

Sirius Module Training for Engineers



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Contents

1. Personal Protective Equipment's:.....	4
2. Test Equipment's:	4
3. Module Description:	5
3.1 Circuit Breaker:	6
3.2 Bypass Circuit Breaker:	6
3.3 Fault Reset:	6
3.4 Auxiliary USB:.....	9
3.5 COMM Connector USB:.....	9
3.6 COMM Status LED:	9
3.7 Terminal Status LED:	9
3.8 LCD Description:.....	9
3.9 F12 Terminals:.....	10
4. How to Start-up the Module:.....	11
5. How to Charge the Module?.....	12
5.1 Charge Cycle Setup:	12
5.2 Connecting Charger to the Module:	13
6. How to discharge the Module?.....	14
6.1 Discharge Cycle Setup:	14
7. SiriusVIEW Interfacing:.....	16
7.1 How to Install Sirius VIEW:.....	16
8. Configuration of Module and Application:	17
9. Overview of SIRIUSCONFIG Application:.....	20
9.1 How to do Parameters Calibration?.....	23
9.1.1 Voltage Calibration:	23
9.1.2 Current Calibration:	25
9.1.3 Temperature Calibration:.....	26
9.2 How to do Alarm Configuration?	27
9.2.1 Over Voltage Alarm Configuration:.....	27
9.2.2 Low Voltage Alarm Configuration:.....	29
9.2.3 High Current Alarm Configuration:	29
9.2.4 High Temperature Alarm Configuration:	30
9.2.5 Time and Date Configuration:.....	30

10. Overview of SIRIUS VIEW Application:..... 32

 10. 1 User Buttons: 33

 10. 2 Energy Server: 39

 10. 3 Email Configuration:..... 39

 10. 4 INIT.DONE: 41

 10. 5 Measuring: 42

 10. 6 System Overview:..... 42

 10. 7 Module Details: 43

 10. 8 Logged Reports: 48

 10. 9 Module Specification: 49

 10.10 Module Status:..... 49

 10. 11 SD Card Status:..... 49

 10. 12 RTC Status: 50

11. Module FAQs:..... 50

12 Sirius VIEW FAQs:..... 55

1. Personal Protective Equipment's:

- Safety Gloves
- Safety Shoes
- Safety Glasses

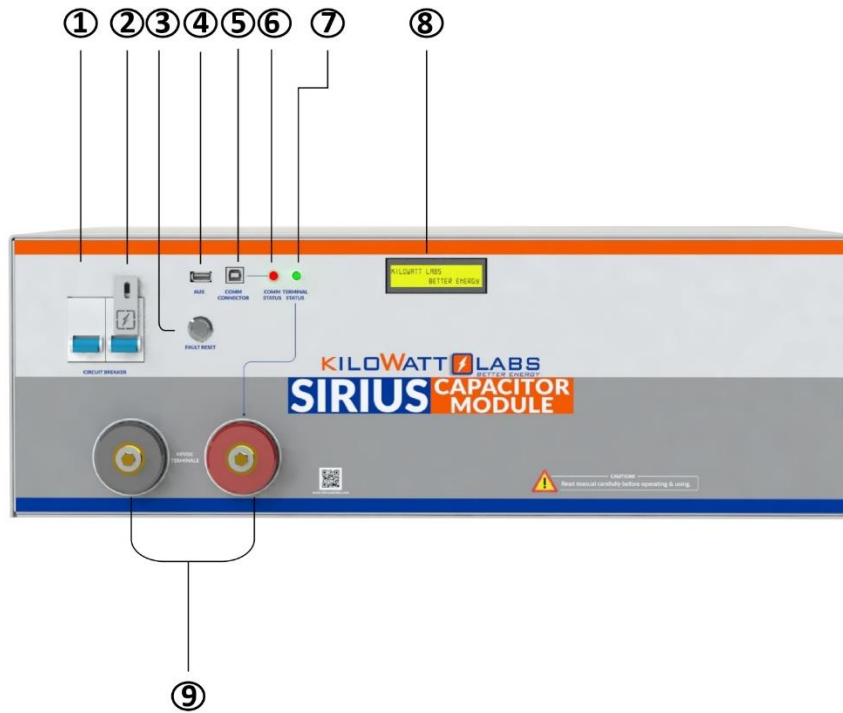


2. Test Equipment's:

- Battery Charger
- Spanner
- Cables for Charging and Discharging 35 sq.mm Single Core x4
- Laptop
- Battery Discharger



3. Module Description:



Object	Mark	Description
1	Circuit Breaker	C100A Circuit breaker for switch ON/OFF Module.
2	Bypass Circuit Breaker	C100A Circuit breaker for bypassing electronic switch.
3	Fault Reset	Fault Reset Button
4	Aux	Auxiliary USB
5	Comm Connector	Communication Connector USB
6	Comm Status	Communication Status LED
7	Terminal Status	Terminal Status LED
8	LCD	(16×2) LCD
9	F12 terminals	Terminals

3.1 Circuit Breaker:

Circuit breaker is used to power ON the Module. It also acts as a second line of protection, if the circuit fails to protect the Module from over current, the circuit breaker will trip.

3.2 Bypass Circuit Breaker:

The Bypass Circuit breaker is used to bypass electronic switch. It is used for Series connection and recovery of the Module.

3.3 Fault Reset:

Fault Reset is a push button which is used to turn ON the terminals manually after it turns OFF due to any error.

The additional features of fault reset are as follows:

- a) Hold fault reset for 5 seconds to toggle the terminals.
 - b) Hold fault reset for 3 seconds to reset fault if there is/are any.
 - c) We can set the Current reading to zero.
 - d) Press fault reset button to check the state of charge and instantaneous power.
 - e) Press the fault reset button to see the individual cell voltages.
- Checking for individual Cell Voltages:

When the fault reset button is pressed, the LCD after displaying the state of charge (SOC) and instantaneous power, will display the cell voltages of the first four cells as shown below:



Whereas:

01=Voltage of 1st Cell

02=Voltage of 2nd Cell

03=Voltage of 3rd Cell

04=Voltage of 4th Cell

By continuously pressing, the cell voltages will be displayed for all the cells.

- Enabling/disabling Cell balancing:

After scrolling through the individual cell voltages, cell balancing can be enabled/disabled by the following steps below:

Step 1: When current is zero, LCD will display the message as illustrated below.



Step 2: After this message appears, hold fault reset button for 5 seconds, then the LCD will display the following message which means that the cell balancing has been enabled.



Step 3: To disable cell balancing, when current is zero, the LCD will display the following message.



Step 4: After this message appears, hold the fault reset button for 5 seconds, then when the LCD displays the following message, it means that balancing has been disabled.





Note!

To enable and disable balancing, the Current should always be zero.



Note!

Balancing is automatically disabled if there is a Current reading greater than zero.

Step 5: To make the current zero, follow the steps below:

→ When current is not zero, the LCD will display the following message.



→ To make the current zero, hold the fault reset button for 3 seconds and the LCD will display the following message.



This means that the current is now zero.

To return back to the normal screen, press the fault reset button once more or leave the Module idle for 5 seconds.



Note!

Make sure that there is no external load or charger before setting the current to zero.

3.4 Auxiliary USB:

This is an auxiliary connector with isolated UART or Serial Communication for wireless monitoring, Module Combiner and future functions.

3.5 COMM Connector USB:

This is a COMM connector to monitor the Module using the Sirius software. FTDi chip is used for this USB.

3.6 COMM Status LED:

COMM Status LED indicates the communication status.

- LED Status Indication:

Color	Status	Indication
Red	Blinking	Control Module is communicating with SiriusVIEW Software.
Red	Steady	Control Module is not communicating with SiriusVIEW Software.
Red	Dimming	Module is in power down state.

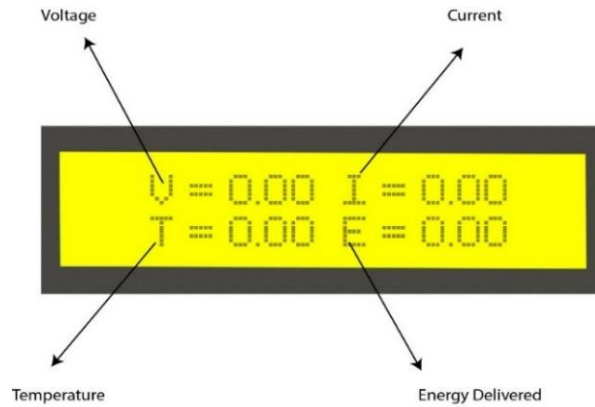
3.7 Terminal Status LED:

Terminal status LED indicates the F12 terminal status.

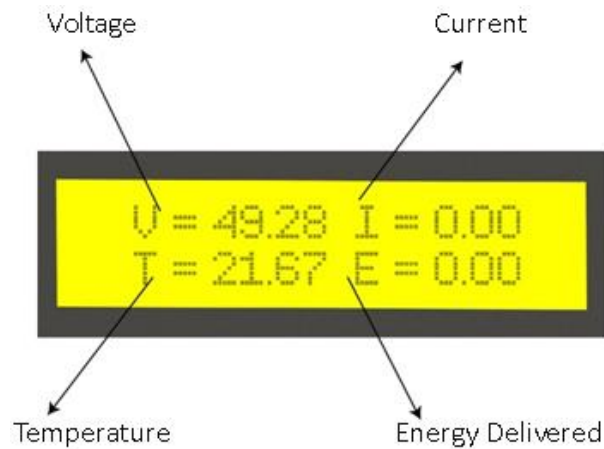
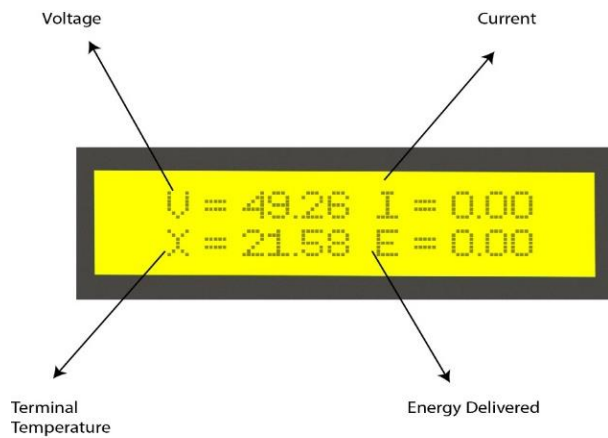
Color	Status	Indication
Green	ON	The F12 terminal is active
Green	OFF	The F12 terminal is not active.

3.8 LCD Description:

→ Once the power is switched ON from the circuit breaker, the Module gets power and the LCD shows the following message after 3 seconds under normal operation:

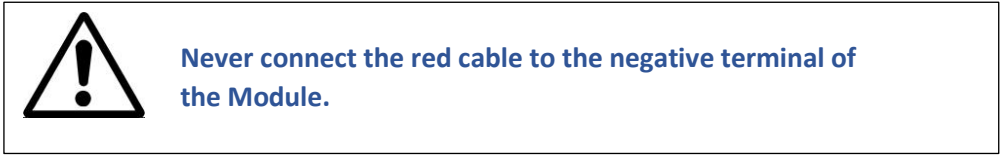


→ After 1 second, the following two LCD screens get switched with each other.



