

KERN[®]

KERN & Sohn GmbH
Ziegelei 1
D-72336 Balingen
E-Mail: info@kern-sohn.com

Tel: +49-[0]7433-9933-0
Fax: +49-[0]7433-9933-149
Internet: www.kern-sohn.com

Service Manual **TKXC-TM-A**

KERN KXC-TM

Type TKXC-TM-A

Version 1.0
10/2023
GB





KERN TKXC-TM-A

Version 1.0 – 10/2023

Service manual

Table of contents

1	Basic Information.....	3
2	Introduction.....	3
3	Feature overview.....	4
4	Service Menu.....	5
4.1	Adjustment procedure	6
4.2	Linearization Procedure.....	7
5	Maintenance	8
5.1	Service, maintenance	8
5.2	Error Codes	8
5.3	Trouble Shooting	9
6	Exchange of components	10
6.1	Spare parts list.....	10
6.2	Opening the device.....	10
6.3	Exchange of components	10
7	Technical drawings.....	11
7.1	Wiring Diagram.....	11
7.2	Component Diagram	11
7.3	Functional Block Diagram	12
7.4	Schematic Diagram	12

1 Basic Information

The device must be repaired only by trained specialist staff or personnel with professional formation (such as a repair-specialist accredited by law concerning verification). The service manual is obligatory for repair work. After repair, original conditions of the device must be restored. Only original spare parts should be used.

2 Introduction

This service manual covers the TKXC-TM-A scale series and is edited for the authorized servicing personnel.

Note all rights are reserved. Copying any part of this manual is prohibited without our permission.

3 Feature overview

- Large LCD, 6-digit H=50mm, VA=89x30mm, with white backlight
- Stable, zero, battery level, gross/net weight and Hi/OK/LO indications
- Buzzer sound
- Weighing unit: kg, g, lb, %, pcs, FFA (kg, g only for verified scale)
- Single or dual range/interval configurable
- 7 buttons operated
- Tare up to Max
- Pre-Tare function
- Percentage weighing function
- Check weighing function
- Piece counting function
- Display Hold function
- Print function with Sum Memory
- Application menu
- Setup menu
- Service menu to be activated by internal verification button
- Real time clock optional
- Alibi Memory optional
- Kern Communication Protocol (KCP)
- Kern Universal Port (KUP) interface, KUP1, KUP2
- Optional external RS-232 interface / Signal light through KUP1/2
- Optional external USB device interface through KUP1/2
- Optional external WiFi interface (main board option)
- Optional external Bluetooth BLE (main board option)
- Optional external Ethernet interface through KUP1/2
- Optional external Analog Output interface through KUP1/2
- Mains power supply with 5.9VDC 1A output
- Optional rechargeable battery, Li-ion 3.7V 3700mAH

4 Service Menu

Hold [ON/OFF] + [TARE] button during power up self-test to enter the Service Menu.

Press → button to select / confirm / shift right

Press ← button to go back / exit / shift left

Press ↓ button to scroll down / decrease digit value

Press ↑ button to scroll up / increase digit value

H10	turn ON/OFF X10 mode (for verified=on only)
Adjust	adjustment
cAL	adjustment function (as in User Menu)
cALEHT	adjustment at predefined weight: ZERO, PULD, HAIt...
cALEud	enter adjustment weight (SI unit only: g/kg), update predefined weight then perform adjustment
GrADJ	set gravity of adjustment location
GrUSE	set gravity of use location
LinEAR	Linearization
2Po int	set initial zero and span with single weight
50	set weight for linearization (10%max<weight<110% max), default 100%max
3Po int	3 points
5Po int	5 points
ZERO	zero calibration, set new initial zero.
PARAMS	scale parameters
VERIFd	legal verification: ON / OFF
RANGES	number of ranges: 1 / 2
2	select: 1 (single range), 2 (enter next level)
NULLING	select range type: NULLING / NULL int
unit	set base unit kg, g; lb for non-verified only
dec.	number of decimal place: 0 ~ 5
MAX	capacity in base unit
065000	set capacity, display W1 if ranges=2
150000	set capacity, display W2 if ranges=2
d	division / readability in base unit
2	set d (1, 2, 5, 10, 20, 50), display W1 if ranges=2
5	set d2 (1, 2, 5, 10, 20, 50), display W2 if ranges=2
e	e = 1d / e = 10d. (only possible for last digit = 1)
OVERLd	overload counter
REN	view counter
OVEREr	erase overload count
MEMory	no/yes to disable memory if memory unavailable during use.
St id	ID of starting memory
int	Initialize memory
rEcord	number of records in memory
info	information query
SERIAL	Serial number
VER	Software version b 1504
VERA	Software version approved A 1000
ADUALw	A/D value
rESEt	reset
ALL	reset all

4.1 Adjustment procedure

(WEr (FY = OFF)

1. Turn the scale on and allow the scale to acclimatize and stabilize for sufficient time.
2. Press and hold the ON/OFF and TARE key to enter setup menu. Display shows $\square RL$.
3. Press \rightarrow , display show $\square RLEHE$.
4. Press \rightarrow , display show the first selectable calibration weight.
5. Press \downarrow or \uparrow to scroll to other selectable calibration weights.
6. Press \rightarrow , display show $\square ER \square$, then $P \square L \square$, then display calibration weight.
7. Place the calibration weight onto the scale gently.
8. Press \rightarrow , display show $H R \square$, then $r \square N \square L \square$. Remove the calibration weight. Scale will return to the weigh mode and display weight.

