



General information

- ▶ Testing any sensors with sin/cos output $1 V_{PP}$ and reference signal, e.g. MiniCODER
- ▶ Transmitting the data via WLAN to mobile terminals (tablet, PC etc.)
- ▶ Display of the data in a web browser, independent of the operating system

- ▶ Used for checking the signals for compliance with adjustable tolerance limits
 - sin/cos signals (amplitude, offset, phase offset)
 - Reference signal (amplitude, offset, position and width)
 - Target wheel (damage, concentricity, quality of the teeth)
- ▶ Defining and saving different tolerance limits

- ▶ **MiniCODER plus:** Used for setting the parameters
 - Automatic calibration of the sin/cos signals
 - Configuring/reading the operating hours counter
 - Saving the 7 configured speed ranges for the operating hours counter in one recordPossible to save several records in the GEL 211

Features

- ▶ Compact device suitable for mobile use
- ▶ Data display on terminals with web support

Advantages

- ▶ **Eases assembly:** Due to the fast evaluation of the measured signals, the interactive correction of the signals and the graphic evaluation, the analysis of the signals is extremely straightforward.
- ▶ **Optimises maintenance and service work:** Diagnostics and parameter configuration on the MiniCODER plus are undertaken in the installed state, e.g. without opening the spindle. This aspect is particularly convenient and efficient.
- ▶ **Increases the reliability:** The measured values from the analysis and the readings from the operating hours counter are documented automatically by the generation of the report, which can be printed out and saved.

Field of application

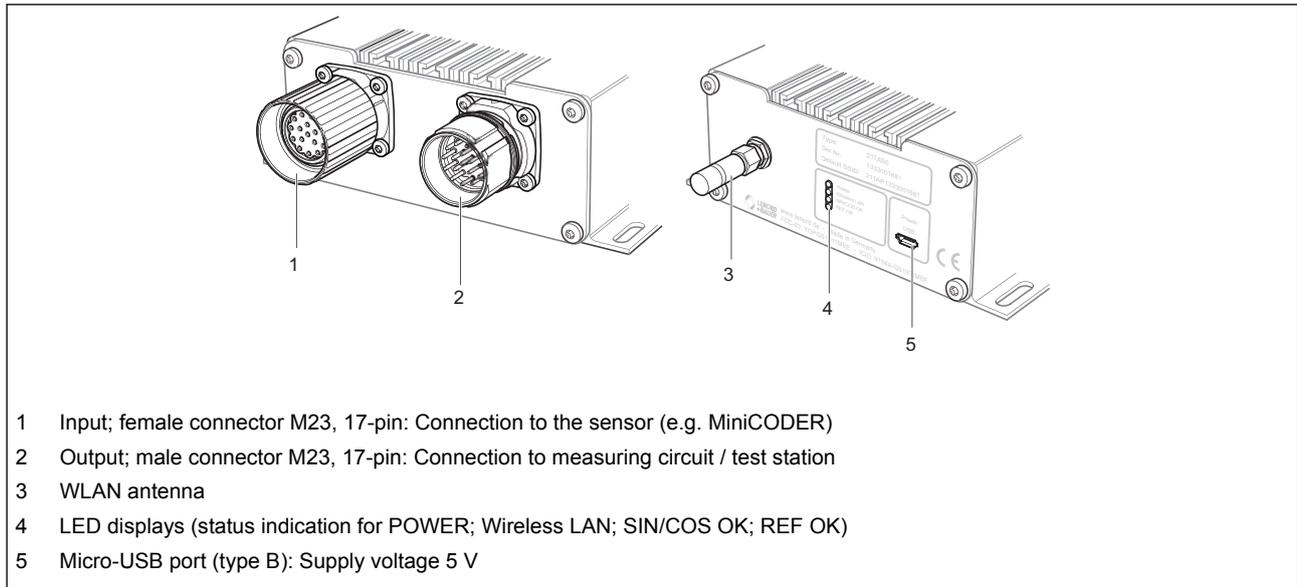
- ▶ Servicing and commissioning machine tools
- ▶ Servicing and commissioning HSC spindles
- ▶ Servicing and commissioning motors

Description

Construction

The testing and programming unit can be integrated into an existing measuring circuit / test station or operated separately.

