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# 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 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
- Optical Time Domain Reflectometers
- Optical Power Meters
- Light Sources
- Live Fiber Identifiers
- 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.

# NEW FIBER PRODUCTS AT TEMPO

# 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.




## 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) |
| 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: | 3.5" Color, Turn-Over LCD |
| Connectivity | USB |
| Operating Conditions | Pressure: 0 to 16,404 feet (0 to 5,000 meters) above Sea Level<br>Wind Velocity up to 15m/s<br>Humidity: 0 to 95%<br>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 with power mode enabled and 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 |
| 52063415 | 06811 | 915FS FSP200 Batt |
| 52080896 | 07096 | Power Supply, 915FS FSP200 |
| 52064141 | 01325 | Splice-On-Connector Adapter (SC & LC) |
| 52066481 | 02401 | Splice-On-Connector Adapter (ST & FC) |

| PART NO. | CAT. NO. | DESCRIPTION |
|---|---|---|
| 52063414 | 01329 | Replacement Electrodes |
| 52064143 | 01332 | 200/250µm Adapter (Pair) |
| 52064142 | 01333 | 900µm Adapter (Pair) |
| 52076996 | 05801 | Loose Tube Adapter (Pair) |
| 52081862 | 07388 | Universal Adapter (Pair) |
| 52067851 | 03245 | 3mm Adapter (Pair) |
| 55500059 | NA LC | North American Line cord |
| 52066954 | 02571 | European Line Cord |
| 52066952 | 02570 | UK Line Cord |
| 52066930 | 02568 | 12 V DC Car Adapter |

# 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


## 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 0.03g2/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 | 3.5" Color, Turn-Over 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 with power mode enabled and assuming that the oven is not cold.

* Specifications subject to change without notice.

## ORDERING INFORMATION:

| PART NO. | CAT. NO. | DESCRIPTION |
|---|---|---|
| 52079876 | 915FS | 915FS Optical Fusion Splicer |
| 52079879 | 915FS-KIT1 | 915FS Fusion Splicer & Cleaver Kit |
| 52079878 | 915FS-KIT2 | 915FS Contractor Fusion Splicer Kit |
| 52063415 | 06811 | 915FS FSP200 Batt |
| 52080896 | 07096 | Power Supply, 915FS FSP200 |
| 52064141 | 01325 | Splice-On-Connector Adapter (SC & LC) |
| 52066481 | 02401 | Splice-On-Connector Adapter (ST & FC) |

| PART NO. | CAT. NO. | DESCRIPTION |
|---|---|---|
| 52063414 | 01329 | Replacement Electrodes |
| 52064143 | 01332 | 200/250µm Adapter (Pair) |
| 52064142 | 01333 | 900µm Adapter (Pair) |
| 52076996 | 05801 | Loose Tube Adapter (Pair) |
| 52081862 | 07388 | Universal Adapter (Pair) |
| 52067851 | 03245 | 3mm Adapter (Pair) |
| 55500059 | NA LC | North American Line cord |
| 52066954 | 02571 | European Line Cord |
| 52066952 | 02570 | UK Line Cord |
| 52066930 | 02568 | 12 V DC Car Adapter |

# 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.

WATCH OUR PRODUCT VIDEO CLICK HERE

### SPECIFICATION:

| | |
|---|---|
| Applicable Fibers | SM (G.652); MM (G.651); DS (G.653); NZDS (G.655); BIF (G.657) |
| Fiber Cleaved Length | 5mm to 25mm |
| 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) |

# 915CL OPTICAL FIBER CLEAVER


## FEATURES

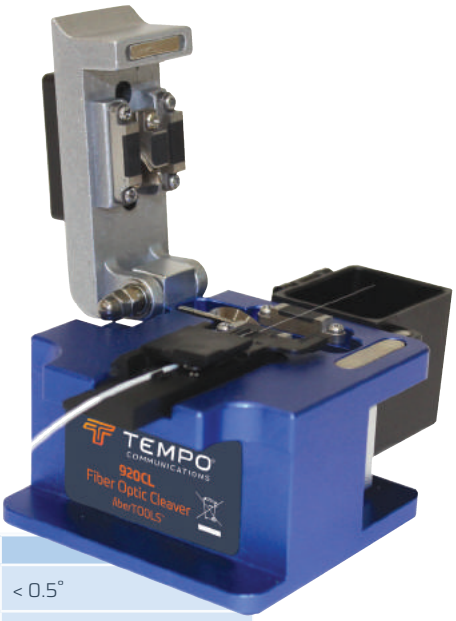
- 48,000 cleaves
- Auto return of blade mechanism for fast and easy cleaves
- Cleaves singlemode and multimode fibers
- Integrated dust bin
- Prepares fibers for use in the 910FS, FSP200 and 915FS fusion splicers
- Supports 200um, 250um, 900um fibers, and loose tube fibers.
- Fixed Clamp. Allows the 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 | 10mm |
| 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:

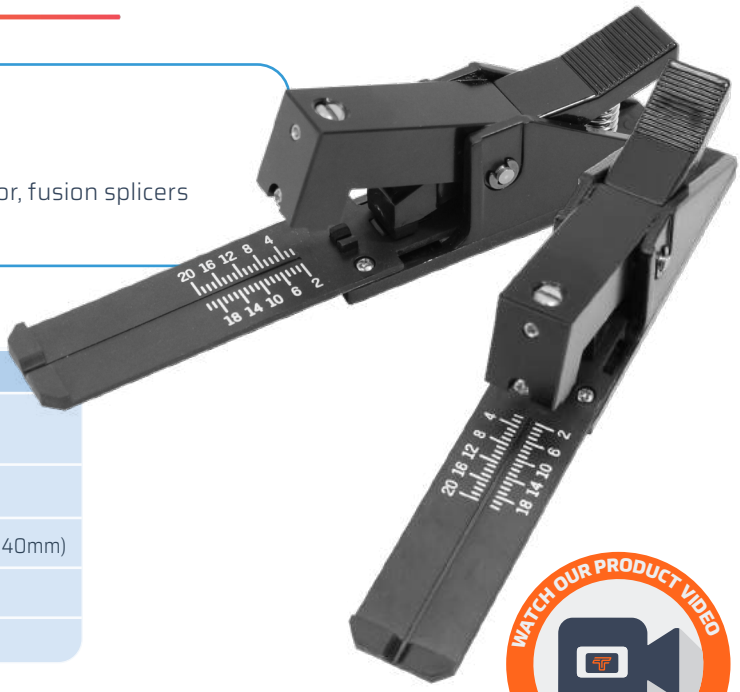
| | |
|---|---|
| Fiber Type | SM (G.652); MM (G.651); DS (G.653); NZDS (G.655); BIF (G.657) |
| Fiber Cleave Length | 5mm to 25mm |
| Cladding Diameter | 125µm |
| Coating Diameter | 0.20mm, 0.25mm and 0.9mm |
| Fiber Count | Single |

