

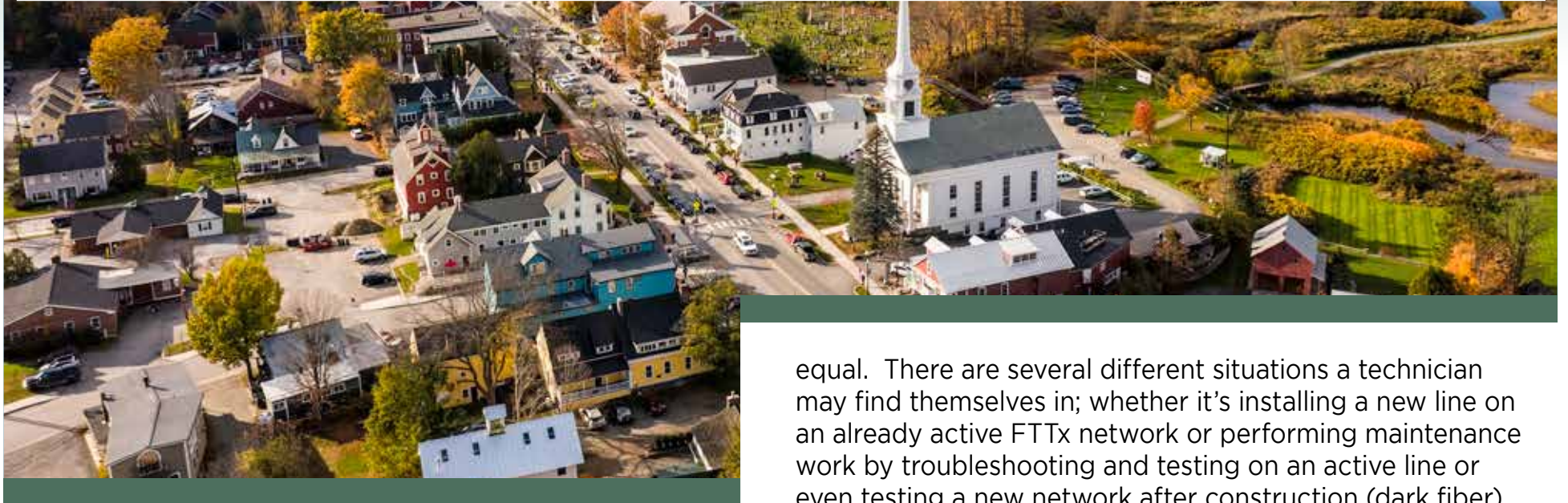
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## FTTx Testing: Different Levels for Different Applications

By Robert Licari - Product Line Manager, Test Equipment



In the past 10 years or so the fiber to the “x” industry, has experienced an extensive boom; generally out-growing the fiber optic industry as a whole. This growth was further spurred on by the Corona Virus pandemic of 2020-22 where many gaps and weaknesses in home & neighborhood networks were exposed due to the large increase in virtual meetings & learning. This led to the allocation of public funds dedicated to the betterment of access to high speed broadband internet. Similar to the 1930s *New Deal* Era Tennessee Valley Authority bringing electricity to rural Americans in the deep south. Today we look to bring high speed internet to the more rural areas of the U.S.

We had seen even before the pandemic an increased demand for fiber optics when state governments put forth legislation to roll out grants to small telephone companies where high speed internet was lacking. The successes of those initiatives have led one way or another to the current federal infrastructure plan which will bring FTTx to nearly every American within the next several years. Thus it’s an exciting time to be part of the industry, as FTTx applications have a tendency to touch nearly every corner of the market; from enclosures, to cable, to fusion splicers, etc. At the end of all of this is test results. Without that magic four-letter word—PASS, the job isn’t done. But it’s important to note that not all FTTx test applications are

equal. There are several different situations a technician may find themselves in; whether it’s installing a new line on an already active FTTx network or performing maintenance work by troubleshooting and testing on an active line or even testing a new network after construction (dark fiber).

When installing a new line to a home or other location, first and foremost the technician needs to establish simple continuity of the fiber by using a Visual Fault Locator (VFL). A VFL is usually a 650nm red colored laser with a range of up to about 3 miles. This low-cost tool will allow the user to confirm two important things: Am I getting light to travel all the way through? If not, where is the light coming out then? In the industry we refer to this as a “continuity test” which makes sure that the correct fiber has been spliced through and that the fiber is physically sound enough to carry the light all the way to its end.

