



# OneExpert™ For xDSL, G.fast & FTTH

Fast, consistent, and complete!

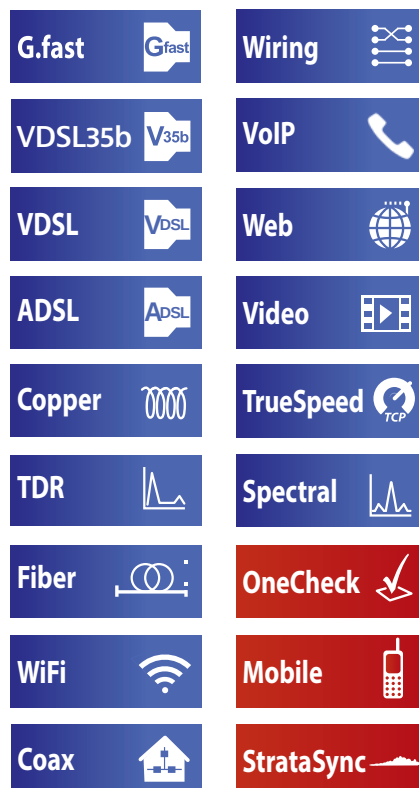
Consistently achieve high-performance results when deploying ultra-fast residential broadband over xDSL, G.fast, and FTTH.

OneExpert helps field technicians fix problems right the first time, every time. A multitouch, user-friendly interface and OneCheck™ automated tests ease complex tasks with clear pass/fail results. And, its future-proof modules ensure years of use supporting access and home networks.



## Key Benefits and Features

- One button OneCheck™ TDR auto identifies fault types and locations right away
- Prove the true customer experience with a standardized TrueSpeed™ test (RFC-6349)
- OneCheck™ automates field tests and simplifies Copper and DSL results to consistently close jobs correctly
- StrataSync™ cloud-enabled asset and test data management provides visibility for test results and completed tasks and keeps track of used instrument inventory
- Modular platform scales for new WiFi, fiber, and xDSL technology including VDSL Profile 35b and G.fast
- OneExpert™ app uses everyday mobile devices for remote control, data enhancements, and connectivity



## Open, Modular Design

OneExpert offers the advantages of integrated cloud-based applications, touch screen interfaces, smartphones, and tablets. OneExpert helps technicians perform more efficiently and fix problems faster while ensuring service providers can invest in a long-term, open platform.

| OneExpert Feature                  | What It Does                                                                  | Why It Is Needed                                                         |
|------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Modular hardware                   | Ensures tester can be updated in line with technology and market advancements | Future-proofs your investment                                            |
| Remote software upgrades           | Software can be enhanced and upgraded in the field                            | Keeps hardware updated with the latest best-practice test applications   |
| Multitouch user interface          | Includes pinch-to-zoom, scrolling, flick, and more                            | Enhances ease-of use by leveraging a user's mobile and tablet experience |
| Large screen                       | Complete graphs appear on a single screen                                     | Improved ergonomics, particularly with TDR trace reading                 |
| Bluetooth®/WiFi-ready connectivity | Optional wireless connectivity                                                | Easy communication with mobile devices, PCs and cloud                    |
| OneCheck Copper and OneCheck DSL   | Automated Viavi suite of tests, many with pass/fail results                   | Leverages best practices to make complex tasks easy                      |
| StrataSync                         | Cloud-based solution manages Viavi instrument assets and field data results   | Plug-and-play back-office integration                                    |

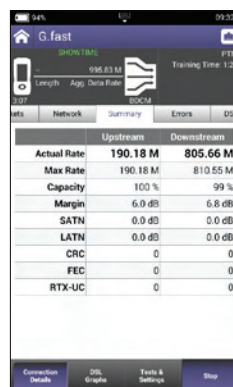


## xDSL Testing up to G.fast

A sync test is essential in characterizing DSL link quality (bandwidth rates, margins, errors, and likelihood for errors). This test also helps determine whether issues are coming from the equipment (CPE or DSLAM/DPU ports) or from the profile settings. It shows important results on a single DSL summary screen page.

### OneExpert supports:

- ADSL/2+ on a single and dual pair
- VDSL single line up to profile 30a
- VDSL single line vectoring, bonded and bonded vectoring up to profile 17a
- VDSL profile 35b
- G.fast



DSL/G.fast summary



Bits-per-tone (BPT) vs SNR graph

| DSL Test                | What It Does                                                                               | Why It Is Needed                                                                                                                             |
|-------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Synchronization test    | Synchronization in auto mode or with a dedicated profile                                   | Verifies the DSL service has been activated on the line under test                                                                           |
| Profile                 | Displays the VDSL2 profile in use on the connection                                        | Mismatch between DSLAM/DPU profile, CPE settings, and customer's expectations                                                                |
| Margins and attenuation | Allows verification that SNR margins and attenuations are within acceptable limits         | Copper loops are exposed to external noise. Adequate noise margins maintain DSL connection quality. Higher attenuation results in lower SNR. |
| DSL errors              | CRC, FEC, LOS, LOF, and LOM                                                                | DSL errors will transfer to application layers such as IP video                                                                              |
| DSL RTX (G.INP)         | DSL retransmission: status, retransmitted DTUs, corrected DTUs, uncorrected DTUs, INP REIN | DSL RTX support to match CPE and statistics to highlight DSL lines at risk, already using retransmission                                     |

|            |                                                                                               |                                                                     |
|------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| BPT graph  | Displays the bit-loading per tone                                                             | Can help to identify disturbers and interferers present on the line |
| Hlog graph | Loop attenuation component of the channel transfer function (during the modem training phase) | Can detect bridged taps, degraded contacts, and bad joints          |
| QLN graph  | Noise floor of the DSL line                                                                   | Shows frequency of potential disturbers/interferers on the DSL line |

## Single Test-Lead Connection

When connecting copper test leads, technicians will try to reduce the expense of multiple test cables as well the incidence of errors resulting from using the wrong lead. It is critical to get a proper connection with a good ground, or risk rendering meaningless test results. However, swapping between DSL testing and copper testing during troubleshooting adds time and risks losing test-lead connection quality.

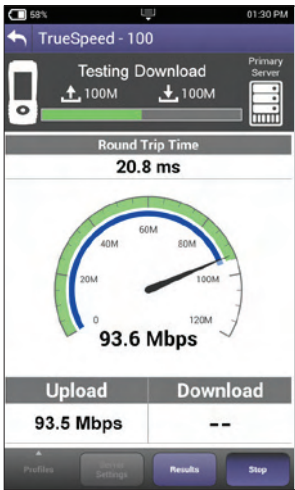
OneExpert lets technicians focus on test leads once, regardless of the number of DSL and copper tests that follow, saving time and, more importantly, avoiding misleading or incorrect results.

| Single Test-Lead Connection                                | What It Tests                                      | Why It Is Needed                                                      |
|------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|
| All tests are conducted from a single test-lead connection | DSL and copper thru a single test- lead connection | Reduces the risk of misleading results from bad test lead connections |



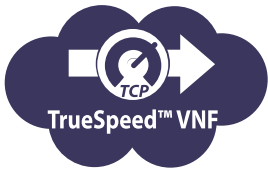
## TrueSpeed (TCP RFC-6349 Speed Testing)

Broadband IP networks and their throughput speeds are non-deterministic and their behavior is unpredictable. OneExpert TrueSpeed provides a standardized RFC-6349 speed test to measure the throughput at the TCP application layer just as a user would experience it. Other methods, such as FTP upload/download, cannot accurately test ultra-fast broadband rates provided by technologies like Super Vectoring and G.fast..



OneExpert TrueSpeed throughput test up to 1Gbps

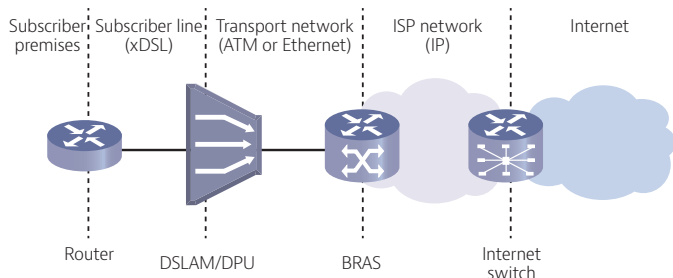
| TrueSpeed Test             | What it Tests                                                                           | Why is it Needed?                                                                                       |
|----------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Actual rate (up/down)      | Actual achieved TCP throughput up to 1Gbps                                              | Measure throughput as customers experience it at the application layer                                  |
| Ideal rate (up/down)       | Baseline for achievable TCP throughput without physical layer overhead                  | Provides a baseline for an ideal-expected-TCP throughput based on the physical layer rate               |
| TCP Efficiency             | Ratio of Successful TCP transmitted without retransmission to the total TCP transmitted | A large throughput isn't very useful for the customer if a lot of IP packets need to be retransmitted   |
| Round trip time (RTT)      | Baseline round-trip delay measurement                                                   | Calculate the bandwidth delay product (BDP) to identify impact of RTT to network throughput             |
| Maximum segment size (MSS) | Test-optimized segment size to achieve maximum throughput speed                         | Per RFC-4821 to ensure that the TCP payload remains unfragmented and unnecessary IP overhead is avoided |



## IP Data — Web

Internet subscribers demand reliable connectivity and new applications require higher data throughput and network-delay time performance. DSL error protection using interleave delay and error recovery mechanisms, like those for IP video, counteract time-sensitive data throughput using TCP/IP with acknowledgment and retransmission. The OneExpert tester allows technicians to quickly test internet connectivity using the built-in web browser. It tests the data rates provided by VDSL vectoring with FTP/HTTP throughput as key reference tests for TCP/IP applications. Mature tests like IP ping delay are still necessary, especially for real-time applications, such as online gaming.

| IP Data Test           | What It Tests                              | Why It Is Needed                                                                                                                 |
|------------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| User authentication    | IPoE, PPPoE, IPv4, and IPv6                | Customer service turn-up                                                                                                         |
| Web browser            | Connection to any website                  | Differentiates between network problems and web-server downtimes and isolates customer PC or mobile devices as points of failure |
| IP ping and TraceRoute | Delay time through the network and routing | Network delay is crucial, especially with high- interaction applications such as gaming                                          |
| FTP/HTTP throughput    | Upload and download rates                  | DSL profile parameters, such as INP, delay, and network aggregation issues, determine user-experienced data speeds               |

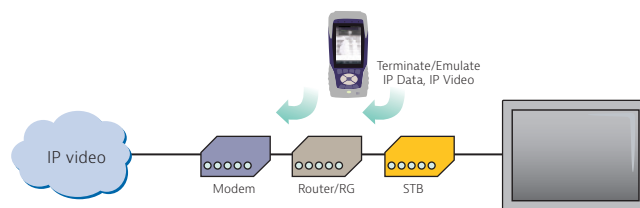


## IP Video

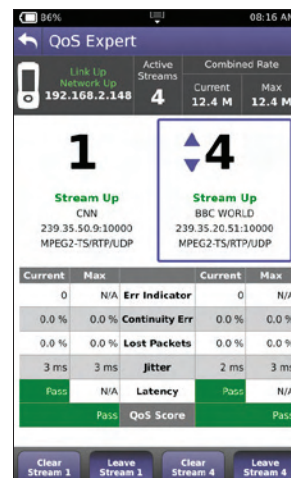
OneExpert can test multiple standard and high-definition television (SDTV/HDTV) streams regardless of compression format (MPEG-2, MPEG-4p10/H.264, VC-1, and others) and automatically detects the stream type with the Broadcast Auto feature. The OneExpert IP Video application allows for termination of the IP video stream anywhere in the access network using the DSL or Ethernet interface.