Note:

- Adjustment function will be blocked for verified scale.
- In step 8, in case $H \square \square \square$ is displayed, this indicates a calibration error. Turn the scale off and then on and repeat the procedures.
- Press $\downarrow \uparrow$ to scroll. Press \leftarrow to esc/exit. Press \rightarrow to enter/confirm.
- There is an alternative way to enter the $\square RLEHE$ menu through the service menu (may need to break the seal).

(WEr (FY = ON)

1. Turn the scale on and allow the scale to acclimatize and stabilize for sufficient time.
2. Break the seal. Press the internal verification button to enter service menu. Display shows $H \square$.
3. Press \downarrow or \uparrow to scroll to $A \square \square \square \square$.
4. Press \rightarrow , display show $\square RL$.
5. Press \rightarrow , display show $\square RLEHE$.
6. Press \rightarrow , display show the first selectable calibration weight.
7. Press \downarrow or \uparrow to scroll to other selectable calibration weights.
8. Press \rightarrow , display show $\square ER \square$, then $P \square L \square$, then display calibration weight.
9. Place the calibration weight onto the scale gently.
10. Press \rightarrow , display show $H R \square$, then $r \square N \square L \square$. Remove the calibration weight. Scale will return to the weigh mode and display weight.

Note:

- In step 10, in case $H \square \square \square$ is displayed, this indicates a calibration error. Turn the scale off and then on and repeat the procedures.
- Press $\downarrow \uparrow$ to scroll. Press \leftarrow to esc/exit. Press \rightarrow to enter/confirm.

4.2 Linearization Procedure

1. Connect scale platform. Allow the scale to acclimatize and stabilize for sufficient time.
2. Turn on the scale, press the verification button on the main board to enter the service menu (may need to break the seal and remove the cover). Display shows $H \square$.
3. Press \downarrow or \uparrow to scroll to $PARAN$. Press \rightarrow . Go through the menu to set up the scale parameters.
4. Display will turn off.
5. Turn on the scale, press the verification button to enter the service menu again. Display shows $H \square$.
6. Press \downarrow or \uparrow to scroll to $ADJUST$. Press \rightarrow , display show CAL .
7. Press \downarrow or \uparrow to scroll to $LINEAR$. Press \rightarrow , display show $2PO$ or 1 .
8. Press \downarrow or \uparrow to scroll to $3PO$ or $5PO$.
9. Press \rightarrow , display show HA , then $ZERO$, then $PULD$, then the standard weight for the first point.
10. Place the calibration weight onto the scale gently.
11. Press \rightarrow , display show HA , then $REMOVE$. Remove the calibration weight. Display show $PULD$, then the calibration weight for the next point.
12. Repeat step 10 and 11 until display show $LSCE$.

5 Maintenance

5.1 Service, maintenance

The appliance may only be opened by trained service technicians who are authorized by KERN.

Disconnect the scales before opening.

5.2 Error Codes

Error message	Explanation
ZEroh	Zero too high at power up
ZEroLo	Zero too low at power up
ZE n it	Over zeroing range
undErZE	Under zeroing range
instAb	Unstable weight
L---	Over weight
---	Under weight
ErroR	Adjustment error
LoBAt	Batteries / rechargeable battery exhausted
SErvtc	Real time clock incorrect / not set
n unAU	Scale memory failed / not detected

5.3 Trouble Shooting

Power on



Full Segments?

If no display,

- check battery / mains power,
- check connection between battery / SMPS board —main board.

If missing segments,

- check LCD pins; damage of LCD.



Display Zero?

If display [L0 bA], check battery >4.2V, SMPS board ~6V.

If display [∩EΓ∩h ∩] or [∩EΓ∩L∩] check the load cell connections, load cell damaged?

If display [∩LbAb] weight platform, overload stopper, loadcell and wires terminal, environment and stable table.

If display [∩EΓ ΓE∩] check RTC battery, set clock.



Proper readout?

If unstable reading, check weight platform, overload stoppers, loadcell and wires terminal, environment and stable table.

If always zero, check ADC. Linearization if necessary.



Correct reading?

