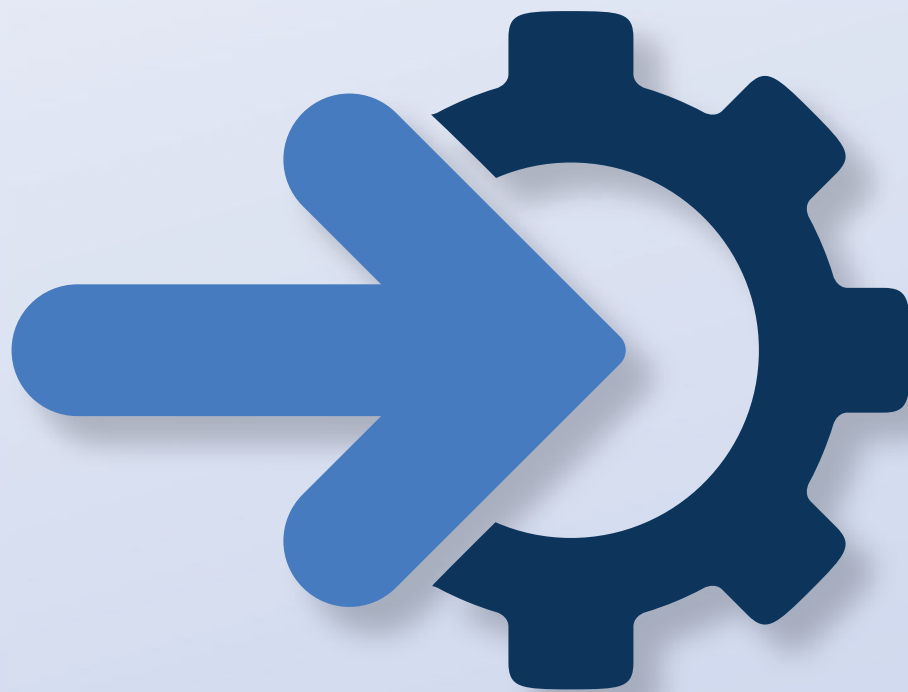


SUNLIGHT

Li.ONFORCE

■ Operation, Safety and Installation Manual
of **Li.ON FORCE** Batteries



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POWER IS KNOWLEDGE

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Operation, Safety and Installation Manual of **Li.ON FORCE** Batteries

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Please keep this manual in the area of use.
All users should be familiar with the following instructions.

1. Introduction

1.1 Purpose of this Manual

This manual provides information and instructions needed in order to use the Sunlight Li.ON FORCE Batteries in electric forklift trucks with safety.

1.2 Scope

The following parts are included in the scope of supply:

- Li.ON FORCE Lithium-Ion battery system.
- Documentation (Operating, Safety and Installation Instructions).
- External multi-functional display.
- After unpacking the parts, please examine them for possible damage. If any damage is found, please do not use the product; if in doubt, please contact Systems Sunlight.

1.3 Product Description

A Li.ON FORCE battery consists of the following main parts:

- i. The battery modules, which consist of series-connected cells encased in aluminum plates. The modules are connected in series and in parallel, depending on the voltage and the capacity of each battery.
- ii. The Battery Management System - BMS (MAB, CMU and secondary safety boards).
- iii. Contactors.

iv. Fuses.

v. The metallic tray.

vi. The user interface control panel.

vii. Compact Display Telecommunication Box with Sunlight cloud (GLocal).

The purpose of the battery is to deliver electric current to electric forklift trucks, respecting the following key principles:

- protection from short circuits and inappropriate charging
- protection from over/under voltage
- protection from over-discharging
- protection from over and under temperature

1.4 Environmental working conditions

Charging Working Temperature:

+2°C to +42°C (+35.6°F to +107.6°F).

Discharging Working Temperature:

-18°C to +52°C (-0.4°F to + 125.6°F).

Relative Humidity: 15% - 90% @ 25 ±5°C (77±9°F).

Atmospheric Pressure:

86KPa~106KPa @ 25 ±5°C (77±9°F).

1.5 Storage

- i. Standard Storage Temperature (more than 1 month): -20°C to +25°C (-4°F to +77°F).
- ii. Absolute Storage Temperature Short term (within 1 month): -20°C to +45°C (-4°F to +113°F).
- iii. Storage Humidity: <70%RH.
- iv. Store the battery in State of Charge (SoC) ~60%. Stored batteries should be fully charged (100%) and discharged at ~60% every four months.
- v. Store Li.ON FORCE batteries in separate storage area, in case of mixed storage of other goods. Keep 2,5m (98.42in) distance between the batteries and the other goods.
- vi. Limited quantities shall be stored in each area, for example, for a 100 m² (1076.39ft²) area the quantity should not be larger than 10 euro-pallets or an equivalent of 10 m³ (13.08yd³) of batteries.
- vii. The safety team of the storage area shall define the required safety measures.

1.6 Certifications

Batteries: UN38.3, designed according to UL2580, IEC62619.

Cells: IEC62619-2017, UN38.3, IEC62660-3-2016 and UL1642.

1.7 Product Life

The product life is specified in the warranty.

1.8 Disposal

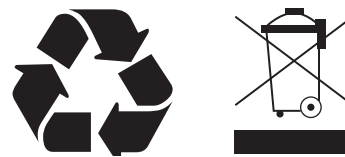
Lithium-Ion batteries are subject to disposal and recycling regulations that may vary by country and by region. Always check and follow the applicable regulations before disposing any battery.

Disposal of Lithium-Ion battery shall be carried out according to local, state and federal laws and regulations.

Many countries prohibit the disposal of waste electronic equipment in standard waste receptacles.

Batteries may be returned to the manufacturer if no disposal and recycling regulations are in place.

Do not mix with other (industrial) waste.