Key performance indicators for real-time protocol (RTP) lets the OneExpert DSL precisely measure network QoS and QoE. QoS Expert easily compares critical quality-of-service metrics such as error indicator, continuity error, lost packets, jitter, and latency between two active streams.

| IP Video Test                | What It Tests                                                                                                                                      | Why It Is Needed                                                                                            |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| IP video stream availability | Access to one or more SDTV or HDTV streams                                                                                                         | Content might come from different sources; possible bandwidth limitations if more than one stream is active |
| Quality of service           | Key IP video performance indicators such as jitter, loss, latency, error indicator; includes QoS Expert to compare performance between two streams | Easy-to-understand pass/ fail metrics if IP video is of good quality                                        |
| Packet loss analysis         | Minimum distance, maximum period, RTP loss and errors                                                                                              | Detailed analysis on on Quality of Experience impact                                                        |
| Rates analysis               | Video, audio, and data substream rates                                                                                                             | Bandwidth consumption in relation to total available rates                                                  |
| PID map                      | PID for video, audio, data                                                                                                                         | Availability of all stream components                                                                       |



IP Video QoS testing



OneExpert IP Video — QoS Expert

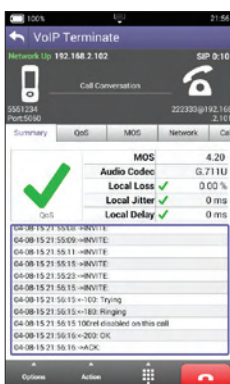
## VoIP

The OneExpert is the ideal test tool to quickly place VoIP calls and verify QoS via mean opinion score (MOS) values. A DSL or Ethernet TE interface tests VoIP anywhere in the access network, replacing either the DSL modem, VoIP phone, or both. The OneExpert also includes an Auto Answer mode in which the unit automatically responds to an incoming call. Viavi provides a wide range voice decoding controls such as G.711, G.722, G.723, G.726, and G.729.

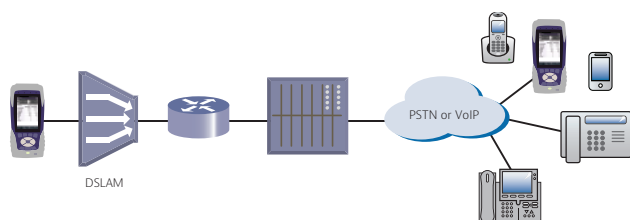
| VoIP Test                             | What It Tests                                                            | Why It Is Needed                                                                                             |
|---------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Service setup/provisioning            | Registration with gateway as a SIP VoIP client                           | User setup and server availability. VoIP clients and servers can have complex setups — preclude setup errors |
| Connectivity beyond signaling gateway | Placing test calls on and off network                                    | Call connection from VoIP-to-VoIP and VoIP-to- public switched telephone network (PSTN)                      |
| Call quality                          | MOS, near- and far-end QoS with packet loss, jitter, delay, and R-Factor | Test how VoIP calls are transferred through the network and received at the customer premises                |



VoIP Test Selection



VoIP Call Summary

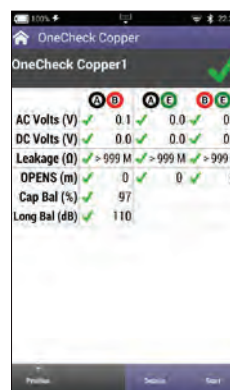


OneExpertDSL tests VoIP throughout the IP network registration with gateway, test calls on and off the network, and measures near- and far-end IP QoS and MoS.

## OneCheck Copper

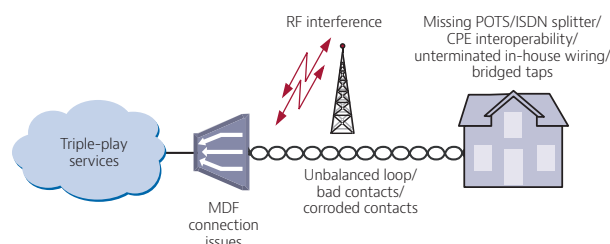
It is critical to test the copper prior to turning up DSL. What may have worked for POTS or lower-speed DSL may not work for VDSL or as the plant degrades. OneExpert's OneCheck Copper function simplifies copper testing for field technicians with repeatable pass/fail results.

| Copper Tests        | What It Tests                                                               | Why It Is Needed                                                                |
|---------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Voltage             | Foreign voltages                                                            | Safety and identifies cross-battery impairments                                 |
| Resistance          | Insulation between tip-A and ring-B and between tip-A, ring-B, and ground-E | Leakage resistance affects DSL sync and performance                             |
| Opens (capacitance) | Loop length and capacitive balance                                          | Cable damage, one side open, loop length must be acceptable for DSL             |
| Balance             | Longitudinal balance, resistive balance, capacitive balance                 | Robustness against noise, otherwise reduced BPT                                 |
| Load coil           | Presence of load coils                                                      | Load coils act as low-pass filters and must be removed for DSL to work properly |
| Ground check        | Ground connection check for balance                                         | Poor or lack of ground leads to incorrect results, hides possible impairments   |



OneCheck Copper

Inexperienced technicians often will call in a copper expert as soon as they are unable to find a fix, even without being sure the copper is faulty, extending repair times and increasing OpEx. OneCheck Copper lets any tier-1 technician assess copper-pair health automatically by testing the copper circuit as a single-ended line test (SELT) to rule out foreign voltages, opens, shorts, or load coils are on the line. It also tests whether the line is balanced enough for noise rejection so that it does not interfere with the DSL signal.



Copper-loop issues such as foreign voltage, opens shorts, and load coils can impact DSL and triple-play performance



## OneCheck™ TDR

OneCheck TDR allows for both simplicity and accuracy to avoid false TDR readings—not one or the other, as with most TDRs. The automated TDR fault identification mode using patented time varying gain (TVG) and adaptive pulse width technologies precisely locates faults in access copper loops and inside home networks. OneCheck™ TDR is a fast test that provides real-time updates.

| TDR Test          | What It Tests                 | Why It Is Needed                                                                                                                                                                                                                                                                                       |
|-------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Loop length       | Location of the cable end     | VDSL requires shorter loop lengths than ADSL2+; loop lengths must be acceptable for the technology used.                                                                                                                                                                                               |
| Bridged taps      | Length of bridged taps        | Bridged taps cause unwanted reflections at the splice point and tap ends. The reflected signal, or circuit noise, degrades DSL performance. Also, bridged taps can act as an antenna picking up external noise along the tap. Bridged taps should be removed when possible to improve DSL performance. |
| Opens, shorts     | Opens and shorts              | Cable damage.                                                                                                                                                                                                                                                                                          |
| Corroded contacts | Presence of corroded contacts | Corroded contacts act as resistive (imbalance) or capacitive (opens) faults that especially impact the pair's continuity and overall balance making it more susceptible to noise, thus degrading DSL performance.                                                                                      |
| Bad splices       | Presence of bad splices       | Bad splices cause unwanted reflections similar to resistive faults that impact the pair's overall balance making it more susceptible to noise, thus degrading DSL performance.                                                                                                                         |
| Load coil         | Location of load coils        | Load coils act as low-pass filters and must be removed for DSL to work.                                                                                                                                                                                                                                |

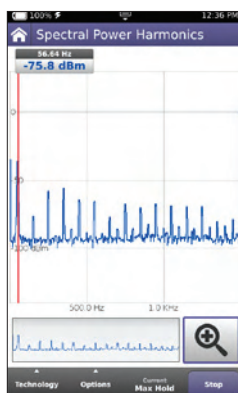


OneCheck TDR mode

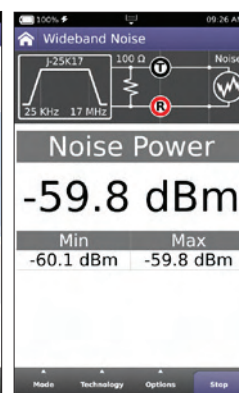
## Locate Copper Impairments

Pristine copper plant enables error free service and high data rates. Qualify the severity of copper impairments and locate copper faults.

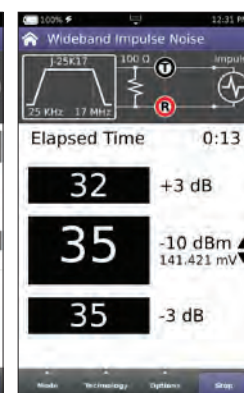
| Copper Test                   | What It Tests                                                                                                                                                         | Why It Is Needed                                                                                                                                      |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Spectral                      | Identifies precise amplitude and frequency of disturbers; includes technology selection for ADSL2+ / VDSL2 and power harmonics; max hold or actual values             | Noise disturbers can impact DSL performance                                                                                                           |
| WB noise                      | Quickly identifies if noise across bandwidth predefined or custom definable filter settings is an issue                                                               | Crosstalk and noise can impact DSL performance                                                                                                        |
| WB impulse noise              | Impulse noise across filter band based on technology selection; counts impulse noise disturbers; shows impulse noise disturber signature in frequency and time domain | Impulse noise disturbers might not be recoverable and can cause intermittent DSL failures                                                             |
| WB receive tones              | Receive power levels                                                                                                                                                  | DSL performance is depending on loop length                                                                                                           |
| Resistive fault locator (RFL) | Resistive path from either wire in a pair to battery or ground or across the pair; distance to fault; includes UFED support                                           | Resistive faults impact DSL performance by upsetting pair balance or subjecting the pair directly to increased noise; lowers SNR; fewer bits per tone |
| K-test                        | Pairs with a fault on both wires (double-sided resistive fault); distance to faults; includes UFED support                                                            | Resistive faults impact DSL performance by upsetting pair balance or subjecting the pair directly to increased noise; lowers SNR; fewer bits per tone |



Spectral Power Harmonics



Wideband Noise



Wideband Impulse Noise

## POTS Dialer

OneExpert reduces the number of test tools a technician needs to carry by providing an integrated butt set. Technicians can use the POTS dialer to verify a line's continuity to the exchange and that it works without conflicting with the customer's broadband equipment due to an eventual missing or defective POTS splitter.

| Copper Test | What It Tests                        | Why It Is Needed                                                                                        |
|-------------|--------------------------------------|---------------------------------------------------------------------------------------------------------|
| POTS        | DTMF and pulse POTS calls, caller ID | Connectivity to exchange and determining if POTS is available, dial test line facilities in an exchange |



POTS Dialer

## OneExpert UltraFED

The UltraFED connects the far end of the pair under test while the OneExpert controls it remotely. One technician with one piece of equipment can now perform two-ended pair testing. This makes testing easier and faster as it eliminates driving to the other end of the cable in order to change line conditions.

| UltraFED Function                         | What it Does                                                                            | Why It Is Needed                                                                                                                                                                     |
|-------------------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TDR Helper                                | Alternately opens and shorts the line across Tip (A) and Ring (B)                       | TDR Helper lets technicians quickly identify the end of the cable or the location of the UltraFED by observing up (open)/dip down (shorted) status                                   |
| RFL Strap                                 | Remotely sets the short/strap line condition                                            | RFL test requires a far-end short between Tip (A) and Ring (B); K-Test is a two-step procedure started with an open, followed by a short at the far end between Tip (A) and Ring (B) |
| Open All                                  | Disconnects Tip (A), Ring (B), and Ground (Earth) from the cable pairs                  | Isolate the pair under test **                                                                                                                                                       |
| Tip (A) / Ring (B) Short                  | Strap mode: Connects Tip (A) to Ring (B)                                                | Used with Loop Resistance or RFL measurements **                                                                                                                                     |
| Tip (A) / Ring (B) / Ground (Earth) Short | Connects Tip (A), Ring (B) and Ground (Earth) to Ground (Earth). Also called strap mode | Used while measuring Resistive Balance **                                                                                                                                            |

| UltraFED Function | What it Does                                                                                                               | Why It Is Needed                                                                                                                                                                 |
|-------------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Quit Termination  | Terminates the pair at the far end                                                                                         | Copper testing for Noise, Impulse Noise, Spectral should be run with a proper termination at the far end as it makes the pair look like it is with real equipment on each end ** |
| Single Tone       | Connects a tone generator across Tip (A) to Ring (B)                                                                       | Loss measurement **                                                                                                                                                              |
| Trace Tone        | Connects a tone generator across Tip (A) to Ring (B) and sends 577 and 1004 Hz tones with cadence High-Low or Low-Low-High | Identifying pair under test **                                                                                                                                                   |
| Off/THRU          | Connects Tip (A) and Ring (B) to the CO Tip (A) and Ring (B)                                                               | Maintain "in-service" customer connection and "out-of-service" as necessary during test**                                                                                        |



