



# MB1550 USER MANUAL

MANUAL / Reference : MAN\_MB1550\_NS\_EN\_V1.0



E-XTEQ provides International engineering / OEM's worldwide connections / High capacity production.

**HIGH-TECH INDUSTRIES: RESEARCH & DEVELOPMENT, ASSEMBLY LINES, WORKSHOPS**

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**E-XTEQ**

Measurement Global Solutions



**Table of Content**

**Introduction**

**Safety Guidelines**

- Maintenance and Storage
- Before Use
- Safety Clothing
- Usage Precautions

**Getting Started**

- Safety Reminders
- Appearance and Dimensions
- Accessories

**Initial Setup**

- Installation
- Network
- Settings

**Balancing**

- Cable connection
- Charge/Discharge Process
- End of Charge/Discharge Process
- Alarm and Security Screens
- Power Off

**Warranty**

- Limited Warranty
- How to Obtain Warranty

**Support Information**

- Error Table
- Local Support

**Technical Specifications**

# Table of Content

## E-XTEQ MB1550 USER MANUAL

- Introduction** ..... 3
- Safety Guidelines**..... 4
  - Maintenance and Storage ..... 4
  - Before Use ..... 4
  - Safety Clothing ..... 5
  - Usage Precautions ..... 5
- Getting Started** ..... 6
  - Safety Reminders..... 6
  - Appearance and Dimensions..... 6
  - Accessories ..... 9
- Initial Setup** ..... 12
  - Installation.....12
  - Network .....14
  - Settings.....17
- Balancing**..... 20
  - Cable connection ..... 20
  - Charge/Discharge Process..... 25
  - End of Charge/Discharge Process ..... 28
  - Alarm and Security Screens ..... 30
  - Power Off..... 31
- Warranty**..... 32
  - Limited Warranty ..... 32
  - How to Obtain Warranty ..... 32
- Support Information** ..... 33
  - Error Table ..... 33
  - Local Support ..... 33
- Technical Specifications** ..... 34

## Revision of the manual

Due to software updates, your experience of the software interface (including but not limited to software features, user interfaces and interaction experiences) may differ from the interface presented in this manual. The software interface is subject to change.

ÉDITION / REVISION	REFERENCE	DATE	UPDATES PARTS
First edition	MAN_MB1550_NS_EN_V1.0	July 2019	-



**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Introduction

## ABOUT //////////////

E-XTEQ is a battery diagnostic tool and equipment manufacturer with a broad spectrum of knowledge and understanding of battery technology for Industrial, OE and Aftermarket Maintenance including EV/HEV applications.

Our mission is to be a passionate global leader of innovative measurement solutions by providing premium testing equipment and unsurpassed services to our valued customers and partners.

MB1550 is designed to support all EV-HEV system applications and can be upgraded to balance future battery modules.

This equipment is built with high security standards and quality to guarantee safety to all users.





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Safety Guidelines 1/2

**For your security, please read the safety guidelines carefully.**

This section indicates the areas that need to be protected in order to prevent harm to people who use this equipment, damage to property and to enable proper use of this product.

**MAINTENANCE AND STORAGE //////////////**

Keep this product away from direct sunlight and wet weather.  
Contact customer support immediately if an unexpected problem occurs

**BEFORE USE //////////////**



Keep the exterior clean and free of dust.  
Do not disassemble or modify the main unit as it may cause an electrical short or fire.  
To reduce the risk of electrical shortage, unplug the AC power plug before cleaning and maintenance.

**Extreme caution: Keep liquids and metallic tools away from the MB1550 while operating.**

MB1550 Module Balancer must be used in a well-ventilated area.

When operating the equipment make sure the surface is dry and clean to minimize any risks.

The lid of this machine is equipped with a pinch prevention mechanism, to avoid injury, stand a safe distance when opening and closing the lid.

Check the safety status as appropriate during charging and discharging.



The battery contains chemicals that may generate explosive gases. Before handling the battery/module, remove all metal accessories such as rings, bracelets and necklaces.  
Short circuit at battery terminals may cause burns.  
Do not place batteries/modules near flames or other heat sources.



The battery fluid is highly corrosive. If the battery Fluid gets on your skin or clothes, immediately wash it with soap and water.  
If electrolyte gets in your eyes, immediately flush with cold water for at least 10 minutes and seek medical attention.



**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

**Safety Clothing**

**Usage Precautions**

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Safety Guidelines 2/2

## SAFETY CLOTHING //////////////

When working on electric and hybrid vehicles, it is important that technicians are supplied with reliable protective equipment to safely carry out work.

The purpose of this is to protect individuals who work on an installation that presents an electrical hazard. The use of improper clothing for a specific hazard can cause significant danger to the user.

**Electrical Safety Gloves** – these are the first line of defense for contact with energized components. Most EV manufacturers recommend that insulated rubber gloves should be worn when working near all high-voltage components, not just the vehicle batteries. Ordinary latex gloves are not thick enough and do not provide enough protection from the shock hazard.

**Cotton Under gloves** – to be worn underneath electrical safety gloves and leather gloves, our cotton under gloves not only reduce sweating, they give protection in warm and humid conditions.

**Leather Over gloves** – these are worn over insulating gloves to protect against mechanical hazards and electrical arcing.

**Safety Glasses** – are extremely important when working on high voltage as it protects the eyes from any ‘flash over’ that can occur if an electrical spark is produced.

**Dielectric Over boots** – to be worn over existing footwear, the dielectric over boot provides additional protection of insulation, preventing electric shocks should a vehicle technician encounter contact with a live electric source.