Other tools that are necessary would be a power meter, which can measure the amount of power (dBm) coming into the ONT (Optical Network Terminal) and that it is at the proper level. The final step, if needed would be a basic, smaller handheld OTDR that every tech can have at their disposal. It will record the exact distance from the drop to the house as well as verify that the leg of the splitter is testing at its proper dB loss for its size (i.e. 15-16dB for a 1x32 splitter). Also it would verify that any splices or terminations on the drop cable are producing minimal loss to be within the established loss & power budgets. When addressing an outage, the testing is a bit more complex. In this

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*(Article continued from front page)*

scenario, the system is live and will stay active throughout the maintenance testing process. The first thing a technician could use would be a PON Power Meter. This tester will test both the upstream and downstream signals from the OLT (Optical Line Terminal; downstream) which is from the provider and the ONT (Optical Network Terminal; upstream) at the house. The OLT signal needs to be bridged through the PON PM in order to give the ONT the signal from the OLT it needs to operate.

When using an OTDR, one cannot use a standard OTDR, they need to use a PON optimized OTDR that has enough dynamic range to get through higher count splitters like a 1x32, 1x64 and up. To get through a 1x32 splitter you need at least a 36/37dB dynamic range OTDR. For 1x64 you would need a 39/40dB unit. It also needs to have a Live/Filtered test port as the technician will likely be testing into a live signal from the house. This live test port has a special filter that utilizes an out-of-band frequency like 1650nm. This frequency will not interfere with the in-network traffic and

filters out the same in-network frequencies from interfering with the OTDR.

Finally, I wouldn't be doing anyone any favors without mentioning the importance of proper cleaning during all this testing. One-Click cleaners have risen in popularity because they are affordable, convenient, easy to use and overall perform fairly well at cleaning connector tips and the connector tips inside bulkheads. With all the great cleaners out there, you also cannot go wrong with simple alcohol and dry wipes. Be sure to microscope and clean regularly and your testing will be much easier and less time consuming.

It seems to be that the sky is the limit for FTTx applications. Now the task at hand will be what has been mentioned and more in the coming years. We hope you look to Fiber Instrument Sales who with almost 40 years of servicing the industry, can help you find the solutions you are looking for when it comes not just to FTTx, but the entire fiber optic industry.

## Fiber-To-The-Home Required Equipment Options For Levels 1 and 2 Applications

Level I: House to Pole	FIS	Price	EXFO	Price	Viavi	Price	AFL	Price
VFL	F19000	\$109	FLS-241	\$435	FFL-050	\$175	VFI-4	\$149
Power Meter	F18513PM	\$185	EPM-53-RBPMA54	\$415	OLP-35V2	\$595	OPM-4	\$575
Connector Cleaner	F16715	\$55	F16715	\$55	F16715	\$55	F16715	\$55
Mini-OTDR	FC1315A26D	\$1,695	OX1PROI88	\$3,595	FOPTPROMAPC	\$4,810	TS10060PLUSP1	\$4,195
OTDR launch reel	PS13100PYAYA	\$120	PS13100PYAYA	\$120	PS13100PYAYA	\$120	PS13100PYAYA	\$120
		<b>\$2,164</b>		<b>\$4,620</b>		<b>\$5,755</b>		<b>\$5,094</b>

Level II: (In-Line Troubleshooting)	FIS	Price	EXFO	Price	Viavi	Price	AFL	Price
OTDR (w/Filtered Test)	FC1550A26D	\$1,500	OX1PROMI88	\$5,990	FSTOTDRPRO-IMAPC	\$7,220	TS10070PROPI	\$6,635
OTDR Launch Reel	PS13100PYAYA	\$120	PS13100PYAYA	\$120	PS13100PYAYA	\$120	Included	
Connector Cleaner	F16715	\$55	F16715	\$55	F16715	\$55	Included	
Conn. Inspection	F17500VIS	\$2,249	FIP-435BAPC	\$3,280	FIT82P01-PRO	\$2,700	Included	
PON Power Meter	N/A		PPM350DDRE-AEUI91EAEUI91	\$2,185	OLP37XV2	\$1,039	TPPMXG0900PR	\$2,495
		<b>\$3,924</b>		<b>\$11,630</b>		<b>\$11,134</b>		<b>\$9,130</b>

\*No PON Meter

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**Steve Casaletta**

**FIS Sr. Product Line Manager, Fusion Splicers and Splice on Connectors**  
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### FIS Fiber Transition Housing (FTH)



This FIS fiber transition housing (FTH) provides an optical demarcation and interconnection point for fiber-to-the-premises (FTTP) applications. Suitable for indoor or outdoor locations, the FTH provides physical protection for the transition between provider and customer, and facilitates system testing. Fiber entering and exiting the housing may be secured using the internal lances with the tie wraps. Slack cable is held neatly and securely using the backplate with integrated slack routing/management guides. The backplate also incorporates mounting clips for fusion or mechanical splices. The housings are molded from an engineering grade thermoplastic selected to withstand harsh outdoor environments. These housings may be installed on a wall or secured to a vertical conduit. Unauthorized access is deterred by the security screw latch. For added security, a lock may be installed on the integrated locking hasp.

