

# VIAVI 180 DSP

## SIGNAL LEVEL METER

Das 180 DSP von Trilithic ist ein Signalpegelmessgerät speziell zugeschnitten für die Installation und Fehlersuche bei HF-Signalen. Das 180 DSP ist mit allen Testmöglichkeiten ausgestattet die ein Techniker braucht, um sowohl analoge als auch digitale Signale überprüfen zu können und sichert somit eine hochqualitative Installation.



- Rückweg-Spektrum-Analyse (4 bis 110 MHz)
- Pegelmessung
- C/N Messung
- QAM Messung (MER/BER/Konstellation/EQ)
- Vollständiger Kanalplan-Scan mit Schräglagenmessung
- Ping, Trace Route, VoIP & Durchsatz-Messungen
- Automatische Erkennung von Kanal-Plänen
- Multi-User Support
- Mehr-Sprachen-Unterstützung
- Erstellen Sie Aufgaben einfach am Messgerät
- Eingebauter Web-Browser, Echtzeit-Datenübertragung
- Interaktiver Basis-HF Installationsvorgang

## SPEZIFIKATIONEN

| LEVEL MEASUREMENT                        |                                                                                                                                                                |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Channel Bandwidth                        | 6 MHz and 8 MHz                                                                                                                                                |
| Amplitude Range                          | -40 dBmV to +50 dBmV                                                                                                                                           |
| Modulation Types                         | Analog: NTSC, PAL B/D/G/H/I/K/N and SECAM B/D/G/H/I/K<br>Digital: 16/32/64/128/256 QAM Annex A, 64/256 QAM Annex B/C, OFDM 4K/8K*                              |
| Analog Measurement Accuracy              | ±0.75 dB @ 77° F (25° C);<br>±2.0 dB from 0 to 122° F (-18 to 50° C)                                                                                           |
| Digital Measurement Accuracy             | ±0.75 dB @ 77° F (25° C);<br>±2.5 dB from 0 to 122° F (-18 to 50° C)                                                                                           |
| Display Resolution                       | 0.1 dB                                                                                                                                                         |
| SPECTRUM MEASUREMENT                     |                                                                                                                                                                |
| Frequency Range**                        | Return Path: 4 to 205 MHz<br>Forward Path: 5 to 1250 MHz                                                                                                       |
| Dual Return Path Diplexers               | 42 MHz: 4 to 42 MHz<br>85 MHz: 4 to 85 MHz                                                                                                                     |
| Manually Adjustable Resolution Bandwidth | Return Path: 300 kHz<br>Forward Path: 10, 30, 100, and 300 kHz; 1 and 3 MHz                                                                                    |
| Auto Ranging Resolution Bandwidth        | 10 kHz: Span ≤ 3.5 MHz<br>30 kHz: Span ≤ 12.0 MHz<br>100 kHz: Span ≤ 35.9 MHz<br>300 kHz: Span ≤ 300 MHz<br>1 MHz: Span ≤ 359.2 MHz<br>3 MHz: Span ≥ 359.3 MHz |
| Display Spans                            | Return Path: 4 to 42 MHz, 4 to 65 MHz, 4 to 85 MHz or 4 to 205 MHz<br>Forward Path: User-selectable in 1 kHz steps                                             |
| Display Scale                            | 1, 2, 5, 7.5 or 10 dB/division                                                                                                                                 |
| Display Range                            | 8 vertical divisions (when marker bar is hidden)                                                                                                               |
| Spurious Free Dynamic Range              | 60 dB @ 25° C (77° F) (+50 dBmV)                                                                                                                               |
| Sensitivity (terminated)                 | Return Path: -40 dBmV (4 to 205 MHz)<br>Forward Path: -40 dBmV (5 to 1250 MHz)                                                                                 |
| DIGITAL CHANNEL MEASUREMENT              |                                                                                                                                                                |
| Deep Interleave Compatibility            | Yes                                                                                                                                                            |
| Downstream MER                           | 40 ±2 dB @ +6 dBmV RF Input Level<br>34 ±2 dB @ -6 dBmV RF Input Level                                                                                         |
| Downstream BER                           | Method: True BER, derived from code words not from MER<br>Standard: ITU J.83 annex A, B, C<br>Range: 1 E-7 to 1 E-9 @ -6 dBmV RF Input Level                   |

|              |                                  |
|--------------|----------------------------------|
| Symbol Rates | $\geq 2$ MSPS; $\leq 6.952$ MSPS |
|--------------|----------------------------------|

