CNT-85 & CNT-85R
Frequency Counters/Calibrators

• High resolution: 10 digits in 1s
• Low uncertainty: 0.0001 ppm (Rb)
• Short warm-up time: 10 min to 4x10^-10
• Wide frequency range to 8GHz
• Smartest input trigger system
• Measures any type of input signal, incl. bursts, AM, FM and noisy signals
• Displays also input signal strength
• Excellent EMC-immunity
• Easy to use
• Ideal for on-site frequency calibration of the master clock in GSM base stations

With the Pendulum CNT-85 and CNT-85R frequency counters and calibrators, Spectracom offers the ultimate tools for stationary as well as portable calibration of frequency, from DC to over 8GHz. These counters are designed for on-site calibration of the master clock in GSM base stations, offering a TUR of >50 over a 10 year period. They also fit on the R&D bench, in the calibration lab or in manufacturing test systems where fast and accurate frequency measurements are needed. Choose between the economy model CNT-85 and the ultimate CNT-85R including a built-in Rubidium time-base reference.

On-Site Frequency Calibration
The CNT-85 frequency counter brings cal lab accuracy to field measurements. With the (optional) ultra-stable oven timebase and a high 10 digits resolution in just one second, it delivers high-accuracy measurements instantly. An overflow mode displays also the 11th and 12th digits, when needed. The CNT-85 is easy to use, compact and has a unique, smart automatic input triggering for any type of signal. A very short warm-up time of the oven oscillator, gives you ppb-performance after only 10 minutes.

CNT-85R Frequency Counter/Calibrator
The Pendulum CNT-85R is one of the most accurate portable frequency calibrator on the market. It offers all the functionality of the CNT-85, plus the stability and accuracy of a built-in Rubidium atomic reference.

This instrument is ideal for high-accuracy frequency calibration, inside as well as outside the cal lab environment, such as in digital communication systems. The short warm-up time means that the CNT-85R is instantly ready for use after a change of location.

GSM Network Operators
Depending on the internal procedures and budgets of the network operator, the requirement for master clock calibration in base stations, can be fulfilled with the following solutions:
• CNT-85 with oven oscillator (option 40), offers a low initial cost solution. With 3 month calibration intervals the counters margin to GSM specification is 5:1, and 1 year calibration intervals give a margin of 3:1.
• CNT-85R, provides low cost of ownership, (10 year adjustment interval, for a margin of better than 50:1 to the GSM specification).
Measuring modes

Frequency A, C
- Range (A): 10 Hz to 300 MHz
- Range (C): 100 MHz to 3GHz or 300 MHz to 8GHz (option)

Resolution: 10 digits/s

Burst Frequency A
- Frequency/PRF of burst signals down to 1µs

Period A
- Range: 6ns to 100 ms
- Resolution: 10 digits/s

Ratio A/E, C/A
- Range: 10^7 to 10^10

Freq. Range: See specs for input A, C and E

Print Width A
- Range: 6ns to 10 ms
- Resolution: 250 ps

Duty Factor A
- Range: 0.000001 to 0.999999
- Totallize A: Event counting with manual start and stop
- Range: 0 to 10^17

Input & Output Specifications

Input A
- Coupling: AC
- Impedance: 1MΩ or 50 Ω
- Sensitivity: 10 Hz to 50 MHz: 10 mVrms
- 50 to 100 MHz: 15 mVrms
- 100 to 150 MHz: 20 mVrms
- 150 to 200 MHz: 30 mVrms
- 200 to 300 MHz: 50 mVrms

Manual Trigger:
- Sensitivity Range: 10 mV to 10 Vrms, in 3dB steps
- Trigger Level: High, medium or low duty factors
- Trigger Slope: Positive or negative
- Auto Trigger: Automatic optimum trigger
- Frequency: Minimum 50 Hz

Signal Monitor:
- A bar graph displays input signal level in 3dB steps, 10 mVrms to 10 Vrms
- Low-pass filter: 100 kHz or OFF
- Max Voltage Without Damage:
  - 350 V (dc + ac peak) to 440 Hz

Input C (Option 10)
- Operating input voltage range:
  - 0.1 to 0.3 MHz: 20 mVrms to 12 Vrms
  - 0.3 to 2.5 GHz: 10 mVrms to 12 Vrms
  - 2.5 to 2.7 GHz: 20 mVrms to 12 Vrms
  - 2.7 to 3.0 GHz: 100 mVrms to 12 Vrms
- Impedance: 50 Ω nom, VSWR <2.5:1

Connector:
- N-type, female

Time Base Options

- Option: Time base type:
  - Standard: UCXO
  - Option 30: OCXO
  - Option 40: OCXO
  - Rubidium

- Aging vs. year:
  - First year: <5x10^-7
  - Subsequent years: <5x10^-6

- Stability vs. temp.:
  - 0°C to 50°C: <1x10^-8
  - 20°C to 26°C (typ.): <1x10^-8

- Short term stability: τ=1s (Allan dev.): n.s.

- Option: Temperature:
  - 0°C to +50°C

Storage temp: 40°C to +70°C

Safety:
- EN61010-1, Cat II, Pollution degree 2, CSA 22.2, CE

Power Line Requirements (at 25°C)
- AC voltage: CNT-85: 90 to 264Vrms, 47 to 440Hz
- CNT-85R: 90 to 264 Vrms, 47 to 63 Hz

Power ratings:
- CNT-85: max 30 W
- CNT-85R: max 100 W [6min warm-up]
- max 47 W (cont. operation)

Battery (option 23/85)
- Stand-by: 20 h typ. w. oven time base
- Operating: 2h typ. depending on installed options

Re-charge time:
- 8h typ. in stand-by mode

Battery type:
- sealed lead-acid cells

Environmental temperature:
- Operating: 0°C to +40°C
- Storage: -40°C to +50°C
- Weight: 1.5 kg (3.3 lb)

Dimensions and Weight
- WxHxD: CNT-85: 210x86x395 mm (8.25x3.4x15.6 in)
- CNT-85R: 315x86x395 mm (12.4x3.4x15.6 in)
- Net: 3.2 kg (7 lb)/5.5 kg (12 lb)
- Shipping: CNT-85: 5.5 kg (12 lb)/8.8 kg (19 lb)

Ordering Information
- Basic models:
  - CNT-85: 300 MHz Frequency Counter incl. Standard timebase (5x10^7/month)
  - CNT-85R: 300 MHz Frequency Counter/Calibrator incl. Rubidium timebase (5x10^11/month)
  - Included with instrument: 3-year product warranty, power line cord, operators manual on CD-rom, certificate of calibration

- Time Base Options:
  - Option 30: Very-high stability Oven Time Base (1x10^7/month)
  - Option 40: Ultra-high stability Oven Time Base (3x10^10/month)

- Other Options:
  - Option 23/85: Battery Pack
  - Option 80: GPIB interface (SCPI)

- Option 22: Rack-Mount Kit (CNT-85R only)
- Option 27: Soft Carrying Case
- Option 27H: Heavy Duty Hard Transport
- Option 95/03: 3 years extended warranty
- Option 95/05: 5 years extended warranty
- OM-85: Operators Manual (printed)
- PW-85: Programmers Manual (printed)

*) Options are factory installed upon order and can not be customer reinstalled.