2. Safety Related Topics

2.1 Inputs

- Charging current (IN)
- Discharging current (OUT)
- Cells Voltage
- Temperature

2.2 Boundary of Battery's Safety System

The Battery Pack (Cells), Conductors, Fuses, Shunt Resistor, BMS are within battery's safety boundary.

The following are considered to be outside of the battery's safety boundary and is not Systems Sunlight's responsibility to perform a safety assessment:

- Charger
- Forklift truck electric equipment/load
- Human error
- External sources of short circuit

Wireless connection to GLocal is not part of the safety boundary.

2.3 Safety Instructions



1. Before using Sunlight Li.ON FORCE Batteries, read all instructions and cautionary markings on the Batteries, and all appropriate sections of this manual.
2. Li.ON FORCE Batteries must be fully charged before commissioning. Failure to do so will void the Warranty.
3. Use of accessories not recommended or sold by Systems Sunlight may result in a risk of fire, electric shock, or injury to persons and will void the Warranty.
4. To reduce the risk of damage to the discharging plug, pull the plug rather than the cable when disconnecting the battery from the forklift.
5. The battery must be installed and operated as it is described in the Installation Manual and any other product documentation.
6. Do not operate the battery with damaged cables or plugs. Inform Systems Sunlight immediately.
7. Do not operate the battery if it has received a sharp blow, been dropped, or otherwise damaged during shipping. Inform Systems Sunlight immediately.
8. Do not disassemble the battery in case of inappropriate operation. Incorrect reassembly may result in a risk of fire, electric shock or injury to persons. Inform Systems Sunlight immediately.
9. Use charger recommended or provided from Systems Sunlight only.
10. Do not expose charger to rain or snow.
11. Check polarity of battery charging and discharging plugs prior to the connection with the charger and the forklift.
12. Service is performed only by Systems Sunlight's authorized personnel.
13. Do not disassemble, crush, modify or heat the battery.
14. Keep the battery away from fire.
15. Do not expose the battery to temperatures $>60^{\circ}\text{C}$ (140°F).
16. Do not short circuit terminals.
17. Do not immerse, throw or wet battery in any liquid.
18. During usage and storage, if any peculiar smell, heat or any other abnormal phenomenon occur to the battery, please shut down the battery immediately.
19. If, during operation, the battery emits an unusual smell, develops heat, or behaves abnormally, the battery should be isolated from air by any measures (except using water), by using fire extinguishers such as AVD type and F-500 agent type and/or Lithium fire blankets. The battery should be treated after smoke dispersing. Contact Systems Sunlight if any of these problems are observed.
20. In the event of vehicle collision, the voltage manual disconnection button (emergency button) of the vehicle should be used, which every forklift is equipped with.

A label with main information is fitted to each battery (Picture 1).

Picture 1: Example of Battery label

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4. Installation into the forklift

4.1 “Sit Down” Forklifts:

The following instructions apply to forklifts with a battery that must be Lifted Out.

Any mistake or wrong judgment could result in damage to the forklift or to the facility, or severe injury. If you are not sure of your ability to install the battery with safety after reading these instructions, please do not try it. Systems Sunlight is not liable for injury, loss or damage of any kind incurred by a customer attempt to remove or install a battery.

The following are required for the installation:

- i. A second forklift truck or a suitable crane of adequate capacity to lift the batteries (old and new battery).
- ii. Lifting Belts or a chain, approx. 2m (78.74in) long, with “C” hooks at each end.
- iii. Empty pallet for the scrap battery.

Important safety notes:

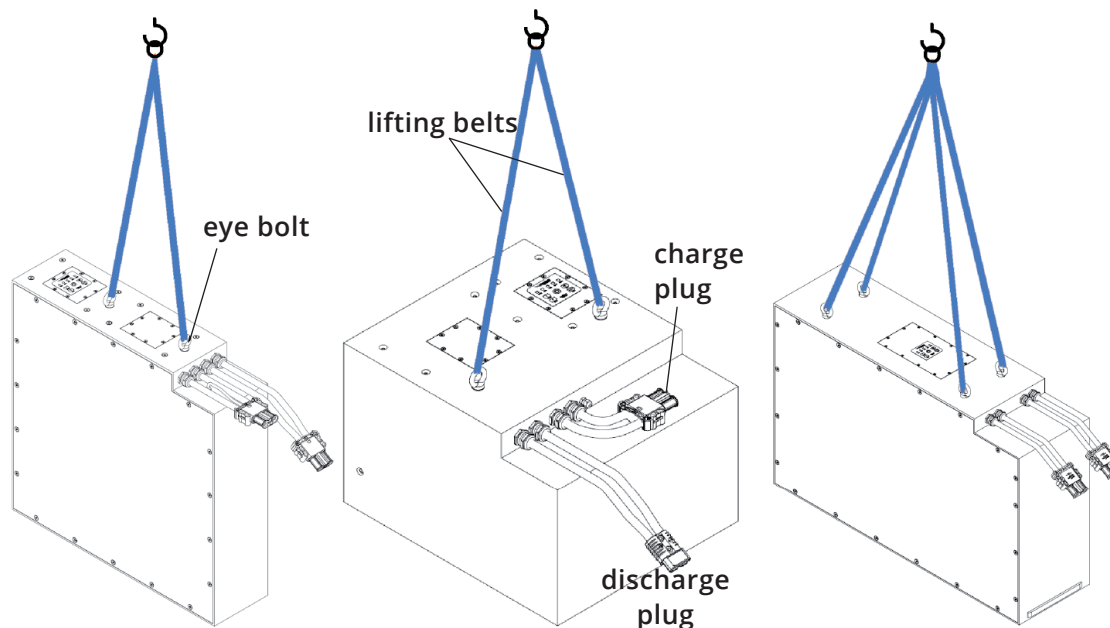
- Check the capacity rating of your forklift or crane to be sure that it can handle the weight.
- Do not try to lift a battery with under-rated equipment.
- Check clearances to avoid damage to the hood, steering wheel, levers, etc.
- The area where the installation takes place, should be clear, flat, unobstructed with adequate height.
- Scrap or discharged batteries still store enough energy to cause arcing, sparks, burns and explosion, and must be treated with the same care as fully charged new or reconditioned batteries.
- Use a fellow worker with good communication skills. Stay in constant communication.