**Insulating Rubber Apron** – this apron is to protect technicians working with live voltages

## USAGE PRECAUTIONS //////////////

The MB1550 Module Balancer can only be used by persons with relevant knowledge or qualifications in that country/region.

Do not use extension cords as there is a risk of fire and electrical shortage.

If use is necessary, check that the extension cord has the following:

1. Identical plug, cable size and the same electrical wiring as the MB1550.
2. Make sure the equipment is securely connected before use.

When unplugging the cord from the outlet, hold the frame of the plug to avoid damaging the plug or power cord. Pulling the cord may cause the cable plug to break. Replace power cord immediately if damaged.

If the outlet shape does not fit the plug, please contact the E-XTEQ service department.

Phone: 1.877.453.3265

E-mail: [serviceusa@e-xteq.com](mailto:serviceusa@e-xteq.com)



*Do not touch the power connector during use. Keep away and Do Not Touch restricted areas of this equipment.*



**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

**Appearance and Dimensions**

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Getting Started 1/6

## SAFETY REMINDERS //////////////

Please review the safety guidelines in this manual before using the MB1550 Module Balancer for safety operations.

The MB1550 module balancer should only be used by persons with relevant knowledge or qualifications in that country/region.

Always wear appropriate protective equipment (protective glasses, insulated gloves, insulated shoes) to operate the battery/module. See page 6 for more information.

When unplugging the MB1550 Module Balancer, pull on the plug frame rather than the cord to reduce the risk of damaging the power plug or cord.

The MB1550 Module Balancer enables a wide range of balancing tasks with 0-150V/0-50A charge capability (0-142, 5V/0-44A modules supported) and discharge capacity up to 1500W.

## APPEARANCE AND DIMENSIONS //////////////

**Dimension Details:**

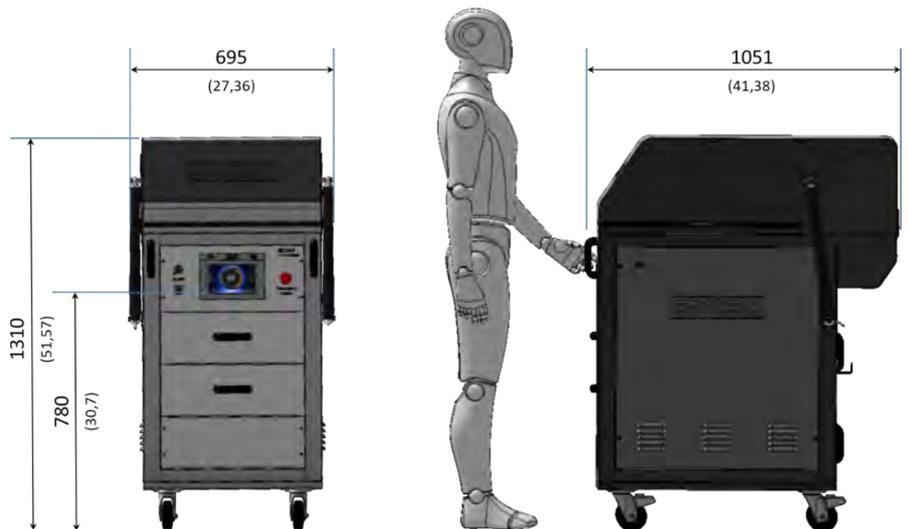
Metrics: 1310 x 1051 x 695 (mm)

Imperial: 51.57 x 41.38 x 27.36 (inch)

**Weight:**

Kilogram: 145 (kg)

Pounds: 320 (lbs)





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

**Appearance and Dimensions**

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Getting Started 2/6

## APPEARANCE AND DIMENSIONS //////////////

### Front and Side View



### Open Cover View



### Rear View



**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

**Appearance and Dimensions**

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Getting Started 3/6

## APPEARANCE AND DIMENSIONS //

### Connection Panel (Under Lid)



**NOTE:**

- The Fan System of the Module Balancer is managed by several internal temperature sensors.
- Monitoring Cable Port 2 is available for future battery modules (See ref. table).
- Monitoring Cable Port 1 is used on the current battery modules (See ref. table).
- Charge/Discharge Port will be the same for charging and discharging battery modules.
- Warning Status Lights will flash every time the lid closes and opens.
- Device Information Placard will provide serial number, product weight, Mfg. date, etc.
- Ethernet Port is to connect the device to internet to be able to update the software.
- Fuse Relay Box is for safety purpose in case of overheating, connecting wrong power cable, etc.
- HDMI Port is for connecting a monitor.
- USB Port is for transferring reports to thumb drive, connecting a keyboard and mouse.
- Emergency Switch in case of an emergency will shut the power off completely.



*During charge/discharge the temperature of the power rack can rise, do not touch or cover the fan cooling system.*

### Status of Warning lights

Lid opening after turning the power on	Red / Green alternative
Lid closing before balancing	Flashing Red
Lid closing before turning the power off	Flashing Red
Balancing completed	Solid Green
Balancing terminated by ERROR or Alarm	Solid Red
Balancing terminated by USER	Solid Red



**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

**Accessories**

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

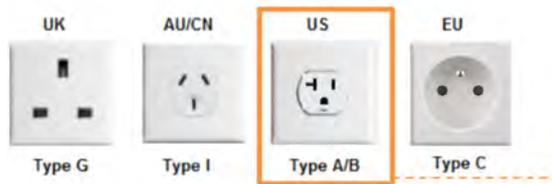
# Getting Started 4/6

## ACCESSORIES // // // // //

### Power Cord

16.4 ft/5m power cord is supplied with the MB1550 Module Balancer.

