

Frequency Synthesizers ND 500 S and ND 1000 S

The Frequency Synthesizers ND 500 S and ND 1000 S are bench top instruments with manual control via front panel rotary switches. This manual operation ensures that fixed frequency settings will be changed only consciously. However the ultra-fast switching of frequency changes less than 1 μ s is only possible via BCD parallel control.

The RF-output is located on the front panel and the output level can be set in a wide range by a potentiometer. Two LED's on the front panel indicate stand-by mode and temperature status of the OCXO. An interface-switch selects the operation modes, IEEE-Bus, RS 232, BCD or local control via rotary switches.

Frequency Synthesizer ND 500 S

- ◆ Frequency range 100 kHz ... 500 MHz
 - ◆ Manual rotary switches on the front panel to set frequency
 - ◆ Highly-stable refer. frequency (OCXO)
 - ◆ Residual FM \leq 0.1 Hz
 - ◆ SSB phase noise \leq - 130 dBc/Hz
 - ◆ Fast frequency switching \leq 1 μ s
 - ◆ BCD parallel control
- RS 232 and IEEE-Bus as option

Frequency Synthesizer ND 1000 S

- ◆ Frequency range 10 kHz ... 1000 MHz
 - ◆ Manual rotary switches on the front panel to set frequency
 - ◆ Highly-stable refer. frequency (OCXO)
 - ◆ Residual FM \leq 0.1 Hz
 - ◆ SSB phase noise \leq - 130/122 dBc/Hz
 - ◆ Fast frequency switching \leq 1 μ s
 - ◆ BCD parallel control
- RS 232 and IEEE-Bus as option



Specifications ND 500 S

Reference Frequency:

Frequency/Type: 10 MHz/OCXO
 Temperature stability (+ 5 °C ... + 45 °C): $\leq 3 \times 10^{-8}$
 Ageing: $\leq 2 \times 10^{-8}$ /month
 Reference frequency output: 10 MHz; + 10 dBm
 Reference frequency input: $10 \text{ MHz} \pm 2 \times 10^{-7}$
 Input level: 0 dBm ... + 8 dBm

Synthesizer:

Frequency range: 100 kHz ... 499.999 999 9 MHz
 Resolution: 0.1 Hz
 Accuracy: same as reference
 Frequency setting: rotary switches and BCD-parallel
 RS 232 and IEEE-Bus (option)
 Switching time to new frequency:
 steps < 1 MHz: $\leq 1 \mu\text{s}$
 steps ≥ 1 MHz: $\leq 5 \mu\text{s}$
 Phase (< 1 MHz step width): phase-continuous

Spectral purity:

Harmonics (level $\leq + 13$ dBm): $\leq - 30$ dBc
 Sub-harmonics: none
 Discrete spurious: $\leq - 72$ dBc
 Residual FM (CCITT, rms): ≤ 0.1 Hz
 SSB-phase noise (10 kHz offset): $\leq - 126$ dBc/Hz
 Noise floor: $\leq - 138$ dBc/Hz

Output:

Output level range: 0 dBm ... + 13 dBm
 Frequency response: $\leq \pm 1$ dB
 Impedance: 50 Ω
 VSWR: ≤ 1.5
 Connector: N-socket

General data:

Power supply: 110 V/120 V, 220 V/240 V ± 10 %
 47 Hz ... 63 Hz; 80 VA (Stand-by 9 VA)
 Electrical safety: EN 61010
 Operating temperature: + 5 °C ... + 45 °C
 EMC: CE-mark
 Dimensions (W x H x D): 447 mm x 88 mm x 450 mm
 Weight: approx. 12.7 kg

Supplied accessories :

1 ea. power cord
 1 ea. operating manual
 1 set spare fuses

Ordering information:

Frequency Synthesizer ND 500 S BN 86302.000
 with BCD-interface
 Frequency Synthesizer ND 500 S BN 86302.001
 with BCD-, RS 232-, IEEE-Bus interface

Accessory:

19" adapters for rack mounting BN 86302.101

Specifications ND 1000 S

Reference Frequency:

Frequency/Type: 10 MHz/OCXO
 Temperature stability (+ 5 °C ... + 45 °C): $\leq 3 \times 10^{-8}$
 Ageing: $\leq 2 \times 10^{-8}$ /month
 Reference frequency output: 10 MHz; + 10 dBm
 Reference freq. input: $10 \text{ MHz} \pm 2 \times 10^{-7}$
 Input level: 0 dBm ... + 8 dBm

Synthesizer:

Frequency range: 10 kHz ... 999.999 999 8 MHz
 Resolution: $f < 500$ MHz ... 0.1 Hz
 $f \geq 500$ MHz ... 0.2 Hz
 Accuracy: same as reference
 Frequency setting: rotary switches and BCD-parallel
 RS 232 and IEEE-Bus (option)
 Switching time to new frequency:
 steps < 1 MHz: $\leq 1 \mu\text{s}$
 steps ≥ 1 MHz: $\leq 5 \mu\text{s}$
 Phase (< 1 MHz step width): phase-continuous

Spectral purity:

Harmonics (level $\leq + 13$ dBm): $\leq - 30$ dBc
 Sub-harmonics ($f \geq 500$ MHz): $\leq - 65$ dBc
 ($f < 500$ MHz): none
 Discrete spurious ($f < 500$ MHz): $\leq - 72$ dBc
 ($f \geq 500$ MHz): $\leq - 65$ dBc
 Residual FM (CCITT, rms): ≤ 0.1 Hz
 SSB-phase noise (10 kHz offset):
 $f < 500$ MHz $\leq - 126$ dBc/Hz
 $f \geq 500$ MHz $\leq - 120$ dBc/Hz
 Noise floor: $f < 500$ MHz $\leq - 138$ dBc/Hz
 $f \geq 500$ MHz $\leq - 135$ dBc/Hz

Output:

Output level range: 0 dBm ... + 13 dBm
 Frequency response: $\leq \pm 1.5$ dB
 Impedance: 50 Ω
 VSWR: ≤ 1.8
 Connector: N-socket

General data:

Power supply: 110 V/120 V, 220 V/240 V ± 10 %
 47 Hz ... 63 Hz; 95 VA (Stand-by 9 VA)
 Electrical safety: EN 61010
 Operating temperature: + 5 °C ... + 45 °C
 EMC: CE-mark
 Dimensions (W x H x D): 447 mm x 88 mm x 450 mm
 Weight: approx. 13 kg

Supplied accessories :

1 ea. power cord
 1 ea. operating manual
 1 set spare fuses

Ordering information:

Frequency Synthesizer ND 1000 S BN 86306.000
 with BCD-interface
 Frequency Synthesizer ND 1000 S BN 86306.001
 with BCD-, RS 232-, IEEE-Bus interface

Accessory:

19" adapters for rack mounting BN 86302.101