



Operating Manual

Wheel loader- / telescopic handler- and forklift scale WK60 series

Valid from program version: 1.1.60 (N1 measuring principle) / 1.3.62 (SWT measuring principle)

Document no.: WK60-RAD-BA-H-2022.01-EN

English (US) (translation of the original German manual)

1. Using this manual

- Read this manual completely before using the scale.
- Read the instructions for the accessory as well, if available.
- The manual is part of the product. Keep it easily accessible.
- Include these instructions when transferring the scale to third parties.

1.1 Hazard symbols in this manual



Danger point or hazardous situation

1.2 Symbols and illustrations used

Symbol	Description
1. 2.	Steps to take
•	Listing
a) or 1)	Lists
Figure no.	Photos and drawings are numbered
	Additional information
	Please read the relevant manual

2. Safety notes



Structural changes to the scale and its components may result in a threat to life due to falling loads.

- Repairs or structural changes to the scale and its components are not permitted.
- Conversions of and repairs to the scale may only be carried out by individuals trained and authorized by the manufacturer.
- Only original spare parts and accessories approved by the manufacturer shall be used.



Inadequate maintenance can endanger persons due to undetected damage to the scale.

- Inspect the scale and all associated components for damage regularly.
- Have damaged components replaced by PFREUNDT Service.

2.1 Intended use (for legal-for-trade scales)

The scale is designed for use on:

- Wheel loaders with a loading bucket *
- Forklift truck with lifting forks or loading buckets as load carrier *
- Telescopic handlers with lifting forks or a loading bucket *

** Approved for Europe, other international approvals available.*



This type of construction can only be used if weighing the bulk goods has been secured so that the loose goods will not tend to stick together.

Changes to the lifting lever, the lifting cylinder, the switching points of the proximity switches / position sensor are not permitted.

Any use other than as designated shall be deemed incorrect.



In Germany, the scale may only be used for business or official purposes if it has been properly assessed and calibrated.

Observe all applicable national regulations.

Calibrate the scale periodically

Scales of this type are subject to mandatory calibration and may only be used in compliance with the national statutory regulations of the relevant country. The company operating the scales is responsible for regular calibration in accordance with national regulations.

National use obligations

Scales of this type may only be used in compliance with national restrictions. They are subject to the accuracy classes. Therefore, scales of this type may only be used in compliance with national regulations.

Requirements in Germany include:

Y(b) Accuracy Class automatic scales may be used for the following categories of materials.

- Bulk goods and mass raw materials, such as:
 - > Gravel, sand, natural stone, foundry slag aggregates
 - > Building material such as ready-mix concrete, mortar, tar coated gravel and similar building materials
 - > Building rubble and building rubble to be recycled
 - > Earth and floor excavation
 - > Ceramic raw materials and industrial minerals
 - > Road salt
 - > Compost
- Household waste for disposal

Other goods with a per ton value not exceeding four times the amount of the services according to the MessEV [Measurement and Calibration Ordinance] or with per ton disposal costs not exceeding four times the amount of the services according to §5 (1) No. 12 of the MessEV, may also be weighed using Accuracy Class III scales or using automatic scales of the corresponding accuracy class (such as (Y(b))).

The fee for the services pursuant to §5 (1), No. 12 of the MessEV will be adjusted every three years to reflect price developments and published in the Federal Gazette by the PTB [National Metrology Institute of the Federal Republic of Germany].

2.2 FCC and IC Certification

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s) and complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation of the device.

Changes or modifications made to this equipment not expressly approved by PFREUNDT GmbH may void the FCC authorization to operate this equipment.

NOTE:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The radiated output power of the device is far below the FCC and ISSED radio frequency exposure limits. Nevertheless, the device should be used in such a manner that the potential for human contact during normal operation is minimized.

The highest reported SAR for body, limb-worn exposure conditions are 0.371 W/kg and 0.213 W/kg respectively.

2.3 Risks of improper use



Improper use of the scale may lead to life-threatening situations. The scale has not been approved for operation in:

- Potentially explosive environments
- Aggressive environments (e.g. in rooms with acid, etching or galvanizing baths)
- Environments prone to stray currents or heat (e.g. due to welding)



Overloading transport vehicles is life-threatening. Overloaded transport vehicles are unsafe in traffic.

