



LARCH
Luftfederwaagen

OPERATING MANUAL

Air suspension scale

LFW-ESP-M5

Model: M5 display



Document	BA-31102026-LFW-ESP-M5-EN
Device	LFW-ESP-M5
Version	V311026
Software	from version 3.4. **
Issue	10/2026



Contents

1	Safety instructions.....	3
2	Product description.....	4
3	Scope of delivery.....	6
4	Technical data.....	7
5	Commissioning.....	8
5.1	Unpacking and checking.....	8
5.2	Charging the battery.....	8
5.3	Switching on.....	8
5.4	Switching off.....	8
6	Operation.....	9
6.1	Screen overview.....	9
6.2	Navigation.....	12
6.3	Menu.....	13
6.4	Connecting to the measuring unit.....	14
6.5	Weight display.....	15
6.6	Info screen.....	17
6.7	Terminal: printer, display and sound.....	18
7	Calibration.....	20
7.1	When is calibration necessary?.....	20
7.2	Requirements for calibration.....	20
7.3	Calibration procedure.....	21
7.4	Checking the calibration.....	23
8	Maintenance and care.....	24
8.1	Cleaning.....	24
8.2	Battery care.....	24
8.3	Data backup.....	25
8.4	Storage.....	26
9	Warranty.....	27
9.1	Scope of warranty.....	27
9.2	Exclusions from warranty.....	27
9.3	Wear parts.....	27
9.4	Warranty procedure.....	28
9.5	Limitation of liability.....	28
10	Contact and support.....	29
11	Appendix.....	31

1 Safety instructions

Important safety instructions – please read!

Read this operating manual completely before commissioning and keep it for future reference.

General safety

- Use the device only for its intended purpose.
- Do not expose the device to extreme temperatures (operation: 0 °C to 45 °C).
- Protect the device from moisture and splash water.
- Do not open the housing – there are no user-serviceable parts inside.
- If the device is damaged, contact customer service.

Electrical safety

- Use only the USB-C charging cable supplied.
- Charge the device only with power supplies of max. 5 V DC.
- Avoid short-circuiting the USB connections.

Operational safety

- Operate the display only with clean, dry fingers.
- Do not use pointed or sharp-edged objects to operate the device.
- Do not expose the device to strong shocks or vibrations.

Caution

The weight display does not replace verified scales for commercial use.
The system is not approved for legal-for-trade (verified) weighing!

2 Product description

Overview

The LFW-ESP-M5 scale display system is a modern display unit for truck weighing data. It receives weight data wirelessly from an LFW-ESP measuring unit and shows it clearly on a 3.2" touchscreen.

Note

This description applies to software version 3.4.** and later.

The M5 display currently shows its texts in German. In this manual, the German screen texts are given as they appear on the display, followed by their English meaning in brackets.

Main functions

Function	Description
Wireless data transmission	Reception of scale data via Wi-Fi
Touchscreen operation	Intuitive control via the capacitive 3.2" colour display
Multi-axle display	Support for up to 5 axles (truck) + 4 axles (trailer)
Calibration function	Simple calibration directly on the device
Battery operation	Integrated battery for mobile use
RSSI display	Display of the signal strength

Printer connection via Bluetooth (BLE)

Optionally, a printer can be connected to the device via Bluetooth Low Energy (BLE). The printer is added in the menu „**Terminal**“ (*terminal*) (section 6.7).

Field of application

The device is designed for:

- Monitoring truck axle loads
- Mobile weight recording
- Load control
- Axle load distribution

3 Scope of delivery

Please check the scope of delivery immediately upon receipt:

Qty	Part
1	LFW-ESP-M5 scale display
1	Magnetic dashboard holder
1	USB-C charging cable
1	Operating manual

Note

If anything is missing or damaged, please contact Larch Luftfederwaagen immediately (section 10).

4 Technical data

Hardware

Specification	Value
Processor	ESP32-S3 dual-core, 240 MHz
Display	3.2" IPS LCD, 320 × 240 pixels
Touchscreen	capacitive, multi-touch
Battery	1500 mAh lithium polymer
Charging time	approx. 1 – 2 hours
Operating time	approx. 6 – 8 hours
Wi-Fi	802.11 b/g/n, 2.4 GHz
Bluetooth	BLE (optional printer connection)
Display language	German (English in preparation)
Dimensions	approx. 58 × 59 × 37 mm
Weight	approx. 120 g

Ambient conditions

Parameter	Value
Operating temperature	0 °C to +45 °C
Storage temperature	–10 °C to +60 °C
Humidity	10 % to 85 %
Protection class	IP20

Received data

Vehicle type	Axles
Truck (tractor unit)	1 – 5 axles
Trailer	1 – 4 axles

5 Commissioning

5.1 Unpacking and checking

1. Carefully remove the device from the packaging.
2. Check the device for transport damage.
3. Remove all protective films from the display.

