

ENSIRIUS MODULE USER MANUAL PART NUMBER: EN-8k-48-1C-X-X-X-1V0-GEN1 VERSION 1.0 , REVISION 0 RELEASE DATE: 22nd APRIL 2024

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### EN-8k-48-1C-X-X-X-X-1V0-GEN1

Document HISTORY

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### EN-8k-48-1C-X-X-X-X-1V0-GEN1

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### EN-8k-48-1C-X-X-X-X-1V0-GEN1

# $S_{\mathsf{AFETY}} \text{ instructions}$

#### SAFETY GUIDELINES

#### PERSONAL SAFETY

• Always wear proper personal protective equipment (eyes protection, gloves, and safety shoes).

#### GENERAL GUIDELINE

- Do not subject the Module to strong impact.
- Do not crush or puncture the Module.
- Do not place the Module near a heat source, such as a fireplace.
- Do not disassemble the Module under any circumstances.
- Ensure precautions to prevent short-circuit under all circumstances.
- Do not touch the terminals with conductors while the Module is charging. Serious burns, shock, or material fusing may occur.
- Protect surrounding electrical components from incidental contact.
- Do not subject the Module to high pressure.
- Do not place any object on top of the Module.
- Do not drop the Module. Internal damage may occur that will not be visible.
- Do not stack Modules once they have been removed from the packaging. Instead the Modules should be placed on shelves.

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• In case the Module is physically damaged for any reason, do not install and energize the Module under any circumstances and immediately contact your Reseller.

#### **MODULE OPERATION**

- Do not operate the Module above the specified voltage.
- Always make sure charger is set as recommended.
- When connecting to external devices ensure that galvanic isolation of the external device(s) does not exceed 1000V.
- Always make sure chargers are disconnected while working on Modules.
- Do not connect or disconnect terminals from the Module without first disconnecting the load.

#### MODULE OPERATING ENVIRONMENT

- Location: Indoor/Outdoor
- Operating Temperature Range: -30°C to 70°C (For continuous operations outside this range, please consult your Resellers or Enercap).
- Operating Humidity: Non-Condensing
- Do not charge the Module when the temperature is below -30°C.
- Do not charge the Module when temperature is above 70°C.

#### MODULE CLEANING

- Disconnect the power before cleaning.
- Use a soft cloth dampened in a solution of mild detergent and water.

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#### STORAGE ENVIRONMENT

• Do not store the Module at temperature greater than 70°C.

#### DISPOSAL

- Do not dispose the Module in fire.
- Do not dispose this Module as unsorted municipal waste. Please use a separate collection facility or contact the supplier from whom this Module was purchased. Please make sure discarded electrical waste is properly recycled per applicable regulations to reduce environmental impact.

# PRE-INSTALLATION

#### INSPECTION

Document (e.g., photo) any damage and report this to your Reseller and shipping agent immediately. Remove the Module from the shipping carton and retain the shipping materials until the unit has been inspected and is determined to be operational.

#### UNPACKING

The Modules and cable accessories are packed in a cardboard carton with foam padding for protection during shipping.



#### Figure 1: Steps to unpack the Module

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#### CONTENT CHECK

Check the contents of the package. The following are standard items shipped by us.



### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### HANDLING

The Module is designed to provide years of trouble-free operation. Proper handling is required to avoid damage to the Module. In particular, the following precautions should be observed.

#### LIFTING A MODULE

1. Pull up the handle on the top of the Module, grip the Module firmly and lift it.



Figure 3: Holding the Module to lift up

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2. Lift up straight, remembering not to turn your body while you are lifting.





Figure 4: Lifting up the Module



No less than four persons should lift the Module.

### EN-8k-48-1C-X-X-X-X-1V0-GEN1

LOCATION REQUIREMENTS

#### AREA OF INSTALLATION

• Install the Module at an appropriate height for ease of viewing LCD and operating switches.



Figure 5: Installation restriction: a) Module can be stored inside b) Modules cannot be stored outside without shelter c) Modules can be installed indoors and outdoors with shelter

#### ENVIRONMENT REQUIREMENTS

• The ambient temperature and relative humidity must meet the following requirements.