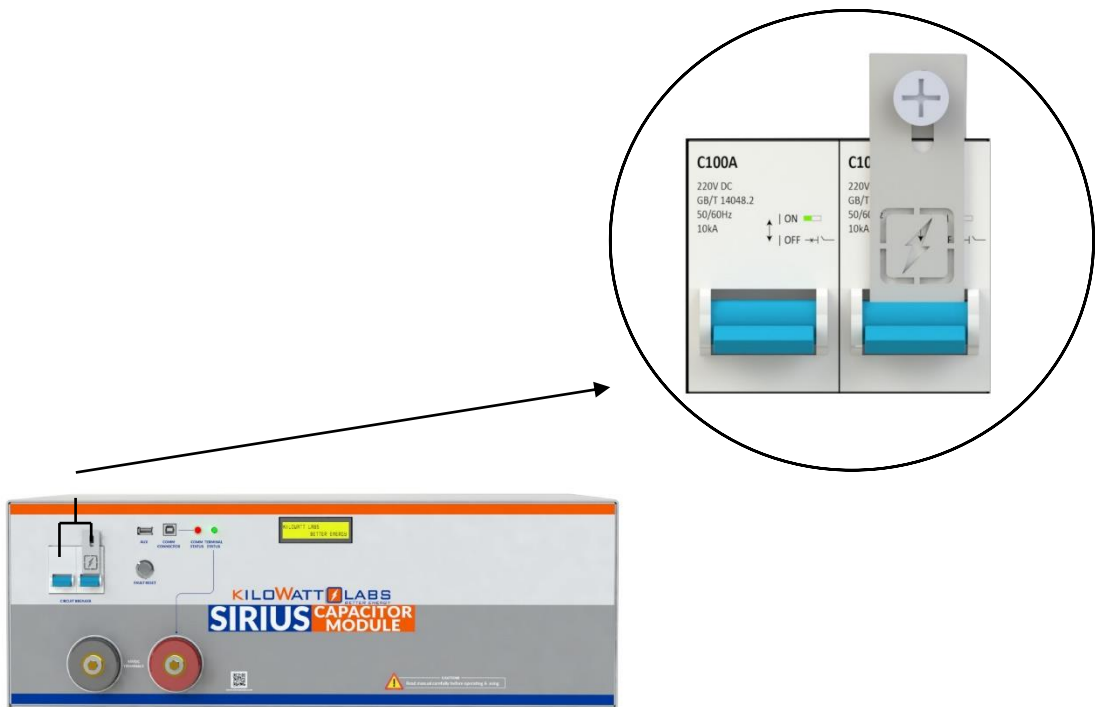
3.9 F12 Terminals:

These are the output terminals of the Module having electronic switch protection that is limited to 100VDC only. F12 terminals are used to connect the load or charger to the Module. There are also positive and negative cables in the jumper cable set. The red one is positive (+), the black one is negative (-).

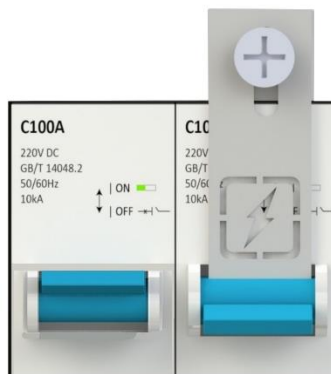


4. How to Start-up the Module:

1. Turn **ON** the Module.
2. Turn ON the circuit breaker by pushing the Blue button upward as shown in the picture below:



3. The picture below shows that the Module is turned ON.



4. Wait till the LCD screen on the front panel of the Module displays initial values.

5. Be sure you are able to see the terminal status LED OFF.
6. Press and hold the fault reset button, after 3 seconds the terminal status LED will change to Green.
7. Release the fault reset button.

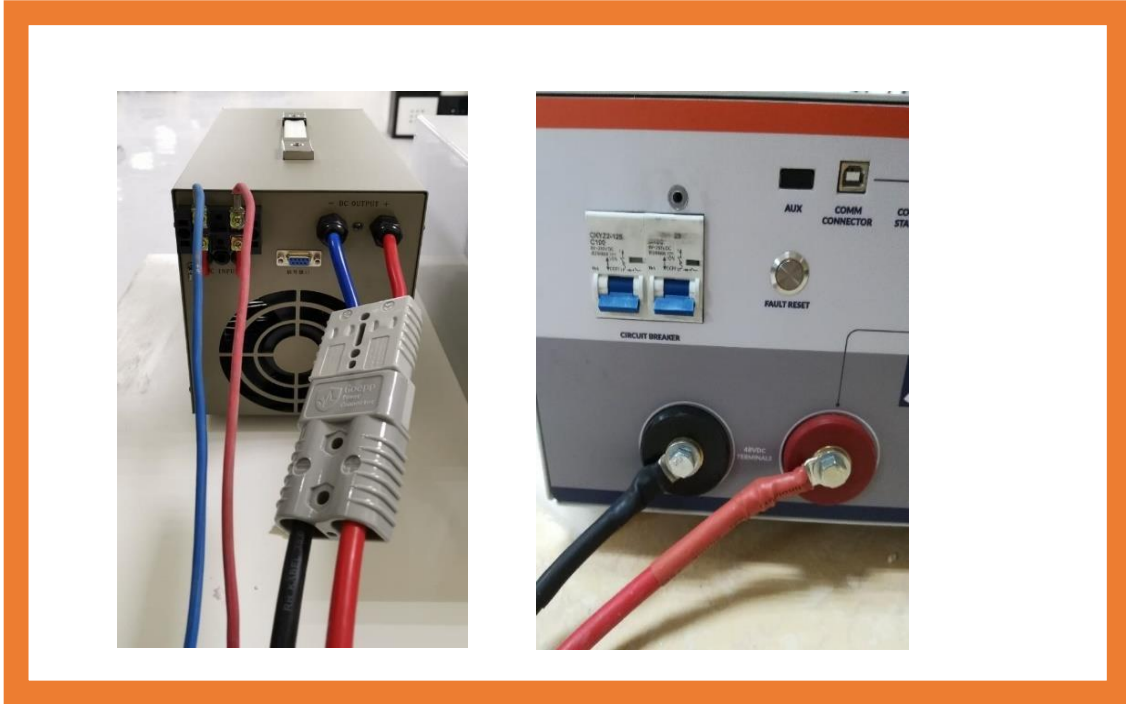
5. How to Charge the Module?

5.1 Charge Cycle Setup:



5.2 Connecting Charger to the Module:

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



- Make sure to activate the Module by pressing the fault reset button to get the output from the terminal.
- Turn ON power switch of the Charger.



6. How to discharge the Module?

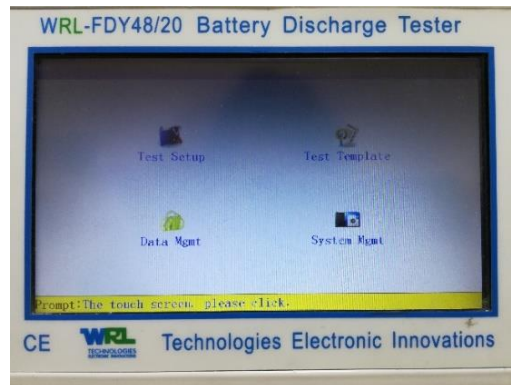
6.1 Discharge Cycle Setup:



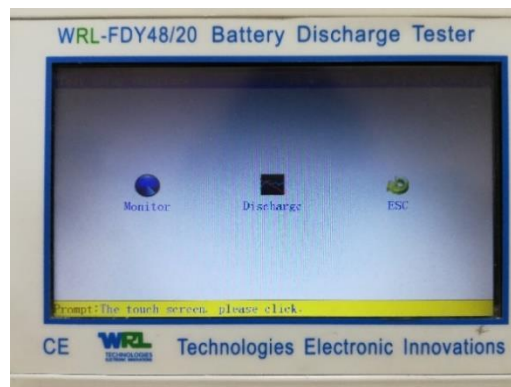
1. Turn ON the discharger. To operate discharger, follow the steps below.
→ Turn **ON** power switch (red button) and circuit breaker of the Discharger.



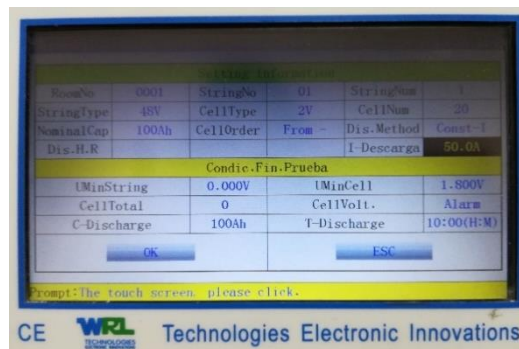
→ Click on the **est Setup** to set the parameters of the discharge tester.



→ Click on **Discharge**.



→ Go to **I-Discharge**.



→ Set the Discharge current to your required current value.



→ Click OK to start discharging.

7. Sirius VIEW Interfacing:

Sirius Module and Sirius VIEW Application communicates via Serial interface by USB cable. Connect USB cable to Comm Connector port and PC.

7.1 How to Install Sirius VIEW:

Follow the steps below to install Sirius VIEW:

→ Go to Amber & Waseem website "<https://www.amberandwaseem.com/>".

→ Go to Downloads and right click.

→ You will see Download Applications and Manuals. Go to Sirius VIEW Setup and click on Download as illustrated below.

Download Applications And Manuals

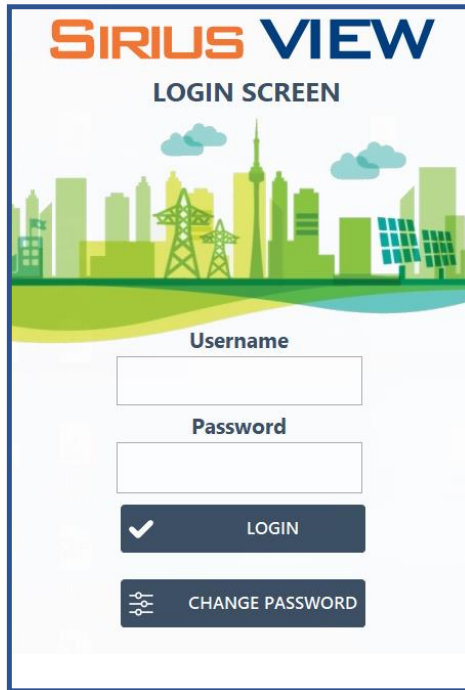
Product	Version	Description	Download
SiriusVIEW Software Manuals	SV 3.1.6		Download
Calibration and Configuration Video	SV 3.1.1 Video	Watch ▶	Download
Sirius Browser Monitoring Video	SV 3.1.1 Video	Watch ▶	Download
SiriusVIEW Installation Video	SV 3.1.1 Video	Watch ▶	Download
SiriusVIEW Introductory Video	SV 3.1.1 Video	Watch ▶	Download
SiriusVIEW Setup	SV 3.1.7 Setup		Download
Read Me	SV Read Me		Download

- SiriusVIEW.rar folder will be downloaded by default in your PC. Extract the file and go to Sirius VIEW Monitoring Application Installer. Click on Volume Folder, down in the volume folder you will find Setup.exe. Click it to start installation.
- Once Installation is finished, you will find Sirius VIEW folder on your desktop. Open the folder and go to Sirius VIEW Monitoring Application.

8. Configuration of Module and Application:

Follow the steps below to use Sirius VIEW properly.

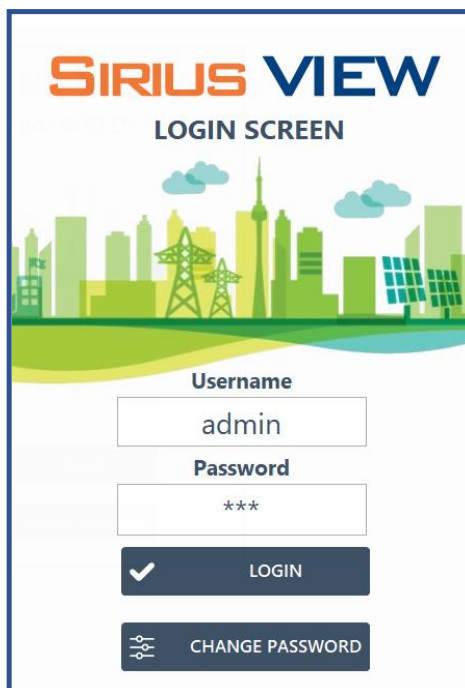
- Turn ON the Module. Refer to section 3 for turning ON the Module.
- Double click on Sirius VIEW Monitoring Application to execute it. A Log-in screen will appear as illustrated below.



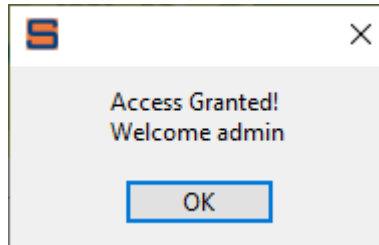
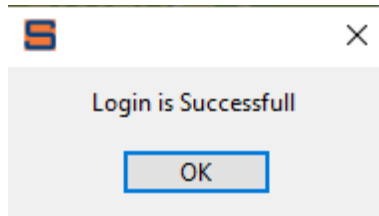
→ Enter the default Username and Password in the login screen.

