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LUMINATO CHASSIS



Luminato web-site: www.telesteluminato.com

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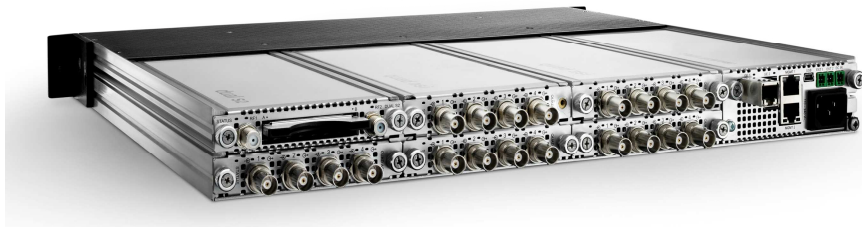
Luminato Chassis

The Teleste Luminato chassis is a base for an IPTV modular platform and cable TV headends. Luminato enables the operator to setup a very compact headend configuration using various processing and interfacing modules. Luminato scales from one chassis headend in a box to a multiple chassis bigger headend system. Architecture of the Luminato platform enables very high performance with very low power consumption.



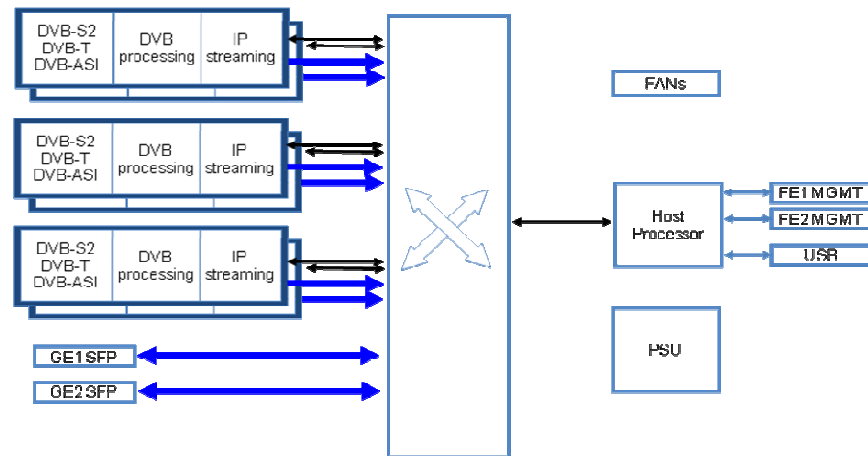
Luminato architecture

The Luminato chassis has 6 module slots for interface and processing modules. The Luminato architecture is future proof to support new module development later on by having all stream processing features in sub modules. Therefore, new functionality can be introduced later into the platform without touching the chassis.



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The stream processing in Luminato is distributed to sub modules, which utilize virtually unlimited processing capacity in practical configurations, without problems typically caused with a central shared processor. All sub modules can process independently incoming streams.



The internal router of the chassis makes the interconnection between sub modules and the payload gigabit Ethernet input and output ports. This means much less cabling at the headend and thereby simplifies headend configuration.

The router also has a separate internal management network for sub modules and a chassis which guaranties reliable operation also in high-load situations. All internal connections are gigabit Ethernet which enables high-performance operation.

Common management interfaces and power feeds for sub modules are also created in the chassis.

High-density design

The new component technology and selected architecture for Luminato creates a very high-density design, which saves a lot of rack space compared to traditional headend setups.

Luminato can have up to 12 receivers with descrambling capability in one chassis. If 6 quad receiver modules without descrambling are installed into the chassis, it increases the receiver count up to 24 in the chassis.

Using quad ASI-modules means that one chassis can have up to 24 ASI inputs or ASI outputs.

Installing six quad QAM modules means up to 24 QAM per chassis.

The Luminato chassis can also have a mix of modules to adapt to the various application needs of the operator.

