GROUND SEGMENT — TURNKEY RF SITE

Remos SmallSat Ground Station

Product Datasheet

VHF/UHF/S-band ground station kit with cross-polarized Yagi arrays, 1.9 m mesh dish, Expedite modem, and Sequencer automation.

VHF/UHF/S-band	Yagi + 1.9 m dish	Expedite	Sequencer
mission band coverage	multi-band antenna suite	modem and scheduler	RF switching and control

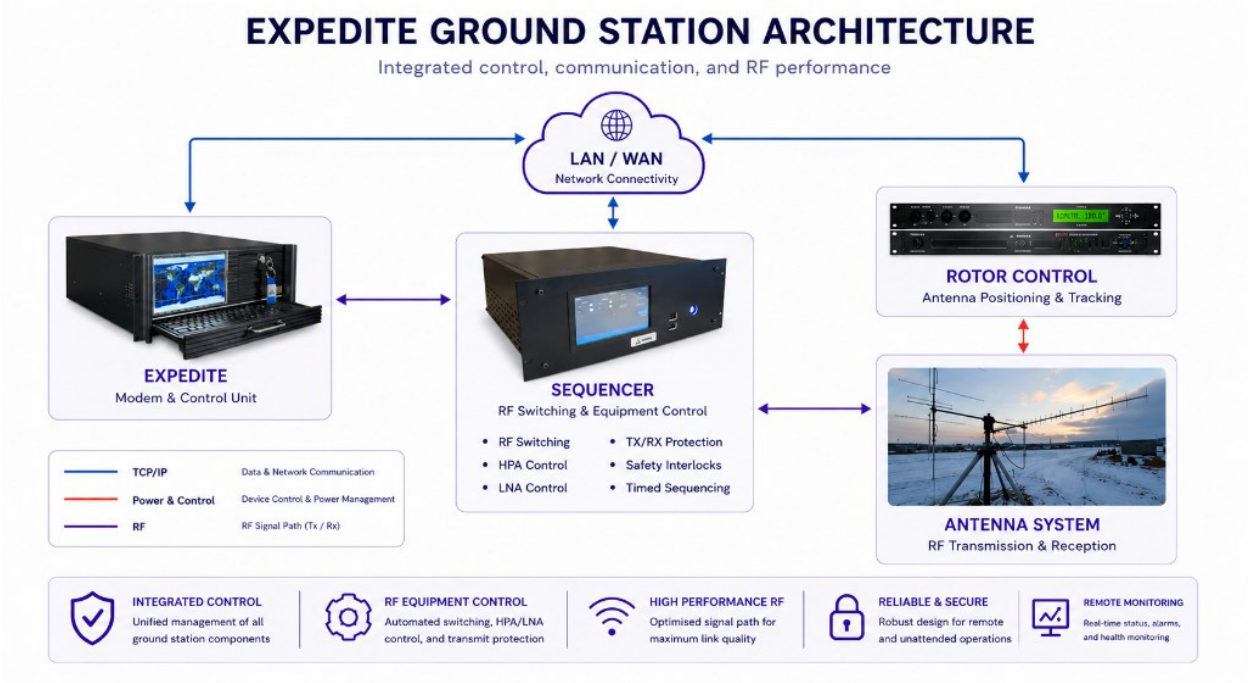
Manufacturer	Remos Space Systems AB
Product	Remos SmallSat Ground Station
Product class	VHF/UHF/S-band SmallSat TT&C ground station
Primary role	Low-rate TT&C, pass scheduling, and automated RF site operations
Included subsystems	UHF Yagi, VHF Yagi, S-band mesh dish, Expedite modem, Sequencer
Reference site	Melderstein, Sweden (66.94N 22.16E)
Product page	https://www.remosspace.com/products/ground-stations/vhf-uhf-s-l-band/
Contact	info@remosspace.com

Remos SmallSat Ground Station — Melderstein, Sweden

Remos Space Systems AB Aurorum 1C, 977 75 Luleå, Sweden

System Overview

- Integrated VHF/UHF/S-band ground station for low-rate TT&C and LEOP support
- Cross-polarized UHF and VHF Yagi arrays for small-satellite uplink and downlink
- 1.9 m mesh parabolic dish for S-band Rx/Tx with RHCP/LHCP feed options
- Remos Expedite software modem for scheduling, tracking, modulation/demodulation, and REST/TCP/IP integration
- Remos Sequencer for deterministic Tx/Rx switching, HPA control, and RF path automation
- Indoor rack equipment connected over LAN/WAN; outdoor antennas on positioner and dish mount
- Suitable for GSaaS delivery, mission rehearsal, and nominal multi-pass operations



Expedite ground station architecture — integrated control, communication, and RF performance

