# *NOYES*®
# FLX380 PON-Optimized FlexTester

## Features

- Standard OTDR, live PON OTDR, PON power meter – from one port!
- 41/38/38/37 dB dynamic range @ 1310/1490/1550/1625 nm
- 0.8/3.5 m event/attenuation dead zone, 40 m PON dead zone
- **ServiceSafe™** live PON detection – prevents OTDR from disrupting service on live PON, while allowing 1625 nm out-of-band OTDR test
- Easy to use Full Auto, Expert, PON and Real Time OTDR modes
- OLS/OPM with **Wave ID** – reduces test time by 80% and eliminates setup errors
- Rugged, hand-held and lightweight (<1 kg)
- High-contrast display: clear and bright, even in direct sunlight
- >12-hour operation, fast charge, Li-Ion battery
- Instant On; Ready to test in <5 sec

## Applications

- **Certify new FTTx PON or point-to-point fiber installations** including splice, splitter and connector loss and reflectance, end-to-end length, loss and ORL
- **Troubleshoot live FTTx PONs** including automatic live PON detection, PON power measurements at ONT and live PON OTDR testing using out-of-band 1625 nm
- **Complete multi-wavelength end-to-end loss tests** faster and eliminate setup errors using AFL's Wave ID loss test feature
- **Generate stable optical source** signals (CW, Wave ID or tones) using the integrated Optical Laser Source
- **Visibly trace fibers or locate fiber bends or breaks** using the integrated Visual Fault Locator (VFL) visible red laser

The NOYES FLX380 FlexTester is the world's smallest, lightest, most complete single-mode fiber optic test set. It combines high-performance, multi-wavelength OTDR/PON OTDR, OLS, OPM, VFL and PON Power Meter in a rugged, hand-held package.

With 41 dB dynamic range, best-in-class event, attenuation, and PON dead zones, and AFL's unique ServiceSafe™ and Wave ID features, the FLX380 FlexTester offers an unmatched combination of optical test functions, ease-of-use, portability and value. FLX380 FlexTester is offered in three models to best suit your application requirements:

- **FLX380-103:** Most complete high-performance test set for verifying both in-service (live) and out-of-service FTTx PONs. Includes ServiceSafe™ live PON detection, integrated PON power meter and 1625 nm filtered live PON OTDR, all from a single port.
- **FLX380-102**: 1310/1490/1550 nm OTDR, OLS, OPM and VFL for complete out-of-service testing at all FTTx PON wavelengths.
- **FLX380-100:** Lowest cost, high-performance, all-in-one 1310/1550 nm OTDR, OLS, OPM and VFL for out-of-service installation testing or troubleshooting on both FTTx PON and point-to-point fiber optic networks.



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The FLX380 FlexTester user interface provides operating modes suitable for both novice and expert users and features a top-down menu structure which is both easy to learn and a pleasure to use. User interface software supports over a dozen languages including English, Chinese (Simplified and Traditional), French, German, Italian, Japanese, Korean, Portuguese, Polish, Russian and Spanish.

Over 1000 OTDR test results may be saved in industry-standard .SOR file format. Stored OTDR and OPM results may be transferred to PC via USB port for viewing, analysis, and professional report generation using the included Windows® compatible Test Results Manager (TRM®) software.

FLX380 FlexTester PRO Test and Inspection kit

FLX380 FlexTester in Soft Carry Case

## FLX380 FlexTester Configuration Options

FLX380 FlexTester is available in two different kit options:

- **FlexTester PRO Test & Inspection Kit** – Combines user-specified FLX380 FlexTester with standard accessories plus FOCIS Fiber Optic Connector Inspection System and optical connector cleaning supplies into a rugged, waterproof hard-shell carry case.
- **FlexTester with Soft Carry Case** – Combines user-specified FLX380 FlexTester with standard accessories and One-Click Cleaner into a convenient, lightweight soft carry case.

