



## **Meinberg Funkuhren**

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## **GNS181: GPS / GLONASS / Galileo / BeiDou based Time Synchronization for Stationary and Mobile Applications**

The GNS181 unit has a special onboard receiver which is able to capture GPS, GLONASS, Galileo and BeiDou signals. Optionally, it is possible to limit the receiver to using only one satellite system or a combination of two or three GNSS systems for synchronization.

The variety of inputs/outputs makes this receiver the first choice for a broad range of applications, including time and frequency synchronization tasks and the measurement of asynchronous time events.

The GNS181 with its integrated GPS / GLONASS / Galileo / BeiDou receiver provides accurate time with ultimate precision both in stationary and mobile environments by supporting standard L1 antennas.

### **Important Note**

This product is no longer available. We will of course continue to provide support for units that have already been purchased and are still in use. Please contact our [1][Sales Team](#) for further details.

### **Key Features**

- Pulses per second and per minute
- 2 time trigger inputs
- Alarm output
- Optional DDS frequency synthesizer
- DCF77 simulation
- Allows direct transmission routes of up to 150 m when using Ultraflex H2010 coaxial cable
- Standard frequency outputs
- Flash-EPROM with bootstrap loader
- Optional up to 4 serial ports up to 4 programmable switching outputs timecode generator (IRIG-B, AFNOR)
- Including 40 dB Multi GNSS L1 antenna, 20 m (65 ft) pre-assembled Belden H155 cable

## Description

The GNS181 offers satellite based time synchronization at the highest accuracy standards for fixed or mobile applications. It is suitable to be deployed in data centers or on board of cars, trucks, aircrafts, ships and other moving platforms. The satellite receiver can determine its position even at a maximum acceleration of up to 5 g, at a maximum speed of 500m/s and at an altitude of up to 18,000 meters.

The GNS181 is used to manage high accurate timing and measurement tasks. The board is able to generate fixed and programmable standard frequencies with very high accuracy and stability. Various oscillator options allow to meet different requirements concerning the accuracy of the outputs in the most cost efficient way. The pulse generator of the GNS181 generates pulses per second and per minute. As an option four programmable outputs are available. The pulses are synchronized to the UTC second.

The module provides two inputs for measurement of asynchronous time events. These capture events can be read via a serial interface. The board uses a binary interface protocol to receive configuration parameters and exchange status information with external equipment via its RS232 interfaces.

### **MRS capability**

The oscillator of the GNS181 can be disciplined by an external reference source (e.g. 1PPS, 10MHz, IRIG, PPS + String).

### **Standard L1 Antenna**

Standard delivery includes a 40 dB Multi\_GNSS L1 antenna. The antenna with an integrated over-voltage protection operates in a frequency range of 1575.42 +-10 MHz and 1602-1615 MHz.

## Characteristics

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Receiver Type</b>              | <b>Combined GPS / Galileo / GLONASS / BeiDou receiver</b> <ul style="list-style-type: none"> <li>* Number of channels: 72</li> <li>* Frequency band: L1</li> <li>* Standard Precision (GNSS)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Type of Antenna</b>            | <b>40 dB GPS L1/GLONASS L1</b><br>Antenna with Integrated Lightning Protection <ul style="list-style-type: none"> <li>* Frequency Band: 1575.42 ± 10 MHz / 1602-1615 MHz</li> <li>* Antenna Gain:</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Synchronization Time</b>       | Max. 1 minute in normal operating conditions<br>Max. 25 minutes (average 12 minutes) upon first initialization or in the absence of saved satellite data                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Frequency Outputs</b>          | Option: Frequency synthesizer 1/8 Hz up to 10 MHz (TTL, sine 1,5Vrms)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Pulse Outputs</b>              | Pulse per second (PPS) and pulse per minute (PPM). TTL level, pulse width: 200 msec                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Accuracy of Pulse Outputs</b>  | Depends on oscillator option:<br>< ±50ns (OCXO SQ, OCXO MQ, OCXO HQ, OCXO DHQ, Rubidium)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Interface</b>                  | Two independent serial RS-232 interfaces (optional four interfaces), menu configurable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Serial Time String Output</b>  | Baud rate: 300, 600, 1200, 2400, 4800, 9600, 19200 Baud<br>Data format: 7E1, 7E2, 7N2, 7O1, 7O2, 8E1, 8N1, 8N2, 8O1<br>Time telegram: [2] <a href="#">Meinberg Standard Time String</a> , SAT, Uni Erlangen, COMPUTIME, Sysplex 1, SPA, RACAL, Meinberg GPS, [3] <a href="#">Capture String</a> , ION, ION Blanked, IRIG-I, NMEA (RMC,GGA,ZDA)                                                                                                                                                                                                                                                                                  |
| <b>Switch outputs</b>             | <b>Optional:</b><br>Four TTL outputs can configured independently for the following modes: <ul style="list-style-type: none"> <li>- free programmable cyclic or fixed impulses</li> <li>- timecode</li> <li>- timer mode; three 'ON'- and three 'OFF'-states can be setup per day</li> </ul> The switch states can be inverted for all three outputs, the impulse lengths are configurable in 10msec steps in a range from 10msec to 10sec.<br>The impulse output can be configured for all channels together to 'always' or 'ifsync'.                                                                                          |
| <b>Supported Timecode Formats</b> | <b>IRIG B002:</b> 100pps, DCLS signal, no carrier, BCD time-of-year<br><b>IRIG B122:</b> 100pps, AM sine wave signal, 1 kHz carrier, BCD time-of-year<br><b>IRIG B003:</b> 100pps, DCLS signal, no carrier, BCD time-of-year, SBS time-of-day<br><b>IRIG B123:</b> 100pps, AM sine wave signal, 1kHz carrier, BCD time-of-year, SBS time-of-day<br><b>IRIG B006:</b> 100 pps, DCLS Signal, no carrier, BCD time-of-year, year<br><b>IRIG B126:</b> 100 pps, AM sine wave signal, 1 kHz carrier frequency, BCD time-of-year, Year<br><b>IRIG B007:</b> 100 pps, DCLS Signal, no carrier, BCD time-of-year, year, SBS time-of-day |

