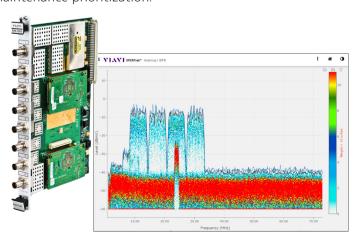# VIAVI
PathTrak RPM3000

High-Performance Spectrum and QAM Analyzer

Return-Path Monitoring Module for the
XPERTrak HFC Monitoring and Maintenance System

The RPM3000 is an eight-port, high-speed return-path quadrature amplitude modulation (QAM) and spectrum analyzer optimized for the PathTrak™ Return Path Monitoring System's QAM and ingress analysis and monitoring functions. Each of the eight ports is an independent, isolated test port between which the RPM3000 module automatically switches to individually measure both upstream QAM and spectrum performance. The measurement settings and functions consist of all typical spectrum analyzer settings, such as resolution bandwidth, video bandwidth, dwell time, span, marker control, maximum hold, minimum hold, peak search, and zero span. In addition, the RPM3000 supports unique MACTrak analyzer settings for troubleshooting live DOCSIS packets from subscribers or from a VIAVI field meter. MACTrak can rank overall node performance according to individual DOCSIS upstream carrier performance, dramatically improving maintenance prioritization.

Key Benefits

· Combines essential spectrum and cable modem upstream analysis and monitoring

· Real-time RF and data metrics based on the subscribers' DOCSIS® packets.

· Supports Field View and Field View QAM™ for one-person upstream troubleshooting

· Eliminates the need for dedicated spectrum and QAM analyzers to troubleshoot return-path problems
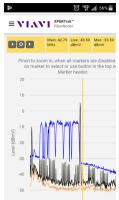
Key Features

· Enables heatmap spectral display in XPERTrak

· Supports all existing MACTrak™ capabilities, including MACTrak Performance Monitoring

· Demodulates and monitors live DOCSIS upstreams

· 500 kHz to 85 MHz frequency range and 50 dB dynamic range to support the required noise floor reductions

Applications

· Upstream ingress remediation

· View in-band and in-service faults missed by standard spectrum analysis tools

· Highlight worst-performing nodes to prioritize repairs with MACTrak node ranking

· Reveal linear and nonlinear impairments such as group delay and laser clipping in addition to simple ingress and CPD

· Identify modems experiencing codeword errors in real time to verify (or fix) faults

The RPM3000 quickly and easily integrates with existing PathTrak systems and is fully compatible with existing RPM cards, HCUs, and other components. Like all PathTrak hardware, the RPM3000 is fully supported by XPERTrak software.

Specifications

PathTrak RPM 3000	
Input ports	8 (F-connector or BNC) with activity indicator
Input port impedance	75 Ω
Frequency range	500 kHz to 85 MHz
Total measurement range	−50 to 60 dBmV
Operational temperature range and accuracy	±2 dB at room temperature; ±3 dB drift, 0 to 50°C
Spur free dynamic range	50 dB typical with 0 dBmV input[1]
Port-to-port isolation	>65 dB
Resolution bandwidths	Standard: 30, 300, 1000 kHz
DOCSIS bandwidths	160, 320, 640, 1280, 2560, and 5120 kHz
Video bandwidths	Programmable to 10, 30, 100, 300, 1000 kHz
Attenuator	0 to 50 dB, in 1 dB steps
Level accuracy	±2 dB on signal pulses >10 μs; ±4 dB on signal pulses >1 μs
Minimum noise burst measurable	<1 μs
Dwell time	Programmable from 1 μs to 100 ms
Monitoring mode	250 max points frequency resolution scan rate depends on measurement settings, typically 8 to 16 scans per second for every port
Interactive Spectrum Analyzer mode	500 points frequency resolution, up to 6 full spectrum scans per second with 20 μs dwell time
Interactive Monitoring View mode	Up to 250 points frequency resolution, up to 6 full spectrum scans per second with 20 μs dwell time
Heatmap Analyzer Mode[2]	Up to 2 simultaneous Heatmap analyzers per RPM3000
Interactive QAM Analyzer mode with MACTrak[3]	64QAM, 32QAM, 16QAM, and QPSK demodulation,level, MER, un-equalized MER, codeword error rate, In-band channel response, group delay, ingress under the carrier, spectrum, micro-reflections, impulse noise, live strip charts over time, CPE MAC address extraction
MACTrak node ranking and history	64QAM, 32QAM, 16QAM, and QPSK supported, level, MER, un-equalized MER, codeword error rate, spectrum, Impulse noise, live strip charts over time, CPE MAC address, one-week rolling history
Recommended input level for active signals	0 to +50 dBmV (over range indicator to prevent invalid measurement results)
Power Consumption	11W

Notes:

1. Minimum from 5 to 85 MHz with 0 dBmV input is 46 dBc; from 500 kHz to 5 MHz is 45 dBc

2. Heatmap functionality requires RPM3000-FULL capabilities and active SW Maintenance and Support Contract

3. QAM Analyzer features are only available on QAMTrak/MACTrak-enabled units.

Ordering Information

PathTrak RPM 3000

Part Number	Description
RPM3000-FULL-BNC	RPM3000 Return Path Monitoring Module with 75 ohm BNC input connectors for the HCU400 or HCU1500 chassis. Includes all MACTrak capabilities including MACTrak Performance Monitoring. System software required.
RPM3000-FULL-F	RPM3000 Return Path Monitoring Module with 75 ohm F-type connectors for the HCU400 or HCU1500 chassis. Includes all MACTrak capabilities including MACTrak Performance Monitoring. System software required.
RPM3000LITEBNC	RPM3000Lite Return Path Monitoring Module with 75 ohm BNC input connectors for the HCU400 or HCU1500 chassis, field upgradable to full RPM3000 capabilities. System software required.
RPM3000LITEF	RPM3000Lite Return Path Monitoring Module with 75 ohm F connectors for the HCU400 or HCU1500 chassis, field upgradable to full RPM3000 capabilities. System software required.

RMP Upgrades

Part Number	Description
RPM3000LITE-UPG	Field upgrade from RPM3000Lite to full RPM3000 card. System software required.
RPM3000MCMON-UPG	Field upgrade to enable MACTrak Performance Monitoring capability in an RPM3000 card. System software required.

Chassis

HCU1500SS	HCU1500 Chassis. Modular 15-slot controller chassis can house 15 separate monitoring module cards (RPM1000, RPM2000, and RPM3000). 19-inch rack mount, 7 rack-units (7U) high.

Modem

1010-00-0427	HSM1000 Headend Stealth Modem enables remote viewing of live spectrum with SDA and DSAM field meters (requires installing PathTrak Field View option on SDA and/or DSAM field meters).

*DOCSIS is a trademark of CableLabs

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