All FLX380 kits include rechargeable, replaceable Li-Ion battery pack, AC charger with country-specific power cord, connector adapters with dust caps, TRM® Test Results Manager software, and a quick reference guide in any one of the supported languages.

## FLX380 FlexTester PRO Test and Inspection Kit

FlexTester PRO Test and Inspection kits combine a FLX380 with a NOYES FOCIS Fiber Optic Connection Inspection System and selected cleaning supplies. FOCIS includes the DFS1 Digital FiberScope plus the DFD1 Touchscreen Tablet for viewing connector end-faces. FOCIS supports inspection of both connector ferrules and end-faces of connectors mounted inside bulkhead adapters on equipment panels. FlexTester PRO kits also include Mini-500 One-Click Cleaners for common 2.5 and 1.25 mm connectors, along with cleaning fluid and cleaning sticks for more stubborn contamination.

With the FOCIS Fiber Optic Connector Inspection System, the FLX380 is always available for OTDR and loss testing.

The user-specified FLX380 FlexTester, FOCIS kit, and cleaning accessories are packaged in a rugged, waterproof hard-shell carry case. The carry case also accommodates common OTDR accessories, such as a single-mode launch fiber ring (FR1-SM) and Optical Fiber Identifier (OFI-400), ordered separately.

## FLX380 FlexTester in Soft Carry Case

FLX380 FlexTesters are available in a soft carry case which includes the user-specified FLX380 complete with 2 GB internal storage, USB cable for uploading results to PC, CD containing Windows-compatible TRM® trace analysis and professional report generation software, AC adapter, rechargeable user-replaceable 12-hour Li-Ion battery pack, tool-free interchangeable adapters and dust caps for the OTDR/OLS, OPM and VFL ports, quick reference guide, and One-Click Cleaner.



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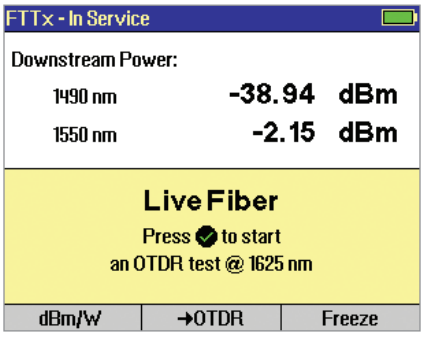
## ServiceSafe Testing on Live PONs

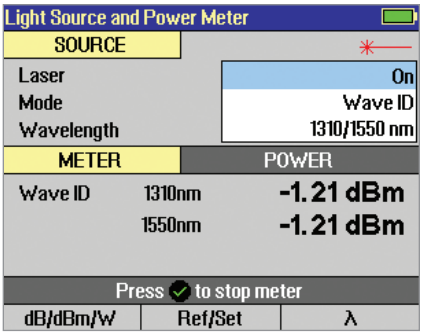
In FTTx PONs, it is possible for one user to lose service while other subscribers served by the same downstream OLT continue to remain in service. Attempting to troubleshoot a faulty optical distribution and drop fiber connection from the out-of-service subscriber's location using a 1310 or 1550 nm OTDR would disrupt service to remaining users. AFL's ServiceSafe feature alerts the OTDR user to the presence of live traffic and prevents the initiation of service-disrupting OTDR tests at 1310 or 1550 nm, while allowing the user to initiate an OTDR test using the non-disruptive 1625 nm OTDR wavelength. And it does this all from the same optical port used for 1310/1550 OTDR testing eliminating unnecessary connector wear and tear switching connections.




## Fast, error-free Loss Tests using Wave ID

All FLX380s include integrated Optical Laser Source (OLS) and Optical Power Meter (OPM) supporting AFL's unique Wave ID capability. With Wave ID, the OPM automatically synchronizes to a single or multi-wavelength Wave ID optical signal sent by another FLX380, OFL280, or NOYES hand-held OLS connected to the other end of the link. The OPM automatically determines which wavelengths are sent and measures power and loss at each wavelength. There is no need for the OPM user to coordinate wavelength settings with the OLS user at the other end, saving significant test time and eliminating setup errors.

