ZL V2

Dynamometer

Technical manual

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Declaration of conformity

Declaration of conformity

Hersteller: **EHP-Wägetechnik GmbH**

Anschrift: **Dieselstrasse 8**

D-77815 Bühl (Baden)

hereby declares that the product: ZL V2 Dynamometer

with all options complies with the following harmonized standards:

EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11 in accordance with Directive 2014/30/EU (electromagnetic compatibility)

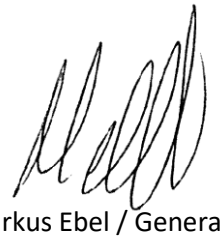
EN 61010-031 Part 1/ Safety requirements for electrical equipment for measurement, control and laboratory use

EN 62368-1 Communication technology equipment - Part 1: Safety requirements

EN 60950-1:2006 in accordance with Directive 2014/35/EU (Low Voltage Directive)

The radio equipment complies with Directive 2014/53/EU

The product is marked with the CE mark.



Bühl, Mai 2025 Markus Ebel / General Manager

This declaration has been prepared in accordance with DIN EN ISO/IEC 17050-1.

Notes to the manual

This technical manual contains the information you need to operate the **ZL V2 dynamometer**.

► Always keep this manual in a place where employees, service personnel, etc. can consult it.

Design features of this manual

Various elements of this manual are provided with fixed design features. This allows you to easily distinguish the following elements:

Normal text

● Enumerations

► Steps for action

Table titles and ***illustrations*** are printed in bold.

ⓘ Tips contain additional information.

Design features of illustrations

If reference is made to elements of a figure in a legend or in the running text, these are given a number (1). The numbers in the running text always refer to the illustration shown.

Figure 1 -Explanation of design features

Technical details

Table 1 - Technical data

Capacity	0-500 tons (depending on model)
Total error	± 0.1 % FS
Overload capacity	300 FS
Compensated operating temperature range	-10 °C to +40 °C
Operating temperature range	-30 °C to +70 °C
Power supply	8.4 V DC
Protection class	IP 66
Load cell material	Aluminum
Application areas	Elongation tests, tensile tests, force measurements, e.g. in mining, transportation, logistics, shipyards, construction, port logistics
Frequency ranges	LORA radio 430,625MHz - 445,625 MHz

Safety instructions

TO NOTE

- **The appliance may only be opened by a specialist!**
- **Protect the device from heat and moisture!**

⚠ IMPORTANT SAFETY INSTRUCTIONS ⚠

► Please follow these safety warnings carefully to avoid damage and danger to persons and property.

► This product is designed for use in road, air transportation, construction, agriculture, forestry, mining, waste disposal, etc. It is mainly used for weighing and load control of trucks and transport vehicles.

Repairs and maintenance of the device are not described in this manual, as all technical maintenance and repair work must be carried out by authorized service centers. Please use a soft, dry cloth to clean your appliance. Never use abrasive or solvent-based chemicals that could damage the surface.

► Connecting the appliance:

- This appliance may only be connected and put into operation by authorized specialist companies.
- The binding connection conditions must be observed.
- Changes to the existing installation may only be carried out by authorized specialist companies.

Improper work on the appliance system can lead to life-threatening accidents.

► If you wish to dispose of this product, do not mix it with normal household waste. There is a separate collection system for used electronic products, which ensures proper treatment, recovery and recycling in accordance with existing legislation.

