



## Radio Base Station ND 950

### Compact and easy upgradable

ACCESSNET® the innovative Trunked Radio System from Rohde & Schwarz, has gained high acceptance on the world market due to its superb features and economical mode of operation. Displaying outstanding operational reliability, the high quality radio base station ND950 was designed especially for ACCESSNET®.

Using Surface Mounted Device Technology, the ND950 not only guarantees excellent dependability but also achieves advantages in size and expandability with its modular and compact construction. Uncomplicated installation through clearly arranged ports and a simple maintenance concept were main aspects in the design

as well as automated self checks and the option of remote maintenance via modem. As the number of users inside a system grows, the radio base station can of course be expanded as necessary. With such high functionality and low cost, an ND950 added today to a Trunked Radio Network will immediately become a mission critical asset.



**ROHDE & SCHWARZ**

R&S BICK Mobilfunk GmbH

## ND950 - the Upgradable Radio Base Station

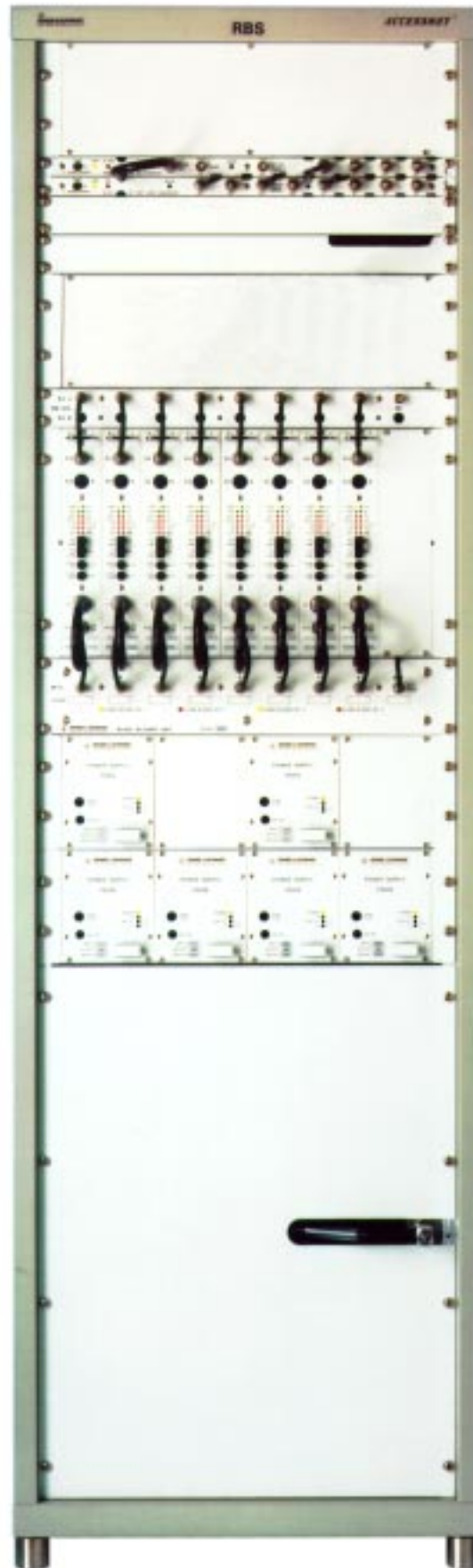
The radio base station ND950 is offered in three different outfits, each mounted in a normed chassis, 48.26 cm (19") in width:

- up to 4 channels in a chassis  
100 cm in height
- up to 8 channels in a chassis  
180 cm in height
- up to 16 channels in two chassis  
180 cm in height

According to the number of radio subscribers each base station can be upgraded up to its maximum by using further transceivers XD950. In the case of all plug-in places being used, the capacity can be expanded by a further radio base station without problem. Using this "box of bricks" system the base unit can be upgraded to a maximum of 32 channels.

The high output power of 50 watt per channel permits the connection of all channels to only one antenna.

High flexibility through modular construction - this means: at all times system design according to your requirements with very small expense and costs which can be calculated exactly.