Scalability

In accordance with the Luminato system architecture, the video processing is performed on sub modules, which enables low-cost applications even with a partially equipped chassis, while having the performance scalability to a fully equipped chassis.

The Luminato has virtually unlimited line speed capacity for stream processing in practical applications, which means that the Luminato chassis doesn't limit any practical configurations.

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The chassis has two gigabit Ethernet ports for payload traffic. These ports can be used as inputs and output depending on the sub modules installed. The current release supports up to 1 Gb/s streaming, but later release will extend capacity 2x 1 Gb/s.

There is no limit for the maximum amount of services in the chassis, which makes it possible to process a high amount of services in the same chassis. Practical setup can be from several tens of services up to 100...200 services in the same chassis. Using a multiple chassis in the headend scales setup can provide a virtually unlimited amount of services.

Hot swap

The sub modules can be swapped without power off the Luminato. Taking out one module doesn't affect other module operations at all. The chassis has centralized management for configuration, which enables automatic configuration recovery in case of a module swap. All this makes maintenance tasks easier and maximizes the service uptime.

Easy installation

The Luminato chassis is designed for 19" rack installation. It has mounting rails, which makes installation easy. Install the rails to the rack, and slide Luminato in place. All connectors are located on the backside.

Managed cooling

Luminato has managed ventilation, where internal temperature is actively monitored and fan speed is adjusted according to the required cooling capacity. Typically, fans rotate well below maximum speed, which increase their lifetime and generate less noise. The chassis cooling capacity is designed to support up to 100W heat dissipation, but typical setup takes less power. The fans can be replaced during live operation without service interruption. The fans are located behind the front panel.

Power supply

The chassis has a dedicated slot for replaceable power and input/output module.

The power and input/output module has AC Power Supply, which supports 110 VAC and 240 VAC systems. Luminato supports also power supply redundancy. The power input/output module has secondary power supply DC voltage input for external backup power supply.

Inputs and Outputs in Power module

The Power and input/output module have two gigabit Ethernet SFP module slots for streaming payload traffic and IP inputs depending on the sub modules installed. The SFP module makes easy adaptation to electrical and fiber media to create interconnectivity from Luminato to other devices.

The module has two management interfaces (100Base-T). The first one is typically used for general management purposes, and the second interface is dedicated connection to Conditional Access Servers.

The USB port can be used for first time setup using terminal software through serial connection profile.

Redundancy

To minimize service outage because of hardware failure, Luminato supports 1+1 redundancy in the chassis level. To keep the Luminato platform as cost effective as possible, all internal redundancy features are minimized.

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The pair of Luminato can be configured to act in main and backup schemes, where secondary Luminato monitors the main status. The secondary Luminato configuration is automatically synchronized with the main Luminato. The secondary Luminato stays in stand-by mode until failure occurs in the main Luminato. When the selected failure event triggers or the main unit is not responding, the main Luminato shuts down all payload outputs based on dedicated hardware circuitry to ensure switch off of all streaming. The secondary Luminato then takes over the stream processing operations.

A virtual common IP address can be assigned to the pair of Luminatos to introduce them as one device to higher-level management software. Still, both devices can be accessed through their own IP address.

Embedded DVB Content Protection

Luminato has the capability to protect services with DVB scrambling. The chassis provides DVB Simulcrypt interface to Conditional Access systems, which allows integration with a large variety of CA vendors. The content protection has been designed to scale to a large number of scrambled streams with minimal system configuration.

The actual scrambling is an integrated feature on the Luminato sub modules, which provides scalable performance and maximum flexibility of the system configuration, supporting both centralized and decentralized scrambling solutions.

Any service can be scrambled simultaneously with multiple CA systems. Other advanced features include short-key change intervals, automatic PSI/SI table generation, detailed monitoring of the interaction with CA system, support of redundant ECM generators and scheduled changes of the content protection properties.

Management

The Luminato chassis has centralized management features for configuration and status monitoring of the sub modules and chassis.

Management features are optimized for typical CATV or IPTV headend operations. There are many helpful features to make headend daily operation easy and effective.