Default Username: admin

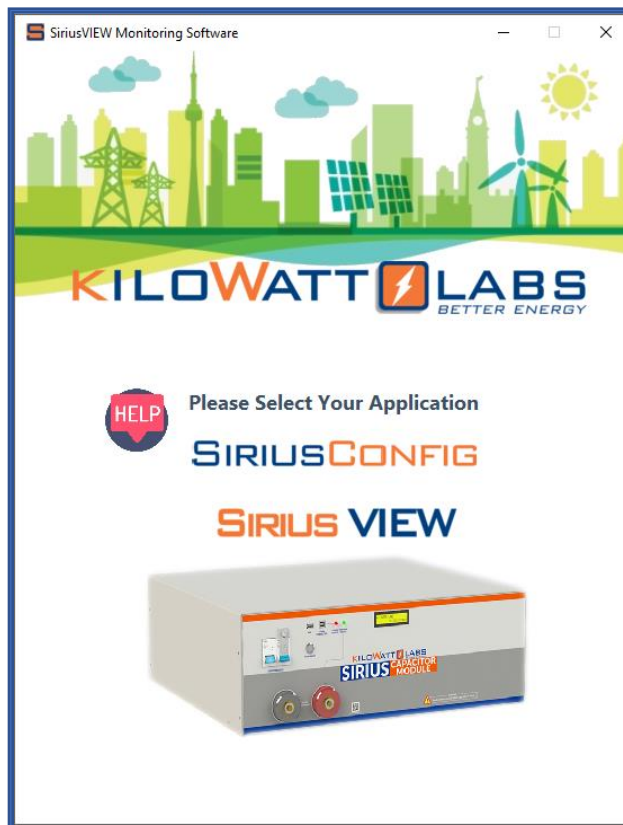
Default Password: 123



→ By clicking on Login, the below pop-up message will appear.



→ Keep on clicking OK until Sirius VIEW Monitoring Software window appears as shown below.



→ By clicking on HELP, a screen will appear which gives brief description about SIRIUS CONFIG and SIRIUS VIEW as shown below.

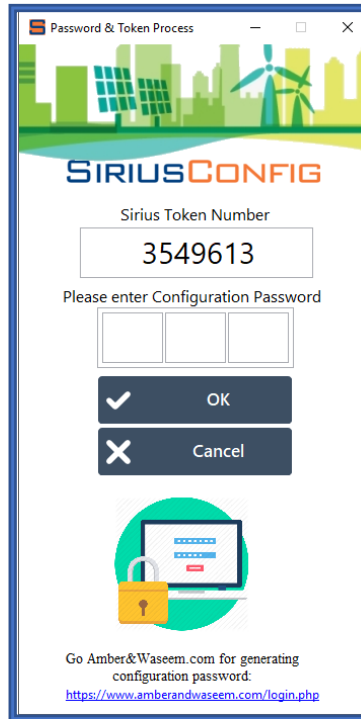
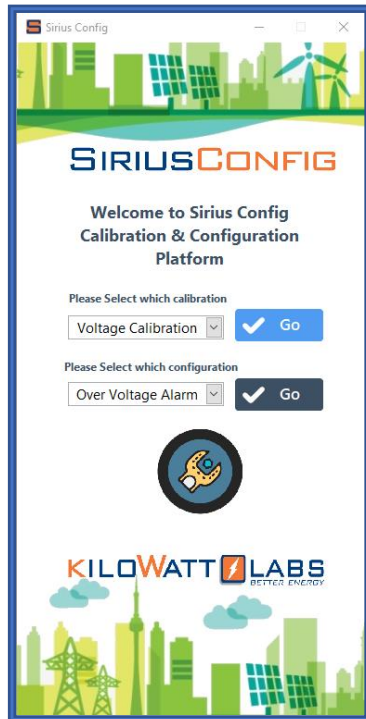


→ Click anywhere on the Help screen to close it.

9. Overview of SIRIUSCONFIG Application:

SIRIUSCONFIG is used to configure and calibrate parameters such as Current, Voltage, Temperature and alarms.

→ Click on SIRIUSCONFIG Application. Two SIRIUSCONFIG pages will appear as shown below.

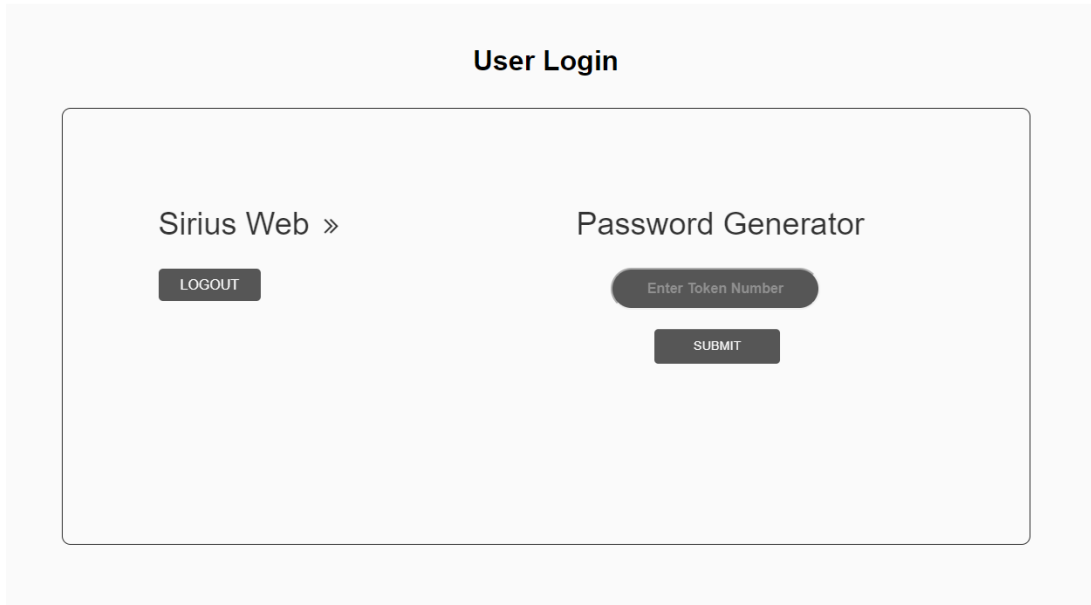


- SIRIUSCONFIG needs password to configure and calibrate parameters. Copy the 7-digit Sirius Token Number.
- Now go to Amber and Waseem Website and click on Remote Application page. When User Login appears, Enter the Serial Number of the Module and last 8 digits of the Serial Number as Password and click on submit button.

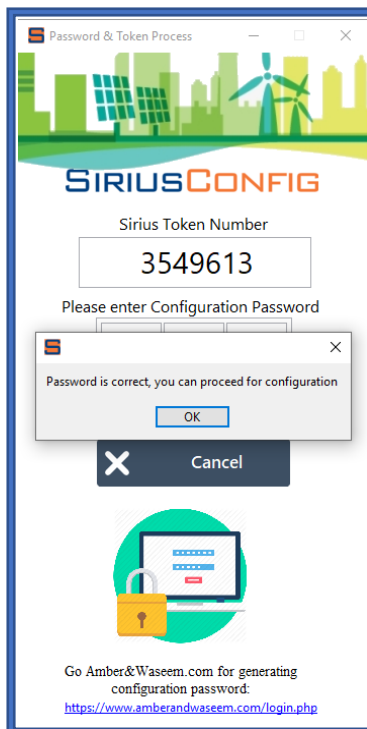
User Login

The form is titled 'User Login' and contains two input fields. The first field is labeled 'Serial Number' and contains the text 'KWL'. The second field is labeled 'Password' and contains the text 'Password'. Below the password field, there is a 'Back To Home' button and a larger 'Submit' button.

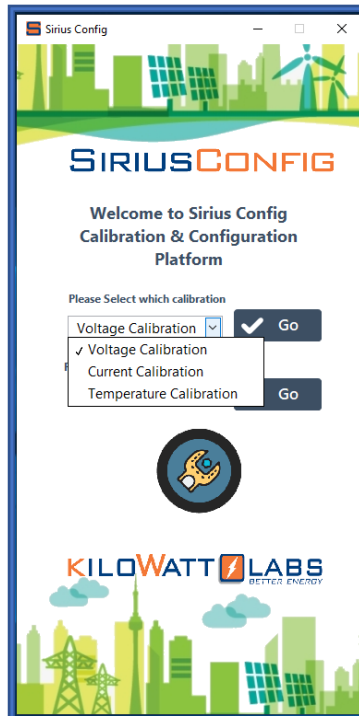
→ After clicking the submit button, Password Generator page will appear as shown below. Paste the token number here and click on submit button.



→ A code will be generated, copy the code and paste in SIRIUSCONFIG dialog box. After entering the password, you will see dialog Screen as shown below. Click OK to proceed.



→ For parameters configuration, click on the drop-down menu and select the parameter you want to calibrate. Click on the Go button.



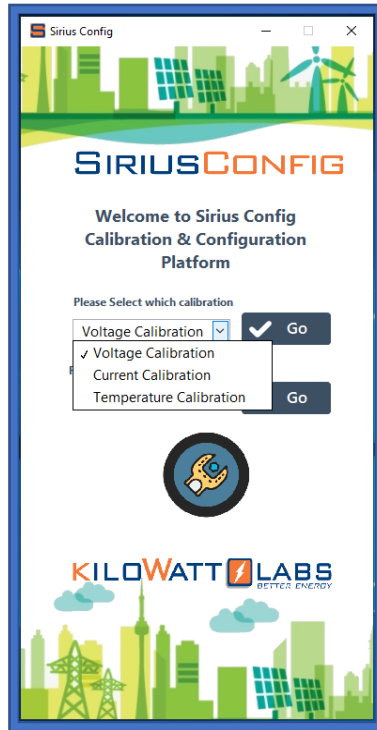
→ For alarm configuration, click on the drop-down menu and adjust the parameters for alarms.

9.1 How to do Parameters Calibration?

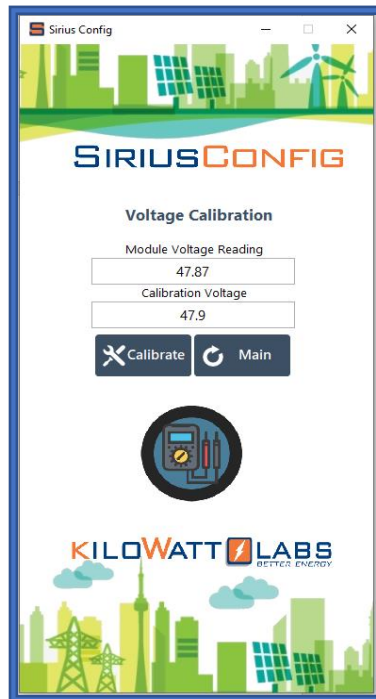
9.1.1 Voltage Calibration:

Follow the steps below to calibrate Voltage.

→ Select voltage calibration from the drop-down menu and click on GO button.



→ After clicking GO, below Voltage Calibration page will appear.



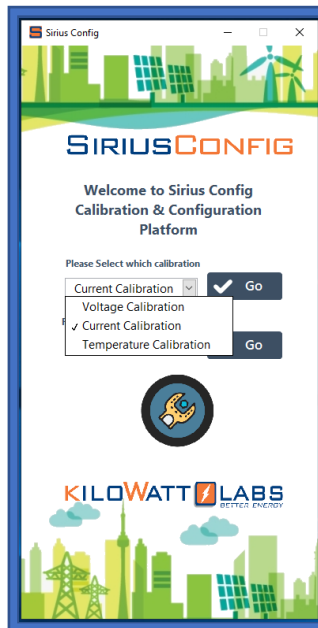
→ Module Voltage Reading gives the present voltage value displayed on LCD. Measure the voltage from the terminals using multimeter.

- Write the measured voltage value in Calibration Voltage text box.
- Click on calibrate button. Voltage value will be updated after 5 seconds.
- Click on Main button to go back to home page.

