



Antenna Switch Matrix NVX

High-speed RF switch matrix for manual and automatic antenna systems

- ◆ 2 ms remote switching for fast automatic scanning systems
- ◆ Non-mechanical switches, low-noise switching
- ◆ High reliability
- ◆ 600 receivers and 13 antennas (example)
- ◆ Modular hardware concept
- ◆ Remote control via optical Ethernet LAN
- ◆ High dynamic range
- ◆ Fast (<10 ms), built-in automatic path check
- ◆ Graphical user interface
- ◆ Modular, future-oriented software under WindowsNT
- ◆ Customer-defined antenna filters and equalizers



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Fast switching by network



The Antenna Switch Matrix NVX connects any number of receivers to antennas

Advantages of optical network control

Control systems used in antenna switch matrixes need to fulfill special requirements different from those used in normal automated RF test and measurement test systems. They serve for connecting numerous control units, process controllers and monitoring consoles with the antenna switch matrix. If an Ethernet network is used for the purpose, these remote controllers are connected to an interface (network card) of the antenna

switch matrix controller via a star-type distribution point (hub). The maximum number of operator consoles is determined solely by the hub size and can be increased through its extension.

Optical cables up to 500 m in length can be used between the hub and remote controllers (standard 10BASE-FL), so controllers may be distributed over a fairly large area. The Antenna Switch Matrix

The increasing scale of automation in radiomonitoring makes special demands on the RF parameters and switching speeds of today's antenna switch matrixes. Custom configurations are also a necessity. The Antenna Switch Matrix NVX meets these requirements thanks to modular design and a flexible control system based on the optical Ethernet.

NVX consequently uses optical multi-mode cables (62.5/125 μm) with an ST connection. An extra advantage of this type of cable is that it excludes electromagnetic interference from remote-control lines on the antenna signals.

If the LAN is connected to a WAN via a router, the antenna switch matrix can also be supervised and controlled over greater distances. For this purpose, the

Antenna Switch Matrix NVX is equipped with interfaces for the TCP/IP WAN protocol.

Advanced radiomonitoring systems work with antenna switch matrixes that are primarily controlled by automated monitoring and optimization processors, so a switching speed of more than 100 operations per second is indispensable. This is easily achieved by the Antenna Switch Matrix NVX thanks to the Ethernet's high data rate of 10 Mbit/s (fast Ethernet 100 Mbit/s).

Configuration and function of the antenna switch matrix

The high switching rate required for automatic control also calls for special RF switch design. PIN diodes are therefore used in the NVX, guaranteeing extremely fast switching times and almost unlimited lifetime without degraded signal quality. The tree structure and special design features ensure 50 Ω matching independently of the number of active receive branches. The output level is not affected by the number of receivers connected.

Another function that is a must for automatic operation is uninterruptible path control of the antenna switch matrix. The NVX works with a test signal just outside the system's frequency band, so the useful signal is not corrupted by testing. The matrix also has comprehensive selftest facilities down to module level. These tests can be started manually from the monitoring panels or automatically through timing mechanisms. They serve for testing all possible signal paths for continuity and isolation and start self-tests in all system components. Results are displayed in switch status graphics, transmitted to all remote controllers and registered in a logbook. The comprehensive selftest as well as modular design throughout the switch matrix and preamplifier ensure minimum time to repair.



