

1RU IPQAM Modulator

AQ1600 Series



- ITU-T J.83 Annex A/C (or A/B/C) compliant
- 2 x 100/1000 Base-T Ethernet ports per module
- Supports up to 72 QAM output channels
- Supports TS over UDP/RTP
- 1+1 PS redundancy
- Modular design
- Supports up to 64 programs per QAM channel
- Complies with DVB-CSA
- SNMP management

ASCENT's AQ1600 is a new generation of modular & high density IPQAM combining TS-over-UDP/RTP input and output, transport stream re-multiplexing, scrambling, PSI/SI processing and 16/32/64/128/256QAM modulation in an 1RU. It supports up to 48 or 72 QAM modulation channels by using three external pluggable 16 or 24QAM channel modules, each QAM module supporting up to two Gigabit copper interfaces. Moreover, AQ1600 supports 1+1 redundant & hot-swappable power supplies for high reliability and overall stability of the system. Its pay-as-you-grow modular design, flexible configuration and licensing mechanism are making the AQ1600 extremely scalable, very reliable with high performance, all of which are important to cable operators.

The AQ1600 supports Web browser and SNMP management with remote monitoring and control that can greatly reduce management time and operating expenses (OPEX) of operators.

With AQ1600, cable operators can be ensured that they will have a scalable, reliable product that enables them to offer high performance video stream services for years into the future. It can be used in cable central head-ends, remote head-ends and VOD networks.

Key Features

- 1RU modular design, supporting up to three pluggable QAM modules
- 16 or 24 QAM output channels per module, up to 48 or 72 QAM output channels in 1RU
- Supports 1+1 redundant & hot-swappable power supplies
- 1+1 redundant copper interfaces per QAM module, supporting TS-over-UDP/RTP input and output
- Supports multiplexing, pass-through, scrambling, PSI/SI processing and QAM modulation
- Supports up to 64 programs per QAM channel and 16 PIDs processing capability per program
- Supports SD and HD audiovisual streams simultaneously
- ITU-T J.83 Annex A/C (or A/B/C) compliant, 6 MHz or 8 MHz bandwidth
- Supports up to four DVB SimulCrypt CAS(s) and complies with DVB-CSA
- Multiple firmware options to enable up to four scrambling channels
- Scrambling processing up to 1024 programs
- Supports UDP/ARP/ICMP/IGMP protocols
- Supports PID filtering, pass-through, PCR auto-correction
- Self-adaptive filter circuit design ensures outstanding out-of-band rejection
- Front panel accessible network management and console port, supporting Web and SNMP management

Specifications

Chassis

Rear Panel	3 x pluggable QAM module slots*
Front Panel	1 x 10/100 Base-T Control Port (RJ45) 1 x Serial Console Port (RJ45)
Power Supply	Built-in AC PSU Optional 1+1 redundant hot-swappable PSU Input Voltage: 90 V _{AC} to 250 V _{AC} , 50/60Hz

Notes:

Hot-pluggable is not supported, make sure the power cord was disconnected before insert or replace QAM modules!

QAM Module

IP Input & Output

Interface	2 x 100/1000 Base-T Ethernet RJ45 connector
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Operation Mode Independent or redundant

Data Format TS-Over-IP(UDP/RTP)

MAC Layer Access IEEE 802.3

Modulation Output - Type B

Output Connector 1 x RF Output
1 x -20dB RF Test Port

Connector Type F-Type (Female, 75 Ω)

RF Frequency Range 30 to 860 MHz

Bandwidth 6 or 8MHz

Numbers of channel 16 QAM modulation channels (or carriers)

Modulation Standards ITU-T J.83 Annex A, B and C

Constellations Annex A: 16/32/64/128/256QAM
Annex B: 64/256QAM
Annex C: 32/64/128 /256QAM

Symbol Rate Annex A: 4.2 to 7 M Baud
Annex B: 5.057 M Baud
Annex C: 4.2 to 5.3 M Baud

RF Output Power Level 98 dB μ V to 119 dB μ V (RF output port)
70 dB μ V to 90 dB μ V (-20 dB test port)

MER \geq 38 dB (64QAM, 6.875M Baud)

SNR (Out of band) \geq 50 dB

Return Loss \geq 14 dB

Gain Fine-tune 0 to 5.0 dB, Step Size 0.25dB

Modulation Output - Type D

Output Connector 1 x RF Output
1 x -20dB RF Test Port

Connector Type F-Type (Female, 75 Ω)

RF Frequency Range 30 to 860 MHz

Bandwidth 6 or 8MHz

Numbers of channel 24 QAM modulation channels (or carriers)

Modulation Standards ITU-T J.83 Annex A and C

Constellations Annex A: 16/32/64/128/256QAM
Annex C: 32/64/128/256QAM

Symbol Rate Annex A: 4.2 to 7 M Baud
Annex C: 4.2 to 5.3 M Baud

RF Output Power Level 98 to 119dB μ V (RF output Port)
70 to 90dB μ V (-20dB test port)

MER \geq 38 dB (64QAM, 6.875M Baud)

SNR (Out of Band) \geq 50 dB

Return Loss \geq 14 dB

Gain Fine-Tune 0 dB to 5.0 dB, step size 0.25 dB

TS Re-Multiplexing

Capacity of Processing Up to 1024 programs

PCR Auto correction

PSI/SI	PSI/SI table auto-generation, manual insertion, Comply with: ISO/IEC 13818-1 DVB SI (ESI EN300468)
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PID	Remapping and filtering and pass-through
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Real-Time Statistics	TS rate, program rate, PID rate
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TS Scrambling (Software Options)

Scrambling Algorithm	Comply with DVB-CSA
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Numbers of CAS	Optional up to four DVB SimulCrypt CAS(s)
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CAS Interface Protocol	TCP/UDP (via Network Management Port)
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EMM Bandwidth	Up to 3 Mbps per TS
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Scrambling Rate	Up to 60 Mbps per QAM channel
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Scrambling Level	Program-level
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Miscellaneous

Front Panel	3.5" LCD with 6 x Control Buttons for 2-line alphanumeric display and settings 3 x Dual color LED, for status indications of power, work and Alarm
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Environmental

Operating Temperature	0 °C to +45 °C
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Storage Temperature	-20 °C to +80 °C
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Operating Humidity	90 %, non-condensing
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Mechanical

Dimensions (W×H×D)	483 mm × 44.5 mm × 450 mm
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Product Weight	Approx. 6.5 kg (fully configured)
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Ordering Information

Product Name

AQ1648-CH-AC1

AQ1648-CH-AC2

AQ1672-CH-AC1

AQ1672-CH-AC2

AQM-16CH

AQM-24CH

Product Description

1RU, AQ1600 modular chassis with 3 x Pluggable QAM module slots, Single AC PSU

1RU, AQ1600 modular chassis with 3 x Pluggable QAM module slots, 1+1 Redundant Hot-swappable PSUs

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1RU, AQ1600 modular chassis with 3 x Pluggable QAM module slots, 1+1 Redundant Hot-swappable PSUs

QAM module with 16 QAM channels, 2 x 100/1000Base-T Ethernet input & output (RJ45), 1 x RF output, 1 x -20 dB RF test port

QAM module with 24 QAM channels, 2 x 100/1000Base-T Ethernet input & output (RJ45), 1 x RF output, 1 x -20 dB RF test port

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