**Anthony Russo**

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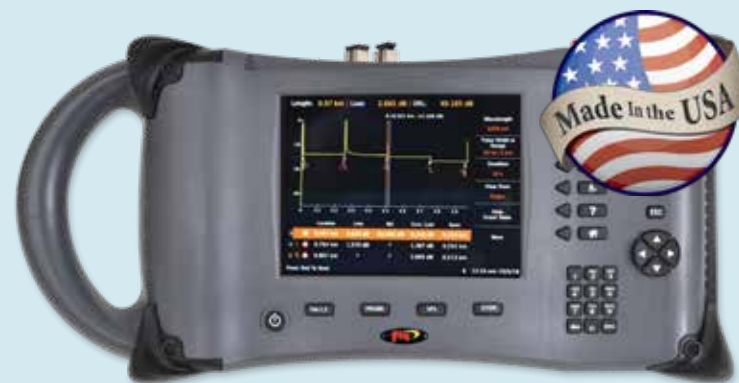
### FIS Thunder Bolt OTDR



The ThunderBolt's large 6.5 inch color screen display and intuitive operation makes this OTDR a favorite. Made in the U.S.A. and designed to troubleshoot and document your fiber optic network; the unit comes as a Singlemode only (1310/1550nm), or SM/MM "QUAD" version (850/1300/1310/1550nm), it can also be available with an on-board power meter, and red light visual fault locator. Compare its features to any OTDR offering and you will easily determine the ThunderBolt is one of the best value investments in the industry for OTDR testing.

**Robert Licari**

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### FIS Pre-Loaded Fiber Optic Enclosures



The FIS Pre-Loaded Fiber Optic Enclosures are designed to be a Plug and Play solution. They're offered in both Rack Mount and Wall Mount style enclosures. They come loaded with your choice of SC/LC adapter panels, splice trays and pigtails. Available in both singlemode and multimode (50um 10gig). OEM and no logo options are available upon request.

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### US Conec's ELiMENT Duplex LC Uniboot Connector



FIS is now offering assemblies built with the US Conec ELiMENT Duplex LC Uniboot Connector for a quick toolless polarity reversal. This connector is available with a 2mm or 3mm boot and is available in SM (UPC or APC) and MM. This connector also offers a push-pull technology for easy insertion and extraction. The no tool polarity reversal feature of this connector reduces the risk of damaging the connector, ferrule or fiber by eliminating any exposure during the polarity reversal process. Consider building your next patchcords with the ELiMENT Duplex LC Uniboot Connector!

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# Product Spotlight

## FIS 1RU RackMount F1RM1RU3X

1RU Rack Mount, 3 Plates, Solid Front/Rear Doors, Black, Unloaded



Shown Loaded with LC Duplex Plates

The 1RU FIS Rack Mount Enclosure accommodates (3) LGX adapter plates, modules or cassettes. Slide out trays and removable front and back doors allow easy access to the patch bay. Multiple cable retention brackets and tie down spots allow for convenient cable management. Spring loaded stop latches keep the tray securely in place when retracted. Rack mount installs into a standard 19" rack. Adapter plates, 23" mounting brackets and 19" flush mounting brackets are sold separately.

For more information call to speak with a sales representative

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# Ask Bruno

Vice President of Technical Services



**Can you please tell me what different equipment options are available for testing FTTx applications?**

The answer depends on a number of variables. Bob Licari, our Test Equipment Product Line Manager, and I reached out to our vendors to ask for their recommendations on the products they suggest for FTTx testing and the requirements of the equipment they may have. The chart on the inside of this issue can point you in the right direction.

A couple of the things we asked them to consider when making their recommendations were the ability to provide formal reports and cost of the equipment. Every installation is different, and each may have different requirements. Bob and I are happy to talk with you about your application whenever you are ready.



View the chart on the inside for more equipment options!

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