- Obtain information about permissible loading of such vehicles and comply strictly with such limits.
- Avoid improper weighing by, for example, ensuring the correct position of the vehicle during weighing.

3. Operating conditions for correct weighing

Tilt setting

Weigh in the most horizontal position possible. If the vehicle is at too much of an incline, a warning appears in the display and weighing is no longer possible.

Weigh only in the permitted temperature range:

- Only use the scale in the permitted temperature range.
- When using external components (printer, etc.), observe the temperatures given in their specific data sheets.

4. The weighing program

4.1 Switching on the scale

1. Hold the On/Off button down for about 2 seconds.
2. The weighing unit activates.
3. After the start-up process, the weighing program opens.

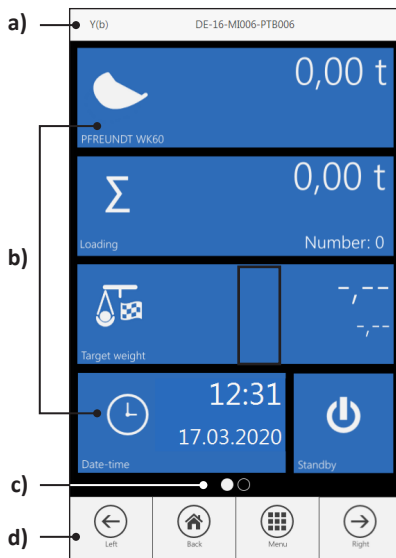


Figure no. 1

4.2 The structure of the weighing program main page

Wheel loader scale

Example



Legend

- a) Metrological information field
- b) Application area
- c) Page display (1 of 2)
- d) Menu bar

Scale application

- = Status and weight display

- The selected attachment

Access additional information, for example:

- Electronic nameplate with the relevant compliance information:
 - > Accuracy class
 - > Approval
- Sensor data including:
 - > Serial numbers
 - > Software version

Loading

- Total
- Number of completed weighings

Additional functions, for example:

- Finish the loading process
- Create and print a weighing document
- Select and manage master data

Target weight

- Enter / select and manage target weight
- Display of target weight and the remaining weight

4.3 Menu options

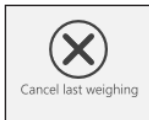


Activate the "Setting-to-zero" function

After pressing the key, you need to move the empty loading bucket through the weighing position. The zeroing takes place automatically.

If the empty weight is within the setting-to-zero range the displayed gross weight is adopted as the new zero point of the scale.

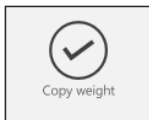
If the empty weight is outside the setting-to-zero range a warning displays.



Cancel last weighing

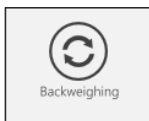
If necessary, you can cancel the last weighing. The weight of the last weighing is not added to the total.

After emptying the loading bucket, cancellation is no longer possible.



Confirm weight

If "automatic cancellation" is active, you need to confirm every weight for the total. Otherwise any weighing cancels automatically when the loading bucket is emptied.



Backweighing

If you only want to weigh a partially loading bucket (e.g. to avoid overloading the vehicle), you must enable backweighing. After emptying the loading bucket, backweighing is no longer possible.

4.4 Symbols in the weight display



The weight is stable and can be used.
(e.g. add total, print weighing slip)



Unload the loading bucket *



Raise the loading bucket completely *

* For forklifts, position the mast vertically.



Totals display incl. number of weighings



The scale application requires a zero setting



The lifting arm moves through the proximity switch N1



The load carrier has not yet been adjusted or an error has occurred in the sensor communication

5. Zeroing the scale

5.1 Zeroing the scale (dynamic)

1.  >  Open the menu and activate the "Setting-to-zero" function.
2. The prompt for zeroing the scale appears.
This does not delete the current total.
3. Lower the lifting arm and raise the empty loading bucket completely (for forklifts, position the mast vertically).
4. Move the lifting arm through the weighing position from below.
5. The zeroing takes place automatically.

