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GNS165: GNSS Satellite Receiver with integrated time code generator (DIN Mounting Rail)

The Meinberg satellite receiver clocks of the GNS165xHS series are available with several options. The variants differ in power supply and the type of DC-isolation of the programmable pulse outputs.

Key Features

- Programmable pulses and switching times, Time code or serial time string configurable for optocoupler outputs
- Two RS-232 interfaces, one RS-485 interface
- DCF77-simulation
- Modulated and unmodulated IRIG-B or AFNOR Outputs
- Antenna connected with up to 70m of coax cable type Belden H155
- Remote control and monitoring with included software mbgdevman (COM 0)
- Aluminium profile case for 35mm DIN mounting rail
- Flash-EPROM with bootstrap loader

Description

The GNS165 is designed for mounting on a DIN rail. The front panel integrates eight LED indicators, a terminal block, two DSUB and three BNC-connectors. The receiver is connected to the antenna/converter unit by a 50 Ohm coaxial cable with length up to 70 m (when using Belden H155 cable). The Multi GNSS antennna is powered via the antenna cable.

Pulse Outputs
The pulse generator of the satellite controlled clock GNS165 provides three independant channels and is able to generate a multitude of different pulses, which are configured with the software mbgdevman. The pulse outputs are electrically insulated by optocouplers or PhotoMOS relays and are available at the terminal block.

Asynchronous Serial Interfaces

One RS-485 serial interface and two RS-232 serial interfaces are available to the user. The corresponding parameters can be set up by mbgdevman using serial port COM 0.

Characteristics

Type of receiver	**Combined GPS / Galileo / GLONASS / BeiDou receiver** * Number of channels: 72 * Frequency band: L1 * Standard Precision (GNSS)
Type of antenna	**40 dB Multi GNSS L1** Antenna with Integrated Lightning Protection for GPS, Galileo, GLONASS and Beidou signals * Frequency Band: 1575.42 ± 10 MHz / 1602-1615 MHz * Antenna Gain:
Control elements	Four LEDs to display the status of the programmable outputs and the time code output Four LEDs to display the status of the receiver (Init, Nav, Fail, Antenna)
Status info	Fail-LED shows that the internal timing has not been synchronized or that a system error occurred Nav-LED shows that the calculation of the position has been achieved after reset

Synchronization time	Max. 1 minute in normal operation mode, approx. 12 minutes after a cold start (discharged buffer battery)
Accuracy of pulse outputs	Better than ±100 nsec after synchronization and 20 minutes of operation better than ±3 µsec during the first 20 minutes of operation
Interface	Two independent serial RS232 interfaces COM 0 and COM 1, COM 2 as RS485 interface
Data format of interfaces	Baudrate: 300 to 19200 baud Framing: 7N2, 7E1, 7E2, 8N1, 8N2, 8E1, 801 Time strings: Meinberg Standard, Meinberg GPS, SAT, Uni Erlangen (NTP), NMEA0183, Computime, Sysplex-1, SPA, RACAL, ION, IRIG J
DCF77 emulation	Amplitude modulated 77.5 kHz sinewave carrier output level approximately -55 dBm (unmodulated)
Optocoupler outputs	3 optocoupler outputs; UCEmax = 55V, ICmax = 50 mA, Ptot = 150 mW, Viso = 5000 V the following operating modes are possible for each channel: - free programmable cyclic or fixed pulses - timer mode; three 'ON'- and three 'OFF'-times programmable per day and channel - receiver state; synchronous state of the GNS-receiver is indicated - DCF77-emulation - Time code (IRIG/AFNOR) - Time string (time telegram of COM1) The switching state of each channel can be inverted, the pulse duration is settable in steps of 10 msec from 10 msec to 10 sec. The outputs can be enabled either: - always (immediately after reset) - only if receiver is GNSS-synchronized
Generated time codes	**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 Funktions Segment **C37.118:** Like IEEE1344 - with turned 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

Physical dimensions	GNS165DHS: 105 mm x 85 mm x 104 mm (h x w x d) for 35mm DIN mounting rail GNS165DAHS: 105 mm x 125,5 mm x 104 mm (h x w x d) for 35mm DIN mounting rail
Electrical connectors	16-pin terminal block for connecting the pulse/switch outputs and the power supply BNC female connectors for DCF77-simulation (AM-modulated 77.5 kHz carrier frequency) and modulated timecode output (3 Vpp into 50 ohm) female Sub-Min-D connectors for serial interfaces and unmodulated timecode outputs
Antenna connector	BNC-connector
Power supply	GNS165DHS: 20 -60 V DC GNS165DAHS: 100-200 V DC / 100-240 V AC (50-60 Hz)
Power consumption	ca. 5W
Backup battery type	When main power supply fails, hardware clock runs free on quartz basis, almanac data is stored in RAM Life time of lithium battery min. 10 years
Firmware	Flash-EPROM, bootstrap loader
Ambient temperature	0 ... 50°C / 32 ... 122°F
Humidity	Max. 85%
Options	Photo-MOS-relay-outputs (instead of optocouplers): Umax = 150 V AC/DC peak, Imax = 150 mA, Ptot = 360 mW, Viso = 1500 V AC
Deployment in special environments	The GNS165 and its variants are already deployed to numerous customers in the power industry. They are used for electrical substation synchronization all over the world, for example in South America, the USA, Asia and Europe. This product is therefore suitable to work under harsh conditions and still provide reliable and accurate synchronization.
RoHS-Status of the product	This product is fully RoHS compliant
WEEE status of the product	This product is handled as a B2B category product. In order to secure a WEEE compliant waste disposal it has to be returned to the manufacturer. Any transportation expenses for returning this product (at its end of life) have to be incurred by the end user, whereas Meinberg will bear the costs for the waste disposal itself.

Manual

The english manual is available as a PDF file: [1]Download (PDF)

Links:

[1] https://www.meinbergglobal.com/download/docs/manuals/english/gns165.pdf