

Frequency Synthesizers ND 500 and ND 1000

The Frequency Synthesizers ND 500 and ND 1000 are remote-only units in a 19"-rack-mount chassis with blank front panels. The ultra-fast switching time of less than 1 μ s is only possible via BCD parallel control. Remote control via the optional IEEE-Bus or RS 232 interface delays the total switching time by the run-time of bus commands.

The output level of ND 500 and ND 1000 can be set in a wide range by a potentiometer on the front panel. Two LED's on the front panel indicate stand-by mode and temperature status of the OCXO.

Frequency Synthesizer ND 500

- ◆ Frequency range 100 kHz ... 500 MHz
 - ◆ 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

- ◆ Frequency range 10 kHz ... 1000 MHz
 - ◆ 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



Frequency Synthesizers ND 500 and ND 1000

Specifications ND 500

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: BCD-parallel
RS 232 and IEEE-Bus (option)

Switching time to new frequency:
step width < 1 MHz: $\leq 1 \mu\text{s}$
step width $\geq 1 \text{ MHz}$: $\leq 5 \mu\text{s}$

Phase (< 1 MHz step width): phase-continuous

Spectral purity:

Harmonics (level $\leq + 13 \text{ dBm}$): $\leq - 30 \text{ dBc}$
Sub-harmonics: none
Discrete spurious: $\leq - 72 \text{ dBc}$
Residual FM (CCITT, rms): $\leq 0.1 \text{ Hz}$
SSB-phase noise (10 kHz offset): $\leq - 130 \text{ dBc/Hz}$
Noise floor: $\leq - 138 \text{ dBc/Hz}$

Output:

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

General data:

Power supply: 110 V/120 V, 220 V/240 V $\pm 10 \%$
47 Hz ... 63 Hz; 73 VA (Stand-by 9 VA)
Electrical safety: EN 61010
Operating temperature: + 5 °C ... + 45 °C
EMC: CE-mark
Dimensions (W x H x D): 19" x 88 mm x 450 mm
Weight: approx. 12 kg

Supplied accessories :

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

Ordering information:

Frequency Synthesizer ND 500 BN 86301.000
with BCD-interface
Frequency Synthesizer ND 500 BN 86301.002
with BCD-, RS 232-, IEEE-Bus interface

Specifications ND 1000

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: 10 kHz ... 999.999 999 8 MHz
Resolution: f < 500 MHz ... 0.1 Hz
f $\geq 500 \text{ MHz}$... 0.2 Hz

Accuracy: same as reference
Frequency setting: BCD-parallel
RS 232 and IEEE-Bus (option)

Switching time to new frequency:
step width < 1 MHz: $\leq 1 \mu\text{s}$
step width $\geq 1 \text{ MHz}$: $\leq 5 \mu\text{s}$

Phase (< 1 MHz step width): phase-continuous

Spectral purity:

Harmonics (level $\leq + 13 \text{ dBm}$): $\leq - 30 \text{ dBc}$
Sub-harmonics (f $\geq 500 \text{ MHz}$): $\leq - 65 \text{ dBc}$
(f < 500 MHz): none
Discrete spurious (f < 500 MHz): $\leq - 72 \text{ dBc}$
(f $\geq 500 \text{ MHz}$): $\leq - 65 \text{ dBc}$
Residual FM (CCITT, rms): $\leq 0.1 \text{ Hz}$
SSB-phase noise (10 kHz offset):

f < 500 MHz $\leq - 130 \text{ dBc/Hz}$
f $\geq 500 \text{ MHz}$ $\leq - 122 \text{ dBc/Hz}$

Noise floor: f < 500 MHz $\leq - 138 \text{ dBc/Hz}$
f $\geq 500 \text{ MHz}$ $\leq - 135 \text{ dBc/Hz}$

Output:

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

General data:

Power supply: 110 V/120 V, 220 V/240 V $\pm 10 \%$
47 Hz ... 63 Hz; 73 VA (Stand-by 9 VA)
Electrical safety: EN 61010
Operating temperature: + 5 °C ... + 45 °C
EMC: CE-mark
Dimensions (W x H x D): 19" x 88 mm x 450 mm
Weight: approx. 12.3 kg

Supplied accessories :

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

Ordering information:

Frequency Synthesizer ND 1000 BN 86305.000
with BCD-interface
Frequency Synthesizer ND 1000 BN 86305.002
with BCD-, RS 232-, IEEE-Bus interface