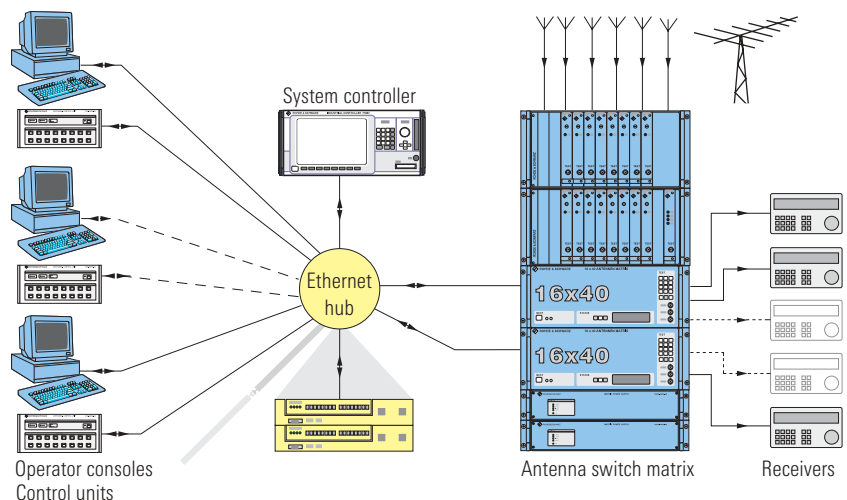
Antenna signals are distributed to the switch matrixes and system outputs via preamplifiers. Antenna amplifiers may be fitted with an equalizer and up to six custom filters.

Control units are available for manual control of the antenna switch matrix and can be modified to match user needs. Active antennas and their receive directions are shown. The system is connected via the optical network.

The antenna switch matrix is controlled by the low-radiation Process Controller PSM 17, which interconnects the various components via network interfaces. Con-

trol units and matrixes are connected by one IPX interface each, while a total of five TCP/IP interfaces are available for control panels and remote controllers, which can also communicate with the antenna switch matrix via WAN.

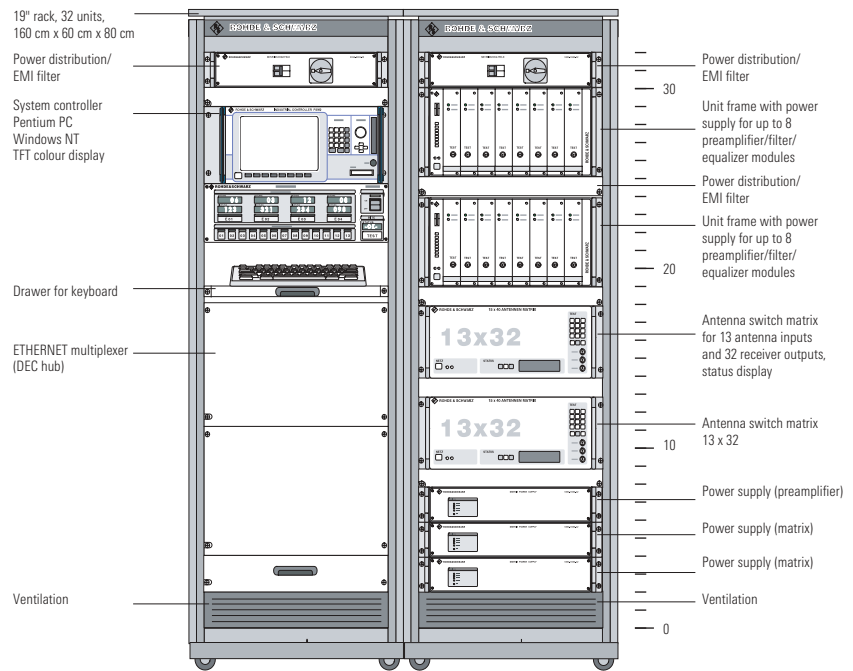
The controller software is operated via a graphical user interface visualizing current switching statuses. User guidance is self-explanatory, which greatly simplifies system configuration. The user interface is connected to the control program via a TCP/IP interface. This allows the user interface to be controlled locally from the controller or remotely from a panel.



Configuration example comprising two Antenna Switch Matrixes NVX1640 with input stage and several control units plus remote-control sources

Optional configurations of the antenna switch matrix

The modular design of the antenna switch matrix enables any system configuration from extremely simple to highly complex setups. At the low end there is the Antenna Switch Matrix NVX for stand-alone operation. All equipment functions are available locally on the NVX control panel. An optional extension is remote operation from a control unit or processor connected directly to the NVX. Thanks to its modular design, the system can be expanded to match all possible requirements.