*\*The cord will be suitable based on the country standards\**



### Charge/Discharge Clamps

The cable will be used for charging and discharging the battery modules.



Charge/Discharge power cable reference number





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

**Accessories**

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Getting Started 5/6

## ACCESSORIES // // // // //

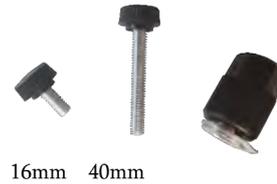
### Terminal Caps

Two pairs of terminal caps are provided with the power cable.

For modules needing a female connector (Module 1), use short terminal cap (16mm).

For modules needing a male connector (Modules 2, 3, 4, 5, 6, 7), use long terminal cap (40mm).

See reference table for further instructions below.



### Monitoring Cables

The monitor connection on the battery module will be different. Please use the correct monitor cable. See reference table for further instructions.



Monitoring cable reference number



**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

**Accessories**

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Getting Started 6/6

## ACCESSORIES //

### Cables compatibility chart

Please refer to the charge and monitoring cable compatibility chart below to find the appropriate set of cables for each module.

Module Number	Name	Model	LIB Type	Cells Monitoring Cable
1	1P8S	HV37, HY51	HEV	T1-184
2	2P2S	ZE0, ME0	EV 24 KW	T1-185
3	2P2S x2	ZE0	EV 30 KW	T1-185
4	2P2S	ME0	EV 40 KW	T1-185
5	2P2S x2	ZE1, ME0, BE0	EV 40 KW	T1-185
6	3P4S	ZE1	EV 62 KW	T1-192
7	3P7S	ZE1	EV 62 KW	T1-193
8	3P9S	ZE1	EV 62 KW	T1-194

### Security Belt

We recommend that the module security belt is always fastened to keep the module secure.

The belt needs to be placed onto the balancing compartment before starting the process as in the pictures below.





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

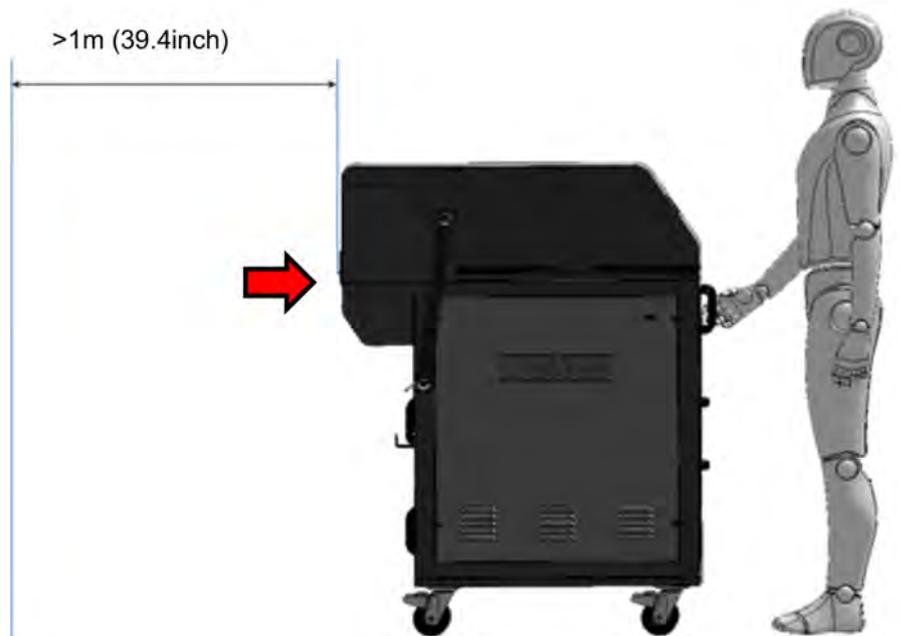
**Technical Specifications**

# Initial Setup 1/8

## INSTALLATION //////////////

The unit needs to be placed in a clean, dry and ventilated area dedicated to EV/HEV applications.

The rear side of the unit must be free and at least at 1m (39.4 in) from a wall or other objects.



*During the balancing process the lid will automatically open and close.*

*The unit extracts hot air and the rear surface may be hot.*

### Wheel Locks

Before turning ON the equipment, always engage the four (4) wheel locks.



**Table of Content****Introduction****Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup****Installation**

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Initial Setup 2/8

**INSTALLATION****Power Cable and Power Switch**

Input power information:

Voltage: 100 – 240 V  
Frequency: 50/60 Hz  
Consumption: 2 kW Maximum)

Connect the power cord to the connector located on the back of the MB1550 Module Balancer, then connect the opposite plug to a standard electrical socket. Switch on the device by setting the switch to the "I" position.

**Ground Connection**

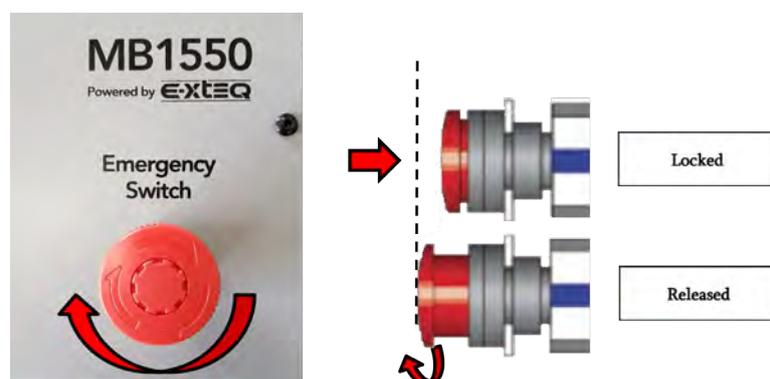
An additional ground connection is available on the rear side of the machine (recommended).