**IRIG B127:** 100 pps, AM sine wave signal, 1 kHz carrier frequency, BCD time-of-year, year, SBS time-of-day

**IEEE1344:** Code according to IEEE1344-1995, 100pps, AM sine-wave signal, 1kHz carrier, BCD time-of-year, SBS time-of-day, IEEE1344 expansion for date, time zone, daylight saving and leap second in Control Functions segment

**C37.118:** Like IEEE1344 - with inverted sign bit for UTC offset

**AFNOR:** Code according to NFS-87500, 100pps, AM sine-wave signal, 1kHz carrier, BCD time-of-year, complete date, SBS time-of-day

|                               |                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Time Trigger Inputs</b>    | Resolution: 100 nsec, triggered by falling TTL slope<br>Time of trigger event readable via RS232-interface                                                                                                                                                                                                                                                          |
| <b>Alarm output</b>           | Synchronous state of the module, TTL high level if synchronous                                                                                                                                                                                                                                                                                                      |
| <b>Electrical Connectors</b>  | 96-pin DIN 41612 connector                                                                                                                                                                                                                                                                                                                                          |
| <b>Backup Battery Type</b>    | <b>CR2032 (lithium button cell)</b><br>In the event of loss of power to the main system, this battery powers the real-time clock and also ensures that GNSS almanac data is properly buffered in RAM.<br>Lifetime of lithium battery: Min. 10 years                                                                                                                 |
| <b>Cable Type</b>             | Coaxial cable Belden H155 indoor or outdoor usage<br>Maximum length of antenna cable: 70 meters                                                                                                                                                                                                                                                                     |
| <b>Operating Voltage</b>      | +5 V DC                                                                                                                                                                                                                                                                                                                                                             |
| <b>Current Draw</b>           | +5V 1.1 A to 1.4 A (depending on oscillator type)                                                                                                                                                                                                                                                                                                                   |
| <b>Firmware</b>               | Flash-EEPROM, bootstrap loader                                                                                                                                                                                                                                                                                                                                      |
| <b>Board Type</b>             | Eurocard                                                                                                                                                                                                                                                                                                                                                            |
| <b>Supported Temperature</b>  | Operational: 0 - 50 °C (32 - 122 °F)<br>Storage: -20 - 70 °C (-4 - 158 °F)                                                                                                                                                                                                                                                                                          |
| <b>Supported Humidity</b>     | Max. 85 % (non-condensing) at 40 °C                                                                                                                                                                                                                                                                                                                                 |
| <b>Warranty</b>               | Three-year warranty                                                                                                                                                                                                                                                                                                                                                 |
| <b>Options</b>                | Synthesizer 1/8 Hz up to 10 MHz (TTL level, sine wave 1.5V <sub>eff</sub> , open drain)<br>Optional up to 4 serial interfaces, 3 programmable TTL outputs and timecode generator (IRIG-B, AFNOR)                                                                                                                                                                    |
| <b>RoHS Status of Product</b> | This product is fully RoHS-compliant.                                                                                                                                                                                                                                                                                                                               |
| <b>WEEE Status of Product</b> | This product is handled as a B2B (Business to Business) category product. To ensure that the product is disposed of in a WEEE-compliant fashion, it can be returned to the manufacturer. Any transportation expenses for returning this product (at end-of-life) must be covered by the end user, while Meinberg will bear the costs for the waste disposal itself. |

## Manual

There is no online manual available for this product.: [4][Contact us](#)

## Links:

[1] <mailto:sales@meinberg.de>

[2] <https://www.meinbergglobal.com/english/specs/timestr.htm>

[3] <https://www.meinbergglobal.com/english/specs/capstr.htm>

[4] <mailto:info@meinberg.de>