\* DOCSIS 3.1 option equipped meters only

\*\* Forward spectrum analysis is optional on the 180 DSP-Lite

| CARRIER-TO-NOISE MEASUREMENT (IN-SERVICE, NON-SCRAMBLED STANDARD CHANNELS ONLY)** |                                           |
|-----------------------------------------------------------------------------------|-------------------------------------------|
| Minimum Input Level for Full Range                                                | +10 dBmV                                  |
| Dynamic Range                                                                     | 50 dB                                     |
| Resolution                                                                        | < 0.5 dB                                  |
| TILT MEASUREMENT                                                                  |                                           |
| Max Number of Carriers                                                            | 14 (dependent on favorite channel setup)  |
| High/Low Delta Resolution                                                         | 0.1 dB                                    |
| Scan                                                                              | Video, audio, pilot, and digital carriers |
| ANALOG AND DIGITAL HUM (IN-SERVICE, NON-SCRAMBLED STANDARD CHANNELS ONLY)         |                                           |
| Minimum Input Level                                                               | 0 dBmV                                    |
| Range                                                                             | 0 to 5%                                   |
| Resolution                                                                        | 0.10%                                     |
| Accuracy                                                                          | $\pm 0.5\%$                               |

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\*\* Hum is optional on 180 DSP-Lite

| SOURCE GENERATOR (ADVANCED MODEL ONLY) |                                                                                                                 |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Modulation                             | CW, 16 QAM, 32 QAM, 64 QAM, 128 QAM, 256 QAM, OFDM (4K/8K)*                                                     |
| OFDM Subcarrier Modulation             | 16 to 4096 QAM, PLC Configurable*                                                                               |
| Frequency Range                        | 5 to 85 MHz                                                                                                     |
| Source Width                           | CW: 50 kHz<br>QAM: 6 MHz<br>OFDM: 6 to 24 MHz*                                                                  |
| Amplitude                              | CW: Adjustable from 10 to 55 dBmV<br>QAM: Adjustable from 10 to 45 dBmV<br>OFDM: Adjustable from 10 to 40 dBmV* |
| QAM Symbol Rates                       | 0.64, 1.28, 2.56, 5.12 MSPS                                                                                     |
| QAM Error Rates                        | BER: Adjustable from 0 to 1.00E-2<br>MER: > 38 dB                                                               |
| CW Source Accuracy                     | $\pm 2$ dB                                                                                                      |

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| PHYSICAL                          |                                                                                                                                                                 |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction                      | Rubber overmolded plastic housing                                                                                                                               |
| Control                           | Glow in the dark keypad and LCD touchscreen and/or via a wireless connection to a mobile device such as a laptop, tablet, iPad® or iPhone®, or Android® handset |
| Display                           | Color LCD touchscreen,<br>180/360: 480 x 272 pixels (approx 4" x 2.25");<br>1G: 800 x 480 pixels (approx 4.5" x 2.75")                                          |
| Annunciators                      | Audible annunciator for key strokes                                                                                                                             |
| Antenna                           | Internal WiFi antenna, 2 dB gain                                                                                                                                |
| Flashlight                        | High-intensity LED (0.25W)                                                                                                                                      |
| Dimensions w/o Case (H x W x D)   | 8.6 x 6.1 x 2.00 in (21.84 x 15.94 x 5.08 cm)                                                                                                                   |
| Dimensions w/ Case (H x W x D)    | 9.6 x 7.1 x 3.00 in (24.38 x 18.03 x 7.62 cm)                                                                                                                   |
| Weight w/o Case                   | 360 DSP: 2.9 lbs (1.32 Kg); 1G DSP: 3.75 lbs (1.70 Kg)                                                                                                          |
| Weight w/ Case                    | 360 DSP: 3.9 lbs (1.79 Kg); 1G DSP: 4.75 lbs (2.15 Kg)                                                                                                          |
| AVAILABLE INTERFACE TYPES         |                                                                                                                                                                 |
| Tx Test Port                      | 75 Ohm Replaceable F-Type Connector<br>Source Generator Output Transmission Only                                                                                |
| Tx/Rx Test Port                   | 75 Ohm Replaceable F-Type Connector<br>Upstream and Downstream RF Measurements<br>DOCSIS 3.1 Modem                                                              |
| Ethernet                          | RJ45 Management Port (10/100 Mbps)                                                                                                                              |
| USB                               | USB 2.0 Type-A Standard Port                                                                                                                                    |
| BATTERY AND POWER                 |                                                                                                                                                                 |
| Charge Time                       | 4 hours                                                                                                                                                         |
| Battery                           | Two 2600 mAh @ 7.4V Li-Ion internal batteries, factory replaceable                                                                                              |
| Power Adapter                     | Input: 100 to 240 VAC ~ 50 to 60 Hz, 1.2A Max<br>Output: 15 VDC, 3.34A                                                                                          |
| ENVIRONMENTAL                     |                                                                                                                                                                 |
| Storage and Operating Temperature | -18° to +50° C (0° to 122° F)                                                                                                                                   |