Station Band Coverage

Band	Frequency		
ModeRF Summary UHF	399–403 MHz; 435–438 MHz	Rx/Tx	Gain 17 dBi; cross polarization; up to 100 W
VHF	137–146 MHz	Rx/Tx	Gain 14 dBi; cross polarization; up to 100 W
S-band	2025–2100 MHz; 2200–2290 MHz; 2400–2450 MHz	Rx/Tx	Gain 29 dBi; RHCP/LHCP; up to 80 W

UHF Yagi Antenna

Parameter	Specification
Frequency range	430–440 MHz.
Free-space forward gain	16.7 dBi.
Front-to-back ratio	27 dB.
Beamwidth	27.8° horizontal; 29.3° vertical.
Polarization	Horizontal/vertical; RHCP and LHCP with phase shift.
Isolation	More than 28 dB.
SWR	Less than 1.2 across the band.
Power handling	2 x 850 W.
Elements	30 total (15 + 15).
Boom	3.5 m tapered boom, 30x30 and 20x20 mm.
Turning radius	2 m.
Net/gross weight	4.3 kg / 6 kg.
Transport length	119 cm.
Survival wind speed	150 km/h.

VHF Yagi Antenna

Parameter	Specification
Frequency range	144–146 MHz.
Free-space forward gain	12.7 dBi.
Front-to-back ratio	32 dB.
Beamwidth	43.4° horizontal; 50.4° vertical.
Polarization	Horizontal/vertical; RHCP and LHCP with phase shift.
Isolation	More than 30 dB.
SWR	Less than 1.2 across the band.
Power handling	2 x 1500 W.
Elements	14 total (7 + 7).
Boom	3.5 m tapered boom, 30x30 and 20x20 mm.
Turning radius	2 m.
Net/gross weight	4.3 kg / 6 kg.
Transport length	119 cm.
Survival wind speed	150 km/h.

S-band Mesh Dish Antenna

Parameter	Specification
Type	1.9 m mesh parabolic dish.
F/D ratio	0.45.
Frequency bands	2200–2290 MHz; 2025–2100 MHz; 2400–2450 MHz.
Mode	Rx/Tx.
System gain	29 dBi.
Polarization	RHCP/LHCP.
Transmission power	Up to 80 W.
Gain at 2000 MHz	27.1 dBd; −3 dB beamwidth 5.3°.
Gain at 2320 MHz	29.2 dBd; −3 dB beamwidth 5.1°.

EXPEDITE Modem

Product Summary

Expedite is Remos' software modem for TT&C with mission scheduling, antenna control unit support, and host integration over REST/TCP/IP. In the Remos SmallSat Ground Station, Expedite coordinates pass operations, rotor/dish control, modem processing, and Sequencer switching from a single operator environment.

EXPEDITE modem appliance

Parameter	Specification
Product class	Software modem for TT&C.
Hardware	4U rack-mount server with built-in digitizer.
Supported frequency range	70 MHz–2.5 GHz.
Mission bands	VHF, UHF, S-band, low-rate X-band.
Operating mode	Continuous and burst.
Symbol rate	100 sps–1 Msps standard; up to 25 Msps optional.
Scheduling	Integrated mission scheduler; pass horizon up to 168 h.
Antenna support	ACU instrumentation; internal or external angle generation.
Host interfaces	TCP/IP, REST, WebSocket, ZeroMQ, web application.
Supported transponders	GOMSpace AX100, AX2150; Satlab SRS-3/4; AAC Clyde Space; EnduroSat UHF II; GAUSS.
Optional extensions	CCSDS SLE; Cortex-like streaming; 25 Msps extension.
Dimensions (H×W×D)	177 x 482 x 555 mm.
Mass	16 kg.
Product page	https://www.remosspace.com/products/expedite/

Operational Capabilities

- Telemetry receive and telecommand transmit processing for supported small-satellite transceivers
- Ephemeris-driven pass planning, Doppler compensation, and mission logging
- Half-duplex RF Sequencer control and link-quality monitoring
- Local GUI, remote desktop, integrated front panel, and REST API operation
- Product manual and REST API documentation (English)

SEQUENCER

Product Summary

The Remos Sequencer is a rack-mounted automation unit for deterministic Tx/Rx switching in the ground-station RF chain. It integrates RF switches, PSU, HPAs, BIAS-Ts, and PLC logic in a 4U enclosure controlled from Expedite over Modbus TCP/IP.

Remos Sequencer — front panel

Remos Sequencer — rear panel

Parameter	Specification
Product class	Ground-station RF switching and automation unit.
Primary role	Ordered Tx/Rx switching, HPA control, and RF path sequencing.
Control interface	Modbus TCP/IP, REST API, SSH; controlled from Expedite.
Front panel	Integrated touchscreen LCD with relay and status indication.
RF connectors	Radio Tx/Rx: SMA female; antenna Tx/Rx: N-type female.
Form factor	4U rack-mount (482.6 x 177 x 425 mm).
Mass	12 kg.
Operating temperature	+10°C to +40°C.
Power	110–240 V AC; 200 W typical, 300 W max rating.
Network	1 x 2.5 GbE; Modbus TCP port 502.
Product page	https://www.remosspace.com/products/sequencer/