Example of medium configuration

Basic system components

Operator Control Panel ABG

- ◆ Easy handling of receivers and antennas
- ◆ Status display for HOT PATH TEST result, manual path test and selftest
- ◆ Indication of receiver number, antenna direction and selected antenna
- ◆ Optical Ethernet LAN interface (others available)
- ◆ Rackmount or desktop version



Process Controller PSM 17

- ◆ Pentium PC compatible
- ◆ TFT colour display
- ◆ Graphical user interface
- ◆ Windows NT operating system
- ◆ Modular application software
- ◆ Optimal adaptation to customer-specific requirements
- ◆ Optical Ethernet LAN (no conducted interference)
- ◆ Ultralow radiation



Antenna Switch Matrix NVX

- ◆ High-speed switching (2 ms typ.)
- ◆ Fast HOT PATH TEST (5 ms typ.) hidden, non-disconnecting path test
- ◆ Optical Ethernet LAN (standard, others available)
- ◆ Local mode, stand-alone full functionality
- ◆ Non-mechanical switching
- ◆ Low switching noise on RF signal
- ◆ High reliability (MTBF >10000 hours)



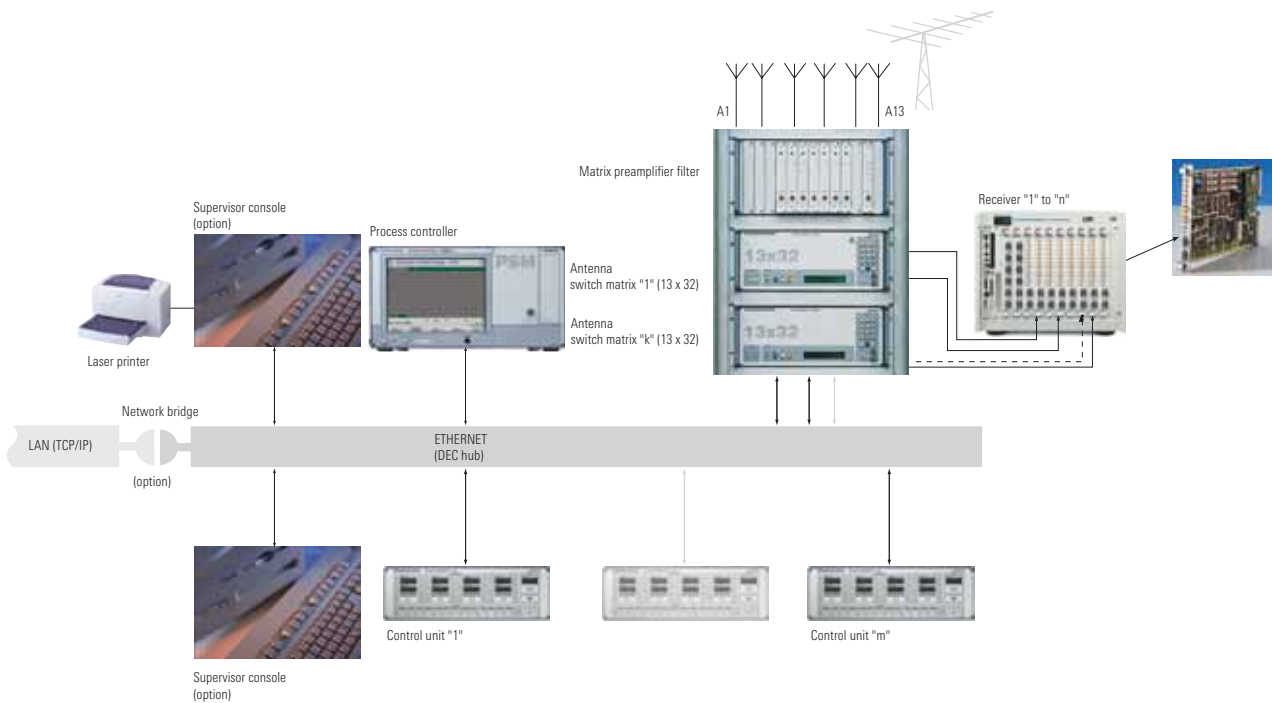
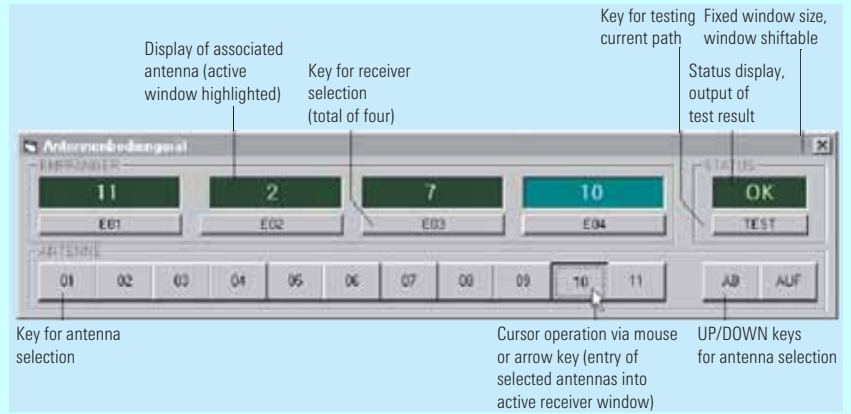
Preamplifier

