

## &lt;인증내역&gt;



- ISO-9000 인증
- Certified by CSA
- Certified by GOST
- CE-marking
- EMC

"Best-in-Test Award" 수상  
(T&M World 1992, 1997,  
2005 and 2007)

CNT-81&CNT-81R Time/Counter/Calibrator는 주파수 측정, 분석, time interval & phase 측정을 위해 사용하는 장비입니다. 주로 생산 시 시험 (Production test systems), R&D, calibration lab 및 기타 다양한 분야에서 사용할 수 있습니다.

## &lt;주요 사양&gt;

- Fast: 8000 measurements/s
- High resolution: 1ps (time)  
11 digits/s (freq.), 0.001° (phase)
- Rubidium stability: 0.0001 ppm
- High trigger resolution: 1.25 mV
- Advanced arming/hold-off
- Modulation Domain Analysis SW
- EMC-immunity for noisy environments
- Ideal for fast test systems, R&D and calibration laboratoires
- 8 GHz option for microwave IRF testing

## &lt;CNT-85 vs CNT-85R 비교표&gt;

<i>Selection Chart</i>	<i>CNT-81</i>	<i>CNT-81R</i>
Frequency, burst, time interval, phase, Vp-p	•	•
Frequency range (standard)	300 MHz	300 MHz
Frequency resolution (1s gate time)	11 digits	11 digits
Time interval resolution (single/average)	50/1 ps	50/1 ps
Vp-p (and trigger level) resolution	1.25 mV	1.25 mV
Arming/Hold-off delay by time and events	•	•
Hold-off resolution	10 ns	10 ns
Best timebase stability/month	$3 \times 10^{-9}$	$5 \times 10^{-11}$
No. of 10 MHz +5 MHz reference outputs	1+0	6+1
Measurement speed:      GPIB to internal memory	250/s 8 k/s	250/s 8 k/s
Statistics calc.: mean, std, dev. and max/min	•	•
TimeView Documenting and Analysis SW	•	•
2.7 GHz HF-input	Option 10	Option 10
8 GHz RF-input	Option 13	Option 13



BAEKDOO  
INTERSYSTEMS  
CO.,LTD.  
백두인터시스템(주)

TEL: 02-579-9126~8  
FAX: 02-579-9129  
E-MAIL: sales@baek-doo.com  
Homepage: www.baek-doo.com

# Modulation Domain Analysis

The analysis PC-SW *TimeView* converts the CNT-81/CNT-81R to a high performance modulation domain analyzer. In the modulation domain you can view rapid frequency changes vs. time, e.g. modulation, sweep, frequency setting, channel hopping etc.

The 16-bit DOS program is standardly included with all CNT-81/81R.

The 32-bit Windows program is an optional accessory (option 29).

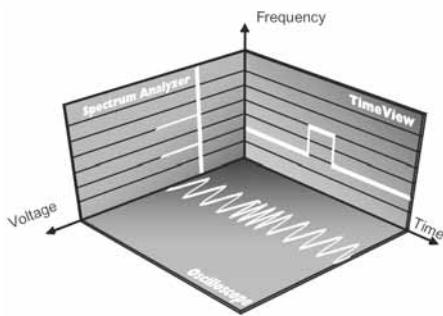


Figure 1: The modulation domain ( $f$  vs.  $t$ ) complements the time ( $V$  vs.  $t$ ) and the frequency ( $V$  vs.  $f$ ) domains

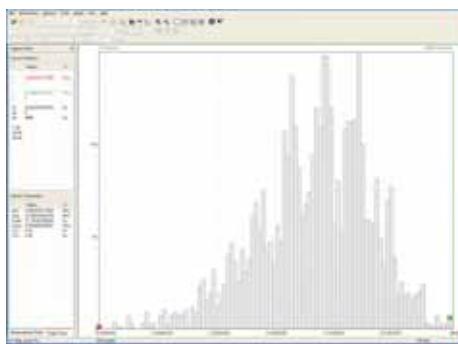


Figure 2: Jitter (rms and peak-peak) and noise is quantified in distribution histograms.

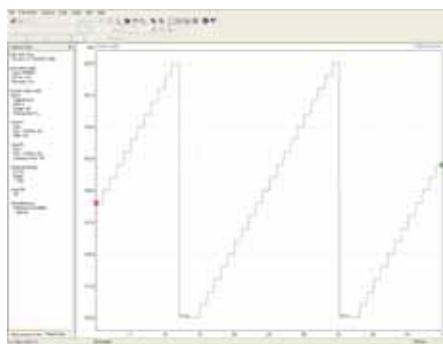


Figure 4: Linearity of frequency sweep can be verified in the modulation domain (frequency vs. time).

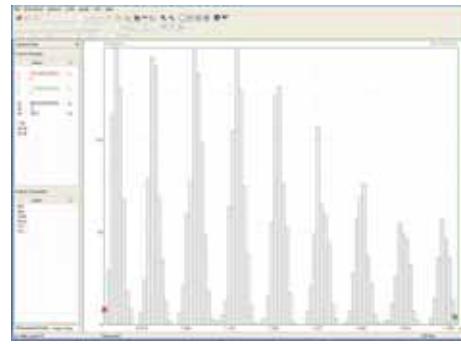


Figure 6: The 9 different pulse width clusters, corresponding to the 9 different pit lengths ( $T_3-T_{11}$ ) in a CD-recording.