Intuitive WEBUI is designed for easy management and monitoring for troubleshooting. It allows the user to establish setup quickly just by entering a few parameters, and then let Luminato do the detailed configuration based on internal intelligence. There is still the possibility to also adjust the detailed configuration for professional users.

Automatic service identification and PID remapping based on internal rules create unique values for all streams. Therefore, it is very easy to do the system-level configuration.

CLI (Command Line Interface) is helpful to do configuration updates in patches and also makes it possible to manage Luminato through low-speed communication links.

Monitoring parameters and warning/alarm messages are available using SNMP protocol and traps. This allows integration to the element management system or higher-level management systems.

The front panel has an indicator to get a quick overview status of Luminato. When all indicators show green, then everything is running as expected. Also, all sub modules have status indicators for module operation and interface

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indicators for signal status. Indicator lamps are helpful to locate interface or a module that requires action.

Features

- 6 processing and interface module slots
- 19" 1RU rack mechanics
- Installation rails for easy installation
- Slot for Power Supply and I/O module
- Power Supply Redundancy
- USB port for initial setup
- 2x gigabit Ethernet ports (SFP modules) for payload
- 1+1 chassis redundancy
- Intuitive WEB user interface
- Automatic SID and PID remapping
- CLI (Command Line Interface)
- SNMP monitoring and traps
- DVB Simulcrypt

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Technical specifications

Parameter	Specification	Note
Luminato Chassis (LCH-A-XXXX)		
Sub module slots	6	supports hot swap
Fans	4	replaceable
Cooling capacity	100 W	
Dimensions (note 1)	44 mm x 483 mm x 385 mm	h x w x d
Installation rails	492 ... 900 mm	Installation depth
Weight	3,5 kg	
Enclosure classification	IP21	
Operating temperature range	-10...+55 °C	
Storage temperature range	-30...+70 °C	
EMC compatibility	EN 50083-2	
Management interfaces		
WEB Browser User Interface	IE7.0 or Mozilla Firefox 3.0 (or newer)	
CLI		
SNMP	version 2 and version 3	note 5
Software Upgrade methods	Windows File system or TFTP	
DVB Common Scrambling Algorithm Content Protection		
Max service to be scrambled	720	note 4
Max EMM bitrate	1 Mb/s	
Luminato Power Supply (LPS-BX-X)		
Power consumption	120 W	max
Internal Supply Voltages	24 V / 4200 mA	LPS-B
External Power supply	24 V / 4200 mA	LPS-C
Connectors, 110 - 230 VAC	IEC	3 pins
Payload Gigabit Ethernet	2 x SFP modules	
Management	2 x RJ-45	100Base-T
External PSU	Phoenix contacts	MC 1,5/ 2-ST-3,5
SFP modules		note 2
First time setup	mini USB	serial profile
Dimensions (note 1)	40 x 109 x 252 mm	h x w x d
Weight	0,5 kg	
Enclosure classification	IP21	
Operating temperature range	-10...+55 °C	note 3
Storage temperature range	-30...+70 °C	
EMC compatibility	EN 50083-2	

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Notes

- 1) Dimensions excluding connectors and locking screws.
- 2) Luminato is verified to operate with Apac Electronics SFP-modules
- 3) Full specification is met 0...+45 °C
- 4) Chassis total capacity, when 6 processing module in use.
- 5) Supported MIBs:
 - MIB2-SYSTEM
 - TELESTE-ROOT-MIB
 - TELESTE-COMMON-MIB
 - DVB-MGSYSTEM-MIB
 - DVB-MGSIGNALCHARACTERISTICS-MIB
 - LUMINATO MIB

Monitoring Functions

Chassis

- Temperature
- Fan failure

Luminato Power Supply

- PSU load (total current)
- Overload alarm
- Low voltage alarm

Backup power supply

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Ordering Information

Luminato Chassis

Order Code: LCH-A-X-XXXX

- includes 6 slot chassis with PSU/Interface slot, 4 fans
- installations rails and screws
- USB cable
- CD ROM with manuals