5.2 Zeroing the scale (static)

You can perform a static zeroing if necessary, depending on the configuration.



Depending on the setting, the static zeroing can be done after the lifting movement or after lowering the lifting arm.

1.  >  Open the menu and select the function "Setting-to-zero".
2. The prompt for zeroing the scale appears.
3. This does not delete the current total.
4. Pull the empty loading bucket in completely.
5. Depending on the configuration, move the lifting arm from below or from above to any position within the weighing area and stop briefly.
6. The zeroing takes place automatically.

5.3 Forced zeroing and warm-up strokes on demand

There are several situations in which compulsory zeroing may be required:

- If the current oil temperature deviates by 10°C from the last measured value.
The oil temperature is measured and stored at each zeroing
- At the latest 30 minutes after the last zeroing.

Depending on the configuration, you will be prompted to zero the scale again.

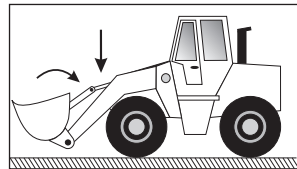
Warm-up strokes

Depending on the configuration, you will also be asked to perform some warm-up strokes with the bucket before zeroing. This is to ensure an optimum operating temperature (oil temperature) in the hydraulics.

If the corresponding warning appears in the display, proceed as follows:

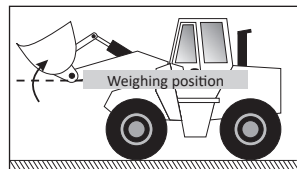
1. Carry out the current weighing
if there is still material in the
bucket.

2. Lower the lifting arm and raise
the empty loading bucket com-
pletely.



3. Move the lifting arm through the
weighing position from below
several times (e.g. 10 times).

10 x

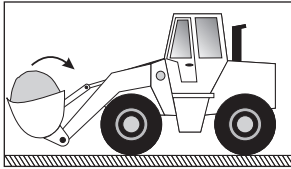


4. Continue with (depending on the
configuration):
 - Zeroing the scale
 - Perform a weighing

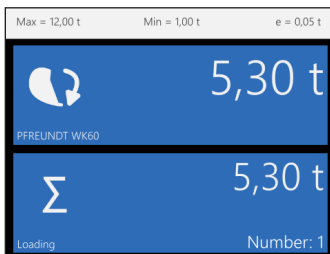
6. Perform weighings

6.1 Perform a weighing (dynamic)

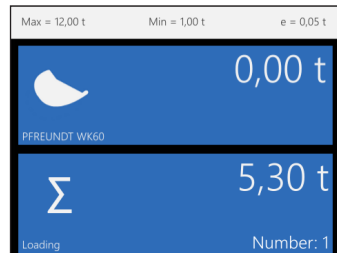
1. Lower the lifting arm and load the bucket.
- 1.1 Raise the loading bucket completely.



2. Move the lifting arm through the weighing position from below.
3. The fixed weight displays and is added to the total.



4.  Empty the loading bucket as soon as you are asked to do so in the display.



Main page of the scale after you empty the loading bucket (example).

5. Continue weighing until the transport vehicle is fully loaded or you have reached the specified target weight.
6. Finish the loading process, e.g. by printing out a weighing slip, see chapter "7. Quit the loading process".

6.2 Perform a weighing (static)

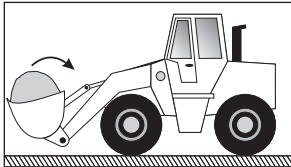
For wheel loader scales, you can carry out static weighings if necessary, depending on the configuration.



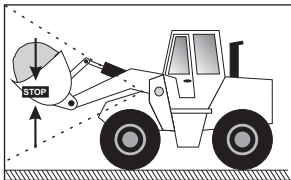
Depending on the setting, the static weighing can take place after the lifting movement or after lowering the lifting arm.

