Sensor test device
for encoders with square-wave signals

GEL 211CSR

Technical Information

Version 02-2019

General information

- Test of encoders with square-wave signals
  Evaluation of encoders with
  - TTL/HTL signal level
  - Current or voltage output
  - Reference ignal
- Transmitting the data via WLAN or Ethernet to different terminals (tablet, PC etc.)
- Display of the data in a web browser, idependent of the operating system
- Compact device suitable for mobile use
- Available as a complete set with test jig, interface module and connection accessories in two transport cases

WLAN variant

Features

Display of the following encoder characteristics:
- Signal level of output signal (HIGH, LOW)
- Phase offset of the individual edges
- Duty cycle
- Applied operating voltage
- Current consumption

Advantages

- Simple analysis of the measured values through clear, graphical display of the signal patterns and table of measured sensor values for each individual channel, such as current consumption, duty cycle, standstill voltage.
- Evaluation of the phase offset at the rising and falling edges of the signals of multi-channel sensors.
- Automatic generation of a report of the measured values from the analysis. This can be printed and saved for documentation purposes.

Field of applications

- Functional test of pulse encoders with square-wave signals

Internet: www.lenord.com
E-Mail: info@lenord.de
Phone: +49 208 9963–0

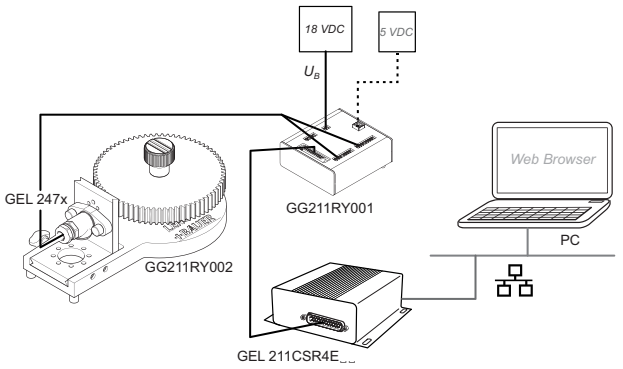
Lenord, Bauer & Co. GmbH
Dohlenstraße 32
46145 Oberhausen, Germany

Description

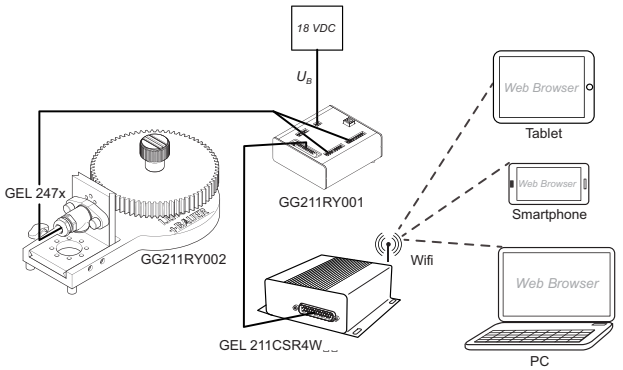
Construction

The mobile sensor test device GEL 211CSR is used for functional tests of speed and position sensors with square-wave signals. It is complemented by a test jig and the interface unit. Sensor and power supply can be easily connected with the interface unit. The test device can be operated as a mobile unit on site or in stationary use.

Connection examples



Data transmission via Ethernet



Data transmission via WLAN

User interface

The sensor test device communicates via WLAN or Ethernet with a client with web support (PC, tablet etc.) and is controlled via the web interface. For this purpose a modern browser and a modern operating system for mobile terminals is required:

- Firefox 10+
- Safari 5.0+
- Chrome 16+
- Opera 10+
- Android 3.0+
- iOS 5.0+
- Internet Explorer 9+ (not recommended)

The user interface can be opened via the IP address of the unit.

