

VIAVI

OneExpert DSP (ONX-220)

Installation/service meter with ONX DNA, making it unequalled in speed, simplicity and value.

When home network quality is unreliable, customers become dissatisfied and are more likely to churn. At the same time technical complexity is increasing, but technician skill and experience at the installation service tier is typically minimal. It's never been more important to have quick, effective troubleshooting tools that enable techs to quickly and efficiently verify performance as advertised. The ONX-220 is fast, complete, and follows up testing with simple cloud data storage to enable real-time close-out and reporting.

Benefits

- Fastest and most comprehensive tool for verifying high speed DOCSIS service activation and performance
- Rugged build quality, workmanship, and reliability expected from VIAVI and our years of measurement experience
- Technicians now have access to a rugged, precise measurement instrument at a budget minded price
- Best balance of features, performance, and cost – designed to meet the budgets of installers and contractors



Key Features

- **AutoChannel™** instantaneous channel lineup detection eliminates need for lineup editing, updating and deploying
- **OneCheck** comprehensive mistake-proof automated tests, including: ingress, downstream channels and DOCSIS carriers at three demarcation points (Tap, GB, CPE)
- **DOCSISCheck** real-time analysis and powerful DOCSIS carrier and data service troubleshooting; upstream and/or downstream
- **ChannelCheck** real-time analysis and powerful downstream QAM, OFDM, and Analog carriers troubleshooting
- **DQI (Digital Quality Index)** focuses on raw information condition on the physical path, immediately detects intermittent and sustained issues within the stream
- Integrated Bluetooth connectivity enables leveraging mobile device GPS and multi-media capabilities with VIAVI Android/iOS Mobile Tech App
- Ready for high-speed Gigabit Ethernet and DOCSIS and WiFi* service testing, unavailable with other low-cost competing products
- **OneCheck Fiber** consolidates tests with P5000i and FiberChek Pro optical inspection scopes, SmartOTDR optical time domain reflectometer and MP60/80 optical power meter

* Network service testing is included only on Plus and Pro models.

Specifications

| Frequency | | | |
|----------------------------------|---|----------------------------|--|
| Range | Diplexer | Upstream | Downstream |
| Automatically Switching Diplexer | 42/85 | 5 - 42 MHz and 5 - 85 MHz | 54 - 1,004 MHz and 108 - 1,218 MHz |
| | 65/204 | 5 - 65 MHz and 5 - 204 MHz | 83 - 1,218 MHz and 258 MHz - 1,218 MHz |
| Accuracy | ±10 ppm typical @25°C | | |
| Downstream Analysis | | | |
| AutoChannel plan builder | Auto detection of channel parameters (analog/digital, symbols, QAM) | | |
| Max input power | 38 dBmV total integrated power | | |
| Return loss | >6 dB | | |
| Upstream Analysis | | | |
| Ingress spectrum scan | 5.0 – 204 MHz | | |
| Sensitivity | –38 dBmV | | |
| RBW | 100 kHz | | |
| Min detectable level upstream | –38 dBmV | | |
| Accuracy | ±2 dB typical at 25°C | | |
| Return loss | >6 dB | | |

| Analog Channel Measurement | |
|---|--|
| Video and audio levels (dual) | |
| Standards | NTSC , PAL |
| Min detectable signal | –50 dBmV (single channel) |
| Level accuracy | ±1.5 dB from –20 dBmV to +15 dBmV typical at 25°C; ±2.0 dB, –10°C to +50°C |
| RBW | 300 kHz |
| Carrier to Noise | |
| Channel types | NTSC , PAL, non-scrambled |
| Range | 30 to 51 dB (NTSC, 4 MHz measurement bandwidth) |
| Required input level | 0 to +15 dBmV with 77 analog channels present, maximum ±15 dB tilt 50 to 1,000 MHz |
| Accuracy | ±2.0 dB within specified measurement range ≤ 600 MHz |
| Downstream Digital Channel Analysis | |
| Calibrated power levels | –20 dBmV to +15 dBmV |
| Level accuracy | ±1.5 dB from –20 dBmV to +15 dBmV typical at 25°C; ±2.0 dB, –10°C to +50°C |
| Modulation(s) | 64, 128, and 256 QAM, OFDM |
| Annex A: 5.057 to 6.952 MSPS | |
| Annex B: 5.057 for 64 QAM and 5.361 MSPS for 256 QAM | |
| Annex C: 5.274 MSPS for 64 QAM and 5.361 MSPS for 256 QAM | |
| Full span MER | |
| Ingress under carrier — full span ingress noise trace | |
| Group delay and in-channel frequency response (ICFR) | |
| Digital quality index (DQI) over time | |
| Errored/severely errored seconds | |
| Level, measured symbol rate, carrier frequency, modulation, interleaver depth (data log only) | |