If not accurate, perform adjustment or linearization.

If cannot reach full capacity, check tray top, overload stopper, loadcell.



Buttons functioning?

If some buttons not working, check the keyboard FPC connection. Replace keyboard if needed.



Interface functioning?

If interface not working, check installation and the connection wires.



Normal operation.

6 Exchange of components

6.1 Spare parts list

2.51.01.08540100	Main board KXC
6.01.45.08540000	Overlay KXC
2.51.01.08540200	FPC assy - KXC keyboard
4.37.01.08540000	Verification cover
4.37.02.08540000	Verification screw post
5.97.50.00001000	Power cord EU H05VV-F 1.5M
5.55.15.03000000	Ferrite bead UF-70B 16.5*30mm
5.52.39.00000200	SMPS PCBA 5.9V 1A

6.2 Opening the device

To open / close the device, unscrew / screw in the 6 M4x12 screw on the bottom housing.

6.3 Exchange of components

Below components can be replaced without opening the device:

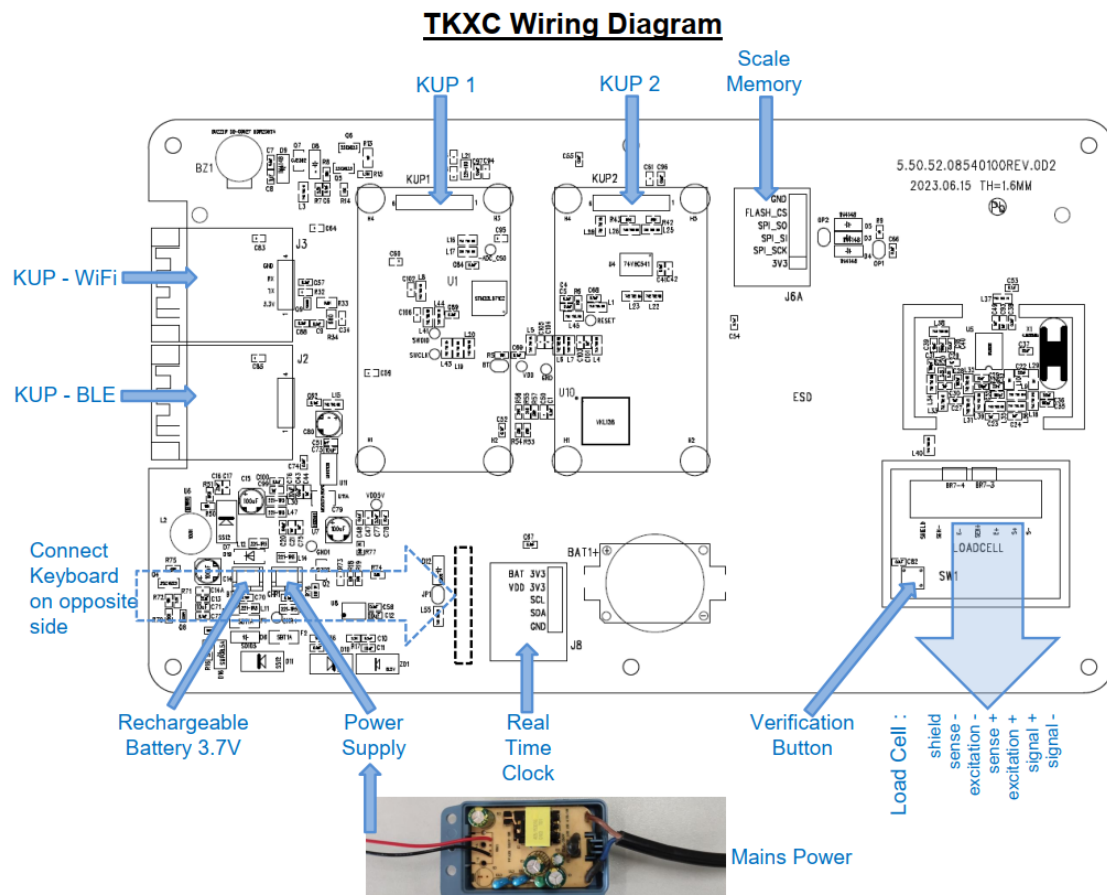
6.01.45.08540000	Overlay KXC
------------------	-------------

Replacement of the main board:

1. Break the verification seal. Open the device by removing the 6 M4 screws and bottom housing
2. Disconnect the connections to the main board
3. Remove the 4 M3 screws
4. Replace a new main board
5. Fix the main board with the 4 M3 screws
6. Connect the main board as per the Wiring Diagram
7. Install the 6 M4 screws to close the device
Note: screw torque shall be 5 ~ 5.5 N.M to ensure the IP68 protection
8. Perform Linearization and Adjustment

7 Technical drawings

7.1 Wiring Diagram



7.2 Component Diagram

