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GRC181: GPS/GLONASS/BeiDou based Time Synchronization for Stationary and Mobile Applications

The GRC181 unit has a special onboard receiver which is able to capture GPS, GLONASS and BeiDou signals. Optionally, it is possible to limit the receiver to using only GPS or GLONASS or only BeiDou signals.

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 GRC181 with its integrated GPS/GLONASS/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-EEPROM 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 GRC181 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 GRC181 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 GRC181 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 GRC181 can be disciplined by an external reference source (e.g. 1PPS, 10MHz, IRIG, PPS + String).

Standard L1 Antenna

Standard delivery includes a 40 dB GPS L1/GLONASS 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

Receiver Type	Combined GPS / GLONASS / BeiDou receiver * Number of channels: 72 * Frequency band: GPS L1, GLONASS L1 * Standard Precision (GLONASS) * Codes: C/A code (GPS)
Type of Antenna	40 dB GPS L1/GLONASS L1 Antenna with Integrated Lightning Protection * Frequency Band: 1575.42 ± 10 MHz / 1602-1615 MHz * Antenna Gain:
Synchronization Time	Max. 1 minute in normal operating conditions Max. 25 minutes (average 12 minutes) upon first initialization or in the absence of saved satellite data
Frequency Outputs	Option: Frequency synthesizer 1/8 Hz up to 10 MHz (TTL, sine 1,5Vrms)
Pulse Outputs	Pulse per second (PPS) and pulse per minute (PPM). TTL level, pulse width: 200 msec
Accuracy of Pulse Outputs	Depends on oscillator option: < ±50ns (OCXO SQ, OCXO MQ, OCXO HQ, OCXO DHQ, Rubidium)
Interface	Two independent serial RS-232 interfaces (optional four interfaces), menu configurable.
Serial Time String Output	Baud rate: 300, 600, 1200, 2400, 4800, 9600, 19200 Baud Data format: 7E1, 7E2, 7N2, 7O1, 7O2, 8E1, 8N1, 8N2, 8O1 Time telegram: [2] Meinberg Standard Time String , SAT, Uni Erlangen, COMPUTIME, Sysplex 1, SPA, RACAL, Meinberg GPS, [3] Capture String , ION, ION Blanked, IRIG-I, NMEA (RMC,GGA,ZDA)
Switch outputs	Optional: Four TTL outputs can configured independently for the following modes: - free programmable cyclic or fixed impulses - timecode - timer mode; three 'ON'- and three 'OFF'-states can be setup per day 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. The impulse output can be configured for all channels together to 'always' or 'ifsync'.

Supported Timecode Formats	IRIG B002: 100pps, DCLS signal, no carrier, BCD time-of-year IRIG B122: 100pps, AM sine wave signal, 1 kHz carrier, BCD time-of-year IRIG B003: 100pps, DCLS signal, no carrier, BCD time-of-year, SBS time-of-day IRIG B123: 100pps, AM sine wave signal, 1kHz carrier, BCD time-of-year, SBS time-of-day IRIG B006: 100 pps, DCLS Signal, no carrier, BCD time-of-year, year IRIG B126: 100 pps, AM sine wave signal, 1 kHz carrier frequency, BCD time-of-year, Year IRIG B007: 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
Time Trigger Inputs	Resolution: 100 nsec, triggered by falling TTL slope Time of trigger event readable via RS232-interface
Alarm output	Synchronous state of the module, TTL high level if synchronous
Electrical Connectors	96-pin DIN 41612 connector
Backup Battery Type	CR2032 (lithium button cell) 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. Lifetime of lithium battery: Min. 10 years
Cable Type	Coaxial cable Belden H155 indoor or outdoor usage Maximum length of antenna cable: 70 meters
Operating Voltage	+5 V DC
Current Draw	+5V 1.1 A to 1.4 A (depending on oscillator type)
Firmware	Flash-EEPROM, bootstrap loader
Board Type	Eurocard
Supported Temperature	Operational: 0 - 50 °C (32 - 122 °F) Storage: -20 - 70 °C (-4 - 158 °F)
Supported Humidity	Max. 85 % (non-condensing) at 40 °C
Options	Synthesizer 1/8 Hz up to 10 MHz (TTL level, sine wave 1.5Veff, open drain) Optional up to 4 serial interfaces, 3 programmable TTL outputs and timecode generator (IRIG-B, AFNOR)

RoHS Status of Product	This product is fully RoHS-compliant.
WEEE Status of Product	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>