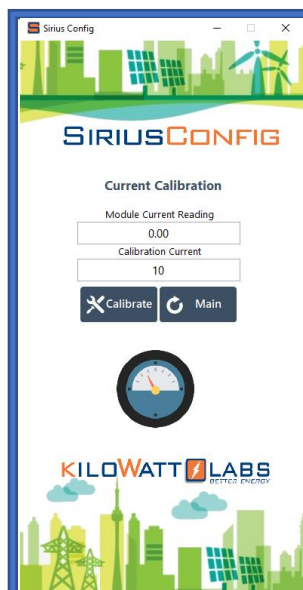
9.1.2 Current Calibration:

Follow the steps below to calibrate current.


- Select Current calibration in the drop-down menu. Click GO button to proceed.




- A Current Calibration page will appear as shown below.



- Connect a discharger with the Module and start discharging it with any current for few minutes. Write the current value in the Calibration Current text box and click Calibrate button.
- Now disconnect the discharger and connect Charger with the Module. Start Charging the Module with the same current for few minutes. Write the Charging Current value in the Calibration Current text box and click on Calibrate Button.

 **Remember! Always start with discharging the Module first.**

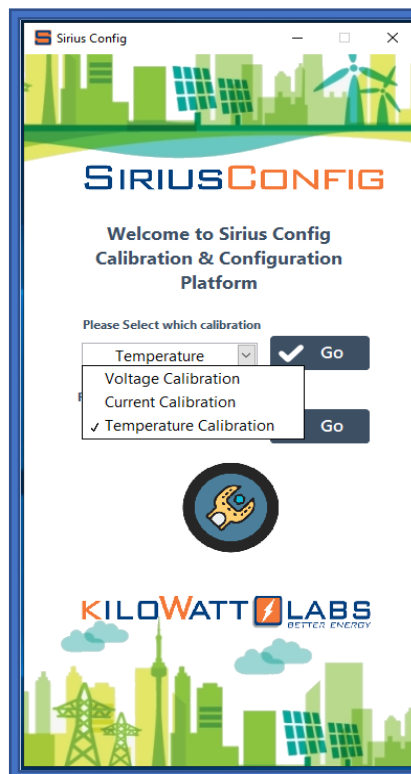
 **Note! We recommend to use high current.**

- Wait for 5 seconds, Module Current Reading will be updated.
- Click on the Main button to return back to the home page.

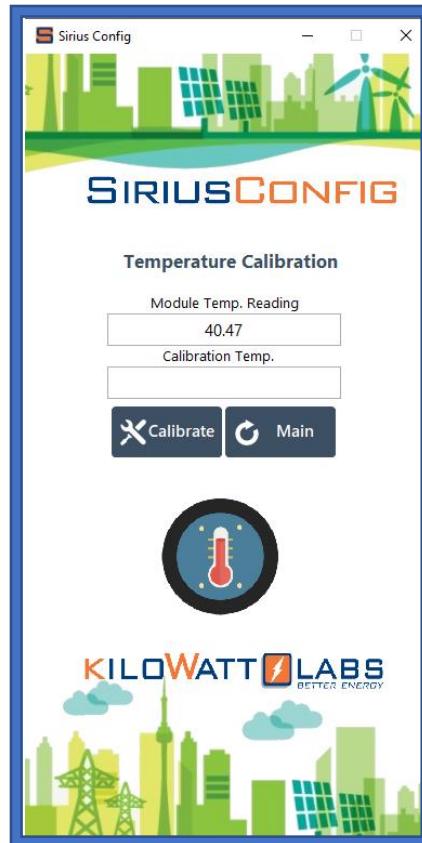
9.1.3 Temperature Calibration:

Follow the steps below to calibrate Temperature.

- Select Temperature calibration in the drop-down menu. Click on GO button to proceed.



→ A Temperature Calibration page will appear as shown below.



→ Take a temperature sensor and note the Temperature value. Write the value in the Calibration temperature text box and click on Calibrate.

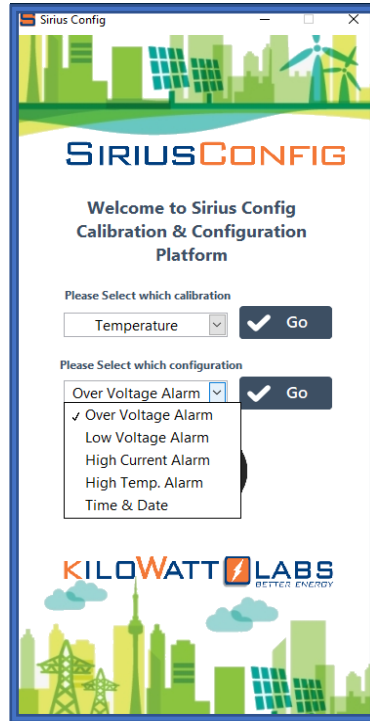
→ Temperature value will be updated after 5 seconds.

→ Go back to home page by clicking Main button.

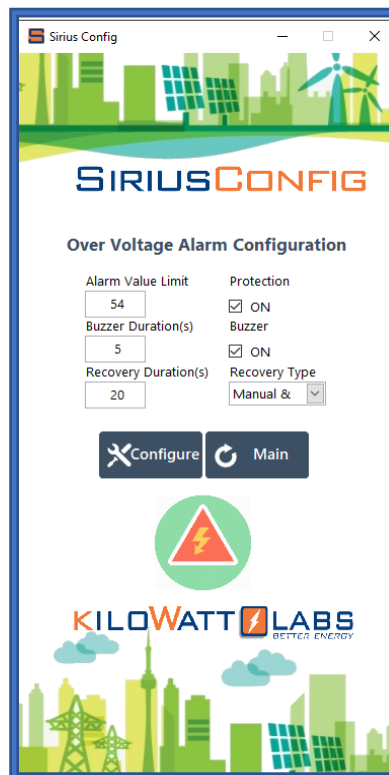
9.2 How to do Alarm Configuration?

9.2.1 Over Voltage Alarm Configuration:

→ Select Over Voltage Configuration from the Configuration drop-down menu as shown below and click on GO button.



→ An Over Voltage Alarm Configuration page will appear as shown below.



Alarm Value Limit: It is the voltage value at which buzzer will give Over Voltage alarm.



Note! Always set the alarm value limit to the maximum voltage of the Module.

Buzzer Duration(s): It is the time; a buzzer will take to beep when the voltage reaches to its maximum limit.

Recovery Duration(s): It is the time, after which the electronic switch will check itself for recovery.

Protection: When the Protection is enabled, buzzer will give alarm and if it is disabled, it will not give alarm.

Recovery Type: There are three options:

- Automatic: Electronic switch will turn ON automatically after recovery.
- Manual: Electronic switch will be activated by pressing the fault reset button.
- Automatic and Manual: Both options are applicable.

9.2.2 Low Voltage Alarm Configuration:

Alarm Value Limit: It is the voltage value at which buzzer will give Low Voltage alarm.



Note! Always set the alarm value limit to the low cut-off voltage of the Module.

9.2.3 High Current Alarm Configuration:

Alarm Value Limit: It is the current value at which buzzer will give High Current alarm.



Note! Always set the alarm value limit to the maximum Charge Current of the Module.

9.2.4 High Temperature Alarm Configuration:

Alarm Value Limit: It is the temperature value at which buzzer will give High Temperature alarm.

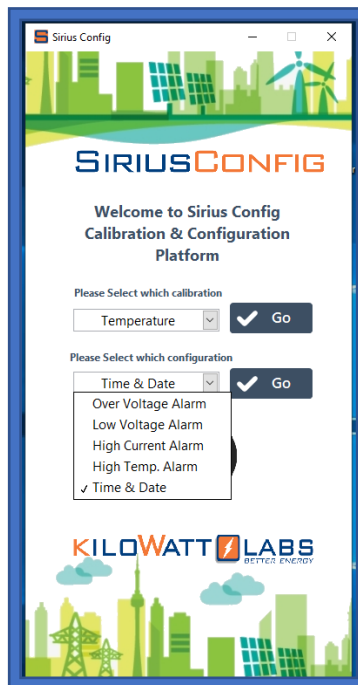


Note! Always set the alarm value limit to 80°C.

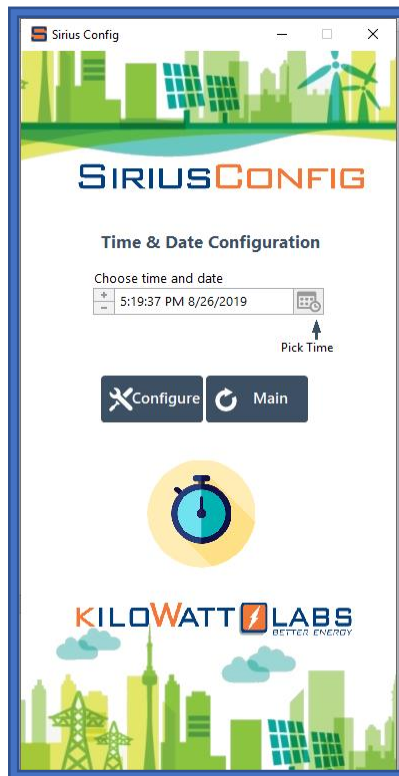
9.2.5 Time and Date Configuration:

Follow the steps below to configure time and date.

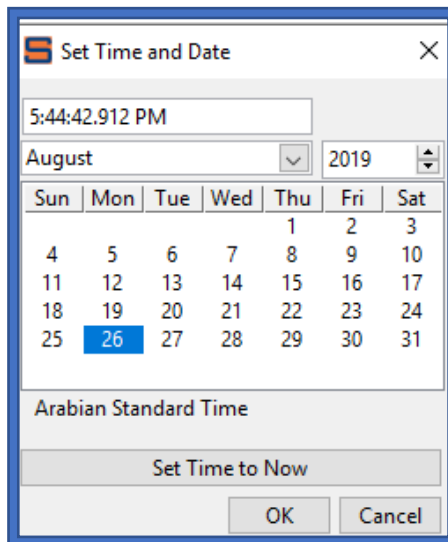
→ Select Time & Date in the drop-down menu. Click on GO button to proceed.



→ A time and date configuration page will appear as illustrated below.



→ By clicking on the Pick Time box at the right corner, a calendar screen will appear as shown below.



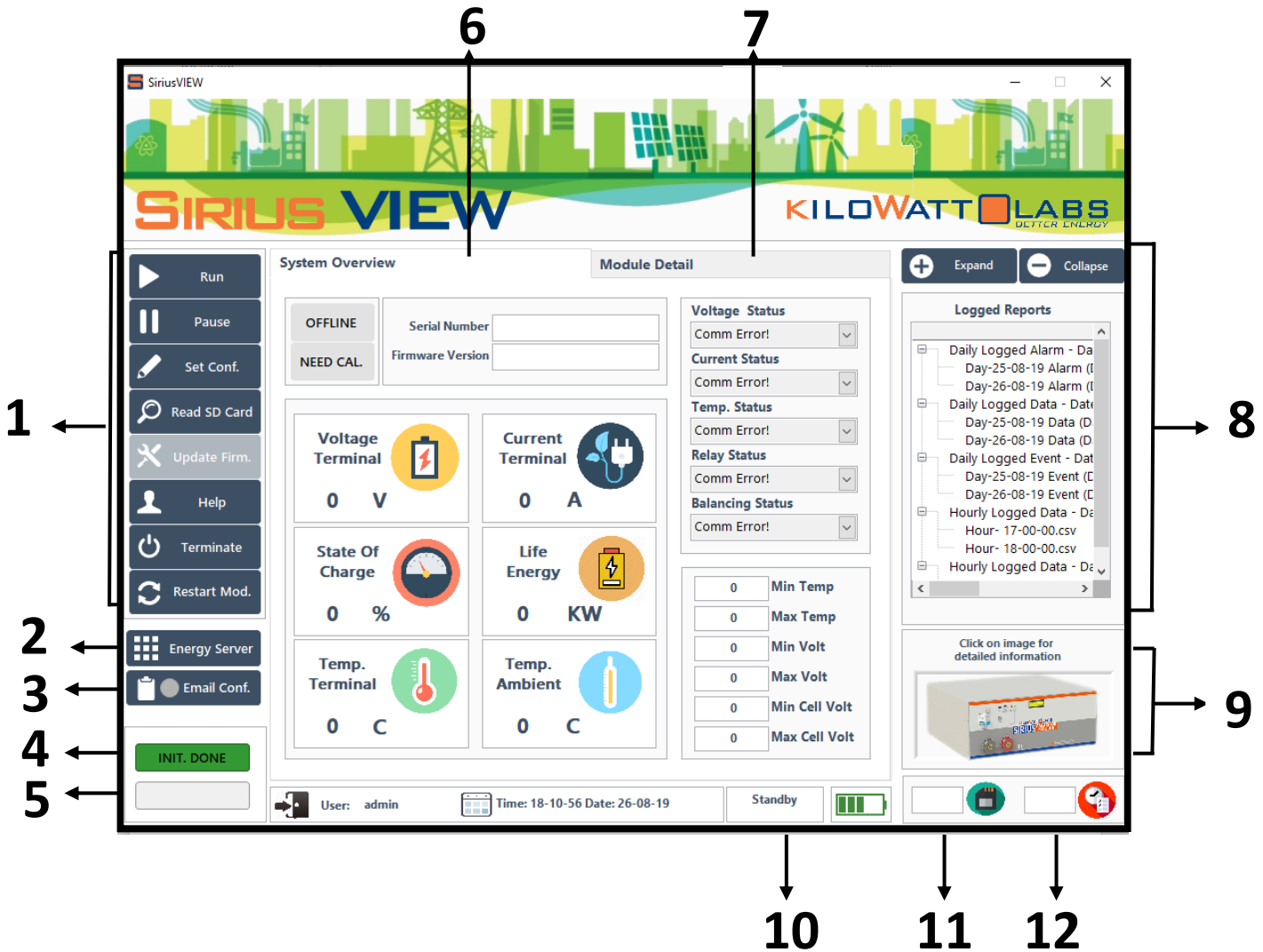
→ You can adjust the time from calendar or by clicking Set Time to Now. Set Time to Now will set the date and time automatically from your PC.