Unit overview



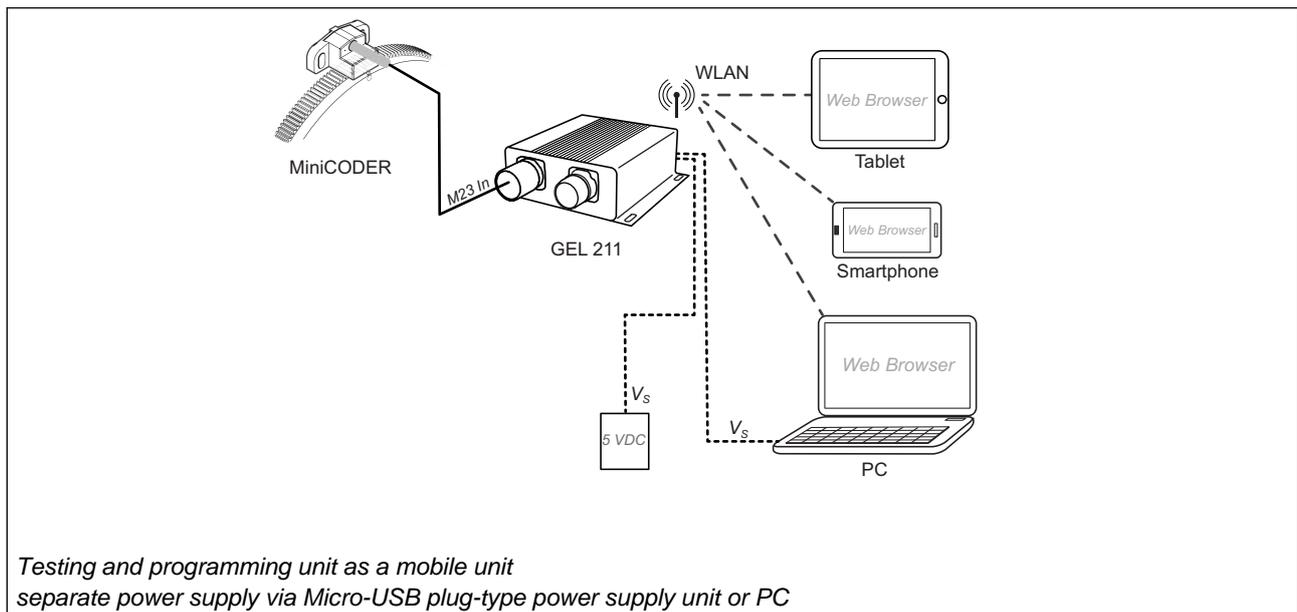
For the duration of the analysis and configuration of the parameters the sensor⁽¹⁾ is connected to the female input connector.

Power is supplied to the unit and the sensor connected via

- ▶ the 17-pin male output connector or
- ▶ the Micro-USB female connector (connection of plug-type power supply unit, PC, laptop etc.).

Sensor signals are checked for compliance with the tolerance limits using the GEL 211. For this purpose different tolerance limits can be saved and retrieved.

Application example



(1) only MiniCODER plus

Functionality

The functionality of the testing and programming unit is dependent on the sensor type.

A differentiation is made between the following sensor types:

- MiniCODER comfort: Any sensors with sin/cos output (1 V_{PP}) and reference signal
 GEL 2444K_1xxxxxx: with reference signal, without internal regulation
 GEL 2444K_Rxxxxxx: with reference signal and internal amplitude regulation
- MiniCODER plus: GEL 2444K_PGxxxxxx: configurable MiniCODER

