

AQ 4000 Series DOCSIS® 3.0

Ethernet Business Services

LTE Backhaul

Description

The AQ 4000 series Rugged Cable Modem is DOCSIS® 3.0 and EuroDOCSIS™ 3.0 compliant and is weatherproof and specially designed for installations where temperatures can be extreme, uncontrolled, and typical of the outside plant in an HFC cable network. This cable modem is designed to withstand electrical over-voltages and surges commonly experienced in HFC network outside plant. All Electroline AQ products have been designed to pass stringent surge tests specified by the Institute of Electrical and Electronics Engineers. It has a built in MEF Compliant Carrier Ethernet NID.

Carrier Ethernet Key Applications

Highlights

- Segment, monitor and bridge diverse networks
- Integrated turn-up testing and service activation baseline reporting
- Fast, flexible, SLA-backed Carrier Ethernet service creation (point-to-point and multipoint)
- Real-time L2 & L3 performance monitoring and service assurance
- Granular traffic conditioning

Service Assurance Applications

- Performance and Traffic Monitoring: Monitor and measure delay, delay variation, frame loss and continuity.
- Service Activation Testing: Use the integrated RFC-2544 based test suite
- Per-Flow Loopbacks: Monitor any Layer 2, 3 and 4 flow in real-time

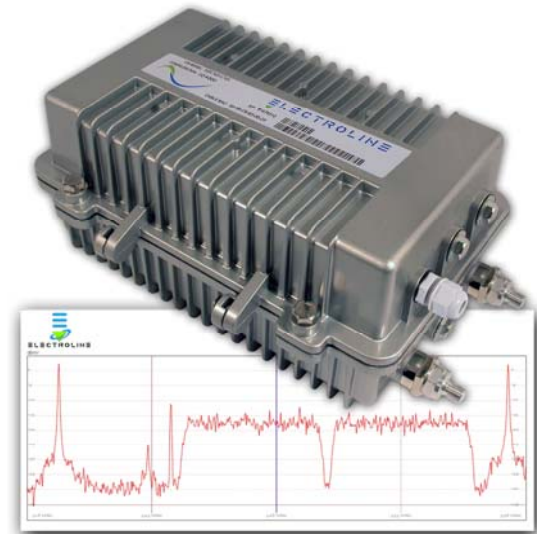
Service Creation and Traffic Conditioning Applications

- Bandwidth Policing
- Zero-Delay Traffic Shaping
- Service Mapping
- Traffic Filtering

Benefits

Virtualized, programmable instrumentation for QoS monitoring, OAM & turn up testing:

- Low-latency, wire-speed packet processing for uncompromised performance
- Full line-rate loopback support for popular third-party test sets
- DOCSIS-friendly management integration for easy BSoD deployments



Cable Modem Features

- Designed for DOCSIS® & EURODOCSIS™ specifications
- Network Monitoring - Embedded Spectrum Analyzer
- Eight (8) bonded downstream channels with data rates in excess of 340 Mbps.
- Four (4) bonded upstream channels with data rates in excess of 120 Mbps.
- Support for BSOD, L2VPN and extended power option
- Strand, pedestal, mast, pole and wall mounting
- HFC cable powered, 40 to 90 VAC
- 10/100/1000 BASE-T auto sensing / auto-MDIX Ethernet port
- Power over Ethernet (PoE and PoE+) option to supply connected devices (choose from 1-port, 2-ports, and 4-ports options)
- Temperature Hardened and weather proof housing.
- Optional wall outlet power supply
- Optional Optical Interface
- Optional 120, 250 and 400 Watts 48VDC output

Carrier Ethernet Features

- SNMP v1 and v2c support
- Automated Y.1564 & RFC- 2544 test suites
- Multi-vendor Level 2 OAM (802.3ag, Y.1731) and Level 3 QoS (RFC-5357 TWAMP) monitoring and test set interoperability
- Integrated MEF Certified Carrier Ethernet networking
- Jumbo Frames support (to 10,240 bytes)
- Automated, instant provisioning (Plug & Go™)
- Wire-speed pass-through without adding delay or delay variation
- Real-time packet processing with microsecond measurement resolution
- Layer 2-4 Loopback functionality & third-party test set interoperability
- Thru-traffic per-flow statistics, tapping and filtering