| | |
|---|---|
| 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 |

WATCH OUR PRODUCT VIDEO CLICK HERE

## 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 |
| 52064143 | 01332 | 200/250µm Adapter (PAIR) |
| 52064142 | 01333 | Adapter, 900µm (PAIR) |
| 52076996 | 05801 | Adapter, Loose Tube (PAIR) |

| PART NO. | CAT. NO. | DESCRIPTION |
|---|---|---|
| 52078357 | 07111 | Fixed Clamp with Screw |
| 52086838 | 04268 | Replacement Screw for Fixed Clamp |
| 52064145 | 01640 | Cleaving Wheel |
| 55500194 | BLD-01 | FCL100 Blade |
| 55500196 | SPR-01 | FCL100 Spring |

# **FIBER FAULT** LOCATORS - OTDR's

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 930XC-30P measures at 1310nm, 1490nm and 1550nm and is used to characterize fiber networks used in GPON applications. The 930XC-20M is a multimode OTDR that measures at 850nm and 1300nm which are commonly used in LAN.

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

All 930XC OTDR's are GR196 compliant which validates all specifications at an independent lab at temperature extremes, along with drop testing and dust chamber validation.

## **930XC** HANDHELD SINGLEMODE OTDR

### FEATURES

- 2 & 3 wavelength options available: 1310/1550nm; 1310/1550/1625nm
- Up to 35dB SWDR on the two wavelength model Up to 38dB SWDR 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

## 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 |

| PART NO. | CAT. NO. | DESCRIPTION |
|---|---|---|
| TRIPLE WAVELENGTH SINGLEMODE PON OTDR | | |
| 52067088 | 02615 | 930XC-30P Singlemode OTDR, 1310/1490/1550nm FC/UPC |
| 52067087 | 02614 | 930XC-30P Singlemode OTDR, 1310/1490/1550nm ST/UPC |
| 52067089 | 02616 | 930XC-30P Singlemode OTDR, 1310/1490/1550nm SC/UPC |
| 52067091 | 02618 | 930XC-30P Singlemode OTDR, 1310/1490/1550nm FC/APC |
| 52067090 | 02617 | 930XC-30P Singlemode OTDR, 1310/1490/1550nm 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 |
| 52039299 | AC-ADPT-V30 | Vehicle Adapter (6FT, 5.5 OD, 2.1M) |
| 52034552 | 20999 | NiMH Battery (9.6V) |

## SPECIFICATIONS:

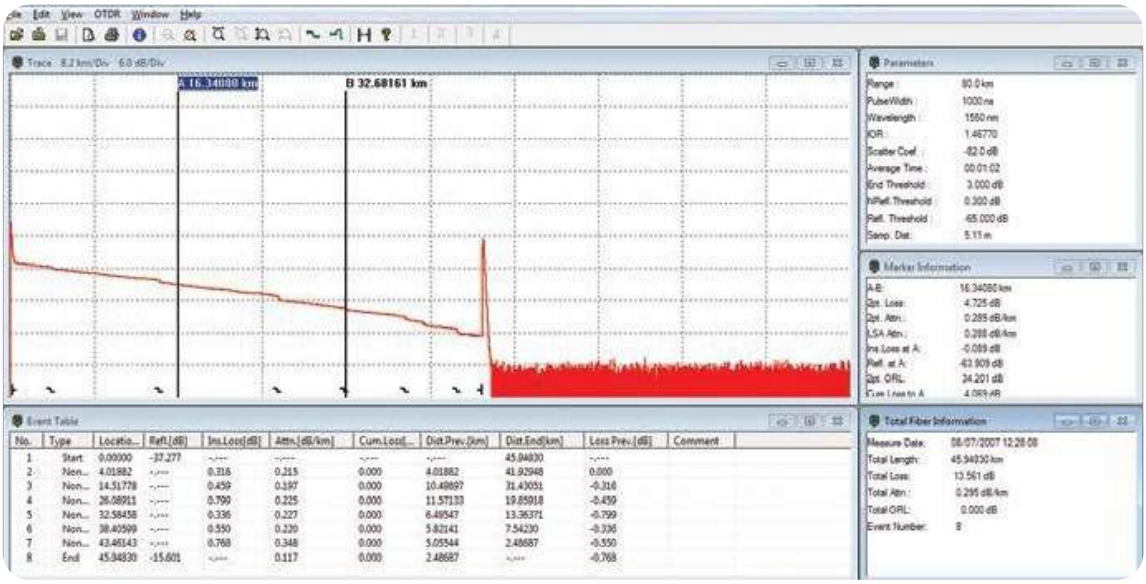
| | 930XC-20C | 930XC-30F | 930XC-30P | 930XC-20M | |
|---|---|---|---|---|---|
| Wavelength (± 20nm) | 1310/1550nm | 1310/1550/1625nm | 1310/1490/1550 nm | 850/1300nm | |
| Dynamic Range (dB) | 35 dB[a] | 38/37/37 | 38/37/37 | 21/24 | |
| Event Deadzone (m) | 1m[b] | 1.0 | 1.0 | ≤2.5 | |
| Attenuation Deadzone (m) | 4.5m[b] | 4.5 | 4.5 | ≤12 | |
| Pulsewidth (ns) | 5, 10, 30, 100, 300, 1µs, 2.5µs, 10µs, 20µs | | | 12, 30, 100, 275, 1µs, 2µs | |
| Selectable Ranges (km) | 0.3, 1.3, 2.5, 5, 10, 20, 40, 80, 120, 160, 240 | | | 0.1, 0.3, 0.5, 1.3, 2.5, 5, 10 | 0.1, 0.3, 0.5, 1.3, 2.5, 5, 10, 20, 40, 80 |
| Sampling Points | 16,000 (Maximum) | | | 16,000 (Maximum) | |
| 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 | BelCore GR196, CE, FCC, UL, RoHS, WEEE | | | | |

