GQ-3680A

Modular Edge QAM Modulator

Product Overview

The GOSPELL's GQ-3680A is a new generation of modular & high density Edge QAM modulator combining TS-over-UDP/RTP input & output, 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 QAM module supporting up to two Gigabit copper interfaces. Moreover, GQ-3680A supports 1+1 redundant & hot-swappable power supplies for high reliability and stability of system. Its pay-as-you-grow modular design, flexible configuration and licensing mechanism are making the GQ-3680 extremely scalable, very reliable and high system performance, all of which are important to cable operators.

The GQ-3680A supports Web browser and SNMP management with remote monitoring and control that can greatly reduce management time and operating expenses (OPEX) of operators.

With GQ-3680A, 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.

Main Features

- 1RU modular design, supporting up to three pluggable QAM modules
- 16 QAM output channels per module, up to 48 QAM output channels
- 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/B/C compliant, 6MHz or 8MHz 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
- Web browser and SNMP management for local and remote management, monitoring and control

Technical Specifications

IP Input & Output (QAM Module)

Interface	2 x 100/1000 Base-T Ethernet
	RJ-45 connector
Operation Mode	Independent or redundant
Data Format	TS-Over-IP(UDP/RTP)
MAC Layer Access	IEEE 802.3

Transport Stream 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)
PID	Remapping and filtering and pass-through
Real-time Statistics	TS rate, program rate, PID rate

Transport Stream Scrambling (Software Options)

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

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
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 to 119dBμV (RF output Port) 70 to 90dBμV (-20dB test port)
MER	≥38dB (64QAM, 6.875M Baud)
SNR(Out of band)	≥50dB
Return Loss	≥14dB
Gain Fine-tune	0 to 5.0dB, Step Size 0.25dB

Network Management

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

Miscellaneous

Front Panel	1 x Serial Console Port (via RJ-45 connector)
	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
Rear Panel	1 x Power Supply Receptacle (AC Input)
	1 x Power switch

Power Supply

Power Supply	Built-in power supply module Optional 1+1 hot-swappable & redundant power supplies
Input Voltage	90 - 250 VAC, 50/60Hz
Power Consumption	Max. 100W

Environmental

Operating Temperature	0℃ to 45℃(32℉ to 113℉)
Storage Temperature	-20 to 80℃(-4℉ to 176℉)
Operating Humidity	90%, non-condensing

Mechanical

Product Dimensions (W x H x D)	483mm x 44.5mm x 450mm 19" x 1.73"(1RU) x 17.7"
Product Weight	Approx. 6.5Kg (14.3 lbs) (fully configured)

Rear Panel View (Sample Config.)

Ordering Information

Hardware Options

Hardware Codes	Descriptions
GQ-3680-A	1RU, GQ-3680 modular chassis with backplane and three QAM expansion slots, without scrambling function 1 x 10/100 Base-T (NM), 1 x Serial Console Port, Single AC Power Supply
GQ-3680-B	1RU, GQ-3680 modular chassis with backplane and three QAM expansion slots, without scrambling function 1 x 10/100 Base-T (NM), 1 x Serial Console Port, 1+1 redundant & Hot-swappable AC power supplies
QM-3680-2C	QAM module with 16 QAM channels, 2 x 100/1000Base-T Ethernet input & output(RJ-45), 1 x RF output, 1 x -20dB RF test port

License Options

License Codes	Descriptions
LC-3680-CA1	Enable scrambling function and one DVB Private Crypt CA
LC-3680-CA2	Enable scrambling function and two DVB SimulCrypt CA(s)
LC-3680-CA3	Enable scrambling function and three DVB SimulCrypt CA(s)
LC-3680-CA4	Enable scrambling function and four DVB SimulCrypt CA(s)