Case
- Side cutters
- Drop Cable Stripper
- Mid Span Slitter
- Ring and Slit Stripper
- 2.5mm Fiber Cleaning Pen
- 1.25mm Fiber Cleaning Pen

FTK-T TERMINATION TOOLS KIT

Contains all of the tools needed to terminate fiber optic cables with a mechanical connector

INCLUDES

- Kevlar Cutter
- 3-in-1 Fiber Optic Stripper
- 915CL Cleaver
- Fiber Optic Tool Case
- Visual Fault Locator
- Side Cutter

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
52086508	FTK-B	Basic Fiber Tool Kit
52086509	FTK-P	Pro Fiber Tool Kit
52086510	FTK-PP	Pro Plus Fiber Tool Kit
52086866	FTK-T	Termination Fiber Tool Kit

INDIVIDUAL TOOL FROM KITS:

PART NO.	CAT. NO.	DESCRIPTION
52051283	PA1511	Kevlar Cutter
52055938	PA1177	3-in-1 Fiber Optic Stripper
52050604	PA1822	Universal Slitter
52024842	TCBMD	6-in1 Multi Tool
55500025	OPM210	Standard Power OPM with VFL
52055941	PA1180	Long Nose Pliers
52085476	FIBKIT CASE	Fiber Optic Tool Case
52055936	PA1175	Side cutters
52086521	TCDCS	Drop Cable Stripper
52076413	MSS100	Mid Span Slitter
52085475	TCCPS	Ring and Slit Stripper
52068671	180XL	Visual Fault Locator

OTHER TOOLS AVAILABLE:

PART NO.	CAT. NO.	DESCRIPTION
52087221	FCL100	Field Fiber Optic Cleaver
52082727	920CL	920CL Optical Fiber Cleaver
52080175	BFA-1	Bare Fiber Adapter
52050560	PA1820	AM25 Slitter (0.18" – 1.0")
52050605	PA1162	Economy Stripper
52049188	PA1915	Pocket Probe / Pick
52050965	PA1922-1	Fiber Optic Carbide Scribe

REPLACEMENTBLADES FOR STRIPPING TOOLS:

PART NO.	CAT. NO.	DESCRIPTION
52086502	TCDCS-2	DROP CABLE STRIPPER BLADE KIT (six blades)
52086503	TCCPS-RING-2	CPS RING BLADE KIT (one replacement blade with hardware)
52086504	TCCPS-SLIT-2	CPS SLIT BLADE KIT (one replacement blade with hardware)

OPTICAL WAVELENGTH SPLITTER

Wavelength division multiplexing (WDM) is a technology or technique modulating numerous data streams, i.e. optical carrier signals of varying wavelengths (colours) of laser light, onto a single optical fiber.

Our Optical Wavelength Splitter (OWS201) allows any technician, who has a standard OPM (Optical Power Meter) to be able to measure signal levels in WDM networks.

The OWS200 "splits" multiplexed wavelengths, found in NGPON2 networks allowing specific wavelengths to be measured with a conventional optical power meter such as the OPM510.

FEATURES

- High accuracy to measure specific channel wavelengths
- Eliminates the need for expensive DWDM power meters
- Wavelength configurable for specific customer equipment
- Configurable for 2, 4 and 8 wavelengths
- Low loss
- SC/APC connections
- Low return loss will not disrupt network
- Compact design
- Convenient lanyard to securely hold

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
55500164	OWS201	OWS 1490 & 1570nm
55500166	OWS202	OWS 1490 & 1577nm
55500921	OWS203	OWS 1490 & 1550nm

SCAN TO WATCH THE VIDEO

DROP FIBER REPAIR KIT

The Drop Fiber Enclosure Kit can be used as a demarcation point to install fiber optic cable splices and as a repair product to reconnect damaged or severed drop fiber cables. Common fiber sizes of 8.1mm, 5.4mm and 5.1mm rectangular cables and 3.0mm and 5.1mm round cables are accommodated with the supplied sealing gaskets. Both fusion splices (total of 24) and two mechanical splices are securely positioned within the GR771 Telcordia compliant and IP68 rated enclosure. The enclosure can be permanently buried or mounted on the side of a building. Two DFE enclosures are typically used to repair a drop fiber as there is not enough slack cable to reconnect the fibers.