*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

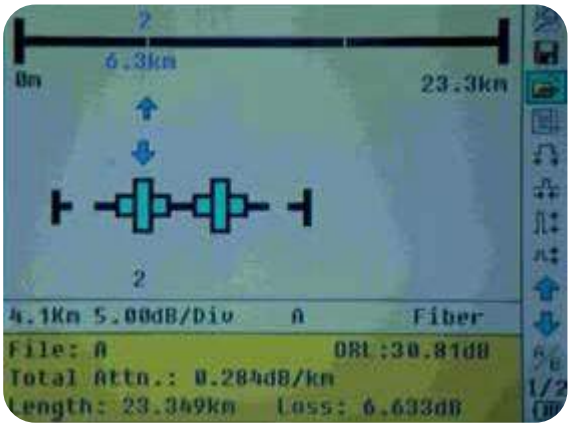



TraceViewer Software showing trace, event table, Parameters, Marker Information & Total Fiber Information.

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.



# **LAUNCH** CABLES

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.

## FEATURES

- Universal compact design
- Rugged  construction

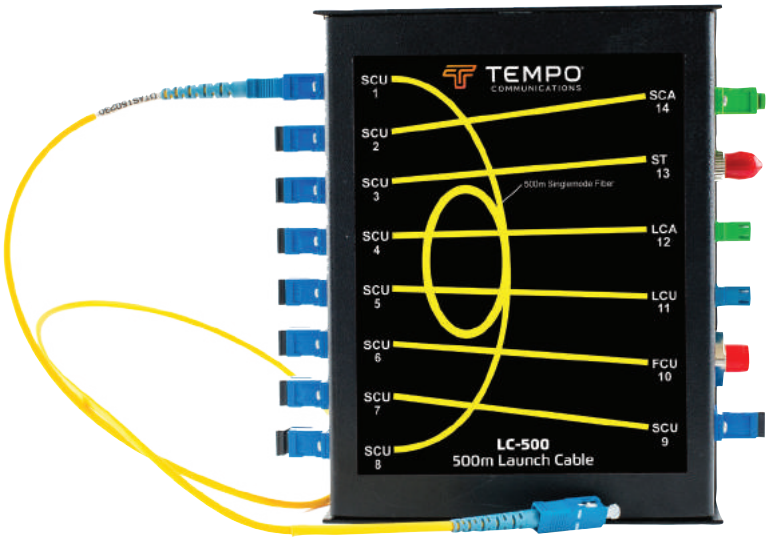
## BENEFITS

- 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 with Patch Panel Matrix |
| 52081881 | LC500SCAPCSM | 500M Launch Cable SC APC Singlemode |
| 52081882 | LC500SCUPCSM | 500M Launch Cable SC UPC Singlemode |
| 52081883 | LC1000SCAPCSM | 1000M Launch Cable SC APC Singlemode |
| 52081884 | LC1000SCUPCSM | 1000M Launch Cable SC UPC Singlemode |
| 52081885 | LC2000SCAPCSM | 2000M Launch Cable SC APC Singlemode |
| 52081886 | LC2000SCUPCSM | 2000M Launch Cable SC UPC Singlemode |
| 52081887 | LC150SCPCMM | 150M Launch Cable SC PC 50/125 Multimode |
| 52081888 | SCLC Adapter | SC TO LC Adapter (Use the SC to LC Adapter to convert the Launch Cable to LC connectors |


LC2000SCUPCSM 2km
Singlemode Launch Cable




LC-500 Patch Panel Matrix with 1m
SC/PC-SC/PC patch cable

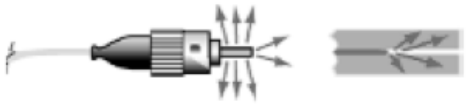
# 180XL VISUAL FAULT LOCATOR

## LOCATING BREAKS AND BENDING LOSSES:

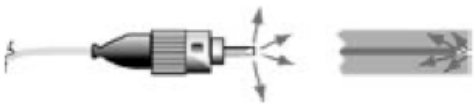
The 180XL visual fault finder is an indispensable tool for quickly identifying bending losses and breaks in optical fibers. If a fiber is bent too tightly, red laser light will be seen escaping through the jacket. Likewise, if a fiber is broken, escaping light will be visible where the break is located.

