



# Data Sheet - CCS5 & TSC

## PROTOCOLS

### Packet & Frame Coding & Flow Control:

ECSS-E-ST-50-01C, 03C, 04C; ESA PSS-04-106,107,151; CCSDS 102.0-B-5, 201.0-B-3,202.0-B-3, 202.1-B-2, 301.0-B-3, 355.0-B-1, 355.1-B-1

### Packet Utilization (PUS): ECSS-E-70-41A, C

Flexible plugin & driver architecture; select protocol at installation.

Main protocols:

**Checkout & EGSE:** EDEN, C&C

**Ground Station:** Safran Cortex & compatible, ESA NIS, NDIU LITE

*SLE (RAF & F-CLTU) with UNIS option.*

## TMTC DATA BASE

**SCOS2000 MIB ICD 7.2** extended: (e.g.) unlimited field lengths, drop & load multiple databases, deduced parameters in TM & TC, variable parameters globally accessible & limit-checked, fine

control of variable length parameters, big & little-endian parameters, VPD\_CHOICE, dynamic HK definition. Online MIB table browser available. All tables accessible from TOPE.

Full details in CCS user manual. Not supported: TC sequence tables (use TOPE or command stack files).

## AUTOMATION LANGUAGE

**TOPE** (includes Tcl/Tk 8.6).

Numerous Tcl extension packages included, e.g. Tk, [incr Tcl], database access.

## OPERATING SYSTEMS

**Windows™:** works on all recent versions.

Automated installer. Tested on Windows 10.

**Linux™** works on all recent distributions, installed as RPM. Tested on RHEL7 and OpenSuse LEAP.





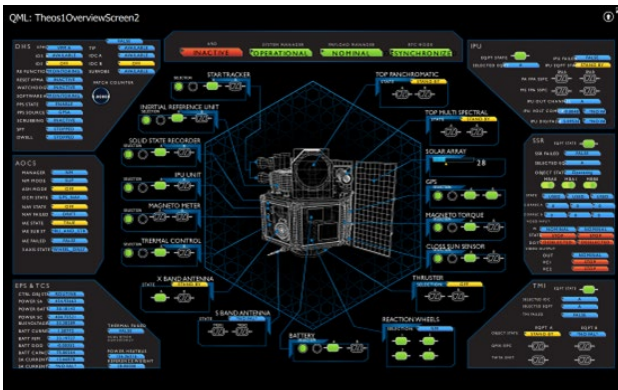
## ARCHIVE

Open format: raw binary segmented files, containing header & content, index stored in RDBMS: MySQL & compatible, PostgreSQL. TSC standalone defaults to SQLITE.

TOPE supports retrieval of any archive object, from current or previous sessions, including TM and TC parameters in specific packets.

## GRAPHICAL DISPLAYS

Native user interface based on Qt. QML (Qt Modeling Language) allows scripting of fluid touch-enabled displays. Mimic editor provides editor for simple schematic QML displays. Tk toolkit allows classic user-scripted graphical user interfaces to be written using TOPE.



TM simulation: inject raw data or generate TM according to its MIB definition.

TC modelling: model and verify commands sent by another entity.

Secure installation option, automated test & quality metrics

## SOFTWARE PLATFORM

C++ based on commercial Qt5.15. Tcl/Tk libraries included on BSD license terms.

IPR owned by Terma.

## SUPPORT

Standard license price includes 1-year warranty & email support. Standard training packages available on request.

Updates from <https://tgss.terma.com>

Export Control restrictions may apply.

**WIKI and access to bug-tracking system available to licensed customers.**