**Emergency Switch**

Located on the front side of the Module Balancer.



The bench will not start if the switch is engaged.



Make sure "Emergency switch" is released before powering on the machine. (Turning clockwise will release the switch).



**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Initial Setup 3/8

## INSTALLATION //////////////

### Main Switch



To power on, turn the switch to "I" position and hold for one (1) second.

## NETWORK //////////////

### Network Connection



The first time the MB1550 is powered on, an internet connection will be prompted.

LAN or Wi-Fi connection will be the options, RJ45 port can be found on the rear panel.

If there is no Ethernet connection, select a Wi-Fi connection. Select the correct name and enter the password. If Wi-Fi does not require password the unit will connect automatically to the internet



Depending on the connection, you may need to wait up to **60 seconds** to establish the connection with E-XTEQ servers. When connected, the unit will automatically go to the login menu.

**Table of Content****Introduction****Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

**Network**

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Initial Setup 4/8

**NETWORK //////////////**

New status will be displayed, and the connection logo will appear at the top right of the screen.



Network settings will be recorded for the next connection.

\*If the connection menu appears again, please check the internet connection or network availability.

Network settings can be modified after from NETWORK settings.



*\*Note: If the network settings change, machine needs to be restarted to enable the change.*

## Login

The module balancer must be connected to internet for the first activation (mandatory).

The unit needs to check if a software version is available.

After the first activation, we strongly recommend connecting the machine to internet:

- To update the software
- To keep track of the logs
- For real-time monitoring and customer assistance
- To synchronize new accounts (if needed)



**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

**Network**

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

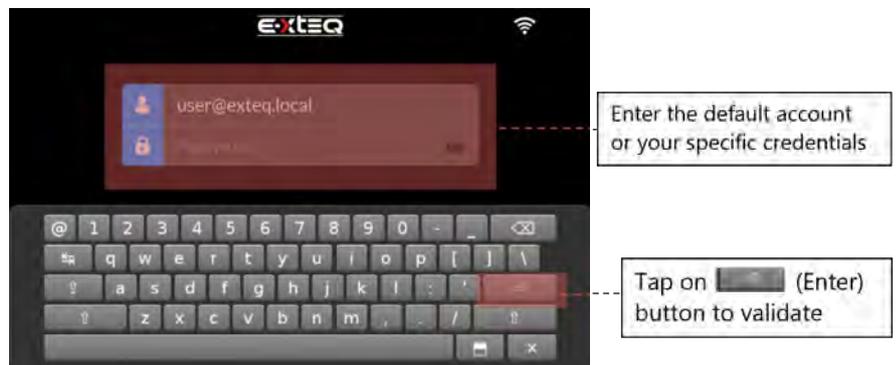
# Initial Setup 5/8

## NETWORK //

Each time the MB1550 powers on, login is necessary.

Default account: [user@e-xteq.local](mailto:user@e-xteq.local)

Default password: pass

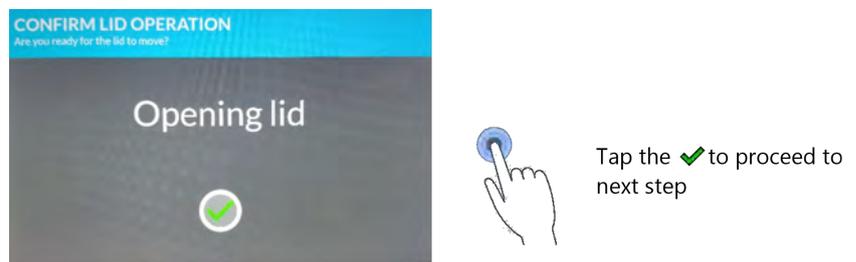


### Automatic Lid

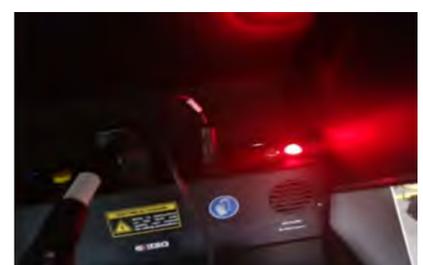
Once logged in, a message will be displayed on the screen, notifying user of the opening lid.

 *The lid is driven by electrical actuators, please make sure there is nothing on the way which would physically prevent the opening of the lid.*

A message will be displayed, after safety confirmation, click on  to confirm.



During this operation, a caution message will appear on the display and the LED lights will start to blink on the connection panel:



**Table of Content****Introduction****Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

**Network****Settings****Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Initial Setup 6/8

**NETWORK //////////////**Safety Anti-Pinch System

To prevent any pinch during the lid closing and to ensure the safety of the user, the module balancer is equipped with an anti-pinch system. The lid will re-open if a person or an object hinders closure. (Detection area is marked in red, which covers the full length of the lid edge).

**SETTINGS //////////////**Languages

From the Main Menu, choose "Settings", "Language" and then select your preferred language.





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

**Settings**

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Initial Setup 7/8

## SETTINGS //////////////

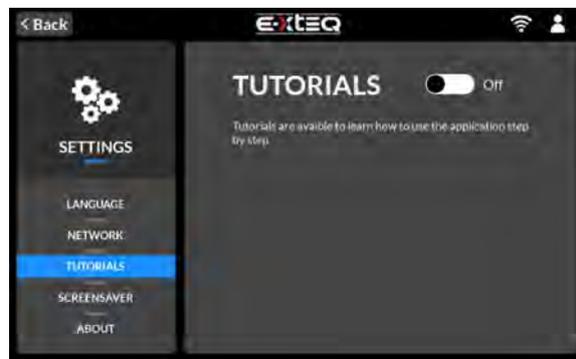
### Network

Network information is available in the "Settings" menu.