Scope of delivery

- **ZL V2 Dynamomenter**
- **Weighing indicator**

Figure 2- ZL V2 dynamometer with weighing indicator

The following accessories are included in the scope of delivery:

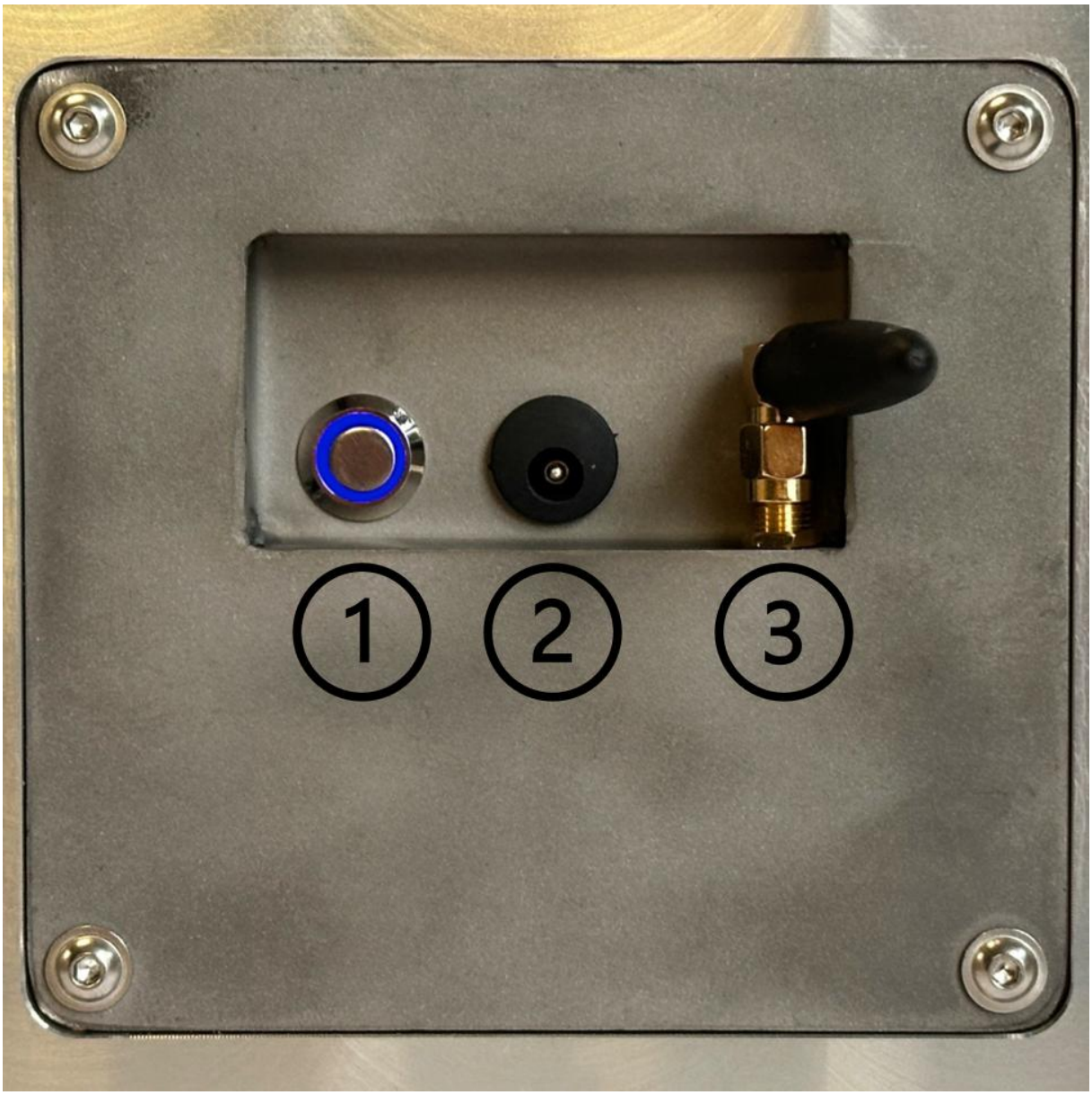
- Antenna
- 2x charging cable
- Integrated rechargeable battery
- Case

Product overview

Dynamometer

The ZL -V2 dynamometer is a load cell designed for force measurements, which works in the tensile direction. It is made of high-strength aluminum with a special alloy that is used in shipyards, shipyards, cranes and heavy industry. The housing surface has a hard anodized coating to ensure greater resistance to harsh environmental conditions. The ZL V2 dynamometer is available in various capacities from 1 ton to 500 tons.

