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# Service Manual
# Medical Baby Scale

## KERN MBA-B

**Type TMBA 15K-3M-B**

Version 1.0
10/2022
GB



GB

# KERN MBA-B

Version 1.0 – 10/2022

**Servicemanual**

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# 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.

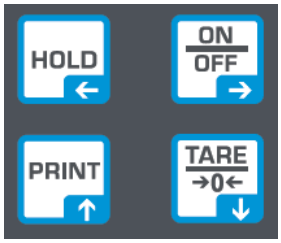
**Instructions about conformity-evaluated scales:**
Repair must be carried only at 100% compliance with the type approval. A violation of this specification will result in a loss of the type approval! After successful repair the balance will have to be reverified before it can be used again in a statutorily regulated field.
The operation and configuration of each scale is described in the accompanying manual of the scale. Any safety information in respect for verification are also described in the accompanying manual

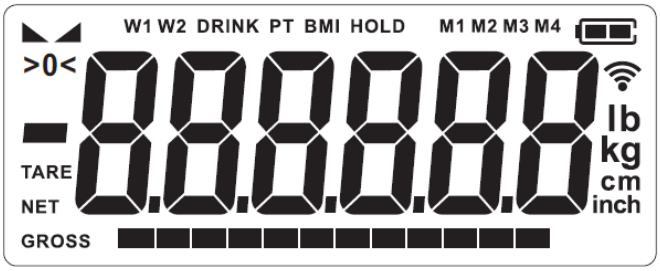
# 2 Introduction

This service manual covers the MBA baby scale series and is edited for the authorized servicing personnel.
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## 3 Feature overview

- Large LCD, 6-digit H=25mm, VA=100x40mm, no backlight
- Stable, zero, battery level, gloss/net weight indications
- 4-adjustable feet with bubble level
- Weighing unit:  kg only
- 4 buttons operated
- Tare up to Max-1e
- Display Hold function
- Auto off selectable
- Print function through optional WiFi interface
- Application menu
- Service menu
- WiFi interface, factory option
- Kern Communication Protocol (KCP) for Wifi interface
- Optional Height Measuring Rod MBA-A01
- Alkaline Batteries, 6xAA size
- Optional Multi-Plug Power adaptor, 12V 500mA



# 4 Calibration information

## 4.1 General introduction

According to EU directive 2014/31/EU balances must be officially verified if they are used as follows (legally controlled area):

a) For commercial transactions if the price of goods is determined by weighing.
b) For the production of medicines in pharmacies as well as for analyses in the medical and pharmaceutical laboratory
c) For official purposes
d) For manufacturing final packages
e) Determination of mass in the practice of medicine that is, weighing patients for reasons of medical supervision during medical surveillance, examination and treatment

In cases of doubt, please contact your local trade in standard.

## 4.2 Verification notes

An EU type approval exists for balances described in their technical data as verifiable. If a balance is used where obligation to verify exists as described above, it must be verified and re-verified at regular intervals.
Re-verification of a balance is carried out according to the respective national regulations. For verification validity period.
The legal regulation of the country where the balance is used must be observed!

**Verification of the balance is invalid without the seal.**
The seal marks attached on balances with type approval point out that the balance may only be opened and serviced by trained and authorised specialist staff. If the seal mark is destroyed, verification loses its validity. Please observe all national laws and legal regulations. In Germany a re-verification will be necessary.

**Balances with obligation to verify must be taken out of operation if:**

- **The weighing result of the balance is outside the error limit.** Therefore, in regular intervals load balance with known test weight (ca. 1/3 of the max. load) and compare with displayed value.
- **The reverification deadline has been exceeded.**

## 4.3 Adjustment

As the acceleration value due to gravity is not the same at every location on earth, each display unit with connected weighing plate must be coordinated - in compliance with the underlying physical weighing principle - to the existing acceleration due to gravity at its place of location (only if the weighing system has not already been adjusted to the location in the factory).This adjustment process must be carried out for the first commissioning, after each change of location as well as in case of fluctuating environment temperature. To receive accurate measuring values it is also recommended to adjust the display unit periodically in weighing operation.