1. Lower the lifting arm and load the bucket.

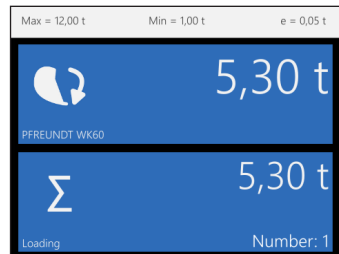
- 1.1 Raise the loading bucket completely.



2. Depending on the configuration, move the lifting arm from below or from above to any position within the weighing area and stop briefly.



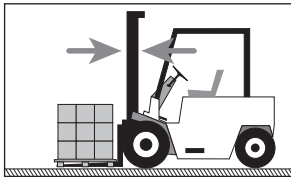
3. The fixed weight displays and is added to the total.



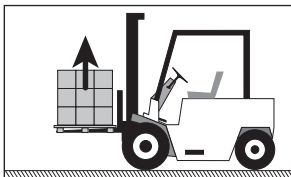
4.  Empty the loading bucket as soon as you are asked to do so in the display.
5. Continue weighing until the transport vehicle is fully loaded or you have reached the specified target weight.
6. Finish the loading process, e.g. by printing out a weighing slip, see chapter "7. Quit the loading process".

6.3 Weighing with forklifts (dynamic)

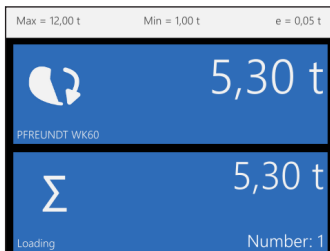
1. Lift the load with the lifting fork.
- 1.1 Then position the mast vertically.



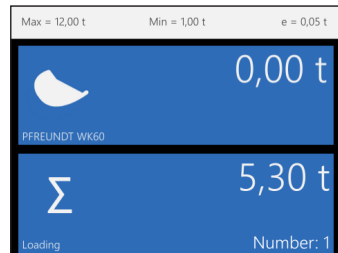
2. Drive with the loaded lifting fork through the weighing position from below.



3. The fixed weight displays and is added to the total.



4.  Empty the lifting fork as soon as you are prompted to do so on the display.

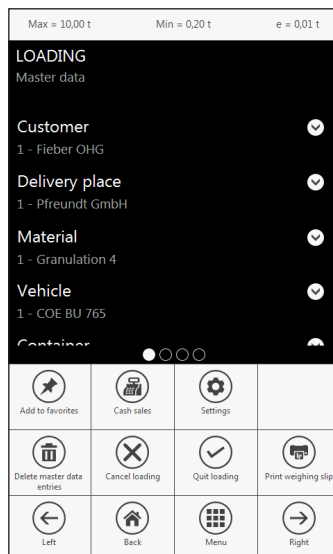


Main screen of the scale after unloading the lifting fork (example).

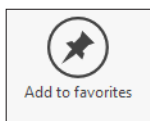
5. Continue weighing until the transport vehicle is fully loaded or you have reached the specified target weight.
6. Finish the loading process, e.g. by printing out a weighing slip, see chapter "7. Quit the loading process".

7. Quit the loading process

1. Tap the "Loading" application or insert a weigh slip into the printer (if available).
2. The page "LOADING - Master data" appears. This offers you additional options to complete the weighing process.

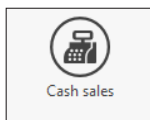


Options in the "Loading" menu, depending on the configuration:



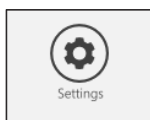
Add to favorites

The current selection of master data can be saved as a favorite. You can save multiple favorites.



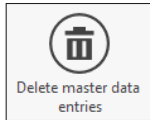
Cash sales

The customer may want to or have to pay in cash. The loading process only ends after you press the button "Obtain amount".



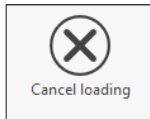
Settings

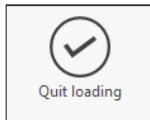
Choose the settings for the master data.



Delete master data entries

Delete the selected master data for the current load. This deletes only the selected master data, not all the master data on the device. You can add the master data back to the selection later.



Cancel loading

Quit loading

Print weighing slip

The loading process ends and a weighing slip is printed.

