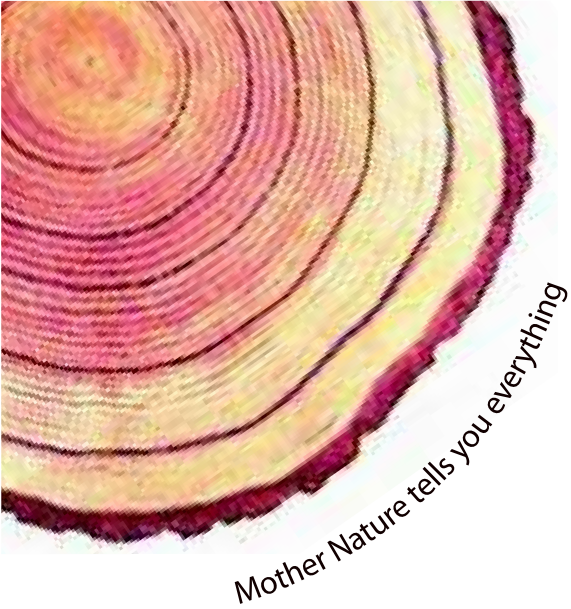

User Manual

Equiplog

Equiplog Data Logger
DL/I-EMD for
Equipment Monitoring Systems
Model No.: 9994x

g-tek™
better by performance

Manufacturers of :
- Circular Chart Recorders
- Inkless Recorders
- Paperless Recorders
- Scanners & Data Loggers
- Networked Data Loggers
- Application Software
- WHO PQS Qualified Data Loggers
- Vaccine Series Data Loggers

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English/ 2026/ Rev.1.0

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1 SAFETY AND THE ENVIRONMENT

1.1 About this document

This instruction manual is an essential component of the product.
Please read this documentation carefully and pay attention to the safety instructions and warning notices to prevent injuries and damage to the product.

Keep this document handy so that you can refer to it when necessary.

1.2 Ensure Safety

- Operate the product properly, for its intended purpose and within the parameter specified in the technical data. Using it beyond the specified limit can cause the damage to the product and personnel also.
- Do not use the product if there are signs of damage to the housing.
- For any defect, please consult the factory or the dealer from where you bought.

1.3 Protecting the Environment

- All the materials used in the data logger are RoHS and Reach compliant. The Data logger is marked with RoHS and CE compliant. There are no hazardous parts in the data logger.

1.4 Correct Disposal and Recycling of the Product

- Disposal properly marking on the Equiplog data logger indicates that data logger and its accessories should not be disposed of with other household or commercial waste at the end of their working life.
- Dispose of faulty batteries/spent batteries in accordance with the local regulations or valid legal specifications.

At the end of its useful life, send the product to the separate collection for electric and electronics devices (observe local regulations) or return the product to Manufacturer for disposal. (Dispose or recycle the **Equiplog data logger** in accordance with the WEEE 2012/19/EU guidelines or your local regulations. For the suitable recycling, the device may also be returned to the manufacturer.)

2 SPECIFICATIONS

2.1 Introduction

The Equiplog Data logger collects real-time equipment performance data, which can be stored either locally or in the cloud, which meets the requirements of **WHO PQS E006/DL01.2 and E006/EM01.2** standards**.** It stores the data up to 1 year and user can see the history data up to last 30 days on display without downloading or connecting the device to the computer. The Data logger and Appliance parameters can be pre-configured at the time of installation as per the requirement of WHO PQS guidelines to meet all three EMS levels. They have been specifically designed for monitoring the temperature during storage of vaccines and other medical products or the medical refrigerator products subject to cold chain requirements.

The logger is primarily designed for maintaining relative time, recording appliance data objects, generating and recording logger data objects, and making that data available in a standardized way to other equipment monitoring devices and systems- like ILR, Vaccine freezers.

The sensor input readings are monitored and saved throughout the entire duration of measurement program. The logger offers model ranging from a Level-1 to Level-3 of EMS levels. With the functionalities like OLED display, event indications for alarms, error codes, mobile app integration, and real-time cloud data access, the Equiplog Data Logger ensures efficient monitoring. It is also compatible with the Varo App on your smartphone, providing instant cold chain insights sent directly to your inbox. Equipped with a rechargeable battery, it is a reliable tool for maintaining cold chain integrity and the safe storage of medical products.

2.2 Features

- WHO/PQS/E006/DL01.2 Compliant
- WHO/PQS/E006/DS01.2 Compliant
- WHO/PQS/E006/EM01.2 Compliant
- Meets the requirements for all three EMS levels
- Compatible with Varo App on your smartphone for instant cold chain insights sent directly to your inbox
- M2M Interface for Appliance Data Monitoring:
    - Compartment Temperature and Door opening
    - Appliance Supply and Compressor On/Off time
    - Ambient Temperature and Humidity
- Connects to SECOP Compressors
- MODBUS RS485 master to connect to controller
- USB Type-C port for M2M Data Access
- 1 Year of data storage and PDF report of last 60 days
- Direct PDF Summary report of last 60 days as per WHO PQS guideline
- Standard Json format files compatible with all appliance data objects

- Rechargeable battery of operating life 5 years*
- Model options to choose from:
    - Level-1: Data Logger with M2M Interface
    - Level-2: Integrated EMD with Local communication
    - Level-3: Integrated EMD with Local and remote communication
- 1.5" OLED intuitive Display (Optional) with multi-function menus
- Resolution of 0.1 °C for Display and Storage
- Local Date and Time setting option
- History data view of last 30 days on display
- Event Indications such as Alarms, Door open, power outage etc.
- Audio-Visual indication for Temperature Alarms
- Audio-Visual monitoring Enable/Disable option
- Error codes for fault conditions in the Appliance
- Mobile Application (Optional)
    - Data Viewing and upload on the Cloud Server Application
- GSM Add-On module feature (Optional)
- Cloud Server Application for detailed Analysis and report generation
    - Real time data monitoring on Cloud Server Application
- Firmware update available through OTA (Over The Air)#

2.3 Technical Data

Table 1 Technical Specifications

Model	**Equiplog (9994x series)**
Display and Operator Panels#	
Display Type#	1.5" OLED display (128x128 pixel Gray scale) with, • Battery Level, Power status, USB symbol, REC indication, GSM strength • Alarm(s) messages, Alarm trigger (Bell) symbol, Local date & time • Alarm status (✓/ ✕) symbol, Current reading for Vaccine compartment with measurement unit. • Multi day Alarm History markers(▲ or ▼ arrows)
Status Indicator#	Status LEDs for • Device working indication, • System Errors condition, • Battery condition, • Alarm Heat/Freeze Indication
Panel Keys#	For Data Logger without Display: 1 key for data recording start; 1 key for alarm acknowledgment For Data logger with Display: 3 multi-purpose keys; 1 key for alarm acknowledgment
Analog Inputs	
No. of Inputs	8 Sensors 2 x Temperature sensors (Vaccine, Freezer compartment)

	2 x Door sensors (Vaccine, Freezer compartment) 2 x Potential free contact for Compressor On/Off 1 x Ambient Temperature & Humidity sensor (Internal) 1 x Temperature sensor for Appliance self Test (Internal)
Temperature Sensor	Thermistor - Tayao 10K NTC, 3 mm diameter, 2.5 meter long cable with sealed cap
Operating Range (Sensor)	-40 °C to + 60 °C (-40 °F to +140 °F)
Accuracy	± 0.5 °C for the range -30 °C to + 30 °C; ± 0.7 °C otherwise
Temperature Response Time	T90 < 20 minutes as per EN12830:1999
Resolution	± 0.1 °C
Door Sensor#	Magnetic reed switch/Potential free contact
Operating range	-30 °C to + 50 °C (-22 °F to +122 °F)
Accuracy	Binary, open/closed
Response Time	An "**open**" event is identified whenever door panel is not fully seated in the closed position for proper compartment sealing.
Voltage Monitoring Input#	
Operating range	-30 °C to + 50 °C (-22 °F to +122 °F)
Accuracy	± 2 % for DC range 0- 72 V ± 2 % for AC range 0- 600 V
Resolution	± 0.1 V
Current Monitoring Input#	
Operating range	-30 °C to + 50 °C (-22 °F to +122 °F)
Accuracy	± 5 % for DC range 0- 10 A ± 5 % for AC range 0- 30 A
Resolution	± 0.1 A
Ambient Temperature-Humidity Sensor	Solid state MEMS sensor#
Operating range	-20 °C to + 60 °C (-4 °F to +140 °F) 0 to 100 %RH
Accuracy	± 0.5 °C for the range +10 °C to + 40 °C; ± 0.7 °C otherwise ± 3 %RH for the range 20 to 80 %RH ± 5 %RH otherwise
Resolution	± 0.1 °C ± 0.1 %RH
Calibration	Each device accompanies NABL (ISO/IEC 17025) traceable certificate
Alarm Details	
Heat Alarm Settings*	For Vaccine: +8°C or above for 10 hours; For Freezer: -15°C or above for 60 minutes
Freeze Alarm Settings*	For Vaccine: -0.5°C or below for 60 minutes;
Door Open Alarm	For Vaccine: > 5 minutes of continuous door opening

Settings*	For Freezer: > 30 seconds of continuous door opening
Power Outage Alarm Setting*	> 24 hours of continuous power outage
Alarm Visual	Display shows▲or ▼arrow for alarm Heat/Freeze condition with bell symbol
Alarm Audio	Buzzer Output at least 70 dB(A). Buzzer will beep in alarm Heat/Freeze condition. For details please refer User Manual.
Alarm Acknowledgement	By pressing  key for 1 second. After Alarm acknowledgement buzzer will be deactivated.
Alarm Event objects	Heat Alarm: “HEAT”, Heat Alarm Acknowledge: “HEATACK”, Freeze Alarm: “FRZE”, Freeze Alarm Acknowledge: “FRZEACK” Vaccine/Freezer Door Open: “DOOR” Vaccine/Freezer Door Open Acknowledge: “DOORACK” Power Outage: “POWR” Power Outage Acknowledge: “POWRACK”
Batch Details	
Activation	Data logger without display: By Pressing “**Start**”  key for more than 10 Seconds. Data logger with display: By Pressing “**Up**”  key for more than 10 seconds.
Deactivation	Cannot be manipulated, reset or deactivated once activated
Data Recording Interval	15 minutes Pre-fixed
Memory	
Data Storage	Yes
Memory Type	Flash, Non-volatile, Data Retention of more than 20 years
Memory Size	1 year’s data storage and summary PDF report of 60 days
Memory Setting	Rollover data records
Environmental Parameters	
Temperature during Transport and Storage – Device inactivated	-30 °C to + 70 °C with Data logger inactivated except relative timekeeping
Temperature during operation	-10 °C to + 55 °C
Humidity during Transport, Storage and Operation	0 to 95 %RH non condensing
Altitude	< 2000 meter
Power Requirements	
Power Supply	12-48 V DC, 2 A
Power Supply Input	DC adapter or SMPS with power output of 15 V DC, 3 A, 45 W

DC power Output	5 V, 1 A, Max 5.2 W
Power connector	Barrel-type male plug with captive cable connected to the appliance Sleeve diameter: 5.5 mm; Sleeve length: 9.5 mm; Pin diameter: 2.1 mm; Polarity: Pin positive, sleeve negative; Cable type: captive to appliance and easily replaceable by trained technician; cable length: 20 cm
Battery	1. LiFePO4 Rechargeable Battery 3.2 V, minimum 1500 mAH; Replaceable Battery 2. CR1220/ CR1225 Coin cell non rechargeable Battery 3 V, 35 mAH, Replaceable Battery
Battery Life	Operating life of 5 Years
Battery Backup	More than 30 days* with recommended operating condition for Data Logger - Level 1 More than 20 days* with recommended operating condition with display operated 4 min/day for Data Logger - Level 2 & Level 3
Minimum Battery run time after full charging	With 8 hours of charging the Battery, it will run for minimum 48 hours
User Interface	
Home screen view	**Display header:** Battery Level, Power status, USB symbol, REC status, GSM strength[#] **Main Body:** Alarm(s) messages, Alarm trigger (Bell) symbol (if any), Local date & time, Alarm status (✓/ ✗) symbol, Current reading for Vaccine Compartment with measurement unit. **Footer:** Multi day Alarm History markers(▲ or ▼ arrows) (if any)
History Data view	Last 30 days history data: day wise overview of vaccine compartment for min, max, average, Heat/Freeze alarm duration, on the display using keyboard
Appliance details view	Appliance Manufacturer: Make, Model, Serial Number, PQS code
Logger details View	Logger Manufacturer: Make, ID, Serial Number, PQS code
Modbus details View	Modbus Communication parameters settings information
Linbus details View	LINbus Communication parameters settings information
System Live View	Power & Cooling: Power and Compressor status, Temp. & Door: Vaccine, Freezer, Ambient Temperature & Door status Error codes: Error Status for Battery, self test, Modbus, Linbus, Vaccine, Freezer sensor Last data upload[#]: Date and Time Alarm Monitor: Enable/Disable Languages: English, French, Russian, Spanish, Chinese, Arabic RTC Setting: Set Local Date and Time
Data File Type	Json Data Objects file for data records, PDF file for Summary report
Data records in Json objects	As specified in PQS specification protocol WHO/PQS/E006/DS01.2
Time format	Comply with the ISO 8601 Internet Date Time format, Absolute time specified in format: YYYYMMDDThhmmssZ Relative time specified in format: PnDTnHnMnS
Logger battery Remaining	Estimated number of days remaining to operate the logger normally on battery