Figure 6: Operating temperatures and humidity of Module

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## **L**LECTRICAL INSTALLATION

#### ELECTRICAL CONNECTIONS

#### CABLE SIZE

We recommend a cable size of 150mm<sup>2</sup> thickness and 1m length to hold current up to 300A. Please use a thicker cable for lengths longer than 1m.

#### CABLE CRIMPING

Crimp the cables for connecting the Modules in series or parallel.

- Wrap the wire crimping area with heat shrink tubing or insulation tape.
- When using a heat gun, protect the equipment from being scorched.



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#### CONNECTING CABLE LUGS, WASHERS, AND BOLTS TO MODULE TERMINALS

Follow the sequence below to connect the cable lugs, washers, and bolts to the positive and negative terminals of the Module.



Figure 13: Connecting lugs, washers, and bolts to negative terminal of Module

Figure 14: Connecting lugs, washers, and bolts to positive terminal of Module

#### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### ELECTRICAL SETUP

#### CONNECTING MODULE TO POWER SUPPLY/CHARGER

Connect positive and negative terminals of charger to the positive and negative terminals of the Module respectively.



Figure 8: Charging Module with power supply

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#### CONNECTING MODULE TO LOAD/DISCHARGER

Connect positive and negative terminals of discharger to the positive and negative terminals of the Module respectively.



Figure 9: Discharging Module from discharger

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#### PARALLEL CONNECTION SETUP:

Any number of Modules can be connected in parallel. All Modules must be at 100% SOC before connecting in parallel.

- Connect the positive (+) terminal of all Modules to the positive busbar.
- Connect the negative (-) terminal of all Modules to the negative busbar.
- Refer to the parallel combination of the Modules as shown below and make your connections accordingly.



#### Figure 10: Modules connected in parallel

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#### SERIES CONNECTION SETUP:

Any number of Modules can be connected in series. All Modules must be at 100% SOC before connecting in series.

• Refer to the series combination of the Modules as shown below and make your connections accordingly.



Figure 15: Modules connected in Series

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### EN-8k-48-1C-X-X-X-X-1V0-GEN1

PARTS DESCRIPTION



### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### DRY CONTACTS OUTPUT

The purpose of the Dry Contact output is to send the information about the unexpected or unwanted events occurring in the Module to the other apparatus so that external equipment can understand the current state of the Module and act accordingly. This card provides four output relays as mentioned below. All output contacts are programmable and user can set the definition for each contact using monitoring LCD (explained later).

#### DRY CONTACT PIN CONFIGURATION:

Dry Contact A – Pin 1

Dry Contact B – Pin 2

Dry Contact C – Pin 3

Dry Contact D – Pin 4

#### WAKE-ON BUTTON

The BMS of the Module goes in a dormant state to save power when not in use for an hour.

You can quickly wake-up the BMS.

Do the following to wake up the BMS;

Press the Wake-ON button, the LCD will power On.

### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### DRY CONTACTS INTPUT

The input Dry Contact is used to trigger the Module through external equipment. This card provides a 4 pin input relay as mentioned below.

#### DRY CONTACT PIN CONFIGURATION:

G - Ground (for isolation)

11- Pin 1

12- Pin 2

13- Pin 3

#### **MONITORING LCD**

The Monitoring LCD allows user to monitor and configure the Module.

#### MECHANICAL ACTUATED BREAKER

The Module has 125A 3P manual circuit breaker. This breaker serves as over current protection for the Module.

#### TERMINAL

The Module has 300A positive and negative terminals. The terminals are equipped with one fastening point supplied with M10x20mm bolts to accommodate interconnecting busbars and cable lugs.

### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### APPEARANCE

The 8000Wh 48V Module looks as illustrated below:



Figure 12: 8kWh 48V Module

### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### MONITORING LCD

The Monitoring LCD allows user to monitor and configure the Module.

#### DASHBOARD

The first page on LCD is dashboard by default. Dashboard page shows the status of terminal voltage, terminal current, State of Charge (SOC), charge and discharge status of the Module.



### EN-8k-48-1C-X-X-X-X-1V0-GEN1

Click on the menu bar  $\equiv$  to go to main menu.



#### MAIN MENU:

The main menu provides parameter viewing and setting functions. The main menu is categorized into three pages.

