



Gyro

G_84300-A

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1 Introduction

The gyro, G_84300-A is based on the latest generation of the MEMS technology. Compared to other gyroscopes, it offers the advantages of reduced noise, less drift, unexcelled robustness and long durability.

Using an integrated microcontroller, the spin rate, angle and one axis can be determined easily.

Application: Support of the determination of position at all types of vehicles as inertial navigation system.

2 Alignment Of The Metering Shaft

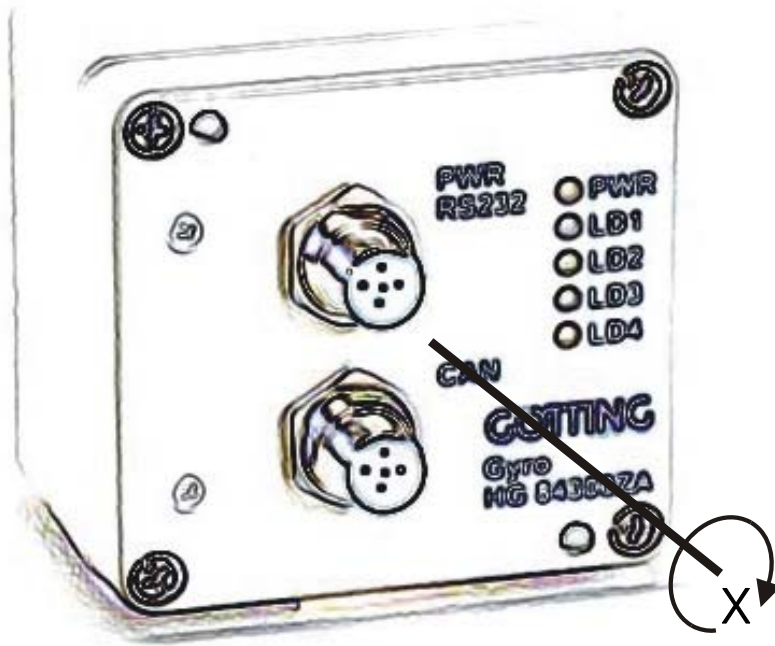


Figure 1 Sketch: metering shaft

3 Hardware

3.1 Dimensions

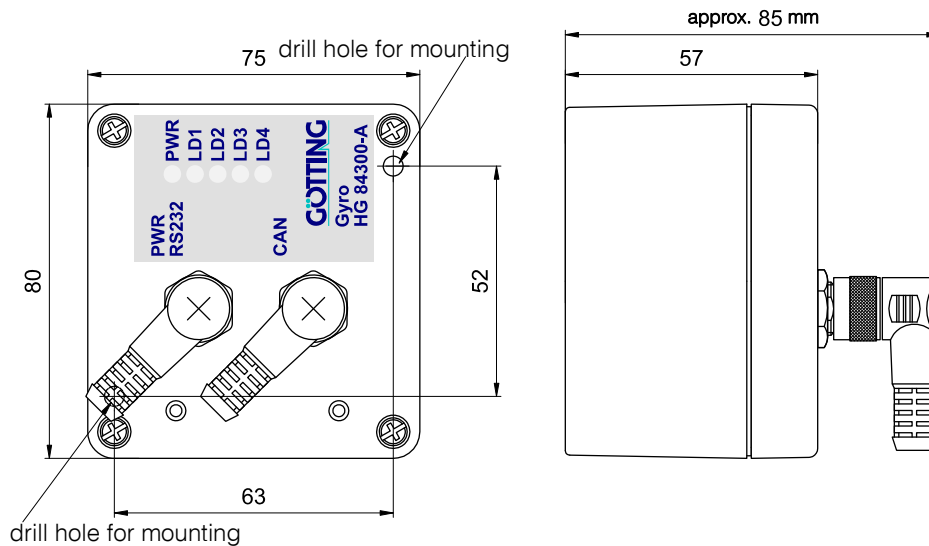


Figure 2 Sketch: dimensions of the casing (in mm)

3.2 Pin Assignment

3.2.1 X1 (PWR/RS232)

5-pin M12 panel plug (A coded)

Pin	Signal	Description
1	+Ub (24V)	supply voltage
2	IN1 *)	input for drift compensation
3	TxD	RS232 data output
4	RxD	RS232 data input
5	GND	supply ground

Table 1 Pin Assignment X1 (PWR/RS232)

*) Annotation IN1: If a high level (24 V) is applied to this input, the currently measured spin rate is saved as drift. The drift compensation has to be proceeded **on a regular base during idleness** in order to increase the exactness of the device. This function **may not be activated during a change of the angle** as the measured drift as well as the calculated angle will happen to be erroneous.