## 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

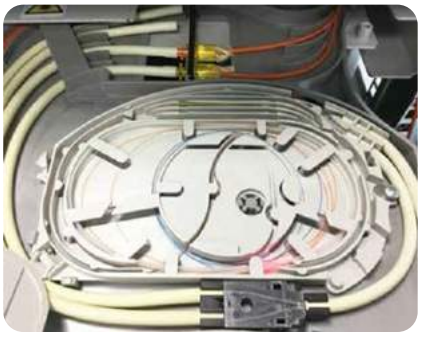
## ORDERING INFORMATION:

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

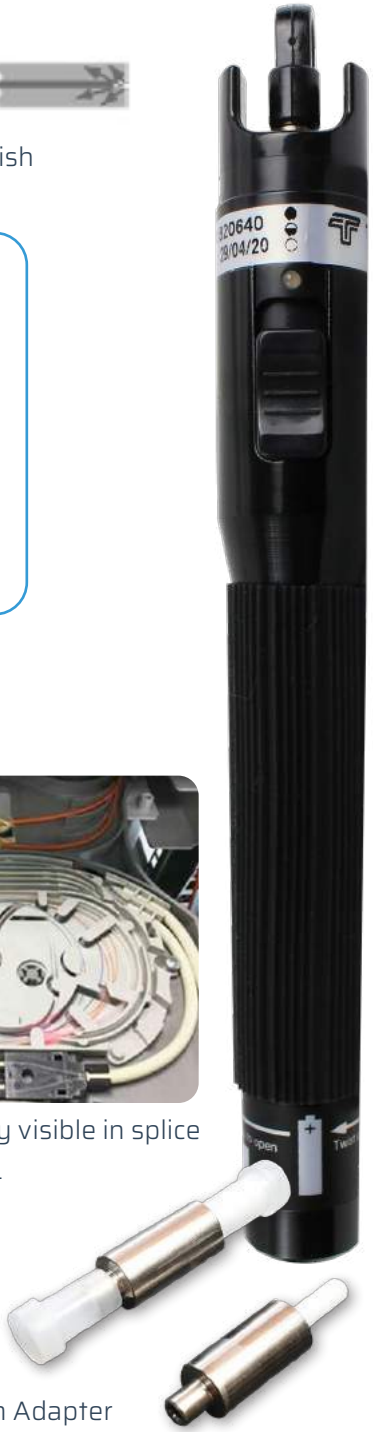
## SPECIFICATIONS:

| | |
|---|---|
| Wavelength | 650nm +/-10nm |
| Emitter Type | Fabry Perot |
| Output Power | 0dBm |
| Spectral Width (CPR) | <2nm |
| Laser Classification | 2 |
| Range | 7km |
| Modes of Operation | CW and 2Hz Modulation |
| Method of Display Operation | Red/Green LED |
| Fiber Type | Singlemode, Multimode |

| | |
|---|---|
| Connector Interface | 2.5mm Universal, Optional 1.25mm adapter |
| Battery | AA (2) |
| Battery Life | 80 Hours with 3.9Wh batteries |
| Weight | 0.15lbs, (70g) (not including batteries) |
| Dimensions | 7.08" x 0.91" Dia (180mm x 23mm Dia) |
| Operating Temperature | -10 to +45C |
| Storage Temperature | -40 to +70C |
| Certifications | CE, WEEE, CDRH Reach RoHs |



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.

## 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)<br>Ø0.9 (Applicable for Ø0.9 Cable)<br>Ø2.0 (Applicable for Ø2.0 Cable)<br>Ø3.0 (Applicable for Ø3.0 Cable) | |
| Signal Indication | Left & Right LED | |
| Signal Direction Test Range (CW/0.9mm fiber) | -46 to 10dBm (1310nm)<br>-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<br>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, RoHS, 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 |
| 52068109 | FI-100-900µm | 900µm 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 |

# 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


## 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)<br>+/-0.1dB (-3 to -50dBm)<br>+/-0.5dB (-50 to -70dBm) | +/-0.5dB +26 to -3dBm<br>+/-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, RoHS, CDRH, WEEE | |

## 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 Conformance


## SPECIFICATIONS:

| PARAMETERS | SPECIFICATIONS | |
|---|---|---|
| MODEL | OPM510 | OPM520 |
| Cal. Wavelength (nm) | 850, 1300, 1310, 1490, 1550, 1625 | |
| Measure range (dBm) | -65 ~ +10[1] | -50 ~ +27 |
| Detector type | InGaAs | |
| Accuracy (dB) | ±5% ±0.01nW<br>(±0.5dB@850nm) | ±5% ±1nW<br>(±0.5dB@850nm) |
| Linearity | +/-0.5dB (+10 to -3dBm)<br>+/-0.1dB (-3 to -50dBm)<br>+/-0.5dB (-50 to -65dBm) | +/-0.5dB +27 to -3dBm<br>+/-0.1dB -3 to -50dBm |
| Resolution (dB) | 0.01dB | |
| Functions | W/mW/µW/dBm/dB(REF)/<br>MOD TONE DETECT 270Hz, 1kHz, 2kHz | |
| Connector Type | SC (Interchangeable LC, ST, SC) | |
| Fiber Type | Singlemode & Multimode | |
| Battery Life | > 100 Hours | |
| Power Supply | 9V Alkaline or 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 | |

## ORDERING INFORMATION:

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

# SLS520 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 Conformance

## SPECIFICATIONS:

| MODEL | SLS520 | SLS525 | SLS530 | SLS535 | SLS536 |
|---|---|---|---|---|---|
| Wavelength (±20nm) | 1310/1550nm | 850/1300nm | 1310/1490/1550nm | 1310/1550/1625nm | 1310/1550/1650nm |
| Fiber Type | Singlemode | Multimode (62.5/125) | Singlemode | | |
| Emitter Type | FP | LED | FP | | |
| Spectrum Width | ≤ 5nm | +/-40nm | ≤ 5nm | | |
| Output Power | ≤ 0dBm/-1dBm | -20dBm/-21dBm | ≤ 0dBm/-1dBm | | |
| Output Power Stability | ±0.05 dB/15min; ±0.10dB/8hr | ±0.05 dB/15min ±0.15dB/8hr | ±0.05 dB/15min; ±0.10dB/8hr | | |
| MOD Frequency | 270, 1kHz, 2kHz | | | | |
| Display | LCD | | | | |
| Battery Life | 60 Hours | | | | |
| Connector Type | SC/PC (Interchangeable LC, ST, FC) | | | | |
| Power Supply | 9V Alkaline or 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/P C 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 |

# 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<br>-3dBm to -50dBm ±0.1db<br>-50dBm to -60dBm ±0.5db |
| Resolution | 0.01dB |
| Power Requirements | Two AA 1.5V batteries<br>(approx. 100 hours continuous operation) |
| Connector Interface | SOC |
| Operating Temperature | -15° C to +55° C |
| Storage Temperature | -35° C to +70° 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<br>(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)<br>CW: Continuous Wave output mode<br>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**

