



Dense modulator for the Luminato platform

HIGH QUALITY QAM MODULATION

The Luminato dense modulator enables flexible multiplexing of SPTS and MPTS video services and PSI/SI table streams. High quality QAM modulation with agile up conversion provides smooth broadcast delivery over HFC network and ensures availability of high-performing video services for years to come.

Versatile functionality

The Teleste Luminato equipped with dense QAM modules provides very compact edge QAM platform for Cable TV operators for multiplexing of SPTS and MPTS video services and also PSI/SI table streams. High quality QAM modulation with agile up conversions secures seamless broadcast delivery over HFC network.

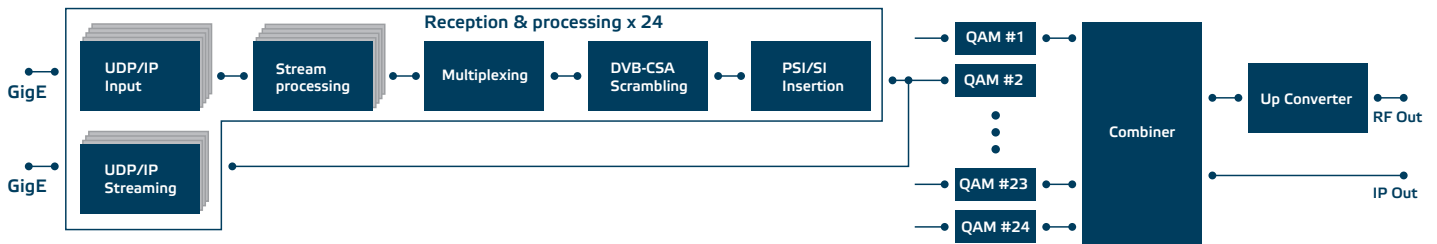
The Luminato dense QAM modules sustain selection of free-to-air and scrambled services from IP stream sources, which can be adjusted to the operator's service line-up with the built-in advanced transport stream processing capabilities. The Luminato dense QAM module supports Standard Definition, High Definition, UHD and 3D video in CBR and VBR formats and numerous audio formats. Optional content protection is based on DVB simulcrypt standard.

Effective flexibility

The Luminato dense modulators allow up to 144 QAM channels in one high-performance Luminato chassis. According to the Luminato system architecture, the video processing is performed on the dense QAM modules. This 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

One or more dense QAM modules can be included in 1 RU Luminato platform with Luminato satellite, terrestrial, cable, IP and DVB-ASI receivers, together forming a complete cable TV headend. The flexible architecture enables comprehensive service bouquet with locally received content in the edge of the network.



Block Diagram, Dense modulator

Embedded content protection

Dense modulator has the optional capability for 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. Component level scrambling is also supported to allow only video and audio scrambling to avoid descrambling challenges in set-top boxes.

Efficiency and reliability

With the advanced transport stream processing, operators can select the services and components that are relevant to their network, enabling them to efficiently manage the network capacity usage. Thanks to a high degree of automated functions the cost of system set-up and operation is minimised. The automated functions also reduce downtime due to changes in the received services.

Parameter	Specification	Note	Parameter	Specification	Note
IP inputs			Out of band noise, 1)		
Frame formats	UDP/IP		< -60 dBc	1st adj. channel	
TS packet per UDP frame	1...7		< -64 dBc	2nd adj. channel	
Max inputs streams/module	1024		< -70 dBc	3rd adj. channel	
Dejittering	PCR processing & buffering		< -70dBc	other channels	
Multiplexers			Harmonics	< -60 dBc	
Number of multiplexers	24		MER	> 42 dB	
Max input services/multiplexer	120		IP streamer output of multiplexer		
Max components per service	32		Framing format	raw UDP/IP	
Output speed	depends on QAM modulator settings		Traffic type	unicast or multicast	
DVB Common Scrambling Algorithm Content Protection			TS format	CBR, VBR	
Max scrambled services	480 per module		Max TS packet speed/ streamer	directly related to QAM output speed	
QAM Output			Maximum speed total	2 Gb/s	
Standard	ITU-T J.83 Annex A, B and C		General		
QAM constellations	Docsis CM-SP-DRFI-I16-170111 (64, 128, 256)		Power consumption	25 W	
Symbol Rate	4...7,4 MS/s		Supply voltage	24 V	
Impedance	75 ohm		Connectors	F 75 Ω, RJ45	
Output return loss	>14 dB	active channel	Dimensions (h x w x d), 2)	20 mm x 109 mm x 253 mm	
	>12 dB	out of act. ch 81...862 MHz	Weight	0,4 kg	
	>10 dB	out of act. ch 862...1200 MHz	Enclosure classification	IP21	
Output Level	96...106 dBμV	15...24 channels	Operating temperature range	-10...+55 °C	
	98...108 dBμV	10...14 channels	Storage temperature range	-30...+70 °C	
	100...110 dBμV	7...9 channels	Specification is met	0...+45 °C	
	102...112 dBμV	4...6 channels	Notes		
Output Power step size	0,2 dB		1) Values for at least quad channels active. Excluding harmonics		
Output center frequency	85...1000 MHz		2) Dimensions excluding connectors and locking screws		
Output frequency step size	50 kHz				



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