



pendulum



**PENDULUM INSTRUMENTS**

Global experts in measurement, analysis and calibration of time and frequency.

[www.pendulum-instruments.com](http://www.pendulum-instruments.com)

## OUR COMPANY

Pendulum Instruments is a high-quality global supplier of solutions for calibration, measurement and analysis of time and frequency related parameters.

### 60+ YEARS OF EXPERIENCE AND EXPERTISE

The company roots dates back to the 1950's, when Pendulum was the Swedish branch of Philips Test & Measurement division. Pendulum Instruments was a spin-off in 1998. Pendulum Instruments currently has offices in Poland, Sweden and USA.

### QUALITY AND RECOGNITION

Pendulum products have been awarded "Best-in-Test" honorable mention from T&M World magazine several times, and Pendulum Instruments was awarded "Electronic Company of the Year" in the "Elektronik i Norden" magazine. Our reputation has created strategic alliances with a.o. Fluke and other big global T&M companies.

### MARKETS SERVED

Today, our products fit the needs of metrology, aerospace and defense, telecom, oscillator manufacturing, RF and Microwave, electronic industries, contract manufacturing in around 100 countries worldwide. We have sales representatives in approximately 100 countries in all continents plus service centers in several countries.



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**Elektronik  
iNorden**  
Electronic Company of the Year





## OUR PRODUCTS

**The company's success is based on technological innovations that have resulted in several products ahead of the market's offer. They represent precision, application fitness and ease-of-use, coupled with innovations and very high quality.**

### GNSS SIMULATORS

Our GPS/GNSS satellite simulators are easy to use, scenario-based instruments that combine a powerful, feature-rich platform with industry-leading value and affordability for any requirement for GPS testing. The simulators are upgradable with new features and constellations via SW licenses, so you never risk that your Simulator would become obsolete.

### TIME AND FREQUENCY COUNTER/ANALYZERS

Pendulum brand frequency counters/analyzers are well known as industry-leading time and frequency measurement instruments. Our products were pioneers in the market with the revolutionary graphical UI and extensive analysis functions. Our products cover pulsed RF measurements to 60GHz as well as Analyzers/Calibrators with built-in Rubidium clock.

### FREQUENCY REFERENCES

We offer several models of very precise GPS-controlled Rubidium Reference clocks for various metrology, industrial and telecom applications. The models offer a unique traceability concept and portability.

### FREQUENCY DISTRIBUTION

Distribution Amplifiers offer an economical solution to the problem of low-noise transfer of frequency reference signals over longer distance, up to 2 km. Our products enable distribution via optical fiber between floors, building or sites using either point-to-point or point-to-multi-point distribution.

PRODUCTS

GSG SERIES  
GPS/GNSS SIMULATORS

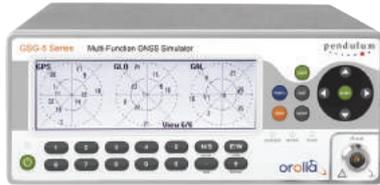
Pendulum brand GPS/GNSS satellite simulators are easy to use, scenario-based instruments that combine a powerful, feature-rich platform with industry-leading value and affordability for any requirement for GPS testing.



## KEY SPECIFICATIONS

### GSG-51

- Single channel GPS L1 generator
- GLONASS L1, QZSS L1, Galileo E1, BeiDou B1 - optional
- RF level range from -65 to -160 dBm
- Affordable unit can be upgraded at any time after purchase



### GSG-5 SERIES

- As GSG-51 plus higher performance
- Multi-channel L1 Simulator
- 4 channels upgradable to 16
- Simulator of multi-path, interference and jamming, leap seconds and more

### GSG STUDIOVIEW SOFTWARE

- GPS/GNSS Test Scenario Builder Software for Windows®
- Simple creation, editing and organization of all scenario parameters including dynamic events
- Create, edit and visualize trajectories with mapping tools.
- Ability to create and modify the simulation of a moving receiver
- Upload (or download) the scenario files to any GSG unit, through the network, USB, or GPIB
- Convert trajectories from CSV, KML, KMZ and GPX files to the required NMEA format
- Create scenario files (including events and trajectories) without the need to be connected to a simulator
- Download Ephemeris and Almanac Data
- Identifies and pre-downloads the relevant RINEX files from official websites
- Multi-language support