RTC Wakeup (RTCW) Time	Relative timestamp of the last time the logger resumed from Off to ON condition.
Mounting of device	Data logger is integrated within an Appliance
Material	Polycarbonate Plastic: non-breakable, non-corrodible housing
On site Installation	Not required
Instructions	User manual and Technician manual in Arabic, English, French, Mandarin Chinese, Russian and Spanish.
Training	If requested, remote training on installation, on-site use, maintenance of the hardware and download of data via the M2M data interface.
Warranty	Refer to warranty certificate for more details.
Service Provision	Replaceable parts of the data logger shall be supplied on request.
Communication Details	
Data Connector	USB Type-C female receptacle shall be used for data download by external devices and power supply from external devices to the logger in the event the logger's energy storage is depleted.
Connectivity	USB 2.0 Compatible Type-C, FAT16
Data Download Time	Approx. 2 minutes for full data download
Physical characteristics	
Overall Dimensions (L x W x D) mm	110 x 80 x 65 mm
Cutout Dimensions (L x W) mm	92 x 45 mm
Weight	Approx. 350 gms
Conformity Standards	
Electromagnetic Compatibility	IEC 61000-6-1/6-3
Resistance to Electrical Storms	IEC 61000-6-1; (IEC 61000-4-2 Basic Standard for applicability of tests)
IP Rating	IP 64 (Bezel only) for USB Type- C M2M port connections with left unconnected and when cable is connected to an E-EMD device
Pollution Degree	II
Installation category	I
RoHS, Reach	Compliant (EU directive 2011/65/EU)
Verification	In accordance with PQS verification protocol E006/DL01-VP.2 and E006/EM01-VP.2

#: Optional Features, please refer to the order code to know about installed options in your device. Sensors are not part of the Data logger and to considered in accessories. Voltage, Current & Door sensors are not included in the accessories.

***: Current alarm settings are pre-fixed from factory as per requirements of WHO/PQS/E006/DS01.2. Other settings are available on request. The Recommended condition is defined as per clause no. 4.2.6 of WHO/PQS/E006/DL01.2 specification protocol.**

3 UNPACKING THE PRODUCT

3.1 Unpacking and Inspection of Equiplog Data Logger

- Equiplog data logger is dispatched in a recyclable, environment friendly package specially designed to give adequate protection during transit.
- If the outer box shows sign of damage, it should be opened immediately, and the device be examined. If the device is found damaged, it should not be operated, and the local representative contacted for instructions.
- Ensure that all accessories and documentation is removed from the box.
- If the Equiplog data logger is for immediate use, you can start installing it as per Installation instructions.
- **Please preserve the original packaging along with all internal packing for future transport requirements.**

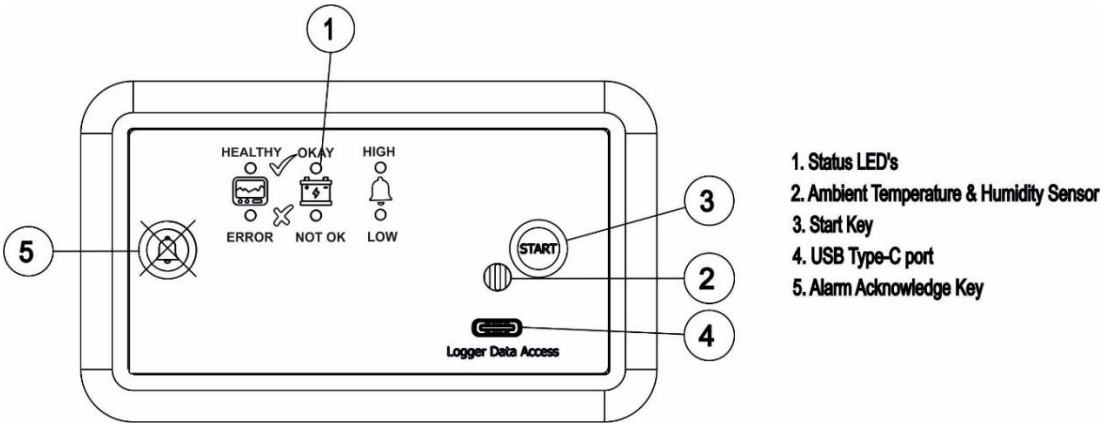


Figure 1 Front panel of Equiplog Data Logger

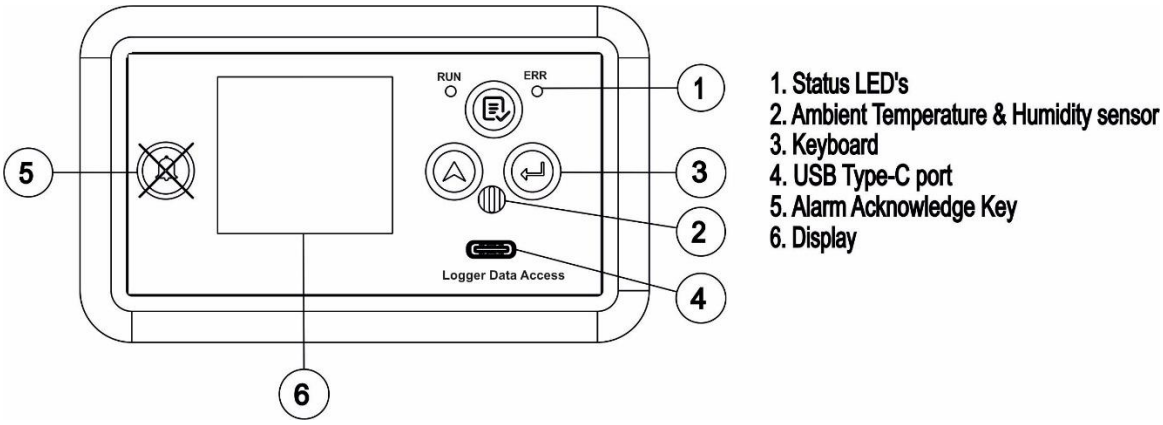


Figure 2 Front panel of Equiplog Data Logger with Display

User can select from the versions available for the Equiplog Data Logger as per selected Order code.

- Equiplog Data Logger without Display
- Equiplog Data Logger with Display
- Equiplog Data Logger with Display and GSM Add On

3.2 Mechanical Dimensions of Equiplog Data Logger

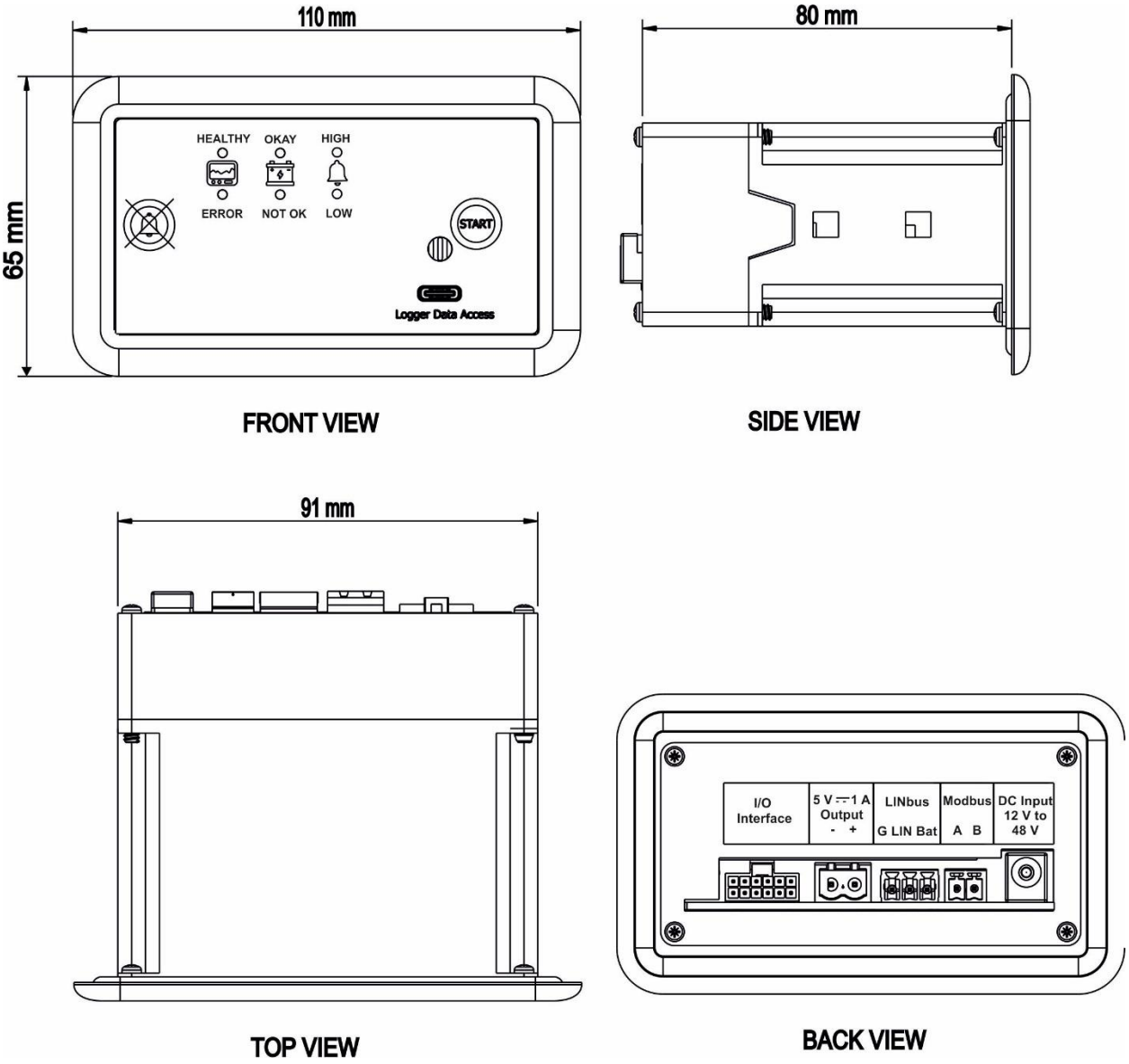
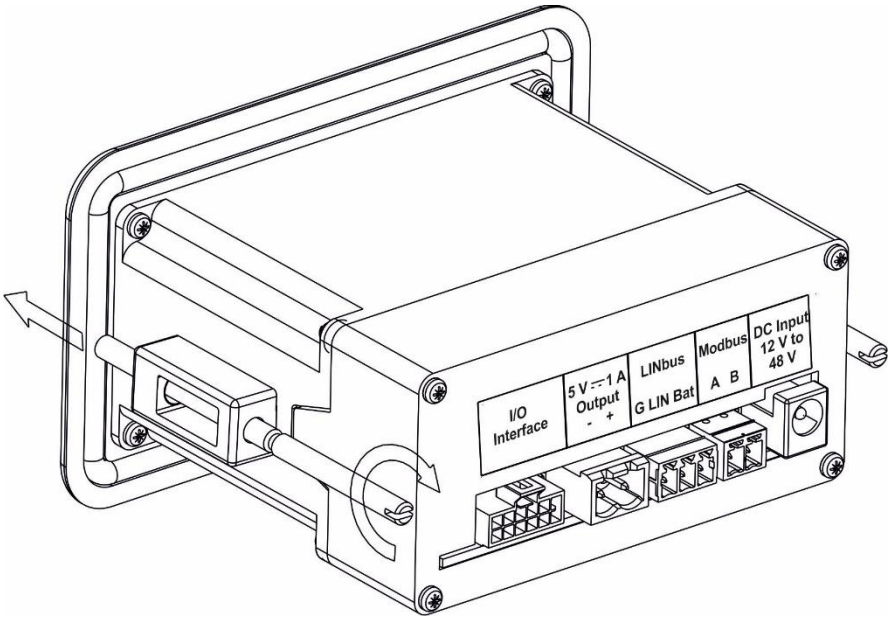