**T1020**

**ST**

**T1030**

**SC**

**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**

**APC-108**

**SC**

**ASC-108/C**

**ST**

**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 | |
| ST |  | 52040191 | T1030-POF | N/A | |

# ACCESSORIES

## fiberTOOLS™ 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 |

# FIBER HAND TOOLS

## 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 |

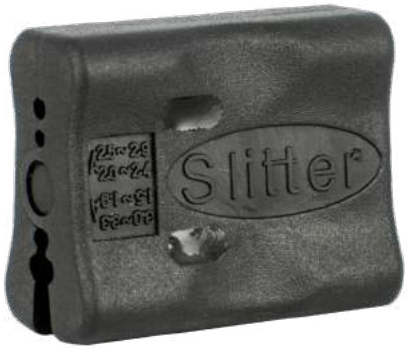
### SPECIFICATIONS:

| |
|---|
| 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 | 05712 | Sheath 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 |

## 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

## ORDERING INFORMATION:

| PART NO. | CAT. NO. | DESCRIPTION |
|---|---|---|
| 55500944 | TCEXT | Fiber Optic Tool Case |


# 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-P but with a Micro OPM 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
- Micro OPM
- 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") |
| 52050561 | PA1821 | AM35 Slitter (1.0" - 1.4") |
| 52050605 | PA1162 | Economy Stripper |
| 52049188 | PA1915 | Pocket Probe / Pick |
| 52050965 | PA1922-1 | Fiber Optic Carbide Scribe |

## REPLACEMENTBLADES FOR STRIPPING TOOLS:

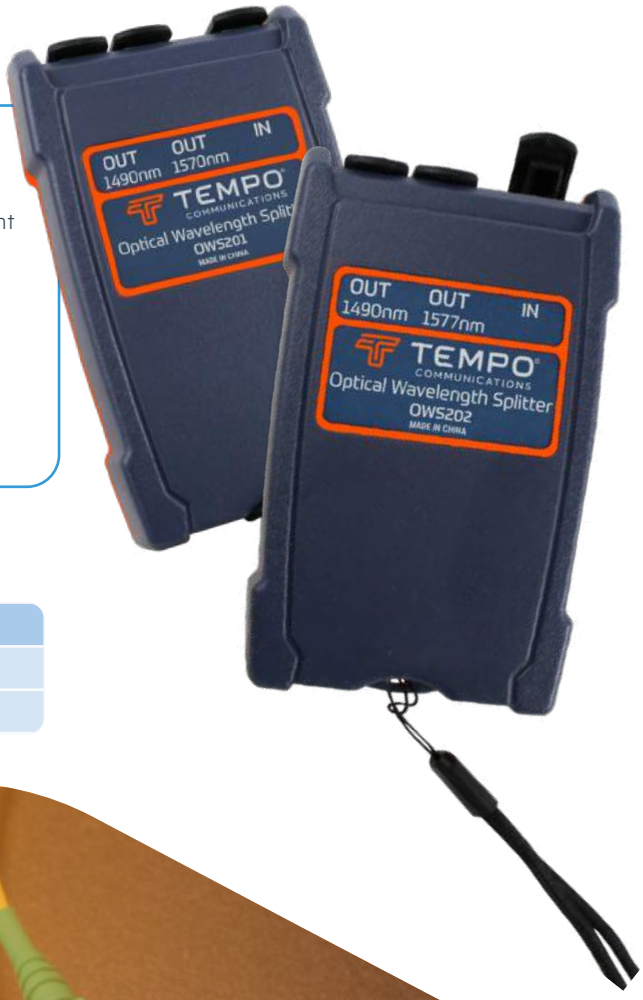
| PART NO. | CAT. NO. | DESCRIPTION |
|---|---|---|
| 52086502 | TCDCS-2 | DROP CABLE STRIPPER BLADE KIT (six blades) |
| 52086503 | TCCPS-RING-2 | CPS RING BLADE KIT (one replacement blade with hardware) |
| 52086504 | TCCPS-SLIT-2 | CPS SLIT BLADE KIT (one replacement blade with hardware) |

# **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 (OWS200) 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 |

WATCH OUR PRODUCT VIDEO CLICK HERE

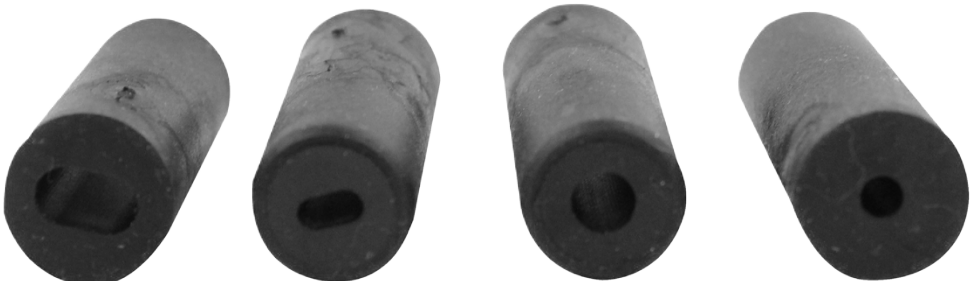
# **DROP FIBER** REPAIR KIT

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 12) and two mechanical splices are securely positioned within the IP68 rated enclosure. The enclosure can be permanently buried or mounted on the side of a building. Two DFE100 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
- Direct bury, wall mount or pole mount
- Fusion splice or mechanical splice
- Up to fourteen fiber capacity
- Two are required due to no slack and damage to cable
- IP68 rated for buried applications and element protection
- Integrated tabs to position and hold fibers in place
- Common fiber sizes of 8.1mm, 5.4mm and 5.1mm rectangular cables and 5.1mm round cables
- Kit contents:
  - -Enclosure
  - -Two mechanical splices
  - -Two gaskets for each of the fiber sizes


