GPS-12RG
GLONASS/GPS-Controlled Rubidium Frequency Standard

 Очень высокая стабильность

GPS-12RG is a very precise GLONASS- and GPS-controlled Rubidium reference clock for various telecom and metrology applications. In its standard configuration, the 10 MHz or 5 MHz outputs provides a calibration reference and a reference for other measurement instruments in the lab or in the test rack. The combined use of both GLONASS and GPS received signals, improves the geographic coverage and leads to a better signal reception also in urban areas, and for field use. Its telecom outputs can be set to either 1.544 MHz (T1) or 2.048 MHz (E1) reference clock outputs, for calibration or synchronization of telecom test instruments and network elements.

The 1-pps output provides an ultra-stable timing reference, with excellent hold-over specifications (less than 1μs after 24 h hold-over). This is useful in applications where timing is critical, like synchronization of DAB, DVB or WCDMA transmitters or for synchronization of radar antenna array systems.

Optional Configurations

The GPS-12RG is equipped with both metrology and telecom clock frequencies as standard. There are three 10 MHz and one 5 MHz outputs, plus two user selectable front-panel telecom outputs (1.544 MHz/T1 or 2.048 MHz/E1), plus a 1-pps (1-pulse-persecond) output. There are also additional optional output frequency possibilities like extra 1, 5 and 10 MHz outputs or extra telecom outputs of 2.048/1.544 MHz and 2.048/1.544 Mbps.

Блокировка при обрыве связи

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Flexible and Easy-to-Use

Its configurable alarm outputs give urgent or non-urgent alarms for hardware failures, loss of Rubidium oscillator lock, entering Holdover mode, and more. User settings and display are selectable for six languages. The GPS-12RG is an excellent metrology reference for calibration of test equipment such as Wandermeters, SDH/SONET network analyzers, and general test and measurement equipment time bases.

Distribution systems

The GPS-12RG can be used with Pendulum distribution amplifier systems, to distribute the ultra-stable reference from GPS-12RG. The FDA-301 and DA-36 distribute the reference signal via optical fibers over long distances (up to 2km) to other rooms, floors or even buildings. This fiber distribution is free from electromagnetic noise pick-up and ground current loops.
### Standard Outputs

(Allan dev.), at temp. 20°C to 26°C:

- \(<2\times10^{-10}\) (τ = 24 h), locked to GPS
- \(<5\times10^{-10}\) (τ = 100 s)
- \(<1.7\times10^{-10}\) (τ = 10 s)
- \(<5\times10^{-11}\) (τ = 1 s)

**Phase noise:**
- \(<1.7\times10^{-11}\)
- \(<5\times10^{-12}\)

**Warm up (+25°C):**
- 10 minutes to \(1\times10^{-9}\) (typ.)

**Frequency stability - Hold-over**
- **Aging/month:** \(<5\times10^{-10}\)
- **Temp. (0°C to 50°C):** \(<1\times10^{-10}\)

### Standard Outputs

- **1.544 MHz or 2.048 MHz (2 front-panel outputs, user selectable)**
- **Connectors:** BNC female (2)
- **Frequency:** 1.544 MHz (T1) or 2.048 MHz (E1) square wave, user selectable on the front panel
- **Output level:** -1.2 V to +1.2 V ±10% in 75 Ω (G.703:10)

#### 3x 10 MHz and 1x 5 MHz (rear panel)
- **Connector:** BNC female
- **Output level:** Sine wave, >1Vrms in 50 Ω load
- **1pps (front-panel output)**
- **Connector:** BNC female
- **Output level:** approx. 0V to +2.0 V in 50 Ω load
- **Duty cycle:** approx. 20% (GPS-locked)
- **Jitter (GPS-locked):** <1ns rms
- **Hold-over accuracy:** approx. 1μs drift after 1 day of Hold-over

### Alarm output (rear)

**Signal coding:**
- **Relay open:** alarm mode;
- **Relay closed:** normal mode;
  - 1 urgent output;
  - 1 non-urgent output
- **Max switching voltage:** 60 VDC
- **Max switching current:** 200 mA

### GPS Antenna Input (rear)

**Connector:** Type ‘N’, female

**DC Antenna Supply:** +5VDC, center-pin positive, through ‘N’ connector

### Options Available

- **Option 70B outputs**
  - **Frequency:** 3x 10 MHz, 1x 5 MHz
  - **Output level:** Sine wave, >1Vrms in 50 Ω
- **Option 71B outputs**
  - **Frequency:** 0.1, 1, 5, 10 MHz
  - **Output level:** Sine wave, >1Vrms in 50 Ω
- **Option 72B Outputs**
  - 2x 2.048 MHz and 2x 2.048 Mbps outputs (G.703)
  - **Output level:** -1.2V to +1.2V +10% in 75 Ω