7.1 Select master data type

On the "LOADING - Master data" page, you can select all the master data required for weighing (customer, material, delivery location, driver, vehicle, forwarding agent, container, etc.).

Open master data list (e.g. customer list)

1. When loading is completed, open the "LOADING - Master data" page.
2. Touch the desired master data type (e.g. customer).
3. The "CUSTOMER - All" page opens with the corresponding master data list (e.g. with the customer list).

Search for and select master data (e.g. customer)

1. Touch the application "Loading" or "Master data".
2. Open the page "CUSTOMER - All".
3. Enter the customer name or the customer number in the input field "Search" and confirm with "Ok".
4. The customer you are looking for displays.



The search and selection are the same for all master data.

8. Data transfer

8.1 Connecting a USB stick

To save data or to transfer data to external computers, you can connect a standard USB stick to the weighing unit. The following data can be transferred: master data, weighing data, customer-specific weighing cards, layouts, etc.

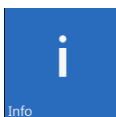
8.2 Data transfer via the PFREUNDT Web Portal

The PFREUNDT Web Portal can also be used to transfer master and weighing data. The connection takes place via WLAN or a mobile network.

9. Description of the functions



Some of the functions presented here are preinstalled as standard in the scale, other functions are available as options.

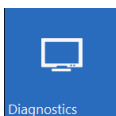


Info (information)

In this application (Info app), you can access and review information about the software (program version) and hardware currently in use.

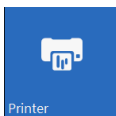


To access sensor data, use the scale application, see chapter 4.2.



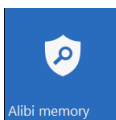
Diagnostics

This application lists and displays general messages, error messages and events relevant to calibration for later error analysis.



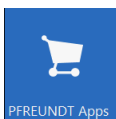
Printer

To use the "Print" function in the individual applications, you need to configure the printer in the weighing unit. To carry out the required functions for this, use the "Printer" application.



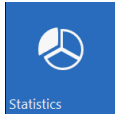
Alibi memory

You can view and print loads and weighings in the alibi memory. The data is stored so as to be tamper-proof. If necessary, business documents must contain an identification for each weighing result (WELMEC 2.5 / Section 6.4).



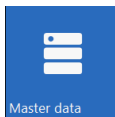
PFREUNDT Apps

Not all functions are installed on delivery. With this application you can install or uninstall additional functions or applications.



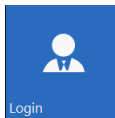
Statistics

The "Statistics" application lets you create evaluations of loading, order and summary document information.



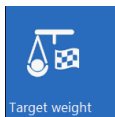
Master data

You can manage and edit all the information required for a weighing in the master data application.



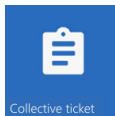
Login

Create and manage new users with this application. You can also change the current user.



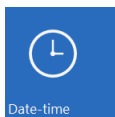
Target weight

To avoid overloading a transport vehicle, you can enter a target weight before each weighing. The target weight can also be automatically copied by a selected vehicle.



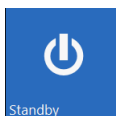
Collective ticket

With this application, you can assign different materials to a delivery note. You can pause a summary document and the materials it contains at any time and restart it for processing.



Date-time

Configure the date and time.



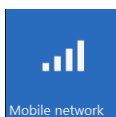
Standby

The Standby app lets you configure and select different standby functions. Among other things, you can have the scale shut down automatically if it is not in use for a specific period of time.



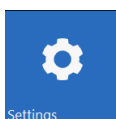
WLAN network

Configure a WLAN network.



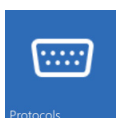
Mobile network

Configure a mobile network.



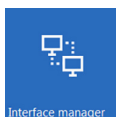
Settings

Configure various settings for the WK60.



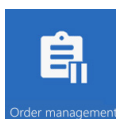
Protocols

Select a protocol for transferring the weighing data to an external computer.



Interfaces manager

This application is used to configure various hardware interfaces such as Bluetooth, GPS, etc.



Order management

Select and process loading orders.