ND950 Front View

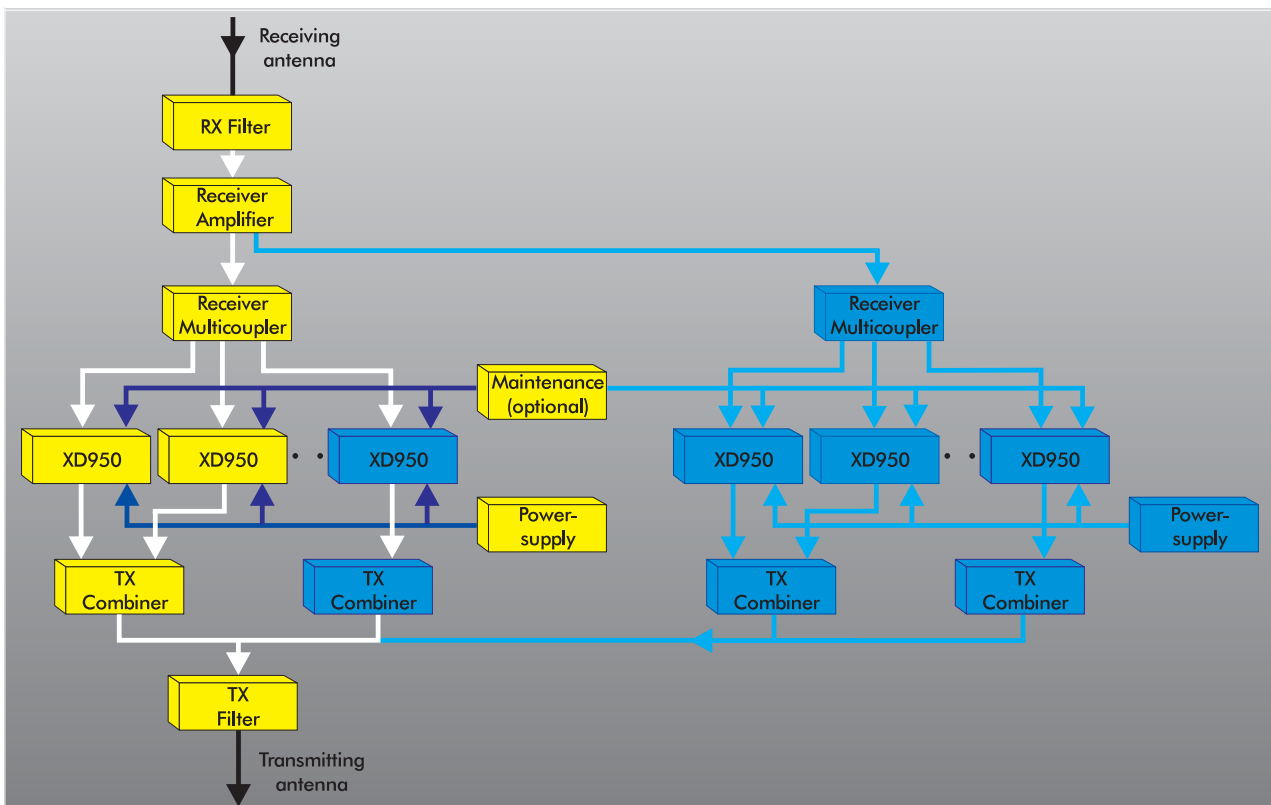
## Easy Connection

To connect the ND950 to an ACCESS-NET<sup>®</sup> Trunked Radio Exchange one four-wire line for each radio channel is enough. This connection not only transmits voice but also alarm messages and all signals for controlling the radio base station. As a further option there is a digital 2 Mbps interface (CCITT G703) available. With only one line 30 radio channels are attached to an exchange. The connection to microwave links will therefore be much simpler and less expensive.

## Flexible Use

The ND950 fits a wide range of operating conditions:

- variable transmitter output power between 1.5 and 50 watt
- various channel spacing from 12.5 kHz, 20 kHz or 25 kHz
- available for frequency range between:
  - 307 - 346 MHz
  - 330 - 350 MHz
  - 380 - 400 MHz
  - 410 - 430 MHz
  - 450 - 470 MHz
  - 484 - 496 MHz
  - 506 - 530 MHz
  - 806 - 870 MHz
- operating temperature range between -10 °C and +55 °C
- upgrade up to 32 channels
- power supply is available in the following choices: 230 V alternating current or 36 to 72 V direct current.



ND950 Block Diagram

## High Operational Reliability

The ND 950 conforms with all European security standards. It is marked with the CE sign and is officially licensed to European standards. Furthermore one of the major aspects was reliability:

- processor controlled self tests of all functions,
- automatic supervision of the output power and the fan blowers with overheating emergency shutdown of the corresponding transceiver,
- automatic TX-antenna supervision with alarm messages and transmitter shutdown,
- consciously overdimensioned power supplies.



ND951 and MMX (Exchange)

## Easy Maintenance

Intelligent service functions help to shorten maintenance work and time:

- remote diagnostics and test functions can be activated via maintenance modem
- processor controlled checks of more than 40 measuring points per channel
- software adjustment of the transceiver (XD 950) instead of mechanical adjustment.

