



FES LCD Display

Version 1.11



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Table of Content

1. Important notices 3

 1.1 Limited Warranty 3

2. Packing list 4

3. General..... 4

4. System description 5

5. Connections 8

6. Repair and service 8

7. Revision history 8

1. Important notices

Please read this manual thoroughly. It contains important information about your FES LCD Display unit.

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1.1 Limited Warranty

This electronic device is warranted to be free from defects in materials or workmanship for one year from the date of purchase. Within this period, LZ design will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts and labor, the customer shall be responsible for any transportation cost. This warranty does not cover failures due to abuse, misuse, accident, or unauthorized alterations or repairs.

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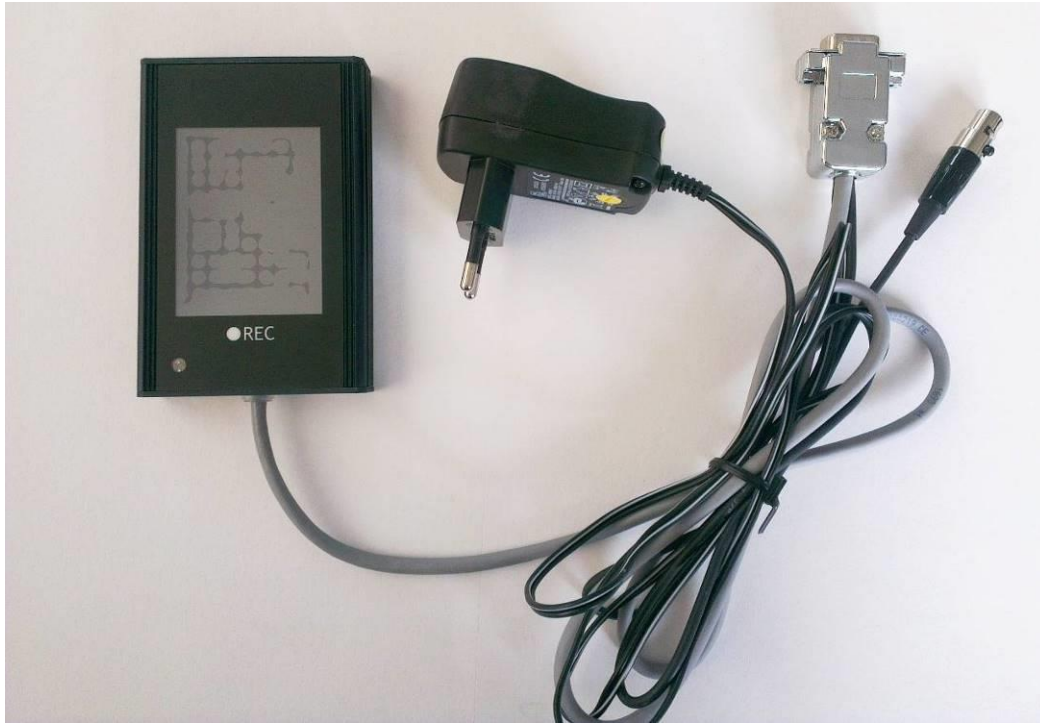
IN NO EVENT SHALL LZ DESIGN BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE, OR INABILITY TO USE THIS PRODUCT OR FROM DEFECTS IN THE PRODUCT. Some states do not allow the exclusion of incidental or consequential damages, so the above limitations may not apply to you. LZ design retains the exclusive right to repair or replace the unit or software, or to offer a full refund of the purchase price, at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

To obtain warranty service, contact your local LZ design dealer or contact LZ design directly.

2. Packing list

FES LCD Display with:

- 110V/220V AC to 12V DC transformer
- DSUB connector (with 15 pins suitable for FES GEN2 battery pack with internal BMS, or with 9 pins suitable for FES GEN1 battery pack with external BMS)
- round connector for communication with charger



FES LCD Display overview.

3. General

FES LCD Display screen shows all the parameters of the FES battery pack. It was developed in cooperation with company REC d.o.o., as more user-friendly solution compared to standard FES BMS Control software, which require PC with Windows operation system.

User can monitor the parameters in real-time and diagnose the potential errors in the FES battery pack. LCD Display require its own power supply (10-16 V), which is usually provided by small 110/220V AC transformer.

