

Full-duplex S-band Ground Station

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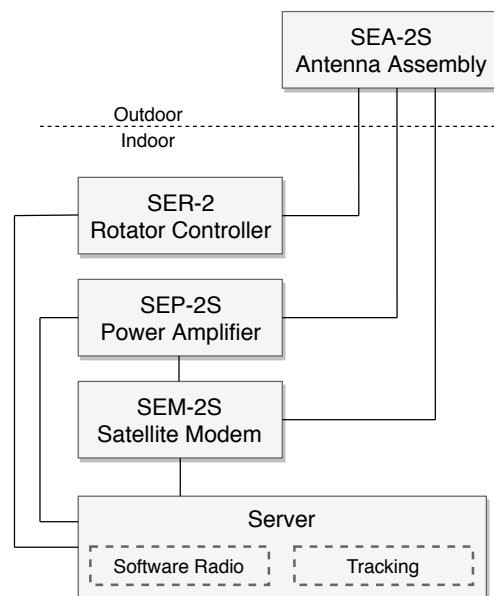
Introduction

The Satlab S-band Ground Station is a fully autonomous ground station capable of tracking and communicating with LEO satellites equipped with S-band transceivers within the commercial S-band range.

The setup is optimised for satellites in the 400-700 km altitude with omnidirectional or patch antenna. As the system is highly customisable it can be optimised for other missions as well.

Features

- Ground station kit for LEO satellite on S-band
- 19" rack mountable server
- Direct conversion SDR modem with ceramic monoblok filters for RX and TX
- 20W Power Amplifier for uplink
- Cavity duplex filter for full duplex operation
- Delivered with support library and example code for use with the SRS-3 transceiver



Key Parameters

Parameter	Specification
Frequency range	TX: 2025 - 2110 MHz, RX: 2200 - 2290 MHz
Modulation and bitrate	GMSK, 32 - 512 kbps
Receive G/T	9 dB/K
Transmit EIRP	36 dBW
Feed	Prime focus, fixed circular polarization (RHCP or LHCP). Build in cavity duplexer and LNA.
Pointing Error	<1 deg
Outdoor / roof mount	2.4m dish, antenna rotor, tower, non-penetrating base mount
Indoor (19" rack)	1U Satellite Modem, 2U Power Amplifier, 1U Rotator Controller, 1U Server
Cables	Two low loss coax, shielded rotor control and sensor; 20 meter
Data Interface	Ethernet
Input voltage	100-240 VAC, 50/60 Hz

Antenna Assembly

- 2.4m prime focus dish
- Fixed right-hand or left-hand circular polarization
- Cavity duplex filter and LNA for full duplex operation
- Half power beam width +/- 2.25 deg
- Pointing error <1 deg
- Tower and mounting base for installation on flat roof or similar level surface
- Includes 20 meter cables between tower and rack

Server Unit

- 1U 19" rack mountable server
- Routes CSP and IP traffic to/from the Satlab SRS-3 transceiver
- Client transmit and receive CSP and IP via Ethernet
- LEO satellite tracking
- Software radio and modem

Satellite Modem

- 1U 19" rack mountable
- External 12V DC power supply (included)
- Protected DC feed for outdoor LNA
- High performance ceramic monoblock filter for RX and TX
- USB3 interface to server for software radio functionality
- RCA connector for HPA TX enable control
- ON/OFF switch, RX Enable LED and TX Enable LED in the front
- Optional 10 MHz ref. clock input

Power Amplifier

- 2U 19" rack mountable
- >20W P_{sat} GaN amplifier
- Temperature controlled cooling fans
- USB for TX enable control and current/temperature monitoring
- Push-to-talk enable signal from modem unit
- 100-240 VAC input power
- ON/OFF switch, Enable LED and Error LED in the front

Rotator Controller

- 1U 19" rack mountable controller
- 100-240 VAC input power
- USB interface to server