## BESTELLINFORMATIONEN

| MODELL                                                                           | BESCHREIBUNG                        | ARTIKELNUMMER                                                               |
|----------------------------------------------------------------------------------|-------------------------------------|-----------------------------------------------------------------------------|
| 180 DSP-Lite                                                                     | Installations- und Servicemessgerät | TRI-DSP-180-LITE                                                            |
| 180 DSP Base                                                                     | Installations- und Servicemessgerät | TRI-DSP-180-BASE                                                            |
| 180 DSP Advanced                                                                 | Plus FDR und Source Generator       | TRI-DSP-180-ADV                                                             |
| OPTIONALES ZUBEHÖR                                                               | BESCHREIBUNG                        | ARTIKELNUMMER                                                               |
| I/O-15                                                                           | Präzisionstestkabel                 | TRI-ACCY-RF-TEST-CBL                                                        |
| I-Stop 1 GHz Test Probe                                                          | Ingress Troubleshooting Probe       | TRI-ISTOP-1000MHZ or<br>TRI-ISTOP-1250MHZ                                   |
| TLB-46                                                                           | Rückweg-Messungs-Low-Pass Filter    | TRI-TLB-46-LPF                                                              |
| MP-80A                                                                           | USB Optischer Leistungsmesser       | MP-80A                                                                      |
| P5000i USB Fiber Scope                                                           | USB Glasfaser Mikroskop             | FBP-P5000i                                                                  |
| Erstanz-Case                                                                     |                                     | TRI-DSP-180-CASE-REPL,<br>TRI-DSP-360-CASE-REPL, or<br>TRI-DSP-1G-CASE-REPL |
| Ersatz-Traggurt                                                                  |                                     | TRI-DSP-STRAP-REPL                                                          |
| Ersatz-Ladegerät (ohne Netzkabel)                                                |                                     | TRI-DSP-PWR-ADPT-NEW                                                        |
| BESTELLINFORMATIONEN                                                             |                                     |                                                                             |
| Seeker Home Leakage Companion Kit Seeker HL Source Transmitter, Antenna and Case |                                     | TRI-LKG-HL-METER-KIT DSP                                                    |
| Meter Leakage Software Option                                                    |                                     | TRI-DSP-SW-HL-LKG-OPT                                                       |