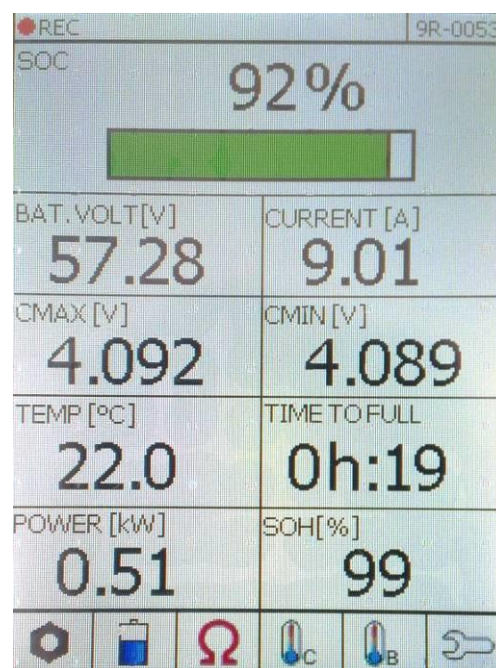
Features:

- robust and small design in aluminum enclosure,
- touch screen display,
- low power consumption,
- portrait/landscape view,
- automatic/manual backlight setting,
- hibernate timer.

4. System description

Main parameters overview:

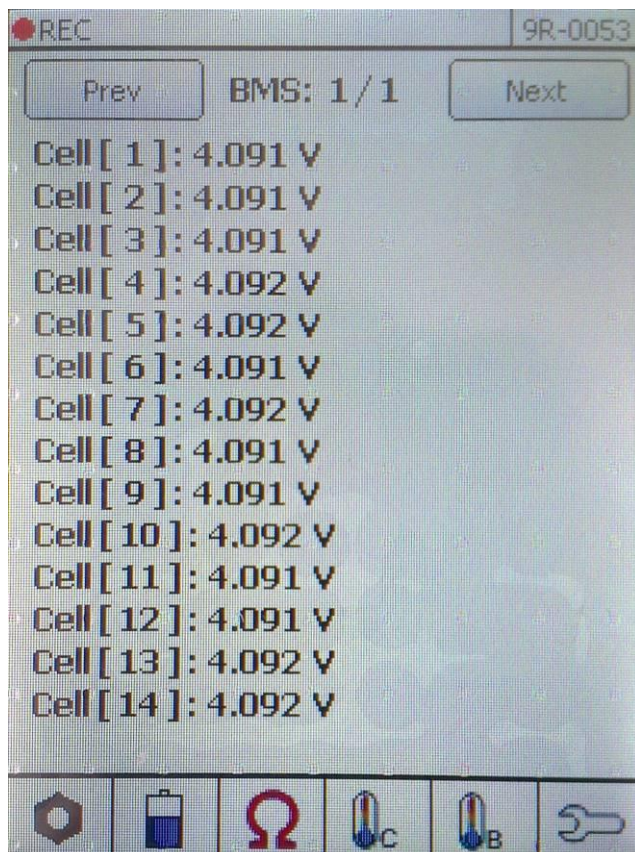
Window	Description
SOC	State of charge of the battery pack
BAT. VOLT [V]	Battery pack total voltage
CURRENT [A]	Battery pack current (when charging)
TIME TO FULL/EMPTY	Approximate time till the battery pack is full during charging
CMAX [V]	Maximum cell's voltage
CMIN [V]	Minimal cell's voltage
TEMP [°C]	Maximal temperature
POWER [kW]	Battery pack charging power
SOH [%]	State of health



