

# Quad QAM module for Luminato platform

The QAM module enables flexible multiplexing of SPTS and MPTS video services and also PSI/SI table streams. High quality QAM modulation with agile up conversion provides easy adaptation to DVB-C delivery over HFC-network.



### Versatile functionality

The Teleste Luminato quad QAM modules provide an advanced DVB-C platform for Cable TV operators. The QAM module enables flexible multiplexing of SPTS and MPTS video services and also PSI/SI table streams. High quality QAM modulation with agile up conversion provides easy adaptation to DVB-C delivery over HFC-network.

The Luminato quad QAM multiplexers support selection of free-to-air and scrambled services from IP stream sources, which can be adjusted to the operator's service line-up with the built-in advanced transport stream processing capabilities. The Luminato quad QAM module support Standard Definition and High Definition video in MPEG-2 and MPEG-4 AVC video formats and numerous audio formats. Optionally content protection can be done based on DVB simulcrypt standard.

### Effective flexibility

Luminato quad QAM module is fully compatible with the high-performance

Luminato chassis, where it can be fitted freely to any of the six module slots. In accordance with the Luminato system architecture, the video processing is performed on the quad QAM modules, which enables low-cost applications even with partially equipped chassis, while having the performance scalability to fully equipped chassis.

### Complete cable TV headend in 1 RU

As one or more Quad QAM modules can be included in 1 RU Luminato platform with Luminato DVB-S, DVB-S2, DVB-ASI and DVB-T receivers, together they can form a complete cable TV headend. Furthermore, this provides effective way for complementing service bouquet with locally received content in the edge of the network.

### Embedded content protection

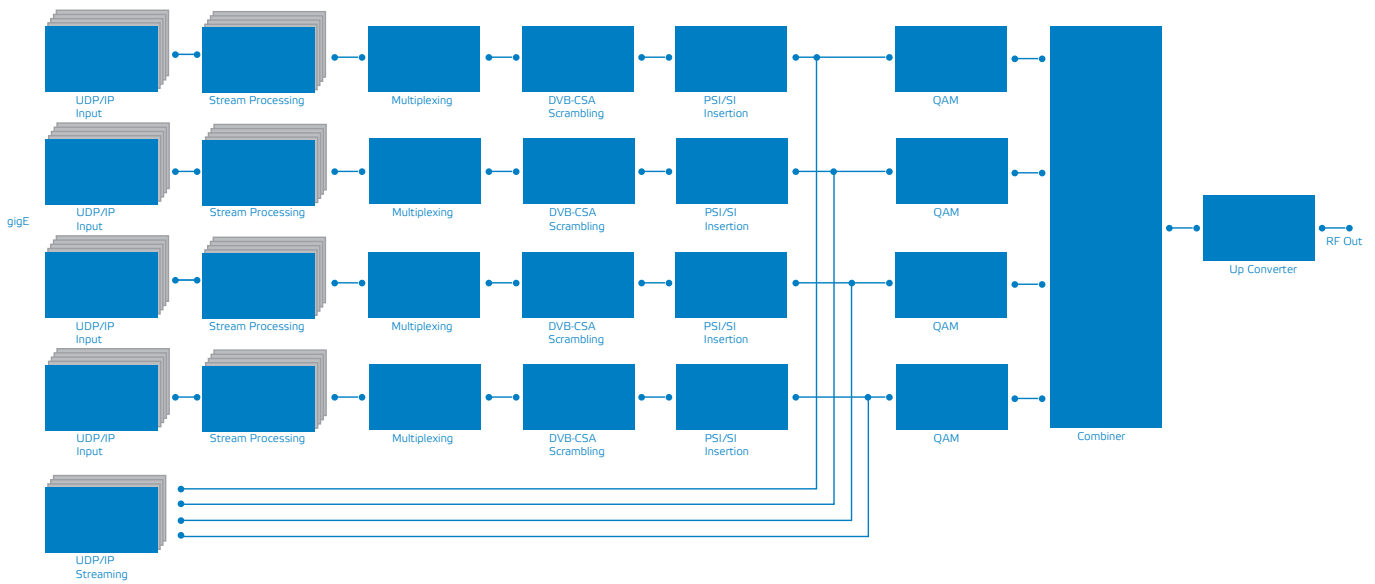
Quad QAM module has the optional capability to do DVB Common Scrambling Algorithm content protection. The embedded scrambling doesn't require any additional hardware and the user can freely select which services will be

scrambled. The content is never accessible in unprotected format which is highly appreciated by content providers. The component level scrambling is also supported to allow only video and audio scrambling and leave other streams untouched to avoid descrambling challenges for bursty data in set-top box.