- Do not make sudden moves that cause the battery to swing or slide.
- Do not put cables, body, hands or feet near “Pinch Points”.

Installation:

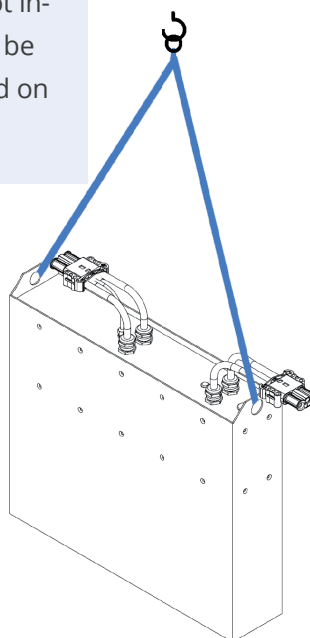
- Mount the eye bolts, procured from Systems Sunlight, by screwing them on the upper part of the battery.
- Lift the battery from the eye bolts with lifting belts or chain and place it in the battery compartment of the forklift (Picture 2a).

⚠ Check the discharging plug of the battery to be in the right side of the forklift i.e. where the plug of the forklift is!



Picture 2a Lifting of the battery from the eye bolts mounted on the tray

NOTE: If the design of the battery does not include eye bolts, then the lifting belts must be applied in the lifting rings which are placed on the sides of the battery tray (Picture 2b).



Picture 2b Lifting of the battery from the rings mounted on the tray

The instructions above must be followed in reverse order to remove the old battery.

4.2 Reach trucks /Narrow Isle Trucks

The following instructions apply to forklifts with battery that Rolls Out.

What is required:

- I. A hydraulic or electric pallet jack.
- II. A block of wood to support the battery.
- III. A 2m (78.74in) chain or lifting belts with hooks to lift the battery.
- IV. A second forklift or crane capable of lifting the weight of the battery.

How to remove the old battery:

- Make sure that the battery is wide enough to fit in both forks of the pallet jack.
- Pull the battery out by approximately 30cm (11.81in), so that the pallet jack can get underneath.
- Lift the battery slightly and pull it out 75%, so that the far end is still supported by the forklift rollers. Do not pull out the battery too far as there is a danger the battery falls off from the last roller.
- Place the wooden block(s) under the near end of the battery to support it and lower the battery. The block(s) should be tall enough to keep the battery in the same level as the last roller of the battery compartment.
- Drive the pallet jack forward as far as possible. Lift the entire battery so that it is fully supported by the pallet jack and above the forklift rollers in the compartment. Do not lift too high or the battery will hit the top of the battery compartment.
- Remove the block(s) and back up so that the battery is completely clear of the forklift.
- Lift the battery from the pallet jack and place it on a pallet for return.

Installation of new battery:

- The instructions above must be followed in reverse order.
- The battery cables on the replacement battery must be on the correct side when placing the

battery on the pallet jack. Be careful during installation not to harm the cables.

- Do not leave the cables on top of the battery because there is not enough space to retrieve the plug once the battery is fully installed.
- Put the cover plate back in place after the installation of the new battery, so that the battery does not roll out.

Important notes:

- The working area must be with adequate space for work and height for lifting.
- Batteries may roll in and out very easily.
- Defective cables can short and spark, causing the battery to explode.
- Do not try to stop a falling battery - be prepared to step aside if the situation gets out of control.

5. Battery use information

5.1 General instructions

- Opportunity charging is permitted and recommended.
- Charge the battery directly when SoC is $\leq 5\%$.
- Do not leave the battery in a SoC $\leq 20\%$ for more than 3 months.
- Charging is not allowed at temperatures $\leq +2^{\circ}\text{C}$ ($+35.6^{\circ}\text{F}$). The BMS will automatically reduce the charging current in low temperatures ($+2^{\circ}\text{C}$ to $+10^{\circ}\text{C}$ / $+35.6^{\circ}\text{F}$ to $+50^{\circ}\text{F}$) and completely stop charging current at temperatures $\leq 0^{\circ}\text{C}$ ($+32^{\circ}\text{F}$).

5.2 Battery Function

- Charging is performed automatically when the charger is connected to the charging plug, within specified temperature limits ($+2^{\circ}\text{C}$ to $+42^{\circ}\text{C}$ / $+35.6^{\circ}\text{F}$ to $+107.6^{\circ}\text{F}$), only to a defined voltage limit, with a current which is supplied from the charger and regulated from the BMS. The limits for Voltage, Temperature and Current are set in the BMS without the intervention of the user.
 - Discharging within specified temperature limits (-18°C to $+52^{\circ}\text{C}$ / -0.4°F to $+125.6^{\circ}\text{F}$), only to a defined voltage limit, with a current defined from the needs of the forklift's motors and other electric subsystems. The limits for Voltage, Temperature and Current are set in the BMS without the intervention of the user.
- Each battery is designed to meet the power and energy requirements for specific forklifts.
- The battery's operational limits are fully controlled from the BMS which consists of three types of electronic boards (the MAB, the CMU and the secondary safety boards), contactors and switches.

The BMS protects the battery from the following dangerous failure modes:

Over/under voltage, over-discharge, over/under temperature, overcurrent IN and OUT.