FEATURES

- Allows technician to repair drop cables in FTTx applications
- IP68 rated for buried applications and element protection
- Accommodates up to 26 fibers
- Re-enterable for rework needs
- Individual gaskets for 8.1mm, 5.4mm rectangular and 3.0mm, 5.1 mm round cable
- Fast assembly with common tools
- Telcordia GR771 compliant
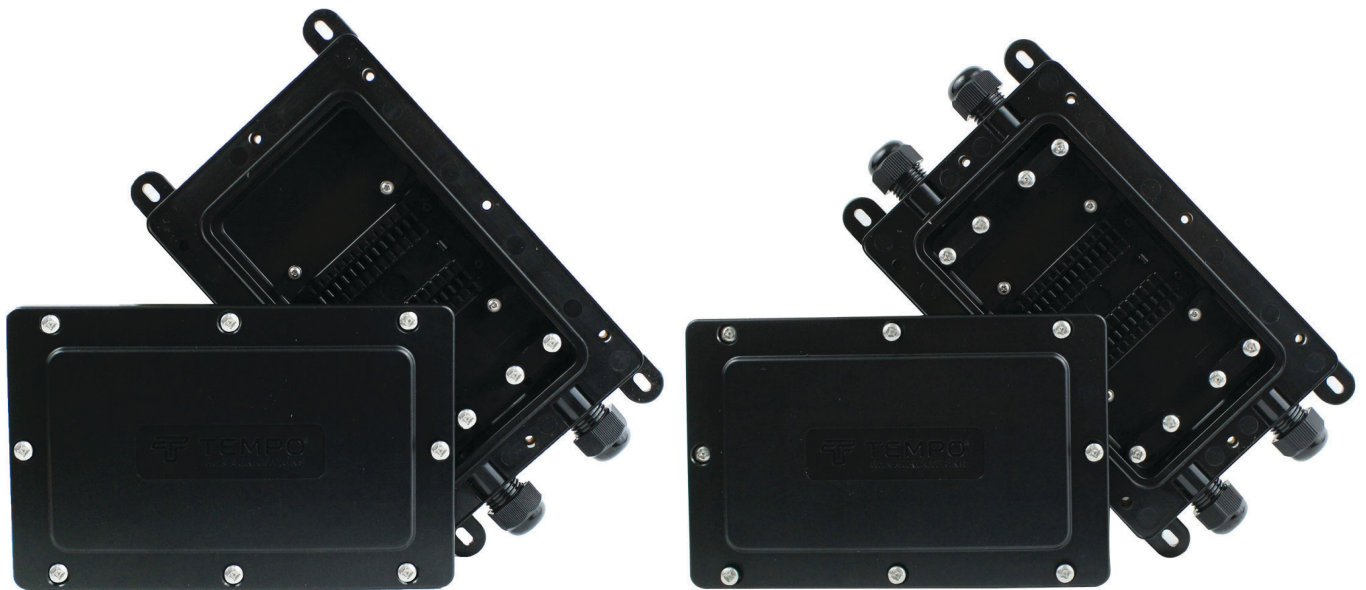
INDIVIDUAL GASKET FOR EACH CABLE SIZE:

8.1mm
Rectangular

5.1mm & 5.4mm
Rectangular

5.1mm
Round

3.0mm Round
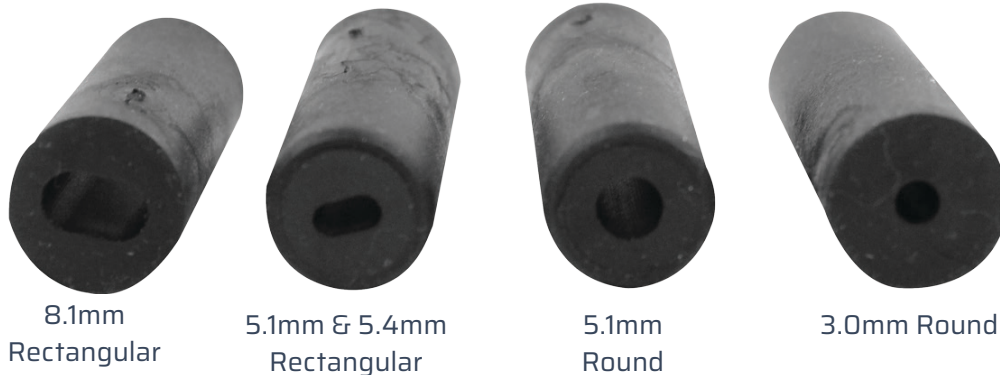
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THE VIDEO