Specifications Continued

| Hum Measurement | |
|-----------------------|------------------|
| Hum frequency range | 25 Hz to 1000 Hz |
| Minimum MER | 33 dB |
| Accuracy up to 5% hum | +/- 0.8% |
| From 5 to 10% | +/- 1.0% |

| OFDM Signal Performance Metrics | |
|---|---|
| OFDM Channels | 24 - 192 MHz wide - up to 3 active OFDM channels |
| Level — max, min, average, standard deviation | relative to a 6 MHz carrier per CableLabs® |
| MER — max, min, average, standard deviation, percentile | 16 to 44 dB |
| MER channel band graph | max, min, avg across entire OFDM carrier |
| Noise | max |
| Echo | dBc |
| ICFR | in-carrier frequency response (dB) |
| Spectrum/IUC | spectrum display, including carrier and ingress under carrier |

| OFDM Profile Analysis |
|---|
| Profiles A, B, C, D, NCP, and PLC (more profiles as implemented) |
| Lock status, codeword errors (corrected and uncorrected) |

| DOCSIS Testing |
|--|
| Supports DOCSIS 3.1 bonding up to 32 SC-QAM + 2 OFDM downstream channels, 8 SC-QAM + 2 OFDMA upstream channels |
| Compliant with CableLabs® specifications for DOCSIS 3.1 |
| Compliant with CableLabs® specifications for DOCSIS 3.0 (32x8 bonding) |

| Displayed DOCSIS Results | |
|--------------------------|---|
| Top level | Number of bonded channels, min receive level, max BER (pre-FEC), min and max MER, max transmit level, max ICFR (in-channel frequency response) |
| Details | Downstream SC-QAM (over time charts: level, MER, BER, DQI), Upstream (charts: transmit over time, upstream ICFR, upstream EQ taps |
| Service tests | Registration, Throughput, Ping/Traceroute, Packet Quality; cable modem pass-through |
| OFDM | OFDM selected in scan, number of subcarriers, PLC lock status, frequency, level, and MER, CWE (corr, uncorr); OFDM channel(s) - Level variation (max, min, avg), MER variation (max, min, avg), ICFR, profile analysis (locked, CWE corr, CWE uncorr) |

| Downstream | |
|-----------------|--|
| Frequency range | 42/65/85/204 to 1,218 MHz (dependent on currently active diplexer frequency) |

| Upstream | |
|----------------------------|--|
| Frequency range | 5 to 204 MHz (dependent on currently active diplexer frequency) |
| OFDMA channels | ≥2, per DOCSIS specification |
| Transmit level range (max) | +61 to +48 dBmV depending on modulation format and number of bonded carriers, per DOCSIS specification |
| SC-QAM channels | up to 8 per DOCSIS specification |

Specifications Continued

| MER | | |
|--|--|------------------------------|
| Specified range ¹ (with input level -5 to +15 dBmV) | 21 to 40 dB, 64 QAM; 28 to 40 dB, 256 QAM; 16 to 44 dB OFDM | |
| Max displayable range | 50 dB | |
| Resolution | 0.1 dB | |
| Accuracy | ±2 dB typical at 25°C | |
| Minimum lock level | -15 dBmV | |
| BER — ChannelCheck and DOCSISCheck mode | Down to 1E-9 (pre and post FEC) | |
| BER — OneCheck mode | Down to 1E-8 (pre and post FEC) default; 1E-9 user selectable | |
| Interleaver depth | 128, 8 max | |
| Display/Interface/Usability | | |
| High-brightness color LCD (800 x 480) | 5 inch diagonal | |
| Touch screen | Capacitive | |
| Boot time | Approximately 20 sec | |
| Environmental | | |
| For indoor/outdoor use | IP 54 light rain (0.5 in/hr; 1.27 cm/hr) | |
| Pollution | 2° | |
| Drop | 1 m (3.3 ft) onto concrete | |
| Temp range | Operating | -10 to 50°C (14 to 122°F) |
| | Storage temp | -20 to 60°C (-4 to 140°F) |
| Humidity | 10 – 90% RH non-condensing | |
| RF immunity | 8.5 V/m (for CATV measurements) | |
| Maximum altitude | 4000 m (13,123 ft) | |