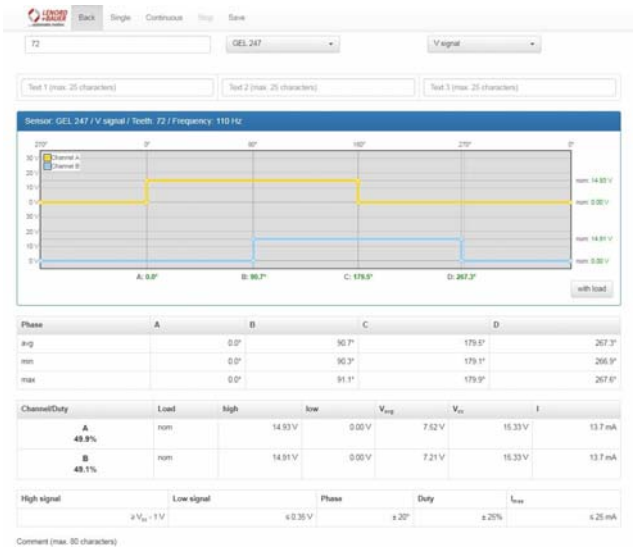
The web interface has been developed for mobile terminals such that it can be used even with small displays. For optimal operation a display with a screen diagonal of 7 inches or larger is recommended.

Signal analysis

Depending on the signal pattern and the number of teeth of the measuring scale, the signal analysis is performed as:

- Single measurement: measures over one turn of the toothed wheel and displays the averaged values.
- Continuous measurement: measures continuously and displays the instantaneous values from tooth to tooth.

A load resistor can be activated (pull-up / pull-down measurement) if required. The result of measurement can be stored or printed as a report.



Single measurement in the web interface

Sensor test device GEL ...	211CSR4E2D	211CSR4W2D
Electrical data		
Supply voltage	5 V DC	
Current consumption via USB port	≤ 500 mA	
Connections	Plug Sub-D, 25 pole Micro-USB (type B)	
Data transmission	Ethernet Report files: WLAN or USB	WLAN Report files: WLAN or USB
Mechanical data		
Degree of protection	IP 20	
Housing material	Aluminium anodised, black	
Weight	Approx. 0.5 kg	
Dimensions (without plug and antenna)	130 × 123 × 45 mm	
Ambient data		
Operating temperature range	0 °C to +70 °C	
Storage temperature range	-20 °C to 85 °C	
Maximum relative humidity of air	80%	
Condensation	Not permitted	

Data of GEL 211CSR4W␣␣

WiFi module certifications	
FCC ID	2AC7Z-ESP32WROOM32U
IC ID	21098-ESP32WROOM32U
Transmitter power output	< 16 dBm
Frequency range	2412 to 2462 MHz

Interface unit

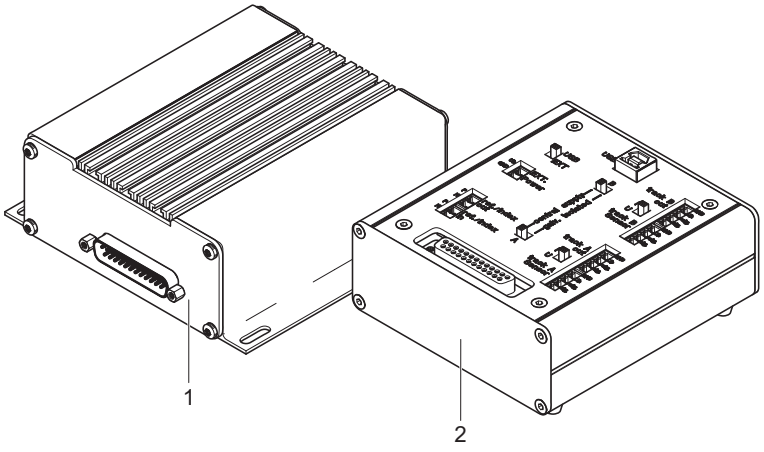
Mechanical data	
Degree of protection	IP 20
Housing material	Aluminium anodised
Weight	approx. 0.5 kg
Dimensions (without plugs / rubber feets)	110 × 100 × 42 mm
Ambient data	
Operating temperature range	0 °C to +70 °C
Storage temperature range	-20 °C to 85 °C
Maximum relative humidity	80%
Condensation	not permitted