COMPONENT PARTS:

PART NO.		PRODUCT	QTY (2 PORT)	QTY (4 PORT)
Case Top	ABS plastic, Black		1	1
Case Bottom	ABS plastic, Black		1	1
Rubber Gasket	8.1mm Rectangular		2	4
Rubber Gasket	5.1mm/5.4mm Rectangular		2	4

PART NO.		PRODUCT	QTY (2 PORT)	QTY (4 PORT)
Rubber Gasket	5.1mm Round		2	4
Rubber Gasket	3.0mm Round		2	4
Rubber Gasket	No Hole		0	2
Cable Clamp	3mm Cable Clamp		2	4
Mechanical Splice	L*W: 37*6mm		2	2

SPECIFICATIONS:

IP Rating	IP68*
Compliance	Telcordia GR771
Size	8.85 x 4.72 x 1.34" (225 x 120 x 34mm)
Weight	0.66lb (0.3kg) 0.8lb (0.36kg) [for the DFE104]
Cable Sizes	8.1mm rectangular, 5.4mm & 5.1mm rectangular and 3.0mm and 5.1mm round
Fusion Splice Locations	Twelve (60mm)
Mechanical Splice Locations	Two
Color	Black
Material	ABS with Polycarbonate (UV resistant)
Operating Temperature	-40 to +80C
Storage Temperature	-40 to +80C

STRUCTURE:
EXAMPLE OF FIBER OPTIC SPLICE
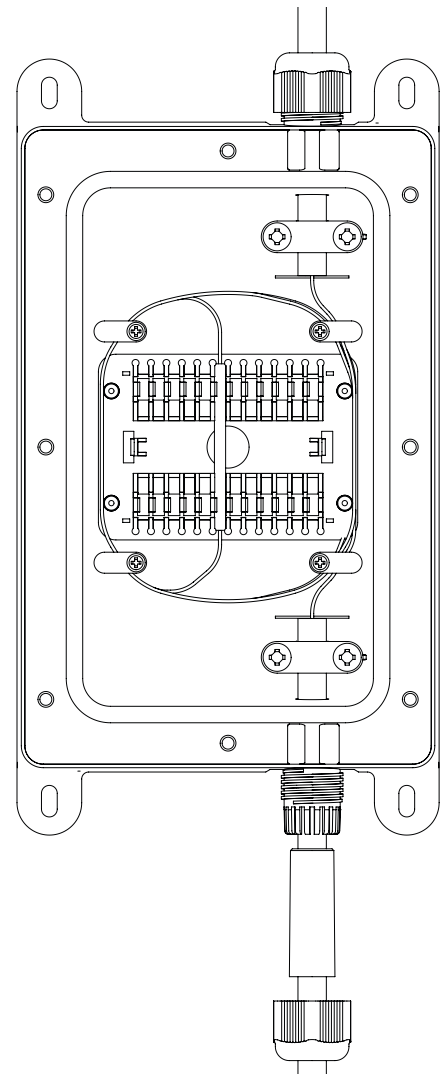
ORDERING INFORMATION:

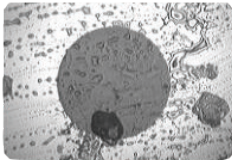| PART NO.	CAT. NO.	DESCRIPTION
55500211	DFE100	Drop Fiber Enclosure Kit, Two Port in Line
55501030	DFE101	Drop Fiber Enclosure Kit, Two Port Stub
55501031	DFE104	Drop Fiber Enclosure Kit, Four Port

OPTI-CLEAN REEL CLEANER

The Opti-Clean reel cleaner is an essential tool to clean fiber optic connectors. It is the best dry method for cleaning fiber optic termini such as SC, LC, FC, ST, E2000 and other common connectors.
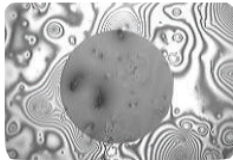
FEATURES

- Lint free cleaning tape.
- Cleans the Entire Ferrule End Face.
- Antistatic design.
- Effective and efficient ferrule end face cleaning.
- Easy-to-replace fiber spools available.