OneExpert UltraFED saves time and simplifies copper testing

## Wiring Tools

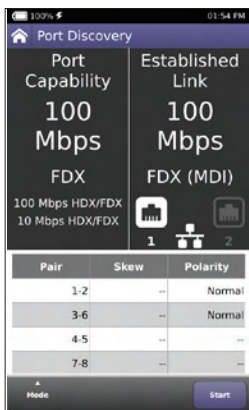
Where available, Ethernet cabling is typically preferred for home networks because it delivers optimal data rates and quality of service. OneExpert wiring tools allow for Ethernet CAT5/6/7 or phone- wiring CAT3 testing. Technicians can quickly set up a home network using the Wire Mapping Smart Remote and resistive IDs as remote probes. Further, OneExpert supports Hub Flash, port discovery and a ping tool against multiple targets including gateway, DNS and target host/IP addresses.

| Wiring Tool          | What It Tests                                                        | Why It Is Needed                                                               |
|----------------------|----------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Wire mapping         | Uses the Wire Mapping Smart Remote to test for physical-layer issues | Locate improper wire connections                                               |
| Loop length          | Loop length per pair                                                 | Verify cable run lengths                                                       |
| Opens, shorts        | Location of opens, shorts                                            | Cable damage, splices, or port connections                                     |
| Cable identification | Cable run identification with resistive IDs                          | Multiple cable runs in the wired home network                                  |
| Hub flash            | Determine to which port the cable is connected                       | Ports at residential gateways (RG) might have different functional assignments |

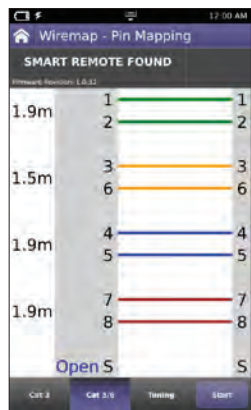
| Wiring Tool    | What It Tests                                                                                 | Why It Is Needed                                                                                                                          |
|----------------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Port discovery | Identifies an Ethernet connection and reports speed of link, signal to noise ration, skew     | Ethernet port configuration or cable wiring might limit the port capabilities within a range of 10, 100, 1000 Mbps, half- or full duplex. |
| Ping tool      | Connectivity to various network resources such as the gateway, DSN, and selected IP addresses | Network connectivity segmentation – home network versus Internet                                                                          |



Wire Mapping Smart Remote



Port discovery



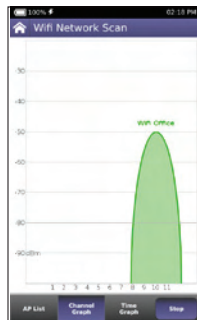
Wire mapping

## WiFi (Internal)

The use of wireless devices and networks is becoming a common part of every household. With the OneExpert WiFi Scan, technicians are equipped with wireless 802.11b/g/n (2.4 GHz) testing capability to show the signal strength, secure set identification (SSID), configured channel, security, MAC address, and 802.11 protocol at the test location of each wireless 802.11b/g/n network in the area. It also indicates whether a network is secure or vulnerable to security threats.

| WiFi Test | What It Tests                       | Why It Is Needed                                                                                                                                                           |
|-----------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WiFi scan | WiFi access point (AP) station scan | Discover potential interfering networks (which could cause slow data transfer speeds), and locate weak spots in the WiFi signal to suggest a better location of the router |

| WiFi Test | What It Tests                                                                                                               | Why It Is Needed                                                               |
|-----------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| WiFi AP   | Connect OneExpert via Ethernet cable to a router or residential gateway to configure as a WiFi AP (Ethernet bridge to WiFi) | Verify Internet connectivity, configure CPE, and run tests from mobile devices |



WiFi Network Scan



OneExpert providing WiFi access point

## WiFi Advisor

With support for the WiFi Advisor accessory on the OneExpert, technicians can evaluate wireless network performance seamlessly for both 2.4 and 5 GHz networks. With support for 802.11 standards a/b/g/n and ac, the ONX and WiFi Advisor combination make WiFi problem solving easier.

Using a single WFED-300AC device, users can quickly visualize, optimize, and troubleshoot WiFi networks with BSSID, Channel, and Spectral views. BSSID view provides quick visibility into active wireless networks and identifies the least-crowded channel to use for an access point. Channel view finds the best channels for an access point by showing utilization, noise, co-channel interferers, adjacent channel interferers, and an overall channel score for each channel. Spectral view shows damaging RF interference with a real-time spectral analyzer configurable by 802.11 band, channel, and channel width.

| WiFi Test         | What It Tests                                                         | Why It Is Needed                                                                               |
|-------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| BSSID details     | View information for a specific AP                                    | Determine whether an AP is running in legacy mode or with outdated security settings           |
| BSSID view        | View all APs by channel                                               | See the WiFi environment across 2.4 GHz and 5 GHz bands to visually determine crowded channels |
| Channel view      | Displays channel utilization, noise, channel score, and best channels | Quickly determine the best channel for WiFi deployment and troubleshooting                     |
| Spectral analyzer | Real time 802.11 and non-802.11 spectrum                              | Locate interference sources such as Bluetooth devices and microwave ovens                      |



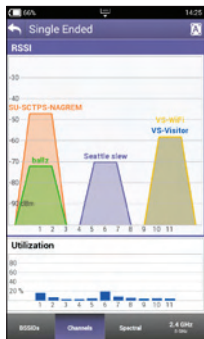
| WiFi Test                 | What It Tests                                                    | Why It Is Needed                                                   |
|---------------------------|------------------------------------------------------------------|--------------------------------------------------------------------|
| Site Assessment Assistant | Works with WiFi Advisor to determine throughput of a WiFi system | TrueMargin™ is the measure of throughput in the actual environment |



OneExpert controls the Wifi Advisor for Single Ended Operation with Best Channel



OneExpert supports the Wifi Advisor Dual-ended mode of operation providing TrueMargin and allows optimization of the Access Point placement



RSSI view per channel



The test application identifies the best channel for WiFi service

## Fiber

Broadband DSL networks and broadband triple-play services often rely on fiber networks. Examples are fiber-to-the-cabinet (FTTC) or fiber-to-the-distribution-point (FTTdp) that bring the DSLAM closer to the customer for greater VDSL bandwidth. The DSLAM is served with fiber back to the exchange to carry broadband signals. Another example is business customers connected to their service providers via ADSL2+/VDSL and via fiber. This drives the need for field technicians who work in these environments to have both DSL and fiber test capabilities.

For point-to-point fiber installations such as FTTC or business connections, field technicians can use the OneExpert together with the Viavi Solutions MP-60 or MP-80 USB optical power meter (OPM) to ensure that fiber cable attenuation meets system requirement performance and is ready to survive network aging and environmental

impacts.



MP-60 optical power meter

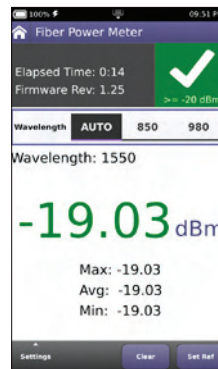


P5000i optical fiber scope

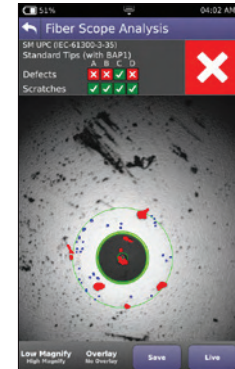
In combination with a Viavi SmartPocket optical laser source (OLS), the OneExpert equipped with an MP-60 or MP-80 OPM can automatically perform optical link loss measurement at different wavelengths—resulting in a faster and more comprehensive fiber test.

Using the P5000i optical fiber scope, technicians can test the #1 cause for troubleshooting in optical networks—contaminated fiber connectors. The P5000i provides pass/fail analysis based on user-selectable acceptance profiles.

| Fiber Test          | What It Tests                                                     | Why It Is Needed                                                                       |
|---------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Optical fiber scope | Pass/fail against predefined profile; includes dual magnification | Contaminated fiber connectors are the #1 cause for troubleshooting in optical networks |
| Optical power level | Optical power level with pass/fail and reference values           | Optical loss must be within budget at ONU site                                         |



Fiber Power Meter



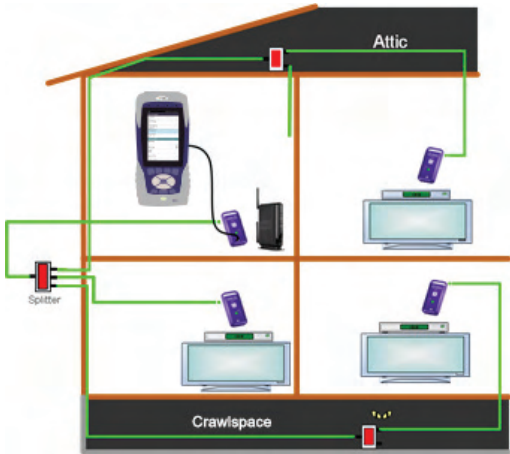
Fiber Scope Analysis

## Coax

Problematic coax cable accounts for most repeat calls as well as video, voice, data, and multiroom DVR installation problems. Most home coax has never even been tested at the frequency ranges that support these services so problems become more apparent after service installation.

The powerful OneExpert in conjunction with the optional Viavi SmartID coax probes can verify in-home coax (quality and topology) and service distribution to quickly display and certify subscriber

coax topology. It immediately identifies and locates physical-layer impairments that affect both triple-play and multiroom DVR services saving valuable troubleshooting time and eliminating the need for repeatedly segmenting the network, making changes, and then retesting. Technicians use the information the device provides to determine whether they can quickly fix the drop, replace it with a new one, or use an alternative means to supply service to the location.



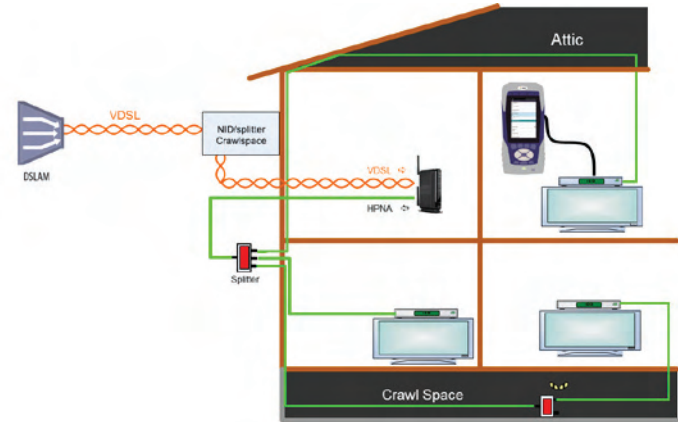
Coax home network under test with SmartIDs

After completing physical-layer testing with SmartIDs, technicians can use the HPNA test to verify the coax network with CPE.

| Smart ID Coax Test Sequence | What It Tests                                   | Why It Is Needed                                    |
|-----------------------------|-------------------------------------------------|-----------------------------------------------------|
| Bidirectional FDR           | Events that cause excessive loss or reflectance | Locates bad splitters and connectors in the network |
| HPNA frequency sweep        | All legs and in both directions                 | Ensures services like whole-home DVR will work      |
| Noise ingress measurements  | Each endpoint in the home                       | Identifies HPNA interferers                         |

### HPNA

The HPNA technology standard developed by the Home Phoneline Network Alliance (HomePNA™) builds on Ethernet to connect and integrate all the home network components over an unpredictable wiring topology. The HPNA communication is used to pass information around a home to other HPNA-connected devices.