= s	ואוט	S	
Main Dashboard	Network Settings	Daily Statistics	Click on right arrow to go to second page
Cell Monitoring	Dry Contacts	System Settings	Click of right anow to go to second page
	First page		

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### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### FIRST MENU PAGE

First Menu page has Main Dashboard, Network Settings, Daily Statistics, Cell Monitoring, Dry Contacts and System Settings.

#### MAIN DASHBOARD

The first page on LCD is dashboard by default. Dashboard page shows the status of terminal voltage, terminal current, State of Charge (SOC), charge and discharge status of the Module.



### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### NETWORK SETTINGS

This page shows the IP Address, Port Number, Mac Address, Communication Protocol and SSID.

#### # FORGET NETWORK:

Click on Forget Network to delete stored network info and Wi-Fi passwords.



### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### DAILY STATISTICS

Daily statistics shows the maximum and minimum voltages, maximum and minimum currents and maximum temperature of the Module.

#### *# RESET STATISTICS:*

Click on Reset Statistics to delete stored preset values.

	SIR	1	V S
$\bigcirc$	Maximum Voltage 53.19 V	$\odot$	Minimum Voltage 53.10 V
<b>∳</b> ∧	Maximum Current 0.00 A	<b>∳</b> <sub>A</sub>	Minimum Current 0.00 A
<b></b>	Maximum Temp#1 0.00 C		Maximum Temp#2 0.00 C
	Reset	Stat	istics

### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### **CELL MONITORING**

This page gives information on each cell's voltage in the Module. This page helps the user to know about the unbalancing and under/over voltage of cells.



### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### DRY CONTACTS

This is the Dry Contact read page. This page helps the user to view all the settings of the Dry Contacts configured.

= SIRIUS					
Contacts	Types	Operation	Enable	Disable	Result
A	WAKE	>	NA	NA	ON
в	WAKE	>	NA	NA	ON
C	SAFETY	>	NA	NA	
	WAKE	>	NA	NA	

### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### SYSTEM SETTINGS

System settings shows the preset limit of high current during charging and discharging, high and low voltage of Module, high and low voltage of cells and high temperature during charging and discharging.

At the bottom a message indicates system is fetching data, and if there is any alarm, it will be displayed on the screen.



#### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### SECOND MENU PAGE

Second menu page has Online Monitoring, Wifi-Direct Monitoring, Bluetooth Monitoring, Restart Module, Firmware Update and Product Manuals.



### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### **ONLINE MONITORING**

Click on Online Monitoring, Module will restart. While restarting, the Online Monitoring will brighten up.







Online Monitoring will connect automatically if SSID and password are defined. For connecting for the first, user need to define SSID and password. Kindly refer to Monitoring QR for defining SSID and password.

### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### WIFI- DIRECT MONITORING

Click on Wi-Fi Direct Monitoring, Module will restart. While restarting, the Wi-Fi Direct icon will brighten up.







Wi-Fi Direct will connect automatically if SSID and password are defined. For connecting for the first, user need to define SSID and password. Kindly refer to Monitoring QR for defining SSID and password.

### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### **BLUETOOTH MONITORING**

Click on Bluetooth Monitoring, Module will restart. While restarting, the Bluetooth icon will brighten up.



- This function is only for use by **ENERCAP** and not available to a user at this time.
- Bluetooth monitoring will connect automatically if SSID and password are defined. For connecting for the first, user need to define SSID and password. Kindly refer to Monitoring QR for defining SSID and password.

#### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### **RESTART MODULE**

If the Module is frozen or unresponsive, click on restart Module to force-restart the Module.



#### FIRMWARE UPDATE

Make sure the Module is in Online monitoring mode when updating the firmware. Click on Firmware Update.



### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### **PRODUCT MANUAL**

Click on product manual. Scan the QR code to download this product manual.





#### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### THIRD MENU PAGE

Third menu page has System Setup, Alarm Record, Monitoring QR, Set Dry Contacts and System Statistics.



### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### SYSTEM SETUP

User can enable/ disable BMS buzzer, enable/disable terminal safety and set and read CAN ID from system setup page.