PERFORMANCE:

Before (1) Before (2) After

SPECIFICATIONS:

	OPTI-CLEAN REEL CLEANER	REPLACEMENT SPOOL
Cleaning Count	> 600 times	> 600 times
Size	130 x 88 x 32mm	104 x 60 x 30mm
Weight	0.14kg	0.08kg

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
55500007	REEL-CLN	Opti-Clean Reel Cleaner
55500008	REEL-CLN-SP	Opti-Clean Reel Cleaner Replacement Spool

SCAN TO WATCH THE VIDEO

CLEANING SWABS
1.25mm and 2.5mm

These easy-to-use cleaning swabs provide a fast and effective process for cleaning 2.5mm bulkheads and 1.25mm bulkheads. They are easy to use.
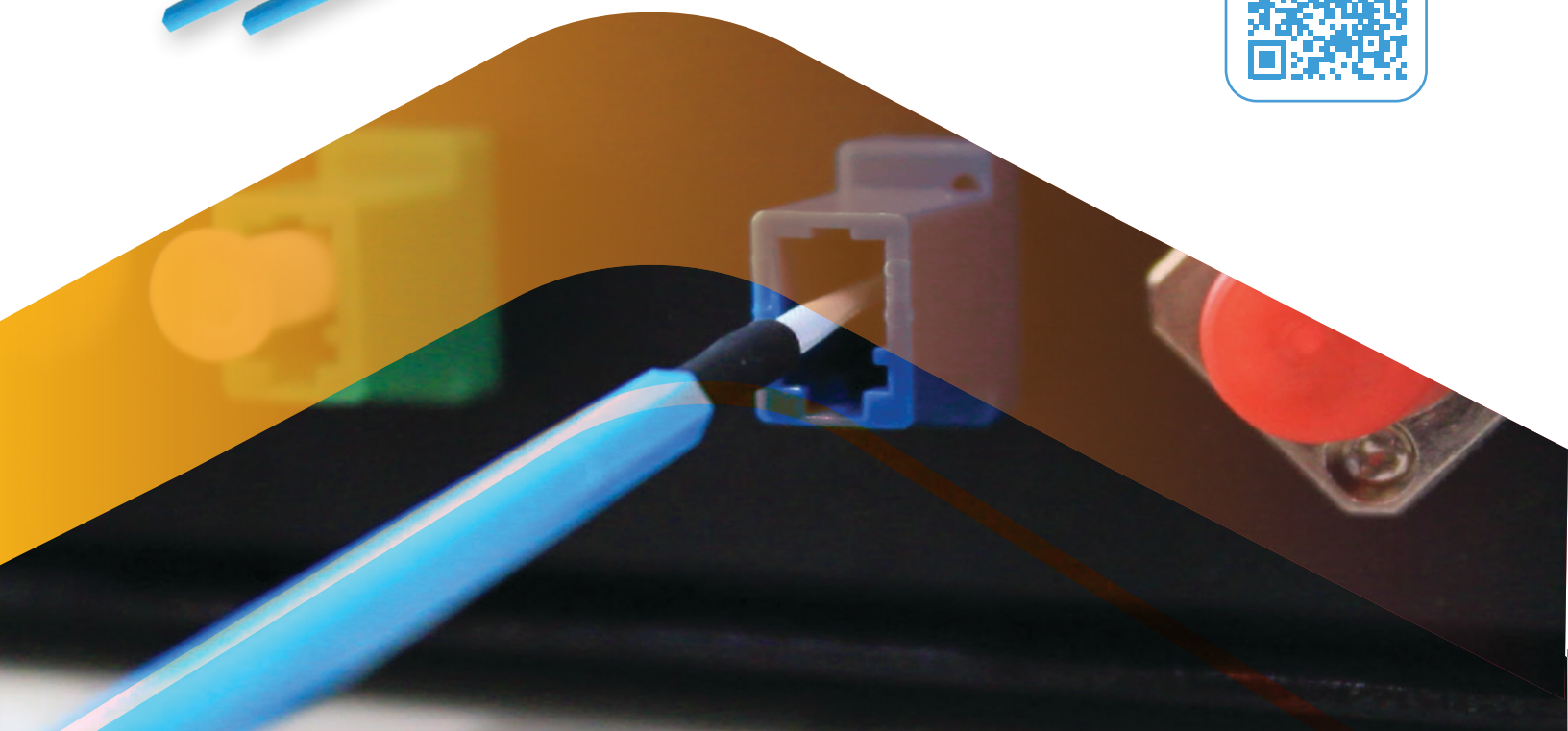
FEATURES

- The precision cleaning swabs are used to clean bulkhead ferrules and inside mating sleeves.
- Available in 2.5mm and 1.25mm versions.
- Single use.
- Sold in 100 packs.