5.2 Charging the battery

First commissioning

1. Connect the USB-C cable to the device.
2. Plug the other end into a USB power supply (5 V, min. 1 A).
3. Charge the device fully before first use (approx. 2 hours).
4. The charge indicator at the top right shows the charge level.

Note

The device can also be operated while charging.

5.3 Switching on

1. Briefly press the power button (on the left side of the device).
2. The logo appears on the display.
3. After a few seconds the main screen appears.
4. The device is now ready for operation.

5.4 Switching off

1. Briefly press the power button (on the left side of the device).
2. The device switches off.

6 Operation

6.1 Screen overview

Main screen I – truck (always shown after start-up)



Fig. 1 – Main screen I: truck display

Main screen II – truck and trailer (changes to this display automatically when a trailer is received)



Fig. 2 – Main screen II: truck and trailer display

Indications in the status bar (top)

Indication	Meaning
Network	Name of the connected Wi-Fi network, e.g. LFW_0102
Signal strength	Signal strength to the truck in % (on main screen II also to the trailer)
ESP	Serial number of the measuring unit (ESP Serial Nr.)
Bat.	Battery charge level

Controls

Element	Function
Key (O) – long press	Show menu (section 6.3)
Right arrow key – long press	Show “truck and trailer” display
Left arrow key – long press	Show “truck” display
Trailer weight field – long press	Change trailer (main screen II only)
Info	Further information on this page (main screen II only)

Warning weights exceeded

All weights are shown in red when a configurable value is exceeded.

6.2 Navigation

Touchscreen gestures:

Gesture	Function
Tap	Select an element
Swipe	Scroll on the info pages
Long press	Change display (on the touch bar below the display or in the trailer weight field)

6.3 Menu

The menu is opened by a long press on (O).



Fig. 3 – Menu

Menu item	Function
Verbinden <i>(connect)</i>	Establish network connection to the measuring unit (section 6.4)
Kalibrierung <i>(calibration)</i>	Calibration empty and loaded (section 7)
Parameter <i>(parameters)</i>	Assign sensors, enter installed axles, warning weights
INFO <i>(info)</i>	Show stored values and current sensor values (section 6.6)
Terminal <i>(terminal)</i>	Printer, display and sound settings (section 6.7)
Zeit/Datum <i>(time/date)</i>	Set time and date
Abbruch <i>(cancel)</i>	Back to the last display

6.4 Connecting to the measuring unit

To establish the network connection to the measuring unit:

1. Open the menu (long press key **(O)**).
2. Select „**Verbinden**“ (*connect*).
3. Select the Wi-Fi network of your measuring unit: **LFW_******
4. Enter the Wi-Fi password (if one has been set).
5. When the connection is successful, the network name appears at the top left.

Note

The network name is made up of the company ID (FID) and the trailer ID (AID) of the measuring unit, e.g. LFW_0102 for FID 01 and AID 02.

The Wi-Fi password is the network key set on the measuring unit (0 – 999). The M5 adds leading zeros automatically.

6.5 Weight display

Main display truck

The main display truck continuously shows:

- **Axle loads:** weight of each axle or pair of axles
- **Total weight:** sum of all axle loads (truck)
- **Truck weight:** weight of the tractor unit

Main display truck / trailer

The main display truck / trailer continuously shows:

- **Axle loads:** weight of each axle or pair of axles
- **Total weight:** sum of all axle loads (truck + trailer)
- **Truck weight:** weight of the tractor unit
- **Trailer weight:** weight of the trailer

Updating

- Reception rate: approx. 1 – 2 Hz (depending on the transmitter)
- If there is no signal, the last value remains displayed for approx. 20 seconds before it is cleared.

Signal strength (RSSI)

The signal strength is shown in %:

Indication	Signal level
100 %	-40 dBm
80 %	-60 dBm
60 %	-80 dBm
40 %	-90 dBm
20 %	-100 dBm or worse

Tip

If the signal is weak, reposition the measuring unit or remove obstacles.

6.6 Info screen

The info screen shows the stored weight and sensor data, the warning weights and the current sensor values.



Fig. 4 – Info screen

Area	Content
Weights	Stored weights for each axle
Stored sensor values	Stored sensor values for the respective weights
Current sensor values	Current sensor values for all installed sensors
Warning weights	Axle loads Total weight Gross combination weight

6.7 Terminal: printer, display and sound

In the menu item „**Terminal**“ (*terminal*) the printer is added and the display and sound are set. << takes you back.