Test jig

General Data	
Material of base plate and mounting bracket	Aluminium anodised
Dimensions of assembled test jig (L × W ×H)	250 × 150 ×110 mm
Total weight (including toothed wheel)	4.2 kg
Diameter of mounting shaft	16 mm
Material of toothed wheel	ferromagnetic steel
Outer diameter of toothed wheel	148 mm
Module of toothed wheel	2.0 (other ones upon request)
Weight of toothed wheel	2.5 kg

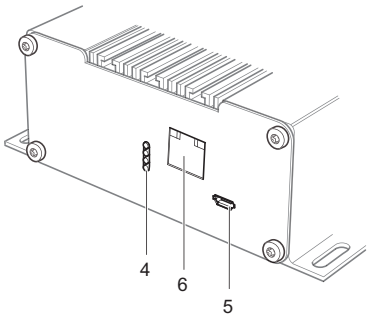
Device view and connections

Device overview

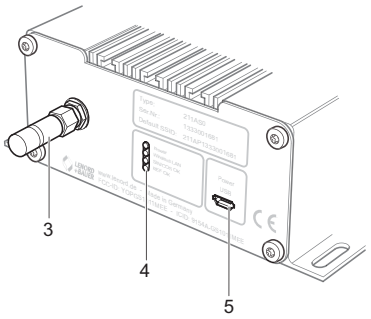


1 Test devide GEL 211CSR4␣2D (front view)
2 Interface unit GG211RY001

GEL 211CSR – rear view



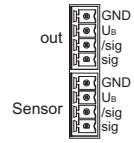
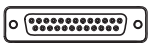
GEL 211CSR4E␣D (Ethernet)



GEL 211CSR4W␣D (WLAN)

3 WLAN antenna
4 LED indicators
5 Micro USB connector (type B): supply volate 5 V
6 Ethernet connector

Connection GG211RY001

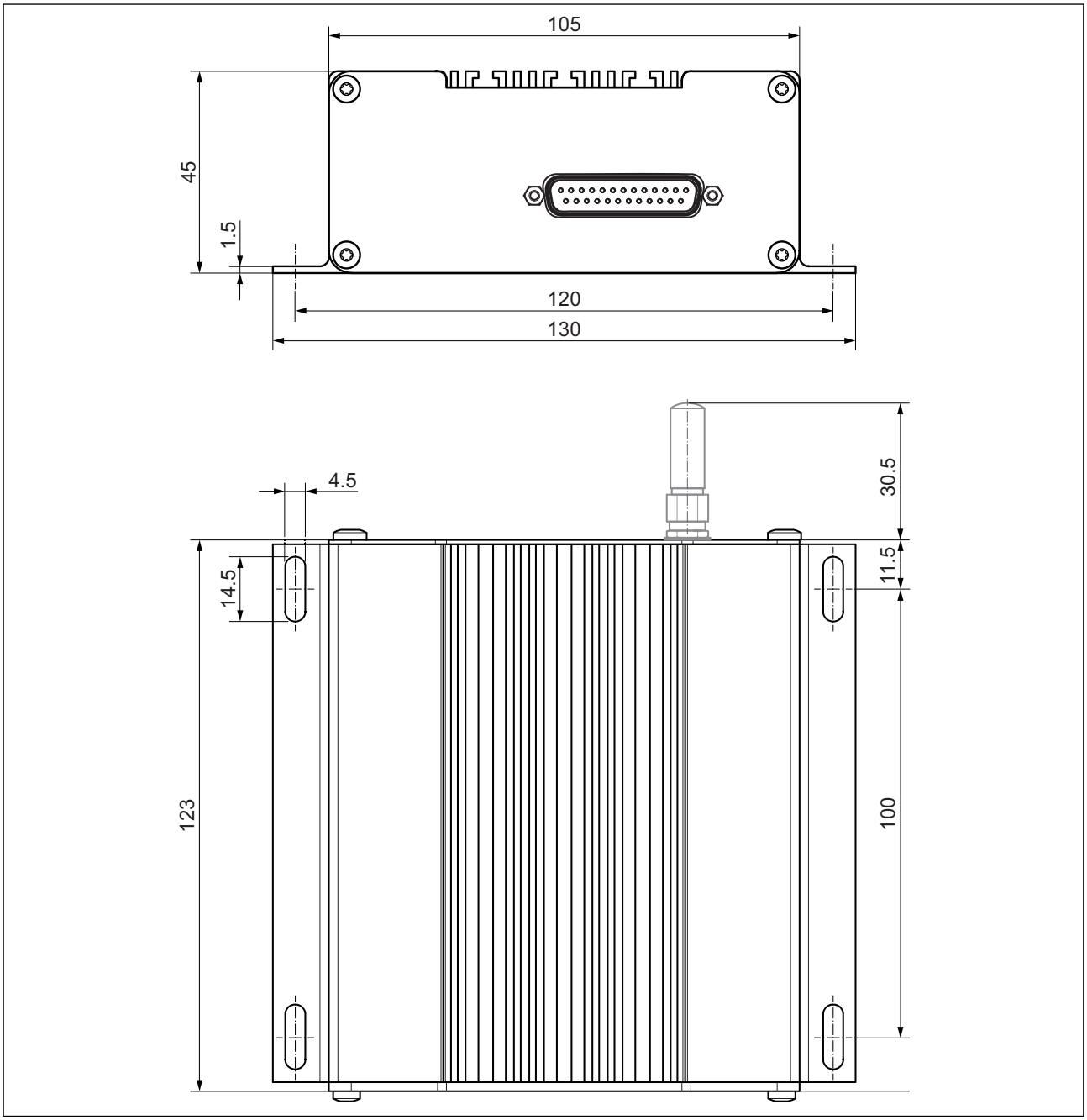
Connection		Plug / socket	Signal identifier
EXT. Power	Power supply, 2-pole Encoder supply and supply for test device		U_B Power supply GND Ground
ref./Index	Reference signals or zero track, 2 sockets **out** Output to control unit, 2-pole **in** Input from sensor, 2-pole		P Inverse signal N Signal
track A **track B**	Track A or B of encoder, 2 sockets **out** [a] Output to control unit, 4-pole, optional **Sensor** Input from sensor, 4-pole		GND Ground U_B Supply voltage /sig Inverse signal sig Signal
	Test device, 25-pole, Sub-D socket		
USB	USB, type B, supply for test device (optional)		