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
55500009	1.25 SWAB	1.25mm Cleaning Swab (100 pack)
55500010	2.5 SWAB	2.5mm Cleaning Swab (100 pack)

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EML100 ELECTRONIC MARKER LOCATOR

Tempo have introduced the 92 kHz markers, targeted at marking fiber optic cable installations, in response to requests from telecom companies who wish to differentiate their ducts carrying copper communication cables from those carrying fiber optic communication cables. It has also been found in practice that installing metallic tracer wires or tapes alongside or in fiber optic ducts is unreliable; they rarely have proper continuity for the whole duct length, often found corroded or not connected at joints. Tempo Communications' Marker-Mate electronic marker locator along with, OmniMarker buried electronic markers form a complete solution for marking and locating buried utilities and other devices to depths of at least 1.5m. Ideally suited to marking fiber optic ducts that, without metallic elements, are otherwise difficult to pinpoint.

FEATURES

- Detects up to nine different marker types
- Rapid switching between scan and single modes
- Digital signal processor accuracy
- Bar graph, numeric & audible signal strength indicators
- Headphone jack
- Low battery warning
- Weather resistant

- Scan mode provides simultaneous detection of all marker types
- User-adjustable Detection Threshold
- Large-character display
- Adjustable speaker volume
- Battery level indicator
- Adjustable time out feature
- Rugged construction

SCAN TO WATCH THE VIDEO

ORDERING INFORMATION:

PART NO.	CAT. NO.	DESCRIPTION
50607984	EML100	Electronic Marker Locator
52085007	OM-02	OmniMarker II, CATV
52085016	OM-04	OmniMarker II, Fiber Optic
52085012	OM-05	OmniMarker II, Telephone

GENERAL	
Housing Material	High density welded polyethylene
Identification	Solid moulded colour and moulded text
Detection Range	1.5m typical for all models (using Tempo EML-100 or RD8000MRX)
Detection Offset	15cm maximum at 1.5m
ELECTRICAL	
Detection Field	Vertical Dipole (OmniMarker II model)
MECHANICAL	
Overall Diameter	100mm max
Anchoring	Two "tie down" loops along flange.
Length	128mm

- Turn off splicer.
- Use lint free swabs.
- Do not touch the electrodes.
- Never use compressed air.
- Use the cleaning brush only to clean debris from general working area, never on the lenses, V-grooves or mirrors.

V-GROOVES (RECOMMENDED DAILY). SEE FIGURE 1.

Clean the bottom of the V-groove using 99% pure isopropyl alcohol and a lint free swab.

Fiber Clamps (Recommended Daily)

If contaminants are present on the clamps, proper clamping may not occur resulting in poor quality splices. The fiber clamps should be frequently inspected and periodically cleaned during normal operation. To clean the fiber clamps do the following:

- Clean the surface of the clamps with 99% pure isopropyl alcohol and a lint free swab.

WIND PROTECTOR MIRRORS (RECOMMENDED DAILY ON 910FS). SEE FIGURE 2.

If the wind protector mirrors become dirty, the fiber core position may be incorrect due to decreased optical path clarity, resulting in higher splice loss. To clean the mirror's, do the following:

i. Clean the mirror surface using 99% pure isopropyl alcohol and a lint free swab.
ii. Mirror should look clean with no streaks or smudges.

OBJECTIVE LENSES (RECOMMENDED WEEKLY). SEE FIGURE 3.

If the objective lens' surface becomes dirty, normal observation of the core position may be incorrect, resulting in higher splice loss or poor splicer operation. Therefore, clean both of them at regular intervals. Otherwise, dirt may accumulate and become impossible to remove.

To clean the objective lenses do the following:
      i. Before cleaning the objective lenses, always turn off the splicer.
      ii. Gently clean the lenses' (X-axis and Y-axis) surface with a dry lint free swab. Using the swab, start at the centre of the lens and move the swab in a circular motion until you spiral out to the edge of the lens surface.
      iii. The lens surface should be clean and free of streaks or smudges.
      iv. Turn on the power and make sure no smudges or streaks are visible on the monitor screen. Press X/Y key to change the screen and check the state of the lens surface on both the X- and Y-screens.