The dynamometer is controlled and monitored via the supplied RM-ZL-V2 radio remote control. Thanks to its robust design, it enables high-precision measurements with an accuracy of 0.1 %. The integrated rechargeable battery enables uninterrupted operation for up to 80 hours. Depending on your requirements, the radio remote control can measure in all units commonly used worldwide, such as kilograms (kg), tons (t), pounds (lb), newtons (N) and kilonewtons (kN) (unit must be communicated before purchase, a change of unit requires a new adjustment and calibration).



1. ON/OFF BUTTON : Used to switch the ZL V2 on and off.

2. CHARGING SOCKET :

If the battery of the ZL V2 is discharged, it must be charged with the charging adapter.

3. ANTENNA CONNECTOR:

Required for the communication of the ZL V2 with the RM-ZL-V2 radio remote control.

The ZL V2 dynamometer has a charging socket and is charged with an 8.4V DC charger. There is an on/off button. When the blue LED on the button lights up, the ZL V2 dynamometer is in operation.

Weighing indicator

The RM-ZL-V2 wireless remote control uses high-precision load cells in combination with a modern Δ-Σ (Delta-Sigma) A/D converter to ensure reliable and precise weight recording.

It has been specially developed for use with crane scales and dynamometers. The integrated LoRa interface enables a range of up to 100 meters with a clear line of sight.

Up to 16 different ZL-V2s can be connected simultaneously. Individual and total weights are shown clearly and graphically on the display.

Thanks to the integrated peak hold function, the system is also suitable for tensile and breakage tests.

With multiple connections, individual scales can be independently tared and zeroed. In addition, the RS232 output enables connection to a computer or printer for data transfer and documentation.

Commissioning

NOTE

● When transporting the ZL V2 dynamometer, ensure that the device is not pulled or dragged, but only lifted and carried.

● The ZL V2 dynamometer must be properly mounted at the intended place of use and made ready for operation using eyelets, bolts or similar.

● Once the above requirements have been met, call up the zeroing mode via the platform display unit and carry out the zeroing procedure.

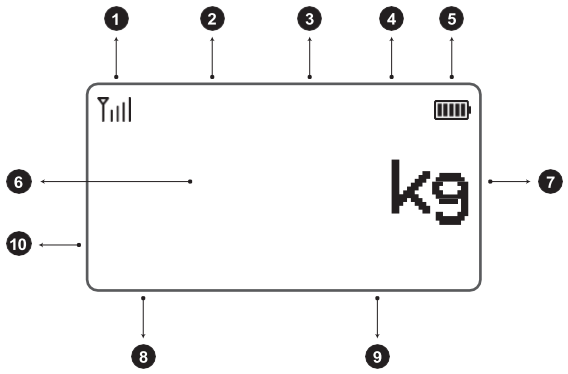
● The weight hanging on the dynamometer must be in a stable position. Precise weighing is not possible with oscillating movements.

Device function

Explanation of key functions

M+	Each press adds up and saves the weight displayed on the screen. The saved value can be deleted using the Clear button.
→0←	Resets the dynamometer to 0.
Print	Sends the weighing information to the printer each time it is pressed.
OK	Is used to call up menus and navigate through menus.
Peak	Enters the peak menu. Holds the current peak value of the weighing. The desired scale can be selected using the up or down arrow keys.
Clear	Deletes the entire weighing record value or deletes the tare in the tare menu.
	Switches the screen backlight on or off.
Tare	Enters the tare menu. Is used to display the net weight. The desired scale can be selected using the up or down arrow keys.
Esc	Is used to exit the menus.
	Switches the device on or off (press and hold for 1 second).