1. MER range declines as input levels decrease. Expected MER range at MIN LOCK level of -15 dBmV

| Input/Outputs | |
|---|--|
| RF | F connector replaceable |
| Charge Port | USB-C |
| USB Port | USB 3.0 (Type A) |
| Ethernet | RJ45 10/100/1000T |
| Power | USB-C |
| Remote Access/Connectivity | |
| VNC accessible via IP address | |
| HTTPS file access via IP address | |
| Mobile Tech application via Bluetooth | |
| Smart Access Anywhere (option) via IP network or the Internet, which can be via Ethernet, WiFi or mobile hot-spot | |
| Battery | |
| Field replaceable 48 WHr 7.4 V, 6-cell Lilon | |
| Typical battery life | 8 hr typical usage |
| Battery charge time | 2 Hrs (90%) 3 Hrs 100% (included USB-C charger) |
| StrataSync Reporting Capability | |
| Session based (job/work order) file saving of results gathered at TAP, GB, and CPE | |
| Measurement screen capture save and recall | |
| StrataSync Core | Asset and data management |
| StrataSync Plus | Optional extended data management (6 years) |
| Warranty | |
| Instrument | 1-year warranty (See http://www.viavisolutions.com/services-and-support/support/warranty-terms-and-conditions for warranty details) |
| Accessories and battery | One-year warranty |

Specifications Continued

| Dimensions | |
|------------------------------------|---|
| Width | 5.27 in (133.88 mm) |
| Height | 9.96 in (252.89 mm) |
| Depth | 2.23 in (57.33 mm) |
| Weight | |
| Device (without protective case) | 3.10 lb (1.41 kg) |
| Protective case and shoulder strap | 1.10 lb (0.50 kg) |
| WiFi (Plus & Pro Models Only) | |
| Test interface | 802.11 a/b/g/n/ac (2.4/5 GHz) |
| Tests | WiFi scan |
| Antennas | 3x3 |
| Scan results | SSID (secure set identification); Channel; Security setting; Power level; MAC address |
| Scan modes | Channel graph; Time graph |
| Fiber Test | |
| <i>Optical Fiber Power Meter</i> | |
| USB optical power meter | MP-60, MP-80 |
| Measurement units | dBm, mW, dB |
| Connector input | Universal 2.5 and 1.25 mm connectors |
| Power source | USB port |

| 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 | |
| Standard Accessories | |
| Protective case with hand strap and detachable shoulder strap | |
| AC power supply with country-specific adaptor plugs (USA, UK, Euro, Australia, China) | |
| Quick start guide | |
| StrataSync Core support | |

Ordering Information

| Description | | Part Number |
|--|----------------------|-------------------------|
| SW Pkg | Dual Diplexer | Model |
| Base | 42/85 MHz | ONX-220-42-85-D31-BASE |
| | 65/204 MHz | ONX-220-65-204-D31-BASE |
| Plus | 42/85 MHz | ONX-220-42-85-D31-PLUS |
| | 65/204 MHz | ONX-220-65-204-D31-PLUS |
| Pro | 42/85 MHz | ONX-220-42-85-D31-PRO |
| | 65/204 MHz | ONX-220-65-204-D31-PRO |
| Options | | |
| Home Leakage Software Option | | ONX-2XX-SW-OPT-HL-LKG |
| Source Transmitter | | ONX-2XX-SW-OPT-SRC |
| Cable Fault Finder | | ONX-2XX-SW-OPT-XDR |
| Smart Access Anywhere (w/ unit purchase) | | ONX-2XX-SW-OPT-SAA |
| Smart Access Anywhere (field upgrade) | | UPG-ONX-2XX-SW-SAA |
| Bronze and Silver Warranty Extensions | | |
| Three-Year Warranty | | BRONZE-3 |
| Five-Year Warranty | | BRONZE-5 |
| Three-Year Warranty and One Calibration | | SILVER-3 |
| Five-Year Warranty and Two Calibrations | | SILVER-5 |
| General Accessories | | |
| ONX-220 Vehicle Charger with Integrated Cable | | ONX-2XX-PWR-ADPT-VEH |
| Strand Hook for OneExpert and DSP Meters | | 1019-00-1366 |
| ONX-220 Soft-Sided Case with Shoulder Strap | | ONX-2XX-CASE-BASIC |
| Test Accessories | | |
| P5000i USB Fiber Scope | | FBP-P5000I |
| MP-80 USB optical power meter | | MP-80A |
| MP-60 USB optical power meter | | MP-60A |
| Replacement Parts | | |
| ONX-220 Wall Charger with Integrated Cable | | ONX-2XX-PWR-ADPT-WALL |
| ONX-220 Field Replaceable Battery (48 WHR) | | ONX-2XX-BATT-48WHR |
| OneExpert Field Replaceable F-connectors (25 pack) | | ONX-CATV-FCON-25PK |
| ONX-220 Form-Fitted Case with Shoulder Strap | | ONX-2XX-CASE-DELUXE |
| Replacement Screen Protector (5 Pack) | | ONX-SCREEN-PROTECTION |