3.2.2 X2 (CAN)

5-pin M12 panel plug (A coded)

Pin	Signal	Description
1	shield (chassis)	ground casing
2	+Ub (24V)	voltage supply
3	GND	ground supply
4	CAN_H	CAN high
5	CAN_L	CAN low

Table 2 Pin assignment X2 (CAN)

NOTE! There is **no terminator** for the CAN bus in the device!



3.3 LED

LED	Description
PWR	voltage supply okay
LD1	- blinking → Measurement active - lit constantly → drift compensation active
LD2	not used
LD3	not used
LD4	blinking → error

Table 3 Functions of the LED

4 Software / Parametrization

After turning on, the device is set to the mode „transparent data output“. The preset standard parameters for the interface are:

- ♦ **115.200 baud, 8 data bit, no parity, 1 stopbit, ANSI emulation**

4.1 Data Output (Transparent Mode)

The angle and the drift compensation offset value are put out as text cyclically (rate is adjustable, see chapter 4.3.1 on page 8).

The values are separated by a comma and each set of data is terminated by CR (carriage return) and LF (line feed).

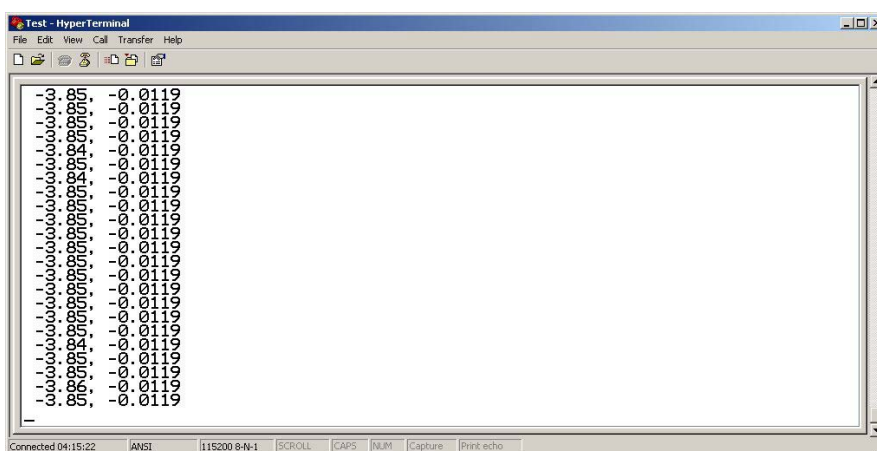


Figure 3 Screenshot: Data Output (Transparent Mode)

4.2 Data Input (Transparent Mode)

4.2.1 Resetting The Angle

To reset the angle to 0° , the following cycle has to be followed:

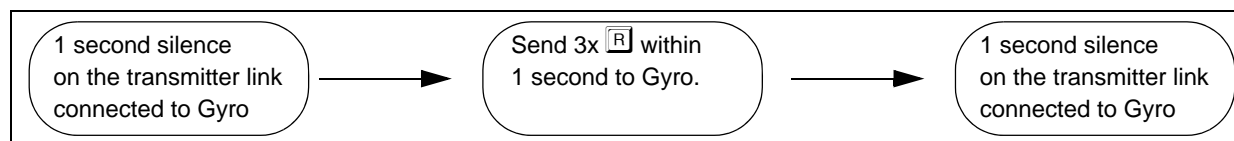


Figure 4 Procedure for resetting angle

4.2.2 Activating And Deactivating Drift Compensation

When the drift compensation is active, an asterisk (*) can be found at the end of each line. In order to activate or deactivate the function, the following cycle has to be followed:

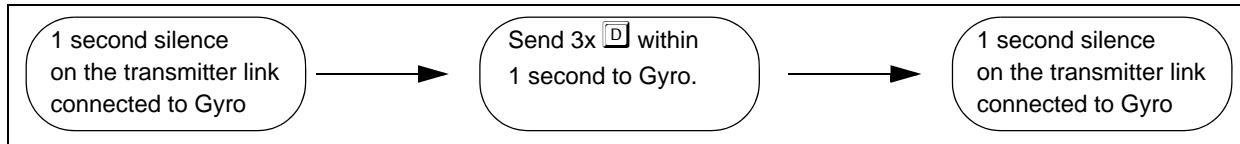


Figure 5 Procedure for activating and deactivating drift compensation

4.3 Changing To Monitor Mode

The monitor mode is proceeded using the serial interface RS232. In the following, we refer to the programm *HyperTerminal*[®] (*Hyperterm.exe*), which is included in the scope of supply of most versions of Microsoft[®] Windows[®]

Despite, another terminal programm, that is capable of dealing with ANSI emulation, can be used as well. If another programm is used, please read the included documentation and set the aforementioned (refer to page 7) parameters.

