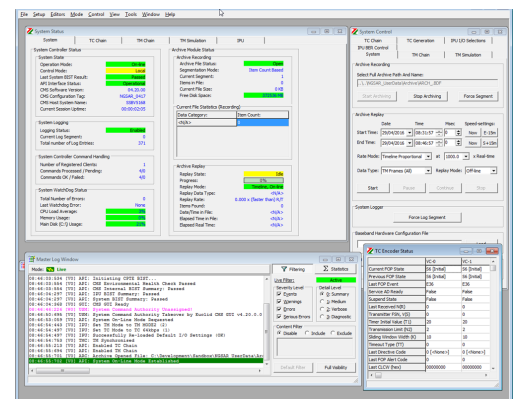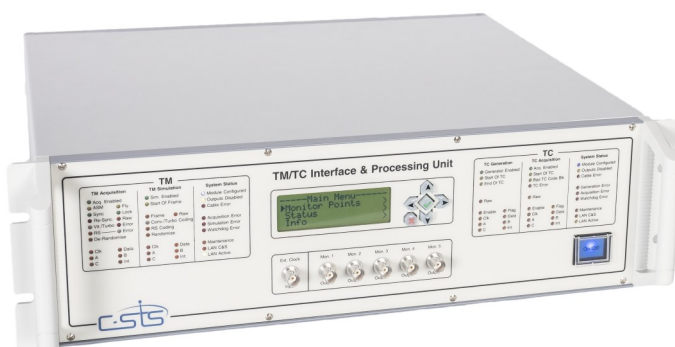# CELESTIA | c-sts

CONTROL YOUR SPACECRAFT USING RS422/LVDS INTERFACES

The TM/TC Front End provides direct control of spacecraft via baseband interfaces during spacecraft design, development, AIT and pre-launch.

Connects to the spacecraft On-Board Computer (OBC) or Central Data Management Unit (CDMU) via the Bypass Interfaces or via an RF SCOE.
Supports ECSS/CCSDS TM/TC Coding

TM/TC Front End

TM/TC Interface & Processing Unit (IPU) combined with the Control and Monitor Software (CMS) running on a workstation/PC.

TM Acquisition - physical layers, frame synchronization, frame annotation (e.g. time stamping, FEC results etc.), VC and packet extraction. Selectable serial decoding, error correction and de-randomisation. Idle Frame, VC filtering, reception analysis (counter continuities, FECW, packet CRCs etc.). CLCW extraction.

TC Generation - Packet, Segment, Frame, CLTU levels. CLTU serialization with PLOP mode and external or internal clocking.

TM Simulation - Packet, Frame and Physical layer generation for closed loop testing including Transponder/CDMU testing, RF Suitcases and stand-alone operation.

TC Acquisition - Physical, CLTU and Segment/Packet support for Echo TC processing, Transponder/CDMU testing, RF Suitcases and stand-alone operation.