| | |
|---|---|
|  | • Prepare the required adjustment weight. The adjustment weight to be applied depends on the capacity of a weighing scale.<br>Carry out adjustment as closely as possible to admissible maximum load of weighing scale. Information about test weights can be retrieved on the KERN website (http://www.kern-sohn.com).<br>• Observe stable environmental conditions. For warm-up time required for stabilisation MWN-M Instruction manual. |

| | |
|---|---|
|  | Access to service menu is locked in verified balances.<br>To disable the access lock, destroy the seal and actuate the adjustment switch.<br>**Attention:**<br>After destruction of the seal the weighing system must be re-verified by an authorised agency and a new verification wire/seal mark fitted before it can be reused for applications subject to verification. |

### 4.4 Adjustment procedure

1. Turn the scale on and allow the scale to acclimatize and stabilize for sufficient time.
2. Press the verification button to enter Service Menu (may need to break the seal). Display shows H 10.
3. Press ↓ or ↑ to scroll to CALE
4. Press →, display show 10.000.
5. Press ↓ or ↑ to select calibration weight, 10.000 or 15.000.
6. Press →, display show ZEro, then PutLd, then the calibration weight.
7. Place the calibration weight onto the scale gently.
8. Press →, display show WAit, then F in 1sh. Scale will return to the weight mode and display weight.
9. Enter the Service Menu, scroll to GrAAdJ to enter the gravity of adjustment location.
10. Scroll to GrAuSE to enter the gravity of use location.

Note:

- In step 8, in case WronG is displayed, this indicates a calibration error. Turn the scale off and then on and repeat the procedures.
- Press ↓↑ to scroll. Press ← to esc/exit. Press → to enter/confirm.

### 4.5 Linearization Procedures :

1. Allow the scale to acclimatize and stabilize for sufficient time.
2. Press the verification button to enter Service Menu (may need to break the seal). Display shows H 10.
3. Press ↓ or ↑ to scroll to L inrtn
4. Press →, display show WAit, then ZEro, then PutLd, then the standard weight for the first point 2.000.
5. Place the calibration weight onto the scale gently.
6. Press →, display show WAit, then PutLd, then the calibration weight for the next point.
7. Repeat step 5 and 6 until the weights of 5, 10, and 15 kg are calibrated, and display show F in 1sh.

## 5 Service Menu

Press the verification button to enter Service Menu (may need to break the seal)
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

| MBA Service Menu | | | |
|---|---|---|---|
| Press Button | Display | Press Button | Display |
| Internal Button | H 10 | | |
| ↓↑ | H 10 | ➔ | H 10oFF |
| | | ↓ ↑ | H 10oFF ⇆ H 10on |
| | L inrtn | ➔ | UA it → ZEro → PutLd → 2.000 |
| | | place 2kg weight ➔ | UA it → PutLd → 5.000 |
| | | place 5kg weight ➔ | UA it → PutLd → 10.000 |
| | | place 10kg weight ➔ | UA it → PutLd → 15.000 |
| | | place 15kg weight ➔ | UA it → F in ish<br>scale turn off |
| | cALE | ➔ | 10 |
| | | ↓ ↑ | 10.000 ⇆ 15.000 |
| | | ➔ | UA it → PutLd → 10.000 |
| | | place weight ➔ | UA it → F in ish<br>return to weight mode |
| | FcP | ➔ | FcPoFF |
| | | ↓ ↑ | FcPoFF ⇆ FcPon |
| | GrAAdJ | ➔ | 9.78793 |
| | | ↓ ↑ | adjust flashing digit |
| | | ➔ | switch to next digit |
| | GrAuSE | ➔ | 9.8 1000 |
| | | ↓ ↑ | adjust flashing digit |
| | | ➔ | switch to next digit |
| ← | return to weight mode | | |

## 6 Trouble Shooting:

Power on

↓

Full Segments?

If no display,

- check battery / power adaptor,
- check connection between keyboard—main board,
- check connection between battery / power adaptor—main board.