Display



1. this symbol shows the wireless signal strength. If there are several transmitters, it shows the signal strength of the nearest transmitter. If no transmitter is transmitting a signal, the no signal symbol appears.

2. the display of the STB symbol indicates that the weight value is stable.

3. the display of the Tare symbol indicates that the weight of the weight value is the net weight.

4. the display of the M+ symbol indicates that the weight value has been saved.

5 This symbol indicates the battery status.

6 This value shows the total sum of the weight values.

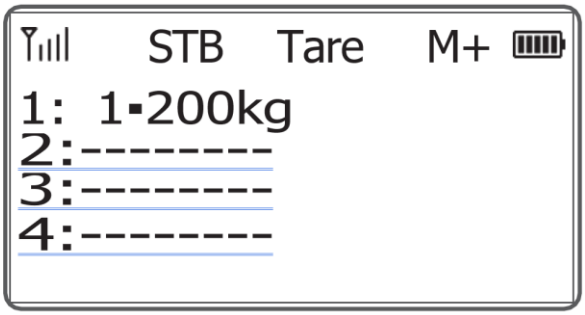
7. this symbol indicates the unit of the weight value

8. displays the time.

9. displays the date.

10. the M+ key adds up the weight value displayed on the screen and stores it in the memory.

Display formats and handling in compound scale operation



To switch from the main display form to the individual display, press the ▲ button. The individual display shows the transmitter number and the corresponding load value. If the transmitters are not working or no signal is being received, a line is displayed.

Zero position indicator (Nullstellungsanzeige)

To call up the zero setting menu, press the ►0◄- button.

To zero the weight, select group zeroing or individual zeroing. If group zeroing is selected, zeroing is performed for all scales. If individual zeroing is selected, the desired scale can be zeroed. To exit the menu and return to the main display, press the [ESC] key.

In the group zero setting, the total sum of the weighing value data of all scales is displayed. If the ►0◄ key is pressed in the menu, all scales are zeroed. To exit the menu and return to the main display, press the [ESC] key.

In the individual zeroing menu, the desired scale is selected using the up or down arrow keys and the weight value of the selected scale is displayed on the screen. If the ►0◄ key is pressed in the menu, the selected scale is zeroed. To exit the menu and return to the main display, press the [ESC] key.

Peak display

To call up the peak menu, press the [Peak] button.

The peak weight menu saves the peak value of the current weight value. The scale can be selected using the up or down arrow keys. The [Clear] button resets the value displayed on the screen to the current weight value. To exit the menu and return to the main display, press the [ESC] button. The stored peak value is retained even after exiting this menu.

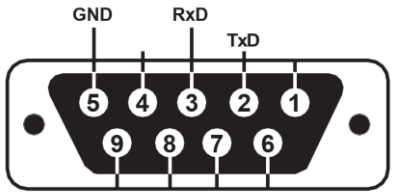
Tara-display

To call up the tare menu, press the [Tare] button.

The tare menu is used to display the net weight. The scale can be selected using the up or down arrow buttons. When the [Tare] button is pressed, the weight of the selected scale is set as the tare and the screen is set to zero. If the [Clear] button is pressed in the menu, the tare recording is canceled. After the tare setting, the tare symbol is displayed on the main display screen. If the tare recording is to be canceled in the main display screen, this menu must be called up, the desired scale selected and then the [Clear] button pressed. To exit the menu and return to the main display, press the [ESC] button.

RS232 Output connection and printer format

A D-Sub 9-pin female RS232 serial port connection is used on the ZL V2. The pin assignment is as follows:



The printer format is selected in the parameter menu according to the product used. These formats are different for the dynamometer and the axle load scale.