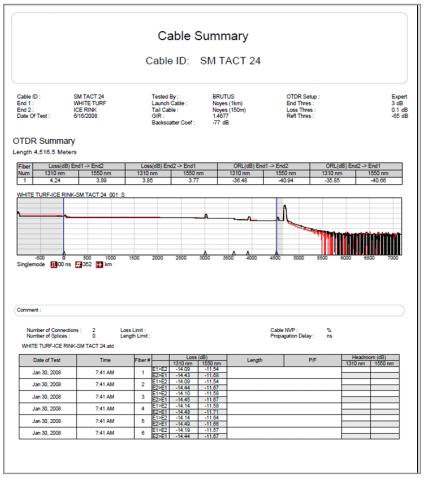
OPM results may be saved using the same file-naming convention applied to OTDR results. Saved OPM results may be recalled and viewed or uploaded to TRM® for report generation.




## Create Professional Test Reports using TRM®

Stored OTDR and/or OPM results can be uploaded via USB to a PC, then viewed and analyzed using TRM Test Results Manager software included with each FLX380 FlexTester. With TRM, users can generate professional acceptance test reports conforming to industry guidelines. TRM allows users to create customized cover pages with their company logo along with results pages showing dual wavelength traces, event tables, event map, and loss results for each fiber. A report generation Wizard makes custom report generation fast and easy.

TRM also supports OTDR trace analysis, providing batch editing features, event add, modify, or delete, trace compare, and advanced event analysis capabilities.



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## Features and Applications by Model

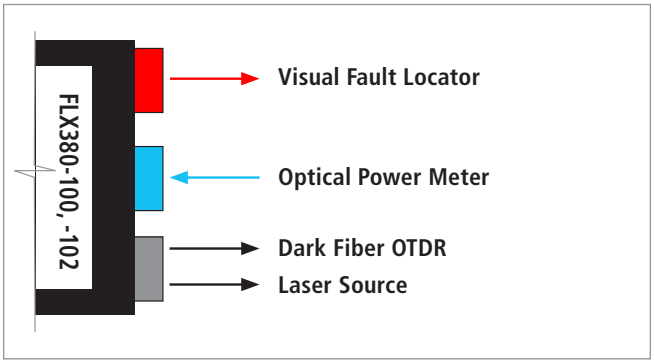
| FEATURES | FLX380 MODELS -100 | -102 | -103 |
|---|---|---|---|
| Compatible with all NOYES optical power meters and laser sources, including tone and Wave ID features | ◆ | ◆ | ◆ |
| Compatible with NOYES optical fiber identifiers (OFI) | ◆ | ◆ | ◆ |
| Integrated high-power optical power meter with Wave ID and tone detection | ◆ | ◆ | ◆ |
| Integrated visual fault locator (VFL with visible red laser) | ◆ | ◆ | ◆ |
| 1310 nm – OTDR, PON OTDR, laser source (CW, Wave ID, tone generation) | ◆ | ◆ | ◆ |
| 1550 nm – OTDR, PON OTDR, laser source (CW, Wave ID, tone generation) | ◆ | ◆ | ◆ |
| 1490 nm – OTDR, PON OTDR, laser source (CW, Wave ID, tone generation) | | ◆ | |
| 1625 nm – FTTx live PON OTDR with 1625 nm filtered detector for in-service PON testing | | | ◆ |
| 1490/1550 nm – FTTx PON power meter (detects and measures downstream PON power levels) | | | ◆ |