## INDIVIDUAL GASKET FOR EACH CABLE SIZE:



8.1mm Rectangular

5.1mm & 5.4mm Rectangular

5.1mm Round

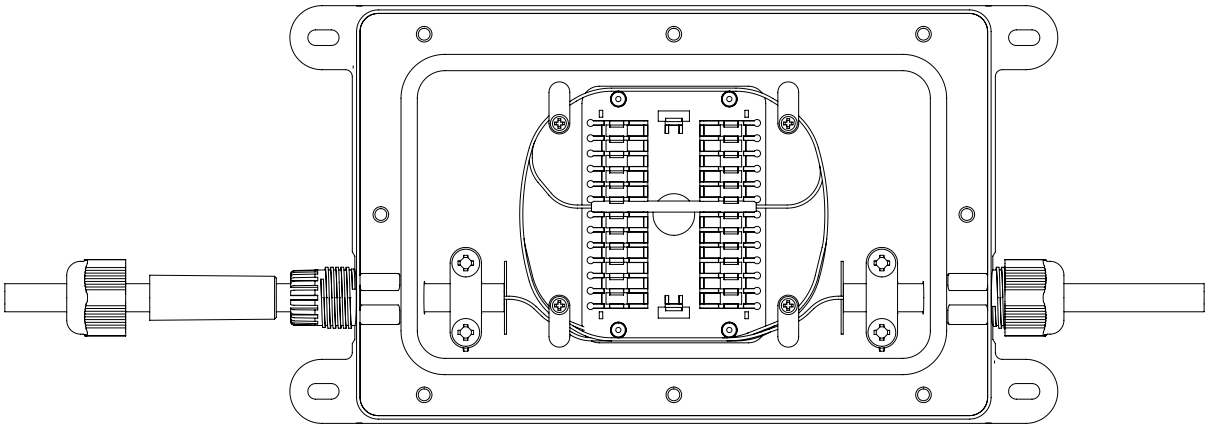
3.0mm Round

## COMPONENT PARTS:

| PART NO. | DESCRIPTION | 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. | DESCRIPTION | 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 |

## STRUCTURE:
## EXAMPLE OF FIBER OPTIC SPLICE



## SPECIFICATIONS:

| | |
|---|---|
| Size | 8.85 x 4.72 x 1.34" (225 x 120 x 34mm) |
| Material | ABS with Polycarbonate (UV resistant) |
| Cable Size | 8.1mm rectangular, 5.4mm & 5.1mm rectangular and 3.0mm and 5.1mm round |
| Mechanical Splice Locations | Two |
| Fusion Splice Locations | Twelve (3 x 60mm) |

| | |
|---|---|
| IP Rating | IP67 |
| Weight | 0.66lb (0.3kg) |
| Color | Black |
| Operating Temperature | -40 to +80C |
| Storage Temperature | -40 to +80C |

## ORDERING INFORMATION:

| PART NO. | CAT. NO. | DESCRIPTION |
|---|---|---|
| 55500211 | DFR100 | Drop Fiber Repair Kit |
| 55501030 | DFE101 | Drop Fiber Enclosure Kit, Two Port Stub |
| 55501031 | DFE102 | Drop Fiber Enclosure Kit, Four Port |

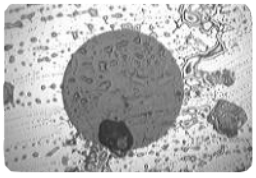
# **OPTI-CLEAN** REEL CLEANER

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.

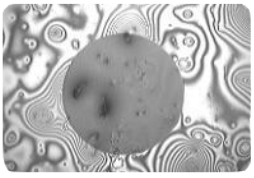
## FEATURES

- 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.

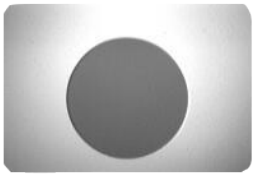
## PERFORMANCE:



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 |


WATCH OUR PRODUCT VIDEO CLICK HERE

# CLEANING SWABS
## 1.25mm and 2.5mm

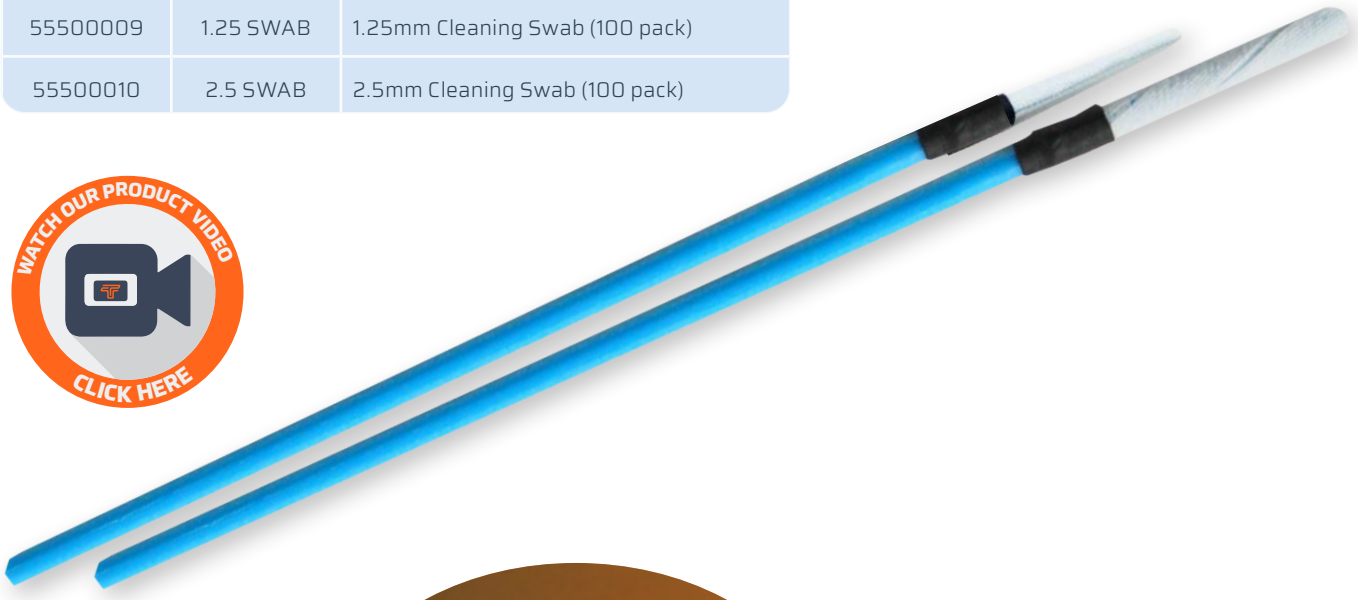
These easy-to-use cleaning swabs provide a fast and effective process for cleaning 2.5mm bulkheads and 1.25mm bulkheads.
They are easy to use.