→ Click on Main to return to the home page.

10. Overview of SIRIUS VIEW Application:

Sirius View application is used for Monitoring, logging and analysis of parameters data in real time.

→ Go to Sirius VIEW and right click. A Sirius View application page will appear as shown below.



Number	Function	Description
1	User Buttons	User interfacing with Module
2	Energy Server	Centauri Energy Server Application
3	Email Configuration	Send daily notification mails to user

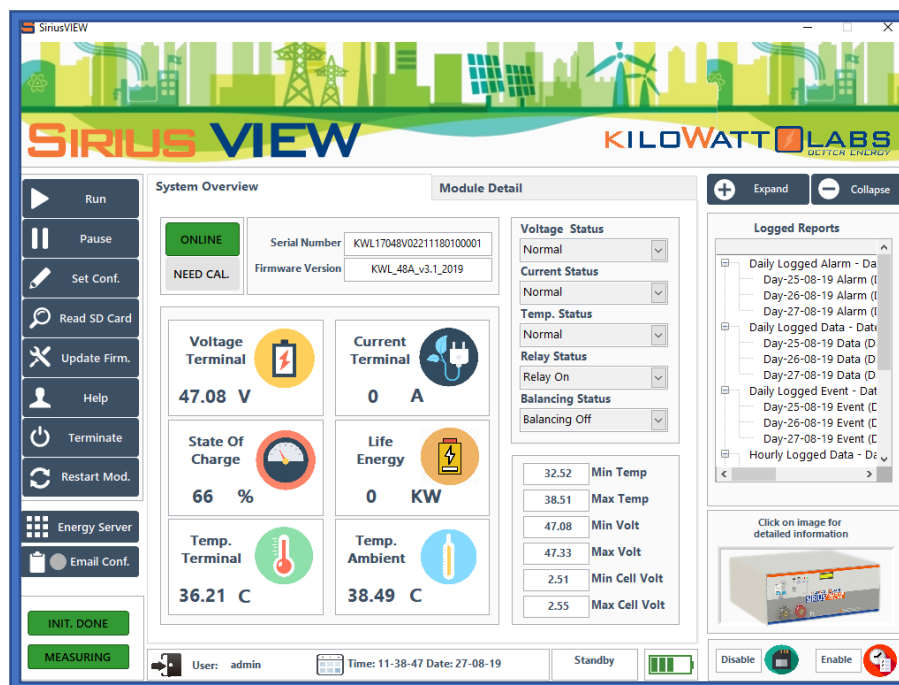
4	INIT.DONE	Communication Status
5	Measuring	Measuring Status
6	System Overview	Serial number, firmware version and measuring parameters status information
7	Module Detail	Module cell voltages, Graphs, history, Alarm & calibration status, Alarm parameters information
8	Logged Reports	Real time data history
9	Module Specifications	Module detailed information
10	Module Status	Module Status (standby/Charging /discharging)
11	SD Card	SD Card Mode (Enable/Disable)
12	RTC	RTC Mode (Enable)

10. 1 User Buttons:

User Buttons allow user interfacing with the Module. The user buttons are explained in detail below:

- Run:

Run button is used to start Sirius VIEW application. When you click Run button, you will see Sirius VIEW Screen as follows.

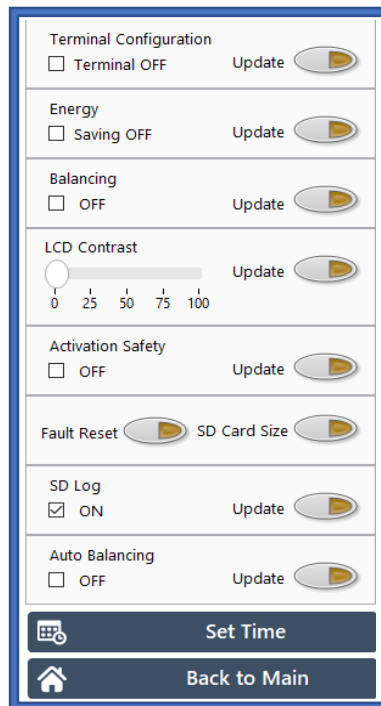


- Pause Button:

Pause button is used to pause Sirius VIEW application.

- Set Configuration:

Set Configuration is used to Configure Module.



Terminal Configuration: Terminal configuration is used to activate terminals. Terminals should be turned ON during charging and discharging the Module.

To activate terminals, click on the square box and then click on update button.



Note! You can also activate terminals by pressing fault reset button on the front panel of Module.

Energy: Energy saving mode is used to save energy by turning OFF the backlight of LCD. If energy saving mode will be ON, Module will have less self-discharge.

To activate Energy saving mode, click on the square box and then click on update button.



Note! Always turn ON the energy saving Mode when you are not using LCD.

Balancing: Balancing can be activated from any voltage level when the Module is in standby state. When all the cells get balanced, the balancing will stop.

To activate cell balancing, click on the square box and then click on update button.



Note! You can also enabled/disabled cell balancing by using fault reset button.
See section 3.3 for more details.

LCD Contrast: The contrast of LCD is configurable. The Default LCD contrast is 70.



Note! Set LCD contrast to low to save power.

Activation Safety: Activation safety is ON by default. When the Module is turned ON it will ask for activation. You can activate it by pressing fault reset button or by enabling terminal configuration from Sirius VIEW. If you disabled activation safety, terminals will be activated automatically when the Module is turned ON.



Warning! Always enable activation safety in order to avoid accident.

Fault Reset: Fault Reset is used to clear alarm messages.

SD Card Size: Size of internal memory is 8 Gb. This feature shows consumed memory size in bytes.

SD Card: Internal logged data can be easily extracted over Sirius VIEW Monitoring application. SD card can keep logging 30 days of data with 10 seconds speed without any interruption. SD Card is OFF by default. To get logged data you need to activate it first by clicking the square box and updating it.

Auto Balancing: Auto balancing is activated automatically during charging when the cells get unbalanced.

Note! Auto balancing is activated only when the Module Voltage reaches ~52 V.

Set Time: Set time is used to set time and date.

Go to set time. Set time and date and click configure button to update it.

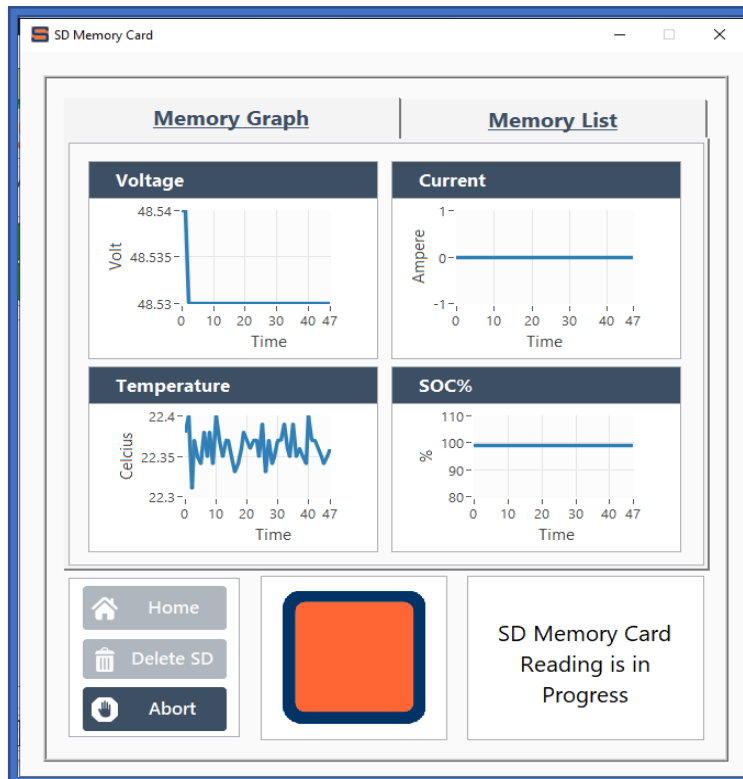
Back to Main page: Click on this button to return back to home page.

- Read SD Card:

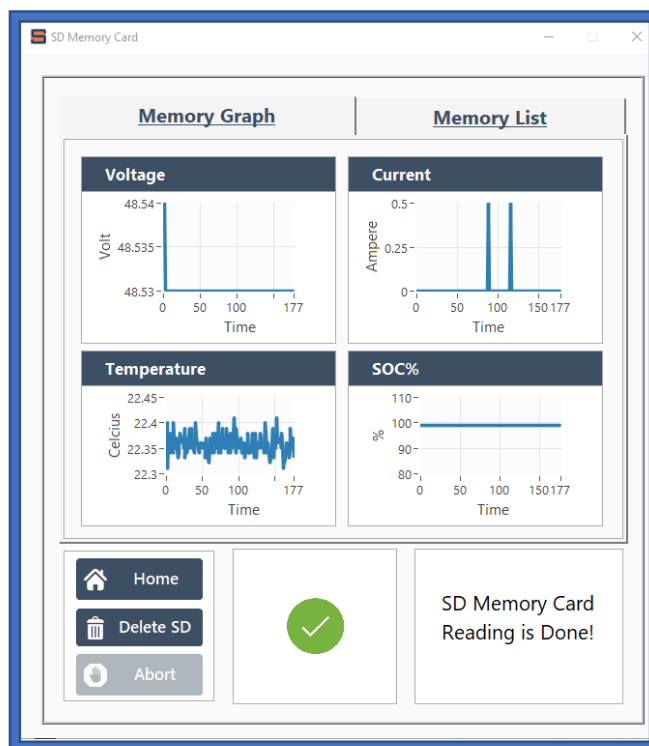
The purpose of this feature is to read all the logged data from the memory card. SD card save the following data after 10 seconds in excel format.

1. Timestamp
2. Voltage
3. Current
4. Terminal temperature
5. Ambient temperature
6. State of Charge (%)
7. All Cell Voltages
8. Voltage Status
9. Current Status
10. Temperature Status
11. Terminal Status

Press Read SD card, a pop-up screen will appear as shown below that will show total voltage, current, temperature and SOC graphs.



Once the reading operation is done or abort, the SD Memory card page will show following message.