### Tutorial

MB1550 is equipped with built-in tutorials to assist in operating the machine. Follow the built-in tutorials to operate the equipment properly.



### About

The device serial number, software version, database version, etc. is located under "About" menu.





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

**Settings**

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Initial Setup 8/8

## SETTINGS //////////////

### Screensaver

Display will turn to screensaver after a specified time. The time setting is adjustable.





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

**Cable connection**

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Balancing 1/12

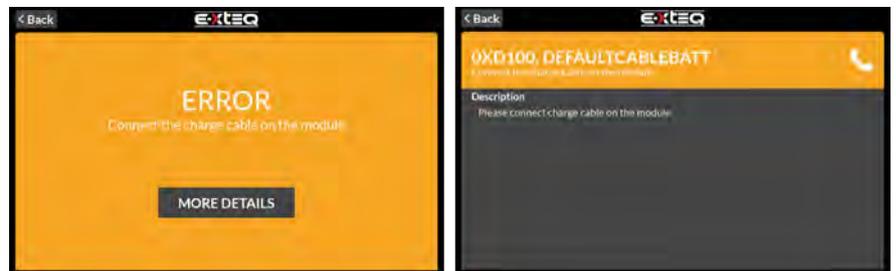
## CABLE CONNECTION //

From the main menu, select "Balancing".

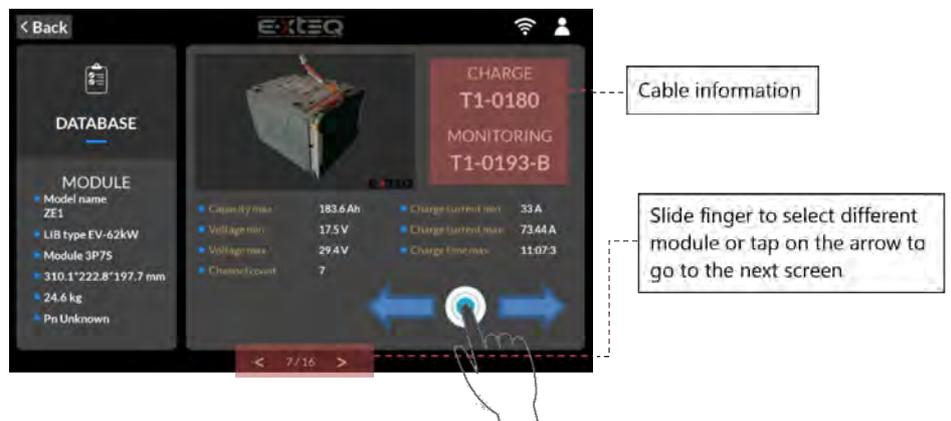


If the charge and monitoring cables are not connected, Warning screen will be displayed to help the user to establish the cable's connection.

Tap on "More Details" to get more information about the error screen.



If charge and monitoring cables are already connected, the unit will select the module available depending on the cable configuration.





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

**Cable connection**

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Balancing 2/12

## CABLE CONNECTION //////////////

Swipe or click on the arrows on the screen to scroll through the different modules and then select the correct module.

The database will provide you with the references of the suitable cables (power and cell monitoring) adapted to that module.



### Cable Connection to the MB1550

First connect the charge cable on the bench then the monitoring cable on Cell 1 or Cell 2 depending on the size. Turn the monitoring cable connector clockwise to secure a proper connection.



### Module Charging/Discharging Cable Connection

For the charge cable, depending on the input (male or female), use the correct charge cable configuration.

Use Table Chart to make sure the proper terminal cap is connected.

- Use shorter terminal cap for module 1





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

**Cable connection**

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Balancing 3/12

## CABLE CONNECTION //////////////

- Use longer terminal cap for module 2, 3, 4, 5, 6, 7, 8



### How to connect

**Step 1:** Turn the cap to screw on the module.



**Step 2:** When connected, turn the main body of the connector until securely fastened.



The connection must be tight to prevent any overheating due to lose connection.

### Monitoring Cable

Each monitoring cable has a specific connector for each module to make sure the connection of the measurement is correct.



If a monitoring cable is damaged, please replace it immediately. Failure to do so may cause incorrect measurements during the balancing procedure or inability to start the process.





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

**Cable connection**

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Balancing 4/12

## CABLE CONNECTION //////////////

### Target Value Settings

After confirming the correct module is selected, tap on "Measure Target Voltage" button.



### Input Target Value

To enter the target value, slide your finger on the touch screen and then tap on "SET".



Click the center of the gauge where the value is displayed, a keypad will display to input the exact value. Confirm the value by tapping "Ok".





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

**Cable connection**

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Balancing 5/12

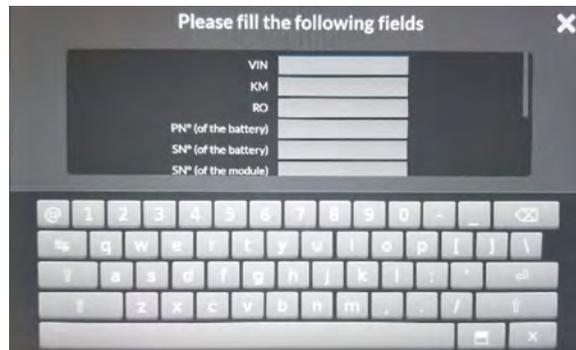
## CABLE CONNECTION //////////////

Validate the value and click on to confirm.



