

## sat-nms NMS - Network Management System

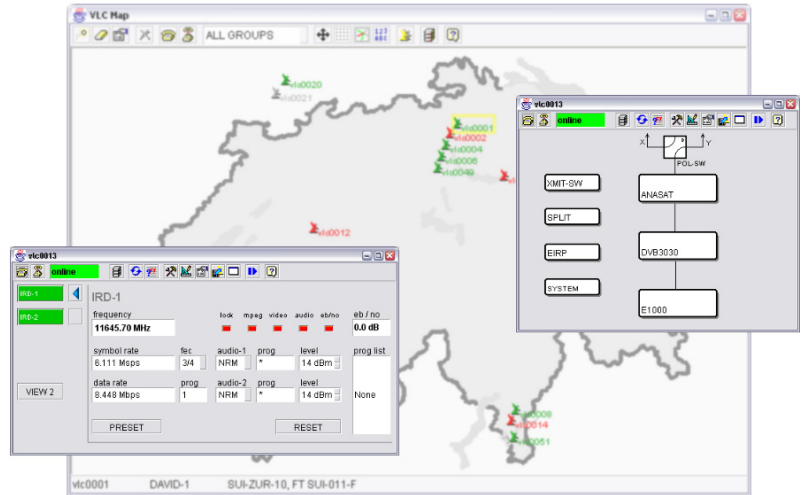
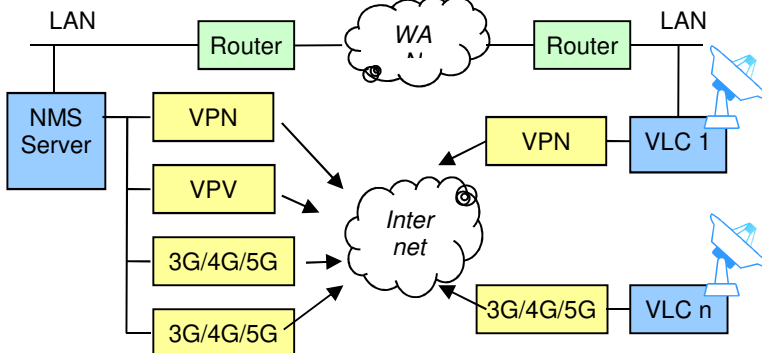
SatService's **sat-nms** NMS Network Management System is a comprehensive software-based system providing monitoring and control of SCPC/MCPC VSAT stations and, in general, satellite ground stations from a central site. The system consists of two parts:

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

### Functionality of the Network Management System

The **sat-nms** 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 **sat-nms** 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 **sat-nms** 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 **sat-nms** NMS provides the same user-friendly operator interface as the **sat-nms** MNC 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 independent from Operating System
- 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 SatCom equipment of different vendors in the same way. For example, the **sat-nms** NMS will automatically represent any modem to the operator with the same **sat-nms** MNC Screen, as well as present all available features. Logical Devices are also available like EIRP Adjustment, Data Logging for any device parameter, Redundancy, Site Diversity Switching or Uplink Power Control.

### Contact Information

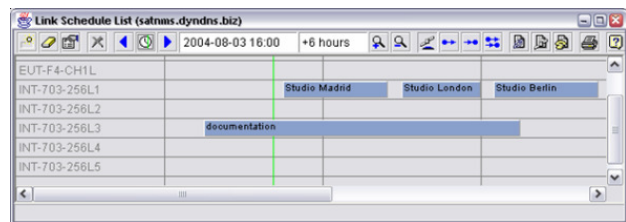
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## Functionality of the VSAT Local Controllers

The VSAT Local Controller (**sat-nms** VLC) monitors and controls the equipment of a site. It is similar to the **sat-nms** MNC System with some extensions to operate unattended and to send event messages to the central NMS. The **sat-nms** VLC has full control of all parameters of the connected equipment. The monitoring is performed locally without any influence and connection to the **sat-nms** 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 **sat-nms** 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 **sat-nms** NMS Screen and can dial into the station.

## Link Management Module **sat-nms** LM

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



## Communication System Monitoring **sat-nms** CSM

The **sat-nms** 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 **sat-nms** VLC System consists of an Industrial PC designed for 19" rack-mounting (1RU) that has space for one interface cards with RS232, RS422 or RS485 interfaces. If the number of interfaces exceeds the internal capabilities, we can provide a solution that use external serial port servers.

## 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

## **sat-nms** NMS Server Hardware

- A minimal **sat-nms** NMS consists of one PC with client- and server Tasks running
- A medium-sized **sat-nms** NMS consists of one Server PC and several client PC's connected via LAN
- Fully redundant **sat-nms** 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

## **sat-nms** 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, potential free relay output contacts and interfaces for PT1000 temperature sensors. As additional feature, the **sat-nms** IO-FEP can also perform the RF-inhibit of high power amplifiers.