MAB board is the central board and one is placed at each battery. In this board all monitored signals from the sensors mounted on the battery (temperature sensors, shunt resistor) and the signals from the CMU boards (cell voltages and temperatures) are gathered.

MAB is responsible for:

- i. The management of the auto power off.
- ii. The communication with the charger.
- iii. The communication with the battery.
- iv. The communication with all the CAN BUS attached devices.

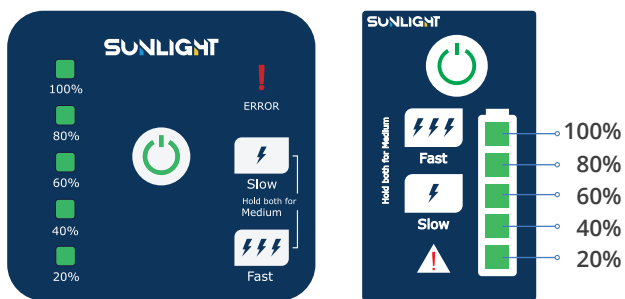
Furthermore, MAB has 8 digital I/O's which can give to BMS more functions such as heating, cooling etc., in case it is required.

- vi. Connection to GLocal (Sunlight's Cloud Platform), through GSM or Wi-Fi, for monitoring the performance and editing the settings (if it is needed).

CMU monitors the voltage of 8 cells, performs the balancing of the cells and monitors the temperature (2 sensors per 8 cells) and the insulation resistance. The number of CMU boards depends on the voltage and Ah of the battery.

5.3 Control panel operation

- i. There are two types of control panels (big and small) placed on the battery, with the same function. The control panels (Picture 3) have 5 green LEDs which are used to show the SoC of the battery in normal use and to inform the user for the error messages which are displayed by flashing certain LEDs depending on the type of error. In the paragraph 5.3.ix the combination of the flashing LEDs is shown in accordance with the error message meaning.



Picture 3 Big and compact small panel

- ii. Error LED. In case of error message turns to red.
 iii. On/Off button.
 iv. Slow charge button. By pressing this button, the standard (slow) charge function is activated. The standard charge rate is normally 0,25C current rate unless something else is asked from the customer. It is coloured white when is pressed and the 5 green LEDs are flashing with slow pace.
 v. Fast button. By pressing this button, the fast charge function is activated. The fast charge rate is normally 0,75C current rate unless something else is asked from the customer. It is coloured white when is pressed and the 5 green LEDs are flashing with fast pace.
 vi. During charge, by pressing the Slow and Fast buttons simultaneously the user can select medium charge rate. The medium charge rate is normally 0,5C current rate unless something else is asked from the customer. The 5 green LEDs are flashing with medium pace (compared with fast and slow).

- vii. During discharge, by pressing the Slow and Fast buttons simultaneously the user can select extension of DoD. This function is used in case the user has neglected to charge the battery resulting to the relays opening. By pressing the two buttons simultaneously the user has a period of 10 minutes to drive the forklift to the charger.

viii. Emergency switch-off.

- a) When the battery is on and in standby mode, press the On/Off button to switch off the battery. By pressing the On/Off button, all the contactors of the battery will open (break) and no voltage will be presented neither in charging, nor in discharging plugs.
 b) When the battery is in operation (charging or discharging) and the current is >10A (charge) or <-10A (discharge) the battery cannot be turned off by pressing only the On/Off button.

In order to switch off the battery in an emergency case during operation, the On/Off and the fast charge buttons must be pressed at the same time.

ix. Alarms displaying.

The errors and the warnings that could possibly occur to the battery during the operation are visible on the control panel. The flashing speed and the combination of the LEDs together define the occurred alarm.

The sequence of the flashing speed of the LEDs is shown below:

Fast: flashing LED 125 msec ON, 125 msec OFF.

Normal: flashing LED 250 msec ON, 250 msec OFF.

Slow: flashing LED 500 msec ON, 500 msec OFF.

When the LED is OFF, the cell of the table is blank.

In the 2 following tables the definition of the occurred alarms is shown in accordance with the flashing LEDs' sequence and the alarm clear mode. If an error does not allow the battery to operate, contact Systems Sunlight for further assistance.

NOTE: All the alarms are shown also in the Compact Display Telecommunication Box presented in the following pages.

SN	error type	LED 20%	LED 40%	LED 60%	LED 80%	LED 100%
1	Cell over voltage				Fast	Fast
2	Cell end of life voltage			Fast		Fast
3	Cell under voltage			Fast	Fast	Fast
4	Cell over temperature		Fast			Fast
5	Cell under temperature		Fast		Fast	Fast
6	System over temperature		Fast	Fast		Fast
7	System under temperature		Fast	Fast	Fast	Fast
8	Cell temperature sensor open (all sensors of the cell)				Normal	Fast
9	Cell temperature sensor short (all sensors of the cell)			Normal		Fast
10	System temperature sensor open (MAB NTC sensor)			Normal	Normal	Fast
11	System temperature sensor short (MAB NTC sensor)		Normal			Fast
12	Short circuit		Normal		Normal	Fast
13	Over current		Normal	Normal		Fast
14	Discharge current		Normal	Normal	Normal	Fast
15	Charge current max				Normal	Normal
16	Charge contactor AUX contact			Normal		Normal
17	Load contactor AUX contact			Normal	Normal	Normal
18	Safety contactor AUX contact		Normal			Normal
19	Load/safety contactor failed		Normal		Normal	Normal
20	CMU communication		Normal	Normal		Normal
21	Insulation resistance low		Normal	Normal	Normal	Normal
22	Insulation resistance hardware error				Slow	Fast
23	Battery voltage measurement difference			Slow		Fast
24	Cell high voltage			Slow	Slow	Fast
25	Cell low voltage		Slow			Fast
26	Cell high temperature		Slow		Slow	Fast
27	Cell low temperature		Slow	Slow		Fast
28	System high temperature		Slow	Slow	Slow	Fast
29	System low temperature				Slow	Normal
30	Cell temperature sensor open (the other is operational)			Slow		Normal
31	Cell temperature sensor short (the other is operational)			Slow	Slow	Normal
32	Regeneration current		Slow			Normal
33	High cell resistance		Slow		Slow	Normal
34	High pack resistance		Slow	Slow		Normal
35	Low state of charge		Slow	Slow	Slow	Normal
36	Absolute maximum battery voltage				Slow	Slow
37	Absolute minimum battery voltage			Slow		Slow
38	Startup battery low voltage			Slow	Slow	Slow
39	System temperature values difference		Slow			Slow
40	SD card error		Slow		Slow	Slow
41	Real Time Clock error		Slow	Slow		Slow