NOTE:
Do not touch the electrodes when cleaning.
It is recommended to clean the objective lenses when replacing the electrodes.
General Fusion Splicer Cleaning (Recommended Daily)
Use the cleaning brush only to clean debris from general working area, never on the lenses, V-grooves or mirrors. Periodically clean the fiber adapters with 99% isopropyl alcohol and a lint free swab. Never touch the fiber clamping area of the fiber adapters.

GENERAL FUSION SPLICER CLEANING (RECOMMENDED DAILY)

Use the cleaning brush only to clean debris from general working area, never on the lenses, V-grooves or mirrors. Periodically clean the fiber adapters with 99% isopropyl alcohol and a lint free swab.
Never touch the fiber clamping area of the fiber adapters.

CLEANING FIBER CLEAVER (RECOMMENDED DAILY)

If the circular blade or clamp pads of the fiber cleaver become contaminated, the cleaving quality could degrade. This may lead to fiber surface or end-face contamination, resulting in higher splice loss.Clean the edge of the circular cleaving blade and clamp pads with a lint free swab using 99% pure isopropyl alcohol.

FIGURE 1	FIGURE 2	FIGURE 3

Clean V-Groove daily   Mirror cleaning in lid   Objective Lens

OPTICAL POWER
METER CALIBRATION GLOSSARY

ABSOLUTE POWER STANDARDS:
The reference photodetectors maintained by the National Institute of Standards and Technology (N.I.S.T.) in Boulder, Colorado. These reference photodetectors are used to transfer optical power calibration to two sets of Secondary Standards maintained by Tempo Communications Ltd.

ACTIVE SET OF SECONDARY STANDARDS/ACTIVE SECONDARY STANDARD:
The most recently calibrated set of Secondary Standards, which are used to calibrate Working Standards used on the production floor. An Active Secondary Standard is one of the photodetectors in the Active Set of Secondary Standards.

ADAPTER:
A mechanical device enabling the coupling and uncoupling of a connector. A bulkhead adapter is used to couple two terminated cable ends. An interface adapter is used to connect a cable to a light source, photodetector, or other device.

AGING OF STANDARDS:
A gradual deviation from specifications due to wear and the deterioration of associated electronic components.

ANSI CERTIFICATE OF CALIBRATION:
A Certificate of Calibration (see below) that includes additional information specified by American National Standards Institute document ANSI/NCSL Z540. In addition to manufacturer, performance, and traceability information, an ANSI Certificate of Calibration must include the name and address of the customer and a detailed description of the methods and Working Standards used to perform the calibration. The calibration status of the Working Standards used must also be documented. Furthermore, an ANSI Certificate of Calibration must include a statement that the certificate or report may not be reproduced, except in full, without written permission from the calibration laboratory.

BACKUP SET OF SECONDARY STANDARDS/BACKUP SECONDARY STANDARD:
The set of Secondary Standards with calibration older than one year, but not exceeding two years. The calibration points of the Backup Set of Secondary Standards are compared to the Active Set at monthly intervals to verify the accuracy of the latter. A Backup Secondary Standard is one of the photodetectors in the Backup Set of Secondary Standards.

CALIBRATION CONDITIONS:
The specific conditions under which a calibration factor is associated with a calibration wavelength. The calibration conditions typically include the centre wavelength and acceptable spectral deviation of the laser source in use; the output power of the laser source; the reference cable type and length; the type of connectors used to terminate the reference cable, including the manufacturer; the interface adapter used; and the ambient temperature and humidity conditions.

CALIBRATION FACTOR:
A number used to correlate the response of a photodetector in a manufactured instrument with the photodetector response of a Secondary Standard or Working Standard. In instruments manufactured by Tempo calibration factors are stored in non-volatile memory, and defined for each calibration wavelength.

CALIBRATION WAVELENGTH:
A specifically defined wavelength used during the point calibration of a manufactured instrument. The absolute accuracy of measurements performed at other than the calibration wavelength may vary, depending on the response linearity of the photodetector incorporated in the instrument at that wavelength. Calibration wavelengths are listed below:

CERTIFICATE OF CALIBRATION:

A document certifying that a manufactured instrument has been calibrated or re-calibrated to conform to published specifications, and that the calibration is traceable to an established standards bureau, i.e., the N.I.S.T. A Certificate of Calibration includes the following: the name and address of the manufacturer; the model number and description of the instrument; the instrument serial number; the condition in which the instrument was received and returned, i.e., within tolerance, out of tolerance, or non-operational; the calibration date, interval, and due date for re-calibration; the conditions under which the instrument was calibrated; the procedures used to perform the calibration; the identity of the calibration technician; and a signature of an authorized representative of the manufacturer.