ONX-220 Feature Matrix

OneCheck – Dashboard

| | ONX-220 | | |
|---------------------|---------|------|-----|
| Measurement Feature | BASE | PLUS | PRO |
| Ingress Scan | ■ | ■ | ■ |
| Downstream Summary | ■ | ■ | ■ |
| DOCSIS Summary | ■ | ■ | ■ |

OneCheck – Downstream Details

| | ONX-220 | | |
|---|---------|------|-----|
| Measurement Feature | BASE | PLUS | PRO |
| Full Channel Scan | ■ | ■ | ■ |
| Basic Channel Details – Level, MER, BER, C/N, DQI | ■ | ■ | ■ |
| Advanced Channel Details – Echo, GD, ICFR | | | ■ |
| System View – Max dB Delta, Max Video Delta | ■ | ■ | ■ |
| Favorites (up to 32 Channels) | ■ | ■ | ■ |
| Tilt | ■ | ■ | ■ |
| Off-Air Ingress Detection (Downstream IUC) | ■ | ■ | ■ |
| MER & BER Graph (All Channels) | | | ■ |
| Smart Scan | | | ■ |

OneCheck – DOCSIS Details

| | ONX-220 | | |
|--|---------|------|-----|
| Measurement Feature | BASE | PLUS | PRO |
| Downstream DOCSIS Channel Scan | ■ | ■ | ■ |
| Basic Downstream Channel Details – Level, MER, BER, C/N, DQI | ■ | ■ | ■ |
| Advanced Downstream Channel Details – Echo, GD, ICFR | | | ■ |
| Upstream DOCSIS Channel Scan | ■ | ■ | ■ |
| Basic Upstream Channel Details – Tx Level, Modulation Type | ■ | ■ | ■ |
| Advanced Upstream Channel Details – ICFR | | | ■ |
| DOCSIS Throughput | | ■ | ■ |
| DOCSIS Packet Quality | | ■ | ■ |

ONX-220 Feature Matrix

| ChannelCheck | | | |
|---|---------|------|-----|
| | ONX-220 | | |
| Measurement Feature | BASE | PLUS | PRO |
| Full Channel Scan | ■ | ■ | ■ |
| Basic Channel Details – Level, MER, BER, C/N, DQI | ■ | ■ | ■ |
| Advanced Channel Details – Echo, GD, ICFR | | | ■ |
| System View – Max dB Delta, Max Video Delta | ■ | ■ | ■ |
| Favorites (up to 32 Channels) | ■ | ■ | ■ |
| Tilt | ■ | ■ | ■ |
| DQI Over Time | | | ■ |
| Level Over Time | | | ■ |
| MER Over Time | | | ■ |
| BER Over Time | | | ■ |
| Downstream ICFR | | | ■ |
| Downstream IUC | | | ■ |
| SmartScan | | | ■ |
| Constellation | ■ | ■ | ■ |

| DOCSISCheck | | | |
|--|---------|------|-----|
| | ONX-220 | | |
| Measurement Feature | BASE | PLUS | PRO |
| Downstream DOCSIS Channel Scan | ■ | ■ | ■ |
| Basic Downstream Channel Details – Level, MER, BER, C/N, DQI | ■ | ■ | ■ |
| Advanced Downstream Channel Details – Echo, GD, ICFR | | | ■ |
| DQI Over Time | | | ■ |
| Level Over Time | | | ■ |
| MER Over Time | | | ■ |
| BER Over Time with ES/SES | | | ■ |
| Downstream ICFR | | | ■ |
| Downstream IUC | | | ■ |
| Upstream DOCSIS Channel Scan | ■ | ■ | ■ |
| Basic Upstream Channel Details – Tx Level, Modulation Type | ■ | ■ | ■ |
| Advanced Upstream Channel Details – ICFR | | | ■ |
| Transmit Over Time | | | ■ |
| Upstream ICFR | | | ■ |
| Speed Check – Throughput | | ■ | ■ |
| Packet Quality – Packet Loss, Round Trip Delay, Jitter | | ■ | ■ |
| Ping & Traceroute | | ■ | ■ |
| Pass Through Modem RJ-45 Port | | ■ | ■ |