### Efficiency and reliability

With the advanced transport stream processing, operator can select the services and components which are relevant to his network. The Luminato will follow-up any changes on the stream to automatically readjust the processing to provide uninterrupted service. This will allow the operator to efficiently manage network capacity usage.

The available tools provide high degree of automated features to minimise the cost of system set-up and operation, and avoiding downtime due to changes in the received services.



Block Diagram, Quad QAM Out

## Features

- DVB TS over UDP/IP reception
- IP address / UDP port selector for input streams
- Network dejittering
- Support SPTS and MPTS multiplexing
- Advanced transport stream processing
- PCR processing
- Multiplexing
- DVB CSA content protection (LQM-A)
- Automatic PSI/SI table generation
- Custom PSI/SI creation and streaming
- High quality QAM modulation
- Agile upconversion

## Technical specifications

Parameter	Specification	Note	Parameter	Specification	Note
<b>IP inputs</b>			Harmonics <-64 dBc <-66 dBc other channels <-70 dBc other channels, 4) MER <-60 dBc MER >43 dB (LQM-A module version) MER >40 dB (LQM-B module version)		
Frame formats	UDP/IP	1 ... 7 TS packets/frame			
Max inputs streams/module	128				
Dejittering buffersize	200 ms	adj. 100 ... 500 ms			
<b>Multiplexers</b>			<b>IP streamer output of multiplexer</b>		
Number of multiplexer	4		Framing format	raw UDP/IP	
Max input service/multiplexer	64		Traffic type	unicast or multicast	
Max components per service	32		TS packets per UDP frame	1 ... 7	
Output speed	depends on QAM modulator settings		Max TS packet speed/streamer	directly related QAM output speed	
<b>DVB Common Scrambling Algorithm Content Protection</b>			Maximum speed total	250 Mb/s	shared with 4 outputs
Max services to be scrambled per module	120	LQM-A only	<b>General</b>		
<b>QAM Output</b>			Power consumption	15 W	
Standard	ITU-T J.83 Annex A and C		Supply voltages	24 V	
QAM constellations	64, 128, 256		Connectors, DVB-ASI	BNC 75 ohm	
Symbol Rate	4 ... 7,4 MS/s		Dimensions	20 x 109 x 253 mm (HxWxD), 1)	
Impedance	75 ohm		Weight	0,4 kg	
Output return loss	>14 dB	active channel	Enclosure classification	IP21	
	>12 dB	act. ch 81 ... 862 MHz	Operating temperature range	-10...+55 °C	
	>10 dB	act. ch 862... 1000 MHz	Storage temperature range	-30...+70 °C	
Output Level	102 ... 112 dBμV	Four adj. channels	Specification is met	0 ... +45 °C	
	104 ... 114 dBμV	Three adj. channels	Notes		
	106 ... 116 dBμV	Two adj. channels	1) Dimensions excluding connectors and locking screws		
	110 ... 120 dBμV	One adj. channel	3) Values for quad channels active. Excluding harmonics		
Output Level accuracy	+/- 2 dB		4) Typical value outside 100 MHz of active channel block		
Output Power step size	0,2 dB		5) Values are meet in quad channel mode within output power range 42 ... 50 dBmV (LQM-B)		
Output center frequency	85...999 MHz				
Output frequency accuracy	+/- 30 kHz				
Output frequency step size	50 kHz				
Out of band noise, 3), 5)	<-58,5 dBc	1st adj. channel			
	<-62 dBc	2nd adj. channel			