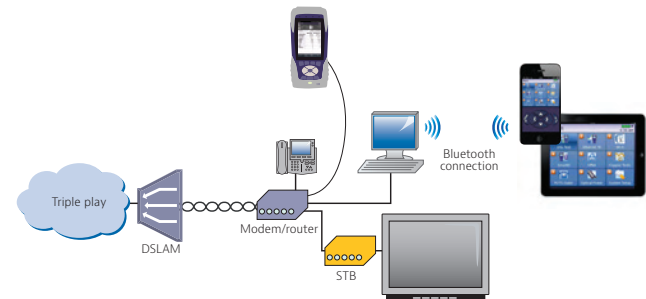
In the HPNA test, OneExpert connects to the HPNA network via CPE and communicates with the HPNA network host to initiate the test. Each communication path between all HPNA network nodes will be tested, letting users segment problem node paths, node-to-node communication issues, and verify that the whole network is functioning correctly. OneExpert can verify that HPNA networks are operating within expected service quality metrics and users can set up pass/fail limits to help simplify testing.

### Mobile App

Testing with the OneExpert mobile iOS app is quicker and more efficient because technicians can leave the test set plugged in at one location and run tests remotely using the mobile app. Manage job files and export completed jobs to a server.

Providers need back-office integration to expand the benefits of collecting daily field test results . The mobile app leverages smartphones or tablets to link internal databases to instrument test results.

| Mobile Device Integration | What It Does                                              | Why It Is Needed                                                                              |
|---------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Job manager               | Helps manage and enrich test results                      | Back-office integration                                                                       |
| Remote access             | Lets users remotely control the unit from a mobile device | Inconvenient test set access or several locations to fix between the test point and the fault |
| Extra information         | Delivers tutorials, manuals, photos of all part numbers   | Helps technicians in the field                                                                |



## StrataSync

Field operation groups face a challenge keeping track of their test equipment inventory: types of instruments, firmware versions, options, and automated test configurations that match standardized methods and procedures. The challenge increases every time a change must be deployed. Without a means to collect and analyze test data, valuable information about network health is missed.

StrataSync is a hosted, cloud-based solution that manages assets, configurations, and test data for Viavi instruments to ensure they are all equipped with the latest software and installed options. It manages inventory, test results, and performance data from anywhere with browser-based ease improving both technician and instrument efficiency. StrataSync manages and tracks test instruments and collects data from the entire network that can be leveraged for results analysis, and informs and trains the workforce.

| StrataSync             | What It Does                                                                                                                                                                                        | Why It Is Needed                                                                                                                                                                                                                                                           |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Asset management       | Manages and tracks test instruments by displaying assets, modules, versions, and locations. Maintains accurate instrument configuration and setup. Provides visibility into instrument utilization. | Save time by eliminating time wasted on instrument setup. Reduce repeats with correctly configured instruments. Improve results and reduce operating costs.                                                                                                                |
| Data-result management | Collects and analyzes results with centralized collection and storage, secure visibility from anywhere, and consolidated test data/metrics.                                                         | Access more data with centrally collected results for better use. Speed problem resolution by sharing data for faster troubleshooting. Drive compliance by tracking and comparing technician performance.                                                                  |
| Updates the workforce  | Informs and trains the workforce through alerts, release notes and manuals, and a comprehensive product-knowledge library.                                                                          | Inform the workforce using a single source for instrument status, new capabilities, and educational content. Improve performance with quick access to training and troubleshooting information. Stay current with alerts for expiring warranties and overdue calibrations. |

|                                                                                                                       |                                                                                                                 |                                                                                                                          |
|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Simple with built-in expertise<br> | Standardize your process<br> | Right the first time, every time!<br> |
| <b>Fast</b>                                                                                                           | <b>Consistent</b>                                                                                               | <b>Complete</b>                                                                                                          |

## Specifications

### DSL Modems

\*Specifications apply to all modems listed unless a modem part is listed after the specification. When listed in the specification, it only applies to parts listed after the specification.

### Test Interface

Replaceable test module; test access over copper test leads (tip A, ring B leads for single channel; T/A, R/B, T1/A1, R1/B1 for bonding) or 8-pin modular (RJ45 type) with pin assignments 4 and 5 for DSL single pair and 3, 4, 5, 6 for DSL bonding.

### Modem Chipset and Version

| Catalog #           | Chipset        | Configuration                                                   |
|---------------------|----------------|-----------------------------------------------------------------|
| ONX-BDCM-GFAST      | Broadcom 63138 | OneExpert Broadcom 63138 (ADSL/VDSL Bonded, G.fast) Test Module |
| ONX-BDCM-DSL-BONDED | Broadcom 63138 | OneExpert Broadcom 63168 (ADSL/VDSL Bonded)                     |
| ONX-BDCM-DSL-ANXAB  | Broadcom 63168 | OneExpert Broadcom 63168 (VDSL, ADSL2+ ANX A/B) test module     |

### G.fast (Fast access to subscriber terminals) Standard Compliance

ITU-T G.9700 for module ONX-BDCM-GFAST

ITU-T G.9701 for module ONX-BDCM-GFAST

### VDSL Standard Compliance

Standard compliance as supported by the Broadcom 63168 and 63138 chipsets

ITU-T G.993.2 — VDSL2

ITU-T-G.998.1 — ATM bonding for module ONX-BDCM-DSL-BONDED and for ONX-BDCM-GFAST

ITU-T-G.998.2 — PTM bonding for module ONX-BDCM-DSL-BONDED and for ONX-BDCM-GFAST

ITU-T-G.993.5 — Self-FEXT cancellation (vectoring)

ITU-T-G.998.4 — Improved impulse noise protection for DSL transceivers

Single-pair profiles: 8a/8b/8c/8d, 12a/12b, 17a, 30a for module ONX-BDCM-GFAST, ONX-BDCM-DSL-BONDED and ONX-BDCM-DSL-ANXAB

Vectoring profiles single-pair: 8a/8b/8c/8d, 12a/12b, 17a for module ONX-BDCM-DSL-BONDED and ONX-BDCM-DSL-ANXAB

Dual-pair profiles: 8a/8b/8c/8d, 12a/12b, 17a for module ONX-BDCM-DSL-BONDED and ONX-BDCM-GFAST

Vectoring profiles single-pair: 8a/8b/8c/8d, 12a/12b, 17a, 35b for module ONX-BDCM-GFAST

Vectoring profiles dual-pair: 8a/8b/8c/8d, 12a/12b, 17a for module ONX-BDCM-DSL-BONDED and ONX-BDCM-GFAST

Band plan 997 and 998, U0 band

ITU G.993.2 Annex Y vector-friendly mode

### ADSL Standard Compliance

Standard compliance as supported by the Broadcom 63168 and 63138 chipsets

ITU-T G.992.1 Annex A, (ADSL)

ITU-T G.992.1 Annex A, B (ADSL) for module ONX-BDCM-DSL-ANXAB

ITU-T G.992.3 Annex A, L (ADSL2)

ITU-T G.992.3 Annex A, B, J, L, M (ADSL2) for module ONX-BDCM-DSL-ANXAB

ITU-T G.992.5 Annex A, M (ADSL2+)

ITU-T G.992.5 Annex A, B, J, M (ADSL2+) for module ONX-BDCM-DSL-ANXAB

|                                                                                                     |
|-----------------------------------------------------------------------------------------------------|
| ITU-T-G.998.1 ATM bonding for module ONX-BDCM-DSL-BONDED and ONX-BDCM-GFAST                         |
| ITU-T-G.998.2 PTM bonding for module ONX-BDCM-DSL-BONDED and ONX-BDCM-GFAST                         |
| ANSI T1.413-1998, Issue 2                                                                           |
| ITU-T G.992.5 INP Amendment 3                                                                       |
| <b>General Settings and Features</b>                                                                |
| Auto sync                                                                                           |
| DSL technology modes G.fast, ADSL, VDSL, auto                                                       |
| PTM mode for ADSL2, ADSL2+, VDSL and G.fast                                                         |
| ATM mode for ADSL, ADSL2, ADSL2+, VDSL2                                                             |
| Auto, ATM, PTM modes configurable                                                                   |
| Vectoring for VDSL2                                                                                 |
| Bonded vectoring support for VDSL2 for module ONX-BDCM-DSL-BONDED and ONX-BDCM-GFAST                |
| Vectoring, vector-friendly, vectoring off modes configurable                                        |
| DSL RTX (G.INP) configurable for upstream/downstream                                                |
| PhyR configurable for upstream/downstream                                                           |
| Seamless rate adaption (SRA) on/off                                                                 |
| Bitswapping on/off                                                                                  |
| Configurable V.43 carrier set                                                                       |
| 24 k interleaving depth on/off                                                                      |
| <b>Modem Status and General Information</b>                                                         |
| VDSL Aggregate Attenuation                                                                          |
| Modem state — synchronization status                                                                |
| Training time                                                                                       |
| Synchronization time                                                                                |
| ADSL mode, VDSL profile                                                                             |
| Transport ATM/PTM/auto                                                                              |
| Single-pair or bonding status                                                                       |
| Vectoring status information                                                                        |
| Estimated loop length                                                                               |
| Download rate                                                                                       |
| <b>Modem Summary Results</b>                                                                        |
| Aggregated Data Rate for ONX-BDCM-GFAST                                                             |
| Actual rate per pair                                                                                |
| Maximum attainable bit rate per pair                                                                |
| Group actual rate for DSL bonding for module ONX-BDCM-DSL-BONDED and ONX-BDCM-GFAST                 |
| Group maximum attainable bit rate for DSL bonding for module ONX-BDCM-DSL-BONDED and ONX-BDCM-GFAST |
| Line capacity per pair                                                                              |
| SNR margin                                                                                          |
| CRC errors and FEC errors                                                                           |
| RTX-UC                                                                                              |
| LATN (line attenuation)                                                                             |
| SATN (signal attenuation)                                                                           |
| <b>Graphical Results</b>                                                                            |
| Signal-to-noise ratio per tone (SNR)                                                                |
| Bits per tone (BPT)                                                                                 |
| Quiet-line noise per tone (QLN)                                                                     |
| Hlog                                                                                                |
| Two traces comparable                                                                               |
| <b>DSL Errors</b>                                                                                   |
| Forward error correction (FEC)                                                                      |
| Forward error correction errors per minute (FEC/min)                                                |
| Cyclic redundancy check errors per minute (CRC)                                                     |

|                                                                            |
|----------------------------------------------------------------------------|
| Cyclic redundancy check (CRC/min)                                          |
| Errored seconds (ES)                                                       |
| Severely errored seconds (SES)                                             |
| Unavailable seconds (UAS)                                                  |
| Loss-of-frame alarm seconds (LOF)                                          |
| Loss-of-signal alarm seconds (LOS)                                         |
| Loss-of-margin alarm seconds (LOM)                                         |
| <b>DSL RTX (G.INP)</b>                                                     |
| Retransmitted DTUs (RTX-TX)                                                |
| Corrected DTUs (RTX-C)                                                     |
| Uncorrected DTUs (RTX-UC)                                                  |
| <b>DSL Signal</b>                                                          |
| Sync count                                                                 |
| Time in synchronization state (uptime)                                     |
| ELE (kl0)                                                                  |
| Estimated Loop Length                                                      |
| Vectoring status                                                           |
| Interleaving status (path)                                                 |
| Interleave delay                                                           |
| Actual INP                                                                 |
| Signal attenuation (SATN)                                                  |
| Line attenuation (LATN)                                                    |
| TX power                                                                   |
| <b>Per Band VDSL2 Statistics</b>                                           |
| Loop attenuation (LATN)                                                    |
| Signal attenuation (SATN)                                                  |
| SNR margin                                                                 |
| Tx power                                                                   |
| <b>DSL Identity</b>                                                        |
| Hardware type (chipset)                                                    |
| Hardware revision (chipset revision)                                       |
| Vendor code                                                                |
| Vendor revision                                                            |
| Vendor software revision                                                   |
| Vendor PHY revision                                                        |
| <b>10/100/1000 Ethernet TE</b>                                             |
| <b>Test Interface</b>                                                      |
| 10/100/1000 Ethernet, RJ45                                                 |
| 2 ports                                                                    |
| <b>Test Results</b>                                                        |
| Link status, speed, duplex                                                 |
| <b>Network</b>                                                             |
| <b>Test Interface</b>                                                      |
| ADSL2+/VDSL2/G.fast modem                                                  |
| Ethernet 10/100/1000 (ports 1 and 2; non-blocking switching between ports) |
| <b>Network Types</b>                                                       |
| DSL/G.fast terminate                                                       |
| DSL/G.fast Trough-router                                                   |
| DSL/G.fast through-bridge                                                  |
| Ethernet terminate                                                         |
| <b>Data Mode</b>                                                           |
| IPoE, PPPoE, multi-VLAN, data off                                          |
| <b>IP Mode</b>                                                             |
| IPv4, IPv6, IPv4/IPv6 dual stack                                           |
| IPoA, PPPoA for xDSL and G.fast                                            |

