

## Application Note – NetLink

### Remote control of Rohde&Schwarz transmitters

NetLink allows service-oriented, standardized remote control and monitoring of broadcast equipment with the aim of:

1. Visualization:
  - globally
  - in detail
2. Reporting:
  - availability
  - error statistics
  - modifications
3. Information:
  - event-triggered alarms in case of fault

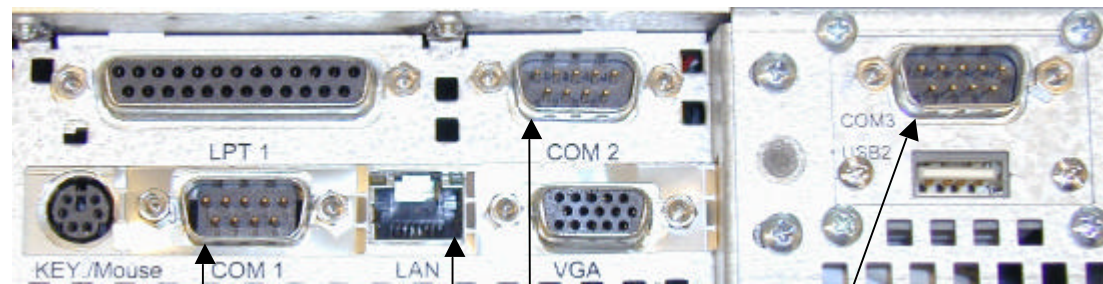
At present, NetLink is available for the transmitter families NX7000 / NX6000 and NH500 / NM500 / NV5000, and on request also for FM transmitters. NetLink is able to control a transmitter system in any standby configuration or two transmitters combined in a rack. One NetLink option is also sufficient for a complete N+1 system; NetLink then primarily communicates with the Central Control Unit GB700.



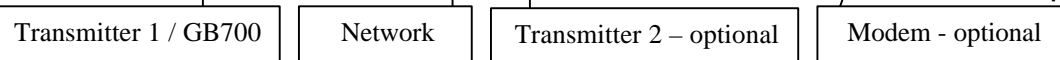
NetLink – front panel

### Connectors

NetLink has three serial interfaces. Depending on the configuration, transmitter 1 is connected to COM1, transmitter 2 to COM2, and the optional modem to COM3. Furthermore, there is a 10/100 Mbit LAN interface (RJ45) for connection to a network. Connectors for a monitor (VGA) and mouse/keypad (PS/2) are also available.



NetLink – rear panel



## Web server

A conventional browser is sufficient for full control and monitoring of the transmitter. Control is as usual on the front panel of the transmitter. The user has access to the transmitter depending on the user rights granted. The following user groups are available:

Query User	Queries only, modifications not possible
Operator	Right to modify only a few parameters, operational view (up to now mainly via parallel interface)
Maintenance	Right to modify all transmitter parameters, for maintenance and service
Administrator	User administration, access to log files, no access to transmitter
Super User	Special account, all rights, access to log files, no access to transmitter

Super Users and Administrators can administrate only the Web server, i.e. they can create, modify, disable or clear accounts. They have no direct access to the transmitter system.

All events can be recorded in a logbook. Super Users and Administrators can modify and display the logbook settings. Various search facilities support troubleshooting.

## Messaging

Proactive information by the transmitter in the case of fault is not possible with the Web server alone. The messaging component provides an independent back channel and is able to send an SMS or e-mail to the service personnel. Only the e-mail address or telephone number of the service personnel must be known. If a fault occurs in the transmitter system, a message containing all the necessary information, such as name of the station, time and error report, will be sent.

## SNMP agent

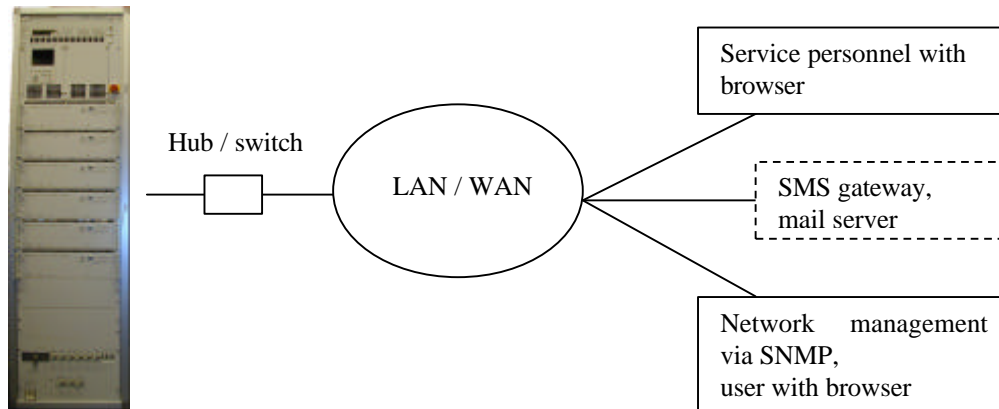
All specific characteristics of the transmitter are simulated in a Management Information Base (MIB). This is a tree structure that can be accessed with an agent via the SNMP protocol so that values may be read or written. Three SNMP versions are currently available, all of which are supported by NetLink. Version 3 provides user management and encrypted data transmission.