[a] If the encoder is supplied with voltage via *track A / B out* the signal outputs are galvanically separated.

Dimensional drawing

all dimensions stated in mm, general tolerance ISO 2768-m

GEL 211CSR4E2D / GEL 211CSR4W2D (with WLAN antenna)



Type code

	Hardware version						
	C Revision level C						
		Software function					
		S Standard					
			Input signal				
			R Square-wave signals, current or voltage input (HTL/TTL)				
				Electronics			
				4 Internal key			
					Communication interface		
					E Ethernet		
					W WLAN (WiFi)		
						Housing	
						2 IP 20	
						6 IP65 (in preparation)	
							Connection
							D Sub-D connector, 25-pole
GEL 211	_	_	_	_	_	_	_

Available sets

Item-Nr.	Scope of supply
GG211RY001	▪ Interface unit
GG211RY002	▪ Test jig ▪ Mounting bracket for speed sensors ▪ Toothed wheel ▪ Transport case
GG211RY003 (Ethernet)	▪ Sensor test device 211CSR4E2D ▪ Sub-D connection cable, plug/socket, 25 pole, 0.5 m ▪ Power supply unit with connection cable, plug 2 poles, 1.8 m (input 100 - 240 V AC / 50 - 60 Hz; output 18 V DC / 660 mA) ▪ US mains adapter ▪ Mating connector set for GG211RY001 (2× 2 pole for terminal ref./Index; 4× 4 pole for terminal signal track A / B) ▪ Transport case
GG211RY004 (WLAN)	▪ Sensor test device 211CSR4W2D ▪ Sub-D connection cable, plug/socket, 25 pole, 0.5 m ▪ Power supply unit with connection cable, plug 2 poles, 1.8 m (input 100 - 240 V AC / 50 - 60 Hz; output 18 V DC / 660 mA) ▪ US mains adapter ▪ Mating connector set for GG211RY001 (2× 2 pole for terminal ref./Index; 4× 4 pole for terminal signal track A / B) ▪ Transport case