### 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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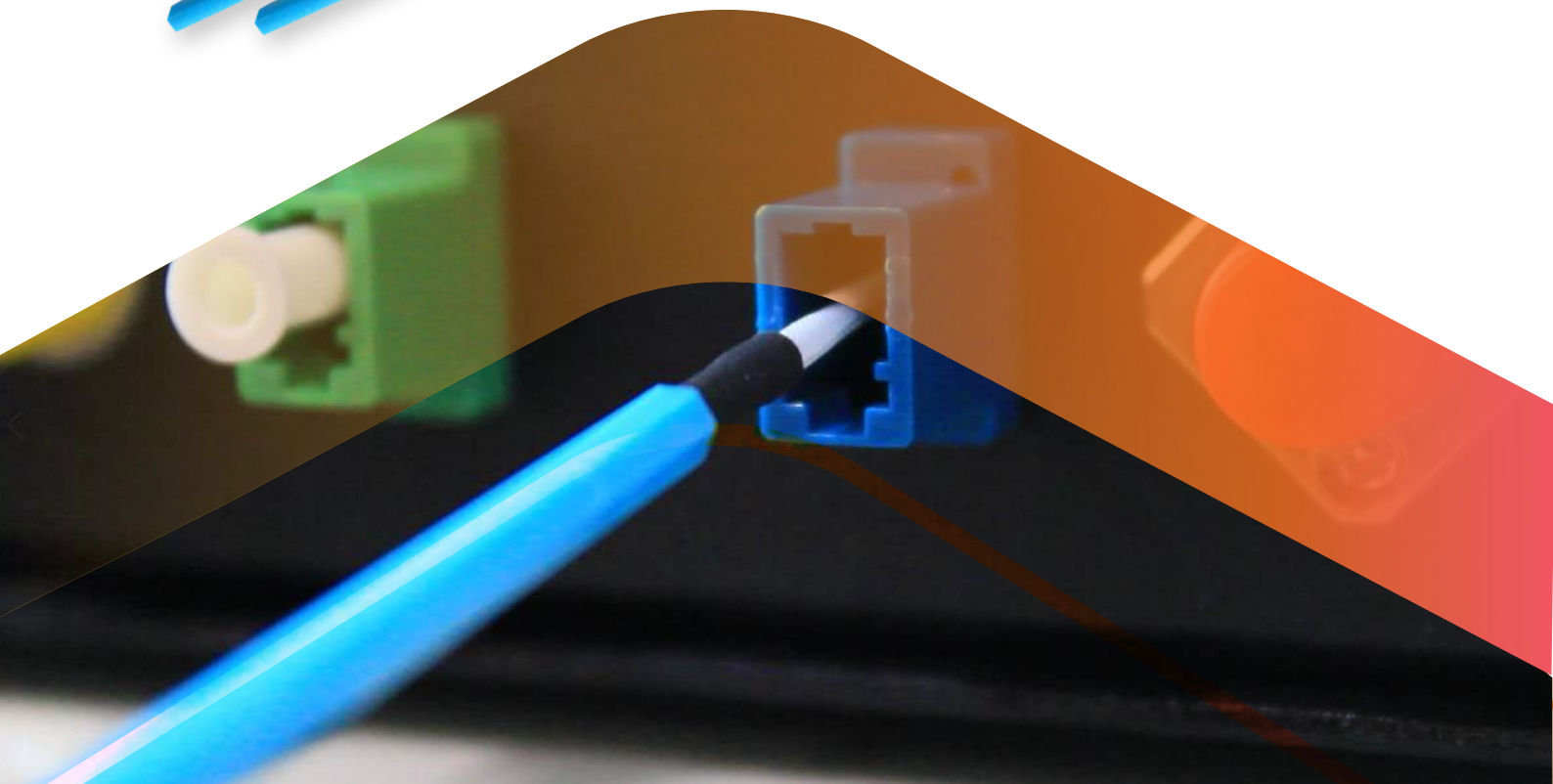


# **EML100** ELECTRONIC MARKER LOCATOR

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 and Spike Marker 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

## 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 |
| 52085015 | OM-07 | OmniMarker II, Europower |
| 55500096 | SM-02 | SPIKE MARKER ORANGE-BLACK 77 KHZ CATV (50 PACK) |
| 55500097 | SM-03 | SPIKE MARKER YELLOW 83 KHZ GAS (50 PACK) |
| 55500101 | SM-08 | SPIKE MARKER BLUE 145 KHZ WATER (50 PACK) |

| 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) |
| Frequency Tolerance | ± 0.35 % |
| **MECHANICAL** | |
| Overall Diameter | 100mm max |
| Anchoring | Two "tie down" loops along flange. |
| Length | 128mm |

# SACRIFICIAL CONNECTORS

The sacrificial connector is used to protect the optical port of fiber optic test equipment and instruments. The sacrificial connector ensures that repeated mating's have no detrimental effect on the optical port (bulkhead) which can lead to reflectivity and insertion loss issues.

A damaged bulkhead is expensive to repair and will take the instrument out of commission. A sacrificial connector, on the other hand, can be replaced when worn or damaged and a new sacrificial connector installed. With near 0dB loss through this connector, there is no impact on the test results.