Figure 3 Overall dimensions of Equiplog Data Logger

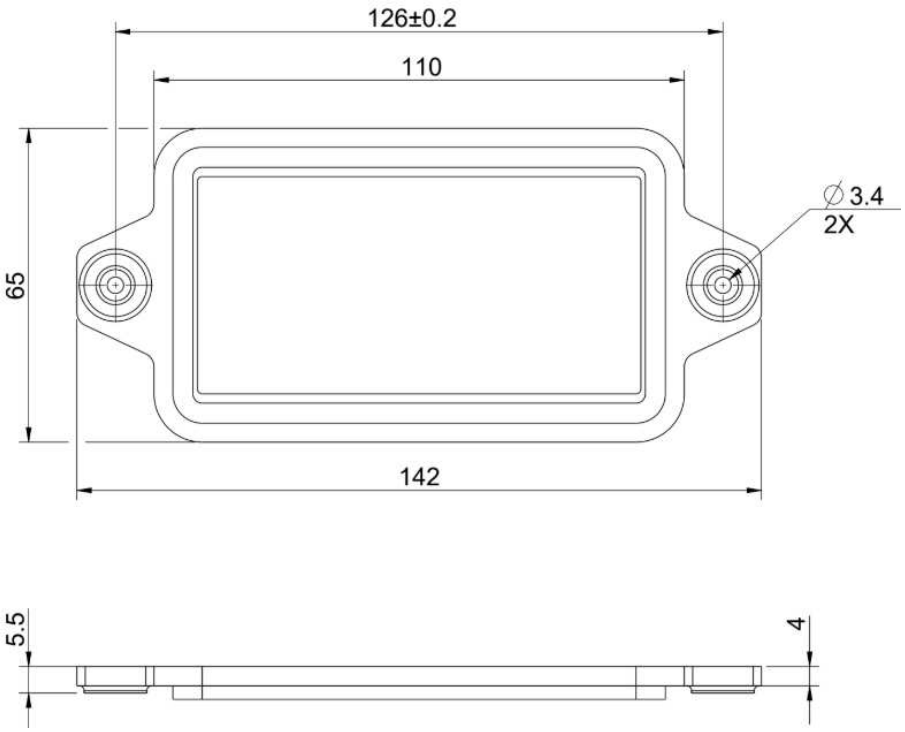
Overall Dimensions	
Dimension (L x W x H) mm	110 x 80 x 65 mm
Cutout Dimensions(L x W x D) mm	92 x 45 mm
Mounting	Panel Mounted
Weight	Approx. 350 gms

3.3 Enclosure Panel Mounting of Equiplog Data Logger with Appliance

- The data logger is available for fitting with the Appliance using two options as shown in figure 4 (a) and (b).
  1. Using Clamps- two clamps are used for fitting the device with the Appliance
  2. Using Support bracket – for fitting the device with the Appliance using screws



(a) Use Clamps for mounting

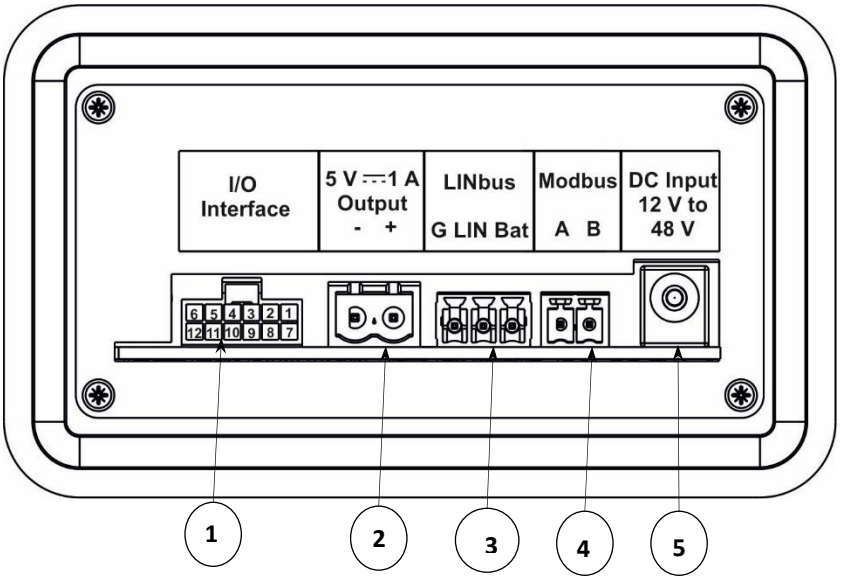


(b) Use Support Bracket

Figure 4 Mounting options for Integrating the Data logger with Appliance

3.4 Installation and connections of Equiplog Data Logger with Appliance

For installation of the Equiplog Data logger with the Appliance, all the required sensors should be connected properly as shown in the figure 5.



1. **I/O Interface**
2. **5 V, 1 A DC Power Output**
3. **LINbus Interface**
4. **Modbus Interface**
5. **Power Supply connector**

Figure 5 Back Panel of the Equiplog Data Logger for Sensor connections

3.4.1 I/O Interface connection for Sensors with Appliance

For the installation of sensors with the appliance, and I/O interface connector should be used and connected to the I/O interface port, as illustrated in Figure 5. The I/O interface port consists of 12 pins for temperature, door, and compressor input sensors with the pinout details provided in Table 2.

Table 2 I/O Interface Sensor connections conventions

Pin No. (Colour) Description	**Pin No. (Colour) Description**
1 (Red) Vaccine Temperature Sensor Input1	7 (White) Vaccine Temperature Sensor Input2
2 (Red) Freezer Temperature Sensor Input1	8 (White) Freezer Temperature Sensor Input2
3 (Blue) Secondary Compressor Digital Positive Input	9 (Grey) Secondary Compressor Digital Negative Input
4 (Blue) Primary Compressor Digital Positive Input	10 (Grey) Primary Compressor Digital Negative Input
5 (Orange) Vaccine Door Digital Input1	11 (Orange) Vaccine Door Digital Input2
6 (Brown) Freezer Door Digital Input1	12 (Brown) Freezer Door Digital Input2

The I/O interface connector, along with the wire assembly for the sensors, is shown in Figure 6, following the pin configuration and color convention detailed in Table 2. To insert or remove the

connector, the user should press the tab on top and pull it from the port, allowing for easy replacement.

If specific sensor needs to be removed from the connector, the wire should be carefully pulled out so that it comes out with its crimping intact. Improper removal may leave part of the wire inside the connector, necessitating the replacement of the entire connector and wire assembly.

6	5	4	3	2	1
12	11	10	9	8	7

Figure 6 I/O Interface Connector with Cable Assembly for Sensors

3.4.1.1 Temperature Sensor connections

- Vaccine and/or freezer temperature sensors will be inserted at the terminals provided in the table 2.
- Place the temperature sensors in the corresponding compartments before starting the recording of data.
- The placement of the sensor inside the refrigerator/freezer varies as per the type and model.

3.4.1.2 Compressor Input connections

- Connect the Compressor sensing digital output – potential free contact switch(s) to the Data logger, if available as shown in the table 5.
- Compressor Run time will be measured based on the digital output data from the Comp1 and /or Comp2 sensors.

3.4.1.3 Door Sensor connections

- Connect the Door Sensor of Vaccine and Freezer compartment for the Appliance with Equiplog data logger as shown in table 5.
- The details of the door sensor is provided in the in section 2.2 Technical Data.

Note: If the sensor inputs are connected to the Compressor temperature unit, which provides the parameter values to the data logger via Modbus/LINbus communication, no need to the connect the sensors terminal in the I/O interface connector.

3.4.2 DC Power Output Connection for External Device

The Equiplog Data logger provides DC power output of 5 V, 1 A for external devices such as the External-EMD, as shown in figure 5, which indicates the rating and polarity for the connection. table 3 displays the pinout details, while figure 7 illustrates the power output connector and cable with a Power M2M barrel connector.

Table 3 DC Power Output Connector

Pin no.	Description
1 (+)	5 V Output Positive terminal
2 (-)	5 V Output Negative terminal

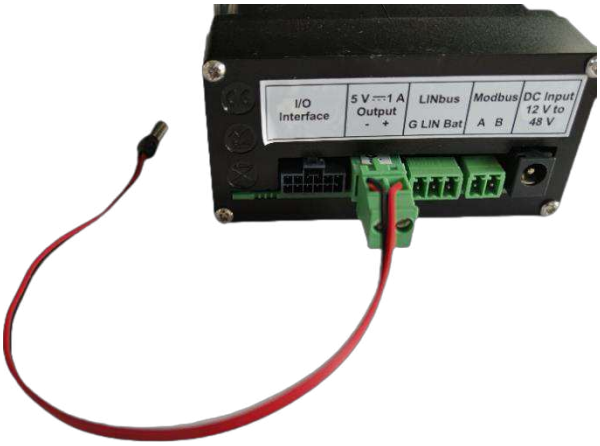


Figure 7 DC Power Output connector with Cable for Power M2M connection

3.4.3 MODbus Connection for Compressor Electronic Unit Communication

When the appliance with the Secop Compressor electronic unit includes a communication port, it provides compressor performance data via Modbus. The connection with the Data Logger should be made using the Modbus connector, as shown in figure 5. The pinout details are provided in table 4. Refer to figure 8 for the actual view of the Modbus connector.

Table 4 Modbus Interface Connector

Pin no.	Description
1 (A)	Modbus RS485 A Terminal
2 (B)	Modbus RS485 B Terminal

Figure 8 Modbus Communication Port for Connecting with Compressor Electronic Unit

3.4.4 LINbus Connection for External Communication Module

When the appliance with the Additional controller module is available for providing the performance parameters through LINbus communication with data logger. The connection with the Data Logger should be made using the Modbus connector, as shown in figure 5. The pinout details are provided in table 5. Refer to figure 9 for the actual view of the LINbus connector.

Table 5 LINbus Interface Connector

Pin no.	Description
1 (Bat)	Bat Terminal
2 (LIN)	LIN Input Terminal
3 (G)	Ground Terminal

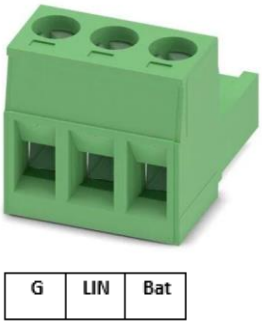


Figure 9 LINbus Communication Port for Connecting with External Communication Module

3.4.5 Power Supply Input Connection for Equiplog Data Logger

The Equiplog data logger can be powered on with a DC input of 12 to 48 V, 2 A, provided by the appliance supply through an SMPS.

- Connect the SMPS output to the Equiplog data logger using a barrel connector power cable, as shown in figure 10.
- The cable can be easily replaced by disconnecting it from the SMPS output and data logger input, then connecting a new cable and powering on the supply.

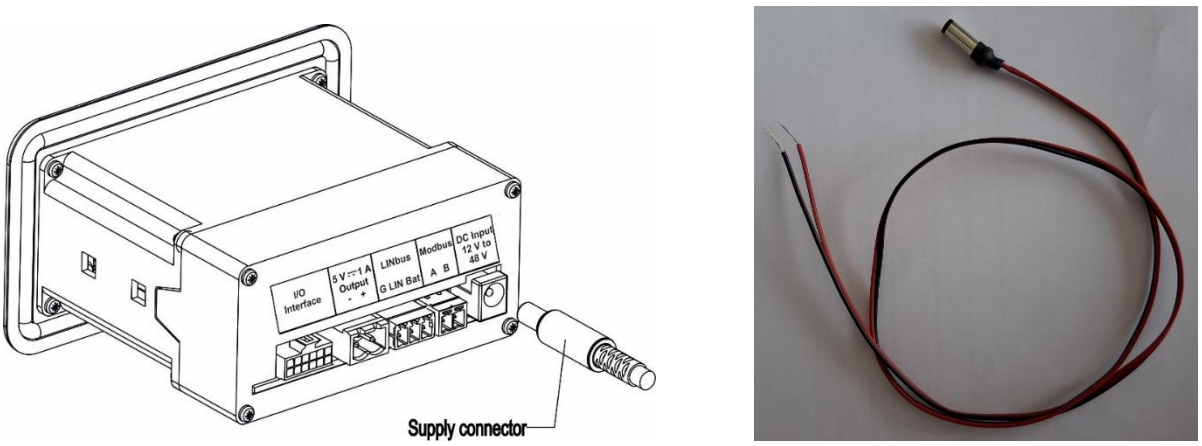


Figure 10 Inserting the Power Supply using Barrel Connector

3.4.6 Insert/Replace the Sim card in Equiplog Data Logger

- The Equiplog Data Logger with Level 3 remote communication uses a GSM module. A SIM card must be inserted into the logger to send data to the cloud server.
- Insert the SIM card during installation, before starting data recording.
- Turn off the power supply, open the back cover and remove the battery, if already connected, before inserting the SIM card.
- Open the enclosure and gently push the SIM card into the designated slot, as shown in figure 11. Ensure the SIM card is inserted correctly.

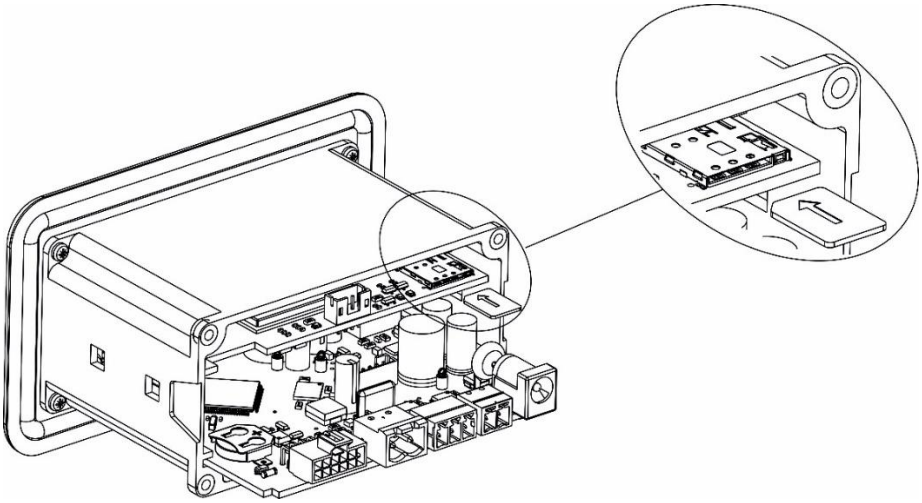


Figure 11 Insert Sim card

- After inserting the SIM card, reconnect the battery inside the enclosure, secure the enclosure properly, and then connect the power supply to the logger.
- Check the SIM card signal strength on the logger display.
- If the SIM card needs to be replaced, follow the same procedure as explained above.

