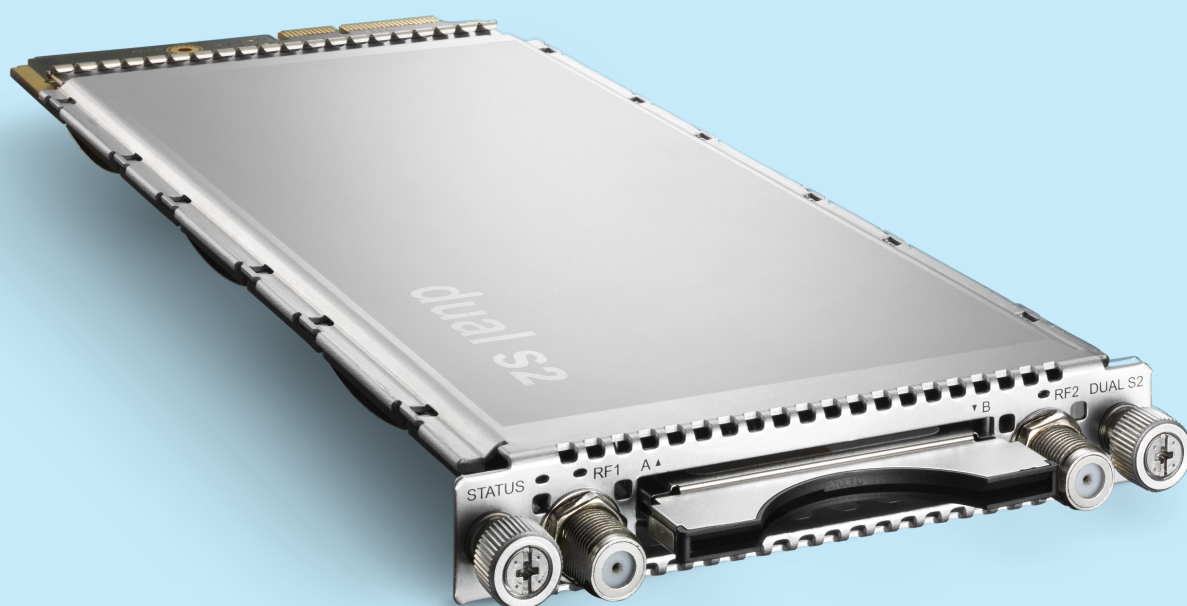


High density Luminato receivers for Cable TV and IPTV networks

Luminato enables flexible selection of free-to-air and scrambled services from DVB-S, DVB-S2, DVB-T, DVB-T2, DVB-C, DVB-ASI, ISDB-T and IP sources, which can be adjusted to the operator's service line-up with the built-in advanced transport streamprocessing capabilities. The Luminato receivers support Standard Definition, High Definition and 3D video in MPEG-2 and MPEG-4 AVC video formats and numerous audio formats.



Headend platform with flexible modularity

- Multiple services per receiver – high efficiency, lower investments
- Embedded security – services can't be accessed in unprotected format
- Hot swap as standard – swap the module and remain the configurations

The Teleste Luminato receivers provide best of breed receiving platform for Cable TV and IPTV operators. The receivers enable flexible selection of free-to-air and scrambled services from DVB-S, DVB-S2, DVB-T, DVB-T2, DVB-C, DVB-ASI, ISDB-T or IP sources, which can be adjusted to the operator's service line-up with the built-in advanced transport stream processing capabilities.

High density

High-performance Luminato chassis has six module slots to be freely furnished with any combination of the receiver modules which enables low-cost applications even with partially equipped chassis. Similarly, Luminato support perfectly pay-as-you-grow model in order to allow optimal timing for investments and system expansion.

Luminato receiver modules can receive content from satellite utilizing DVB-S, DVB-S2 and DVB-ASI networks or terrestrial DVB-T, DVB-T2, DVB-C, ISDB-T or IP networks. All receiver types enable reliable and high performance operation for receiving up to four digital television Multi-Program Transport Streams per module.

Satellite and terrestrial receivers are available as quad-receiver model or dual-receiver model with DVB descrambling. All Luminato module slots furnished with quad-receivers enable having up to 24 receivers in one RU chassis. As one receiver can process multiple services per receiver, the amount of received services can be vast. This increases efficiency and lowers headend investments dramatically. The optional descrambling uses DVB Common Interface modules flexibly supporting large variety of Conditional Access Systems.

Efficiency and reliability

With advanced transport stream processing, operator can select the services and components which are relevant to his network - either to save bandwidth or otherwise simplify the outgoing stream content. The Luminato receiver follow-up any changes on the received 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.

Interoperability as standard

Luminato receivers support Standard Definition, High Definition and 3D video in MPEG-2 and MPEG-4 AVC video formats and numerous audio formats.

The output of the receiver is always fully DVB compatible IP streams – complete with automatically generated PSI/SI streams. The output can be either carried as Multi Program Transport Stream or de-multiplexed to Single Program Transport Streams, which are directly suitable for IPTV networks and allow highly flexible stream routing and re-multiplexing on Cable TV networks. The IP output streams from the device can be transmitted either directly to another module on the chassis for further processing, to IP connected head-end equipment on the local or remote head-end, or directly to IPTV network. Further, each module can create up to 120 output IP streams.