NetLink can be seamlessly integrated into network management tools such as HP OpenView. The operators in the control center have limited knowledge of the transmitter technology, which means that a rough display of the operational functions is sufficient.

SNMP works bidirectionally. On the one hand, the remote system (NetLink) can be queried and modified (via GET and SET), and on the other hand, traps are provided. In the case of a fault, a trap is automatically sent to the control center and displayed. The personnel can obtain initial information via the browser and then alert the service team. The service personnel in turn can access NetLink also via the browser (with more rights) and control all parameters, logbooks, etc, of the transmitter.

## Network application

NetLink can easily be integrated into the corporate network (LAN/WAN). All that has to be done is to adapt the network settings, such as IP address. Web browser, SNMP and error messaging via e-mail can thus be used in a simple and efficient way. NetLink supports 10 Mbit and 100 Mbit networks.

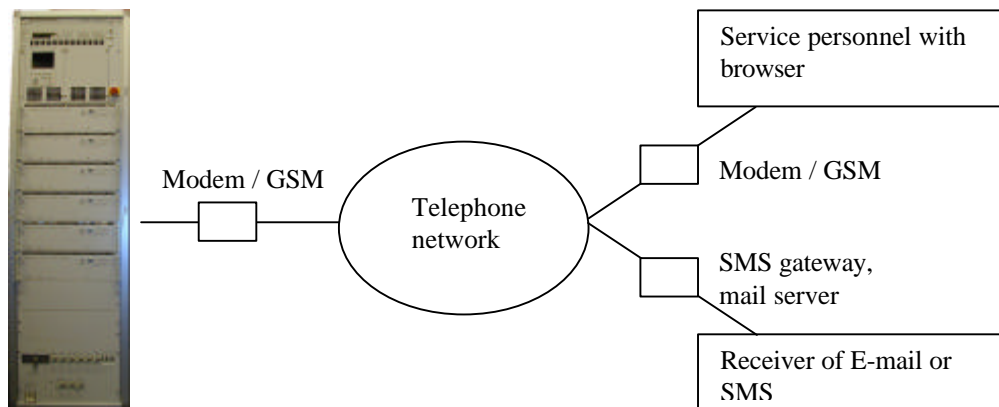


Each user can access the transmitter according to the rights granted to him. The network management centers are additionally and independently informed about faults occurred by way of traps. Messages to further destinations can be sent by e-mail or SMS.

## Modem application

If the transmitter station does not have a LAN interface, but normal telephone access, the modem option is the best solution. In this case, communication is effected via the telephone line and transparent for the user. This means that the browser can still be used to access the transmitter. Transmission mode and speed depend on the nature of the telephone network available.

If a fixed telephone network is not available, a GSM modem can also be used. Maximum mobility is thus ensured.



A modem also allows the transmitter to be accessed in the usual way. The user dials the appropriate telephone number and logs in. It is also possible that NetLink calls back or dials another number to be entered.

If a problem occurs in the transmitter, NetLink automatically dials the number of the provider and sends an SMS or e-mail to the previously configured telephone number or address.



**ROHDE&SCHWARZ**

Project: *NetLink*

# NetLink – Remote Control of R&S Transmitters

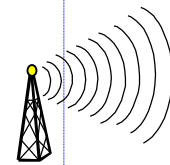
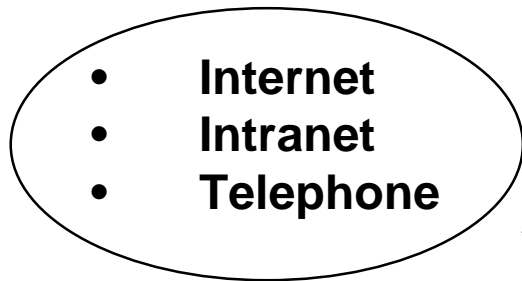
Transmitter with NetLink

Network

Control Center / Mobile Users



- Integrated: RJ45
- Options: Modem, GSM



**Alarm**  
(SMS / E-mail)



**Service and Maintenance**  
(Web browser)



**Management System**  
(SNMP / CORBA)