### GSG-6 SERIES

- Multi-frequency, multi-channel GNSS simulator
- Simulation of multiple GNSS systems on multiple frequency bands on 32, 48 or 64 channels
- GPS L1P, L2P, GLONASS L2 C/A (OPT L2), GPS L2C (OPT L2C), GPS L5, IRNSS L5, Galileo E5a/b, BeiDou B2 (OPT L5) - optional
- High accuracy calibration of timing pulse from timing receivers, to below 1 ns



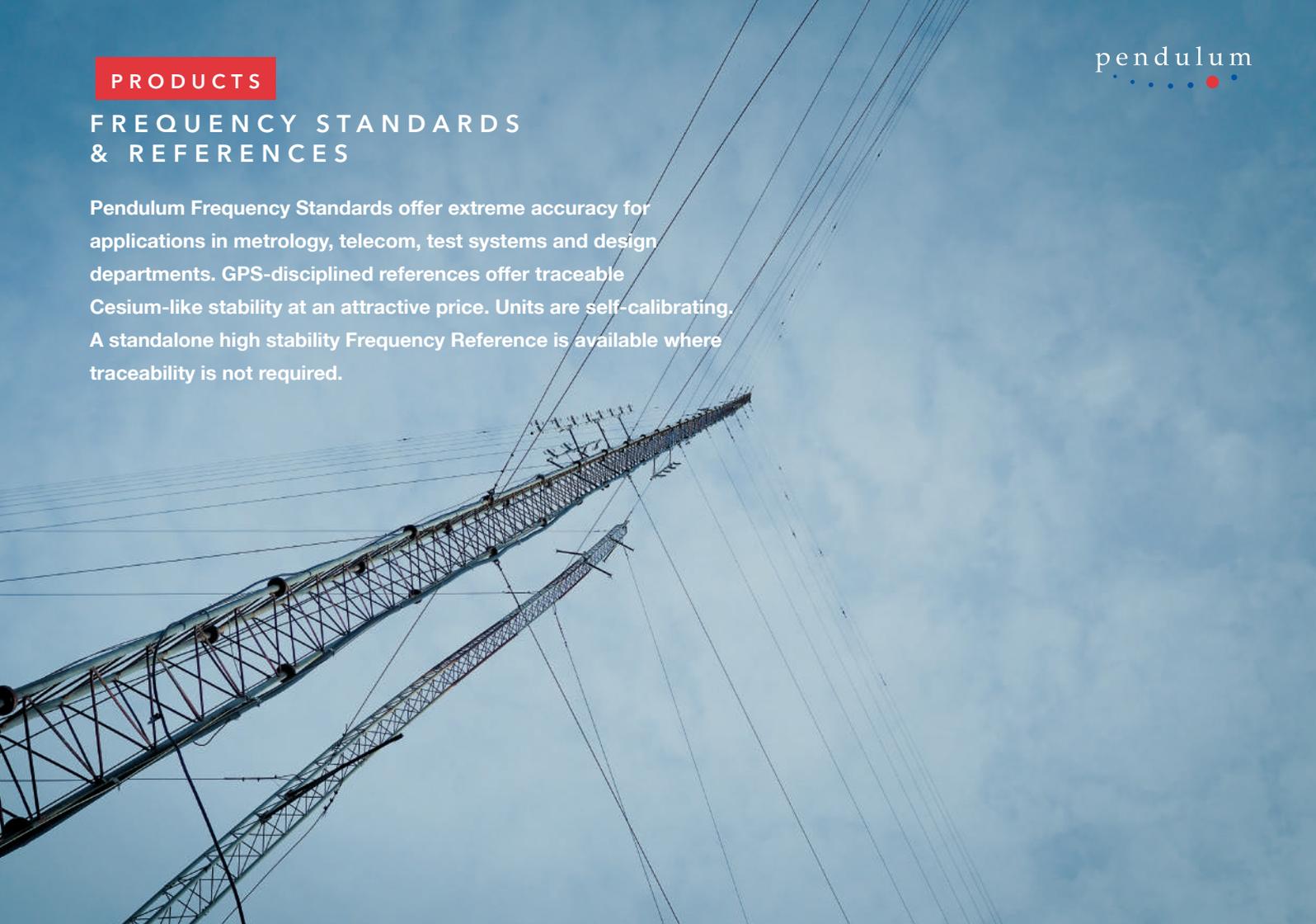
PRODUCTS

## CNT-90 SERIES FREQUENCY COUNTERS/ANALYZERS

Pendulum CNT-90 series of Frequency Counter/Analyzers are well-known as industry-leading, high-performance, time and frequency measurement and analysis instruments.

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PRODUCTS

## FREQUENCY STANDARDS & REFERENCES

Pendulum Frequency Standards offer extreme accuracy for applications in metrology, telecom, test systems and design departments. GPS-disciplined references offer traceable Cesium-like stability at an attractive price. Units are self-calibrating. A standalone high stability Frequency Reference is available where traceability is not required.

## KEY SPECIFICATIONS

### GPS-12R/12RG FREQ. STANDARD

- GPS-disciplined Rubidium clock
- Internal battery option for transportation and mains-free field use
- Multi-frequency outputs: 1 pps, 10 MHz, 5 MHz, 1MHz, 1.544 MHz (T1) or 2.048 MHz (E1)
- Seven standard outputs and four optional
- User friendly front panel operation, with eight languages
- Use of both GLONASS and GPS gives better signal reception (GPS-12RG)



### GPS-88/89 FREQ. STANDARD

- GPS-disciplined frequency standard
- Choice of Rubidium or ovenized crystal oscillator
- Traceable internal calibration system approved by Swedish National Testing & Research Institute
- Remote monitoring via Ethernet interface
- No doubt-about-accuracy via display of frequency offset
- Seven standard outputs; 5x 10MHz, 1x 5MHz, 1x1-pps
- Five extra optional frequency outputs