Intuitive and user friendly graphical web user interface for management providing local and remote access.

Multiservice descrambling

Luminato receivers use DVB Common Interface modules to descramble incoming services with DVB scrambling.

Receiver models with descrambling capability are equipped with two Common Interface modules slots and two or four satellite, terrestrial or cable inputs. The Common Interface modules can be flexibly connected to either of the inputs. For example, each of the inputs can allocate own Common Interface module, or one input can use both modules for descrambling higher number of services or two different CAS system descrambling. When both descrambling slots are assigned to one input, then the other input can still be used for Free to Air services.

Embedded content protection

All receiver modules have the optional capability to do DVB Common Scrambling Algorithm and AES 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.



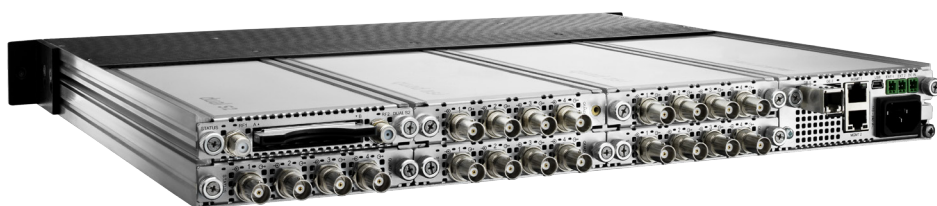
Dual DVB-S2 (S) module with Dual Common Interface module (optional) installed



Quad DVB-S2 (S) module



Dual DVB-T2 (T) / Quad DVB-T2 (T) module with Dual Common Interface module (optional) installed



Luminato platform fully furnished with ASI modules and Dual S2 receiver module with CI



Quad DVB-ASI module



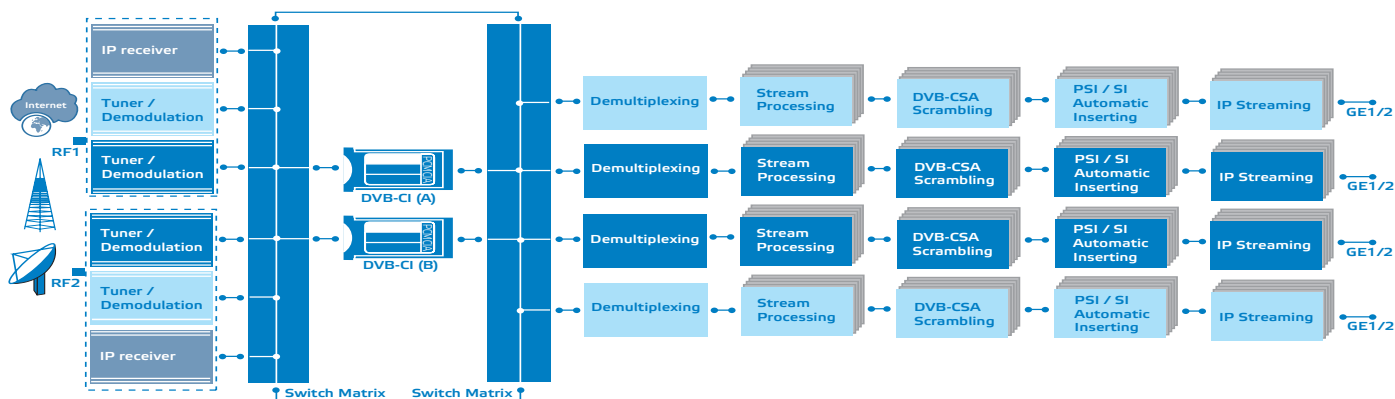
Dual IP receiver module



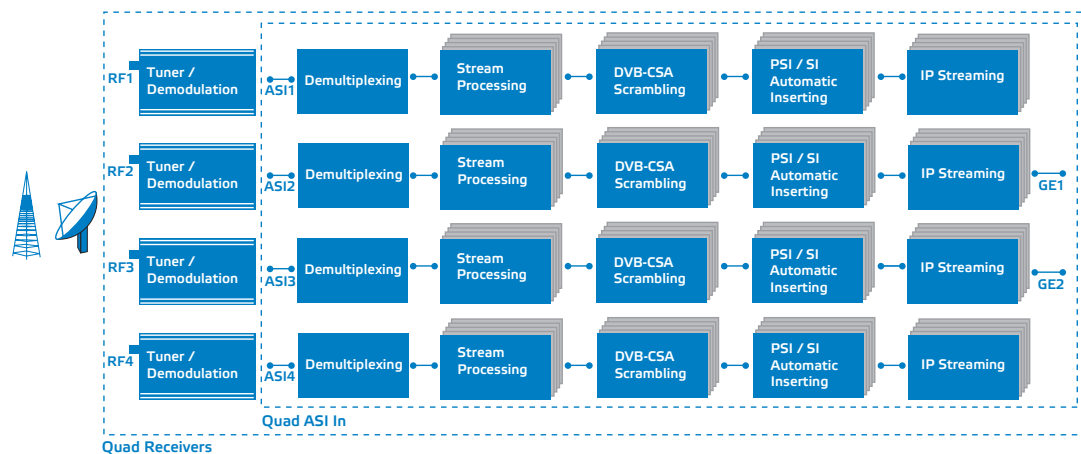
Dual ISDB-T / Quad ISDB-T module



Dual DVB-C / Quad DVB-C module with Dual Common Interface module (optional) installed



