



# Wireless DOCSIS 3.1 Meter

Coax Network Meter

CGNDP3M



The CGNDP3M is a weather-resistant, portable DOCSIS 3.1 meter providing all major testing features required for both DOCSIS and DVB-C network environments with detailed, comprehensive results communicated via a mobile device (Android/iOS) using Hitron's ProMeter mobile app. An Intel Puma 7, OFDM 2x2 with 5GHz WiFi means powerful troubleshooting at a cost-efficient price point.

## Portable DOCSIS 3.1 Meter

The CGNDP3M Coax Network Testing Meter has a DOCSIS 3.1/3.0/2.0/1.1 compliant cable modem to ensure interoperability with all existing cable systems. Further, the CGNDP3M features a 2.5 Gigabit Ethernet port and 802.11b/g/n/ac wireless LAN access point combined to simplify cable connectivity testing and troubleshooting.

## Detailed Diagnostics Supported

All diagnostic readings from the CGNDP3M are displayed on Hitron's handy mobile app ProMeter, compatible with your technician's existing smartphones or tablets\* (iOS/Android). ProMeter provides powerful detailed insights such as upstream/downstream, spectrum, channel scan, MER, Flux, QAM analysis, OFDM, OFDMA, Ingress, Noise, Ping and Traceroute, and SnapShot, a proprietary feature that takes a "snapshot" of the network at a particular time. ProMeter also includes a SpeedTest that measures speeds over 2 Gbps.

## Key Features

- Switchable Upstream (5-42, 5-85, 5-204)
- DOCSIS 3.1/3.0/2.0/1.1 Compliant
- DOCSIS WAN
- DOCSIS Logger
- DOCSIS Registration Status
- AC Detection and Rejection
- Full Frequency Spectrum Support up to 1.2 GHz
- IQ Constellation
- Pre-equalizer Analysis
- Speed Test
- QAM Measurements
- Optional Cloud Data Collection & Reporting

## Interfaces

- 2x RF F-Type 75Ω Male Connector
- 2x Female F-81 Coax Barrels included
- 1x 2.5GBASE-T Ethernet Port (Auto-MDI/MDIX)
- 1x USB 3.0 Port

## Reception-Demodulation

- DOCSIS 3.1/3.0/2.0/1.1
- DOCSIS 3.1 Demodulation: Multi-carrier OFDM 16 to 4096QAM
- DOCSIS 3.1 using 2 OFDM 192MHz Downstream Channels + 32 SC-QAM
- DOCSIS 3.0 Demodulation: 64QAM, 256QAM
- DOCSIS 3.0 using 32 Bonded Downstream Channels
- Frequency (edge-to-edge): 54-1218MHz / 108\*1218MHz / 254-1218MHz
- Channel Bandwidth: 6/8MHz (DOCSIS 3.0)
- Spectrum Measurement Range: -100dBmV to +50dBmV
- Input Return Loss: >6dB

## Transmitter-Modulation

- DOCSIS 3.1/3.0/2.0/1.1
- DOCSIS 3.1 Modulation: OFDMA BPSK to 4096QAM
- DOCSIS 3.1 Data Rate: Up to 700Mbps with OFDMA 96MHz Upstream Channels
- DOCSIS 3.0 Modulation: QPSK, 8QAM, 16QAM, 32QAM, 64QAM, and 128QAM (SCDMA only)
- DOCSIS 3.0 Data Rate: Up to 320Mbps with 8 bonded Upstream Channels
- Frequency: Switchable 5-42MHz / 5-85MHz / 5-204MHz
- Upstream Transmit Signal Level: +11 to 65dBmV
- Output Return Loss: >6dB

## Wi-Fi

### Wi-Fi Characteristics

- 802.11a/b/g/n/ac
- 2T2R 5GHz 11ac with 400Mbps PHY Rate
- 20/40MHz Channel Bandwidth
- High Power Design for Multi-radio Co-location
- Supports 5180MHz-5240MHz UNII-1, 5748-5825MHz UNII-3 Bands

### Wi-Fi Features

- Wi-Fi Output Power Range for North America & Europe
  - 5G (11ac, HT:20): 10dBm
  - 5G (11ac, HT:40): 11dBm

### Wi-Fi Security

- WPA2

## Management

- ProMeter App-based GUI for configuration and management
- Power-on Self-Diagnostic
- MIB II/MCNS MIB
- Protocol Support: SNMP v1, v2C, v3

## Mechanical

- LEDs: 7 Status LEDs (Power, Wi-Fi, DS, US Status, Charge, Bat)
- Factory Default Reset Button
- Forced Power Off Button
- Power Restart Button
- Dimensions: 210mm (H) x 165mm (W) x 79mm (D)
- Net Weight: 1300 +/- 10g