Can only be used in conjunction with the PFREUNDT Web Portal.

9.1 Other functions (without application icon)



Some of the following features are optional and can be installed through the PFREUNDT app.

Cash sale (see also page 16)

Complete loadings, orders and summary documents as cash sales.

External data interface

Store loading information on RFID chips.

Voucher number extension

Extension of the voucher numbers with a prefix. The prefix is set before the voucher numbers and may include max. 5 characters. You can create multiple prefixes and save them in a list for selection. However, the scale only uses 1 prefix at a time to store the loads.

Relay

Connection and use of external relays at the multifunctional connections MIO 1/2 of the weighing unit.

10. Technical data WK60 series

Supply voltage:	9 V to 36 V ==
Printers need 24 V, use a transformer if necessary.	
Rated voltage:	24 V ==
Power consumption including printer:	max. 6 A
Protection class per ISO 20653:2013-02:	IP42 / IP5K2
Interfaces:	Plugs:
1 x RS 232	D-Sub 9-pin (m)
2 x CAN (in acc. with ISO11898-2)	8 mm snap
1 x USB 3.0	USB A female
1 x USB 2.0	USB A female
1 x Ethernet (LAN)	RJ 45
3 x Proximity switches (N1 to N3)	8 mm snap
2 x MIO 1/2 multifunctional input (10 kHz) /output (1 kHz)	per 8 mm snap
1 x Analog-to-digital converter (ADC)/(12 bit)	8 mm snap
1 x Supply voltage (UBin = voltage in)	8 mm snap
1 x voltage protective circuit (UBout = voltage out), switchable	8 mm snap
Position determination:	GPS
WK60	unlocked
WK60-S	optional
Data memory:	
All data inclusive adjustment parameters and Alibi memory in the mounting pan.	
Weight incl. attachment:	roughly 1.8 kg
Environmental conditions:	
Operating temperature:	-10 to +40 °C
Storage temperature:	-20 to +70 °C
Maximum humidity:	95 % at +55 °C
Maximum altitude:	up to 2000 m (typical)

Communication interfaces

WLAN according to IEEE 802.11:		b / g / n (d / e / h / i / w)
Frequencies:		2400 - 2483.5 MHz
Output power:		20 dBm @ b mode 17 dBm @ g / n mode
Bluetooth:		v4.2 / v3.0 + HS / v2.1 + EDR
Frequencies:		2400 - 2483.5 MHz
Output power:		+ 4 dBm @ BR + 1 dBm @ EDR + 3,5 dBm @ LE
LTE (EMEA): *		
Category:		CAT1
LTE band:		B1, B3, B7, B8, B20, B28A
2G band:		B3, B8
Frequencies:		2100 MHz, 1800 MHz, 2600 MHz, 900 MHz, 800 MHz, 700 MHz
Output power: **		see below
* not supported for FCC / ISCED / Australia / New Zealand		
** LTE / GSM / GPRS / EDGE - output power:		
Class 4 (2 W, 33 dBm)		@ GSM 900
Class 1 (1 W, 30 dBm)		@ GSM 1800
Class 3 (0.2 W, 23 dBm)		@ LTE (FDD)
Class E2 (0.5W, 27dBm)		@ EDGE 850 / 900
Class E2 (0.4W, 26dBm)		@ EDGE 1800 / 1900

11. Instructions for care and cleaning



Incorrect cleaning agents will damage the WK60 weighing unit or the touchscreen.

Do not use aggressive or abrasive cleaning agents.

WK60 weighing unit and pPrinter matrix

You can clean the WK60 weighing unit and the PFREUNDT pPrinter Matrix printer with a damp cloth.

Touchscreen

To clean the touch screen, use a lint-free cloth (such as a microfiber cloth or eyeglass lens cleaning cloth). Swipe across the touchscreen with light circular movements without applying pressure.

Mechanical components

Regular vehicle cleaning is sufficient to clean the mechanical components.

12. Disposal



Never throw electrical appliances into the trash. Appliances must be collected separately and disposed of in an environmentally sound manner. Observe the applicable national laws and regulations for waste disposal.

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Easy. Better. Weighing.



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