If missing segments,

- check fixing of LCD frame, zebra connector under LCD.

↓

Display Zero?

If display [LO bAt], check battery >6.5V, power adaptor ~12V.

If display [ 0Eroh ı ] or [ 0EroLo ] check the load cell connections, load cell damaged?

If display [ instab ] check weighing platform, overload stopper, load cell and wires, environment and stable floor.

↓

Proper readout?

If unstable reading, check weighing platform, overload stoppers, loadcell and wires, environment and stable floor.

If always zero, check ADC. Linearization if necessary.

↓

Correct reading?

If not accurate, perform adjustment or linearization.

If cannot reach full capacity, check weighing platform, overload stopper, load cell.

↓

Buttons functioning?

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

↓

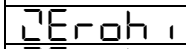
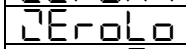
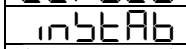
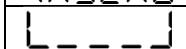
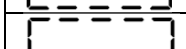
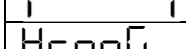
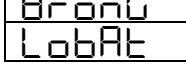
Interface functioning?

If interface not working, check the connection and wires to WiFi module.

↓

Normal operation.

# 7 Error Messages

| Error message | Explanation |
|---|---|
|  | Zero too high at power up |
|  | Zero too low at power up |
|  | Unstable weight |
|  | Over weight |
|  | Under weight |
|  | Adjustment error |
|  | Batteries / rechargeable battery exhausted |

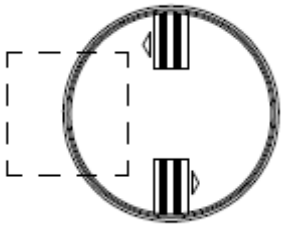
# 8 Exchange of Components:

## 8.1 Spare Parts List

| | |
|---|---|
| 2.51.00.16820100 | Main board MBA |
| 2.51.00.16820200 | Keyboard 4-tact switch |
| 6.01.45.16820002 | Panel overlay MBA |
| 2.40.01.09290000 | Adjustable foot |
| 4.37.06.16820300 | Battery door |
| 4.23.01.16820000 | Battery holder 6xAA |
| 4.37.11.09281300 | Round Cover |
| 5.91.01.00000200 | Power adaptor jack |
| 3.77.06.16820000 | Loadcell 20kg ZEMIC L6D-C3 wire=400mm |

## 8.2 Opening the device

To open the device, break the seal, turn the round cover on the bottom housing counterclockwise to remove. Unscrew two M6 Hex. screws inside the round hole. Remove the bottom housing assembly gently.



To close the device, put back the bottom housing assembly gently. Fix the bottom housing assembly with two M6 Hex screws. Make sure the gap between top and bottom housing are even on all directions. Install the round cover by turning it clockwise. Seal the cover as needed.

Below components can be replaced without opening the scale:

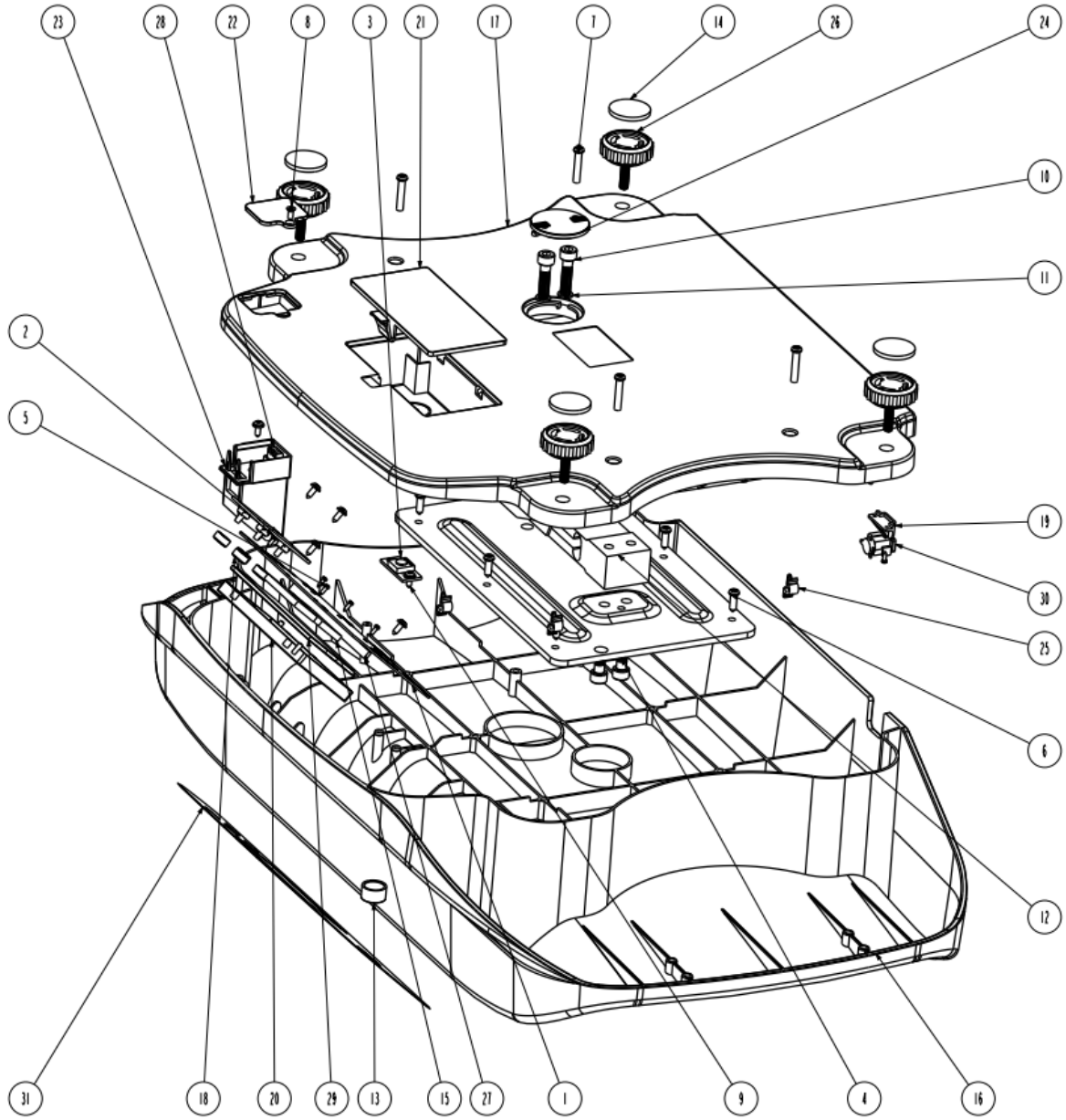
| | |
|---|---|
| 6.01.45.16820002 | Panel overlay MBA |
| 2.40.01.09290000 | Adjustable foot |
| 4.37.06.16820300 | Battery door |
| 4.23.01.16820000 | Battery holder 6xAA |
| 4.37.11.09281300 | Round Cover |

## 8.3 Replace Main board

1. Open the device.
2. Disconnect the connections to the main board
3. Remove two M3x8 tap. screws
4. Replace a new main board
5. Fix the main board with two M3x8 tap. screws
6. Connect the main board as per the Wiring Diagram
7. Close the device
8. Perform Linearization and Adjustment
9. Seal the device after verification