Test information input screen will allow the following: VIN number/Battery information/ module information, etc.

The fields can be left empty if the information is not available.



A prompt screen will appear, asking for confirmation. Tap on to continue.



*The lid is driven by electrical actuators, please make sure there is nothing physically preventing the lid from closing.*

**Test detail information cannot be input afterwards.**

Lid movement confirmation screen will appear after test detail input. Lid will automatically close.



**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

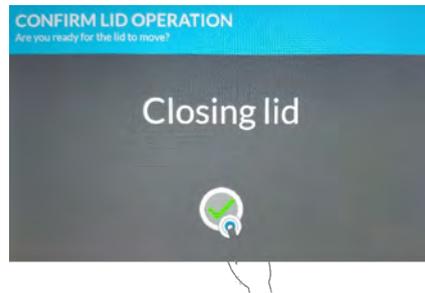
Local Support

**Technical Specifications**

# Balancing 6/12

## CABLE CONNECTION //////////////

A message will be displayed, after safety confirmation, click on to confirm. When lid is moving, a warning message will be displayed. Balancing will automatically start after the lid is closed.



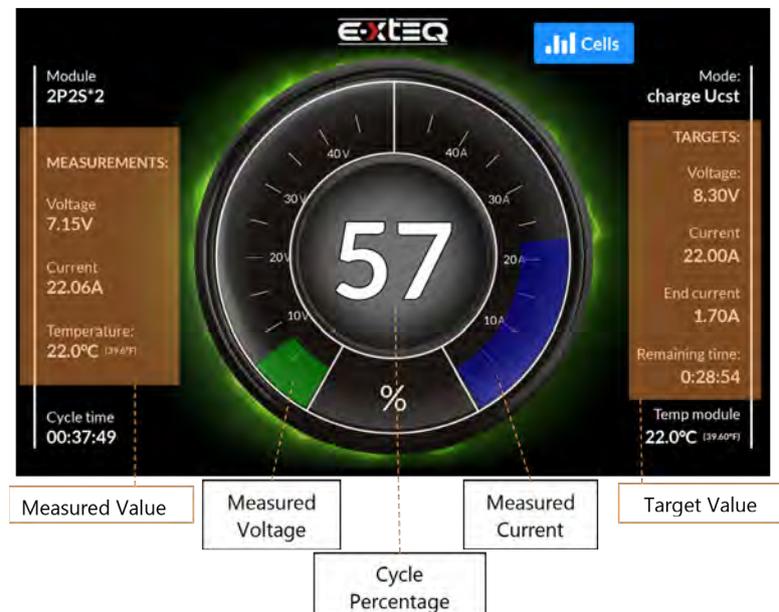
## CHARGE/DISCHARGE PROCESS //////////////

Depending on the target values entered, the MB1550 will charge or discharge the module.

(If the input value is higher than the current, module will be charged, if input value is lower than the current, module will be discharged)

- Percentage of the progress is displayed in the center of the screen.
- On the left side of the screen, the module code and the measurement details will be displayed. (voltage, current, temperature and cycle time).
- On the right column, the mode (charge/discharge) and the target values of the charge/discharge will be displayed, as well as the temperature.

Example of screen showing the progress of the charge (green background):





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Balancing 7/12

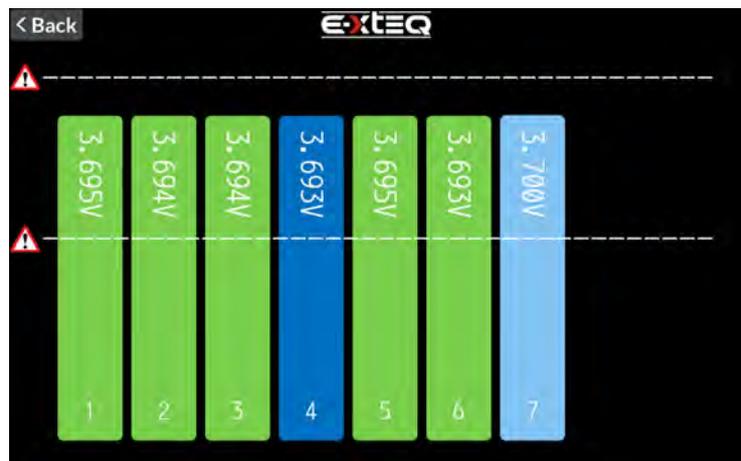
## CHARGE/DISCHARGE PROCESS

Example of screen showing the progress of the discharge (white background):



To see the cells charging in detail, tap on 'CELLS' tab.

Below is an example of cells real-time voltages in detail. White dotted lines indicate the max/min of the cell voltage based on the database.



The cell with the lowest value is in blue. The cell with the highest value is in sky blue.



**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

**Charge/Discharge Process**

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

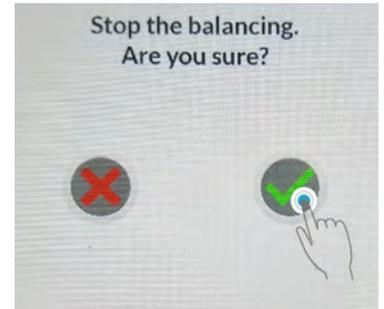
Local Support

**Technical Specifications**

# Balancing 8/12

## CHARGE/DISCHARGE PROCESS //

If you want to stop a balancing process, press and hold at the center of the gauge (where the value is displayed). A warning message will be displayed:



Tap on  button, to confirm the termination of the process. Balancing will stop and the lid will open after operator confirms.

The message displayed on the report will be: "NOK Terminated by user".