| FIBER TESTING APPLICATIONS | FLX380 MODELS -100 | -102 | -103 |
|---|---|---|---|
| **Point-to-point fiber optic cable installation test and troubleshooting**<br>Verify end-to-end length, loss and return loss. Verify splice and connector loss and reflectance. Locate source of excess loss and/or reflections, including micro- or macro-bends. | ◆ | ◆ | ◆ |
| **FTTx PON construction test**<br>Test to or through splitters. Verify end-to-end length, loss and return loss. Verify splitter, splice and connector loss and reflectance. Locate source of excess loss and/or reflections, including micro- or macro-bends. | ◆ | ◆ [a] | ◆ |
| **FTTx customer fiber troubleshooting – dark fibers**<br>Locate cable cuts, open splices, micro- or macro-bends and bad connections | ◆ | ◆ | ◆ |
| **FTTx in-service (Live PON) troubleshooting**<br>Automatically detect live PONs. Prevent service-disrupting 1310/1550 nm OTDR tests on live PONs. Locate macro bends, poor splices or high-loss connections without disrupting service to active PON subscribers. | | | ◆ |
| **FTTx service turn-up (commissioning)**<br>Verify PON power levels at the ONT (subscriber) location. Locate faults in distribution or drop cables, or between splitters in PONs built using distributed splitter architecture, all without disrupting service to active PON subscribers. | | | ◆ |

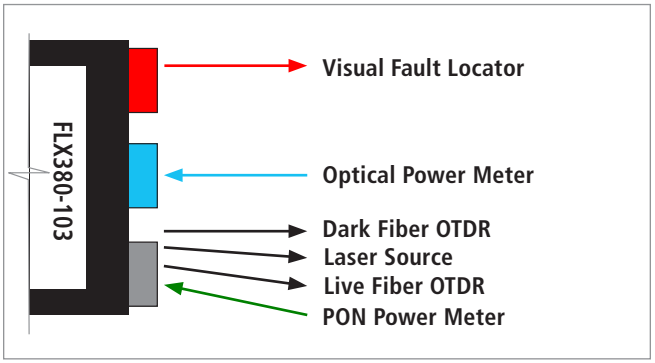
**Note:**

a. Adds 1490 nm OTDR and OLS. Testing at 1310 / 1550 nm is recommended and typically all that is needed to test FTTx PONs during construction.

### FLX380-100 and -102 models




### FLX380-103 model



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## Specifications [a]

| OTDR (POINT-TO-POINT, PON, LIVE PON) | |
|---|---|
| Emitter Type | Laser |
| Safety Class | Class 1 FDA 21 CFR 1040.10 and 1040.11, IEC 60825-1: 2007-03 |
| Fiber Type | Single-mode |
| Available Wavelengths | 1310 / 1490 / 1550 / 1625 nm |
| Wavelength Tolerance | ±20 / ±20 / ±20 / ±10 nm |
| Dynamic Range (SNR=1) [b] | 41 / 38 / 38 / 37 dB |
| Event Dead Zone [c] | 0.8 m |
| Attenuation Dead Zone [d] | 3.5 m |
| PON Dead Zone [e] | 40 m |
| Pulse widths | 5, 10, 30, 100, 300 ns; 1, 3, 10, 20 µs |
| Range Settings | 250 m to 240 km |
| Data Points | Up to 30,000 |
| Data Point Spacing | 5.0 cm (range <1.5 km); Range/30,000 (range >1.5 km) |
| Group Index of Refraction | 1.4000 to 1.6000 |
| Distance Uncertainty (m) | ±(1 + 0.003% x distance + data point spacing) |
| Linearity | ±0.05 dB/dB |
| Trace File Format | Bellcore GR-196 v1.1 |
| Trace File Storage Medium | Internal memory (>1000 traces) |
| Data Transfer to PC | USB cable |
| PON OTDR Modes | FTTx – PON Construction, In Service, Expert |
| Standard OTDR Modes | Full Auto, Expert, Real Time |