### 6688/6689 FREQ. REFERENCE

- Stand-alone frequency reference
- Rubidium (6689) or high stability OCXO (6688)
- 5x10 MHz and 1x5 MHz outputs as standard
- Optional five extra 10 MHz outputs
- 0.001 ppm aging in 10 years (Rubidium)



## PRODUCTS

FREQUENCY DISTRIBUTION  
AMPLIFIERS

Pendulum Frequency Distribution Amplifiers can cost-effectively distribute a central Frequency Reference to multiple users or testers. The dual use of coax and fiber enables both short range distribution (coax), as well as long range distribution between floors, buildings and sites (fiber). The Frequency Distribution Amplifiers can distribute frequency reference signals up to 2 km over fiber without any noise pickup or ground loop problem. Choose between the NEW modular multi-frequency, point-to-multi-point FDA-301, or the low-cost compact single-fiber DA-36 for point-to-point distribution



## KEY SPECIFICATIONS

NEW

### FDA-301 FREQ. DISTRIBUTION AMPLIFIER

- Distributes sine, pulse, ToD and E1/T1 clock/data signals over fiber and/or coax
- 3 modular output slots provides easy upgradability in the field
- Up to 18 fiber or 12 coax outputs
- No-noise pickup and EMP-proof distribution over fiber
- Distribute up to 2km over fiber
- Auto-switch-over when connecting two input sources for input redundancy
- Optional DC power input for power redundancy



### DA-36 FREQ. DISTRIBUTION AMPLIFIER

- Distribution of reference frequencies over fiber or coax
- Drive up to 2 km of optical fiber
- Eliminate ground current loop problems
- No noise and interference pick-up, EMP-proof
- Easy to install - flexible, lightweight and small diameter cable
- Coax: 1 input, 4 outputs; Fiber: 1 input, 1 output





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## CONTACT PENDULUM INSTRUMENTS

Global experts in measurement, analysis and calibration of time and frequency.

### General enquiries

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