Overview of functions

Function		Sensor type	
		MiniCODER comfort	MiniCODER plus
Signal analysis: SIN/COS	<ul style="list-style-type: none"> ▶ Amplitude (peak-to-peak) of the sin/cos signals ▶ Amplitude difference (synchronism error) ▶ Offset on the sin/cos signals ▶ Phase difference between sin and cos signals 	✔	✔
Signal analysis: REF	<ul style="list-style-type: none"> ▶ Amplitude of the reference signal ▶ Quiescent level of the reference signal ▶ Position and width 	✔	✔
Tooth wheel analysis ⁽¹⁾	<ul style="list-style-type: none"> ▶ Concentricity and circularity of the tooth wheel via the fluctuation in the SIN/COS signals ▶ Quality of the teeth and signal quality via the standard deviation of the BQ value ▶ Identification of damage on the target wheel via the difference between BQ_{min} and BQ_{max}. Damage to the tooth structure is apparent due to noticeable steps in the analysis curve. 	✔	✔
Automatic sensor calibration	<ul style="list-style-type: none"> ▶ Optimising the amplitude synchronism ▶ Stepwise reduction/increase in the amplitudes of the sin/cos signals ▶ Minimising the offset on the sin/cos signals ▶ Commissioning wizard for the optimisation of the assembly times with automatic analysis reporting 	✖	✔
Analysis reports	<ul style="list-style-type: none"> ▶ Preparing the report with the measured values from signal analysis SIN/COS and REF and tooth wheel analysis 	✔	✔
Operating hours counter	<ul style="list-style-type: none"> ▶ Defining 7 speed ranges ▶ Retrieving and saving the operating hours ▶ Retrieving and saving the number of start-ups ▶ Preparing an operating hours report 	✖	✔
Information on the sensor	<ul style="list-style-type: none"> ▶ Reading the spindle number (assignment of the spindle) ▶ Reading the type code and serial number for the identification of the sensor ▶ Total operating time of the sensor ▶ Temperature peaks in the sensor: highest and lowest measured temperature 	✖	✔
Information on the GEL 211	<ul style="list-style-type: none"> ▶ Firmware version ▶ Serial number ▶ WLAN SSID 	✔ Independent of the sensor	

✔ Function can be used

✖ Function cannot be used

⁽¹⁾ The tooth wheel is analysed with the aid of a mathematically defined evaluation quotient (BQ value).

Description

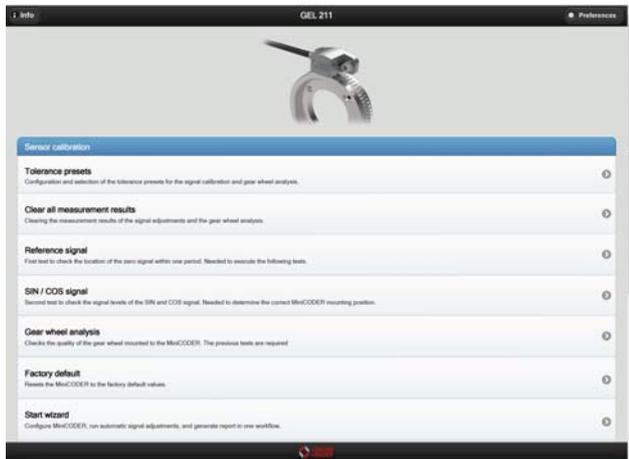
User interface

The testing and programming unit communicates via WLAN 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.



Start screen for the web interface



Display of the SIN/COS signals for the signal analysis information on the tooth-to-tooth values and indication of the average values over one turn