For running the monitor mode, the following steps have to be followed:

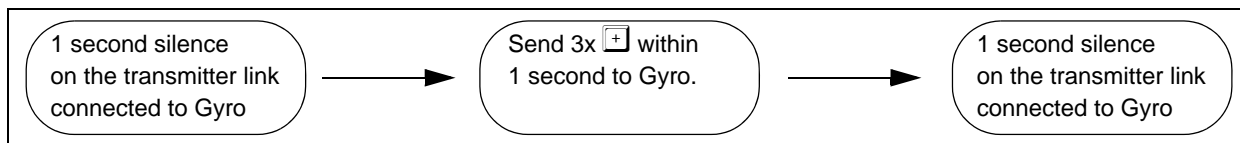


Figure 6 Procedure for running the monitor mode

4.3.1 Terminal Output In Monitor Mode

```

Test - HyperTerminal
File Edit View Call Transfer Help
HG84300 1.07 Main menu Goetting KG
Angle : 25.13 CAN TxD counter: 139
Cal. value : 16.2663 CAN RxD counter: 0
Offset : 0.1119
Temperature: 29.5 CAN errors: 0_
-----
R: Reset angle
D: Drift compensation
1: Data rate ( 1 ) * 10ms
2: UART baudrate 115200 kbit/s
3: CAN config CFG 1
4: CAN baudrate 1 Mbit/s
5: CAN id command 0x0100
6: CAN id gyro out 0x0200
P: Preset drift comp. 0n
S: Save parameter
U: Update software
L: Log data
Connected 00:05:16 ANSI |115200 8-N-1 |SCROLL |CAPS |NUM |Capture |Print:echo
  
```

Figure 7 Screenshot: Terminal Output In Monitor Mode

Possible Entries

- **R** set angle to 0°
- **D** activate or deactivate drift compensation
- **1** parametrize rate of data output (value range: 1 to 10 [x 10ms])
- **2** parametrize RS232 baudrate (9600, 19200, 38400, 57600, 115200 baud)
After changing these parameters, the system has to be reset.
- **3** choose CAN configuration (currently only CFG 1)
- **4** set CAN baudrate (125 kbit/s, 250 kbit/s, 500 kbit/s, 1 Mbit/s)
- **5** set CAN identifier for receiver box
- **6** set CAN identifier for transmitter box
- **P** presetting for automatic activation of the drift compensation after turning on the device
- **S** save parameter safe against mains failure (necessary after each change)
- **U** updating software (see chapter 4.4 on page 9)
- **L** return to „Transparent data output“

4.4 Software Update

The firmware files have to match the variant of the device and partly even the case of application, so the Götting KG provides the firmware files directly on demand. The update procedure can be started directly from the terminal output (see chapter 4.3.1 on page 8) with **U**. Then the update is realized in the following steps:

- Step 1

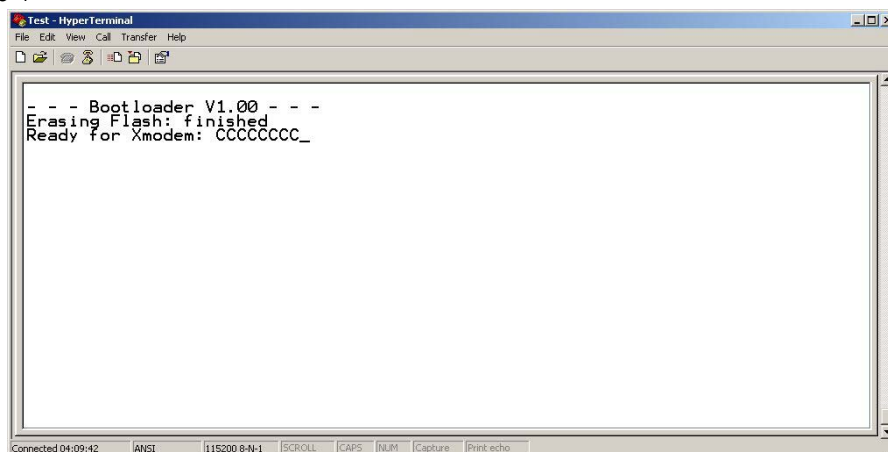


Figure 8 Screenshot: terminal output after running the software update

◆ Step 2

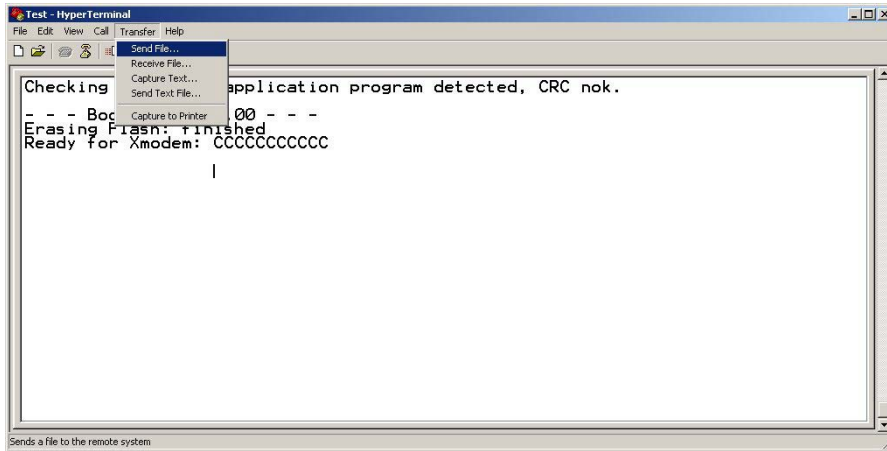


Figure 9 Screenshot: select menu item for transferring file

◆ Step 3



Figure 10 Screenshot: new window for entering the file name

◆ Step 4

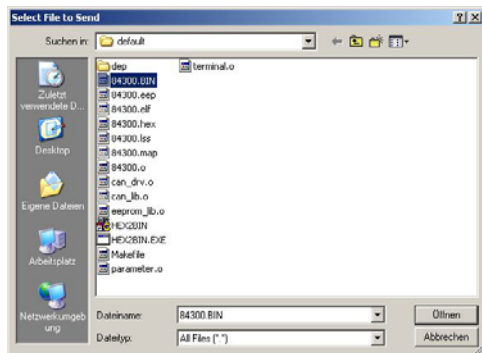


Figure 11 Screenshot: choose file

◆ Step 5



Figure 12 Screenshot: file is now chosen

- ◆ Step 6

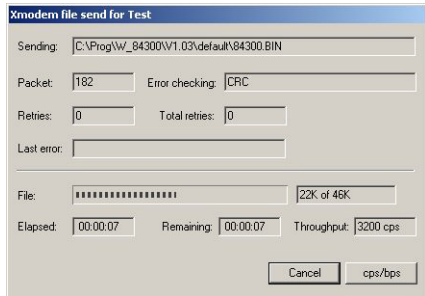


Figure 13 Screenshot: status window during data transmission with Xmodem

- ◆ Step 7

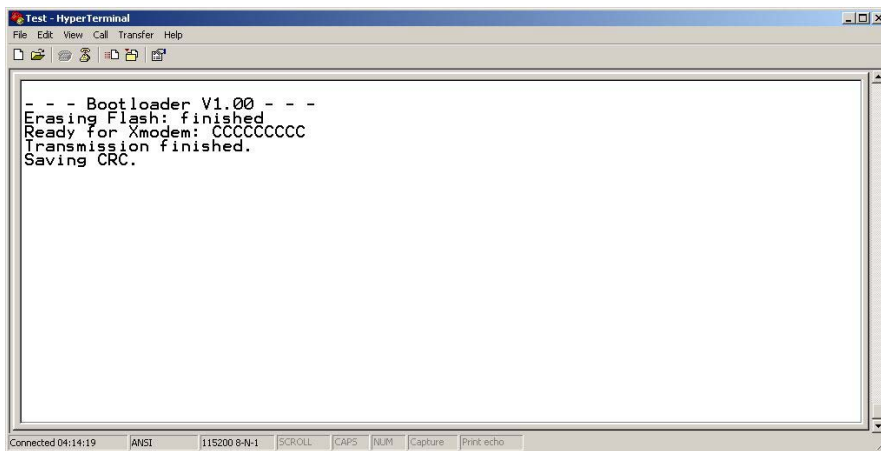


Figure 14 Screenshot: terminal output after data transmission

5 CAN Bus Interface

Annotations:

- **Angle:** radian
- **Temperature:** unit 0.01 °C

5.1 Transmitter Box

Length: 8 Byte

Byte	Data
1	Byte 1 Angle
2	Byte 2 Angle
3	Byte 3 Angle
4	Byte 4 Angle
5	Lowbyte Temperatur
6	Highbyte Temperatur
7	System status
8	Counting unit (sender)

Table 4 Composition Transmitter Box

5.2 System Status

Bit	Bedeutung
1	Value 1 → Drift compensation active
2	Value 1 → Confirmation: angle set to 0°
3	-
4	-
5	-
6	-
7	Error calibration data
8	Error parameter

Table 5 Composition System Status

5.3 Receiving Box

Length: 8 byte

Byte	Data
1	Command *)
2	-
3	-
4	-
5	-
6	-
7	-
8	-

Table 6 Composition Receiving Box

*) Annotations for Command:

Bit	Description
1	Drift compensation active
2	set angle to 0
3	-
4	-
5	-
6	-
7	-
8	-

Table 7 Composition of a command

6 Technical Data

6.1 Measuring Accuracy

Drift (changing temperature)	< 0.1 °/s
Drift (constant temperature)	< 0.01 °/s
Nonlinearity of scaling factor (over whole measurement range)	< ± 0.3 %
Angular random walk	< 5 °/√hr

Table 8 Technical Data: Measuring Accuracy

6.2 General Information

Measurement range	± 300 °/s
Bandwidth	75 Hz
Data rate	1 to 100 Hz
Interface	CAN and RS 232
Dimensions	80 x 75 x 57 mm L x W x H without connector (see Figure 2 on page 5)
Weight	380 g
Casing	aluminium die casting
Mounting	passage in casing matches screws M4
Protection class	IP65
Temperature range (operation)	-40 to + 70° C
Temperature range (storage)	-55 to + 85° C
Relative air humidity at 25° C	95% (without bedewing)
MTBF	>100,000 h
Voltage supply	24 V ±25%
Current consumption	35 mA
Connections	<ul style="list-style-type: none"> - 5-pin M12 panel plug, A coded (voltage supply + RS-232) - 5-pin M12 panel plug, A coded (CAN bus)

Table 9 Technical Data: general information

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9 Essential Information for Reading this Manual

In documentations of Götting KG the following symbols and assignments were used at the time of printing this manual:

- ◆ Security advices have the following symbols, depending on the emphasis and the degree of exposure:

NOTE!



ATTENTION!



CAUTION!



WARNING!



- ◆ Continuative information and tips are identified as follows:

Tip!



- ◆ Program texts and variables are highlighted by using the font 'Courier'.
- ◆ Whenever input of key combinations is required for the operation of programmes, the corresponding **K**ey**s** are **H**ighlighted (in Götting KG programs it is usually possible to use small and capitalized characters equally).
- ◆ Sections, figures and tables are automatically numbered consecutively throughout the entire document. In addition, each document has an index listed behind the front page, including pages and - whenever the document has more than 10 pages - following the actual system description a figure and table index in the back. In certain cases (for long and/or complicated documents) a subject index is added.
- ◆ Each document provides a table block with meta-information on the front page, indicating the system designer, author, revision and date of issue. In addition, the information regarding revision and date of issue are included within the footer of each page, enabling the exact allocation of the information with a date and certain a system revision.
- ◆ Online-Version (PDF) and printed manual are generated from the same source. Due to the consistent use of Adobe FrameMaker for the generation of documentation, all directory entries (including page numbers and subject index) and cross references in the PDF file can be clicked on with the mouse and will lead to the corresponding linked contents.
- ◆



10 Copyright and Terms of Liability

10.1 Copyright

This manual is protected by copyright. All rights reserved. Violations are subject to penal legislation of the Copyright.

10.2 Exclusion of Liability

Any information given is to be understood as system description only, but is not to be taken as guaranteed features. Any values are reference values. The product characteristics are only valid if the systems are used according to the description.

This instruction manual has been drawn up to the best of our knowledge. Installation, setup and operation of the device will be on the customer's own risk. Liability for consequential defects is excluded. We reserve the right for changes encouraging technical improvements. We also reserve the right to change the contents of this manual without having to give notice to any third party.

10.3 Trade Marks and Company Names

Unless stated otherwise, the herein mentioned logos and product names are legally protected trade marks of Götting KG. All third party product or company names may be trade marks or registered trade marks of the corresponding companies.