

## GQ-3680

### Modular IPQAM



### Product Overview

GOSPELL's GQ-3680 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, GQ-3680 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 GQ-3680 extremely scalable, very reliable with high performance, all of which are important to cable operators.

The GQ-3680 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-3680, 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 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, 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

- Front panel accessible network management and console port, supporting Web and SNMP management

## Technical Specifications

### Chassis

Rear Panel	3 x Pluggable QAM Module Slot*
Front Panel	1 x 10/100 Base-T Control Port(RJ-45)
	1 x Serial Console Port (RJ-45)
Power Supply	Built-in AC PSU
	Optional 1+1 redundant hot-swappable PSU
	Input Voltage: 90 - 250 VAC, 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
	RJ-45 connector
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, 75Ω)
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 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

#### Modulation Output-Type D

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
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 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

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

### TS 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

### 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

### Environmental

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

### Mechanical

Product Dimensions	483mm x 44.5mm x 450mm (W x H x D) 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-3680B-1PS	1RU, GQ-3680B modular chassis with 3 x Pluggable QAM module slots, Single AC PSU
GQ-3680B-2PS	1RU, GQ-3680B modular chassis with 3 x Pluggable QAM module slots, 1+1 Redundant Hot-swappable PSUs
GQ-3680D-1PS	1RU, GQ-3680D modular chassis with 3 x Pluggable QAM module slots, Single AC PSU
GQ-3680D-2PS	1RU, GQ-3680D modular chassis with 3 x Pluggable QAM module slots, 1+1 Redundant Hot-swappable PSUs
QM-3680B	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
QM-3680D	QAM module with 24 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)

## For More Information

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