

IPQ6250

Broadcast EdgeQAM Modulator



IPQ6250 is a new generation of modular & high density Edge QAM modulator combining TS-over-UDP/RTP reception, transport stream re-multiplexing, scrambling, PSI/SI processing and 16/32/64/128/256QAM modulation in a 1U rackmount unit. It supports up to 48 QAM channels by using three external pluggable 16 QAM modules, each of QAM modules supporting up to two Gigabit copper interfaces. Moreover, the IPQ6250 supports 1+1 redundant & hot-swappable power supplies for high reliability and stability of system. Its pay-as-you-grow modular design, flexible configurations and licensing mechanism are making the IPQ6250 unparalleled scalability, reliability and system performance to cable operators. The adopts Web browser and SNMP management with remote monitoring and control that can greatly reduce management time and operating expenses (OPEX) of operators.

With the IPQ6250, cable operators can be ensured that they will have a scalable, reliable, high performance video stream services for years into the future. It can be applied to cable DTV head-ends, sub head-ends and VOD networks.

Features

- 1RU modular design, supporting up to three pluggable QAM modules
- 16 QAM output channels per module, up to 48 QAM output channels
- Processing module with Two 1000 Base-T ports
- Dual copper interface per QAM module
- Supports multiplexing, pass-through, scrambling, PSI/SI insertion and QAM modulation
- 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/B/C compliant, 6MHz or 8MHz bandwidth
- Multiplexed or scrambled TS over UDP output
- Non-adjacent Frequency out
- VOD Service (option)
- 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
- PID filtering, pass-through, PCR auto-correction
- Excellent RF performance, MER \geq 42db
- Web browser management for local and remote management, monitoring and control

Applications

- Digital headend system base on IP network
- Broadcast Application built-in multiplexing and scrambling function
- MPEG-TS transmission over local IP network
- VOD Edge QAM modulator

QAM Reference Information

J.83 Annex A: Table of constellation, bandwidth, symbol rate and bit rate.

Constellation	QPSK	16QAM	32QAM	64QAM	128QAM	256QAM
Minimum bit Rate (Mbps)	2	4	5	6	7	8
Maximum bit Rate (Mbps)	14	28	35	42	49	56
Minimum Bandwidth (MHz)	1.15	1.15	1.15	1.15	1.15	1.15
Maximum bandwidth (MHz)	8.05	8.05	8.05	8.05	8.05	8.05
Minimum Symbol Rate (Mbaud)	1	1	1	1	1	1
Maximum Symbol Rate (Mbaud)	7	7	7	7	7	7

Channel Bandwidth = 1.15 * Symbol Rate Symbol Rate = Output Bit Rate/m
 m = 2, 4, 5, 6, 7, 8 Corresponding: QPSK, 16QAM, 32QAM, 64QAM, 128QAM and 256QAM

8MHz Maximum Output Bit Rate

Constellation	C/N Threshold	Maximum Valid Bit Rate	Channel Utilization Ratio
16QAM	22dB	25.8Mbps	3.2 bit/Hz
32QAM	25dB	32.2Mbps	4.0 bit/Hz
64QAM	28dB	38.7Mbps	4.8 bit/Hz
128QAM	31dB	44.2Mbps	5.5 bit/Hz
256QAM	34dB	51.6Mbps	6.4 bit/Hz

Maximum Valid Bit Rate = Output Bit Rate * 188 / 204

TECHNICAL SPECIFICATIONS

IP Input (QAM Module)

Interface	2 x100/1000 Base-T Ethernet RJ-45 ports
Operation Mode	Independent or redundant
Data Format	MPEG TS-Over-IP/UDP/RTP
MAC Layer Access	IEEE 802.3
Addressing&Protocol	Multicast and Unicast

MPEGoIP output

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)
PID	Remapping, filtering and pass-through Up to 3 module

Modulation Standards 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 to 119dBμV (RF output Port) 70 to 90dBμV (-20dB test port)
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MER	≥42dB (64QAM, 6.875M Baud)
SNR (Out of band)	≥50dB
Return Loss	≥14dB
Gain Fine-tune	0 to 5.0dB, Step Size 0.25dB

Real-time Statistics	TS bitrate, program bitrate, PID bitrate
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Transport Stream Scrambling (Software Options)

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

Modulation Output (QAM Module)

Output Connector	1 x RF Output 1 x -20dB RF Test Port
Connector Type	F-Type (Female, 75Ω)
RF Frequency Range	30 to 860 MHz
Bandwidth	6 or 8MHz
Qty of QAM channel	16 QAM channels (or carriers) each module

Management

Interface	1 x 10/100 Base-T Ethernet
Connector	RJ-45 (Front Panel Accessible)
Management	Web browser and SNMP management

Environment

Power Supply	Built-in power supply module Optional 1+1 hot-swappable & Redundant power supplies
Input Voltage	90-250 VAC, 50/60Hz
Dimensions	490mm × 490mm × 45mm
Weight	8kg