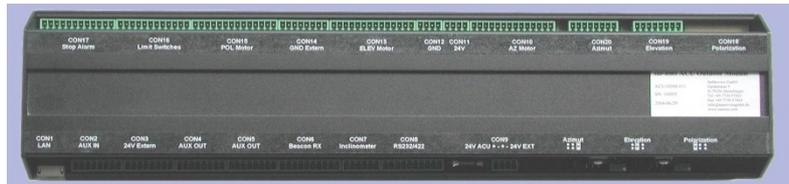


## sat-nms ACU-ODM - Antenna Control - Outdoor Module

The **sat-nms** ACU-ODM Module (Outdoor Module) is the core module of a complete antenna step-track system, which tracks precisely any antenna size on the satellite. The software implements the standard step-tracking mode as well as an improved Adaptive Tracking Algorithm. The **sat-nms** ACU-ODM records the tracked positions for several days based on these data and calculates a mathematical model to predict the antenna position. This reduces possible step-track failures and provides continuous operation in case of a beacon receive failure.

In the third operation mode called "Program Tracking" the antenna follows a path defined by a file that contains time stamped azimuth, elevation and polarization values, which usually has been calculated by external software.



The **sat-nms** ACU-ODM Module can also be used as a pure and very cost-effective antenna-positioning controller for smaller antennas as in this case. The tracking software option needn't be installed.

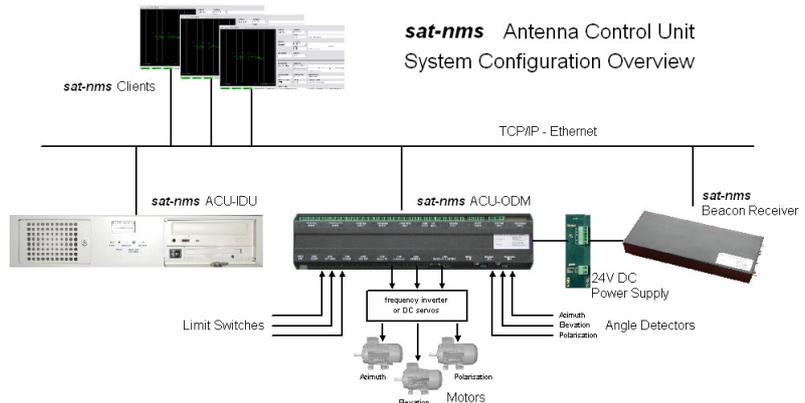
The DIN Rail Module provides all necessary interfaces to any antenna. The **sat-nms** ACU-ODM Module can be very flexibly adapted to any type of antenna as the motor controllers can be selected independently.

- Three motor controllers, like DC servos for smaller antennas or frequency inverters, which are commonly used in larger antennas.
- Limit switches, alarm circuits
- Angular detectors measuring the azimuth, elevation and polarization angle, three different daughter boards are available that cover most of the angle detectors used in satellite ground stations:
  - Analog resolver, covering the existing antennas
  - Digital angle detectors with SSI interface
  - A/D interface to measure the voltage across a precision potentiometer



The DIN Rail Module can be directly integrated into a cabinet at the antenna. Together with the **sat-nms** LBRX Beacon Receiver, also available as DIN Rail Module, it is possible to have a complete step-track system integrated into the antenna cabinet.

The **sat-nms** ACU-ODM Module includes an integrated web server and provides its operator interface via web browser. The **sat-nms** ACU-ODM includes also http and ftp for remote diagnosis and support. The system is easy to maintain. The support can be performed remotely and the interface to high-level MNC Systems is provided via Ethernet and TCP/IP.



### Key Features

- Web-based, user-friendly Operator Interface
- Step-track Algorithm as Option available
- Together with **sat-nms** LBRX a complete step-track System in a Cabinet at the Antenna
- Outdoor Unit: high quality Frequency Converters for AZ and EL Drive Speed Control
- HTTP Protocol for external MNC Interface

### Contact Information

SatService  
Gesellschaft für Kommunikationssysteme mbH  
Hardstrasse 9, D-78256 Steisslingen, Germany  
Phone +49 7738 99791 10,  
Fax +49 7738 99791 99  
E-Mail [sales@satservicegmbh.de](mailto:sales@satservicegmbh.de)  
[www.satnms.com](http://www.satnms.com), [www.satservicegmbh.de](http://www.satservicegmbh.de)

## Technical Specification

### Positioning

Operational Modes	Manuel Mode (Positioning) Step-Track Adaptive Tracking, takes into account last Days History Program Tracking, based on time stamped File Data 99 (including Beacon Receiver Configuration of <b>sat-nms</b> LBRX) Resolver, Digital SSI and Potentiometer
PRESETS, Storage of <b>sat-nms</b> ACU System Configuration	
Position Encoding with three different Interfaces via Daughter Boards	
Quantization Error	Resolver 16bit: 0.0055° SSI 13bit: 0.044°, 16bit: 0.0055°, 17bit: 0.0028°, 19bit: 0.0007° 0.001°
Display Position Resolution	<b>sat-nms</b> LBRX or Analog Voltage Input
Interface to Beacon Receivers selectable	0 to 10V
Analog Voltage Input	Better than 10% of receive 3dB Beamwidth (RMS). The encoder coupling and alignment error should not exceed 0.003° to achieve the specified tracking accuracy. The influence of antenna structure thermal error is not considered.
Option Tracking Accuracy	1°/sec
Maximum Travel Rate of each Antenna Axis	

### System Interfaces

Interface Connectors	Mini Combicon MCV1.5/XX-G-3.5
To <b>sat-nms</b> MNC and <b>sat-nms</b> ACU-IDU	Ethernet or RS232
To 6 Limit Switches	Opto-Coupler Input for Azimuth, Elevation and Polarization
Interlock and Motor-off Switches	Opto-Coupler Input
3 Angular Detectors	Resolver, SSI or A/D Input
Motor Driver Interface for Frequency Inverter, DC Servos etc.	Via Opto-Coupler In- and Outputs: Motor on/off and Direction (Output) Low and High Speed Selection (Output) Reset Driver (Output) Driver Fault (Input)

### MNC Interface Specification

Ethernet Interface for <b>sat-nms</b> MNC and User Interface	10-Base-T, via HTTP GET Requests
RS232 MNC Interface	Mini Combicon MCV1.5/10-G-3.5
Summary Fault Indication	Mini Combicon MCV1.5/12-G-3.5

### Electrical and Mechanical Specification, Environmental Conditions

Supply Voltage	22V to 28V unregulated DC, 500mA
Temperature Range	5° to 50° C
Humidity	Up to 90% non-condensing
DIN Rail Module	425x105x60mm