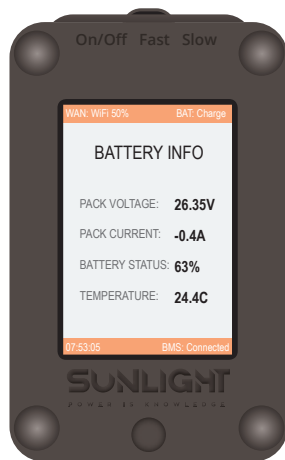
Table 1 Error types & Flashing LEDs' sequence

SN	error type	Alarm type	Action	Alarm clears when:
1	Cell over voltage	Error	open discharge contactor	Alarm cause removed
2	Cell end of life voltage	Error	open discharge/charge contactors	On/off Button pressed
3	Cell under voltage	Error	open charge contactor	On/off Button pressed
4	Cell over temperature	Error	open discharge/charge contactors	Alarm cause removed
5	Cell under temperature	Error	open discharge/charge contactors	Alarm cause removed
6	System over temperature	Error	open discharge/charge contactors	Alarm cause removed
7	System under temperature	Error	open discharge/charge contactors	Alarm cause removed
8	Cell temperature sensor open (all sensors of the cell)	Error	open discharge/charge contactors	Alarm cause removed
9	Cell temperature sensor short (all sensors of the cell)	Error	open discharge/charge contactors	Alarm cause removed
10	System temperature sensor open (MAB NTC sensor)	Error	open discharge/charge contactors	Alarm cause removed
11	System temperature sensor short (MAB NTC sensor)	Error	open discharge/charge contactors	Alarm cause removed
12	Short circuit	Error	open discharge/charge contactors	On/off Button pressed
13	Over current	Error	open discharge/charge contactors	Alarm clear mode after 5 seconds of deactivation of contactors and if alarm cause is removed
14	Discharge current	Error	open discharge contactor	same as above
15	Charge current max	Error	open charge contactor	On/off Button pressed
16	Charge contactor AUX contact	Error	open charge contactor	On/off Button pressed
17	Load contactor AUX contact	Error	open discharge/charge contactors	On/off Button pressed
18	Safety contactor AUX contact	Error	open discharge/charge contactors	On/off Button pressed
19	Load/safety contactor failed	Error	open discharge/charge contactors	On/off Button pressed
20	CMU communication	Error	open discharge/charge contactors	Alarm cause removed
21	Insulation resistance low	Error	open discharge/charge contactors	Alarm cause removed
22	Insulation resistance hardware error	Error	open discharge/charge contactors	Alarm cause removed
23	Battery voltage measurement difference	Error	open discharge/charge contactors	Alarm cause removed
24	Cell high voltage	Warning	no contactors opening	Alarm cause removed
25	Cell low voltage	Warning	no contactors opening	Alarm cause removed
26	Cell high temperature	Warning	no contactors opening	Alarm cause removed
27	Cell low temperature	Warning	no contactors opening	Alarm cause removed
28	System high temperature	Warning	no contactors opening	Alarm cause removed
29	System low temperature	Warning	no contactors opening	Alarm cause removed
30	Cell temperature sensor open (the other is operational)	Warning	no contactors opening	Alarm cause removed
31	Cell temperature sensor short (the other is operational)	Warning	no contactors opening	Alarm cause removed
32	Regeneration current	Error	no contactors opening	Alarm cause removed
33	High cell resistance	Error	open discharge contactor	Alarm clear mode after 5 seconds of deactivation of contactors and if alarm cause is removed
34	High pack resistance	Warning	no contactors opening	Alarm cause removed
35	Low state of charge	Warning	no contactors opening	Alarm cause removed
36	Absolute maximum battery voltage	Error	open discharge/charge contactors	Alarm cause removed
37	Absolute minimum battery voltage	Error	open discharge/charge contactors	Alarm cause removed
38	Startup battery low voltage	Error	open discharge/charge contactors	Alarm cause removed
39	System temperature values difference	Warning	no contactors opening	Alarm cause removed
40	SD card error	Warning	no contactors opening	Alarm cause removed
41	Real Time Clock error	Warning	no contactors opening	Alarm cause removed

Table 2 Error types, Action & Alarm Clearance

5.4. Compact Display Telecommunication Box

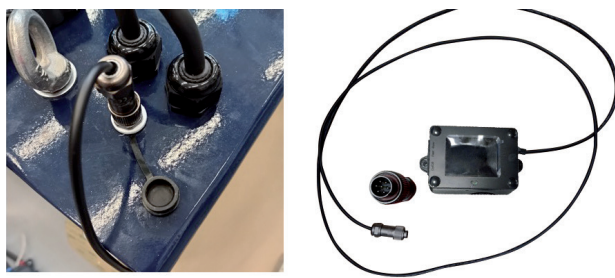
The Li.ON FORCE batteries are equipped with the Compact Display Telecommunication Box (Picture 4).



Picture 4 Compact Display Telecommunication Box

5.4.1 Functions and use of the Compact Display Telecommunication Box

This display is connected permanently to the battery via a 7pin cable.