Note: To remove the SIM card, disconnect the power supply to the logger to prevent any issues. Gently press the SIM card until it clicks back slightly, then pull it out.

3.4.7 Insert/Replace the Battery

- The Equiplog data logger comes with a pre-installed rechargeable battery.
- To replace the battery, turn off the power supply and remove the back cover of the data logger, as shown in figure 12.
- Disconnect the battery connection cable from the logger and remove the battery.
- Insert the new battery, ensuring the correct polarity in the battery holder.

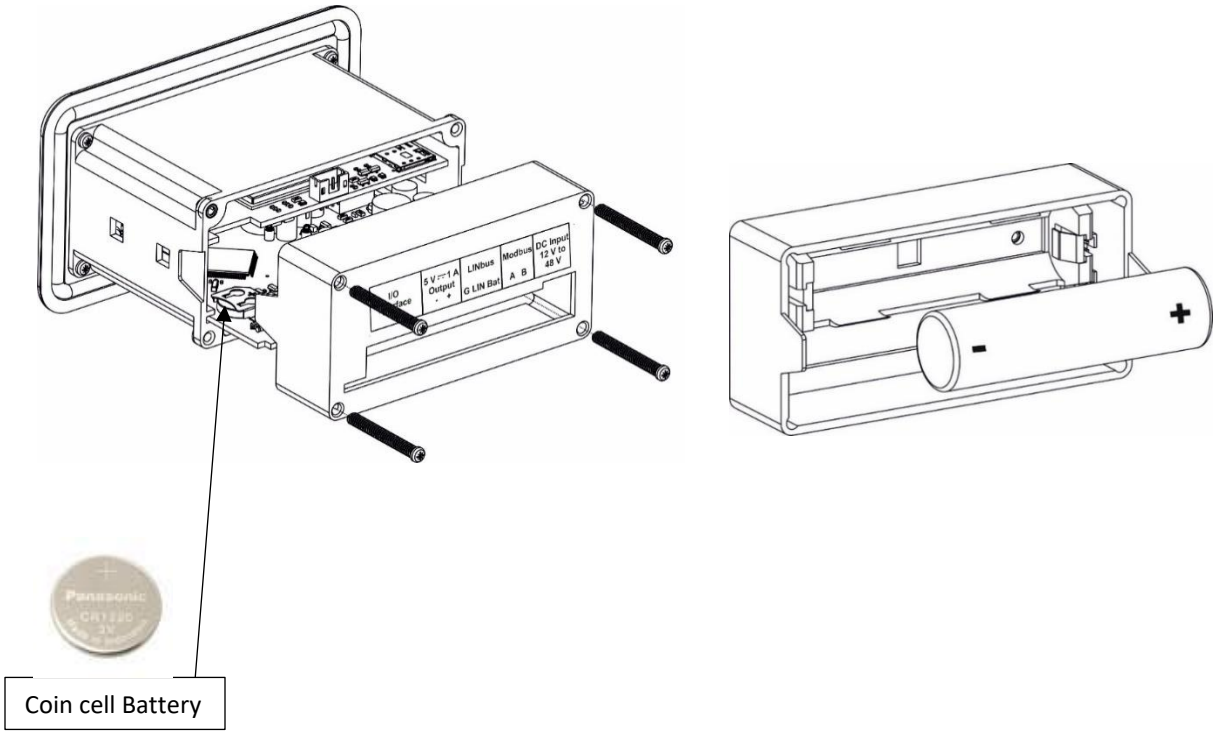


Figure 12 Inserting /Replacing the Battery

- Reconnect the battery connection cable, secure the enclosure, and place the data logger back into the appliance.
- The device contains a coin cell battery for timekeeping. It continues to keep time even when both the DC supply and the rechargeable battery are unavailable.
- To replace the coin cell battery, open the back cover as shown in figure 12.
- Gently push the used coin cell battery outward to remove it. Insert a new coin cell battery into the holder, ensuring correct polarity.
- Refit the back cover securely and place the logger back into the appliance

3.4.8 Connect USB Cable with M2M Logger Data Access

- Connect a USB 2.0 Type-C cable to the logger's M2M port labeled "**Logger Data Access**" to access the data files, as shown in figure 13.
- After use, safely disconnect the USB cable from the external device.

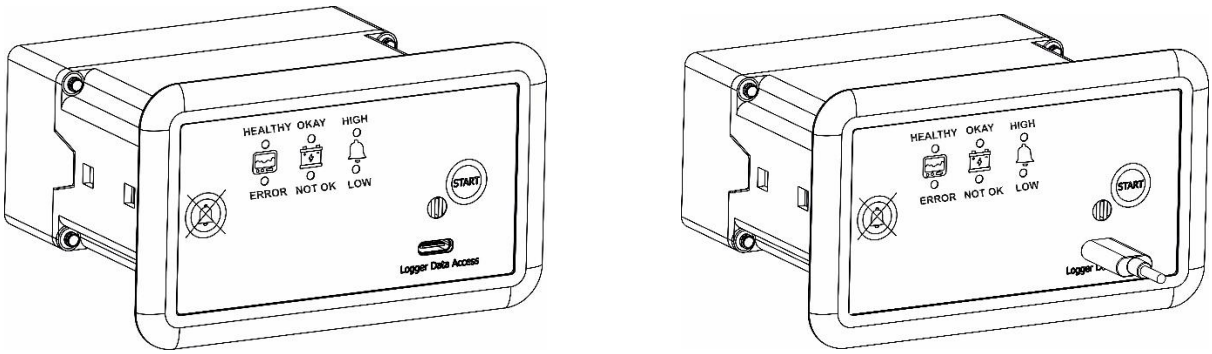


Figure 13 Connect USB Type C cable for M2M Data Access from the logger

4 List of Abbreviations

Table 6 Commonly used Abbreviations

Abbreviation	Description
EMS	Equipment Monitoring Systems
EMD	Equipment Monitoring Device
I - EMD	Integrated - Equipment Monitoring Device
DL	Data Logger with M2M Interface
Avg_Temp	Average Vaccine Temperature for the day
Min. Temp	Minimum temperature reading of the Vaccine compartment for the day
Max. Temp	Maximum temperature reading of the Vaccine compartment for the day
Avg. Temp	Average temperature reading of the Vaccine compartment for the day
Heat Alarm	Vaccine compartment Heat alarm time in Hr: Mn for the day
Freeze Alarm	Vaccine compartment Freeze alarm time in Hr: Mn for the day
Amb. Temp	Ambient Temperature
Door	Vaccine/Freezer door open alarm is triggered
Heat	Vaccine/Freezer Heat alarm is triggered
Freeze	Vaccine/Freezer Freeze alarm is triggered
Power	Power Outage alarm is triggered
MB-Ok	Modbus communication is working ok
LN-Ok	LINbus communication is working ok
LN-Tout	LINbus communication is timed out
MB-Close	Modbus communication is closed
LN-Close	LINbus communication is closed
RTC	Real Time Clock
DD	Date
MM	Month
YY	Year
HR	Hour
MN	Minute
SC	Second
BATF	Battery Faulty Error
SETF	Self Test Fail Error
SERV	Vaccine Sensor Error
SERF	Freezer Sensor Error
MBER	Modbus Comm Error

LBER	Linbus Comm Error

Note: In the manual, the terms Heat & High and Freeze & Low are interchangeably used

5 PRODUCT DESCRIPTION

5.1 Status LEDs

The status LEDs indication descriptions is based on two variants the data logger without display and with display.

1. The data logger without display has six status LEDs, the table 7 shows the indication of the status LEDs in different conditions.

Table 7 Status LEDs indication for Equiplog Data logger without display

Status LEDs Status	Status LED Indications
System Status	
HEALTHY LED	Batch off: HEALTHY LED blinks at 5 seconds interval Batch On: HEALTHY LED blinks at 1 second interval This LED indicates that system is working OK.
ERROR LED	ERROR LED blinks at 1 second interval when the system error# condition has occurred. During the start data recording process this LED remains On, after that it turns off.
Battery Status	
OKAY LED	When Power Supply is connected, OKAY LED remains off if the battery charging is completed. OKAY LED turns on when the recoverable fault condition occurs during charging. When on Battery, OKAY LED remains off.
NOT OK LED	When Power Supply is connected, NOT OK LED remains off if the battery fully charged. NOT OK LED turns on when battery is charging. OKAY and NOT OK both LEDs turns on, when non-recoverable fault occurs during battery charging. When on Battery, NOT OK LED remains off.
Alarm Status	
HIGH LED	When Batch is On, If Heat Alarm is triggered for Vaccine/Freezer compartment, HIGH Alarm LED blinks at 1 second interval; otherwise the LED remains off.
LOW LED	When Batch is On, If Freeze Alarm is triggered for Vaccine/Freezer compartment, LOW Alarm LED blinks at 1 second interval; otherwise the LED remains off.

2. The data logger with display has two status LEDs, the table 8 shows the indication of the status LEDs in different conditions.

Table 8 Status LEDs indication for Equiplog Data logger with display

Status LEDs Status	Status LED Indications
RUN LED	Batch off: RUN LED blinks at 5 seconds interval Batch On: RUN LED blinks at 1 second interval
ERR LED	ERR LED blinks at 1 second interval when the system error# condition has occurred. During the start data recording process this LED remains On, after that it turns off.

 # System Errors include: Vaccine/freezer sensor connection error, Heat/Freeze Alarm condition, Self test fail, Modbus/LINbus communication error, Battery Low condition

Note: When the device is operated on battery only, status LEDs blinks for lesser time than when device on Power supply.

5.2 Key Functions

The data logger without display consists of two keys Start key and Alarm acknowledge key.

Start Key: This key is used to start the data recording on the data logger.

Alarm Acknowledge key: In case of Heat/Freeze Alarm trigger condition, to deactivate the buzzer.

The data logger with OLED Display has three multipurpose keys along with the Alarm acknowledge key.

Review key: It is used to enter the menu or come out from the main menu/submenu.

UP Key: This serves the purpose of advancing to the next submenu and initiating recording.

Enter key: It is employed for accessing the submenu and for reactivating the display when it automatically turns off.

5.3 Display (OLED) (Available in Level 2 , Level 3 I-EMD)

The OLED 1.5” diagonal display has resolution of 128x128 pixels and 16 gray scales, ensuring a high-resolution and excellent display effect.

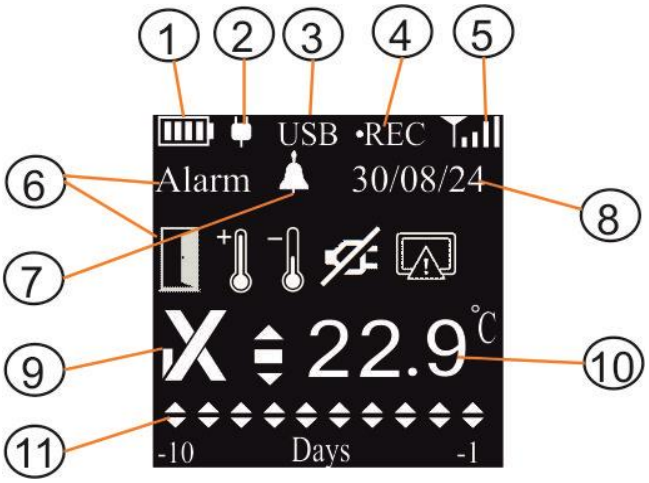


Figure 14 OLED Display format

The Home screen of the display as shown in figure 14 is divided into three parts – Header, Main Body and Footer view as follows:

- **Header:** Battery Level, Power status, USB symbol, REC status, GSM signal strength#
- **Main Body:** Alarm(s) messages, Alarm trigger (Bell) symbol (if any), Local Date and time, Alarm status (✓/✕) symbol, Current temperature reading for Vaccine compartment with unit.
- **Footer:** Multi day Alarm History markers(▲ or ▼ arrows)

The description for each symbol/ text are explained as below:

1) Battery level/charging Status Indicator:
   a. Battery Level : Sufficient ; Partly empty ; Low ; Empty
   b. Battery Charging Status: Charging in process , charging completed , charging error
2) Power Supply On/Off indication: When Power Supply is on, power adapter symbol will appear on the display, otherwise it will not be seen on the display
3) USB Connection symbol: When USB host is connected with the data logger "**USB**" symbol appears on the display.
4) Recording status: Once the recording of the data is started "**•REC**" symbol is seen on the display.
5) GSM Signal Strength and SIM card Indicator#: Excellent ; Good ; Fair ; Poor ; No Sim card
6) Alarm(s)messages: If alarm(s) generated, respective messages will appear as Door/Heat/ Freeze/ Power/ System Error
7) Bell Symbol: It indicates active alarm(s) condition
8) Local Date and Time: Depending on the selected model, Date and Time will be seen on the display with 3 seconds of refresh rate in DD/MM/YY and HR:MN:SC format on the display.
9) Alarm status symbol: Ok/ Alarm (✓/✕) indication for active alarms
10) Vaccine Temperature reading with measurement unit

11) Alarm History marker: Multi days alarm history markers for Heat/Freeze Alarm triggered

 # : If the data logger with GSM Add on module is selected, Absolute time is synced through GSM and will be UTC time.

Note: If the Vaccine/Freezer/Ambient Temperature sensor is disconnected or broken or temperature is outside it operating range, the display will show reading as "**- -.- °C**" instead of any incorrect value.