Block Diagram, Dual / Quad Receivers (■ only Quad C, T/T2 and ISDB-T Receivers) / (■ only Dual IP Receivers)



Technical specifications

Parameter	Specifications	Note	Parameter	Specification	Note
Satellite receiver RF input – DVB-S / DVB-S2			IP Input		
Impedance	75 ohm		Packet format	UDP/IP 1...7 TS packets per frame	
Frequency range	950 ... 2150 MHz		Traffic type	unicast or multicast	
AFC Range	8 MHz		Input streams per module	2	
Constellation	QPSK, 8PSK, 16APSK	*	Dejittering buffersize	120 ms	
FEC modes (autodetected)	All ratios compliant with ETS302307		Maximum bitrate per input	180 mb/s	
Signal levels	-70... -25 dBm		DVB Common Interface Descrambling		
Symbol rate	1,5...67,5 MS/s	QPSK *	Connector	PCMCIA	dual slots
* For QPSK > 4700ksym/s and 8-PSK > 31500 ksym/s satellite signal reception, high bitrate PSK modes in LRS receivers are required. APSK and high bitrate PSK modulation modes are only available in RF1 in dual DVB-S2 module (RF2 disabled) and RF1 and RF3 in quad DVB-S2 module (RF2 and RF4 disabled).	1,5...63 MS/s	8PSK *	Standard	DVB_CI EN50221	
	1,5...47 MS/s	16 APSK *	CA module	PC-Card type II	hot plug
Standard	ETS300421, ETS302307	DVB-S, DVB-S2	TS bitrate	up to 96 Mbit/s	
Terrestrial receiver RF input – DVB-T / DVB-T / ISDB-T			DVB Common Scrambling Algorithm and AES Content protection		
Impedance	75 ohm		Max service to be scrambled per module	120	
Frequency range	47 ... 862 MHz		IP Streaming		
Constellation	QPSK, 16QAM, 64QAM	DVB-T/T2/ISDB-T	Packet format	1 ... 7	DVB transport packets in UDP/IP or RTP/P
	256QAM	DVB-T2	Traffic type	unicast or multicast	
	DQPSK	ISDB-T	Max. IP streamer per module	120	
FEC modes (autodetected)	All ratios compliant with standards		Max. streaming capacity per module	250 Mb/s	
OFDM spectrum	2k, 8k	DVB-T	Traffic shaping	max peak traffic limiter	
	2k, 4k, 8k	ISDB-T	Adjustable voltage	13/18 V	LRT-X 13 V only
	1k, 2k, 4k, 8k, 16k, 32k	DVB-T2	22 kHz tone	on/off	
Segments	Full (13seg)	ISDB-T	Max output current per connector	500 mA	LRS-X **
Signal levels	-90 ... -20 dBm		Max output current per connector	100 mA	LRT-X **
Channel Bandwidth	6, 7, 8 MHz		** Note: Total DC feed power must be less than main PSU capacity minus installed module power consumption		
Transport stream bitrates per RF input	According to standards		General		
Standard	ETS300744	DVB-T	Supply voltages	24 V	
	ETS302755	DVB-T2	Power consumptions	6 W	LAS-C ***
	ABNT NBR 15601	ISDB-T		7 W	LIC-A***
	Nordig unified ver 2.2.1	DVB-T/T2		7 W	LRS-C ***
Cable receiver RF input - DVB-C				7 W	LRS-D ***
Impedance	75 ohm			7 W	LRT-B ***
Frequency range	110...862 MHz			7 W	LRC-A ***
Constellation	16QAM, 64QAM, 128QAM, 256QAM			9 W	LRC-B ***
FEC modes (autodetected)	All ratios compliant with standards			9 W	LRT-H ***
Signal levels	43... 77 dBμV			9 W	LRT-I ***
Channel bandwidth	7, 8 MHz			10 W	LRT-C ***
Symbol rate	4... 7,2 MS/s		Connectors, RF	F female	
Standard	ITU-T J.38 Annex A and C		DVB-ASI	BNC 75 ohm	
	ETS300429		Weight	0,3 kg	
	Nordig unified ver 2.2.1		Dimensions (H x W x D)	20 x 109 x 253 mm	Excluding connectors and locking screws
DVB ASI input			Enclosure class	IP21	
Impedance	75 ohm		Operating temperature	-10...+55 °C	
Max. speed per interface	216 Mb/s	payload traffic	Storage temperature	-30...+70 °C	
Max. speed total (4 ports)	250 Mb/s	shared with 4 inputs	Specification is met	0...+45 °C	
Standard	EN50083-9				