Picture 5 Connection of Compact Display to the battery

The functions and the use of the Compact Display Telecommunication Box is described below:

- i. Communicates with the battery via Wi-Fi and displays all the critical parameters of the battery (alarms, temperature, battery voltage, battery current, and SoC).
- ii. Switching On/Off the battery from the Compact Display Telecommunication Box. To switch off the battery the On/Off button must be pressed continuously for two seconds in both cases.
- iii. Slow charge button. By pressing this button, the standard (slow) charge function is activated. The standard charge rate is normally 0,25C current rate unless something else is asked from the customer. It is coloured white when is pressed and the 5 green LEDs are flashing with slow pace.
- iv. Fast button. By pressing this button, the fast charge function is activated. The fast charge rate is normally 0,75C current rate unless something else is asked from the customer. It is coloured white when is pressed and the 5 green LEDs are flashing with fast pace.
- v. During charge, by pressing the Slow and Fast buttons simultaneously the user can select medium charge rate. The medium charge rate is normally 0,5C current rate unless something else is asked from the customer. The 5 green LEDs are flashing with medium pace (compared with fast and slow).
- vi. During discharge, by pressing the Slow and Fast buttons simultaneously the user can select extension of DoD. This function is used in case the user has neglected to charge the battery resulting to the relays opening. By pressing the two buttons simultaneously the user has a period of 10 minutes to drive the forklift to the charger.
- vii. Emergency switch-off.
When the battery is ON and in standby mode, press the On/Off button to switch off the battery. Being in ON state, by pressing the On/Off button, all the contactors of the battery will open (break) and no voltage will be present neither in charging nor in discharging plugs.
When the battery is in operation (charging or discharging) and the current is >10A (charge) or <-10A (discharge) the battery cannot be

turned off by pressing only the On/Off button. In order to switch off the battery in an emergency case during operation, the On/Off and the fast charge buttons must be pressed at the same time.

- viii. Sends to GLocal via Wi-Fi or 2G, 3G, 4G, (whatever is available at the user's premises) all the parameters which are visible on the user's display.

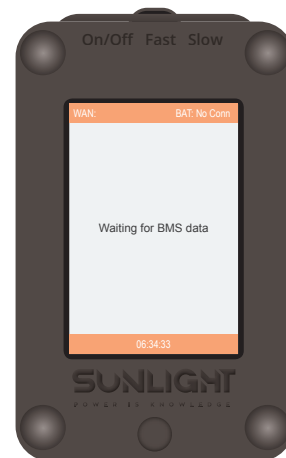
5.4.2 Getting started with the Compact Display Telecommunication Box

- i. Switch on the Li.ON FORCE battery by pressing the On/Off button of the control panel or from the On/Off button of the display (Picture 6).



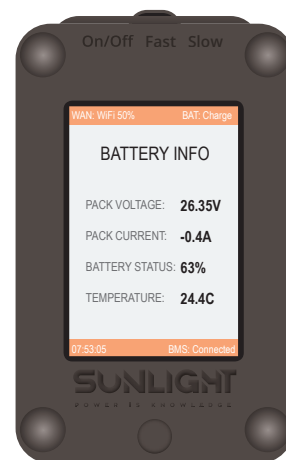
Picture 6

After 1 minute the following screen will appear on the display (Picture 7).



Picture 7

After the successful communication establishment between the display and the battery, the following screen will be shown to the display (Picture 8):



Picture 8

Picture 9 shows the active errors of the battery:

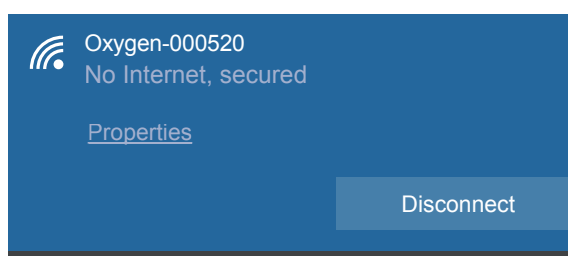


Picture 9 Indicative error

5.4.3 Enabling the Wi-Fi of the Compact Display Telecommunication Box

To send the data of the battery to the GLocal (Sunlight cloud platform), the Wi-Fi communication between the display and the Wi-Fi network shall be enabled from the customer. The steps are described below for the display:

Connect to the wireless network (Oxygen-000520) of the display with a Laptop.



Picture 10

To login, insert the secure key which is the WPA key or the Wi-Fi password (depending on the label of the display) written in the label of the Display Telecommunication Box (see Picture 11).

Open the browser:

<http://192.168.254.254>

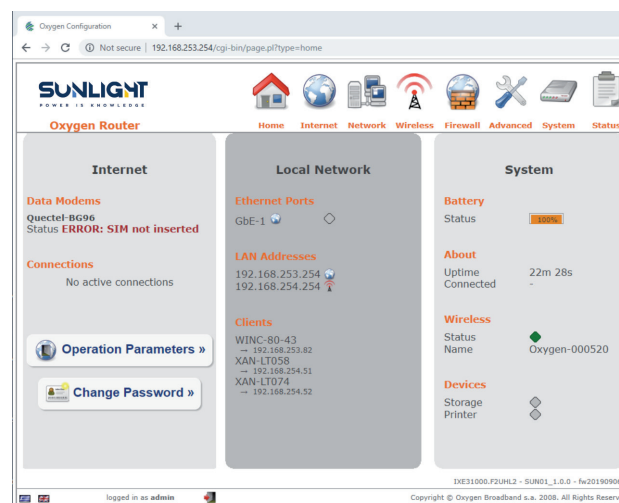
User: admin

Password: The password is written on the label of the box and depending on the label of the display, could be the password after “admin” or the password after “pass” (see Picture 11).