Definition of speed ranges for the MiniCODER plus



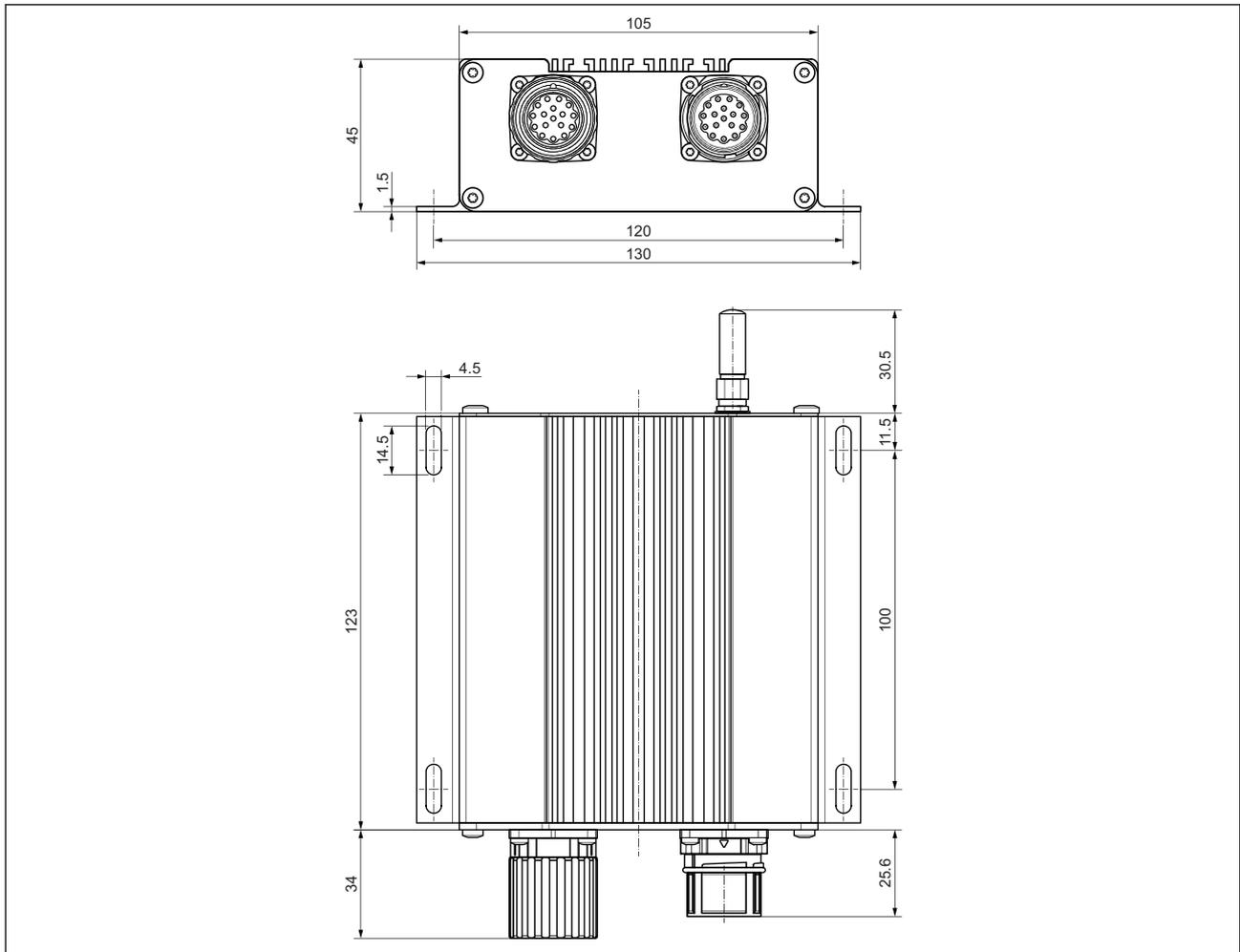
Duration of operation in different speed ranges display of the configurable operating hours counter in the MiniCODER plus

Technical data

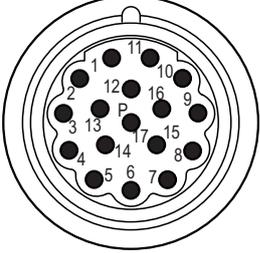
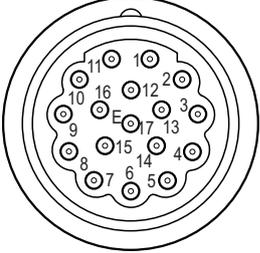
Electrical data	
Supply voltage • Current consumption via USB port	5 V DC ≤ 500 mA
Connections	Micro-USB (type B) Signal output: M23 female connector, 17-pin; Signal input: M23 male connector, 17-pin
Data transmission	WLAN Report files: WLAN or USB
WLAN module approvals	FCC ID: YOPGS1011MEE IC ID: 9154A-GS1011MEE
Mechanical data	
Housing material	Anodised aluminium, black
Weight	Approx. 0.5 kg
Ambient data	
Operating temperature range	0 °C ... +70 °C
Storage temperature range	-20 °C ... 85 °C
Protection class	IP 20
Maximum relative humidity of air	80%
Condensation	Not permitted

Dimensional drawings

Dimensional drawing GEL 212



Pin layout

M23 connection	Pin	Signal	Function
 <p><i>Input (female contacts) Connection of the sensor</i></p>  <p><i>Output (male contacts)</i></p>	1	SIN+	Signal track 1
	2	SIN-	Inverse signal track 1
	3	REF+	Reference track (zero signal)
	7	0 V	Earth encoder supply (GND)
	10	U _B	Encoder supply +5 V
	11	COS+	Signal track 2
	12	COS-	Inverse signal track 2
	13	REF-	Inverse signal reference track
	4 - 6 8 - 9 14 - 17		No evaluation
	<p>The pin layout corresponds to the MiniCODER standard. Connections with the same number (1–9, 11–17) are connected through (exception: encoder supply, pin 10).</p>		



Lenord, Bauer & Co. GmbH
Dohlenstraße 32
46145 Oberhausen, GERMANY
Phone: +49 208 9963-0
Fax: +49 208 676292
Internet: www.lenord.com
E-Mail: info@lenord.de

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