Menu

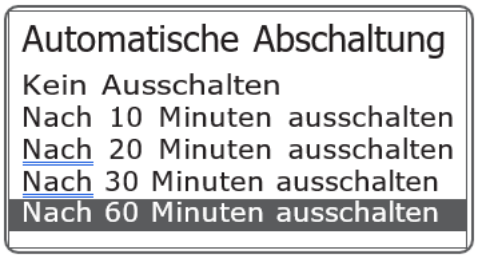
To access the menu, press the [OK] button in weighing mode and the password field is called up. The password value can be 0001 or 0002. The [OK] button is used to navigate between the menus.

- Press [0001] to call up the menu for the general parameters.
- Press [0002] to open the menu for the weighing parameters.

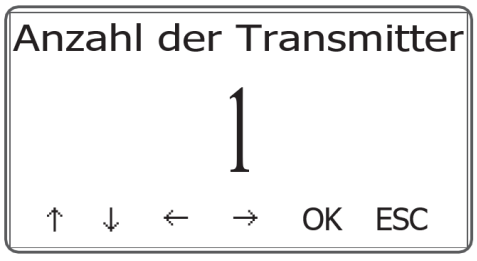
Parameter settings

- Language: The device language can be changed
- Switch-off time: The switch-off time of the hand-held terminal is defined.

After the set time has elapsed, the device is switched off. If the "No switch-off" option is selected, the device does not switch off automatically and must be switched off manually using the power button.



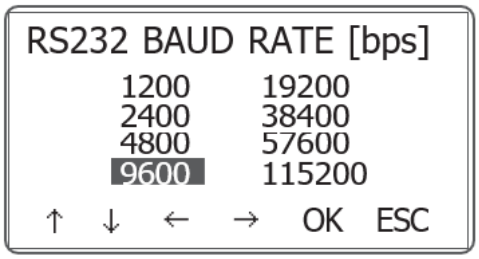
- Number of transmitters: The number of transmitters used is entered. A maximum of 16 transmitters can be entered.



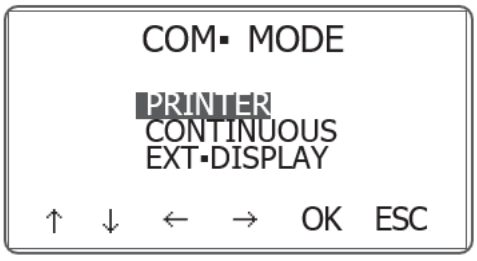
Unit: This is the unit of the weight displayed on the screen. It can be changed to kg, t, lb, kN.
Note: Changing the units requires readjustment and calibration!

- Send delay: Specifies the speed at which the display of the RM-ZL-V2 is refreshed.
- Print option: The print format for the printer is selected depending on the product used. Dynamometer or axle load scale

- RS232 baud rate: The communication speed for RS232 is set. This setting determines the data transfer rate.

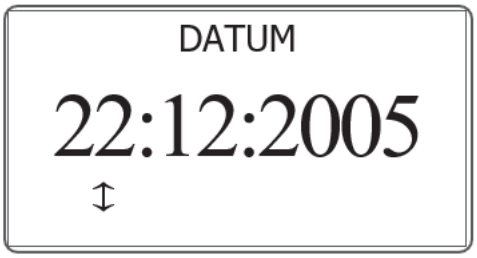


- Communication mode (Com Mode): The communication mode is set.



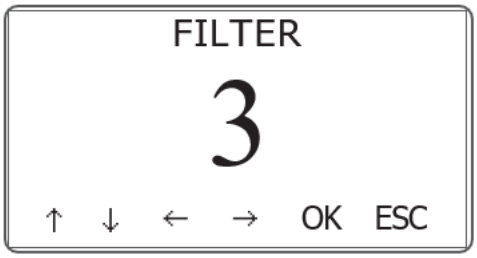
- Clock: The time can be set using the arrow buttons.

- ● Date: The date can be set using the arrow buttons.