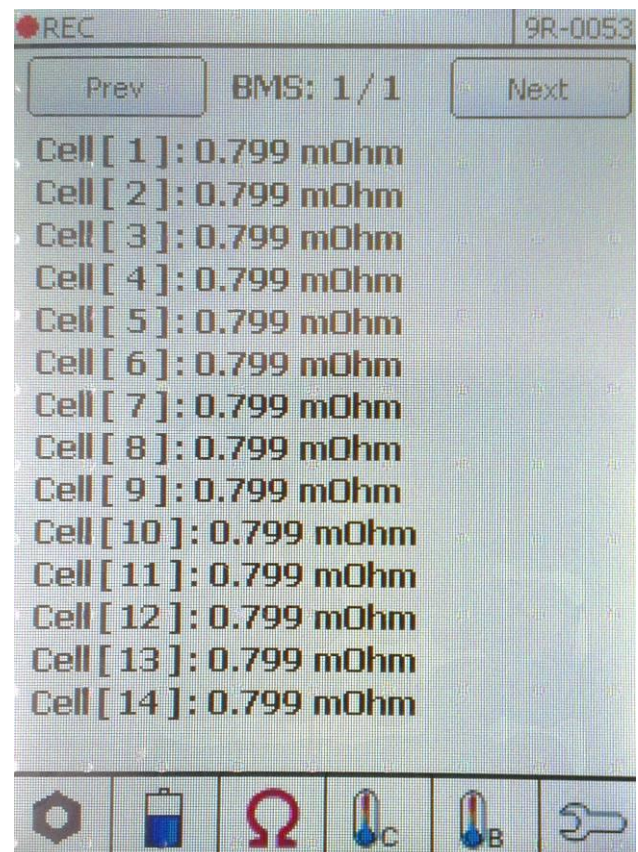
First tab - main parameters.

Description of additional tabs in the lowest line:

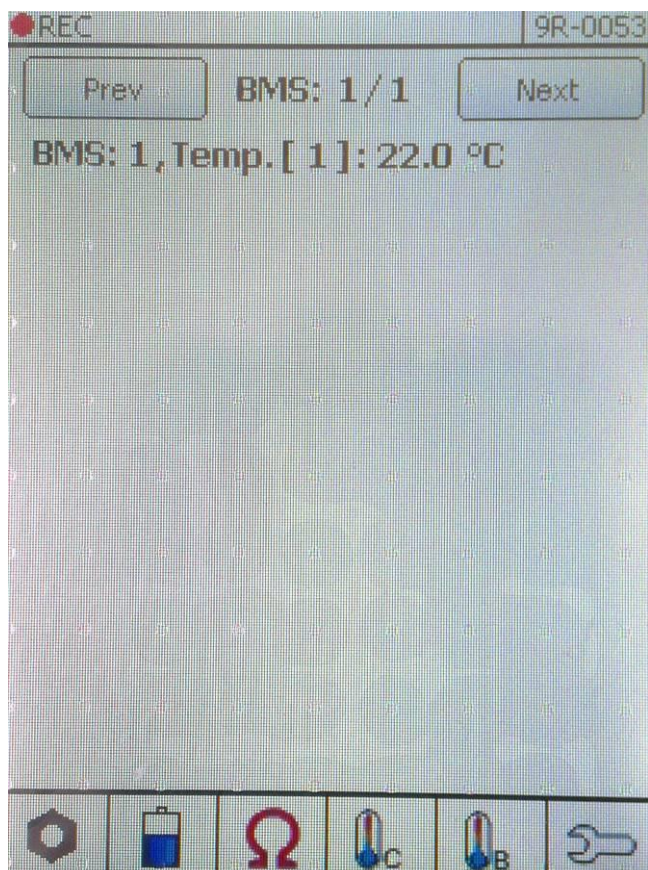
Icon	Tab	Description
	Main parameters	First tab shows main parameters of the FES battery pack.
	Cell's voltage	Second tab shows each cell's voltage.
	Cell's impedance	Third tab shows each cell's DC impedance.
	Cell's temperature	Forth tab shows battery pack temperature.
	BMS temperature	Fifth tab shows BMS temperature.
	LCD –TFT settings	Sixth tab serves for LCD display settings.



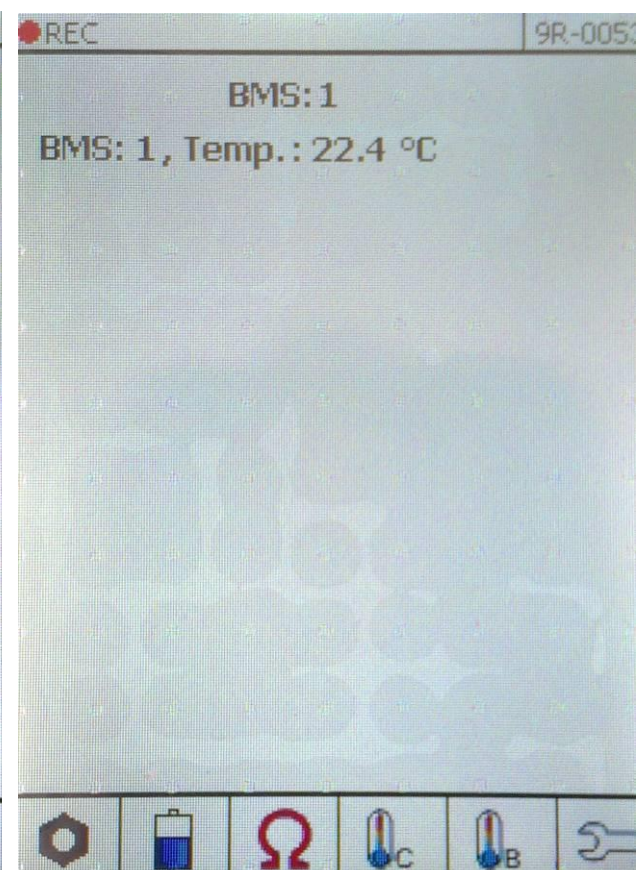
Second tab – cell's voltages.