Fig. 5 – Terminal menu

Element	Function
Drucker – Firma (<i>printer – company</i>)	Enter company details for the printout
Schalter „nicht geeicht“ (<i>switch “not verified”</i>)	Switch the note “not verified” on the printout on or off
Schalter „Long Print“ (<i>switch “long print”</i>)	Switch detailed printout on or off
Drucker Suche (<i>printer search</i>)	Search for a Bluetooth printer (BLE) nearby
Statuszeile unten (<i>status bar at the bottom</i>)	Shows the connected printer or “kein Drucker” (no printer)
Display – Helligk. (<i>brightness</i>)	Display brightness in %

Element	Function
Sound – Frequ. / Dauer / Lautst. (<i>pitch / duration / volume</i>)	Pitch, duration and volume of the signal tone in %

Adding a printer

1. Open the menu (long press key **(O)**) and select **„Terminal“** (*terminal*).
2. Switch on the printer and bring it close to the device.
3. Tap **„Drucker Suche“** (*printer search*).
4. After a successful connection, the name of the printer is shown at the bottom instead of “kein Drucker” (no printer).

7 Calibration

7.1 When is calibration necessary?

A calibration should be carried out:

- at first commissioning
- after replacing a sensor
- after changes to the suspension
- if the weight display deviates
- at least once a year to check accuracy

Note

The calibration can be carried out by the user, provided the steps in this manual are followed exactly.

7.2 Requirements for calibration

Equipment required

- Reference scale (wheel load scale or weighbridge)
- Vehicle with known axle loads (empty and loaded)
- Level, firm standing surface
- Rest period before calibration so that the suspension can settle

Ambient conditions

- Temperature: 15 °C to 25 °C
- Compressed air system completely filled
- Stable ground
- All axles lowered, air suspension at ride height
- Vehicle free of tension, parking brake released



7.3 Calibration procedure

Step 1: Open the calibration menu

1. Open the menu (long press key **(O)**).
2. Select „**Kalibrierung**“ (*calibration*).
3. Answer the query „**LKW / Anhänger**“ (*truck / trailer*) (only if a trailer is received).
4. Query „**Leer / Beladen**“ (*empty / loaded*): select the current load condition.

Step 2: Enter the weight



Fig. 6 – Calibration screen

Element	Meaning
„Abgleich - LKW“ (calibration - truck)	Shows whether the calibration is done for the truck or the trailer.
Leer / Beladen (empty / loaded)	Shows whether the calibration is done empty or loaded.
„Achse - 1“ (axle - 1)	Shows which axle is currently being calibrated.
Input field	Entry of the axle load. Below it is the total sensor value assigned to this axle.
< / >	One axle back / next axle
Info	Further information on this page
Number keys, <<	Entry of the weight; << (backspace) deletes the last digit.
Speichern (save)	Save the value in the device
Abbruch (cancel)	Back to the main page

1. Determine the actual weight of each axle.
2. Enter this value using the numeric keypad.
3. Correction: delete the last digit with the << key (backspace).
4. Tap „**SPEICHERN**“ (save). The value is saved in the device.



Caution

Each axle must be saved individually. Each value must be saved before moving on to the next axle.

Step 3: Further calibrations

Repeat step 2 for:

- all axles (1 – 5 for truck, 1 – 4 for trailer)
- both load conditions („LEER“ (*empty*) and „BELADEN“ (*loaded*))

Recommended sequence

1. Truck axle 1 – empty
2. Truck axle 2 – empty
3. ... (continue for all installed axles)
4. Truck axle 1 – loaded
5. Truck axle 2 – loaded
6. ... (continue for all installed axles)

Step 4: Completing the calibration

1. Tap „Abbruch“ (*cancel*).
2. The system calculates the calibration curves automatically.
3. The device returns to the main screen automatically.

7.4 Checking the calibration

1. Load the vehicle with a known weight.
2. Compare the display with the reference weight.
3. The maximum deviation should be < 2 %.
4. If the deviations are greater, repeat the calibration.

8 Maintenance and care

8.1 Cleaning

Cleaning the display

1. Switch off the device.
2. Use a soft, lint-free microfibre cloth.
3. Slightly moisten the cloth with distilled water or display cleaner.
4. Wipe the display carefully.
5. Dry it with a dry cloth.

Do not use

aggressive cleaning agents (alcohol, acetone, solvents)
abrasives or scouring pads
high-pressure or steam cleaners
paper towels (they can scratch the display)

Cleaning the housing

- Use a slightly damp cloth.
- Prevent liquid from entering openings.
- Dry the device completely before switching it on.

8.2 Battery care

For maximum battery life

- Charge the battery at 10 – 20 % remaining capacity.
- Avoid deep discharge (< 5 %).
- Store the device at approx. 50 % battery charge.
- Charge the device at least every 3 months, even if it is not used.
- Ambient temperature during charging: 10 °C to 35 °C.