| OPTICAL LASER SOURCE (OLS) | |
|---|---|
| Emitter Type, Safety Class | Class I, FDA 21 CFR 1040.10 and 1040.11, IEC 60825-1: 2007-03 |
| Fiber Type | Single-mode |
| Available Wavelengths | 1310, 1490, 1550 nm |
| Wavelength Tolerance | ±20 nm |
| Spectral Width (FWHM) | 5 nm (maximum) |
| Internal Modulation | 270 Hz, 330 Hz, 1 kHz, 2 kHz, CW |
| Wavelength ID (one, two, or three wavelengths) | Compatible with NOYES Optical Power Meters and Light Sources |
| Output Power Stability [f] | 0.25 dB |
| Output Power | -1 dBm (1310, 1550 nm) ±1.5 dB; +3 dBm (1490 nm ) ±1.5 dB |

| PON POWER METER FOR SINGLE-MODE ONLY | |
|---|---|
| Calibrated Wavelengths | 1490, 1550 nm |
| Detector Type | Filtered InGaAs |
| Isolation | >40 dB |
| Measurement Range | +23 to – 50 dBm |
| Accuracy [g] | ±0.5 dB |
| Resolution | 0.01 dB |
| Measurement Units | dBm or Watts (nW, µW, mW) |

| OPTICAL POWER METER | |
|---|---|
| Calibrated Wavelengths | 1310, 1490, 1550, 1625, 1650 nm |
| Detector Type | InGaAs |
| Measurement Range | +23 to -50 dBm |
| Tone Detect Range | +3 to -35 dBm |
| Wavelength ID Range | +3 to -35 dBm |
| Accuracy [h] | ±0.25 dB |
| Resolution | 0.01 dB |
| Measurement Units | dB, dBm or Watts (nW, µW, mW) |

| VISUAL FAULT LOCATOR (VFL) | |
|---|---|
| Emitter Type | Visible red laser, 650 ±20 nm |
| Safety Class | Class II FDA 21 CFR 1040.10 and 1040.11, IEC 60825-1: 2007-03 |
| Output Power (nominal) | 0.8 mW into single-mode fiber |
| Modes | CW, 2 Hz flashing |

| GENERAL | |
|---|---|
| Size (in boot) | 20.1 x 13.0 x 5.3. cm (7.9 x 5.1 x 2.1 in) |
| Weight | 0.8 kg (1.8 lb) |
| Operational Temperature | -10 °C to +50 °C, 0 to 95 % RH (non-condensing) |
| Storage Temperature | -20 °C to +60 °C, 0 to 95 % RH (non-condensing) |
| Power | Rechargeable Li-Ion or AC adapter |
| Battery Life | 13.5 hours, Telcordia test conditions<br>12.5 hours, backlight on, continuous test |
| Display | LCD, 320 x 240, 3.5 in (89 mm), color, high-contrast transflective with backlight and AR coating. |

**Notes:**

a. All specifications valid at 25 °C unless otherwise specified.

b. Typical using 240 km range, 20 µs pulse and 3 min averaging.

c. Typical distance between the two points 1.5 dB down each side of a reflective spike caused by a -45 dB event using 5 ns pulse width.

d. Typical distance from the location of a -45 dB reflective event to the point where the trace falls and stays within 0.5 dB of backscatter, using a 5 ns pulse width.

e. Typical distance from the start of a 13 dB splitter loss to the point where the trace falls and stays within 0.5 dB of backscatter, using a 100 ns pulse width with high resolution at 1310 nm.

f. Over 15 minutes after 30 minute warm-up.

g. At calibration wavelengths and power levels of approximately -5 dBm for 1550 nm and -10 dBm for 1490 nm.

h. At calibration wavelengths and power level of approximately -10 dBm.