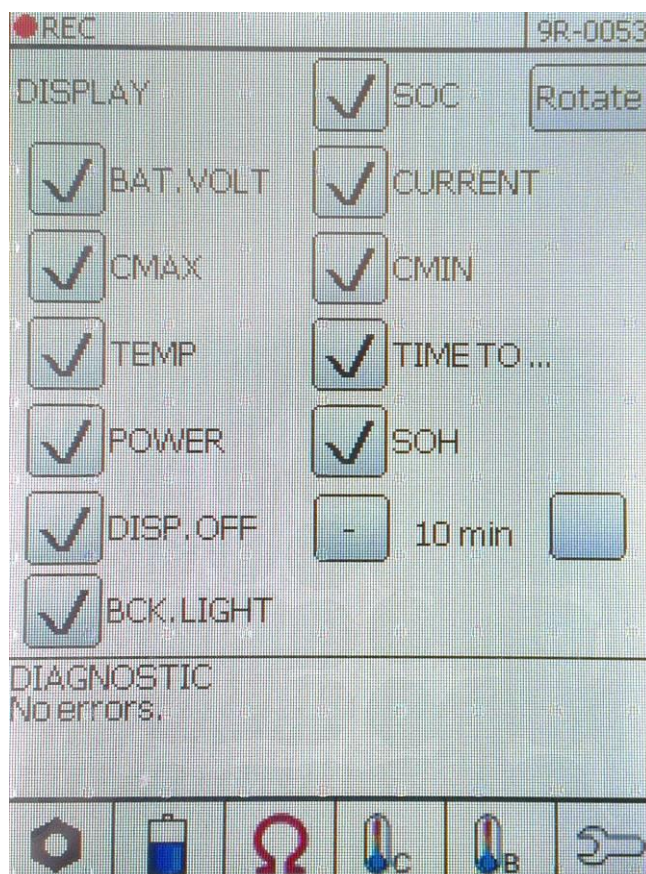
Third tab – cell's DC impedance.



Fourth tab – cell's temperatures.



Fifth tab – BMS temperatures.



FES LCD settings.

FES LCD display settings buttons description:

Icon	Description
SOC	Show/Hide SOC from the main parameters' tab
BAT. VOLT	Show/Hide battery pack voltage from the main parameters' tab
CURRENT	Show/Hide battery pack current from the main parameters' tab
TIME TO...	Show/Hide Time to full/empty from the main parameters' tab
CMAX	Show/Hide CMAX from the main parameters' tab
CMIN	Show/Hide CMIN from the main parameters' tab
TEMP	Show/Hide highest temperature from the main parameters' tab
POWER	Show/Hide charging power from the main parameters' tab
SOH	Show/Hide SOH from the main parameters' tab
DISP. OFF	Selects or turns-off backlight sleep mode timer.
BCK. LIGHT	Selects automatic or manual backlight settings.
Rotate	Rotates screen Portrait/Landscape.
DIAGNOSTIC	Describes the error in the system.

5. Connection

1. Connect RS485 communication connector to BMS data connector.
2. Plug in small transformer to wall outlet.
3. Switch on BMS and wait until initial check is finished.
4. Initial display with data becomes visible.

Charging:

5. If charging is required, connect round connector to charger.
6. Plug in charger supply cable to 220V/50Hz AC wall outlet.

6. Repair and service

In case of troubles please contact LZ design d.o.o.

7. Revision history

May 2014	Initial release of the manual, Version 1.0
October 2017	Minor updates, Version 1.1
September 2019	Minor updates, Version 1.11