Operational Capabilities

- Deterministic switching between transmit and receive RF paths
- Local status visibility on integrated LCD; USB keyboard/mouse support
- Ethernet host integration for automated mission workflows
- Configurable relay and switching behavior for site-specific RF chains
- Commissioning support via visible IP address and Modbus connectivity checks

Integration and Deployment

Function	Specification
System control	Expedite orchestrates modem, scheduler, ACU, and Sequencer functions.
RF path	Sequencer sits between Expedite and antenna/LNA/PA hardware.
Networking	Indoor equipment interconnected over LAN/WAN TCP/IP.
Customer furnished	Suitable RF cables (SMA/N, 50 Ω), Ethernet, antenna foundations, and VPN/network access as required.
Documentation	Product manuals and REST/Modbus integration documentation (English).

Integration with Remos Umoja Ground Station Network Manager

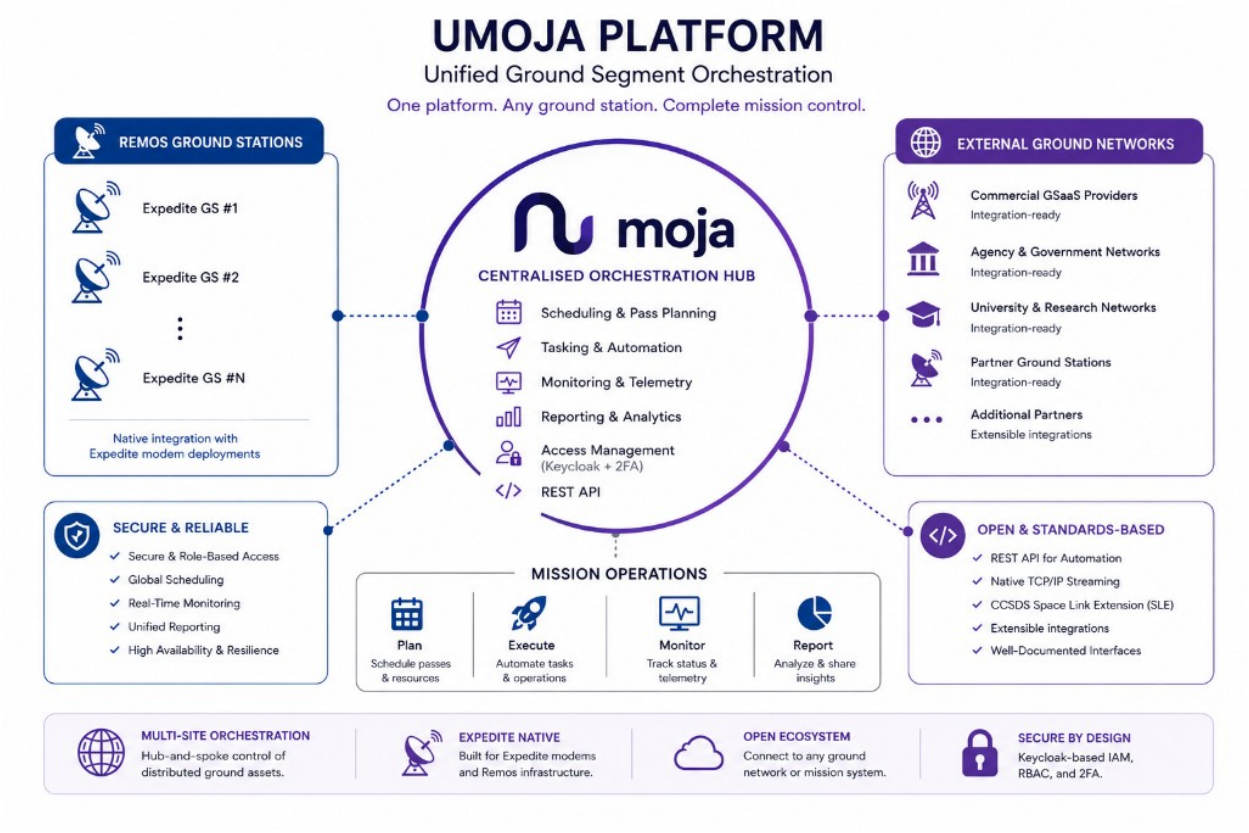
Remos Umoja is a web-based ground-station orchestration and GSaaS management platform. It provides a central hub for scheduling, monitoring, and reporting across distributed ground assets. The Remos SmallSat Ground Station integrates natively with Umoja, so Expedite modem operations at Melderstein can be managed alongside other Remos sites and partner GSaaS networks from a single portal.

Multi-GS
network orchestration

Expedite native
modem integration

REST API
automated operations

Keycloak + 2FA
secure access



Umoja platform — unified ground segment orchestration

Remos Space Systems AB
Aurorum 1C, 977 75 Luleå, Sweden
info@remosspace.com remosspace.com/products/ground-stations