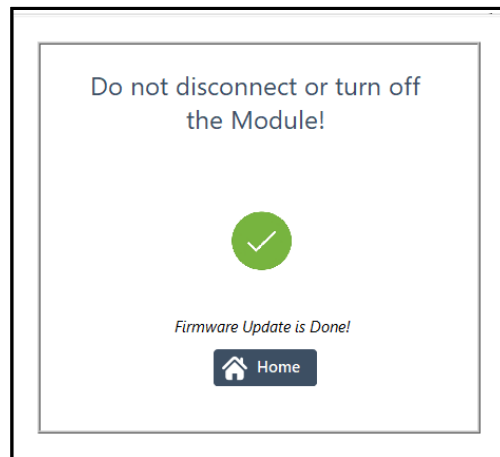
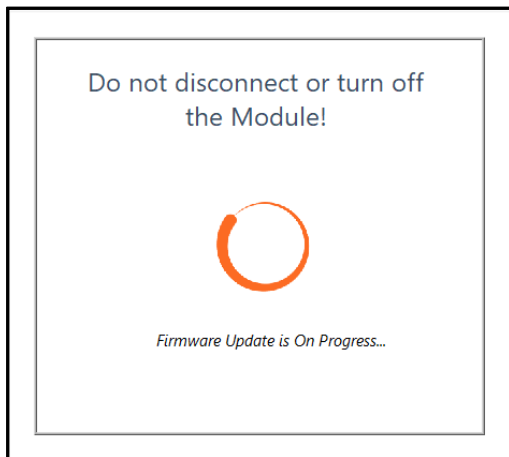
After reading operation is done, Sirius VIEW application will create SD Card report folder.



Note! Logged reports from History and SD Card report are same. The only difference is logged reports are created when PC is connected to the Module whereas SD Card report are created when PC is not connected to the Module and SD card is activated.

- Update Firmware:

Sirius Modules are shipped with the most updated firmware, however from time to time the company may update the firmware for more accurate measurements and improved features. You will receive a notification when the new version is released. To update the latest firmware version, click on the Update Firmware.



Note! Do not disconnect or turn OFF the Module, it can cause serious damage to firmware.

- Help:

Get help from kilowatt Labs if there is any complaint or need support.



- Terminate:

Terminate button is used to terminate Sirius VIEW application.

- Restart Module:

Click on Restart Module button to restart your Module from Sirius VIEW application.

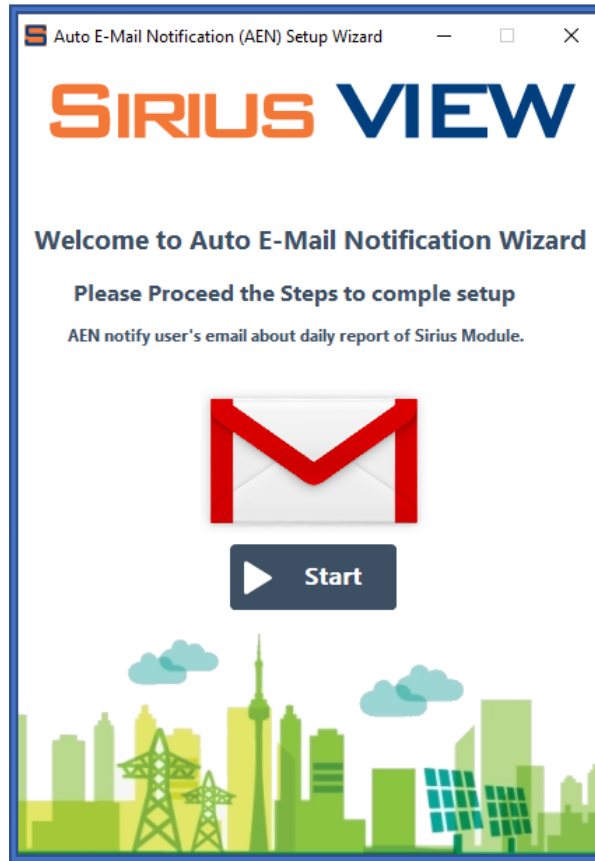
10. 2 Energy Server:

This feature is only for Energy Servers.

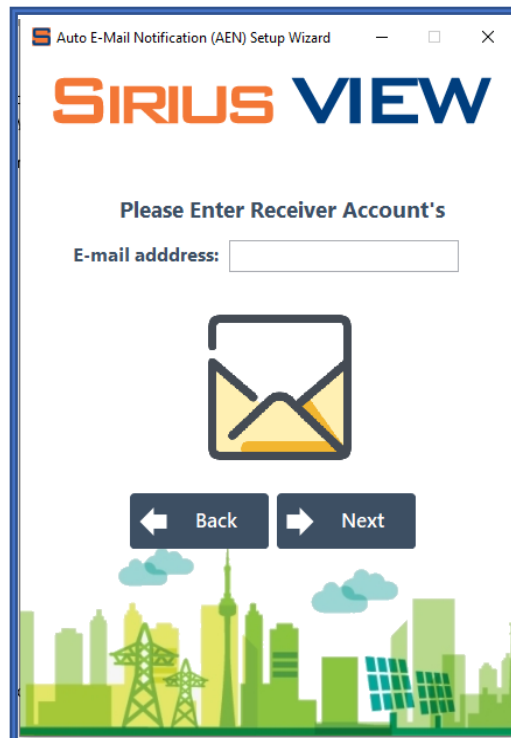
10. 3 Email Configuration:

Sirius Module has auto E-Mail feature that will notify users about daily report of the Module at the end of the day.

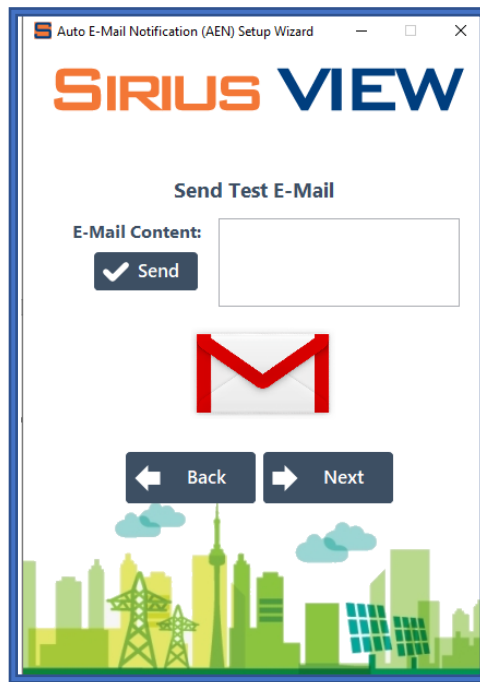
→ Click on the email configuration button, a dialogue screen will appear as shown below.



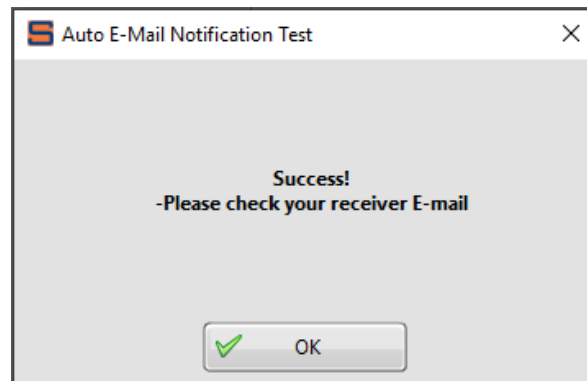
→ Click on start button to proceed.



→ Enter your E-mail address in the E-mail address text box and click on Next button. It will ask for test E-mail as illustrated below.



→ Click on Send and Next button, a test E-mail will be sent to your E-mail address.

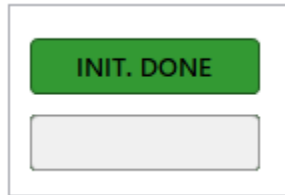


10. 4 INIT.DONE:

INIT.DONE indicates the connection between PC and the Module. When the connection between PC and the Module is established successfully, INIT.DONE will be constantly turned ON.



Note! If there is any problem during connection, check USB cable and ensure the Module is working properly.



10. 5 Measuring:

For getting measurements, press RUN button. While getting measurements, MEASURING LED should blink every 1 second. If blinking has stopped, it will represent measurement interrupt or technical issues.

10. 6 System Overview:

The screenshot shows the 'System Overview' interface with the following components and callouts:

- 1**: Points to the 'ONLINE' status indicator.
- 2**: Points to the 'NEED CAL.' status indicator.
- 3**: Points to the 'Serial Number' field (KWL17048V02211180100001).
- 4**: Points to the 'Firmware Version' field (KWL_48A_v3.1_2019).
- 5**: Points to the 'Voltage Terminal' and 'Current Terminal' cards.
- 6**: Points to the 'Voltage Status', 'Current Status', 'Temp. Status', 'Relay Status', and 'Balancing Status' dropdown menus.
- 7**: Points to the temperature and cell voltage data table.

System Overview		Module Detail	
ONLINE	Serial Number	KWL17048V02211180100001	
NEED CAL.	Firmware Version	KWL_48A_v3.1_2019	
Voltage Terminal 45.97 V	Current Terminal -0.53 A	Voltage Status Normal	
State Of Charge 55 %	Life Energy 0.03 KW	Current Status Normal	
Temp. Terminal 39.33 C	Temp. Ambient 41.63 C	Temp. Status Normal	
		Relay Status Relay On	
		Balancing Status Balancing Off	
		32.52	Min Temp
		41.73	Max Temp
		45.97	Min Volt
		47.33	Max Volt
		2.46	Min Cell Volt
		2.55	Max Cell Volt

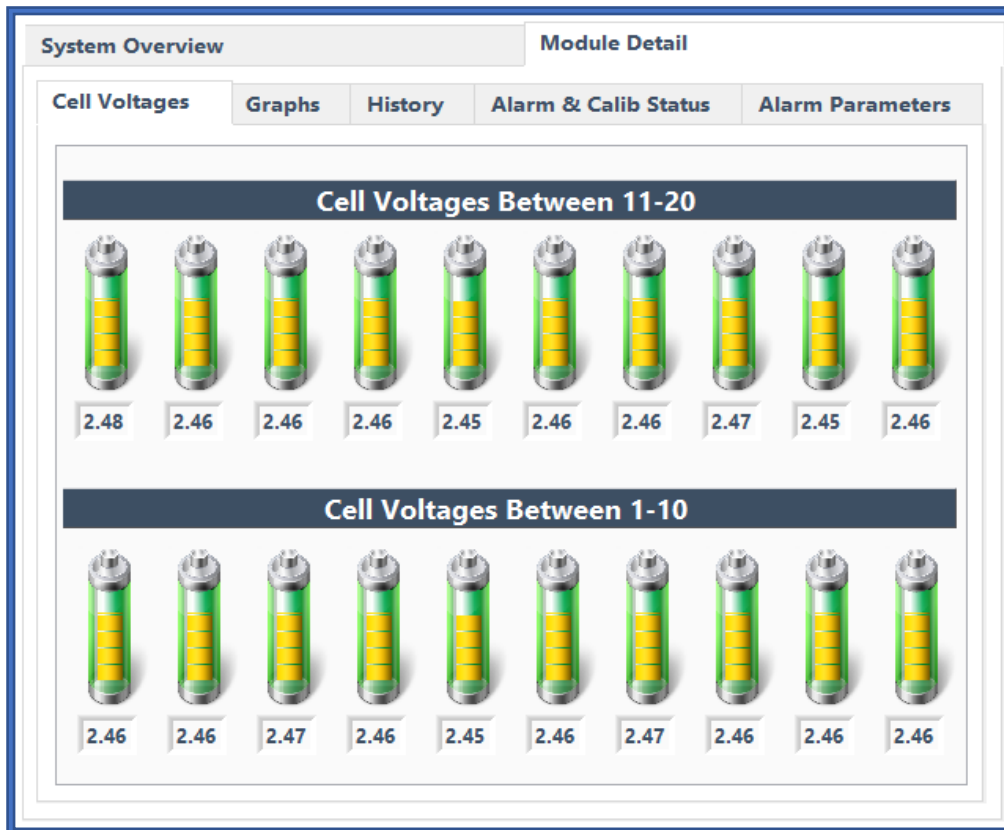
Number	Feature	Description
1	ONLINE	The function of ONLINE is same as INIT.DONE.
2	NEED CALIBRATION	It informs the user about the status of parameter calibration. Calibration: when all parameters are calibrated. NEED CAL.: When all parameters are not calibrated.
3	Serial Number	Serial number of Module
4	Firmware Version	Firmware version of Module
5	Module Parameter Values	Real time measurement of parameters
6	Alarm Status	Status of parameters alarm
7	Statistical Measurement	Maximum and minimum value of parameters

10. 7 Module Details:

This feature includes individual cell voltage, graphs of the Module parameters and their history, alarm and calibration status and alarm parameters details.

