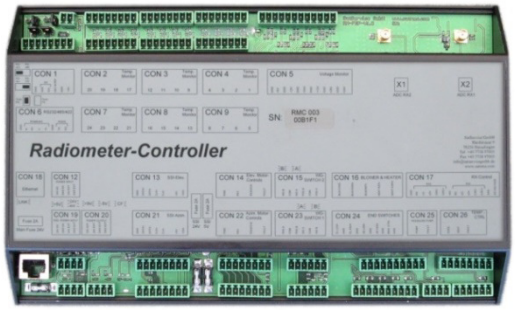
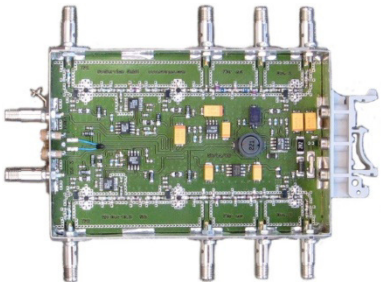
sat-nms RMC and *sat-nms* RMD - Radiometer Modules

This ***sat-nms*** RMC Radiometer Controller was developed by SatService GmbH to use it not only as core module for new radiometers in any frequency band, but also to upgrade existing radiometers. A lot of radiometers are installed worldwide to measure the atmospheric attenuation and water vapor content for satellite communication and scientific applications. They will be used for in-orbit acceptance testing (IOT) and anomaly investigations by satellite operators to verify the payload of communication satellites. As these radiometers installed in the 90's are becoming outdated, SatService developed a new radiometer controller to retrofit the old radiometers with new state-of-the-art electronics and software. This includes also a highly linear ***sat-nms*** RMD Radiometer Detector for the detection of the noise signal in any IF Band between 50 and 2000MHz.

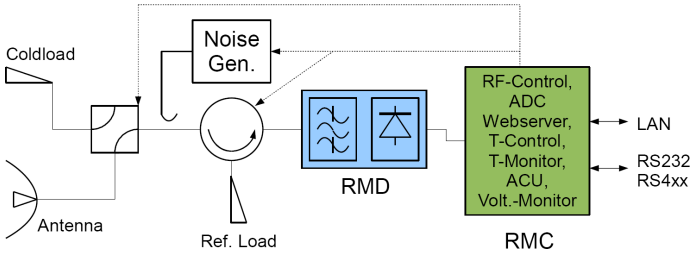


Two new modules of the ***sat-nms*** Product Family form the core of a radiometer: ***sat-nms*** RMC Radiometer Controller and ***sat-nms*** RMD Radiometer Detector Modules. These modules are developed and manufactured by SatService GmbH. The chosen radiometer concept provides high stability and measuring accuracy as well as easy and flexible operation due to operator-friendly user interface.



The radiometer type implemented is noise balancing / noise injecting. In addition to that the software includes all other additional functions necessary for a radiometer, for example, control functionality for azimuth and elevation of the radiometer antenna. This allows automatic tip curve calibration and automatic calibration with a cold load via ***sat-nms*** RMC. Also the complete high precision temperature control of the feed box, including the microwave and IF receiving system, is performed via the radiometer controller.

Customers can upgrade their existing radiometers with this controller in an easy way. It is completely independent for which receive frequency (for example, 13.5GHz, 22GHz or 60GHz) the radiometer is built, as this controller interfaces on IF and control level to the radiometer frontend. Therefore, the existing waveguide sections can be kept as they are.



Like any equipment belonging to the ***sat-nms*** family, the radiometer controller provides an Ethernet TCP/IP interface. All measurement results and the monitoring parameters are available via HTTP web interface and can be monitored and controlled from remote IOT software either via HTTP get functions or via RS232 interface. The controller includes a compact flash card of 2GB for data logging purposes and allows download of data via FTP.

Key Features

- Noise Balancing/ Adding Radiometer Type
- High Gain Stability
- Receive Frequency independent
- Universal Design
- Wide IF Frequency Input Range
- Compact, small DIN Rail compatible Box
- TCP/IP-based Design
- HTTP web-browser Interface
- Integrated FTP Server
- Full remote Administration and Support

Applications

- IOT Measurements
- Atmospheric Attenuation Measurement
- Long-term Recording of propagation Conditions
- Water Vapor Content Measurement
- Uplink Power Control

Contact Information

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Technical Specification

sat-nms RMD Radiometer Detector Specification

Input Frequency Range	50 to 2000MHz
Measurement Bandwidths internal at 70=MHz IF	40MHz
Measurement Bandwidths internal	Any Bandwidth defined by an external Filter
L-Band Input Connector	SMA female 50Ohm
Input Noise Figure	< 10dB
L-Band Test output Connector	SMA female 50Ohm
Coupling Factor of L-Band Test output Port rel. to input	35dB
Input Level Measurement Range	-128…-118dBm/Hz
Maximum Input Level	-41,5dBm
Input Damage Level	-13dBm
Analog output Voltage Range	0…5VDC
Output Connector for analog output Voltage	SMA female
Supply Voltage	12...24VDC / 0,55A

sat-nms RMC Radiometer Controller Specification

Temperature Measurement Range	0 to 308K Sky Noise
Radiometer Type implemented	Noise Balancing, Noise Adding
Integration Time Constant	1s…60s
Number of Radiometers to be controlled simultaneously	2
Number of Frequency selectable	2 (in one of the two Radiometers)
Switching Rate	256Hz
Measurement Resolution	Range/2048 = 0,15K
Feed / Reflector Blower Control	Within Software
Temperature Regulation for Feed / Waveguide Box integrated	Within Software
Integrated Antenna Controller for Az and El	
Number of Temperature Measurement Points	24
Integrated CompactFlash for Data Logging	2GB, more than 2 years capacity

MNC Interface Specification

Ethernet Interface for MNC and User Interface	10-Base-T, Via HTTP GET Requests
RS232 MNC Interface	D-SUB 9 female

Electrical and Mechanical Specification, Environmental Conditions

Supply Voltage	24VDC / 0.5A
Temperature Range	5° to 50° C
Humidity	Up to 90% non-condensing
DIN Rail Module	270x165x70mm
Weight	1.4 kg