

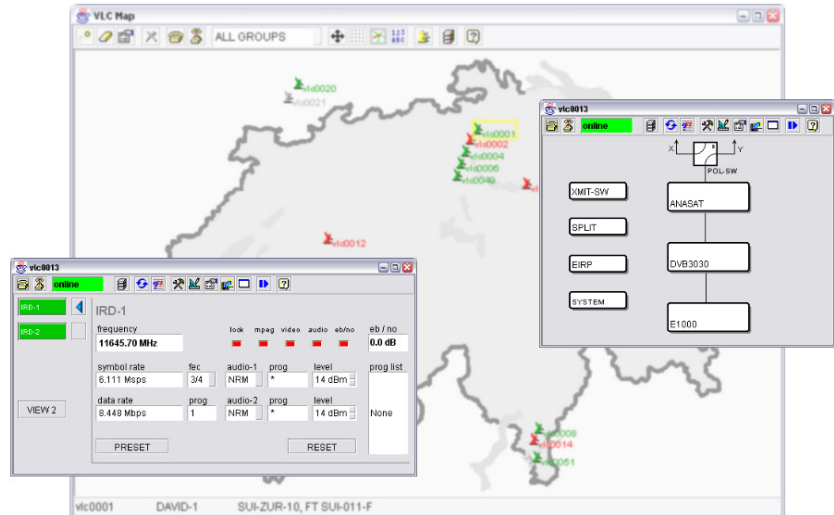
sat-nms Network Management System

SatService Network Management System is a comprehensive software-based system providing monitoring and control of SCPC/MCPC VSAT stations and, in general, satellite ground stations from a central site. The system consists of two parts:

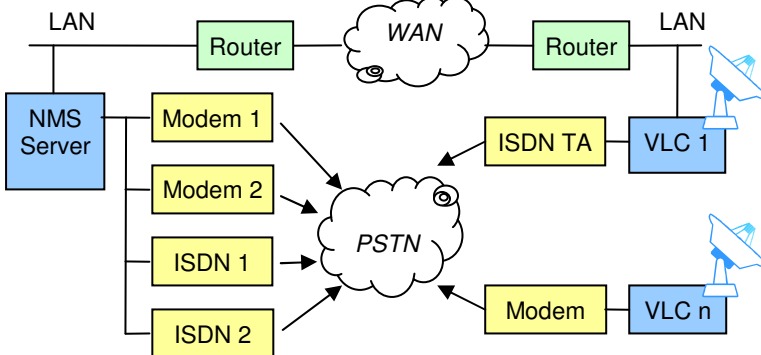
- Network Management System (NMS) manages communication with VLC's and clients and central event database
- VSAT Local Controller (VLC) interfaces to the equipment in the ground station

Functionality of the Network Management System

The *sat-nms* Network Management System provides the monitoring & control functionality for a complete network of satellite ground stations or VSAT's. It can manage from small networks up to several hundred of small or big satellite ground stations. The NMS is located at a central site, which may or may not be located at the site of a ground station. Each site has a VLC installed. The VLC is connected to the equipment to be monitored and controlled via local serial or LAN interfaces at the site. All VLC's are connected to the central NMS via TCP/IP network or dial-up line (e.g. telephone or ISDN).



Therefore, sites that have no satellite connection to the NMS site or are out of the satellite coverage are also accessible allowing worldwide applications.



The NMS provides the same user-friendly operator interface like the M&C system. The user can select between the device-oriented user interface (always available) and the task-oriented user interface (option). The user can define his own screens on the system for each satellite ground station or VSAT.

Key Features

- Client Server Software Architecture
- TCP/IP based design
- Full remote administration and support
- Client is operating system independently
- Unlimited number of clients possible
- Central Event/Alarm Log with filter utilities
- Task- and device-oriented user interfaces
- Macro recording functionality
- Software configurable Interface Device Configuration
- CAD Like Screen Configuration Utility for user configurable operator screen contents
- Comparable equipment of different manufacturers has the same "look and feel"
- multi-tenant / multi-client capable

The Virtual Device Driver Concept presents different vendor's Satcom equipment in the same way. For example, the NMS will automatically represent any modem to the operator with the same M&C screen, as well as present all available features. Logical Devices are also available like EIRP Adjustment, Data Logging for any device parameter, Redundancy or Site Diversity switching, or Uplink Power Control.