Luminato Chassis options

LCH-X-A-XXXX module assembly service

- Sub modules are installed at factory to chassis
- Module locations must be specified in ordering

LCH-X-X-XXSX DVB Simulcrypt content protections

- Enables DVB simulcrypt interface to CAS systems

LCH-X-X-XXXXP PSI/SI editor

- Enables PSI/SI table editor, that can be used to create PSI and SI tables manually. This is useful if a special descriptor is needed to be inserted in the tables. Another usage would be to create SI table streaming.
- PSI tables: PAT,PMT, ...
- SI tables: SDT,NIT, ...

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Accessories

Power Supply and Input/Output module

This module has a main power supply for the Luminato chassis

The module has connectors for:

- Mini USB for initial setup. Any terminal software can be used through serial port profile.
- 2x 100 Base-T for management (MGMT1, MGMT2)
- 2x Gigabit Ethernet SFP module slots for video streaming (GE1, GE2)
NOTE: recommended to Apac Electronic SFP-modules (ordering codes below)
- 24 VDC input for secondary power supply (automatic switchover, if main power supply fails)
- I/O connectors for redundancy purposes or contact closures or switch detection

Order Code: LPS-BX-X Power Supply 100W, I/O connectors



Power Supply Option options

LPS-XX-A module assembly service

- Sub module is installed at factory to chassis

Power Cords:

LPS-XA-X Power Cord, Euro Plug

LPS-XB-X Power Cord, UK Plug

LPS-XD-X Power Cord, India Plug

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SFP modules for payload ports GE1 and GE2.

Order Code	Description	Additional info	Note
LSFP-A-X	Electrical CAT5 (100m) 10/100/1000Base-TX SFP module	RJ-45 connector	SGMII-module , select "Electrical only" from user interface
LSFP-B-X	Optical MMF 850nm (550m) 1000Base-FX SFP module	Dual LC optical connector	SERDES-module, select "Fiber Compatible" from user interface
LSFP-C-X	Optical MMF 1310nm (2km) 1000Base-FX SFP module	Dual LC optical connector	SERDES-module, select "Fiber Compatible" from user interface
LSFP-D-X	Optical SMF 1310nm (10km) 1000Base-FX SFP module	Dual LC optical connector	SERDES-module, select "Fiber Compatible" from user interface
LSFP-E-X	Optical SMF 1310nm (30km) 1000Base-FX SFP module	Dual LC optical connector	SERDES-module, select "Fiber Compatible" from user interface
LSFP-F-X	Optical SMF 1550nm (70km) 1000Base-FX SFP module	Dual LC optical connector	SERDES-module, select "Fiber Compatible" from user interface
LSFP-G-X	Electrical CAT5 (100m) 1000Base-TX SFP module	RJ-45 connector	SERDES-module, select "Fiber Compatible" from user interface

SFP module options

LSFP-X-A module assembly service

- SFP-module is packed into Luminato chassis accessory box to chassis at factory

Cover plates

NOTE:

Cover plate must be installed to unused slot to keep ventilation operating as designed.

Order Code: **LCP-A**

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External power supply

PSU is used as a redundant power feed to the Luminato Chassis. PSU can be installed to the external chassis or Luminato chassis (Note: requires two slots).

PSU module has 6 DC outputs.

Order Code: LPS-CX-X Backup Power 100W



External power supply options

LPS-XX-A module assembly service

- Sub module is installed at factory to chassis

Power Cords:

- LPS-XA-X Power Cord, Euro Plug
- LPS-XB-X Power Cord, UK Plug
- LPS-XD-X Power Cord, India Plug

External Power Supply chassis

Order Code: LCH-C-X-XXXX standalone chassis for one redundant PSU.

Chassis can be installed either rack mount or wall mount

- Create cover for LPS-CX-X
- Forced ventilation