## Electrical

- Input Power: 12VDC, 5A
- Power Adapter: 100-240VAC, 50/60Hz to 12VDC
- Battery: Lithium Battery Cells 8850mAh
- Battery: ~8h of Typical Operation, ~4h Full Load, ~4h to Charge
- Surge Protection
  - RF Input sustains at least 2KV
  - Ethernet RJ-45 sustains at least 4KV

## Environmental

- Operating Temperature: -14°C (7°F) ~ 42°C (108°F)
- Operating Humidity: 10% ~ 90% (Non-condensing)
- Storage Temperature: -40°C (-40°F) ~ 80°C (176°F)
- Water Resistant

## Regulatory Compliance

- FCC Part 15 Class B Subpart B, Part 15.247, Part 15.407, Part 15.1091
- ICES-003 Issue 6, Class B
- RoHS Compliant

## Features provided by the ProMeter App

### Spectrum Analysis

- Real-time Spectrum
- Spectrum Averaging Intervals: Selected from 1-16
- High-reliability Measurements
- MoCA Spectrum
- Automated Testing

### Channel Scan

- Downstream Receive Power (Rx) and MER are collected for each downstream channel.
- Individual Channel Power and MER can be accessed by clicking on each channel bar in the graph.

### Constellation

- QAM Constellations, Power Levels, MER, etc, can be confirmed on each DOCSIS channel for verification without repeated data entry.

### Flux

#### Pre-Equalization

- Cable Modem Adaptive Equalizer Response and Coefficients displayed.
- "Invisible" Cable Problems detected:
  - Cable Damage
  - Loose Connectors
  - Water Damaged Cables

### ICFR

- Peak-to-valley Measurement of Frequency Response Deviations in-channel

### Taps

- DOCSIS 2.0/3.0 Pre-equalization Taps
  - Taps 1-7 counter group delay at or near the diplexer roll (85 MHz)
  - Tap 8 IS the primary or main tap that contains the RF payload (FFT)
  - Taps 9-24 overcome any RF echoes due to impedance mismatches encountered in the cable system

### Echoes

- The echo measurement indicates the cavity width between the two impedance mismatches that make up the impairment.
- At 0.87 velocity of propagation, a DOCSIS 2.0/3.0 equalizer tap is equal to approximately 85 feet of cable (26 meters).

### DOCSIS Measurements

- Signal Levels and MER for Downstream Channels
- Upstream Channels
- DOCSIS Registration Status Flow
- DOCSIS Registration Information
- Re-register feature to restart the cable modem and re-synchronize to the CMTS

### D3.1 OFDM and OFDMA Measurements

- Downstream OFDM Metrics:
  - Frequencies & Subcarriers
  - Status Indicator
  - Modulation Order vs Subcarrier, Bit Loading
- Downstream Channel Estimate Coefficients
- Full Spectrum Plot of the OFDM Carrier displayed.
- Power Levels and Error Rates for the Fundamental Components inside the OFDM Carrier measured.
  - PLC: Physical Link Channel
  - NCP: Next Codeword Pointer
  - MDC (Profiles): Actual Modulation Profiles in use in the channel
- Minimum and Average MER Readings for each 6 MHz

### Ingress

- Find and Troubleshoot Ingress and Noise

### Upstream Alignment

- Observe the Overall In-Channel Return Path Response to the CMTS Port
- Upstream DOCSIS Transmit Levels used to observe and manage amplifier levels and tilt.

### Downstream Alignment

- Low/High Tilt, Reference and Raw Spectrum all in one widget
- Operates independently without a headend sweep unit
- Captures frequency bin data at each downstream channel to display frequency response (Utilizing 6 MHz chunks of OFDM Downstream as a "high" measurement channel.)

### Channel Maps

- Channel Map Selection to focus on known channels
- Detect and Create Channel Maps automatically

### Ping/Trace Route

- Ping or Traceroute to IP addresses (and websites) to test for latency and/or packet loss.
- Configurable Ping Count, Packet Size
- Enter an IP Address or a DNS Name for a website

### Extra Features

The following features are offered with a HitronCloud package.

- Feature Management performed via the MSO Web UI
  - Technician Account Creation and Management
  - Firmware Upgrade Management
  - Data Collection
  - Speed Test
  - App Analytics

### Optional Accessories

- CSN-01 Pressure Tester
- Meter Battery Charger Dock
- Extra/Spare Battery
- Car Charger Wire
- Shoulder Bag
- Antenna