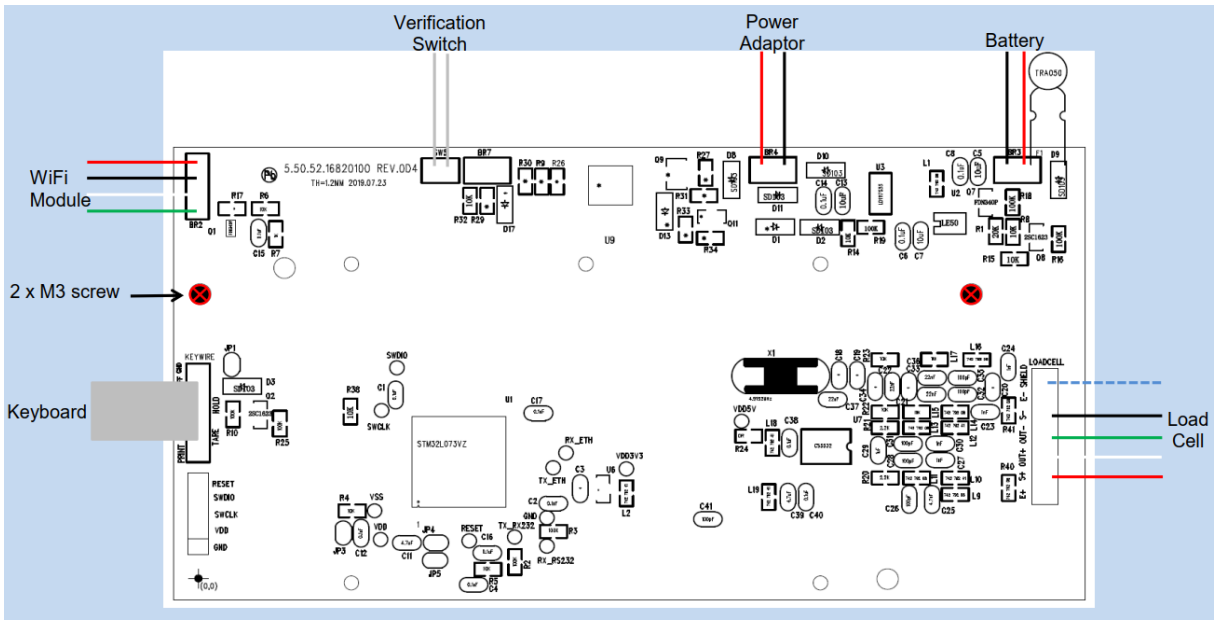
# 9 Technical drawings

## 9.1 MBA Exploded view

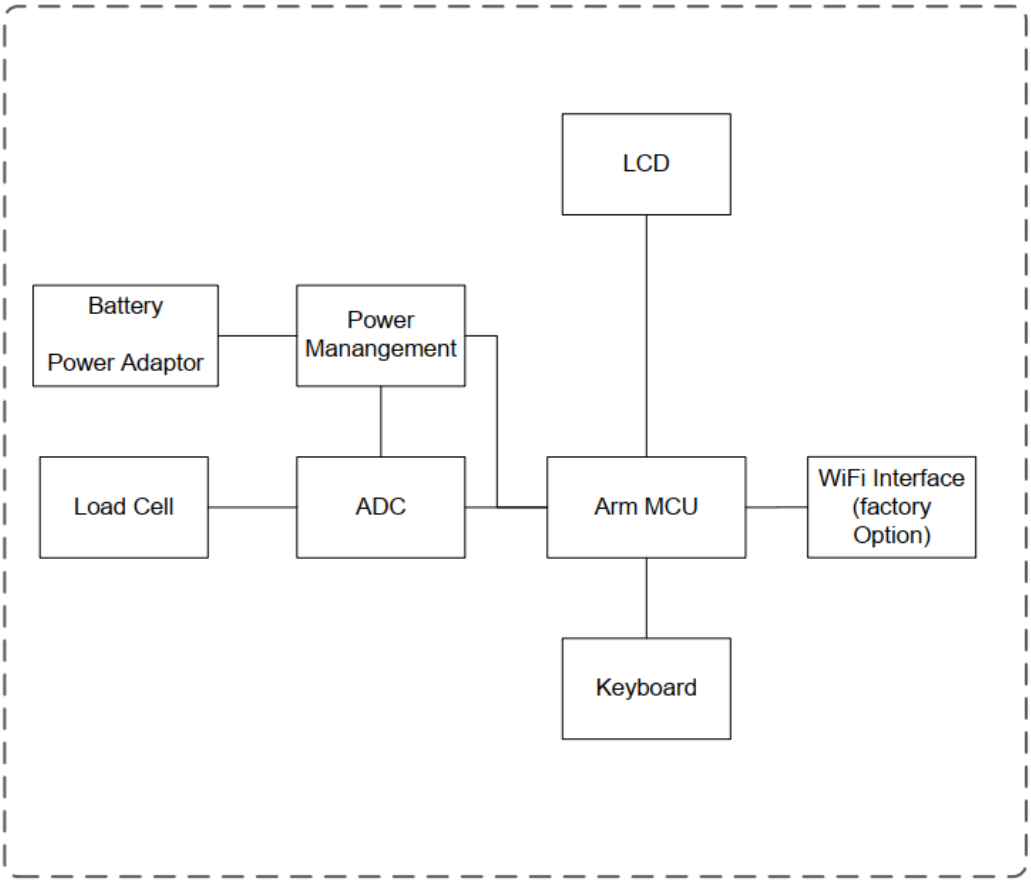


| NO. | MODEL NO. | TITLE | QTY. | MATERIAL |
|---|---|---|---|---|
| 31 | 6.01.45.16820000 | OVERLAY | 1 | PVC |
| 30 | 5.91.01.00000200 | AC-ADAPTOR-JACK | 1 | electronic |
| 29 | 5.87.40.06267201 | LCD | 1 | GALSS |
| 28 | 5.85.05.00433600 | SHIELD-WIRE-336MM | 1 | electronic |
| 27 | 5.85.03.03010000 | ZEBRA | 1 | RUBBER |
| 26 | 4.37.18.09420002 | FOOT | 4 | ABS+Steel |
| 25 | 4.37.12.06050500 | INSERT_WIRE_CLIP | 3 | ABS |
| 24 | 4.37.11.09281300 | PLUG | 1 | ABS |
| 23 | 4.37.09.16820300 | 3709-WIFI-STAND | 1 | ABS |
| 22 | 4.37.08.16820300 | WIFI-DOOR | 1 | ABS |
| 21 | 4.37.06.16820300 | BATTERY-DOOR | 1 | ABS |
| 20 | 4.37.05.16820300 | LCD-COVER | 1 | ABS |
| 19 | 4.37.04.16820300 | PRESSING-PLATE | 1 | ABS |
| 18 | 4.37.03.16820300 | KEY | 4 | ABS |