Battery life

- typically: 500 – 1000 charging cycles
- After approx. 2 years the capacity may decrease.
- If the operating time is greatly reduced, contact service.

8.3 Data backup

The calibration data is stored automatically in the internal memory of the weighing system and is retained even after a restart or update.

8.4 Storage

If not used for a longer period (> 1 month):

1. Charge the battery to approx. 50 %.
2. Switch off the device.
3. Store it in a dry, cool place (15 °C to 25 °C).
4. Avoid direct sunlight.
5. Recharge the battery every 3 months.

9 Warranty

9.1 Scope of warranty

Manufacturer's warranty	
Duration	12 months from date of purchase
Scope	Repair or replacement of defective parts Malfunctions with intended use Material and manufacturing defects

9.2 Exclusions from warranty

The warranty becomes void in the event of:

- improper use or misuse
- mechanical damage (fall, impact, pressure)
- ingress of liquids
- unauthorised repair attempts or opening of the housing
- use of accessories that have not been approved
- unauthorised software modifications
- normal wear (e.g. battery ageing)

9.3 Wear parts

The following parts are subject to natural wear:

- battery (normal decrease in capacity after approx. 500 charging cycles)
- touchscreen surface with intensive use
- USB connection with frequent plugging

9.4 Warranty procedure

1. Contact support (see section 10).
2. Have the following information ready: proof of purchase with date of purchase, serial number of the device (on the back), description of the fault, software version (in the info menu).
3. Support checks the case and issues an RMA number if necessary.
4. Send in the device with the RMA number (only after consultation!).
5. After inspection, the device is repaired or replaced.

Sending in

- Use secure packaging (original or equivalent).
- Insure valuable shipments.
- Note the tracking number.
- Enclose a copy of the proof of purchase.

9.5 Limitation of liability

The manufacturer is not liable for:

- indirect or consequential damage
- loss of data
- production downtime
- loss of profit

Liability is limited to the purchase price of the device, unless otherwise required by mandatory law.

10 Contact and support

Larch Lukas



Address Entgasse 552, A-6232 Münster, Austria
 Phone +43 664 5241817
 E-mail l.larch@luftfederwaage.at
 Web www.luftfederwaage.at
 Hours Mon – Fri 9:00 – 16:00 (CET)

Information required for support requests

Information	Where to find it
Serial number	on the back of the device or in the info menu
Date of purchase	on the proof of purchase
Firmware version	Menu → Info
Description of the fault	What is the problem? Since when has it occurred? Is it reproducible? Is an error message displayed?

Manufacturer information

Manufacturer	Larch Luftfederwaagen Entgasse 552, A-6232 Münster, Austria
Company register no.	625531z
VAT ID no.	ATU80609003
Managing director	Larch Lukas

Further resources

- Technical documentation
- Quick guide (PDF download)

Feedback and suggestions for improvement

Your opinion is important to us! Please send feedback, suggestions for improvement as well as errors or unclear points in this operating manual to:
I.larch@luftfederwaage.at

11 Appendix

11.1 Declaration of conformity

This device complies with the following directives and standards:

- CE marking
- RoHS Directive (Restriction of Hazardous Substances)
- WEEE Directive (Waste Electrical and Electronic Equipment)
- Radio Equipment Directive 2014/53/EU

The complete declaration of conformity can be found at www.luftfederwaage.at.

11.2 Disposal

Electrical appliances do not belong in household waste!

The crossed-out wheeled bin symbol indicates that this device must be disposed of separately from household waste at the end of its service life.

Disposal options

- Return to the dealer (when purchasing a new device)
- Municipal collection points for electronic waste
- Manufacturer take-back programme (on request)

Battery disposal

The integrated lithium polymer battery must be disposed of properly. Do not remove the battery yourself. Hand in the complete device at a collection point.

11.3 Copyright and trademarks

© 2026 Larch Luftfederwaagen. All rights reserved.

This operating manual is protected by copyright. Reproduction, even in part, only with the written permission of the publisher.

Trademarks

- M5Stack® is a registered trademark of M5Stack Technology Co., Ltd.
- ESP32® is a registered trademark of Espressif Systems.
- All other trademarks mentioned are the property of their respective owners.

11.4 Disclaimer

The information in this operating manual has been compiled with the greatest care. However, the manufacturer accepts no liability for the correctness, completeness and timeliness of the contents.

Subject to technical changes. The manufacturer reserves the right to improve or change the product without prior notice.

In case of doubt, the German version of this operating manual shall prevail.

11.5 Revision history

Version	Date	Changes
V311026	10/2026	English edition for software version 3.4.** and later

