CELESTIA | C-STS

Optical Modem

OPTICAL MODEM FOR OPTICAL GROUND STATIONS

The Celestia Optical Modem is a key component for optical satellite communications. It can be integrated into optical ground stations or used in laboratory test environments. The modem is compatible with multiple standards and is engineered to support data rates up to 10 Gbps. Optional add-ons include an Optical Front End that can contain an Optical Receiver or multiple tunable laser seeds with programmable skew and wavelengths.

The Optical Modem is multi-standard compatible, and can be in-field reconfigured/updated.
19-inch-rack mountable for optical communication ground stations and test / lab environments.

The Optical Modem receives data from an optical downlink, performs the required processing layers, error correction / ARQ etc. and outputs the User Data (typically directly via LAN). Likewise, data to be sent to the spacecraft is received from the user by the Optical Modem, formatted, error correction coding and layers applied before transmission towards the optical uplink.

When integrated in an Optical Ground Station, the system can be operated as a “black-box” via the LAN based Control/Status/Data interface. A Local Graphical User Interface is also provided for stand-alone use and supporting integration tests and investigations.

The system is highly flexible and scalable. An optional Optical Front End offers one or more Single or Multimode Fibre coupled detectors and/or optical tunable Tx outputs. The system can also be used with external optical transmitters and receivers.

Test functions are available including PRBS/BER Checkers, user data pattern transmission and raw data acquisition. Raw data acquisition is a powerful function for non-standard tests, investigations and offline data processing using C-STS or customer provided software tools.

KEY FEATURES

General

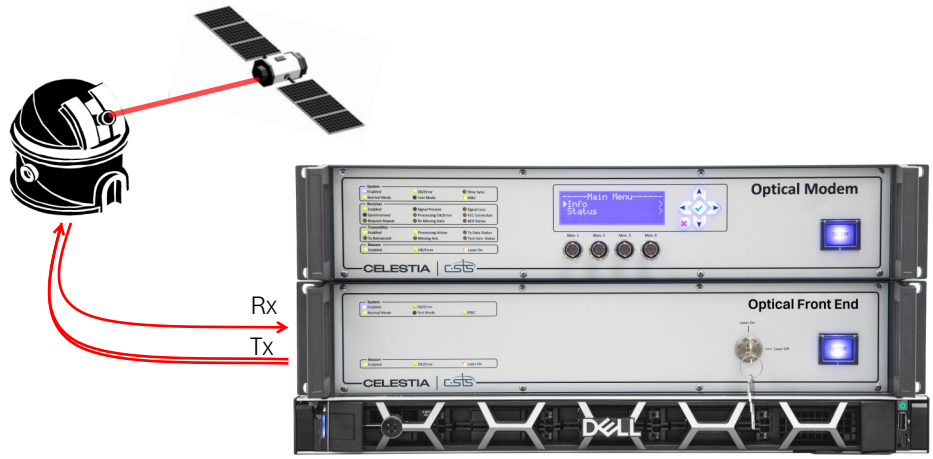
- Standard compatibility: SDA , CCSDS O3K RS Branch, custom
- Multiple tunable optical Tx outputs with programmable skew (optical C-band)
- SMF or MMF Receiver for optical input
- 10Gbit LAN for data ingress/egress
- Control and Monitoring software included

Data Processing

- Hardware processing of digital bitstream from optical receiver and uplink generation
- Bitstream coding/decoding, FEC, data extraction/encapsulation, with ARQ support
- Designed for data rates of up to 10Gbits
- Ingest raw data to disc: browse and process
- Internal BER test data generation: PRBS or custom from file

OPTICAL MODEM

The Optical Modem is connected via fibre to the optical ground station's optical bench via the Optical Front End, where it receives, transmits and directly processes optical Tx/Rx data. It offers a 10 Gbps LAN interface for user data ingress and egress, and is built to integrate into the client's OGS system with full remote control. A preinstalled local GUI allows on-site operation and can also be accessed through Windows Remote Desktop.



Optical Front End (OFE) for Optical Modems

- Electrical to optical converter: Multiple tunable optical Tx outputs with programmable skew
- Optical to Electrical converter: Powerful receiver for very low optical input powers
- Control and Monitoring via Ethernet
- Adjustable squelch
- RSSI output
- Data reception C-Band and L-Band
- Data reception and transmission up to 10 Gbps

C-STS Data Management

- C-STS Control and Management
- Ingest Platform
- Logging
- Data Access

Custom configurations have been delivered to clients with specific data-handling and optical-characteristic requirements. The device can also be configured as a purely data-receiver/processor without optical components. Back-end software accompanies the modem for control, monitoring, and data storage/archiving.

Interface to Telescope (with Optical Front End)	Single Mode Fibre, Multi Mode Fibre	**Dimensions Optical Front End H x W x D**	133 x 448 x 500 mm
Baud Rate	Up to 10 Gbps	**Weight**	<15kg
Monitoring Interfaces	4 x BNC ports	**Input Power Range**	100 - 240VAC 50 - 60Hz
Control Interfaces	Gigabit Ethernet	**Operating Temperature**	+10°C to +40°C
Compatibility	SDA, CCSDS O3K, Custom	**Operating Humidity**	30% - 85% (non-condensing)
10G TCP/IP Data Offload	SFP+ Optical or Copper	**Storage Temperature**	-10°C to +60°C
Dimensions Optical Modem H x W x D	133 x 448 x 500 mm (Dimensions are indicational only)	**Storage Humidity**	Up to 85% (non-condensing)

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Scan the QR code to access the C-STS website for all data sheets and more information