## FEATURE MATRIX

| Modell                                      | 180 DSP<br>LITE | 180 DSP | 360 DSP | 1G DSP |
|---------------------------------------------|-----------------|---------|---------|--------|
| <b>ANALOG NTSC/PAL CHANNEL MEASUREMENTS</b> |                 |         |         |        |
| Video/Audio Level                           | ■               | ■       | ■       | ■      |
| Delta V/A                                   | ■               | ■       | ■       | ■      |
| Carrier-to-Noise                            | ■               | ■       | ■       | ■      |
| Hum                                         | Option          | ■       | ■       | ■      |
| <b>DIGITAL QAM CHANNEL MEASUREMENTS</b>     |                 |         |         |        |
| Level                                       | ■               | ■       | ■       | ■      |
| Pre/Post BER                                | ■               | ■       | ■       | ■      |
| MER                                         | ■               | ■       | ■       | ■      |
| Constellation                               | ■               | ■       | ■       | ■      |
| Equalizer                                   | ■               | ■       | ■       | ■      |
| BER vs Time                                 | ■               | ■       | ■       | ■      |
| Errored Seconds                             | ■               | ■       | ■       | ■      |
| Severely Errored Seconds                    | ■               | ■       | ■       | ■      |
| Hum                                         | Option          | ■       | ■       | ■      |
| <b>DIGITAL OFDM CHANNEL MEASUREMENTS*</b>   |                 |         |         |        |
| Average Level                               | ■               | ■       | ■       | ■      |
| Max P/V                                     | ■               | ■       | ■       | ■      |
| In-Channel Tilt                             | ■               | ■       | ■       | ■      |
| PLC Constellation                           | ■               | ■       | ■       | ■      |
| PLC Level                                   | ■               | ■       | ■       | ■      |
| PLC Pre/Post BER                            | ■               | ■       | ■       | ■      |
| PLC MER                                     | ■               | ■       | ■       | ■      |
| Decoder Stress vs Time                      | ■               | ■       | ■       | ■      |
| Default Profile Summary                     | ■               | ■       | ■       | ■      |
| <b>CABLE MODEM STATISTICS</b>               |                 |         |         |        |
| Priority                                    |                 |         | ■       | ■      |
| Channel Frequency                           |                 |         | ■       | ■      |
| Tx/Rx Level                                 |                 |         | ■       | ■      |
| Signal-to-Noise Ratio                       |                 |         | ■       | ■      |
| Pre/Post BER/CWER                           |                 |         | ■       | ■      |
| MER                                         |                 |         | ■       | ■      |
| <b>CABLE MODEM OFDM MEASUREMENTS*</b>       |                 |         |         |        |
| Summary for All Profiles                    |                 |         | ■       | ■      |
| Advanced Profile Statistics                 |                 |         | ■       | ■      |
| Multiple Profile Selection                  |                 |         | ■       | ■      |
| Continuous Pilot Distributed MER            |                 |         | ■       | ■      |
| Subcarrier Measurement Details              |                 |         | ■       | ■      |

\* DOCSIS 3.1 option equipped meters only

| Modell                                                 | 180 DSP<br>LITE | 180 DSP  | 360 DSP  | 1G DSP    |
|--------------------------------------------------------|-----------------|----------|----------|-----------|
| <b>NET TESTS</b>                                       |                 |          |          |           |
| Ping                                                   | ■               | ■        | ■        | ■         |
| Trace Route                                            | ■               | ■        | ■        | ■         |
| Throughput                                             | ■               | ■        | ■        | ■         |
| VoIP                                                   | ■               | ■        | ■        | ■         |
| Modem Speed Test                                       |                 |          | ■        | ■         |
| <b>MISCELLANEOUS FEATURES</b>                          |                 |          |          |           |
| Tilt Measurement                                       | ■               | ■        | ■        | ■         |
| Channel Plan Auto Discovery                            | ■               | ■        | ■        | ■         |
| Channel Plan Scan                                      | ■               | ■        | ■        | ■         |
| Multi-language support                                 | ■               | ■        | ■        | ■         |
| Create jobs right on the meter                         | ■               | ■        | ■        | ■         |
| Interactive basic RF installation process              | ■               | ■        | ■        | ■         |
| Forward Spectrum Analysis (5 to 1250 MHz)              | Option          | ■        | ■        | ■         |
| Return Spectrum Analysis (4 to 205 MHz)                | ■               | ■        | ■        | ■         |
| Built-in web browser, real-time data transmission      | ■               | ■        | ■        | ■         |
| Multi-user support                                     | ■               | ■        | ■        | ■         |
| WiFi Survey                                            |                 |          | ■        | ■         |
| Frequency Domain Reflectometer                         |                 | Advanced | Advanced | ■         |
| Source Generator (CW, QAM & OFDM*)                     |                 | Advanced | Advanced | ■         |
| Upstream Traffic Control Plus                          |                 |          | Pro      | ■         |
| Upstream Linear Distortion Measurement                 |                 |          | Pro      | ■         |
| QAM Error Vector Spectrum Analysis (Ingress under QAM) |                 |          | Pro      | ■         |
| Cable Modem Sweep                                      |                 |          |          | Sweepless |
| Forward Passive Sweep                                  |                 |          |          | Sweepless |
| Forward Active Sweep (w/8300A FST)                     |                 |          |          | Sweep     |
| RSA High-Resolution Return Sweep (w/8310 RSA)          |                 |          |          | Sweep     |
| SSR High-Speed Return Sweep (w/9581 SST)               |                 |          |          | Sweep     |
| SST Compare with 9581 SST                              |                 |          |          | Sweep     |
| Home Leakage Test                                      | Option          | Option   | Option   | Option    |
| Full-featured TDR                                      |                 |          |          | Option    |

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