	DOCSIS®	EURODOCSIS™
RF DOWNSTREAM		
Operating Frequency Range (center)	111 to 999 MHz	112 to 1002MHz
Tuner Frequency Range	Edge-to-edge 54-1002, 85-1002, 108-1002 MHz	108 to 1002MHz
Tuner	Full band capture frontend with 8 fully independent digital tuners	
Demodulation	8 demodulators, 64 QAM or 256 QAM	
Maximum Raw Data Rate	8 downstream channels, each 6 MHz channel: 42.88 Mbps for 256 QAM and 30.34 Mbps for 64 QAM	8 downstream channels, each 8 MHz channel: 55.62 Mbps for 256 QAM and 41.71 Mbps for 64 QAM
Bandwidth per Channel	6MHz	8MHz
Operating Level Range	-15 to +15dBmV	+43 to +73 dBµV for 64 QAM +47 to +77 dBµV for 256 QAM
Input Impedance	75 ohms	
RF UPSTREAM		
Operating Frequency Range (edge-edge)	5 to 42 MHz, 5 to 65 MHz, or 5 to 85 MHz	5 to 65 MHz, or 5 to 85 MHz
Upstream Transmission	4 upstream channels	
Modulation	QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM at ATDMA Mode QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM, 128 QAM at SCDMA mode	QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM at ATDMA Mode QPSK, 8 QAM, 16 QAM, 32 QAM, 64 QAM, 128 QAM at SCDMA mode
Maximum Data Rate per	Chnl Width (MHz) Raw Data Rate (Mb/s)	Chnl Width (MHz) Raw Data Rate (Mb/s)
Modulation		
QPSK	1.6 2.56	1.6 2.56
16 QAM	1.6 5.12	1.6 5.12
QPSK	3.2 5.12	3.2 5.12
16 QAM	3.2 10.24	3.2 10.24
32 QAM	3.2 12.8	3.2 12.8
8 QAM	6.4 15.4	6.4 15.4
16 QAM	6.4 20.5	6.4 20.5
32 QAM	6.4 25.6	6.4 25.6
64 QAM	6.4 30.72	6.4 30.72
ELECTRICAL		
Input Voltage	Cable powered 40 to 120 AC 50 / 60 hz sin or Quasi square wave; or Wall plug adaptor: @ Input = 100 to 240 volts Ac, 50/60 Hz	
Power Consumption (modem module)	<10 Watts	
Surge Protection (F connector) Ring Wave Combination wave	IEEE C62.41-1991, cat A3 6KV 200A IEEE C62.41- 1991, cat B3 6KV 3KA	IEC 61000-4-12, Level 4 (4KV/133A) IEC 61000-4-5, Level 4 (4KV/2KA)
Data Ports	Ethernet 10/100/1000BASE-T (Auto-sensing with Auto-MDIX) RJ-45 Ethernet (1)	
Optical (optional)	SFP cage	
RF	Female "F" type	
Power Over Ethernet (PoE+); choose from 1-port, 2-ports, and 4-ports options	For IEEE 802.3at configuration: 48Vdc at 600mA; Optional configurations: 24Vdc at 1A; or 12Vdc at 2A	
MECHANICAL		
Dimension (W x D x H)	Not including "F" connector: 11.8"x5.0"x7.7" (30cmx12.7cmx20cm)	
Weight	5 lbs	
Operating Temperature	-40° to 140°F (-40° to 60°C)	
Operating Humidity	0 to 90% RH non-condensing	
Designed to Comply with the Following Standards	DOCSIS / EuroDOCSIS 3.0, 2.0, 1.1, 1.0	
Regulatory and Safety Approvals	As required per country	

For more information on our products, please visit: www.electroline.com or call: 800-461-3344