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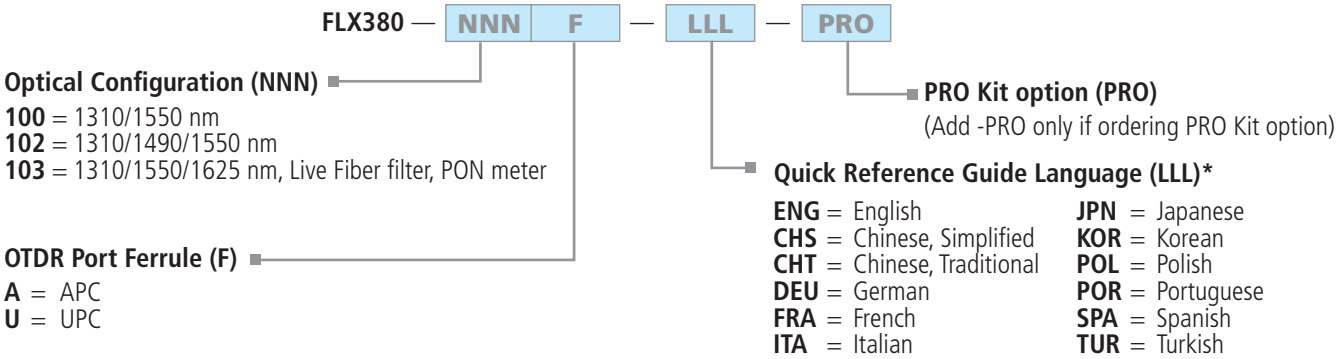
## Ordering Information

FLX380 PRO kits include hard shell carry case, FOCIS solution (DFS1 FiberScope with DFD1 Touchscreen Tablet) and cleaning supplies. FLX380 with soft carry case option includes a 2.5 mm One-Click Cleaner. All FLX380 FlexTester models come with (1) SC adapter for the OTDR/OLS port, (1) 2.5 mm OPM port Universal adapter, (1) 2.5 mm VFL port Universal adapter, USB cable (connects with Type A USB port on your PC), TRM software and AC adapter with power cord.

| WAVELENGTHS AND ADDED FEATURES | NOTES | AFL NO. |
|---|---|---|
| 1310, 1550, 1625 nm OTDR, live PON filter, PON meter, OLS/OPM with Wave ID, VFL | Most complete FLX380 FlexTester for testing FTTx PONs in or out of service. Includes ServiceSafe and 1490/1550 nm downstream PON power meter. | FLX380-103 |
| 1310, 1490, 1550 nm OTDR, OLS/OPM with Wave ID, VFL | Supports construction testing of FTTx PONs at 1310, 1490 and 1550 nm. OTDR and stable source with Wave ID supported at all three wavelengths. | FLX380-102 |
| 1310, 1550 nm OTDR, OLS/OPM with Wave ID, VFL | Adds ability to test at 1490 nm (FTTx downstream data) | FLX380-100 |

When placing an order, select options as follows: Optical Configuration (NN), OTDR Port Ferrule type (F), Language Package (LLL)* and optional PRO kit configuration.

Example: FLX380-103U-ENG-PRO indicates a three-wavelength (1310/1550/1625 nm) FLX380 FlexTester with UPC OTDR port ferrule, English / Euro language package in PRO Kit configuration with DFD1, DFS1 and cleaning supplies.




* All FLX380 models are shipped with one of three software language packages installed and a user-specified quick reference guide. Contact AFL/NOYES for a complete list of currently available languages (user interface and quick reference guide).