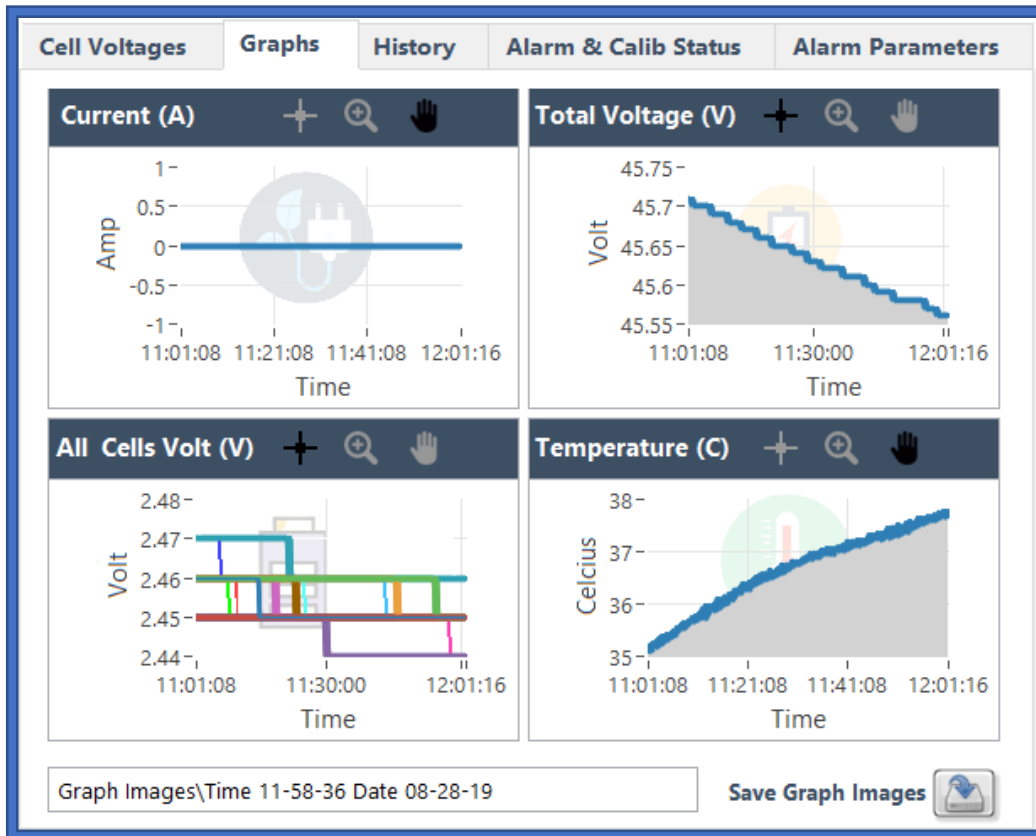
- Cell Voltages:

This feature is only available for Modules that have individual cell monitoring. The voltage range of supercapacitor cell is 2.2V to 2.7V. This page shows the individual cell voltage level of 20 cells. The number of cells may vary depending on the model of the Sirius Modules. This page helps the users to know about the unbalancing and under/over voltage of cells.



- **Graphs:**

This page shows the graphs of current, terminal voltage, individual cell voltage and temperature with respect to time. Each graph has zoom and move tools at the top to zoom in and out or move respectively. User can also save graph images by clicking the save button at the bottom of the page.



- **History:**

History contains logged data files recorded over time. The file records the data of:

1. All parameters measurements (Terminal Voltage, Ambient Temperature, Terminal Temperature, Current, State of charge)
2. All parameters statistical measurements (Minimum Temperature, Maximum Temperature, Minimum Voltage, Maximum Voltage, Minimum Cell Voltage, Maximum Cell Voltage)
3. All Cell Voltages (if Module has individual cell monitoring)
4. Parameters Alarm Status

5. Calibration Code
6. Balancing Status
7. Terminal Status

The screenshot shows the SiriusVIEW software interface. The 'System Overview' tab is selected, and the 'Module Detail' sub-tab is active. The 'History' sub-tab is selected, displaying a table with the following data:

Serial Number	Time & Date
KWL17048V02211180100001	Time: 13-49-01 Date: 08-28-19
KWL17048V02211180100001	Time: 13-49-02 Date: 08-28-19
KWL17048V02211180100001	Time: 13-49-03 Date: 08-28-19
KWL17048V02211180100001	Time: 13-49-04 Date: 08-28-19
KWL17048V02211180100001	Time: 13-49-05 Date: 08-28-19
KWL17048V02211180100001	Time: 13-49-06 Date: 08-28-19
KWL17048V02211180100001	Time: 13-49-07 Date: 08-28-19
KWL17048V02211180100001	Time: 13-49-08 Date: 08-28-19
KWL17048V02211180100001	Time: 13-49-09 Date: 08-28-19
KWL17048V02211180100001	Time: 13-49-10 Date: 08-28-19
KWL17048V02211180100001	Time: 13-49-11 Date: 08-28-19
KWL17048V02211180100001	Time: 13-49-12 Date: 08-28-19
KWL17048V02211180100001	Time: 13-49-13 Date: 08-28-19
KWL17048V02211180100001	Time: 13-49-14 Date: 08-28-19

Below the table, there are two summary boxes:

- Total Dis. Energy (KWH): 0
- Total Char. Energy (KWH): 0

At the bottom, the Report Folder is listed as: C:\Users\Mamoona\Desktop\SiriusVIEW\

On the right side of the interface, there is a 'Reset Counters' button and a 'Cycle by Session' counter showing 0. An illustration of a wind turbine is also present.

The table of history page shows only 1 minute of data, after 1 minute the table is cleared and the data is saved automatically in excel format. The excel files are created automatically in Sirius VIEW Report Folder on an hourly basis. At the end of day, daily report folder will be created that will contain the data of the whole day.

The history page also calculates the total charge and discharge energy. Click Reset Counters to clear Total charge and discharge energy.



Note! Calibration code is for maintenance and diagnosis. The default calibration code is 63.

- Alarm and Calibration Status:

This page shows the alarm and calibration status of the Module. It contains 3 tables as shown below.

The screenshot shows the 'Alarm & Calib Status' page with the following components:

- Table 1:** An event log table with columns 'Time & Date' and 'Event'. The first entry shows 'Time: 10-33-11 Date: 08 Start Standby'.
- Table 2:** An alarm status table with columns 'Time & Date', 'Voltage Alarm', 'Current Alarm', and 'Temperature Alarm'.
- Table 3:** A calibration status section with the following items:
 - Current is: UNCALIBRATED
 - No Load Current is: CALIBRATED
 - Temperature is: CALIBRATED
 - Capacity is: CONFIGURED
 - Serial Number is: CONFIGURED
 - Quality is: CHECKED

Table 1: shows the date and starting time of the event of charging, discharging and standby mode.

Table 2: shows the alarm status of high and low voltage, over current and over temperature, date and the time at which the alarm occurs.

Table 3: shows the status of parameters calibration and configuration.

- Alarm parameters:

This page gives information of alarm conditions of the parameters.

The screenshot shows the 'Alarm Parameters' page with the following settings:

- High Voltage:** Alarm Volt. 54, Alarm Dur. 5, Alarm Counter 20, Alarm Set? (Enabled), Prot. Set? (Enabled), Man. Rec. Set? (Enabled), Auto. Rec. Set? (Enabled).
- Low Voltage:** Alarm Volt. 44, Alarm Dur. 5, Alarm Counter 20, Alarm Set? (Enabled), Prot. Set? (Enabled), Man. Rec. Set? (Enabled), Auto. Rec. Set? (Enabled).
- High Temperature:** Alarm Temp. 80, Alarm Dur. 5, Recover. Temp 60, Alarm Set? (Enabled), Prot. Set? (Enabled), Man. Rec. Set? (Enabled), Auto. Rec. Set? (Enabled).
- High Current:** Alarm Current. 450, Alarm Dur. 5, Tolerate Counter 5, Rec. Counter 20, Alarm Set? (Enabled), Prot. Set? (Enabled), Man. Rec. Set? (Enabled), Auto. Rec. Set? (Enabled).
- Password Status:** Password Status (Enabled), Pass. Disabled, Pass. Correct, No Trigger.
- Button Sound Feed:** Button Sound Feed. ON

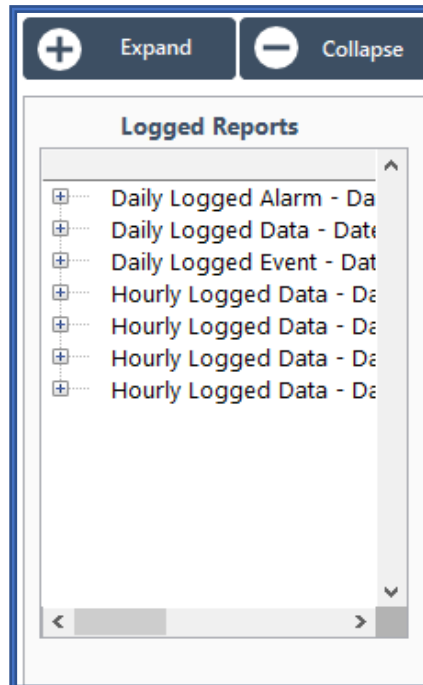
1. It shows the limit at which buzzer will beep, the duration of the beep and the time after which buzzer will check itself for recovery.
2. It shows whether buzzer, activation safety, Auto & Manual recovery is enabled or disabled.
 - Green box represents Enable.
 - Grey box represents Disable.
3. This feature is only applicable to Modules with Anti-Theft protection.
4. User can turn ON/OFF button sound feed.



Note! All parameters are configured and calibrated before shipment. Parameters can be calibrated and configured from SIRIUSCONFIG. Please read Overview of SIRIUSCONFIG (Section 9).

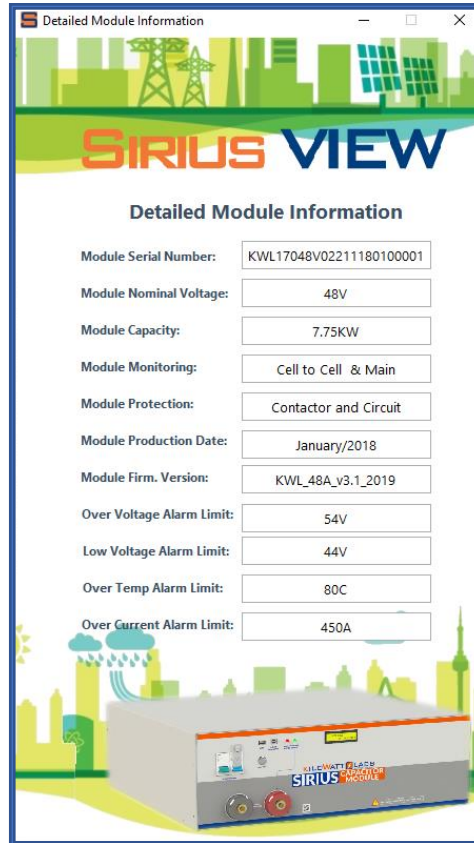
10. 8 Logged Reports:

User can access daily logged alarm, data and events from logged reports directly. Users can also Expand and Collapse the logged report by clicking respective buttons.



10. 9 Module Specification:

Click on image for detailed information of Module.



10.10 Module Status:

It shows whether the Module is charging, discharging or in standby mode.

10. 11 SD Card Status:

It shows whether SD card is enabled or disabled.



Note! If SD Card is enabled from configuration and the status is showing disabled then there is some technical issue.

10. 12 RTC Status:

It shows whether RTC is enabled or disabled.



Note! RTC should always be enabled. If the status is disabled, configure the time and date from Sirius Config.

11. Module FAQs:

Q. How to determine the current status (charging/discharging)?

A. When the current value on the LCD is negative it means the Module is discharging and when it is positive, it means the Module is charging.