| 17 | 4.37.02.16820300 | BOTTOM | 1 | ABS |
| 16 | 4.37.01.16820300 | TOP-TRAY | 1 | ABS |
| 15 | 4.32.19.00404000 | EVA-PAD-19X40X4MM | 2 | EVA |
| 14 | 4.25.10.02531000 | RUBBER-FOOT-D25X3MM | 4 | EVA FOAM |
| 13 | 4.23.11.03840700 | LEVEL_BALL | 1 | PMMA |
| 12 | 3.77.06.16820000 | LOADCELL-20KG | 1 | AL |
| 11 | 3.15.01.00609400 | SPRING-WASHER-M6X9 | 4 | Steel |
| 10 | 3.12.49.029540000 | MAC-SCREW-M6X25 | 4 | Steel |
| 9 | 3.11.17.00508100 | TAP-CREW-M3X8-W | 6 | Steel |
| 8 | 3.11.11.00508100 | TAP-SCREW-W3X8 | 1 | Steel |
| 7 | 3.11.10.01720100 | TAP-SCREW-M4X20 | 4 | Steel |
| 6 | 3.11.10.00712101 | TAP-SCR-EWM4X12 | 12 | Steel |
| 5 | 3.11.10.00206100 | TAP-SCREW-M2X6 | 7 | Steel |
| 4 | 3.03.53.16820100 | BOTTOM-TOP-PLATE | 2 | T=4.0 Steel |
| 3 | 2.51.00.16820300 | KEY-PCB-ASSY | 1 | electronic |
| 2 | 2.51.00.16820200 | KEY-SMT-ASSY | 1 | electronic |
| 1 | 2.51.00.16820100 | SMT-ASSY | 1 | electronic |