## Specification (400 MHz Version)

### General information

Mode of operation: Duplex  
 Duplex spacing: 10 MHz  
 Channel spacing: 12.5 kHz  
 20 kHz and 25 kHz optional  
 Frequency accuracy:  $\leq \pm 1000$  Hz  
 Temperature range:  $-10$  °C ...  $+55$  °C  
 Relative humidity: 20...75 %

AF S/N ratio with  
 psophometric filter:  $\geq 50$  dB at  $\pm 1.5$  kHz frequency  
 deviation  
 AF S/N ratio without  
 psophometric filter:  $\geq 30$  dB at  $\pm 1.5$  kHz frequency  
 deviation  
 Modulator-sensitivity:  $-23$  dBm... $-3$  dBm (adjustable in  
 1 dB steps)

### Receiver

Frequency band: 410...420 MHz, 420...430 MHz  
 450...460 MHz or 460...470 MHz  
 (other bands optional)  
 RF-sensitivity:  $\leq 0$  dB $\mu$ V<sub>emf</sub> for 20 dB SINAD  
 Cochannel rejection:  $-8$  dB... $0$  dB at 20/25 kHz channel  
 spacing  
 $-12$  dB... $0$  dB at 12.5 kHz channel  
 spacing  
 Adjacent channel selectivity:  $\geq 60$  dB ( $\pm 12.5$  kHz)  
 $\geq 70$  dB ( $\pm 20$  kHz)  
 $\geq 70$  dB ( $\pm 25$  kHz)  
 Spurious response rejection:  $\geq 80$  dB  
 Intermodulation response:  $\geq 70$  dB  
 Blocking:  $\geq 90$  dB  
 Spurious radiation:  $\leq 2.0$  nW  
 AF-output power at line output:  $-18$  dBm... $+2$  dBm  
 (adjustable in 1 dB steps)  
 Impedance symmetry:  $\geq 46$  dB (300...600 Hz)  
 $\geq 50$  dB (600...3000 Hz)  
 $\geq 30$  dB

### Receiver band-pass filter

Frequency band: 410...470 MHz (different ranges  
 optional)  
 Bandwidth: 5 MHz, adjustable in the  
 specified frequency band  
 Insertion loss:  $\leq 2.0$  dB  
 Impedance: 50 Ohm

AM suppression:  
 AF frequency response  
 (De-emphasis): 300...3000 Hz  $+1$  dB/ $-3$  dB  
 (at 20 kHz and 25 kHz channel  
 spacing)  
 300...2550 Hz  $+1$  dB/ $-3$  dB  
 (at 12.5 kHz channel spacing)  
 THD:  $\leq 5$  %

### 4 way transmitter-combiner

Frequency band: 410...430 MHz or 450...470 MHz  
 (other bands optional)  
 Bandwidth: 10 MHz  
 Recommend channel spacing: 175 kHz  
 Minimum channel spacing with  
 increase of loss: 100 kHz  
 Permitted power per channel: 50 Watt  
 Insertion loss at 175 kHz  
 channel spacing:  $\leq 4.6$  dB  
 Impedance: 50 Ohm

AF S/N ratio with psophometric  
 filter:  $\geq 50$  dB at  $\pm 1.5$  kHz frequency  
 deviation  
 AF S/N ratio without  
 psophometric filter:  $\geq 30$  dB at  $\pm 1.5$  kHz frequency  
 deviation

### Power supply

AC supply: 230 V  $\pm 15$  %, 47...63 Hz  
 or  
 DC supply: 36...72 V (positive terminal  
 to ground)

### Transmitter

Frequency band: 410...420 MHz, 420...430 MHz  
 450...460 MHz or 460...470 MHz  
 (other bands optional)  
 RF output power: 1.5 Watt ... 50 Watt  
 Rise time of transmitter power:  $\leq 138$  ms  
 Fall time of transmitter power:  $\leq 50$  ms  
 Spurious emission:  $\leq 2.0$  nW (transmitter off)  
 Intermodulation attenuation:  $\geq 70$  dB  
 Frequency deviation max.:  $\pm 5$  kHz (at 25 kHz channel  
 spacing)  
 $\pm 4$  kHz (at 20 kHz channel  
 spacing)  
 $\pm 2.5$  kHz (at 12.5 kHz channel  
 spacing)  
 Adjacent channel power:  $\leq -70$  dBc  
 Impedance symmetry:  $\geq 46$  dB (300...600 Hz)  
 $\geq 50$  dB (600...3000 Hz)

Power consumption per channel  
 AC type:  $< 140$  VA  
 DC type:  $< 140$  Watt  
 Total power consumption  
 8 channel unit, AC model:  $< 1.2$  kVA  
 8 channel unit, DC model:  $< 1.2$  kW

### Ordering Information

Name	Part-No.
ND 950/4 radio base station (AC) 4 channels in a 180 cm rack	60 413 00
ND 950/4 radio base station (DC) 4 channels in a 180 cm rack	60 513 00
ND 950/8 radio base station (AC) 8 channels in a 180 cm rack	60 417 00
ND 950/8 radio base station (DC) 8 channels in a 180 cm rack	60 517 00
ND 950/16 radio base station (AC) 16 channels in two 180 cm racks	60 425 00
ND 950/16 radio base station (DC) 16 channels in two 180 cm racks	60 525 00

AF frequency response  
 (Pre-emphasis): 300...3000 Hz  $+1$  dB/ $-3$  dB  
 (at 20 kHz and 25 kHz channel  
 spacing)  
 300...2550 Hz  $+1$  dB/ $-3$  dB  
 (at 12.5 kHz channel spacing)

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 Subject to change

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**ISO 9001**  
DQS REG.NO 3880-01



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