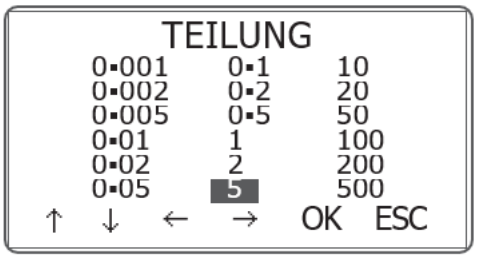


Weighing parameter setting

- Filter: The filter value defines the time required for the data to be stabilized. If the filter value is 0, stabilization is the fastest. If the filter value is 5, stabilization takes the longest.

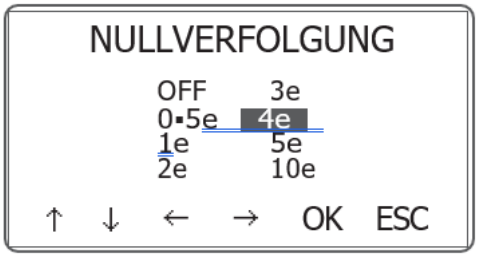


- Division: This is the change in the displayed weight value.

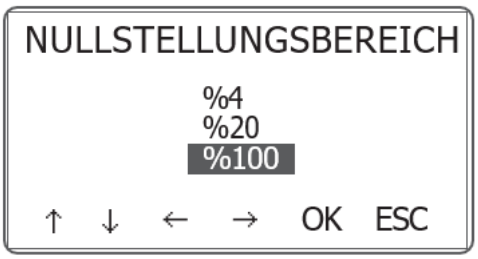


- Zero setting when switching on: If the zero setting is set to "ON" when switching on, the device is automatically reset to the zero value the first time it is switched on, depending on the zero tracking value.

- Zero tracking: If zero tracking is set to "ON" when switching on, the maximum value for zero tracking is set.



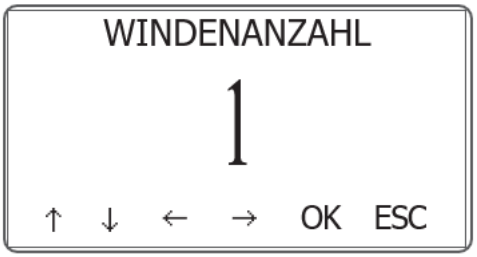
- Zeroing range: The zeroing range defines the maximum limit for the zero setting when a zero setting is performed during the weighing process.



Channel setting: Sets the channel assignment for the integrated LoRa interface between the wireless remote control and the dynamometer.

- Number setting: Sets the scale number of the dynamometer. The assignment is made in the order from 1 to 16. If several ZL-V2s are used, the one to which the number is assigned remains switched on, while the others are switched off.

- Number of winches: This is the menu for selecting the equipment/rope for the crane system. A selection from 0 to 20 can be made.



Number of pulleys: The transmission ratio of the scale can be set in this menu if it is used in combination with a cable pull. Setting examples according to the following table:

Last	Ausrüstung/Seil	Lastzelle	Bildschirm	Auswahl
10000 kg	1/1	10000 kg	10000 kg	0
10000 kg	1/2	5000 kg	10000 kg	1
10000 kg	2/4	2500 kg	10000 kg	2
21000 kg	3/6	3500 kg	21000 kg	3
20000 kg	4/8	2500 kg	20000 kg	4
30000 kg	5/10	3000 kg	30000 kg	5

Figure 3- Sample table number of winches

Frequency table

You can select different radio channels on the tension measuring tab, each of which operates with its own frequency. Ideally, select a channel whose frequency is not already being used by other devices in your production environment to avoid interference or overlapping.

The following table provides an overview of the available channels and their associated frequencies (in MHz).

Channel	Radio frequency
1	430,625
2	431,625
3	432,625
4	433,625
5	434,625
6	435,625
7	436,625
8	437,625
9	438,625
10	439,625
11	440,625
12	441,625
13	442,625
14	443,625
15	444,625
16	445,625

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