CELESTIA | C-sts

EAGLE-1 OPTICAL MODEM FOR OPTICAL GROUND STATIONS

The Celestia Eagle-1 Optical Modem is optimized for the Eagle-1 QKD satellite. It handles the high-speed classical optical communications between ground and space, and is designed for integration into optical ground stations. The Modem is compatibility tested with the Eagle-1 flight terminal. The system can be delivered with an optical receiver and an Optical Transmitter Unit supporting multiple tunable seeds with programmable skew.

Eagle-1 Optical Modem

The Eagle-1 Optical Modem is designed to be the Eagle-1 satellite's counter terminal in optical ground stations. The system is 19" rack mountable and is designed for optical ground stations. The system is configurable, and can be delivered with or without a laser Transmitter Unit and optical receiver. The system is optimized for communications with the Eagle-1 flight terminal and the same data handling framework is implemented.

The modem can be configured with several optical Tx outputs with programmable skew, and an Rx channel for very low optical input powers. The system can be configured to work with external optical transmitters and receivers.

Features such as FEC and ARQ helps to prevent loss of data. The Modem's optical receiver has a fade mitigation mechanism that compensates for rapid fades.

KEY FEATURES

General
- Eagle-1 specific Optical Modem
- Standard compatibility: SDA 2.1.2
- Multiple optical Tx outputs with programmable skew
- Powerful receiver for very low optical input powers
- FC/APC input and output bulkhead connectors
- Gigabit LAN for data ingress/egress
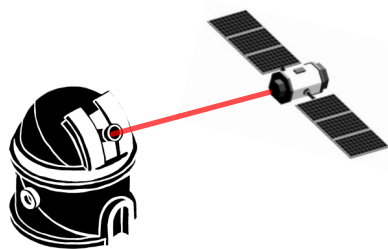- Control and Monitoring software included

Data Processing
- Hardware processing of digital bitstream from optical receiver
- Bitstream decoding, FEC decoding and data extraction
- Internal BER test data generation: PRBS or custom from file
- Internal loopback tests: optical and electrical

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Specification subject to change without notice.
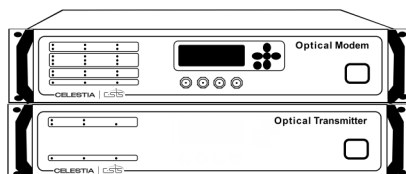
EAGLE-1 OPTICAL MODEM

Optical Signal Acquisition

Optical Modem

Advanced Functionality

- Fibered Input and Output
- Data Reception and Processing
- Decapsulation
- Decoding
- Formatting for Storage

C-STS Data Management

Data Ingest and Control

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

Rx

Tx

The Eagle-1 Optical Modem is designed to be seamlessly integrated with the customer's systems. A local GUI is also supplied which can be accessed both locally and remotely. The modem is connected to the optical ground station telescope via fibre and optical TX and RX data is received/ transmitted, and processed directly by the Modem. The Eagle-1 Modem is agnostic to the data being transmitted and received: User data is not interpreted by the Modem and is provided on a separate LAN interface that connects to the user's ingress/ egress system.

The system can be configured with multiple optical TX outputs with programable skew. The outputs are on the same channel, each with a slight wavelength offset which helps mitigate fading, ensuring signal integrity and reliability.

The modem is compliant to the EAGLE-1 Optical Free Space Interface Control Document (ICD) for the European Commission (EC) EAGLE1-STS-TE-ICD-0087 Issue D and Ground Terminal Interface Control Document for the European Commission EAGLE1-00746-SYS-ICD-TCO Issue 1.0.

Interface to Telescope	Single Mode Fibre	**Dimensions H x W x D**	133 x 448 x 500 mm
Baud Rate	Up to 10 Gbits	**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 2.1.2, EAGLE-1	**Operating Humidity**	30% - 85% (non-condensing)
10G TCP/IP Data Offload	SFP+ Optical or Copper	**Storage Temperature**	-10°C to +60°C
		Storage Humidity	Up to 85% (non-condensing)

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

bsi ISO 9001 Quality Management Systems CERTIFIED

Datasheet version 1.0