### FLX380 FlexTester PRO Test & Inspection Kit

| DESCRIPTION | AFL NO. |
|---|---|
| FLX380-103 PRO kit, APC connector, FOCIS, cleaning supplies, hard carry case | FLX380-103A-PRO |
| FLX380-103 PRO kit, UPC connector, FOCIS, cleaning supplies, hard carry case | FLX380-103U-PRO |
| FLX380-102 PRO kit, APC connector, FOCIS, cleaning supplies, hard carry case | FLX380-102A-PRO |
| FLX380-102 PRO kit, UPC connector, FOCIS, cleaning supplies, hard carry case | FLX380-102U-PRO |
| FLX380-100 PRO kit, APC connector, FOCIS, cleaning supplies, hard carry case | FLX380-100A-PRO |
| FLX380-100 PRO kit, UPC connector, FOCIS, cleaning supplies, hard carry case | FLX380-100U-PRO |

### FLX380 FlexTester in Soft Carry Case

| DESCRIPTION | AFL NO. |
|---|---|
| FLX380-103 1310/1550/1625 live PON OTDR, OLS, OPM, VFL; APC connector, soft carry case | FLX380-103A |
| FLX380-103 1310/1550/1625 live PON OTDR, OLS, OPM, VFL, UPC connector, soft carry case | FLX380-103U |
| FLX380-102 1310/1490/1550 PON OTDR, OLS, OPM, VFL, APC connector, soft carry case | FLX380-102A |
| FLX380-102 1310/1490/1550 PON OTDR, OLS, OPM, VFL, UPC connector, soft carry case | FLX380-102U |
| FLX380-100 1310/1550 OTDR, OLS, OPM, VFL, APC connector, soft carry case | FLX380-100A |
| FLX380-100 1310/1550 OTDR, OLS, OPM, VFL, UPC connector, soft carry case | FLX380-100U |



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## Available Accessories

### Test Port Adapters

| DESCRIPTION | AFL NO. |
|---|---|
| FC adapter, OTDR/OLS port | 2900-50-0002MR |
| SC adapter, OTDR/OLS port | 2900-50-0003MR |
| ST adapter, OTDR/OLS port | 2900-50-0004MR |
| LC adapter, OTDR/OLS port | 2900-50-0006MR |
| FC adapter, OPM port | 2900-52-0001MR |
| SC adapter, OPM port | 2900-52-0002MR |
| ST adapter, OPM port | 2900-52-0003MR |
| LC adapter, OPM port | 2900-52-0004MR |
| 2.5 mm adapter, OPM port | 2900-52-0005MR |
| 1.25 mm adapter, OPM port | 2900-52-0006MR |
| 2.5 mm adapter, VFL port | 2900-53-0001MR |
| 1.25 mm adapter, VFL port | 2900-53-0002MR |
| Dust cap for UCI outputs | 8800-00-0072PR |

### Fiber Rings (use as launch or receive / tail fibers)

| DESCRIPTION | AFL NO. |
|---|---|
| Fiber Ring, Single-mode, 150 m (492 ft) | FR1-SM-150-y1-y2 |
| Fiber Ring, Single-mode, 500 m (1640 ft) | FR1-SM-500-y1-y2 |
| Fiber Ring, Single-mode, 1000 m (3280 ft) | FR1-SM-1000-y1-y2 |

y1, y2 – connectors for single-mode cables, specify type as follows:
ST, SC, ASC (angled SC), FC, AFC (angled FC), LC
Other connector types, fiber types, and fiber lengths quoted upon request.

## Calibration Plans

AFL recommends annual calibrations on NOYES Test and Inspection products. Prepaid Cal plans offer two annual calibrations at a discounted price, a convenient calibration expiration email service, express calibration services and access to the NOYES product knowledge base. Cal Plus plans offer the same services as the Cal plans with the addition of a two year extended warranty (three years total coverage).

| FLX380 MODEL | 2 YR CAL PLAN, AFL NO. | 2 YR CAL PLUS PLAN AFL NO. |
|---|---|---|
| FLX380-100 | CAL2-00-FLX3-100 | CAL2-01-FLX3-100 |
| FLX380-102 | CAL2-00-FLX3-102 | CAL2-01-FLX3-102 |
| FLX380-103 | CAL2-00-FLX3-103 | CAL2-01-FLX3-103 |

**NOYES International Sales and Service Contact Information**

Available at www.AFLglobal.com/NOYES/Contacts



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