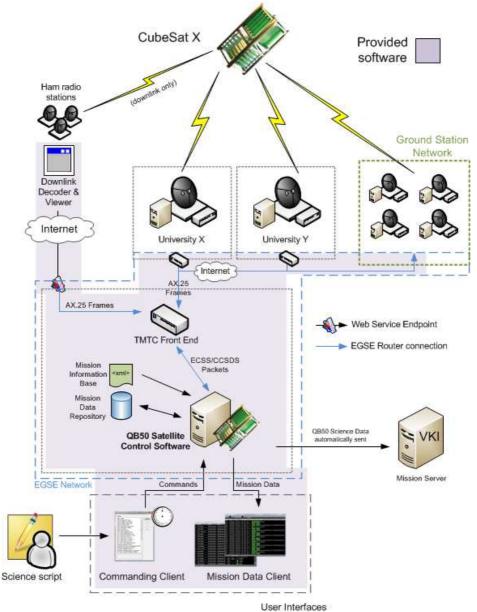


Satellite Control Software

We provide you full software to control and monitor your satellite as part of your ground segment.



Key Features

- Receive telemetry (housekeeping and payload data)
- Send telecommands with multi-stage acknowledgements
- Calibrate values and perform checks
- Store raw and engineered values
- Persist raw streams for replay
- Support for **multiple ground stations** (down- and uplink)
- Highly configurable using an XML-based Mission Information Base

Key Benefits

- Ready to use, requires only configuration
- Based on a flight-proven system
- Decoder for the radio amateur available
- Based on well-known and supported standards
- Compatible with AX.25 and QB50 science requirements
- Can connect several GS to create a small network





Interested, questions Send us an email to <u>stephane.billeter@epfl.ch</u>

and scholz@vki.ac.be in cc



Data Format

D SwissCube Mission Data Client

- KISS for the interface with the ground stations¹
- UI Frames of the AX.25 Link Access Protocol for Amateur Packet Radio²
- ECSS Telemetry and Telecommand Packet Utilization³
 - o Telecommand Verification
 - Housekeeping & Diagnostic Data Reporting
 - Function Management
 - Mission-specific Services

Clients

- Mission Data Client: graphical client for displaying housekeeping and payload data (alphanumeric displays, etc.)
- **Commanding Client:** application for commanding the spacecraft and controlling the ground segment using scripts
- Extensibility:
 - API for sending space and ground commands

swiss **space** center

• API for retrieving data (live and historical)

Telecommands Rea Time	al- Telemetries Real-Time	Housekeeping Real- Time		Image Service				
Telecommands History	Tolomotrios History		ousekeeping History		Housekeeping Overview			
Tracing	Power Readings	🐢 Telecomm	ands History - SwissCi	ube Mission Data Cl	ient			
		Page: <	1 > - It	ems per Pag	e: 20 🔻	- Re	efresh	
-			Date	Time	Doy AP			r RGTOASCData
ate Time	Message	Token 3171	23/05/2007		143 69			••••••••••••••••••••••••••••••••••••••
/05/2007 14:11:47.03	Distribution client connected.	3170	23/05/2007		143 69 143 68		_	
/05/2007 14:11:46.98	Distribution client connecting	3169	23/05/2007		143 68	_	_	00-11-DD-69-00-1A-AC-C7-7D-00-04-8F-80-01-81
/05/2007 14:09:26.22	Telecommands Real-Time win		23/05/2007		143 68			●●○○○○ 00-03-0A
/05/2007 14:09:26.13	New distribution filter applied	3167	23/05/2007	12:24:57.14	143 68	4 128	1	
/05/2007 14:09:20.26	Power Readings window laune	24.66	23/05/2007	12:24:57.13	143 68	4 11	4	00-11-DD-69-00-1A-AC-C7-7B-00-04-8F-80-01-00
/05/2007 14:09:19.95	New distribution filter applied	3165	23/05/2007	12:24:56.84	143 68	_	-	••••••••••••••••••••••••••••••••••••••
/05/2007 14.09.19.95	New distribution litter applied	5104	23/05/2007		143 68			
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			23/05/2007		143 68			
		3157	23/05/2007		143 68			00-11-DD-69-00-1A-AC-C7-75-00-04-8F-80-01-8C
		3156	23/05/2007	12:24:54.80	143 68	8 128	4	••••••••••••••••••••••••••••••••••••••
			23/05/2007		143 68			
		3154	23/05/2007		143 68			00-11-DD-69-00-1A-AC-C7-73-00-04-8F-80-01-01
			23/05/2007		143 69			0-03-0A
		3152	23/05/2007	12:24:52.67	143 68	4 128	1	

Conclusions

Interfaces, installation and configuration are fully documented for an easy use of the software. The SCS can be used during your ground testing.

By choosing the SCS, you will receive software which was already used and tested, which can work easily in a network of ground stations to optimise the communication with your Cubesat.

http://en.wikipedia.org/wiki/AX.25#KISS-mode framing

^[3] Tailored ECSS-E-70-41A – Ground systems and operations – Telemetry and telecommand packet utilization.



^[1] <u>http://www.ka9q.net/papers/kiss.html</u>, <u>http://en.wikipedia.org/wiki/KISS</u> %28TNC%29,

^[2] http://www.tapr.org/pdf/AX25.2.2.pdf, http://en.wikipedia.org/wiki/AX.25