Contact Information

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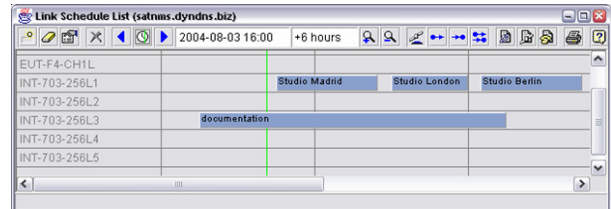
www.satnms.com www.satserviceambh.de

Functionality of the VSAT Local Controllers

The VSAT Local Controller (VLC) monitors and controls the equipment of a site. It is similar to the **sat-nms** M&C system with some extensions to operate unattended and to send event messages to the central NMS. The VLC has full control of all parameters of the connected equipment. The monitoring is performed locally without any influence and connection to the NMS. The equipment is polled and monitored continuously. If an alarm is detected, like summary alarm, lock alarm, thresholds or Limits of Data Quality, this alarm is sent to the NMS and is stored in a central data base. The operator is alerted via a graphical and an audible alarm. The operator monitors the status of the equipment via the NMS screen and can dial into the station.

Link Management Module LM

On top of the normal NMS functionality the **sat-nms** system can provide a Traffic and Link Management package as option which allows the operator to set up and manage complete links, either operator driven or scheduled automatically by time.



Communication System Monitoring CSM

The CSM module enables the operator to monitor the signal spectrum of defined satellite-links or -channels easily by means of a spectrum analyzer and to program a measurement sequence that verifies the levels of defined channels with cyclic measurements in the background.

Technical Specification

Each VLC System consists of an Industrial PC designed for 19" rack mounting (2RU) which has space for up to three interface cards with freely available RS232 or RS485 interfaces. This offers a wide capability of the number of interfaces of an M&C system. If the number of interfaces exceeds the internal capabilities, we can provide a solution which consists of an internal PC card and external 19" rack mountable interface panels which provide RS232 interfaces.



Supported interfaces to Satcom equipment

- Serial interface RS232 and/or RS422/RS485 on a D-SUB9 patch panel
- Network interface (IP over Ethernet, TCP, SNMP, HTTP)
- Opto-coupler inputs and outputs for alarm/status contacts or waveguide/coaxial switches via **sat-nms** IO-FEP
- Potential free relay output contacts via **sat-nms** IO-FEP
- Ethernet interface for overall Network Management and user interface

Electrical and Mechanical Specification, Environmental Conditions

| | |
|-------------------|-----------------------------|
| Supply voltage | 230V/50Hz, 110V/60Hz, 100VA |
| Temperature range | 10° to 40° C |
| Humidity | Up to 90% non condensing |
| Dimensions | 19", 2RU x 480mm or 1RU |

Common VLC configurations

| | |
|----------|---------------------------------------|
| VLC-0/0 | only Network interfaces |
| VLC-4/8 | 4x RS422/485 and 8x RS232 and Network |
| VLC-0/24 | 24 x RS232 and Network |

NMS Server Hardware

- Minimal NMS consist of one PC with client- and server tasks running
- Medium sized NMS consists of one Server PC and several client PC's connected via LAN
- Fully redundant NMS with two server PC's and one Network Attached Storage RAID system for data
- Communication links via serial interfaces to modems, ISDN adapters or satellite control channels to VLC's
- Network connectivity via LAN interface for TCP/IP connections to VLC's or client PC's

IO Panel

The **sat-nms** IO-FEP interfaces to any "low level" interface commonly used in satellite ground stations like equipment alarm contacts, waveguide- or coaxial-switches and other status signals. It provides opto-coupled in- and outputs and potential free relay output contacts and interfaces for PT1000 temperature sensors. As additional feature, the IO-FEP can also perform the RF-inhibit of high power amplifiers.