6 USING THE PRODUCT

6.1 Start the Data Recording

Ensure that the Equiplog data logger is properly installed with all required sensor connection in the Appliance for starting the recording of data. Turn on the supply of the Appliance as well as the supply of the data logger. Once started, the data recording cannot be stopped, Maximum one year of data are stored in the data logger memory, after that new data entry will overwrite old data as per first in first out manner.

6.1.1 Start Data Recording for device without display

Press "**Start**" 

key for 10 seconds to start the data recording in the data logger, the ERROR LED remains ON indicating the batch start process. Once the batch is started ERROR LED turns off and HEALTHY LED blinks at every 1 second.

Note: Section 6.1.2 to 6.4 is described for the Level 2 and Level 3 data logger with Display option. Throughout the Manual Display with GSM signal strength indication refers to Level 3 Data logger.

6.1.2 Start Data Recording for device with display

The display shows the Power ON Screen for 2 seconds, after that home screen will be seen on the display. Press "**Enter**" key to turn on the display and verify the Appliance and logger details are properly configured in the data logger by using menu sequence explained in the **section 6.3**.

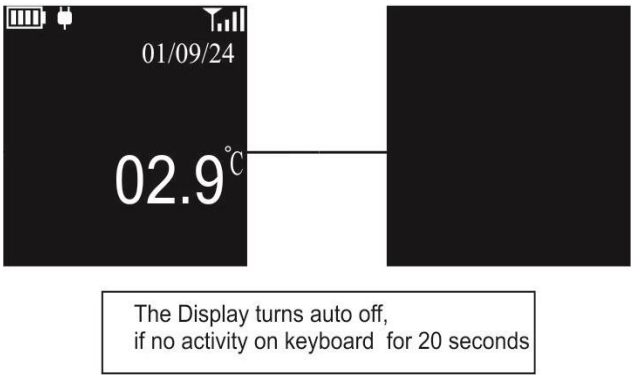


Figure 15 Power up condition of the Data logger

Before starting the data recording, ensure that

1. Date and time is set by using RTC setting menu in Level -2 Device with local communication (refer section 6.3.4 system live view menu for RTC setting)
2. Date and time is synced properly by GSM interface in Level-3 Device with remote communication

To start the data recording in the data logger, press "**Enter**" key to turn on the display and press **"Up" key** for 10 seconds. The ERR LED remains ON indicating the batch start process. Once the batch is started ERR LED turns off and RUN LED blinks at every 1 second. This process is described step by step in figure 16.

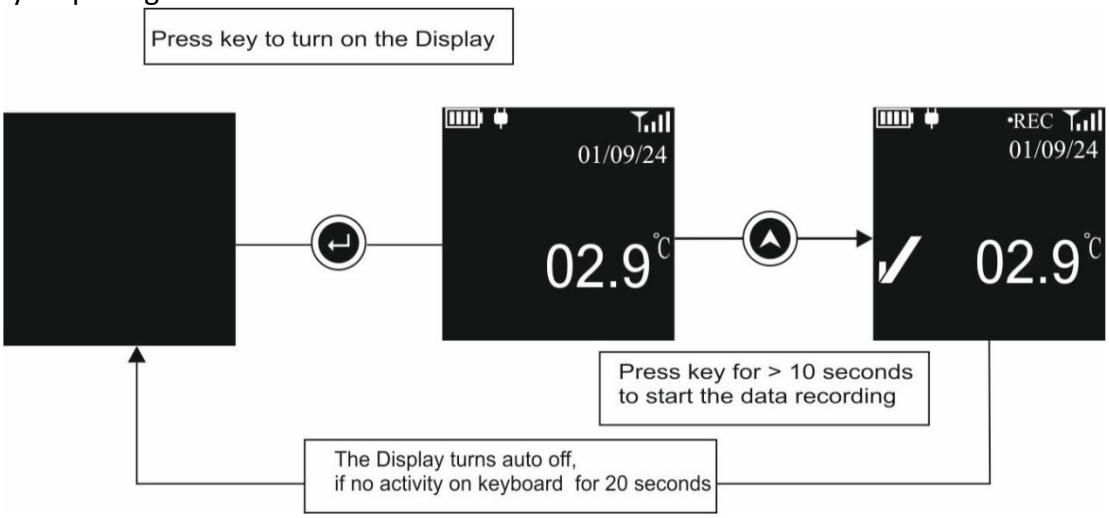


Figure 16 Start Recording of the data

The RTC relative time and RTC wakeup time are initialized when the data recording is started. Once the recording is started, it cannot be stopped.

Note: If "**Up**" key is not pressed continuously for 10 seconds, the recording will not start and user has to repeat the process.

6.2 Home Screen Overview

The display of the data logger is normally remains off, when no activity on the keyboard. To turn on the display, press "**Enter**" key for 1 second. The display will show home consisting for most recent vaccine temperature reading with other information as described in section 5.3 and figure 17.

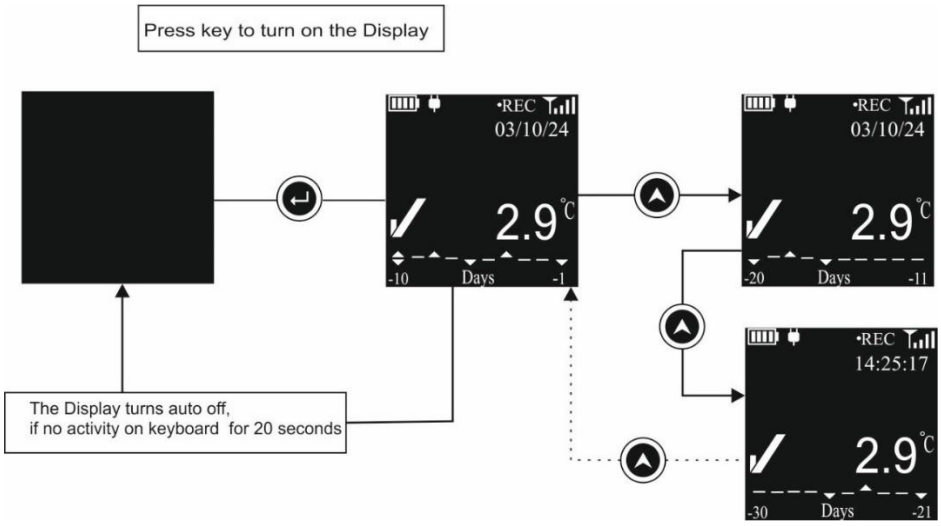


Figure 17 Home Screen Navigation

The date and time will alternate every 3 seconds and will be displayed in the format DD/MM/YY, HR:MN:SC. The date and time settings will be either local or UTC, depending on the selected product code of the Equiplog data logger—Level 2 for local time and Level 3 for UTC.

To view alarm markers older than the last 10 days, press the "**Up**" key once to display alarm markers for days -11 to -20. Pressing the "**Up**" key again will show alarm markers for days -21 to -30.

Note:

1. If there are no alarms in the last 30 days, pressing the "**Up**" key will not change the screen.
2. If no alarms exist for days -11 to -20 days but there are alarms for days -21 to -30 days, both screens will be seen by pressing "**Up**" key step by step.

6.3 Main Menu Sequence

The menu Sequence is designed to be intuitive, allowing users to easily navigate and access different functions of the device. The visual indicators on the Home screen helps to monitor the device status at a glance.

The Main menu consists following options as described the figure 18:

1. History
2. Appliance Info
3. Logger Info
4. System Live View
5. MODBUS Master (optional)
6. LINBUS Master (optional)
7. Exit

- User can turn on the Display by Pressing "**Enter**" key and then pressing "**Review**" key for viewing menu options.
- Use "**Up**" key to scroll through the menu options.
- Press "**Enter**" key to access the menu options and "**Review**" key to exit the Submenu/Main menu.
- If no key is pressed for 20 seconds while accessing the menu, the display will turn off, and the user will need to start the menu selection process again.

Note: If the appliance does not have a separate Compressor Electronic unit that sends performance data for the primary and secondary Compressor compartments to the Equiplog data logger via Modbus or LINbus, the Modbus and LINbus Master menu option will not be visible in the menu.

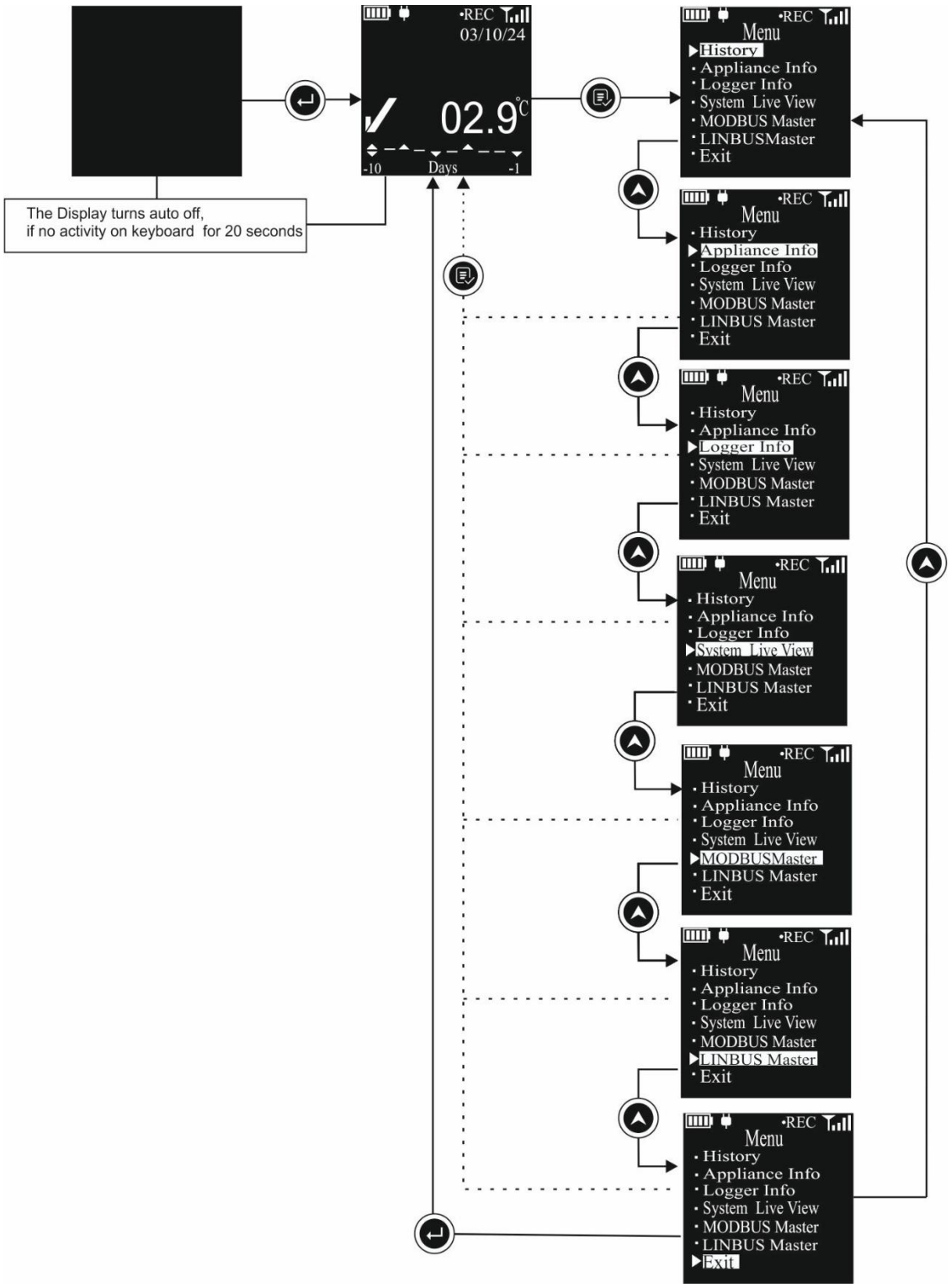


Figure 18 Main Menu Sequence

6.3.1 History Menu

In this menu, History data of the data logger can be viewed for last 30 days on the display by selecting the options as shown in figure 19. The history menu will show the option to choose from following:

1. Today to -10 Day
2. -11 Day to -20 Day
3. -21 Day to -30 Day

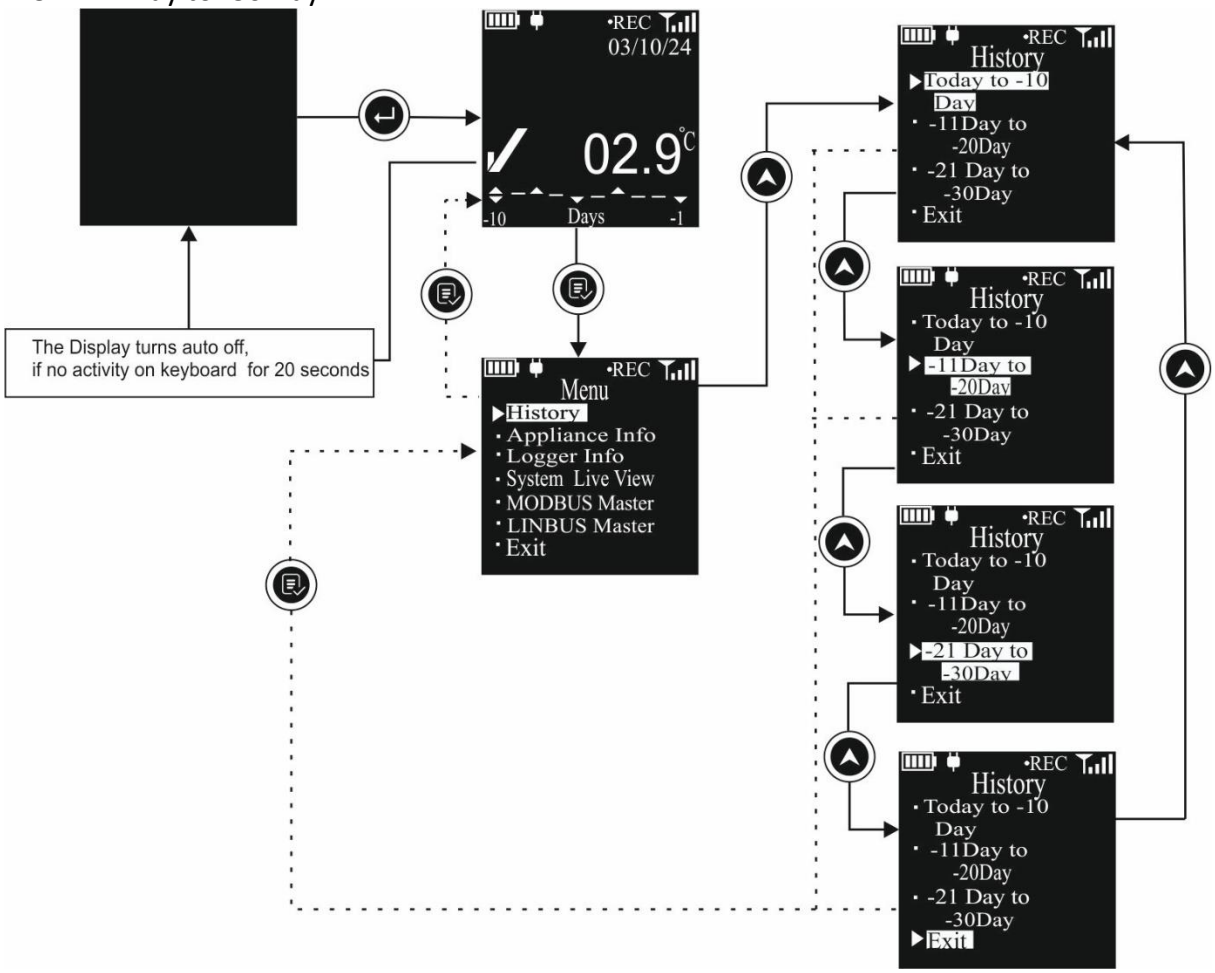


Figure 19 History View Menu

The following steps guide you through accessing and navigating the historical data:

- From the main menu, select the History menu.
- Use "**Up**" key to navigate between history day range options
- Press "**Enter**" key to confirm the range to view.
- After selection, the day wise history will be available by pressing "**Up**" key to scroll through each day's history data view.
- Day wise history consists of following:
  - **dd/mm/yy**: Corresponding date for the history day will be seen on the display.
  - If Heat/Freeze Alarm is triggered for the day, bell symbol with ▲ or ▼ arrow will be displayed.
  - **Min. Temp:** Minimum Vaccine Temperature reading for the selected day
  - **Max. Temp:** Maximum Vaccine Temperature reading for the selected day
  - **Avg. Temp:** Average Vaccine Temperature reading for the selected day
  - **Heat Alarm:** Total time duration for which temperature remains above Heat Alarm limit for the selected day
  - **Freeze Alarm:** Total time duration for which temperature remains below Freeze Alarm limit for the selected day

- **Next^:** Indication for scroll through next day by pressing "**Up**" key.

➢ Continue to press the "**Up**" key to view the data for subsequent or previous days.

➢ To exit the history view or return to previous menu, use "**Review**" key.

Note:

1. The history day range options will be visible as per the no. of days elapsed from the start of data logger.
2. If the device is started today, then there will be only today's data will be shown in the history view.

For Example,

If the device is running since 30 days, all three options will be seen. By choosing the "**Today to -10 day**" option, the display will be showing following data for corresponding history day as shown in figure 20.

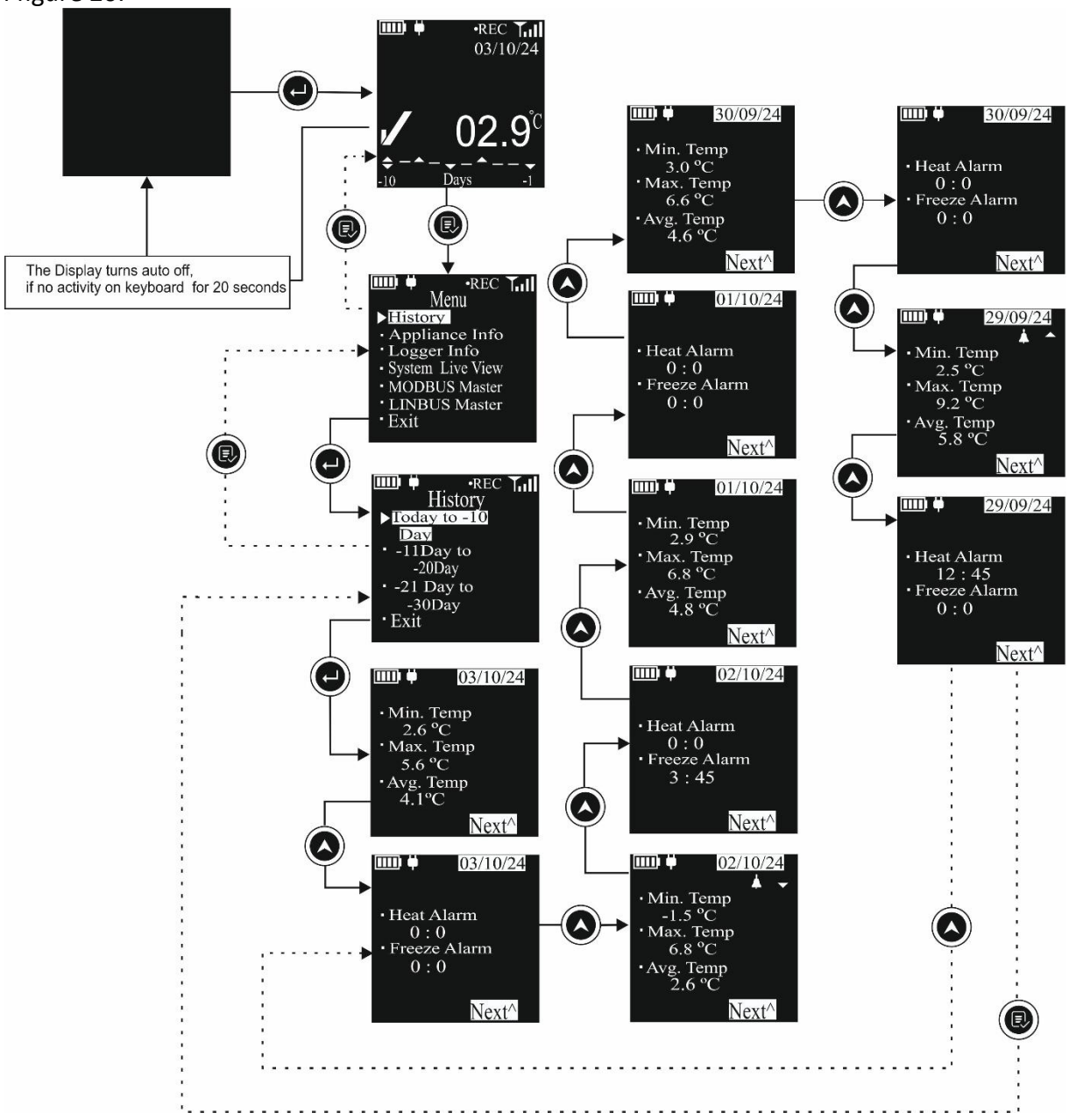


Figure 20 View History data Sequence for Today to -10 day

- Press “**Enter**” key to enter the selected History view range: For Today, the date shown is 03/10/24, Vaccine temperature reading is within the Heat/Freeze alarm limits.
- Press “**Up**” key again to view “-1 day” data: Here, the date shown is 02/10/24, Alarm was triggered indicated by bell symbol with ▼ arrow and Freeze alarm was triggered and duration for freeze alarm was 3 hours 45 minutes
- Press “**Up**” key again to view “-2 day” data: Here, the date shown is 01/10/24, the readings were within the Heat/Freeze alarm limits.
- Press “**Up**” key again to view “-3 day” data: Here, the date shown is 30/09/24, the readings were within the Heat/Freeze alarm limits.
- Press “**Up**” key again to view “-4 day” data: Here, the date shown is 29/09/24, Alarm was triggered indicated by bell symbol with ▲ arrow and Heat alarm was triggered and duration for heat alarm was 12 hours 45 minutes.
- Similarly, further history data can be seen by pressing the "**Up**" key again by following the same steps and finally it returns the display to the Today screen.

Here, After the -5 days history screen, pressing the "**Review**" key exits the submenu. Press the "**Review**" key twice more to return to the home screen.

Note: If the screen contains multiple pages of content, you can navigate by pressing the “**Up**” key.

6.3.2 Appliance Info

This menu provides pre-configured Appliance administrative information:

1. Make: Appliance Manufacturer name
2. Model: Appliance model name/ number
3. Serial Number: A unique serial Number assigned to the Appliance
4. Appl. PQS Code: WHO PQS code of the Appliance

- Access the main Menu and select the Appliance Info option as per the steps shown in figure 21.

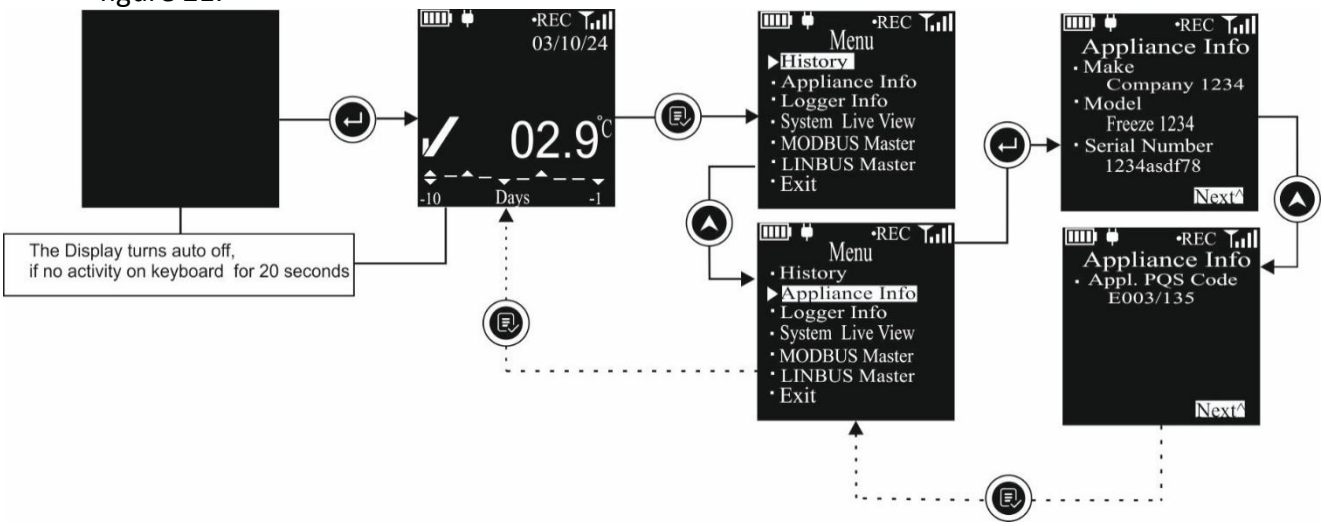


Figure 21 Appliance Information Menu

- To exit from the Appliance menu press “**Review**” key.

- From the main menu, user can navigate to other menu options. If not, then press "**Review**" key again to exit from menu and getting home screen on the display.

Note: The information shown in figure 21 are for example purpose only.

