

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 $<_{-} 0.1$ Hz
SSB phase noise $<_{-} -130$ dBc/Hz
Fast frequency switching $<_{-} 1$ 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 $<_{-} 0.1$ Hz
SSB phase noise $<_{-} -130/122$ dBc/Hz
Fast frequency switching $<_{-} 1$ 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 8630 1.000
 with BCD-interface
 Frequency Synthesizer ND 500 BN 8630 1.002
 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 ... 999.99 9 999 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