|                                                                  |
|------------------------------------------------------------------|
| <b>MAC Setting</b>                                               |
| Factory default, user-defined                                    |
| <b>PPP/IP Connectivity</b>                                       |
| BRAS: PAP/CHAP, IPCP                                             |
| RFCs 2516, 1483, 2684                                            |
| <b>VLAN Setting</b>                                              |
| Tag on/off                                                       |
| VLAN interface count 1 to 6                                      |
| ID selection 0-4095                                              |
| Priority selection 0-7                                           |
| <b>LAN Server for DSL Through-Router</b>                         |
| NAT disable/enable                                               |
| IPv4 Server address                                              |
| Netmask                                                          |
| DHCP Server disable/enable                                       |
| Forward Multicast disable/enable                                 |
| <b>IP Setup and Status</b>                                       |
| WAN/LAN status                                                   |
| Gateway/DNS                                                      |
| Static or DHCP                                                   |
| DHCP user class                                                  |
| DHCP vendor class                                                |
| IP release/renew                                                 |
| DNS support WAN and LAN                                          |
| IPv6 mode manual, stateless, DHCPv6 stateful                     |
| DHCPv6 option IA_PD, IA_NA                                       |
| IPv6 global address                                              |
| Local address mode: manual, automatic                            |
| Local IPv6 address                                               |
| Subnet prefix length                                             |
| IPv6 gateway                                                     |
| DNS server                                                       |
| <b>Network Results</b>                                           |
| Network status, IP address, net mask, gateway, DNS, MAC address  |
| Packet statistics rate, bytes, frames, errors, drops, collisions |
| Skew and polarity per pair                                       |
| <b>IP Data</b>                                                   |
| <b>Test Interface</b>                                            |
| ADSL2+/VDSL2, RJ45 and copper test leads                         |
| Ethernet 10/100/1000, RJ45                                       |
| <b>IP Ping</b>                                                   |
| IP ping mode: IPv4, IPv6                                         |
| Echoes sent/received, ping delay (cur/average/max/min)           |
| Lost count/percentage, packet size                               |
| Supports IP address or DNS name destination                      |
| <b>TraceRoute</b>                                                |
| Destination, Hop count, delay per hop                            |
| IPv4/IPv6 Address, DNS Name                                      |
| Transmit Type UDP or ICMP                                        |
| DNS Lookup disabled/enabled                                      |
| <b>File Transfer Throughput Test — Speedtest</b>                 |
| Transfer rate, bytes transferred, transfer status                |
| Transfer protocols FTP, HTTP, HTTPS                              |
| Transfer direction download, upload                              |

|                                                                       |
|-----------------------------------------------------------------------|
| HTTP authentication type none, basic, digest                          |
| Concurrent download disabled, 1, 2, 3                                 |
| Auto repeat disabled, enabled                                         |
| <b>Web Browser</b>                                                    |
| Web connectivity through browser                                      |
| <b>TrueSpeed Option</b>                                               |
| <b>Test Interface</b>                                                 |
| 10/100/1000 Ethernet, RJ45                                            |
| ADSL2+/VDSL2, RJ and copper test leads                                |
| Settings                                                              |
| Primary server                                                        |
| Fallback server                                                       |
| Profile with committed information rate (CIR) for upload and download |
| <b>Measured and Calculated Results</b>                                |
| Actual rate download/upload                                           |
| Ideal rate download/upload                                            |
| TCP efficiency                                                        |
| Round trip time (RTT)                                                 |
| Maximum segment size (MSS)                                            |
| <b>Standards</b>                                                      |
| Viavi TrueSpeed VNF                                                   |
| RFC-6349                                                              |
| <b>IP Video Option</b>                                                |
| <b>Test Interface</b>                                                 |
| xDSL, RJ45 and copper test leads                                      |
| Ethernet 10/100/1000, RJ45                                            |
| <b>Modes</b>                                                          |
| Terminate                                                             |
| <b>Set-Top Box Emulation</b>                                          |
| IGMPv2 and v3 emulation client                                        |
| RTSP emulation client                                                 |
| <b>Service Selection</b>                                              |
| Broadcast auto                                                        |
| Broadcast MPEG2-TS/UDP                                                |
| Broadcast MPEG2-TS/RTP/UDP                                            |
| Broadcast RTP/UDP                                                     |
| Broadcast rolling stream                                              |
| Broadcast TTS/UDP                                                     |
| Broadcast TTS/RTP/UDP                                                 |
| RTSP MPEG2-TS/(RTP)/UDP                                               |
| RTSP MPEG2-TS/(RTP)/TCP                                               |
| RTSP RTP/UDP                                                          |
| RTSP RTP/TCP                                                          |
| <b>Video Settings</b>                                                 |
| IPv4 IGMP version 2, 3                                                |
| RTSP port                                                             |
| RTSP interoperability normal, Oracle, Siemens                         |
| IPv6 MLD version 2, 3                                                 |
| <b>Video Source Address Selection</b>                                 |
| IP address and port number                                            |
| IP address, port number, and VoD URL extension                        |
| RTSP port select                                                      |
| RTSP vendor select                                                    |
| <b>Video Analysis Per Video Stream</b>                                |



|                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Simultaneous stream support                                                                                                                         |
| 6 terminate                                                                                                                                         |
| Number of active streams                                                                                                                            |
| Combined rate, current/max                                                                                                                          |
| <b>QoS</b>                                                                                                                                          |
| Error indicator current/score                                                                                                                       |
| IGMP latency current/score                                                                                                                          |
| RTSP latency current/max/score                                                                                                                      |
| PCR jitter current/max/score/history                                                                                                                |
| RTP packet jitter current/max/score/history                                                                                                         |
| RTP lost current/max/score/history                                                                                                                  |
| Continuity error lost current/max/score/history                                                                                                     |
| Overall current/max/score/history                                                                                                                   |
| <b>Packet Loss Statistics</b>                                                                                                                       |
| RTP loss distance errors current/max/total                                                                                                          |
| RTP loss period errors current/max/total                                                                                                            |
| Minimum RTP loss distance                                                                                                                           |
| Maximum RTP loss period                                                                                                                             |
| RTP packets lost count                                                                                                                              |
| RTP OOS count                                                                                                                                       |
| RTP errors count                                                                                                                                    |
| Continuity errors count                                                                                                                             |
| Ethernet RX errors, RX drops count                                                                                                                  |
| <b>Video Stream Data Results</b>                                                                                                                    |
| Total current/min/max/average                                                                                                                       |
| IP current/min/max/average                                                                                                                          |
| Video current/min/max/average                                                                                                                       |
| Audio current/min/max/average                                                                                                                       |
| Data current/min/max/average                                                                                                                        |
| Unknown current/min/max/average                                                                                                                     |
| <b>Transport Stream Statistics</b>                                                                                                                  |
| Error indicator count                                                                                                                               |
| Continuity errors count                                                                                                                             |
| Sync errors count                                                                                                                                   |
| PAT errors count                                                                                                                                    |
| PMT errors count                                                                                                                                    |
| PID timeouts count                                                                                                                                  |
| Service name                                                                                                                                        |
| Program name                                                                                                                                        |
| <b>QoS Expert</b>                                                                                                                                   |
| Compare two streams for error indicator, lost packets, jitter, latency                                                                              |
| <b>PID Analysis (each stream)</b>                                                                                                                   |
| PID number                                                                                                                                          |
| PID type (video, audio, data, unknown)                                                                                                              |
| PID description                                                                                                                                     |
| <b>Layer Correlation</b>                                                                                                                            |
| Combined result view for Ethernet RX errors, RX dropped, video continuity error, video RTP lost, video loss distance total, video loss period total |
| <b>Standards</b>                                                                                                                                    |
| RFC 2236, IGMP                                                                                                                                      |
| RFC 2326, RTSP                                                                                                                                      |
| ISO (IEC 13818), video transport stream and analysis                                                                                                |
| ETSI TR 10-290 V2.1, video measurements                                                                                                             |
| TFC 1483, RFC-2684, ATM AAL5                                                                                                                        |

|                                                                                                 |                    |
|-------------------------------------------------------------------------------------------------|--------------------|
| <b>VoIP Software Option</b>                                                                     |                    |
| <b>Test Interface</b>                                                                           |                    |
| xDSL, RJ45 and copper test leads                                                                |                    |
| Ethernet 10/100/1000, RJ45                                                                      |                    |
| <b>Supported Signaling Protocols</b>                                                            |                    |
| SIP RFS 3621                                                                                    |                    |
| <b>Supported Codec Configurations</b>                                                           |                    |
| ITU-T G.711 u-law/A-law (PCM/64 kbps)                                                           |                    |
| ITU-T G.722 64K                                                                                 |                    |
| ITU-T G.723.1 (ACELP/5.3, 6.3 kbps)                                                             |                    |
| ITU-T G.726 (ADPCM/32 kbps)                                                                     |                    |
| ITU-T G.729a (GS-ACELP/8 kbps)                                                                  |                    |
| <b>VoIP Settings</b>                                                                            |                    |
| Auto-answer                                                                                     |                    |
| Local alias                                                                                     |                    |
| Outbound alias                                                                                  |                    |
| Proxy gateway                                                                                   |                    |
| Call control port                                                                               |                    |
| 100Rel support                                                                                  |                    |
| SIP interoperability                                                                            |                    |
| Audio codec                                                                                     |                    |
| Frame interval                                                                                  |                    |
| Jitter buffer size                                                                              |                    |
| Mute line                                                                                       |                    |
| User-selectable transmit source (live voice conversation, tone transmit, IP voice announcement) |                    |
| User-selectable silence suppression, jitter buffer                                              |                    |
| RTP Port, IP ToS                                                                                |                    |
| QoS                                                                                             |                    |
| <b>Call Actions</b>                                                                             |                    |
| Clear, mute                                                                                     |                    |
| DTMF in-band                                                                                    |                    |
| <b>Summary Results</b>                                                                          |                    |
| Network and call status                                                                         |                    |
| State log                                                                                       |                    |
| QoS pass/fail                                                                                   |                    |
| MOS, audio codec, local loss, local jitter, local delay                                         |                    |
| <b>QoS Results</b>                                                                              |                    |
| Local overall QoS                                                                               | Actual/history     |
| Remote overall QoS                                                                              | Actual/history     |
| Delay                                                                                           | Min/actual/max     |
| Local jitter                                                                                    | Min/actual/max     |
| Remote jitter                                                                                   | Min/actual/max     |
| Local packet loss                                                                               | Count/actual%/max% |
| Remote packet loss                                                                              | Count/actual%/max% |
| <b>MOS Software Option Results (requires VoIP software option)</b>                              |                    |
| Conversational MOS                                                                              |                    |
| Listener MOS                                                                                    |                    |