ONX-220 Feature Matrix

| Network Connectivity Modes | | | |
|-------------------------------|---------|------|-----|
| | ONX-220 | | |
| Measurement Feature | BASE | PLUS | PRO |
| DOCSIS Cable Modem | ■ | ■ | ■ |
| Pass Through Modem RJ-45 Port | | ■ | ■ |
| Ethernet | ■ | ■ | ■ |
| WiFi | ■* | ■ | ■ |
| Bluetooth | ■ | ■ | ■ |
| Mobile App Integration | ■ | ■ | ■ |

| DOCSIS 3.1 Testing | | | |
|--|---------|------|-----|
| | ONX-220 | | |
| Measurement Feature | BASE | PLUS | PRO |
| Automatic SC QAM Signal Detection, Identification, and Measurement in Scan | ■ | ■ | ■ |
| Bonding Verification SC QAM (32 x 8) and OFDM (2 x 2) | ■ | ■ | ■ |
| OFDM Signal Level Variation – Min/Avg/Max | ■ | ■ | ■ |
| PLC – Detection, Lock Status, Level, MER, and CWE | ■ | ■ | ■ |
| NCP – Lock Status and CWE | ■ | ■ | ■ |
| Profile Analysis – Lock Status and CWE | ■ | ■ | ■ |
| OFDM Ingress Under Carrier Analysis | ■ | ■ | ■ |
| Web Browser | ■ | ■ | ■ |
| Ping & Trace Route | | ■ | ■ |
| Speed Check – Throughput | | ■ | ■ |

* Base model has WiFi connectivity only (no testing)

ONX-220 Feature Matrix

Ethernet Testing

| | ONX-220 | | |
|--------------------------|---------|------|-----|
| Measurement Feature | BASE | PLUS | PRO |
| Web Browser | ■ | ■ | ■ |
| Ping & Trace Route | | ■ | ■ |
| Speed Check – Throughput | | ■ | ■ |
| Ookla Speed Test | | ■ | ■ |

WiFi Testing

| | ONX-220 | | |
|--------------------------|---------|------|-----|
| Measurement Feature | BASE | PLUS | PRO |
| 2.4 & 5 GHz Network Scan | | ■ | ■ |
| Web Browser | ■ | ■ | ■ |

Fiber Optic Modes

| | ONX-220 | | |
|--|---------|------|-----|
| Measurement Feature | BASE | PLUS | PRO |
| OneCheck Fiber | ■ | ■ | ■ |
| Optical Fiber Scope Support – P5000i | ■ | ■ | ■ |
| Optical Power Measurement Support – MP60/MP80 | ■ | ■ | ■ |
| Optical Time Domain Reflectometer Support – Smart OTDR | ■ | ■ | ■ |

VIAVI Care Support Plans

Increase your productivity for up to 5 years with optional VIAVI Care Support Plans:

- Maximize your time with on-demand training, priority technical application support and rapid service.
- Maintain your equipment for peak performance at a low, predictable cost.

Contact your local representative for more information on VIAVI Care Support Plan options or visit:

viasolutions.com/viavicareplan

Features

*5-year plans only

| Plan | Objective | Technical Assistance | Factory Repair | Priority Service | Self-paced Training | 5 Year Battery and Bag Coverage | Factory Calibration | Accessory Coverage | Express Loaner |
|---|------------------------------------|----------------------|----------------|------------------|---------------------|---------------------------------|---------------------|--------------------|----------------|
|  BronzeCare | Technician Efficiency | Premium | ✓ | ✓ | ✓ | | | | |
|  SilverCare | Maintenance & Measurement Accuracy | Premium | ✓ | ✓ | ✓ | ✓* | ✓ | | |
|  MaxCare | High Availability | Premium | ✓ | ✓ | ✓ | ✓* | ✓ | ✓ | ✓ |



Contact Us **+1 844 GO VIAVI**
(+1 844 468 4284)

To reach the VIAVI office nearest you,
visit viasolutions.com/contact.

© 2020 VIAVI Solutions Inc.
Product specifications and descriptions in this document are subject to change without notice.
onx220-ds-cab-nse-ae
30187793 906 1220

viasolutions.com