S/N	184017000133	admin : 6a2DjbMTUA
MAC	243F3000893C	serial : 105806000520
PASS	MTf3BX4b7R	mac : 001D1C0F00EE
WiFi	RYRAILKURR	wpa key : ENISHACCEE

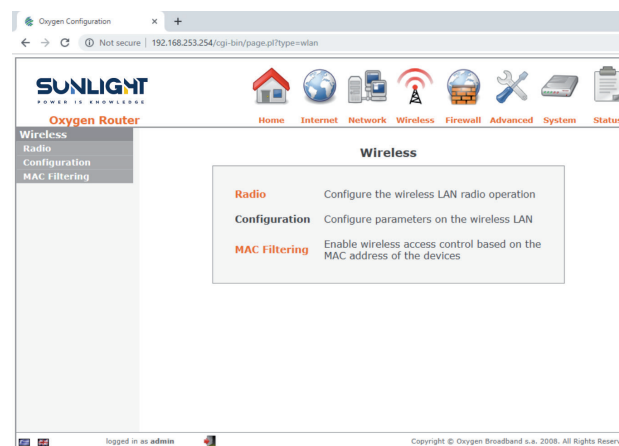
Picture 11 Different labels

After login, the home page appears (Picture 12), then press the Wireless button.

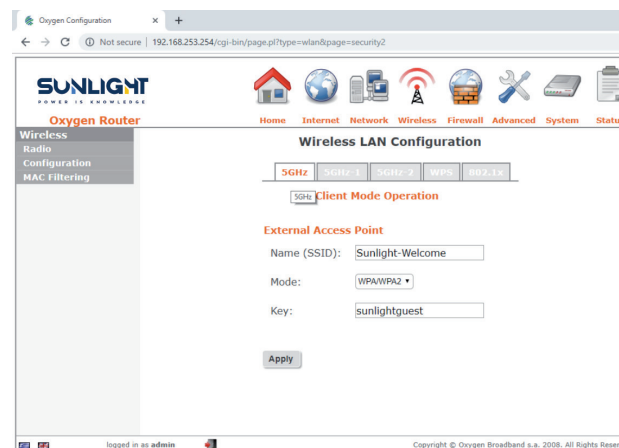


Picture 12

Choose the configuration field:



Picture 13



Picture 14

At the Wi-Fi field insert:**Name (SSID):** the name of your Wi-Fi**Mode:** The security mode of the Wi-Fi network normally is: WPA/WPA2

(In any case, it should be checked)

Key: Your Wi-Fi password

Click Apply

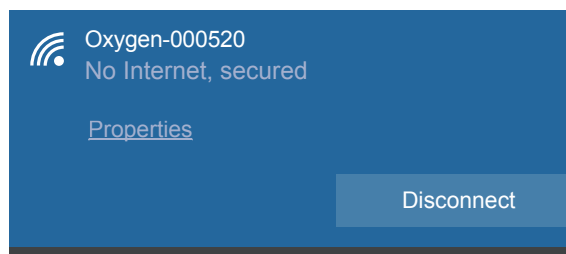
Disconnect from the wireless network (Oxygen-000520).

5.4.4 Firmware Upgrade of the Compact Display Telecommunication Box

It may be needed to update the firmware of the Compact Display Telecommunication Box.

The steps are described below:

Connect to the wireless network (Oxygen-000520) of the Compact Display Telecommunication Box with a laptop. In order to login please insert the secure key, which is the WPA key written behind the Compact Display Telecommunication Box.



Picture 15

Open the browser:

<http://192.168.254.254>

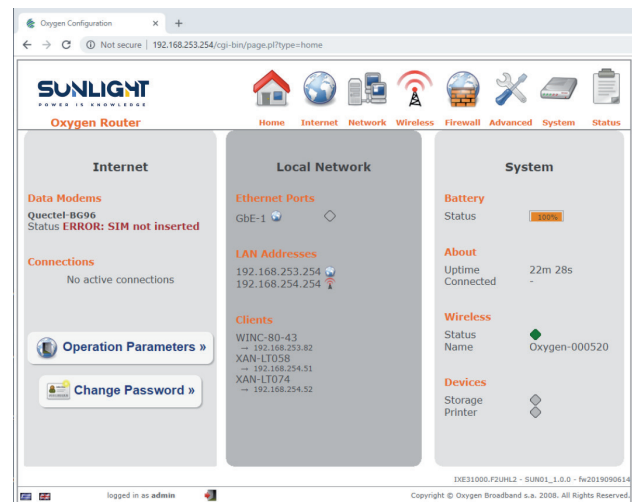
User: admin

Password: The password is written on the label of the Compact Display Telecommunication Box and depending on the label of the Display, it could be the password after "admin" or the password after "pass" (see Picture 16).

S/N	184017000133	admin : 6a2DJbMTUA
MAC	243F3000893C	serial : 105806000520
PASS	MTf3BX4b7R	mac : 001D1C0F00EE
WiFi	RYRAILKURR	wpa key : ENISHACCEE

Picture 16

After login, the home page appears:



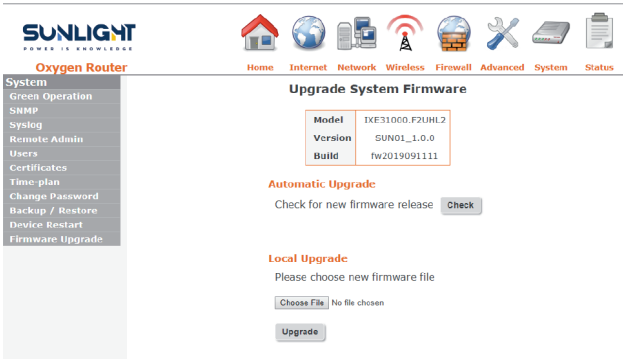
Picture 17

Go to the System field and choose Firmware Upgrade:

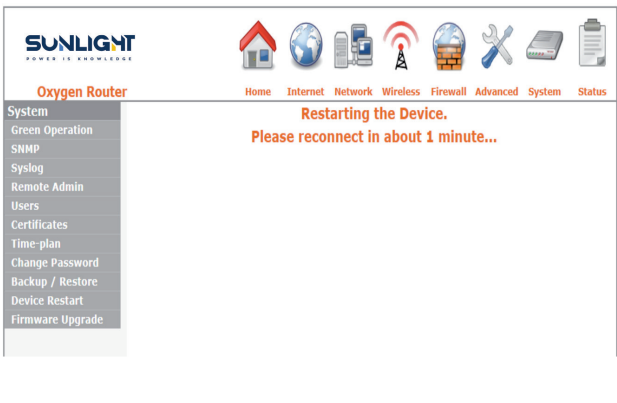


Picture 18

In the field "Local Upgrade" choose the corresponding file (firmware) and press upgrade.



Picture 19



Picture 22

5.5 Discharge Mode of Li.ON FORCE battery

Wait for some minutes:



Picture 20

If the battery is switched off the steps below must be followed:

- Switch on the battery by pressing the On/Off button of the control panel or the On/Off button of the Compact Display Telecommunication Box. Wait for 20 seconds for the initialization of the BMS.
- Battery is ready for use.
- Connect the discharge plug to the corresponding plug of the forklift.

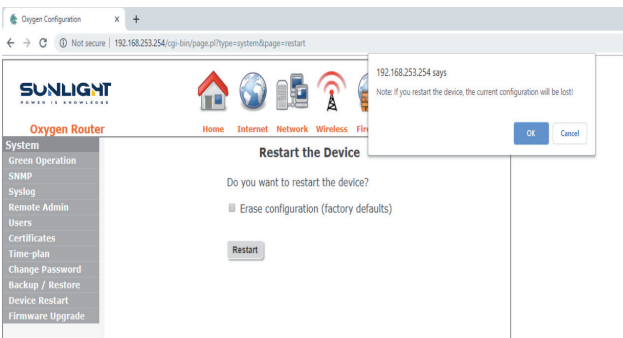
NOTE: If the battery is not used, the battery will shut down automatically in approximately 4 hours.

After finishing the upgrade procedure go again to System button and select Device Restart.

5.6 Charge Mode of Li.ON FORCE battery

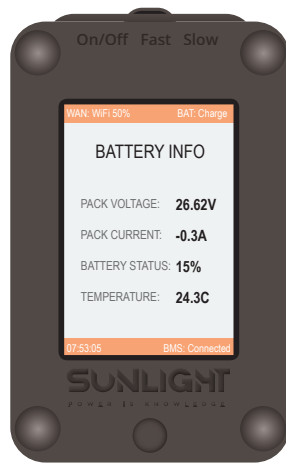
If the battery is switched off the steps below must be followed:

- Switch on the battery by pressing the On/Off button of the control panel or the On/Off button of the Compact Display Telecommunication Box. Wait for 20 seconds for the initialization of the BMS.



Picture 21

- Connect the charging plug to the battery's corresponding plug. Wait for 20 seconds for the handshake between the BMS and the charger.
- Charging will start automatically. The user can choose between standard, medium and fast charge rate from the control panel as it is described in chapter 5.3.
- When the battery is fully charged, the Compact Display Telecommunication Box will show the Picture 23. Additionally, an indication of a fully charged Li.ON FORCE battery is shown on the green LEDs (100%) of battery's control panel (Picture 3).

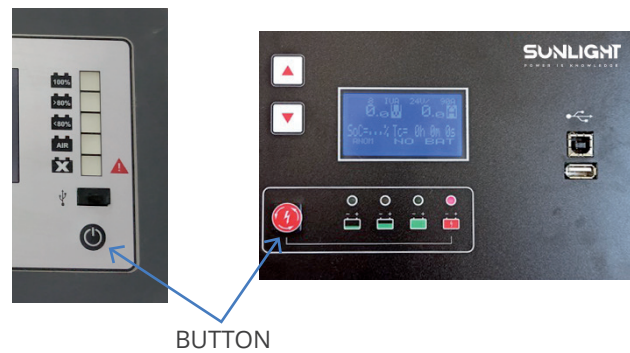


Picture 23 Fully charged battery in Compact Display Telecommunication Box

NOTE: After the end of a full charge and if the battery is not used, the battery will shut down automatically in approximately 4 hours.



In order to stop charge manually (for example during an opportunity charge) push the button of the charger for 1 second (Picture 24 shows two different charger types) and then disconnect the plug.



Picture 24



Do not disconnect the charge plug prior to the interruption of charge with the charger's button, because there is a danger to produce sparks (and possible melted contacts) due to high charge current.

5.7 Switch off the battery

In order to switch off the battery, press continuously for 2 seconds the On/Off button of the control panel or the On/Off button of the Display.

5.8 Additional information for charging

The approximate required time to bring a battery to full charge state depends on the number of ampere hours (Ah) depleted from the battery. Ampere hours (Ah) are determined by multiplying the number of hours times the number of Amps supplied by a battery to a load.

For example, if a load is connected to a battery, which drew 20 Amps for a period of 5 hours, the battery will have supplied 100 Ah. The approximate recharge time would then be calculated by dividing the 100 Ah depleted from the battery, by the ampere charge rate of the charger.

Examples:

The time to charge a fully discharged 100Ah battery with 0,5C charge rate i.e. 50 Amperes, is 2 hours.

The time to charge a fully discharged 100Ah battery with 0,25C charge rate i.e. 25 Amperes, is 4 hours.

6. Connection to GLocal

The connection to GLocal cloud platform is described to the corresponding manual.





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