CONNECTOR:

A mechanical device that allows an optical fiber or cable to be repeatedly coupled or uncoupled from an interface or another cable. An optical fiber fitted with connectors is said to be connectorised or terminated.

CONNECTOR REPEATABILITY:

The ability of a connector to be mated and unmated repeatedly without affecting its attenuation, return loss and other performance specifications. A lack of repeatability is usually attributable to the inability of a connector to maintain accurate and consistent alignment of the cores of the optical fibers.

FIBER OPTIC CABLE:

An optical fiber, multiple fibers, or fiber bundles, which may include a jacket and strength members (kevlar, steel, or other materials), fabricated to meet optical, mechanical, and environmental specifications.

LINEARITY:

The ability of a photodetector to generate electrical current in amounts proportional to the incident wavelength and intensity of light.

PHOTODETECTOR:

A semiconductor device that converts light energy into an electrical current. The conversion of light energy into electrical current is, in principle, proportional and linear with the incident power, which is expressed in Watts. The conversion ratio of a photodetector is dependent on the wavelength of the light received, therefore, this wavelength must be precisely defined for a point calibration (see below) to be valid.

POINT CALIBRATION:

The correlation of electrical current produced by a photodetector, quantified in Amps, with an incident power of light energy, expressed in Watts, at a single defined wavelength. This photodetector response is expressed in Amps-per-Watt (A/W

SECONDARY STANDARDS:

The reference photodetectors maintained by Tempo Secondary Standards are calibrated at regular intervals by the N.I.S.T. using the Absolute Power Standards maintained by the Institute. Tempo maintains two sets of Secondary Standards, each set containing one reference photodetector of Si and InGaAs composition. Each set of Secondary Standards alternates as Active and Backup at one-year intervals.

SPECTRAL DEVIATION:

The difference between the actual output wavelength of a light source and its specified wavelength. Spectral deviation is usually attributable to manufacturing tolerances.

UNCERTAINTY:

The margin of error for a calibration or measurement attributable to external causes, such as connector repeatability, ambient temperature, back-reflections, or spectral deviation from a defined calibration wavelength. Uncertainty will cause slight variations in optical power measurements unless the conditions and equipment used are identical to those employed during the calibration of the instrument. Uncertainty is typically expressed in percent (%).

WORKING STANDARDS:

A set of reference optical power meters incorporating photodetectors of Si or InGaAs composition that are calibrated using an Active Secondary Standard. These reference optical power meters are used to perform a point calibration of manufactured instruments at specified wavelengths.

INSERTION LOSS MEASUREMENT

WHAT IS INSERTION LOSS?

An insertion loss (IL) measurement characterizes the light loss through a component or connection.

There are two accepted methods for measuring insertion loss, both of which may be found in reference document FOTP-171, published by the Electronic Industry Association (EIA).

Insertion loss measurements require a light source, an optical power meter, and a patch cable manufactured to precise tolerances, known as a reference cable.

In general, an insertion loss measurement is a two step process:

1) Establish a baseline power level measurement for the light source and reference cable in use. This is referred to as "referencing" or "calibration."

2) Connect the device under test and measure the difference between the measured power and the Reference power.

INSERTION LOSS MEASUREMENTS

To measure the insertion loss of a connector/cable, do the following:

STEP 1: Connect an appropriate Tempo LED or laser source to the optical power meter using a suitable reference cable. The reference cable should be 2 to 3 meters in length. See the illustration.

STEP 2: Make sure the source is in continuous wave (CW) output mode. Set the optical power meter to the output wavelength of the source using the [λ] key and to dBm units using the [dBm] key. Note that the dBm output from the reference cable should be within acceptable limits.

STEP 3: Store the reference power level by pressing the [Rel] key for a few seconds. The main numerical display should read 00.00 dB.

STEP 4: Disconnect the reference cable from the optical power meter and insert the cable to be tested using an appropriate bulkhead adapter.