|                                             |                                                                              |
|---------------------------------------------|------------------------------------------------------------------------------|
| R-Factor                                    | Conversational, listener, G.107, burst, gap, maximum possible, maximum codec |
| Degradation                                 | Packet loss%, codec%, delay%, reency%, discard%                              |
| <b>Network</b>                              |                                                                              |
| Local throughput                            | Rate, bytes, packets, packets OOS                                            |
| Remote throughput                           | Bytes, packets                                                               |
| Delay                                       | Network, packetization, encoding, buffering, total                           |
| <b>Call Info</b>                            |                                                                              |
| Call duration                               |                                                                              |
| Far end IP                                  |                                                                              |
| Far end name                                |                                                                              |
| Far end alias                               |                                                                              |
| RTCP used                                   |                                                                              |
| Codec RX                                    |                                                                              |
| Codec packetization interval RX             |                                                                              |
| Silence suppression                         |                                                                              |
| Codec TX                                    |                                                                              |
| Codec packetization interval TX             |                                                                              |
| Jitter buffer replayed                      |                                                                              |
| Jitter buffer dropped                       |                                                                              |
| <b>Wiring Tools</b>                         |                                                                              |
| <b>Test Interface</b>                       |                                                                              |
| RJ45 and RJ11 (Wire Mapping)                |                                                                              |
| <b>Tests</b>                                |                                                                              |
| Wire mapping with Wire Mapping Smart Remote |                                                                              |
| Locate cable runs with resistive IDs        |                                                                              |
| Hub flash                                   |                                                                              |
| Port discovery                              |                                                                              |
| Ping tool                                   |                                                                              |
| <b>Wire Mapping Results</b>                 |                                                                              |
| Pin assignment mapping                      |                                                                              |
| Loop length per pair                        |                                                                              |
| Opens                                       |                                                                              |
| Shorts                                      |                                                                              |
| <b>Resistive ID Results</b>                 |                                                                              |
| Label ID number                             |                                                                              |
| Pin pairs                                   |                                                                              |
| Resistance value                            |                                                                              |
| Auto-detect interface RJ11 or RJ45          |                                                                              |
| <b>Hub Flash Results</b>                    |                                                                              |

|                                                                       |
|-----------------------------------------------------------------------|
| Remote Ethernet port flash for 10/100/1000 Mbps Ethernet ports        |
| <b>Port Discovery Results</b>                                         |
| Port capability, duplex, established link, skew and polarity per pair |
| <b>Ping Tool Results</b>                                              |
| Ping reply and delay to Gateway, DNS, Host/IP                         |
| <b>WiFi (internal)</b>                                                |
| <b>Test Interface</b>                                                 |
| 802.11 b/g/n (2.4 GHz)                                                |
| <b>Tests</b>                                                          |
| WiFi scan                                                             |
| WiFi access point                                                     |
| <b>WiFi Scan Results</b>                                              |
| SSID (secure set identification)                                      |
| Channel                                                               |
| Security setting                                                      |
| Power level                                                           |
| MAC address                                                           |
| <b>WiFi Scan Modes</b>                                                |
| AP List (Access Point)                                                |
| Channel graph                                                         |
| Time graph                                                            |
| <b>WiFi Access Point</b>                                              |
| Configure OneExpert as WiFi access point (Ethernet to WiFi bridge)    |
| <b>WiFi Advisor (sold separately)</b>                                 |
| <b>Test Device</b>                                                    |
| WFED-300AC                                                            |
| <b>Test Interface</b>                                                 |
| 802.11 a/b/g/n/ac 3x3                                                 |
| Band support for 2.4 GHz and 5GHz                                     |
| <b>BSSID View</b>                                                     |
| Real-time RSSI                                                        |
| Noise                                                                 |
| SSID                                                                  |
| BSSID/MAC                                                             |
| Channel utilization                                                   |
| Channel width                                                         |
| Security                                                              |
| Standard                                                              |
| SNR                                                                   |
| <b>Channel View</b>                                                   |
| RSSI                                                                  |
| Channel utilization                                                   |
| Noise                                                                 |
| Channel score by channel                                              |
| Best channels recommendation                                          |
| <b>Spectral View</b>                                                  |
| Real-time spectral measurements                                       |
| Max hold                                                              |
| <b>Site Assessment Assistant</b>                                      |

|                                                                                                     |                                             |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------|
| TrueMargin™ measurement                                                                             |                                             |
| Coaxial Cable Testing                                                                               |                                             |
| Test Interface                                                                                      |                                             |
| Coax using SmartID or SmartID Plus                                                                  |                                             |
| Test Probes (near end)                                                                              |                                             |
| SmartID, SmartID Plus                                                                               |                                             |
| Settings                                                                                            |                                             |
| Supports any cable coax type with configurable velocity of propagation (VOP) and cable compensation |                                             |
| Tests                                                                                               |                                             |
| Locate cable runs with active RFIDs (requires SmartID Plus)                                         |                                             |
| Single-ended coax map (SECM)                                                                        |                                             |
| Tests Using SmartIDs as Remote Probes                                                               |                                             |
| Locate cable runs with SmartIDs                                                                     |                                             |
| Dual-ended coax map (DECM)                                                                          |                                             |
| VDSL home-run check tests home coax runs for VDSL service use                                       |                                             |
| Whole-home check tests the entire coax network physical layer prior to HPNA test                    |                                             |
| Test Results                                                                                        |                                             |
| Noise ingress and frequency sweep test summary with pass/fail results                               |                                             |
| Mapped overview of coax network                                                                     |                                             |
| Detailed view of cable lengths, faults, splitters, filters, amplifiers                              |                                             |
| Graphically depicts frequency sweep data                                                            |                                             |
| HPNA Network Test                                                                                   |                                             |
| Test Interface                                                                                      |                                             |
| Ethernet RJ45 interface to CPE                                                                      |                                             |
| Tests                                                                                               |                                             |
| Quick and chronic test                                                                              |                                             |
| Settings                                                                                            |                                             |
| Configurable minimum PHY rate                                                                       | 12 – 256                                    |
| Configurable SNR                                                                                    | 0 – 40                                      |
| Configurable max packet loss                                                                        | 0 – 99 (quick)<br>0 – 9,999 (chronic)       |
| Payload length size                                                                                 | 6 – 1482                                    |
| Number of packets to send                                                                           | 0 – 5,000 (quick)<br>0 – 5000,000 (chronic) |
| General Connection Status                                                                           |                                             |
| Station list including indication of the host                                                       |                                             |
| Device ID number                                                                                    |                                             |
| Device MAC address                                                                                  |                                             |
| Device HPNA CopperGate® chipset firmware and version identification                                 |                                             |
| HPNA Network Results                                                                                |                                             |
| Segment specific rate, constellation, and baud                                                      |                                             |
| Segment specific packet error rate (PER)                                                            |                                             |
| Segment specific SNR                                                                                |                                             |
| Segment specific receive power                                                                      |                                             |
| Segment MAC addresses                                                                               |                                             |

| Fiber Test                                                         |                                      |           |
|--------------------------------------------------------------------|--------------------------------------|-----------|
| Optical Fiber Power Meter                                          |                                      |           |
| USB optical power meter                                            | MP-60, MP-80                         |           |
| Min/max/average optical power level and wavelength                 | dBm, mW                              |           |
| Connector input                                                    | Universal 2.5 and 1.25 mm connectors |           |
| Power source                                                       | USB port                             |           |
| Selectable pass/fail threshold                                     |                                      |           |
| Signal QoS                                                         |                                      |           |
| Reference value                                                    |                                      |           |
| Optical Fiber Scope                                                |                                      |           |
| USB optical fiber scope                                            | P5000i                               |           |
| Results for zone defects                                           | Pass/fail                            |           |
| Results for zone scratches                                         | Pass/fail                            |           |
| Low mag field-of-view (FOV)                                        | Horizontal 740 μm, vertical 550 μm   |           |
| High mag field-of-view (FOV)                                       | Horizontal 370 μm, vertical 275 μm   |           |
| Particle size detection                                            | <1 μm                                |           |
| Power source                                                       | USB port                             |           |
| Setting for profile, tip, focus meter, button action               |                                      |           |
| Actions for live mode, test mode, high magnification               |                                      |           |
| Probe model, serial, firmware                                      |                                      |           |
| Copper Test - DVOM                                                 |                                      |           |
| Test Interface                                                     |                                      |           |
| Tip/A – ring/B – ground/earth                                      |                                      |           |
| Range                                                              | Resolution                           | Accuracy  |
| AC Volts                                                           |                                      |           |
| 0 – 300 V peak                                                     | 1 V                                  | 2% ±1 V   |
| DC Volts                                                           |                                      |           |
| 0 – 300 V                                                          | 1 V                                  | 2% ±1 V   |
| Resistance                                                         |                                      |           |
| 0 – 999 Ω                                                          | 1 Ω                                  | 2% ±2.5 Ω |
| 1 – 9.99 kΩ                                                        | 10 Ω                                 | 2%        |
| 10 – 99.9 kΩ                                                       | 100 Ω                                | 2%        |
| 100 – 999 kΩ                                                       | 1 kΩ                                 | 2%        |
| 1.0 – 9.9 MΩ                                                       | 10 kΩ                                | 6.5%      |
| 10.0 – 100 MΩ                                                      | 100 kΩ                               | 2%        |
| Leakage                                                            |                                      |           |
| 0 – 49.99 Ω                                                        | 1 Ω                                  | 2% ±2.5 Ω |
| 50 – 999 Ω                                                         | 1 Ω                                  | 5% ±2.5 Ω |
| 1.0 – 9.99 kΩ                                                      | 10 Ω                                 | 2%        |
| 10.0 – 99.9 kΩ                                                     | 100 Ω                                | 2%        |
| 100 – 999 kΩ                                                       | 1 kΩ                                 | 2%        |
| 1.0 – 9.9 MΩ                                                       | 10 kΩ                                | 5%        |
| 10 – 99.9 MΩ                                                       | 100 kΩ                               | 10%       |
| 100 – 999MΩ                                                        | 1 MΩ                                 | 15%       |
| Distance to Short                                                  |                                      |           |
| (conversion from resistance measurement depending on cable setup)  |                                      |           |
| 0 – 30 k ft (0 – 10 km)                                            |                                      |           |
| Capacitance/Opens                                                  |                                      |           |
| (conversion from capacitance measurement depending on cable setup) |                                      |           |
| 0 – 471 nF                                                         | 1% ±15 pF                            |           |

|                                                                                 |                |                  |
|---------------------------------------------------------------------------------|----------------|------------------|
| 471 nf – 1.57 uF                                                                | 2%             |                  |
| 0 – 3 k ft (0 – 999 m)                                                          | 1 ft (1 m)     |                  |
| 3 – 10 k ft (1 – 3.3 km)                                                        | 10 ft (1 m)    |                  |
| 10 –100 k ft (1 – 33.3 km)                                                      | 100 ft (10 m)  |                  |
| <b>DC Current</b>                                                               |                |                  |
| 0 – 110 mA                                                                      |                |                  |
| <b>Longitudinal Balance</b>                                                     |                |                  |
| 28 – 70 dB                                                                      | 1 dB           | ±2 dB            |
| 70 – 120 dB                                                                     | 1 dB           | Indication only  |
| <b>Calculated Balance</b>                                                       |                |                  |
| <b>Power Influence (PI) – Noise to Ground</b>                                   |                |                  |
| +45 to +120 dBr n                                                               | 1 dB           | ±2 dB            |
| –45 to +30 dBm                                                                  | 1 dB           | ±2 dB            |
| <b>Metallic Noise</b>                                                           |                |                  |
| +5 to +50 dBr n                                                                 | 1 dB           | ±2 dB            |
| –85 dBn to –40 dBm                                                              | 1 dB           | ±2 dB            |
| <b>Calculated Balance</b>                                                       |                |                  |
| 28 to 95 dB                                                                     | 1 dB           | ±2 dB            |
| <b>Filters</b>                                                                  |                |                  |
| IEEE 743 C-Message (dBr nC), IEEE 743 3K Flat (dBr n), O.41 Psophometric (dBmP) |                |                  |
| <b>Load Coil Counter</b>                                                        |                |                  |
| up to 5 ±1                                                                      |                |                  |
| <b>TDR</b>                                                                      |                |                  |
| <b>Test Interface</b>                                                           |                |                  |
| Tip A – ring B                                                                  |                |                  |
| <b>Range</b>                                                                    |                | <b>Accuracy</b>  |
| 0 to 30 k ft (0 to 10 km)                                                       |                | 0.5% of distance |
| <b>Test Modes</b>                                                               |                |                  |
| OneCheck TDR                                                                    |                |                  |
| Standard                                                                        |                |                  |
| SmartGain TDR                                                                   |                |                  |
| In-home                                                                         |                |                  |
| OneCheck TDR                                                                    |                |                  |
| <b>Features</b>                                                                 |                |                  |
| World view                                                                      |                |                  |
| Peak hold                                                                       |                |                  |
| QuickRange                                                                      |                |                  |
| Reference trace set, show, save, load                                           |                |                  |
| Stress TDR                                                                      |                |                  |
| <b>Typical Test Case</b>                                                        |                |                  |
| 500 ft (150 m) bridged tap visible at 18 k ft (5500 m) on a 20 k ft (6000 m)    |                |                  |
| 24 AWG cable/0.5 mm cable                                                       |                |                  |
| <b>Short Range</b>                                                              |                |                  |
| 0 to 1000 ft (0 to 305 m)                                                       | 0.3 ft (0.1 m) | 1 ft (0.3 m)     |
| TDR at VOP = 0.67 (AWG=24 or 0.5 mm)                                            |                |                  |
| <b>UFED</b>                                                                     |                |                  |
| TDR helper                                                                      |                |                  |
| <b>POTS</b>                                                                     |                |                  |
| <b>Test Interface</b>                                                           |                |                  |
| RJ11, tip A – ring B                                                            |                |                  |
| <b>POTS Dialer</b>                                                              |                |                  |
| DTMF or pulse-dial mode                                                         |                |                  |
| Ring detect                                                                     |                |                  |