6.3.3 Logger Info

This menu provides pre-configured Logger administrative information:

1. Make: Logger Manufacturer name
2. ID: Logger model name/ number
3. Serial Number: A unique serial Number assigned to the Logger
4. Logger PQS Code: WHO PQS code of the Logger

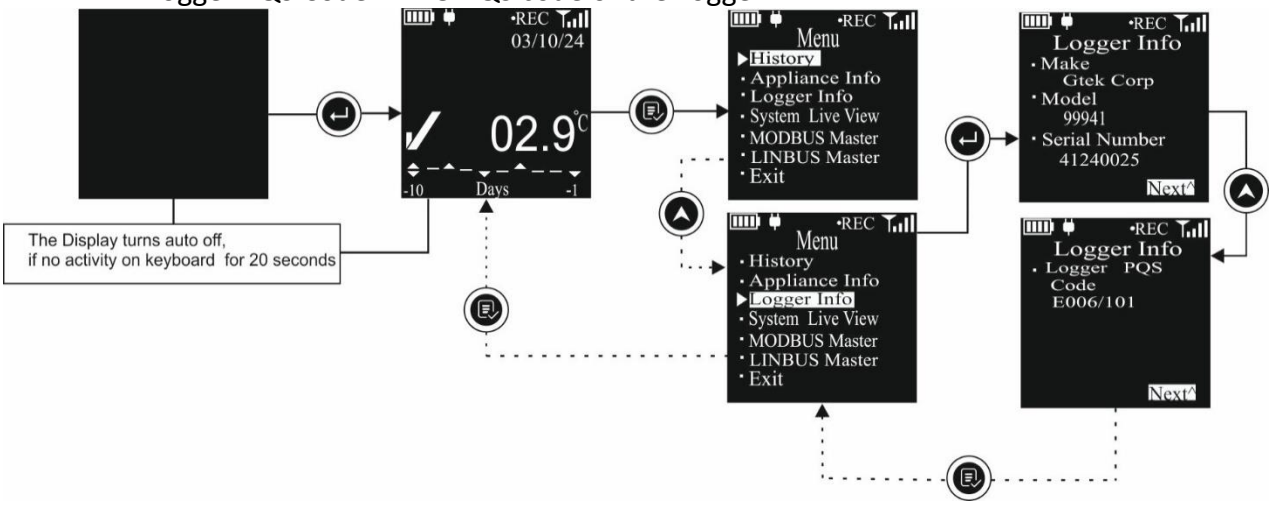


Figure 22 Logger Information Menu

- Access the main Menu and select the Logger Info option as per the steps shown in figure 18.
- To exit from the Logger menu press "**Review**" key.
- From the main menu, the user can navigate to other menu options. If not required, press the "**Review**" key again to exit the menu and return to the home screen.

Note: The information shown in figure 22 are for example purpose only.

6.3.4 System Live View

The system Live view menu will provide the real time view of the performance parameters as well as Alarm Monitor, Language and RTC setting Menu. Follow the steps to access this menu as shown in figure 23.

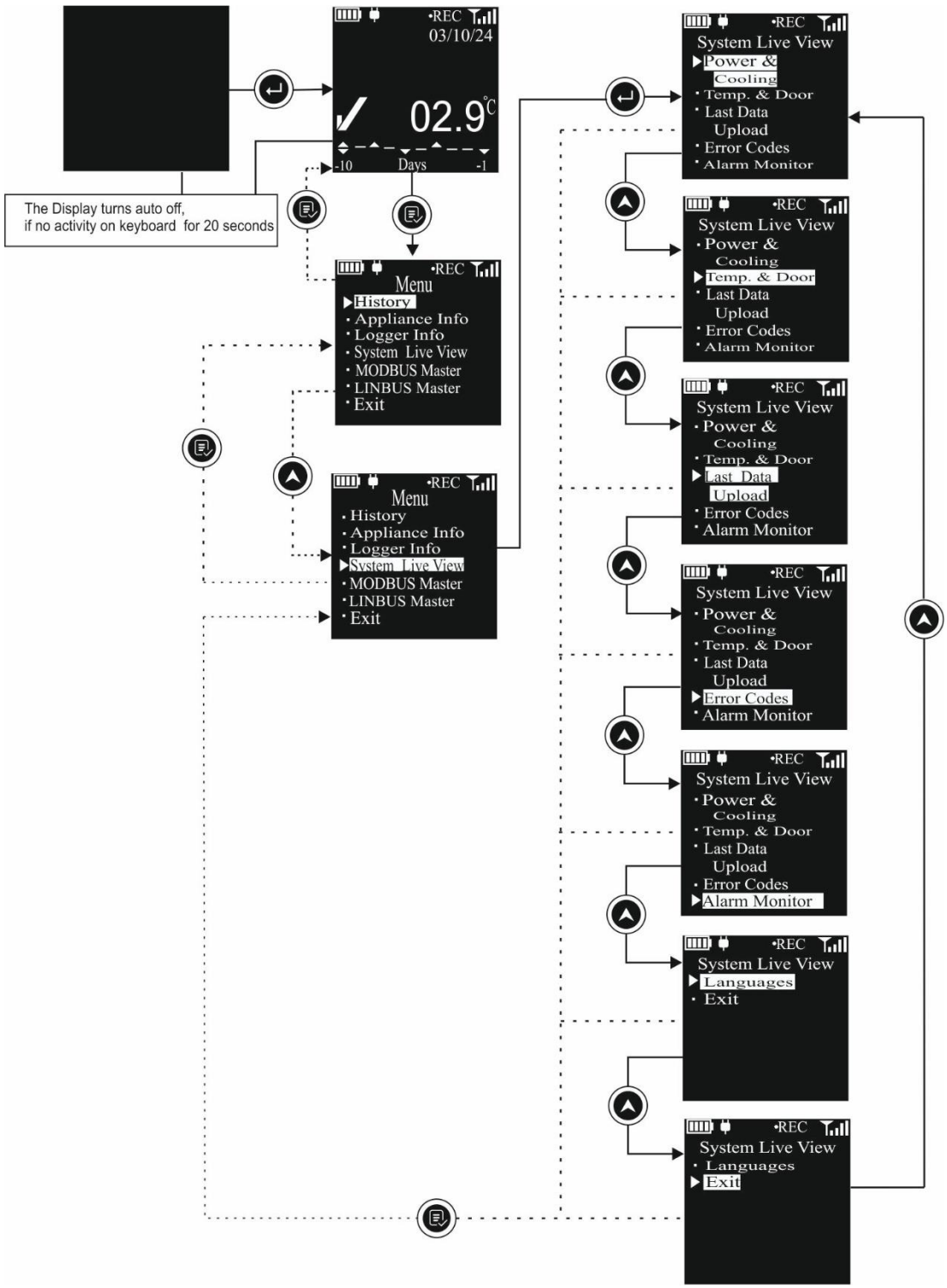
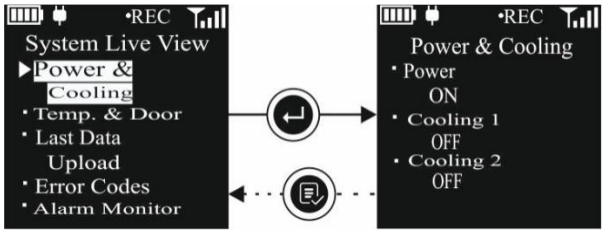
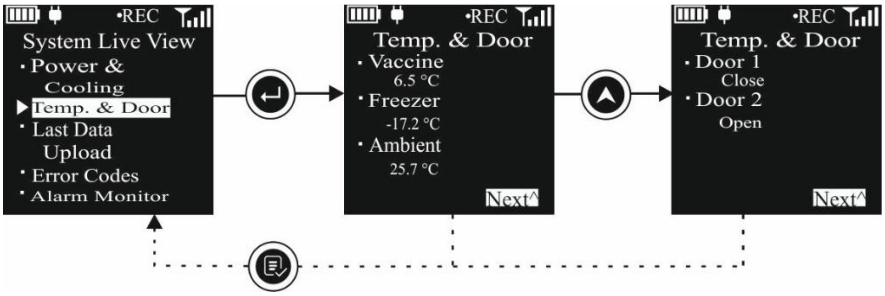


Figure 23 System Live View Menu

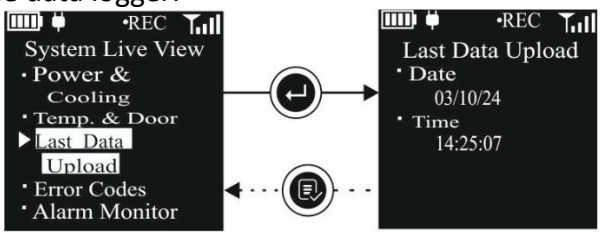
- From the main menu select the System Live view option, once entering the menu the display will show following options:
  1. **Power & Cooling:** Selecting this option will provide the Power supply and compressor status information
     For example, if Power supply is on, primary and secondary compressor are OFF.



2. **Temp. & Door:** Selecting this option will show the current Vaccine, Freezer and Ambient Temperature reading; Door 1 and Door 2 Open/Close status

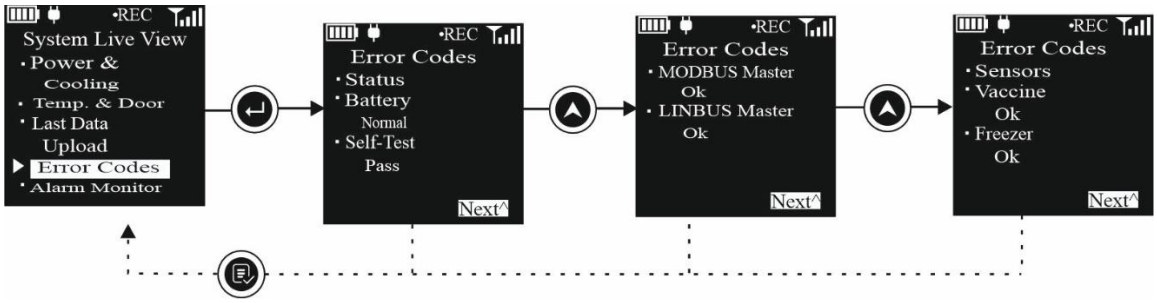


3. **Last Data Upload#:** This option will be visible only when GSM add on module is available in the data logger.



Last data uploaded date and time will be seen as below:
Date: dd/mm/yy
Time: Hr/Mn/Sc

4. **Error Codes:** User can see the Error codes for the various error conditions as follow:



Status:

Battery: Normal/Faulty (Battery charging status is normal/faulty)
Self-Test: Pass/Fail (Self-Test check status Pass/Fail)
MODBUS Master#: OK/Error (Modbus communication is running OK/stopped)
LINBUS Master#: OK/Error (LINbus communication is running OK/stopped)

Sensors:

Vaccine: OK/Error (Vaccine sensor is Ok/faulty (Broken or reading out of range)
Freezer: OK/Error (Freezer sensor is Ok/faulty (Broken or reading out of range)

5. **Alarm Monitor:** When an appliance is out of service or no longer storing vaccines, alarms should be disabled to save energy. The user can enable or disable alarm monitoring through the menu, as shown in figure 24. If "**Alarm Disable**" option is selected, the audio-visual alarm indication will be disabled and this status will be displayed on the device display. Alarm monitoring can be re-enabled at any time by selecting the appropriate option from the Alarm Monitor menu.

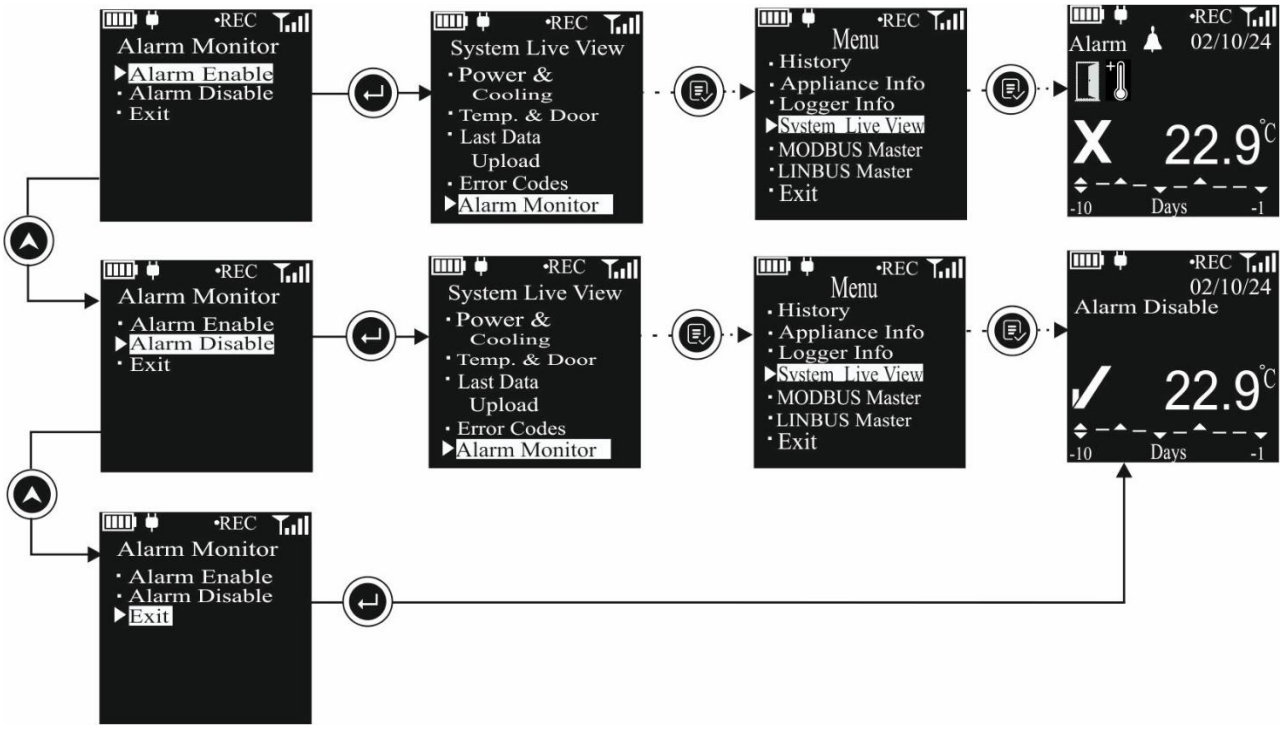


Figure 24 Alarm Monitor selection Menu

6. **Languages:** The I-EMD display's default language is English. Users can change the language through the Language Settings menu. Available language options include English, French, Russian, Spanish, Chinese, and Arabic. To select a preferred language, follow the steps shown in figure 25.