### Option 78/HS

- **Internal rechargeable NiMH battery for GPS-12RG. Includes additional inlet for +12 VDC external power supply/charging**
- **Operation time:** 2h
- **Stand-by time:** 2.5h
- **Ext. +12 VDC inlet:** +10.5 to +18 V, 5A

### Environment

**Power Supply**
- **Line voltage:**
  - 100 V to 240 Vrms (±10%)
  - 50 Hz to 60 Hz (±10%)
- **50 Hz to 400 Hz (±10%);**
- **100 V to 240 Vrms (±10%);**
- **50 Hz to 400 Hz (±10%);**

**Internal Battery**
- Via internal NiMH battery, capacity 45 Wh, 12 VDC connector for charging and continuous operation (option 78/HS)
- **Freq. Stablity:** \(<2\times10^{-10}\) when switching between any power source; AC MAINS
- **Internal temperature controlled fan**

**Jitter:**
- \(<1ns\) rms
- \(<35ns\) during normal operation

**Output level:**
- \(<1x10^{-10}\)
- \(<5x10^{-11}\)
- \(<1x10^{-10}\)

**Frequency stability - Hold-over**
- **Aging/week:** \(<2x10^{-12}\)
- **(τ =1s)**
- **(τ =100 s)**
- **(τ =24 h), locked to GPS**
- **Approx. 20% (GPS-locked)**

### Duty cycle:

**Output level:**
- \(<1V\) to +2.0 V in 50 Ω load

### Built-In Options

- **Option 70B:** 3x 10 MHz plus 1x 5 MHz extra outputs, sine, 1Vrms
- **Option 71B:** Multiple reference outputs 0.1/1/5/10 MHz, sine, 1Vrms
- **Option 72B:** 2x 2.048 MHz and 2x 2.048 Mbps outputs (G.703)
- **Option 78/HS:** Internal Battery and external +12 VDC power supply inlet
- **Option 79/01:** 1x ext. 1 PPS disciplining input, 1x1 PPS out, 2x 10 MHz sine out

### Optional Accessories

- **Option 01/90:** GNSS antenna, 40 dB gain, N connector, includes mounting kit
- **Option 22/90:** 19" rack mount kit
- **Option 27:** Soft carrying case
- **Option 27H:** Heavy-duty transport case
- **Option 29/12:** GPS-12 Monitor, Control and Monitoring SW (via USB)
- **Option 02:** Antenna cable, 20 m
- **Option 02/50:** Antenna cable, 50 m
- **Option 02/130:** Antenna cable, 130 m
- **Option 09/07:** Calibration certifi cate with protocol, Rubidium oscillator
- **Option 90/00:** Calibration certifi cate hold-over aging/week
- **Option 95/05:** Extended warranty with 2 extra years
- **Option 99/11:** Service Agreement
- **OM-12:** Printed User’s Manual

### Mechanical Data

**WidthxHeightxDepth:**
- 210 x 108 x 395 mm
- (8.25" x 3.6" x 15.6")

**Weight:**
- Net 3.1 kg (6.6 lbs); excl batteries
- Shipping 4.1 kg (8.8 lbs); excl batteries

### Ordering Information

- **Basic Model**
  - **GPS-12RG:**
    - Glonass/GPS-controlled Rubidium Frequency Standard with 3x 10 MHz, 1x 5MHz, 1x 1pps, and 2x 1.544 MHz or 2.048 MHz outputs

- **Included with Instrument:**
  - Important Information document
  - User Manual in electronic format (PDF)
  - Calibration certificate
  - 2 year warranty*

### Specifications and Accessories

- **Power Supply**
  - **Line voltage:** 100 V to 240 Vrms (±10%)
  - 50 Hz to 60 Hz (±10%)
  - 200 mA

- **GPS Antenna Input (rear)**
  - **Connector:** Type ‘N’, female
  - **DC Antenna Supply:** +5VDC, center-pin positive, through ‘N’ connector

- **Options Available**
  - **Option 70B outputs**
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    - **Output level:** Sine wave, >1Vrms in 50 Ω
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    - **Output level:** Sine wave, >1Vrms in 50 Ω
  - **Option 72B Outputs**
    - 2x 2.048 MHz and 2x 2.048 Mbps outputs (G.703)
    - **Output level:** -1.2V to +1.2V +10% in 75 Ω

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