Cable/connector under test

Source   Power meter
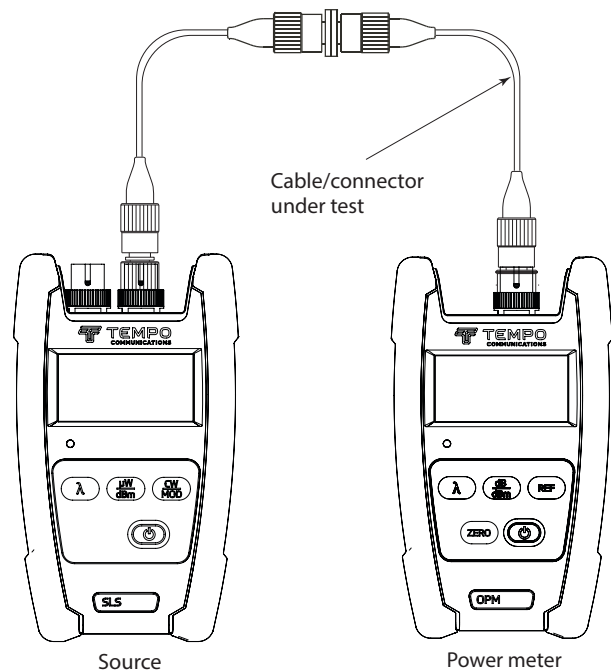
ABOUT dB, dBm, and WATTS

Fiber optic measurements are performed using decibel (dB) units.

The decibel is a logarithmic, relative, dimensionless unit it gives no indication of the absolute power level. Loss is always indicated using a minus (-) sign, and a gain is indicated by a plus (+) sign. Because dB units are relative and dimensionless, a correlation with an absolute unit of measure must be established to be useful. To indicate absolute power, logarithmic decibel units are referenced to linear Watt units: 0dBm = 1 milliwatt (mW).

To convert Watt units to dBm, the following formula is used: $$P = 10 \log \left(\frac{Px}{1mW} \right) dBm$$

The table on the right illustrates the relationship between absolute logarithmic dBm units and absolute linear Watt units: Absolute logarithmic dBm [P] Absolute linear Watts [Px]

dBm (P)	WATTS (Px)
+10dBm	10mW
+3dBm	2mW
0dBm	1mW
-3dBm	0.5mW
-10dBm	100µW
-20dBm	10µW
-30dBm	1µW
-40dBm	100nW
-50dBm	10nW
-60dBm	1nW
-70dBm	100pW
-80dBm	10pW
-90dBm	1pW

RETURN LOSS
MEASUREMENT METHODS

WHAT IS RETURN LOSS?

A return loss measurement characterises the strength of a reflection produced by variations in the refractive index along a fiber optic link, known as a back-reflection or Fresnel reflection. Quantified in decibel (dB) units, return loss is the logarithmic expression of the ratio of the reflected power over the incident power, that is, the intensity of light reflected back to the return loss meter over the intensity of the light injected into the fiber, expressed as a positive number.

If not controlled, back-reflections can degrade the performance of a fiber optic system by interfering with the operation of the laser transmitter, or by generating noise at the receiver.

A common source of back-reflections is the junction where two fiber optic connectors are mated. Because of this, a connector with high return loss, which sends very weak reflections back to the transmitter, is superior to a connector with low return loss that sends back strong reflections. When measuring connectors, extremely low return loss values usually indicate a defect, such as core misalignment, poor fiber end-face contact, scratches, breaks, or end-face contamination.

RETURN LOSS MEASUREMENT METHODS

OPTICAL TIME DOMAIN REFLECTOMETER (OTDR) METHOD

An Optical Time Domain Reflectometer (OTDR) launches a train of light pulses into the device under test and collects backscatter information as well as superimposed Fresnel reflections. The OTDR is optimised to accurately measure loss-per-distance based on the received backscatter level. An OTDR also gives an estimation of the strength of a reflection at a given distance based on its peak height.

RETURN LOSS DEFINED

Reflections—or more specifically Fresnel reflections—occur at the boundary between two media with different refractive indices. The percentage of the light reflected can be calculated if the refractive indices of both media are known.

The most commonly known percentage of reflected power, the 4% reflection, is caused by a glass-to-air boundary. Reflectance in general is the ratio of reflected power to incident power. When knowledge of a reflection at a discrete point is important, the term reflectance is preferred. Reflectance is expressed in negative decibels (dB). Optical return loss (ORL), often referred to as return loss, describes the ratio of reflected power over the incident power of a system as a whole. Similar in concept to reflectance, return loss is also expressed in decibels.

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*SCAN TO VIEW OUR
OTHER CATALOGS*

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