- ◆ Modular mainframe for 4 antenna-preamplifier modules
- ◆ Up to 6 customer-specific filters included
- ◆ One antenna equalizer
- ◆ HOT PATH TEST signal generator
- ◆ Excellent dynamic range
- ◆ Transient input protection



Software ABG

- ◆ Easy handling of receivers and antennas
- ◆ Status display for HOT PATH TEST result, manual path test and selftest
- ◆ Indication of receiver number, antenna direction and selected antenna



Medium configuration example with two Antenna Switch Matrixes NVX1332

Specifications

Antenna Switch Matrix NVX

Antenna signal Inputs	11 per unit, 26 max.
Outputs	32 per unit
Frequency range	1.7 MHz to 30 MHz (extendable)
Gain	0 dB \pm 1 dB
Intercept point IP3	35 dBm
IP2	76 dBm
1 dB compression point	-13 dBm
Frequency response	\pm 1 dB
Isolation	>30 dB between any output channel
Switching time	2 ms typ., 15 ms including path check
Display	alphanumeric display (matrix address, matrix status, selftest result, path indication)
Interface	Optical Ethernet LAN (10BASE-FL), also available 10BASE-T (twisted pair), 10BASE-2 (coaxial), AUI, RS-232-C
Built-in test	BITE down to module level, HOT PATH TEST (can be disabled)
MTBF	>10000 hours

Preamplifier

Mainframe	1 to 4 amplifier modules, 1 test signal generator for HOT PATH TEST
Input	1 per module with overload protection
Output	4 per module, extendable
Gain	0 dB \pm 1 dB, adjustable attenuator 0 dB to -20 dB
Customer-specified filters	0 to 6 notch filters and/or band rejection filters, 1 equalizer (optional 2)

System Controller PSM 17

Features	TFT colour display, VGA, ultralow radiation, optical Ethernet, interface (default)
Operating system	WindowsNT
Application software	C
Graphical user interface	switch status and system status on main display frame, receiver and antenna configuration setup with locking functions, selftest setup, selftest results on graphic display and log file

For more detailed information and ordering information please call +49 2203 49 325.

Certified Quality System
ISO 9001
DQS REG. NO 1607



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