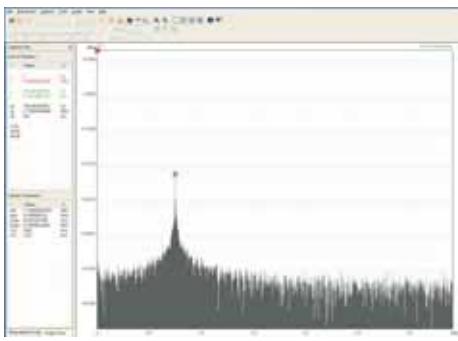


Figure 3: The FFT-diagram reveals the modulation frequency, whether intended or unwanted.

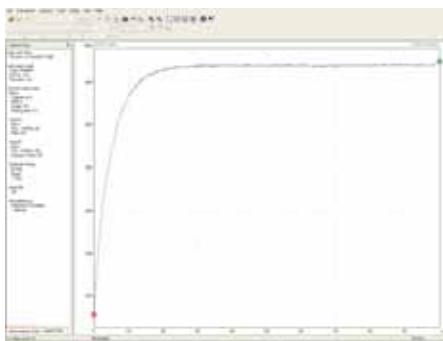


Figure 5: Repetitive samplings gives an effective sampling rate of 10 Msa/s. This VCO has a frequency switching time of approx. 10.7 us.

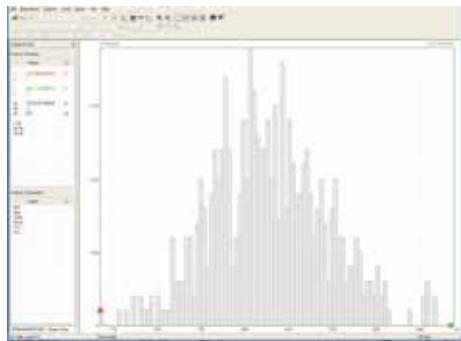


Figure 7: Zoom in on  $T_3$ -cluster displays an rms-jitter of 13 ns, which is OK for an audio CD.



# CNT-81 & CNT-81R Specifications

## GPIB Interface

<i>Max Measurement Rate*</i>	
<i>Via GPIB:</i>	250 readings/s
<i>To Internal Memory:</i>	8k readings/s
<i>Time Stamping:</i>	125 ns resolution
<i>Back-to-back-Period:</i>	Up to 40k readings/s (100 ns resolution)
<i>Internal Memory Size*:</i>	Up to 6100 readings
<i>Data Output:</i>	ASCII, IEEE double precision floating point

## TimeView™ Time & Frequency Analyse Software

TimeView is supported on both CNT-81 and CNT-81R models.

### *Versions:*

DOS-version:	Standardly supported
Windows (32 bit) version:	Optional accessory (option 29)

### *Data Capture Modes and Measurement Rate\**

Free-run sampling:	8k readings/s
Repetitive Sampling:	Up to 10 MSa/s
Back-to-back-Period:	Up to 40k readings/s

### *Waveform Capture:*

### *Instrument Control:*

### *Data Analysis:*

All front panel functions and some AUX MENU functions
Measurement data vs time
FFT Graph
Root Allan Variance
Smoothing function
Zoom function
Cursor measurements
Distribution Histogram

### *File Storage:*

Setup and Measurement data

\* Depending on measurement function and internal data format.

## Time Base Options

Model:	CNT-81	CNT-81	CNT-81	CNT-81R
Option: Stability:	Standard UCXO	Option 30 OCXO	Option 40 OCXO	- Rubidium
<i>Ageing:</i> per month per year per 10 years	$<5 \times 10^{-7}$ $<5 \times 10^{-6}$ n.s.	$<1 \times 10^{-8}$ $<7.5 \times 10^{-8}$ n.s.	$<3 \times 10^{-9}$ $<2 \times 10^{-8}$ n.s.	$<5 \times 10^{-11}$ $<2 \times 10^{-10}$ $<1 \times 10^{-9}$
<i>vs. temp:</i> 0°C-50°C 20°C-26°C (typ.)	$<1 \times 10^{-5}$ $<3 \times 10^{-6}$	$<5 \times 10^{-9}$ $<6 \times 10^{-10}$	$<2.5 \times 10^{-9}$ $<4 \times 10^{-10}$	$<3 \times 10^{-10}$ $<2 \times 10^{-11}$
<i>Short Term:</i> $\tau=1s$ (Allan Dev.)	n.s.	$1 \times 10^{-11}$	$5 \times 10^{-12}$	$5 \times 10^{-11}$
<i>Warm-up Stability:</i> <i>after warm-up time of:</i> 30 min.	n.s. 30 min.	$<1 \times 10^{-8}$ 10 min.	$<5 \times 10^{-9}$ 10 min.	$<4 \times 10^{-10}$ 10 min.
<i>Total Uncertainty (2σ):</i> (20°C -26°C) 1 year after calibration 2 years after calibration	$<7 \times 10^{-6}$ $<1.2 \times 10^{-5}$	$<1 \times 10^{-7}$ $<2 \times 10^{-7}$	$<2.5 \times 10^{-8}$ $<5 \times 10^{-8}$	$<2.5 \times 10^{-10}$ $<5 \times 10^{-10}$

\* After 1 month of continuous operation.

## US: Pendulum Instruments Inc

5811 Racine Street  
Oakland, CA 94609-1519, USA  
Voice:(510)-428-9488 Fax: (510)-428-9469

## International: Pendulum Instruments AB

PO Box 2020, SE-16102 Bromma, Sweden  
Voice: +46 8 598 51057 Fax:+46 8 598 51040

## Pendulum Instruments

[www.pendulum-instruments.com](http://www.pendulum-instruments.com)  
- Experts in time & frequency calibration,  
measurement and analysis

Specifications subject to change without notice

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Incorporating XL Microwave