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GPS165: Satellite Receiver with integrated time code generator (DIN Mounting Rail)

The Meinberg satellite receiver clocks of the GPS165xHS 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
- Included GPSANTv2 antenna uses downconverter technology to enable long transmission routes of up to 1100 m (1200 yards)
- DC-insulated antenna circuit
- Remote control and monitoring with included software Meinberg Device Manager (COM 0)
- Aluminium profile case for 35mm DIN mounting rail
- Flash-EPROM with bootstrap loader

Description

The GPS165 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 300 m (when using RG58 coax-cable). The antenna/converter unit is powered via the antenna cable. It is possible to connect up to four receivers to one antenna by using an optional antenna diplexer.

Pulse Outputs

The pulse generator of the satellite controlled clock GPS165 provides three independant channels and is able to generate a multitude of different pulses, which are configured with the Meinberg Device Manager software. 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 Meinberg Device Manager using serial port COM 0.

Characteristics

Receiver Type	12 channel GPS C/A-code receiver
Status Indicators	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
Type of Antenna	Included [1]GPSANTv2 antenna with innovative downconverter technology that allows transmission routes of up to 300 m using RG58 cable, 700 m using RG213 cable, and 1100 m using H2010 Ultraflex cable
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)
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
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
Serial Time String Output	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 GPS-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 GPS-synchronised
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
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 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
Operating Voltage	GPS165DHS: 20-60 V DC GPS165DAHS: 100-240 V DC / 100-240 V AC (50-60 Hz)

Firmware	Flash-EPROM, bootstrap loader
Physical Dimensions	GPS165DHS: 105 mm x 85 mm x 104 mm (h x w x d) for 35mm DIN mounting rail GPS165DAHS: 105 mm x 125,5 mm x 104 mm (h x w x d) for 35mm DIN mounting rail
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	Photo-MOS-relay-outputs (instead of optocouplers): Umax = 250 V AC/DC peak, Imax = 150 mA, Ptot = 360 mW, Viso = 1500 V
Deployment in special environments	The GPS165 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 and Europe. This product is therefore suitable to work under harsh conditions and still provide reliable and accurate synchronization.
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

The English manual is available as a PDF file: [2]Download (PDF)

Links:

[1] https://www.meinbergglobal.com/english/products/gps-antenna-converter.htm
[2] https://www.meinbergglobal.com/download/docs/manuals/english/gps165.pdf