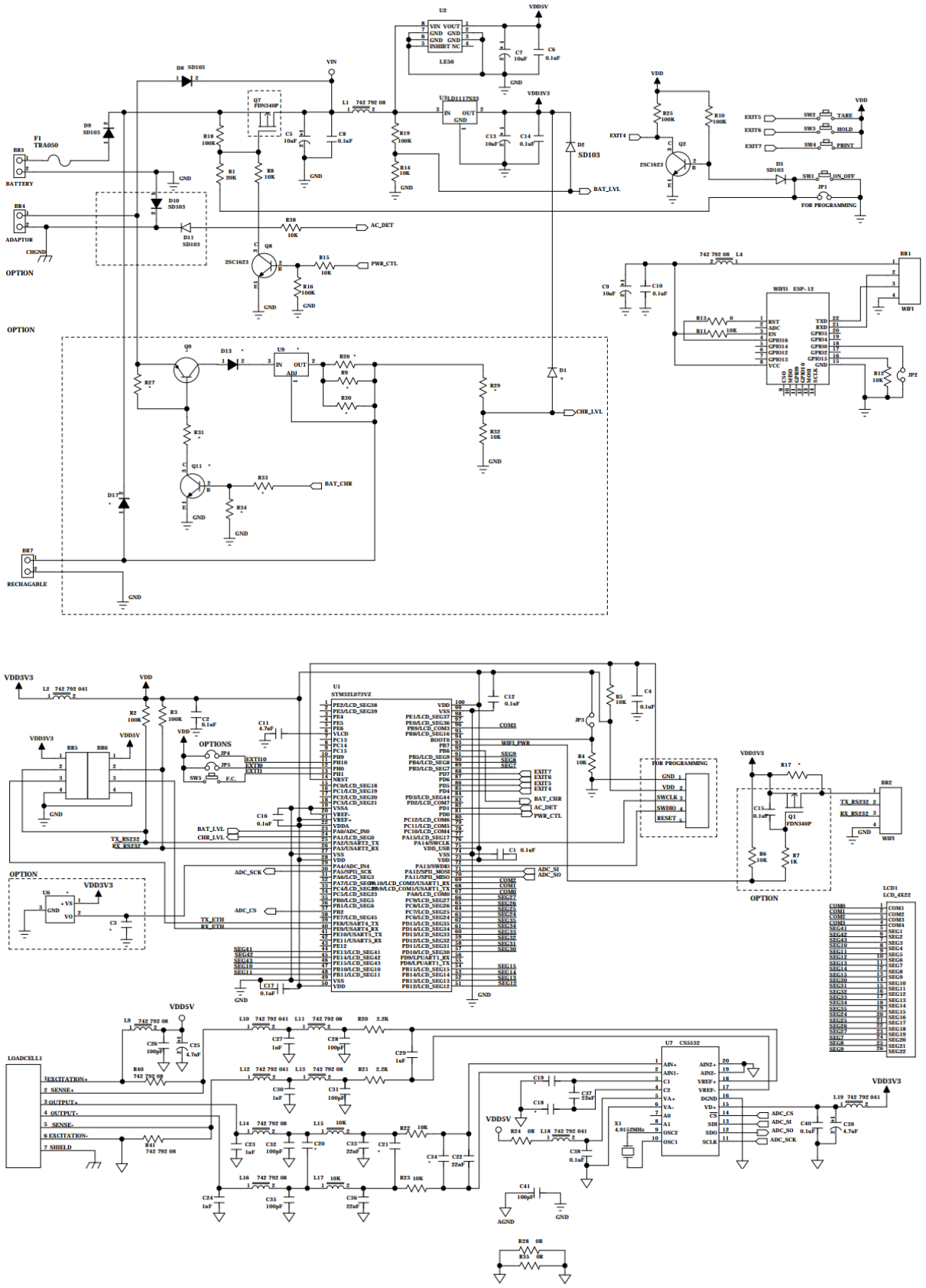
## 9.2 MBA Wiring Diagram




## 9.3 MBA Functional Block Diagram



## 9.4 MBA Schematic Diagram



## 9.5 MBA Component Diagram