Module status can be confirmed.





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

**End of Charge/Discharge Process**

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

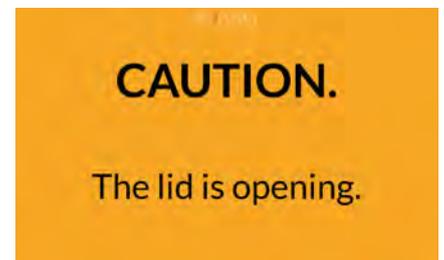
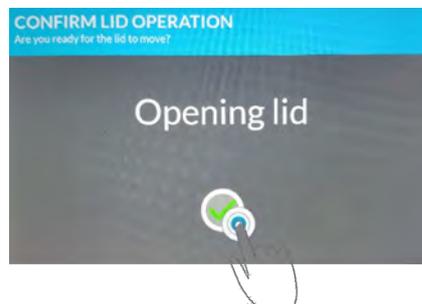
# Balancing 9/12

## END OF CHARGE/DISCHARGE PROCESS //////////////

When the charge/discharge reaches the 100% progression (current or voltage threshold is reached), the MB1550 will stop the operation, and display the lid movement confirmation screen.

 *The lid is driven by electrical actuators, please make sure there is nothing physically preventing the lid from opening.*

A message will be displayed. After safety confirmation, click on  to confirm.



Once the module is complete Click on "Report" button to preview the generated report.





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

**End of Charge/Discharge Process**

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Balancing 10/12

## END OF CHARGE/DISCHARGE PROCESS //////////////

Report file (PDF) can be downloaded from USB port.

Refer to Page Refer to pages 29 and 30 for the procedure.



The module balancer stores the balancing reports in the internal memory. They are downloadable through USB port.

When USB memory is connected, the user can select to download: "LAST REPORT" or "All".





**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

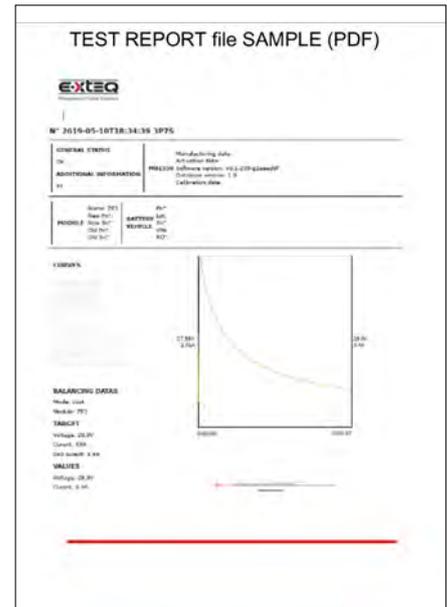
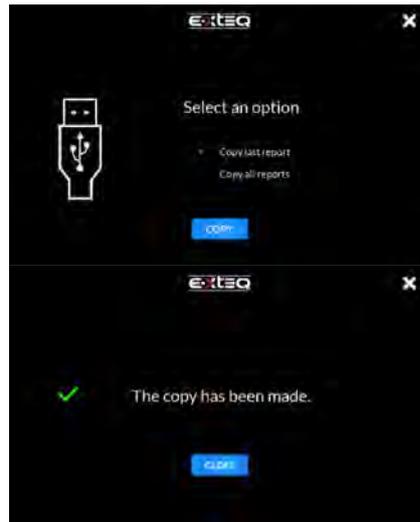
Error Table

Local Support

**Technical Specifications**

# Balancing 11/12

## END OF CHARGE/DISCHARGE PROCESS //////////////



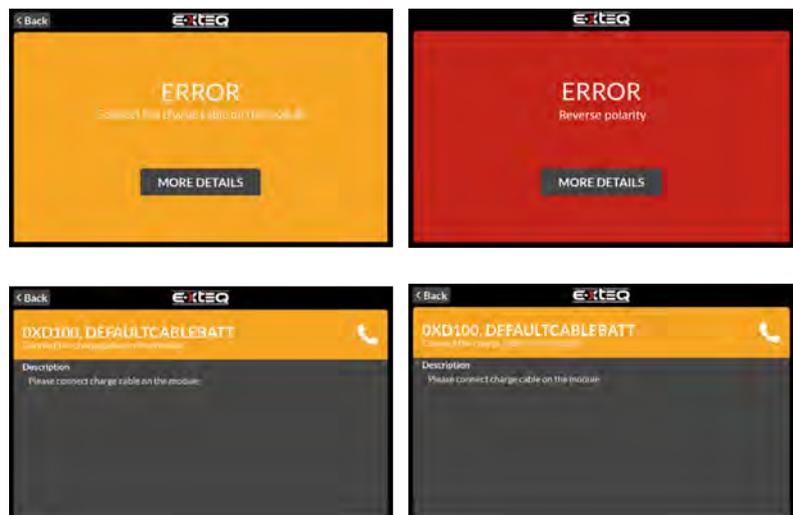
## ALARM AND SECURITY SCREENS //////////////

### Warning Messages

The integrated thresholds (from the database) of the MB1550 software will prevent the overvoltage and the overcurrent outputs, the internal temperature and the backflow.

The equipment will also have status lights on the connection panel to alert the user.