#### # BMS BUZZER:

If the BMS buzzer is enabled, every time when the BMS reads data from the Module, it will buzz. Tap on the BMS buzzer to disable it.



### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### **#** TERMINAL SAFETY:

This feature is added to secure the operation of BMS. Click on Terminal Safety to enable the feature. When safe feature is enabled, Module will not charge or discharge.

If you want to charge and discharge the Module, disable the safe feature by clicking on Terminal Safety. .





### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### ALARM RECORDS

ENSIRIUS Module has all the alarms settings with protection feature as default. This page shows all the logged alarms with time and date.

	SIRIUS				
	Alarm Type	Record Time			
1.	Cell High	04:55 18/1/2023			
2.	Difference Voltage	04:55 18/1/2023			
Э.	Cell High	04:54 18/1/2023			
4.	Difference Voltage	04:53 18/1/2023			
5.	Cell High	04:21 18/1/2023			

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#### MONITORING QR

Click on monitoring QR to scan the QR code.



#### Follow the steps below to complete the process:

57 PM | 3.9KB/s 姫 🗑 20 % h. 0 \$ 57 PM | 1.6KB/s 袋 包 0 (F ha (0 \* \*0.420 6 4 6 2:58 PM : 1.6K8/s & 0 8 0 ad 10 0 Sign in to ETISALAT-WIFI-00018 0.0KB/s 🕸 🕄 Sign in to ETISALAT-WIFI-00018 Sign in to ETISALAT-WIFI Sign in to a Wi-Fi network \* -ENCONNECT+ Interfac FTISALAT-WIFI-00018 6.4 Saving Credentials Trying to connect ESP to network. If it fails reconnect to AP to try again IPIGuest OfficeWifi LT Office a al اد ه اد ه 4.4 4.4 0 No AP set No AP set No AP set . **4** ÷ . 4 ÷ . 4 4 ∎ ® ∢ ÷ Click on Configure Enter the SSID and From the WIFI List, Click on click on ETISALAT-WIFI password of your Save WIFI-xxxxx router

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### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### SET DRY CONTACTS

Dry Contact Write page allows the user to configure the Dry Contacts.

The user can specify Dry Contact, its type, and the condition they want. Module has four Dry Contacts:

- Dry Contact A
- Dry Contact B
- Dry Contact C
- Dry Contact D

These Dry Contacts can be set for the following six parameters.

- Terminal Voltage
- Current
- Temperature
- SOC
- Disable
- Enable

#### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### STEPS TO CONFIGURE DRY CONTACTS:

Click on Set Dry Contacts. Set Dry Contacts window will open.





DRY CONTACT PIN SELECTION

Tap on the Contact Name to navigate

through the Dry Contact A, B,C and D.



#### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### DRY CONTACT CONDITION

There are two set conditions:

- 1. Less than or equal to
- 2. Greater than

Tap on the Contact Condition to navigate through the conditions



#### DRY CONTACT PARAMETER TYPE SELECTION

Select the Contact type by navigating

through the list. Tap on the Contact

Type for navigation.



#### EN-8k-48-1C-X-X-X-X-1V0-GEN1

#### DRY CONTACT FUNCTION SELECTION:

After the name, type and condition of the Dry Contact is set, choose the set value to enable and disable the function.



Clicking enable or disable will open the set value prompt window.

	- SIRIUS					
	159	22	2 1	21		ОΚ
1	З	Β	4	5	вск	OEL
6	٦	8	9	Ø		CLR

Write the value and click OK. When everything is set, click on Save Configurations.

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#### SYSTEM STATS

System stats shows the statistics of the Module from the time of first start. It shows total charge and discharge energies, highest and lowest current read, system run time, main board and BMU serial.

	SIRIUS					
- <del>&gt;-</del> j	Total Charge Energy Ø.23 kWh	Total Discharge Energy Ø.03 kWh				
<b>∳</b> ∧	Highest Curr. Read 13.20 A	Lowest Curr. Read -65.10 A				
$\bigcirc$	System Run Time 7 Days 15 Hour 11 Min. 50 Sec					
	Main Board Serial :	EN02048V00330023A00001				
	BMU Serial :	רשרשבשש				
	Alarm! -Cell High_ Time:04:59 18/1/2023					