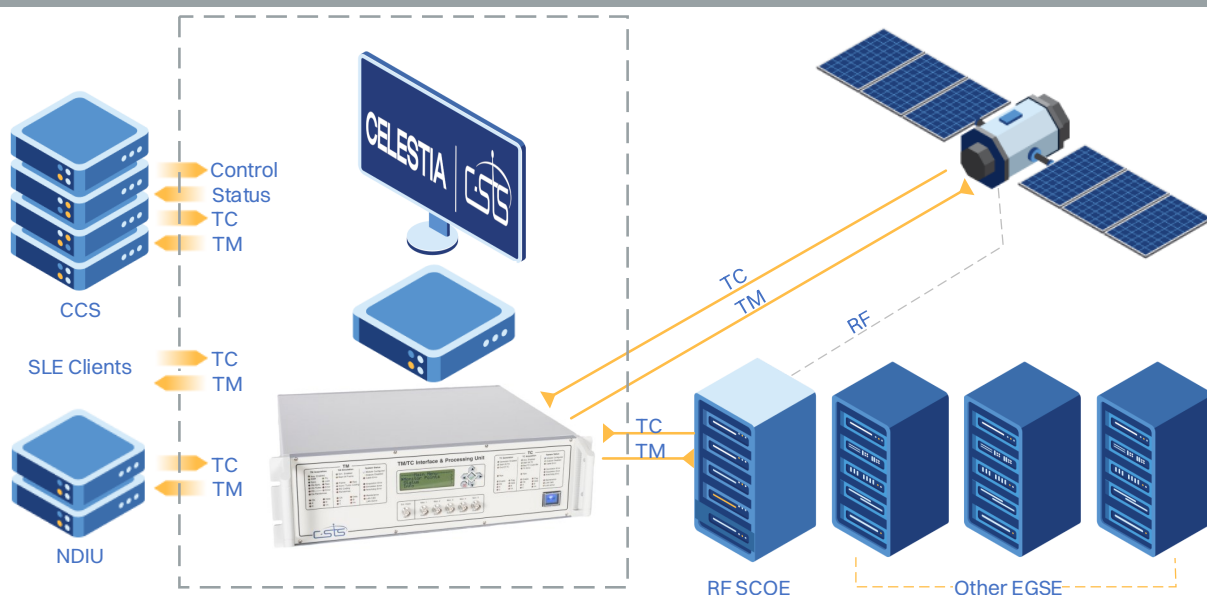**Test Functions** - Bit Error Rate Testers / Custom Functions.

TM/TC IPU
- 3U 19"Rack Mountable Unit
- 60 configurable RS422/LVDS pairs
- Galvanic isolation and FMEA protection (FMEA Report available)
- FPGA based signal routing and processing
- FPGA based Frame/CADU/CLTU processing including Coding/Correction layers

Control and Monitoring Software
- TM/TC Frame/CLTU and Packet processing, Checking, Statistics
- Local GUI (Data monitors, local TM/TC data editors/generators)
- Archiving/ Logging/Archive Extraction
- Remote Interface Plugins
- Typical LAN interfaces (including EDEN, C&C and SLE)

25+ years proven heritage in European spacecraft AIT and launch support.

Flexible tools for coding configurations, diagnostics, test data injection and analysis.

User friendly local GUI allows stand-alone use or as a black-box system integrated with a CCS/AIT. Standard software plug-ins for different CCSs (e.g. EDEN, C&C and SLE) + NDIU Lite.

The TM/TC FE allows the user to control and monitor the spacecraft at CLTU/CADU and/or packet levels.

TM Simulation and TC Acquisition for closed-loop testing + PRBS based BER generators/checkers.

Customisable Standard products. Options to include Service AD Telecommanding and Encryption, TC Authentication and specific formats, coding and interface configurations.

A combination of a standard 3U/19" Unit (TM/TC Interface and Processing Unit or IPU) and the TM/TC Application Software (Control and Monitor Software or CMS) .

Common options: IRIG-B or G, PPS/10MHz Receiver, Turbo decoding module and High speed LAN module.

Function	Description	Standard/Option
TM Reed-Solomon	Use/Bypass. (255,223), IL 1-8 with Virtual Fill	Standard
TM Convolutional/Viterbi	Use/Bypass. K=7 Rates: 1/2, 2/3, 3/4, 5/6, 7/8	Standard
TM/TC Randomisation	Use/Bypass. (independent for TM and TC)	Standard
Turbo	Rates:1/2, 1/4. Block Lengths: 1784, 3568, 7136, 8920	Option
TC Packet Support	Options available (BD only, AD&BD ,TC Authentication)	Options
TM Data Rates	0-10Mbps / 0-80Mbps (interface dependant)	Standard/Option
TC Data Rates	Typically <2Mbps (higher on request)	Standard
Line Coding	NRZ-L, NRZ-M, SP-L, (O)QPSK differential coding/decoding	Please ask
LAN Interfaces	EDEN, C&C, NDIULite, SLE and custom solutions	Please ask

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more information

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CERTIFIED

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