Example of warning and alarm screens:



**Table of Content****Introduction****Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

**Power Off****Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

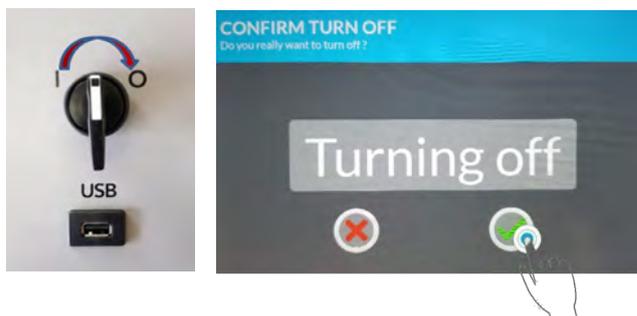
**Technical Specifications**

# Balancing 12/12

**POWER OFF //////////////**

Turn the main switch to "0", hold it more than 1s.

A confirmation screen will be displayed:



Tap on button to confirm POWER OFF.

Lid will automatically close.



**Table of Content**

**Introduction**

**Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Warranty

## LIMITED WARRANTY //////////////

The MB1550 product is backed by a Limited 2-Year Warranty. This warranty covers manufacturer defects and workmanship. The warranty excludes misuse or abuse and normal wear and tear. All accessories are backed by 1-Year Warranty for only manufacturer defects.

All parts with 1-Year Warranty are listed below. Please read "How to obtain warranty" instructions in order to receive the correct parts and prevent any charges.

Accessories:

- AC Power Cord
- Module Charge Cable
- Monitoring Cable

## HOW TO OBTAIN WARRANTY //////////////

Before sending a unit back for repair, an RMA (return materials authorization) number must be obtained by E-XTEQ customer service. To get an RMA number, the customer/end user must call the toll number under support section below. We will ascertain if the unit needs to come in for repair or replacement.

If the unit has to be replaced, E-XTEQ will provide full instructions in order for the end user to receive the replacement parts within 48 hours.

**Table of Content****Introduction****Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

Technical Specifications

# Support Information

**ERROR TABLE //////////////**

WARNING MESSAGE	SCREEN MESSAGES	WHAT TO DO?
WARNING	Communication failure	Please restart the machine to reboot the complete system
WARNING	Reverse polarity	Reverse + and – charge/discharge connectors on the module
CAUTION	Connect the charge cable on the bench	The charge cable needs to be connected to the bench. For additional help contact your local distributor or E-XTEQ technical support.
CAUTION	Monitoring cable disconnected on the bench side	The monitoring cable needs to be connected to the bench. For additional help contact your local distributor or E-XTEQ technical support.
CAUTION	Please connect the charge cable on the module	The charge cable needs to be connected to the module. For additional help contact your local distributor or E-XTEQ technical support.
CAUTION	Please plug the cell cable to the module	The monitoring cable needs to be connected to the module. For additional help contact your local distributor or E-XTEQ technical support.
CAUTION	The LID is opening	The bench cover is opening, please be careful on the associated area to prevent interaction with environment and/or persons
CAUTION	The LID is closing	The bench cover is closing, please be careful on the associated area to prevent interaction with environment and/or persons

**LOCAL SUPPORT //////////////**

If assistance is needed, please contact your distributor:

**AMERICAS:**

E-XTEQ Technical Support

1-877-453-3265

[serviceusa@e-xteq.com](mailto:serviceusa@e-xteq.com)[www.e-xteq.com](http://www.e-xteq.com)**ASIA / OCEANIA:**

+81-3-5659-8178

[altiainfo@altia.co.jp](mailto:altiainfo@altia.co.jp)<http://altia.co.jp/english/inquiry/>**EMEA:**

00800 7797 79 20 (toll free)

0049 6182 959 406

[tss-technical-support@bosch-automotive.com](mailto:tss-technical-support@bosch-automotive.com)

**Table of Content****Introduction****Safety Guidelines**

Maintenance and Storage

Before Use

Safety Clothing

Usage Precautions

**Getting Started**

Safety Reminders

Appearance and Dimensions

Accessories

**Initial Setup**

Installation

Network

Settings

**Balancing**

Cable connection

Charge/Discharge Process

End of Charge/Discharge Process

Alarm and Security Screens

Power Off

**Warranty**

Limited Warranty

How to Obtain Warranty

**Support Information**

Error Table

Local Support

**Technical Specifications**

# Technical Specifications

**E-XTEQ MB1550 // // // // //****Electrical specification**

Voltage: 100 – 240 V

Frequency: 50/60 Hz

Consumption: 2 kW

Output current accuracy:  $\pm 0,1A$  Resolution: 0.01AOutput voltage accuracy:  $\pm 10$  mV Resolution: 1mVCell voltage measurement: Accuracy:  $\pm$  read value x 0.1% Resolution: 1mV

Temperature: Accuracy: 0.18°F Resolution: 0.18°F

(CTN 10kOhm)

**Charge mode**

100V &lt; Vac &lt; 180V Vac &gt; 180V

Channel1 (60V-50A): 60Vdc/I=33A max 60Vdc/50A max

Channel2 (150V-20A): 150Vdc/I=13A max 150Vdc/20A max

**Discharge mode**

Max power Dissipation: 3000W

Max voltage: 150 Vdc

Max current: 50 A

**Imperial**

Dimensions(in): 12.2 x 41.4 x 27.4 (in)

Weight (lbs.): 485 lb.

Display: 7" Touch panel

Protection index: IP 2X

Use temperature: 32°F to + 104°F

Storage temperature 4°F to 140°F

Relative humidity: 0 to 90% Non-condensing

**Metric**

Dimensions(mm): 310 x 1051 x 695 (mm)

Weight (kg): 145 kg

Display: 7" Touch panel

Protection index: IP 2X

Use temperature: 0°C to + 40°C

Storage temperature -20°C to 55°C

Relative humidity: 0 to 90% Non-condensing



*Detroit, Paris, Yokohama, Shanghai, Taiwan.*

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