|                                                                                                                                                                                                                                     |                           |                      |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------|----------|
| Caller ID (Bellcore Telcordia TR-TSY-000030)                                                                                                                                                                                        |                           |                      |          |
| Call log (last 10 calls)                                                                                                                                                                                                            |                           |                      |          |
| Phonebook (quick dial)                                                                                                                                                                                                              |                           |                      |          |
| Copper TIMS Option                                                                                                                                                                                                                  |                           |                      |          |
| Wideband Characteristics                                                                                                                                                                                                            |                           |                      |          |
| Range                                                                                                                                                                                                                               | Resolution                | Accuracy             |          |
| Frequency                                                                                                                                                                                                                           |                           |                      |          |
| 10 kHz to 30 MHz                                                                                                                                                                                                                    |                           | 50 ppm               |          |
| Amplitude                                                                                                                                                                                                                           |                           |                      |          |
| −80 to +10 dBm                                                                                                                                                                                                                      | 0.1 dB                    | ±2 dB                |          |
| Termination 100 Ω, 120 Ω, 135 Ω                                                                                                                                                                                                     |                           |                      |          |
| Narrowband (VF) Characteristics                                                                                                                                                                                                     |                           |                      |          |
| Frequency                                                                                                                                                                                                                           |                           |                      |          |
| 200 Hz to 10 kHz                                                                                                                                                                                                                    |                           | 50 ppm               |          |
| Amplitude                                                                                                                                                                                                                           |                           |                      |          |
| −40 to +10 dBm                                                                                                                                                                                                                      | 0.1 dB                    | ±0.5 dB              |          |
| 50 to 100 dBr n                                                                                                                                                                                                                     | 0.1 dB                    | ±0.5 dB              |          |
| Termination 100 Ω, 120 Ω, 135 Ω                                                                                                                                                                                                     |                           |                      |          |
| Technology Filter Selection                                                                                                                                                                                                         |                           |                      |          |
| Custom, ADSL, ADSL2+, VDSL 8 MHz, VDSL 12 MHz, VDSL 12 MHz ISDN, VDSL 17 MHz, VDSL 17 MHz ISDN, HDSL, G-filter, G2-filter, J-25K8, J-138K8, J25K12, J-138K12, J-25K17, J-138K17, E-filter, F-filter, E1, no filter, power influence |                           |                      |          |
| Spectral Test                                                                                                                                                                                                                       |                           |                      |          |
| Technology filter selection                                                                                                                                                                                                         |                           |                      |          |
| Spectral Power Influence test                                                                                                                                                                                                       |                           |                      |          |
| Set reference, show reference                                                                                                                                                                                                       |                           |                      |          |
| Max hold                                                                                                                                                                                                                            |                           |                      |          |
| Configurable external bridge                                                                                                                                                                                                        |                           |                      |          |
| Power spectral density                                                                                                                                                                                                              |                           | dBm, dBm / Hz, dBr n |          |
| Span Selection                                                                                                                                                                                                                      | Range                     | Resolution           | Accuracy |
| Narrowband Frequency Range                                                                                                                                                                                                          |                           |                      |          |
| Power influence                                                                                                                                                                                                                     | 0 Hz to 1.5 kHz           | 1.9 Hz               | 50 ppm   |
| POTS                                                                                                                                                                                                                                | 0 Hz to 10 kHz            | 2.9 Hz               | 50 ppm   |
| Wideband Frequency Range                                                                                                                                                                                                            |                           |                      |          |
| ADSL2+                                                                                                                                                                                                                              | 20.484 kHz to 2.2 MHz     | 1.078 KHz            | 50 ppm   |
| VDSL 8 MHz                                                                                                                                                                                                                          | 21.562 kHz to 7.5 MHz     | 2.156 KHz            | 50 ppm   |
| VDSL 12 MHz                                                                                                                                                                                                                         | 21.562 kHz to 7.5 MHz     | 2.156 KHz            | 50 ppm   |
| VDSL 17 MHz                                                                                                                                                                                                                         | 17.25 kHz to 17.3 MHz     | 4.3125 KHz           | 50 ppm   |
| VDSL 30 MHz                                                                                                                                                                                                                         | 17.25 kHz to 30 MHz       | 8.625 KHz            | 50 ppm   |
| Custom range selection                                                                                                                                                                                                              |                           |                      |          |
| Amplitude                                                                                                                                                                                                                           |                           |                      |          |
|                                                                                                                                                                                                                                     | −80 dBm to 0 dBm          | 0.1 dB               | ±2 dB    |
|                                                                                                                                                                                                                                     | −130 dBm/Hz to −40 dBm/Hz | 0.1 dB               | ±2 dB    |
| Viewable range                                                                                                                                                                                                                      |                           |                      |          |
|                                                                                                                                                                                                                                     | −130 dBm to 30 dBm        |                      |          |
|                                                                                                                                                                                                                                     | −160 dBm/Hz to −20 dBm/Hz |                      |          |

|                                                                                                                                                                      |                    |                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|
| Narrowband and Wideband RX Tones and Loss                                                                                                                            |                    |                            |
| Meter and list view                                                                                                                                                  |                    |                            |
| Configurable External Bridge                                                                                                                                         |                    |                            |
| Power level                                                                                                                                                          | dBm, dBr n         |                            |
| Narrowband and Wideband Noise                                                                                                                                        |                    |                            |
| Technology filter selection                                                                                                                                          |                    |                            |
| Configurable external bridge                                                                                                                                         |                    |                            |
| Custom filter                                                                                                                                                        |                    |                            |
| Noise power actual/min/max                                                                                                                                           | dBm, dBr n         |                            |
| Wideband Impulse Noise                                                                                                                                               |                    |                            |
| Technology filter selection                                                                                                                                          |                    |                            |
| Elapsed Time counter                                                                                                                                                 |                    |                            |
| Threshold, +3 dB threshold, -3 dB threshold                                                                                                                          |                    |                            |
| Configurable external bridge                                                                                                                                         |                    |                            |
| Configurable dead time                                                                                                                                               |                    |                            |
| Timeline view                                                                                                                                                        | dBm, dBr n, mV     |                            |
| Counter view                                                                                                                                                         | dBm, dBr n, mV     |                            |
| Wideband Impulse Noise Capture                                                                                                                                       |                    |                            |
| Technology filter selection                                                                                                                                          |                    |                            |
| Single and continuous capture                                                                                                                                        |                    |                            |
| Trigger threshold                                                                                                                                                    |                    |                            |
| Time and frequency domain capture                                                                                                                                    | dBm, dBr n         |                            |
| Capture display                                                                                                                                                      | 10%, 50%, 90%      |                            |
| RFL Test Option                                                                                                                                                      |                    |                            |
| Resistive Fault Locator                                                                                                                                              |                    |                            |
| Single and multiple gauge selection                                                                                                                                  |                    |                            |
| Temperature adjustment                                                                                                                                               |                    |                            |
| UFED support                                                                                                                                                         |                    |                            |
| Results for distance to short (DTS), distance to fault (DTF), distance short to fault (DSTF), resistance to short (RTS), resistance to fault (RTF), fault resistance |                    |                            |
|                                                                                                                                                                      | Range              | Accuracy                   |
| Fault resistance (RF)                                                                                                                                                | 0 to 20 MΩ         |                            |
| Loop resistance                                                                                                                                                      | 0 to 7 kΩ          |                            |
| Resistance to Fault (RTF)                                                                                                                                            | RTS 1 Ω to 99 Ω    | 0.1% RTS ±0.1Ω<br>±RF/10MΩ |
|                                                                                                                                                                      | RTS 100 Ω to 999 Ω | 0.2% RTS ±0.1Ω<br>±RF/5MΩ  |
| K-Test                                                                                                                                                               |                    |                            |

|                                                                                                              |                                                               |                                 |
|--------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------|
| Two-sided fault test                                                                                         |                                                               |                                 |
| Results include fault resistance 1, fault resistance 2                                                       |                                                               |                                 |
| UFED support                                                                                                 |                                                               |                                 |
|                                                                                                              | Range                                                         | Accuracy                        |
| Fault resistance (RF)                                                                                        | 0 to 20 MΩ                                                    |                                 |
| Loop resistance                                                                                              | 0 to 7 kΩ                                                     |                                 |
| Resistance to fault (RTF)                                                                                    | RTS 100 Ω to 999 Ω                                            | 3% of Resistance to strap (RTS) |
| Mobile Device Application                                                                                    |                                                               |                                 |
| iOS Support                                                                                                  |                                                               |                                 |
| 8.0 to 9.1                                                                                                   |                                                               |                                 |
| StrataSync                                                                                                   |                                                               |                                 |
| Asset management                                                                                             |                                                               |                                 |
| Data management                                                                                              |                                                               |                                 |
| General                                                                                                      |                                                               |                                 |
| Power Supply                                                                                                 |                                                               |                                 |
| Battery                                                                                                      | Li-ion internal rechargeable, 7.4 V nominal voltage, 6600 mAh |                                 |
| Operating time >4 hours for typical use cases                                                                |                                                               |                                 |
| Auto power down (adjustable)                                                                                 |                                                               |                                 |
| AC line operation via external adapter/car charger                                                           |                                                               |                                 |
| Connector                                                                                                    |                                                               |                                 |
| DSL test module                                                                                              | 8-pin modular (RJ45 type)                                     |                                 |
| Ethernet                                                                                                     | 2 x 8-pin modular (RJ45)                                      |                                 |
| T/A, R/B, T1/A1, R1/B1 and ground/Earth                                                                      | 2 mm recessed banana                                          |                                 |
| POTS                                                                                                         | 8-pin modular (RJ45) and tip A – ring B                       |                                 |
| USB                                                                                                          | 2 x USB 2.0 client ports                                      |                                 |
| Connectivity                                                                                                 |                                                               |                                 |
| USB flash drive                                                                                              |                                                               |                                 |
| Remote operation                                                                                             |                                                               |                                 |
| Mobile device application                                                                                    |                                                               |                                 |
| Bluetooth                                                                                                    |                                                               |                                 |
| Standard                                                                                                     | Bluetooth 2.1 + EDR, Bluetooth 4.0 ready                      |                                 |
| WiFi                                                                                                         |                                                               |                                 |
| Standard                                                                                                     | 802.11 b/g/n (2.4 GHz)                                        |                                 |
| Audio Support                                                                                                |                                                               |                                 |
| Speaker/microphone                                                                                           |                                                               |                                 |
| Bluetooth headset                                                                                            |                                                               |                                 |
| USB headset                                                                                                  |                                                               |                                 |
| Permissible Ambient Temperature                                                                              |                                                               |                                 |
| Nominal range of use                                                                                         | 0 to 50°C (32 to 122°F)                                       |                                 |
| Storage and transport                                                                                        | -10 to 60°C (14 to 140°F)                                     |                                 |
| Humidity                                                                                                     |                                                               |                                 |
| Operating humidity                                                                                           | 10 to 90%                                                     |                                 |
| Water/Dust Ingress                                                                                           |                                                               |                                 |
| Complies with IP54                                                                                           | Designed to comply with IP54                                  |                                 |
| Display                                                                                                      |                                                               |                                 |
| 127 mm (5 in) diagonal color WVGA (800 x 480 pixels) backlit LCD with projected capacitive multitouch screen |                                                               |                                 |
| Physical                                                                                                     |                                                               |                                 |