## FEATURES

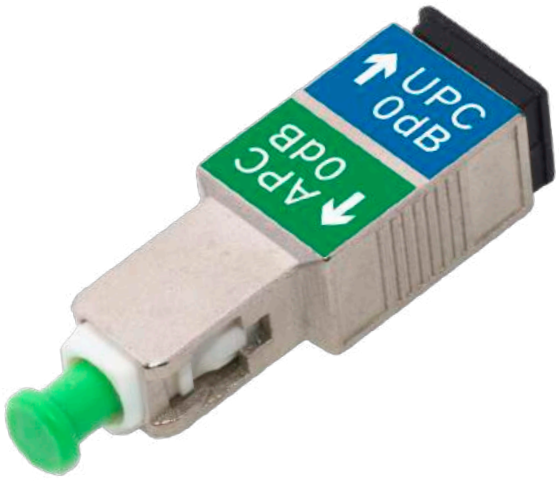
- Prevents damage to instrument and equipment bulkheads
- Low insertion loss
- Low reflectance
- GR326 / IEC61300-2 compliant
- GR910/ UV94-V0 compliant
- RoHS compliant

## ORDERING INFORMATION:

| PART NO. | CAT. NO. | DESCRIPTION |
|---|---|---|
| 55500159 | ZDBSCA | Zero dB SC/APC |
| 55500160 | ZDBSCU | Zero dB SC/UPC |
| 55500161 | ZDBSCAU | Zero dB SC/APC (M) -SC/UPC (F) |
| 55500163 | ZDBSCUA | Zero dB SC/APC (F) -SC/UPC (M) |

## SPECIFICATIONS:

| | | |
|---|---|---|
| Fiber Type: | Single Mode | |
| Operating Wavelength: | 1310nm & 1550nm | |
| Ferrule Type: | PC | APC |
| Maximum Insertion Loss: | 0.5dB | |
| Return Loss: | ≥40dB | ≥55dB |
| Maximum Optical Power: | ≤500mW | |
| Operating Temperature: | -40 - +70°C | |
| Storage Temperature: | -40 - +70°C | |



# MAINTENANCE
## OF FSP200, 915FS, FCL200, 915CL AND 920CL

- 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**

Clean V-Groove daily

**FIGURE 2**

Mirror cleaning in lid

**FIGURE 3**

Objective Lens

*The above procedures are also recommended for the 910FS and 910CL

# 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

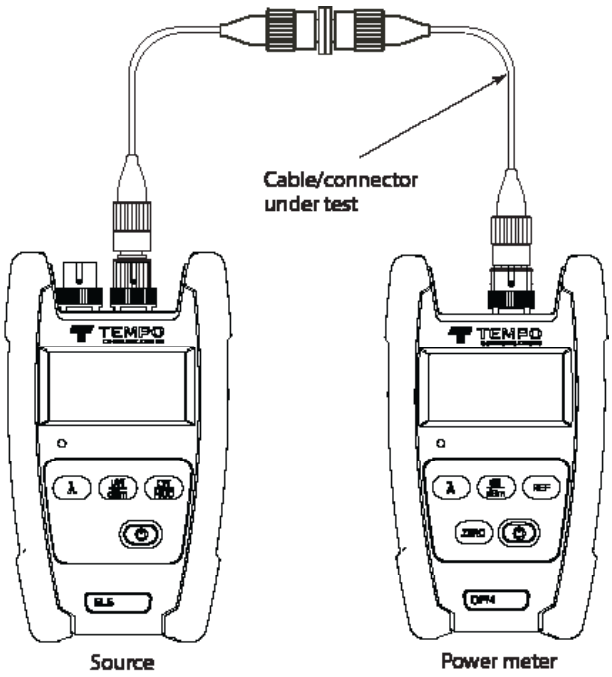
To measure the insertion loss of a connector/cable, do the following:

**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.




## 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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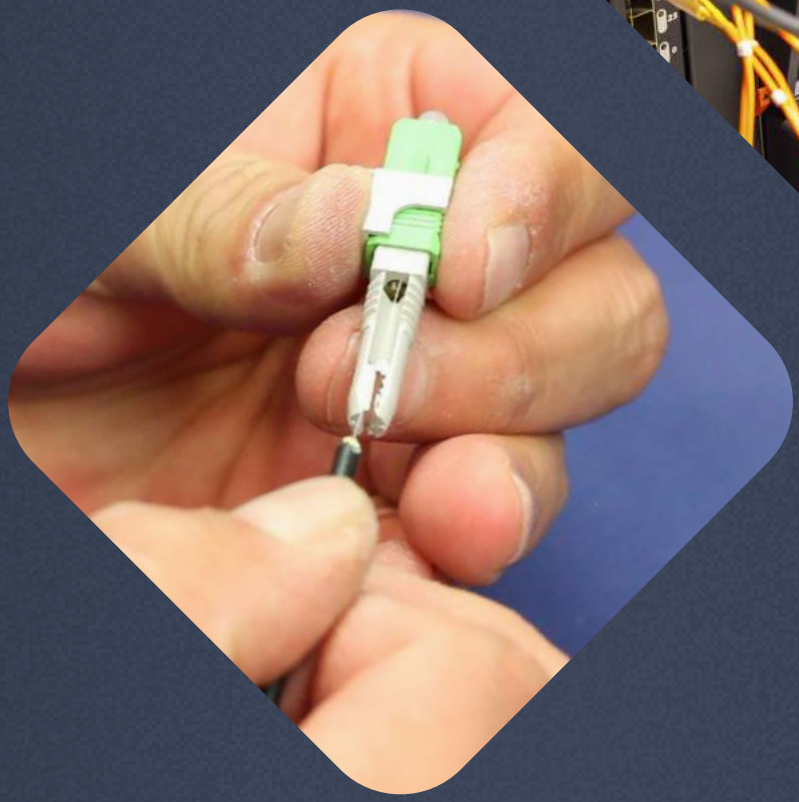


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