Q. The current reading on the LCD is not accurate for the first charging/discharging Session?

A. The user should wait for 5 minutes after starting the Module for the first charge/discharge session (it is only one time for warming up).

Q. Can we use unprotected terminal while the Module is switched OFF/ON (For Anderson Terminals)?

A. **Module is ON:** There will be an output voltage measured across the unprotected terminal, however the protected terminal can be toggled ON/OFF by using fault reset button, but if 'Activation Safety' option is checked OFF from the Sirius VIEW application, the protected terminal will be ON all the time.(Please refer to User Buttons (Section 10.1).

Module is OFF: Both of the terminals will not work when the Module is switched OFF.

Q. The Module shows zero current while using unprotected terminal for recovery (For Anderson Terminals)?

A. Please consults with your Reseller.

Q. How to reset the current to zero?

A. Please refer to the Fault Reset description (Section 3.3).

Q. If we leave the Module turned ON after it reaches 44V or below. What will happen?

A. When the Module reaches the minimum voltage and below (whether terminal is ON or OFF), the LCD will display "Low Charge Module" message.

Q. What will happen if the Module is totally empty? or If the Module is left on after it is drained, will it keep draining to the point that it will not charge without some sort of manual recovery?

A. Getting Module totally empty (zero voltage) after leaving the Module stand by for long time is normal, so in this case LCD & electronic switch will be OFF, but the Module can be recovered.

Q. Self-consumption of the Module when connected to a power source and the terminal is ON, seem to consume about 1Amp or about 1kWh per day?

A. The maximum current of the Module BMS is 60mA not 1A.

Q. We are getting multimeter value different (Voltage, Current Charge/discharge, Temperature, Energy) from that displayed in LCD across the terminal? or why has the Module lost the calibration?

A. It is normal since each electronic tool or equipment needs calibration after long time of use to get accurate results, and for that the Module needs to be calibrated. But before that please check the following:

- Firstly, double check the value with accurate meter (we suggest fluke multimeter), if the deviation between the Module and multimeter is less than $\pm 0.5\%$ it is acceptable.
- Secondly, if the deviation is more than $\pm 0.5\%$, the Module needs calibration.

Please read How to do parameter calibration? (Section 9.1)

Q. What could happen when connecting different model of Sirius Module parallel/series together?

A. Modules can be connected in parallel or in series if they will have:

- Same Voltage
- Same Capacity

It is possible but not recommended especially connecting old BMS design to the new one. The system might get unpredictable during extreme scenarios like Module charge full or low.

Q. Is it possible to connect Sirius Module in parallel with other chemical batteries such as lithium-ion or lead acid?

A. It is possible but not recommended. Make sure the total voltage of each battery is the same as the Module and the charging voltage does not exceed the Module's maximum voltage. The possible drawback is that you will not get the total capacity of the chemical battery because extreme voltages are not the

same.

Q. If we set the cutoff voltage on the charge controller systems /inverter end to 45V, will that allow the Module to sit at idle for longer periods of time to avoid an undervoltage situation?

A. Yes.

Q. Which is most compatible charge controller systems/ inverter, and whether any charge controllers have been integrated with Sirius in this application?

A. All charge controllers that are compatible with our Module specification (please refer to technical specification sheet of Module) can be used with Sirius Module, however you must follow the charging curve of Sirius Module.

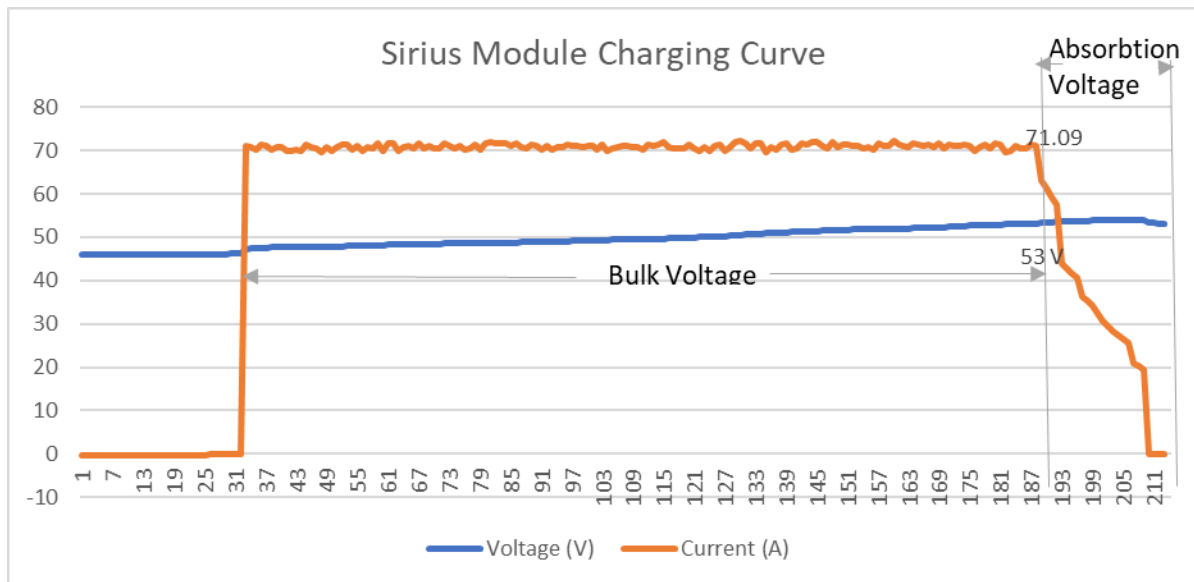


Figure 1: Sirius Module charging curve.

Also, Kilowatt labs can provide Centauri Energy Server for microgrid system for more information please visit www.kilowattlabs.com.

Q. How to check charging/discharging energy of Module?

A. Please refer to Module Details (Section 10.7).

Q. How to reach the rated capacity of Module?

A. The display shows the total delivered energy (discharged) from the time the Module started till current time, and the Module has ~74A at 1C and 125A at 1.7C(Max. charging current). So, to obtain the standard energy 3.55kWh, start the charging cycle from minimum voltage 44V to maximum voltage 54V with constant current of 74 A as shown in charging curve of Sirius module, then for discharging cycle start from maximum voltage 54V to minimum voltage 44V with 74 A constant current. (Please refer to SiriusVIEW application manual for Round trip efficiency).

Q. What would be the effect on energy when charge/discharge the Module at different C-ratings?

A. When the charge rate increases, the time for charging/discharging decreases, which means that maximum energy can be obtained in a short period of time as shown in the table below.

Charge rate (C)	Charging current (Amp)	Discharging current (Amp)	Time (Minutes)
0.28	20	20	Approx. 4hrs
0.5	37	37	Approx. 2hrs
1	74	74	Approx. 1hr
1.35	100	100	45 mins
1.7	125	125	35 mins

Table 2: Charge rate with its corresponding time.

Q. Why the Module needs twice of power cycle?

A. When the Module is switched OFF and the Sirius VIEW is still open you have to wait for 10 Sec (since the application is still communicating with the Module) before turning ON the Module, or either by terminating the Sirius VIEW or by disconnecting the communication cable.

Q. How much is the capacity of the internal storage (SD Card)?

A. 8GB SD Card is used in the Module which logs 85 bytes of data per 10 seconds. Note that data logging should be turned ON before the Module will start logging and data logging is limited to 30 days. After reading the data the Module will delete it automatically. By default, data logging is OFF for firmware

version 2.0 and above.

Q. What is the reason if the LED isn't working at all?

A. Due to different reasons that may happen such as:

- If we can get the output (Terminal, software communication), the LED may have some technical issues.
- The protected terminal is not working.

Please consult with your Reseller.

Q. How to troubleshoot the communication between the Module and PC?

A. If you face any communication difficulties between the Module and PC please troubleshoot as follows:

- Double Check the cable connection (try to use another USB cable).
- Try to use another port in the PC.
- Check the Module USB drive in your PC from setting then search for Device Manager then go to ports as shown below (Please refer to USB serial driver quick install).

After the troubleshooting if the problem still doesn't solve, please consult with your Reseller.

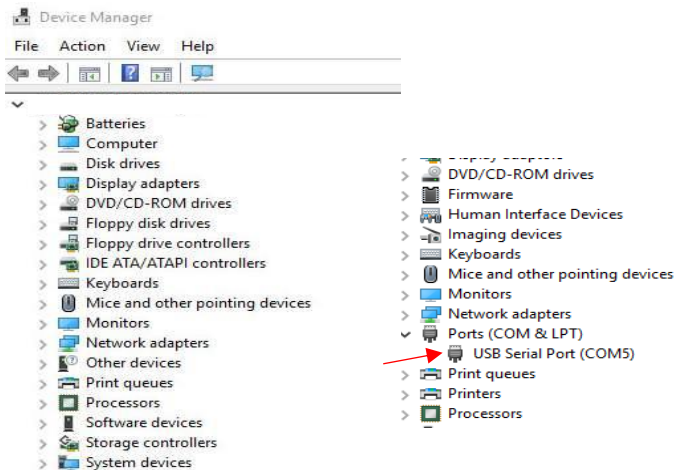


Figure: Module Port & com

Q. The Module doesn't seem to show correct State of Charge (SOC).

A. The Module is using the previous data to correct the state of charge in the long run. Charge the Module to maximum Voltage and then discharge it to cut-off Voltage and repeat the process several times to correct the SOC. Note that open voltage is not directly related to SOC.

Q. Can we connect Modules in parallel?

a. Do we need to calibrate them?

b. How to calibrate?

A. Yes.

a. Yes

b. Calibrate each Module individually before connecting in Parallel.

Q. One of the Cell is 0V, however Module is at 46V.

A. It can happen due to many possibilities.

1. Cells are connected in Series and parallel combination, so you will still get terminal voltage even if one cell is zero.

2. The IC of the Cell monitoring PCB is monitoring 12 cells. This IC might not be working properly due to which one of the cells get discharged.

Charge that cell manually.

Q. When the modules are connected in parallel, the current drawn in all the Module become unequal.

A. This is normal. All Modules cannot give equal current because current depends on internal resistance and ESR of the Module.

Q. When the Module voltage drops below low voltage but the Module is still switch ON, does it need recovery?

A. No, it does not need recovery. Charge the Module normally.

12 Sirius VIEW FAQs:

Q. Do I need to use SiriusVIEW Software?

A. The Module can work stand-alone without the Sirius VIEW. It can be used only for updating firmware, to activate SD card, to calibrate and configure parameters and alarms and to extract the data & measurement from the Module.

Q. How do I know if there is firmware issue in the Module?

A. New Firmware is uploaded to <https://www.amberandwaseem.com/>. Always check the website for an update.

Q. What kind of issues can happen about firewall and antivirus programs?

A. There will be no problem as far as the software is run as administrator.

Q. How to calibrate Module parameters?

A. To calibrate Module parameter like (Voltage, Current, Temperature, Energy) kindly Refer to Sirius CONFIG (Section 9).

Q. The Module is showing Contact Service.

A. This may be due to damage in the Cell monitoring PCB, Main Board or Top board.

→ Check the Cell monitoring PCB and cables for balancing, they might be loosened due to which cell data of few cells is shown to be zero thus raising the alarm of contact service.

→ Check the IC of the main board, there might be dry contact due to which it gives contact service alarm.

Q. Can the Sirius Module be installed standing vertically with the connection facing up without potentially stressing the cells inside the Module?

A. Yes, but NOT in a movable or vibrating position.

Q. What is the difference between the “balancing” and “auto balancing” in “set Config” tab in SiriusVIEW?

A. Balancing: Balancing can be activated from any voltage level when the Module is in standby mode (Zero current). When all the cells get balance, the balancing will stop. The time required to balance all cells depends on cells condition.

Auto balancing: Auto balancing is activated automatically during charging when the cells get unbalanced.

Note that it is activated only when the Module Voltage reaches ~52 V.

Q. Can balancing and auto balancing options be activated at a same time?

A. Yes.

Q. When to use Sirius Config?

A. The Module is received with full settings and the most updated firmware, however, if you want to calibrate parameters (current, voltage, date and time, alarm, temperature) you can use SIRIUSCONFIG. Read “Overview of SIRIUSCONFIG” (Section 9).