## Ordering Information

The OneExpert can be ordered fully configured for high-end ADSL2+/VDSL2 /G.fast and copper test demands or scaled for specific needs and applications, such as all fiber only without copper.

| <b>Included Test Applications</b><br>(all mainframes and package orders except noted differently below) |                        |
|---------------------------------------------------------------------------------------------------------|------------------------|
| <b>Copper on mainframe ONX-580</b>                                                                      |                        |
| TDR                                                                                                     |                        |
| OneCheck Copper                                                                                         |                        |
| DVOM                                                                                                    |                        |
| Opens                                                                                                   |                        |
| Longitudinal balance                                                                                    |                        |
| Load coil                                                                                               |                        |
| POTS TDR                                                                                                |                        |
| <b>Wiring Tools</b>                                                                                     |                        |
| Wire map on mainframe ONX-580                                                                           |                        |
| Hub flash                                                                                               |                        |
| Port discovery                                                                                          |                        |
| Ping tool                                                                                               |                        |
| <b>IP Data Tests</b>                                                                                    |                        |
| Web browser                                                                                             |                        |
| IP ping                                                                                                 |                        |
| FTP/HTTP speed test                                                                                     |                        |
| <b>WiFi</b>                                                                                             |                        |
| Scan                                                                                                    |                        |
| Access point                                                                                            |                        |
| <b>Coax — SmartID<sup>1</sup></b>                                                                       |                        |
| Locate IDs                                                                                              |                        |
| Single-ended coax map                                                                                   |                        |
| Dual-ended coax map                                                                                     |                        |
| Whole home check                                                                                        |                        |
| <b>StrataSync</b>                                                                                       |                        |
| 1-year asset management                                                                                 |                        |
| Description                                                                                             | Part Number            |
| <b>Mainframe</b>                                                                                        |                        |
| OneExpert; ONX-580 <sup>2</sup>                                                                         | ONX-580                |
| OneExpert; ONX-580A <sup>2</sup>                                                                        | ONX-580A               |
| Battery                                                                                                 | ONX580-BATTERY-48WH    |
| AC universal power adapter                                                                              | AC-CHARGER             |
| <b>Module</b>                                                                                           |                        |
| OneExpert Broadcom 63168 (bonded ready) test module                                                     | ONX580-BDCM-DSL-BONDED |
| OneExpert Broadcom 63168 (VDSL, ADSL2+ ANX A/B) test module                                             | ONX-BDCM-DSL-ANXAB     |
| OneExpert cover module                                                                                  | ONX-COVER              |
| <b>Software Options</b>                                                                                 |                        |
| ADSL/VDSL bonding option for module ONX-BDCM-DSL-BONDED                                                 | ONX580-BONDED          |
| G.fast option for module ONX-BDCM-GFAST                                                                 | ONX580-GFAST           |
| VDSL2 profile 35b option for module ONX-BDCM-GFAST                                                      | ONX580-V35B            |
| Apple device connectivity                                                                               | ONX580-APPLE-001       |
| Bluetooth                                                                                               | ONX580-BLUETOOTH       |
| HPNA                                                                                                    | ONX580-HPNA            |

| TrueSpeed                                                       | ONX-TRUESPEED          |
|-----------------------------------------------------------------|------------------------|
| IP video                                                        | ONX580-IPVIDEO         |
| VoIP                                                            | ONX-VOIP               |
| MOS <sup>3</sup>                                                | ONX-MOS                |
| Resistive fault locator                                         | ONX580-RFL             |
| Transmission impairments and spectral <sup>4</sup>              | ONX580-TIMS            |
| Description                                                     | Part Number            |
| <b>Cables</b>                                                   |                        |
| CAT5 cable, shielded, RJ45                                      | CB-016994              |
| Lineman dual pair DSL/copper, bed of nails clips                | CB-008502              |
| Lineman dual pair DSL/copper, telco clips                       | CB-008501              |
| Single pair DSL/copper, T/R/GND – A/B/Earth, bed of nails clips | CB-PAIR1-BON-GND       |
| Single pair DSL/copper, T1/R1 – A1/B1, bed of nails             | HSTDVOM-BON-YW-BL      |
| Pair 1 DSL/copper cable 4 mm safety banana, T/R – A/B           | HSTDVOM-4MM-RED-BLK    |
| Pair 2 DSL/copper cable 4 mm safety banana, T1/R1 – A1/B1       | HSTDVOM-4MM-YW-BL      |
| Ground/earth lead — regular telco clip                          | HSTDVOMCLIPGREEN       |
| Pair 1 DSL/copper WB2 4 mm safety banana, T/R/GND – A/B/Earth   | CB-00686               |
| Pair 2 DSL/copper WB2 4 mm safety banana, T1/R1 – A1/B1         | CB-00688               |
| Telco clip package for 4 mm banana                              | CB-CLIPS               |
| Spectral monitor cable                                          | CB-SPE-MON             |
| SmartID USB cable 6 ft                                          | SMARTID-USBCABLE-6FT   |
| SmartID USB cable 3 ft                                          | SMARTID-USBCABLE-3FT   |
| <b>Accessories</b>                                              |                        |
| Large carrying case                                             | CC-034601              |
| Small carrying case                                             | CC-CARRYING-CASE-SMALL |
| Test Module case                                                | CC-MODULE-CASE         |
| Soft glove                                                      | AC-GLOVE               |
| Strand hook                                                     | HST-000-098-01         |
| Hand strap                                                      | AC-HANDSTRAP           |
| Shoulder strap                                                  | AC-005101              |
| Car adapter                                                     | AC-CAR-CHARGER         |
| USB headset                                                     | CUSB-HEADSET           |
| Bluetooth headset                                               | AC-BLUETOOTH-HEADSET   |
| SmartID Plus incl. micro USB cable                              | SMARTID-PLUS-IPC-TELCO |
| SmartID Plus 1 unit                                             | SMARTID_PLUS_IPC       |
| SmartID, 6 units                                                | SMARTID-6PC-TELCO-KIT  |
| SmartID accessory kit                                           | SMARTID-ACCKIT-TELCO   |
| Wire mapping smart remote; RJ11, RJ45                           | AC-WIREMAP-REMOTE      |
| UFEDIIB bonded far end device with standard accessories         | UFEDIIB-PKG-1          |
| SDI-100 WAND                                                    | SDI-100                |
| MP-60 – USB optical power meter                                 | MP-60A                 |
| P5000i – USB fiber scope                                        | FBP-P5000I             |
| <b>Wifi Advisor</b>                                             |                        |
| Wifi Advisor Basic Package                                      | WFED300AC-1PC          |
| WiFi Advisor Installer Package                                  | WFED300AC-2PC          |
| <b>Services and Support Plans</b>                               |                        |
| Bronze Support Plan 5 years                                     | BRONZE-5               |
| Silver Support Plan 3 years                                     | SILVER-3               |
| Silver Support Plan 5 years                                     | SILVER-5               |

1. Requires SmartID and SmartID Plus to be ordered separately.

2. Includes test applications as specified above. Requires selection of battery, AC universal power adapter, and power cord.

3. Requires VoIP software option.

4. Enables copper RX tones, spectral, WB noise, wideband impulse noise, wideband impulse noise capture.

## Packages

| Package Description                         | Test Module            |                    |           | Software Options |     |      | Test Cables |             |                                   |                         |          |       | Probes          |      | Part Number           |
|---------------------------------------------|------------------------|--------------------|-----------|------------------|-----|------|-------------|-------------|-----------------------------------|-------------------------|----------|-------|-----------------|------|-----------------------|
|                                             | ONX580-BDCM-DSL-BONDED | ONX-BDCM-DSL-ANXAB | ONX-COVER | DSL Bonded       | RFL | TIMS | 5-leads BON | 3-leads BON | 2-leads 4 mm banana + earth telco | 3-leads WB2 4 mm banana | CB-CLIPS | CAT-5 | Wire Map Remote | UFED |                       |
| ONX-580 DSL bonded standard                 | ✓                      |                    |           | ✓                |     |      | ✓           |             |                                   |                         |          |       |                 |      | ONX580-DSL-BONDED-P1  |
| ONX-580 DSL bonded advanced                 | ✓                      |                    |           | ✓                | ✓   | ✓    | ✓           |             |                                   |                         |          |       |                 |      | ONX580-DSL-BONDED-P2  |
| ONX-580 DSL bonded complete                 | ✓                      |                    |           | ✓                | ✓   | ✓    | ✓           |             |                                   |                         |          |       |                 | ✓    | ONX580-DSL-BONDED-P3  |
| ONX-580 DSL bonded home standard            | ✓                      |                    |           | ✓                |     |      | ✓           |             |                                   |                         |          | ✓     | ✓               |      | ONX580-DSL-HOME-P4    |
| ONX-580 DSL bonded home advanced            | ✓                      |                    |           | ✓                | ✓   | ✓    | ✓           |             |                                   |                         |          | ✓     | ✓               |      | ONX580-DSL-HOME-P5    |
| ONX-580 DSL bonded home complete            | ✓                      |                    |           | ✓                | ✓   | ✓    | ✓           |             |                                   |                         |          | ✓     | ✓               | ✓    | ONX580-DSL-HOME-P6    |
| ONX-580 DSL standard                        | ✓                      |                    |           |                  |     |      |             |             | ✓                                 |                         | ✓        | ✓     | ✓               |      | ONX580-DSL-P7         |
| ONX-580 DSL advanced                        | ✓                      |                    |           |                  | ✓   | ✓    |             |             | ✓                                 |                         | ✓        | ✓     | ✓               |      | ONX580-DSL-P8         |
| ONX-580 DSL complete                        | ✓                      |                    |           |                  | ✓   | ✓    |             |             | ✓                                 |                         | ✓        | ✓     | ✓               | ✓    | ONX580-DSL-P9         |
| ONX-580 DSL ANX-A-B standard                |                        | ✓                  |           |                  |     |      |             |             | ✓                                 |                         | ✓        | ✓     | ✓               |      | ONX580-DSL-ANXAB-P14  |
| ONX-580 DSL ANX-A-B advanced                |                        | ✓                  |           |                  | ✓   | ✓    |             |             | ✓                                 |                         | ✓        | ✓     | ✓               |      | ONX580-DSL-ANXAB-P15  |
| ONX-580 DSL ANX-A-B complete                |                        | ✓                  |           |                  | ✓   | ✓    |             |             | ✓                                 |                         | ✓        | ✓     | ✓               | ✓    | ONX580-DSL-ANXAB-P16  |
| ONX-580 DSL ANX-A-B-30 MHz advanced package |                        | ✓                  |           |                  |     | ✓    |             |             |                                   | ✓                       | ✓        | ✓     | ✓               |      | ONX580-DSL-ANXAB-P18  |
| ONX-580 Copper BON Standard                 |                        |                    | ✓         |                  |     |      |             | ✓           |                                   |                         |          |       | ✓               |      | ONX580-Copper-BON-P20 |
| ONX-580 Copper (4mm) Standard               |                        |                    | ✓         |                  |     |      |             |             | ✓                                 |                         | ✓        |       | ✓               |      | ONX580-Copper-P23     |



5 leads BON and 3-leads BON (Red, Black, Green)



2-leads 4mm banana + earth telco



CB-CLIPS



CAT-5



SmartRemote/  
Wire Map Remote

## Standard Equipment

All packages include ONX-580 mainframe, battery, AC universal power adapter, glove, handstrap, large carrying case, and strand hook.



Power cord choice  
varies by country



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