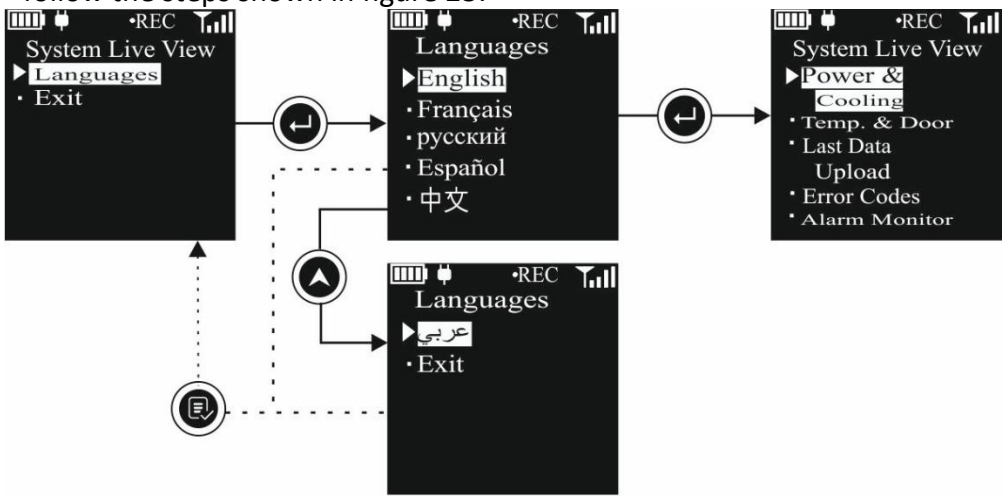


Figure 25 Language Selection Menu

7. **RTC Setting#:** The device has an ability to set the local date and time through RTC Setting menu as shown in figure 26. To set the Local date and time follow the steps outlined in figure 26 completely to set the date and time properly. Use the "**Up**" key to update a parameter and the "**Enter**" key to proceed to the next parameter. The adjusted date and time will be displayed on the home screen.

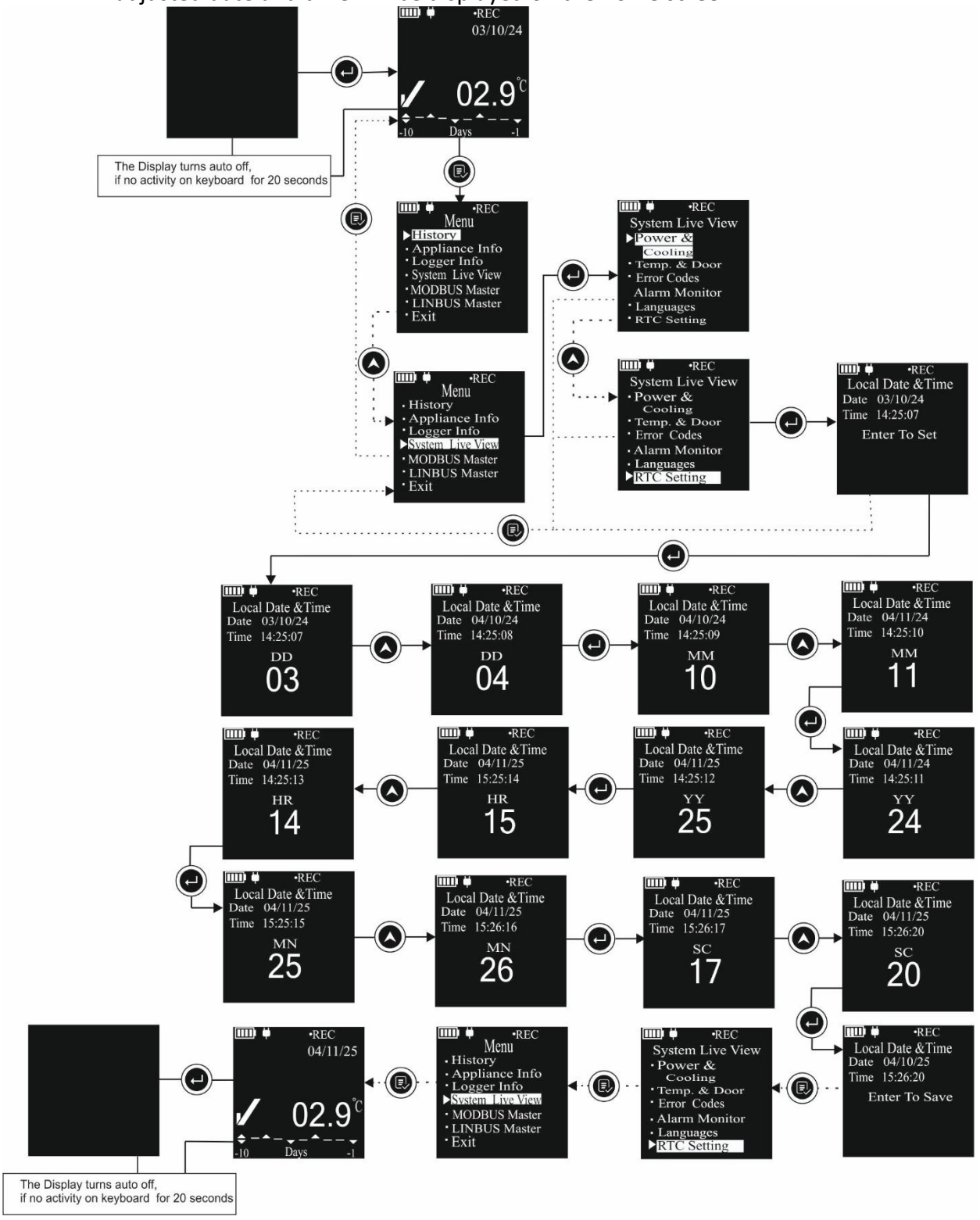


Figure 26 RTC Setting Menu

 # : This option will be visible only, when selected modules are available in the data logger at the time of installation process.

6.3.5 MODBUS Master

The user can view the Modbus Master parameter settings of the data logger in this Menu, as per Modbus configured parameters at the time of installation with Appliance.
Follow the steps shown in figure 27 for viewing Modbus master information with example parameters.

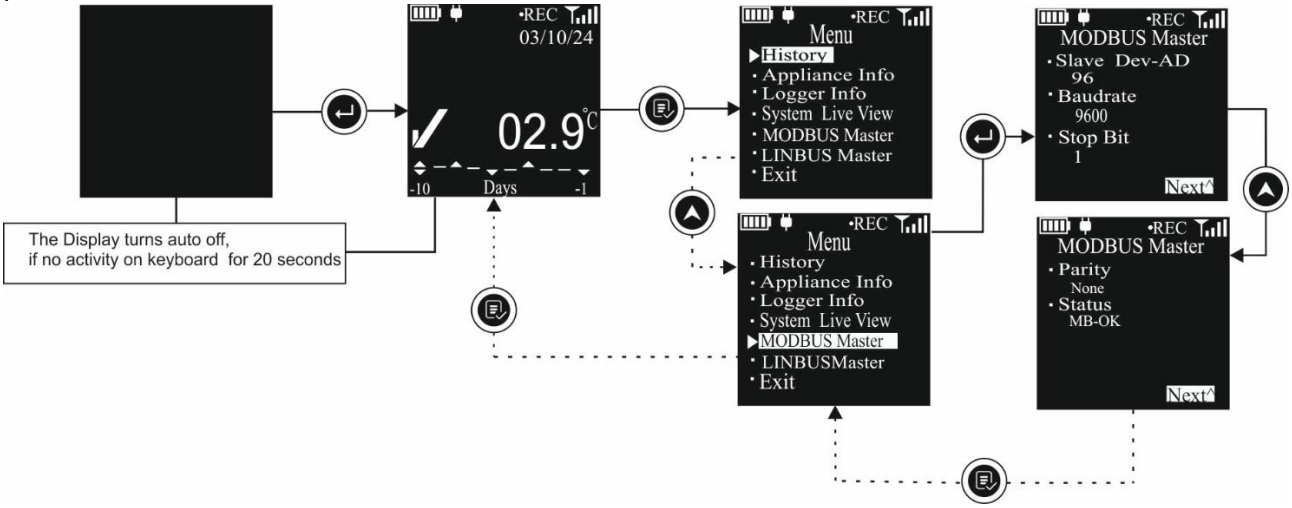
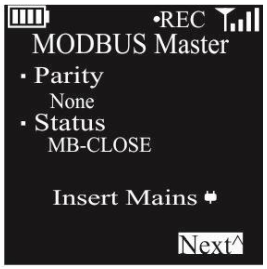


Figure 27 Modbus Master Menu

This menu consists of

1. Slave Dev-AD: Modbus Slave device address (Device address of the Controller connected with data logger as Modbus slave),
2. Baud rate: Communication Speed in bits per seconds (bps)
3. Stop bit: Number of stop bit used in Modbus serial communication
4. Parity: Parity bit setting selected for Modbus serial communication
5. Status: Shows the Modbus communication status, whether it's working OK, closed, or if there is any error.
    a. OK: Modbus communication is working OK
    b. Error: Modbus communication is stopped due to communication error
    c. MB-Close: Modbus communication is closed, due to Power supply is off and device is on battery.



Note: This menu option will be visible only, when Modbus communication is selected in the configuration at the time of installation process.

6.3.6 LINBUS Master

The user can view the LINbus Master parameter settings of the data logger in this Menu, as per LINbus configured parameters at the time of installation with Appliance.
Follow the steps shown in figure 28 for viewing LINbus master information with example parameters.

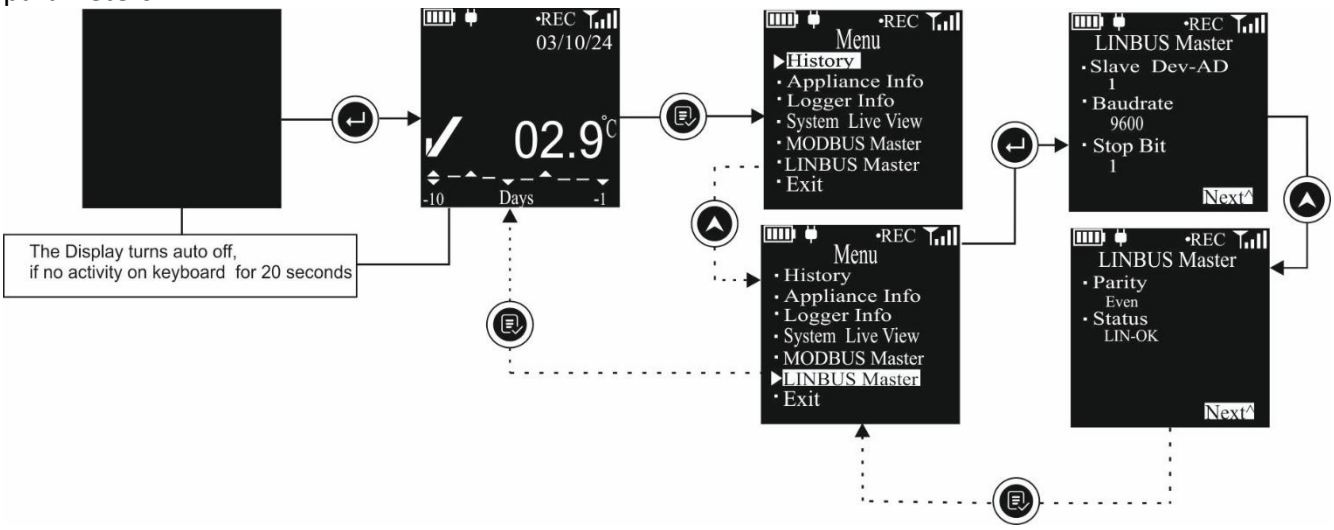


Figure 28 LINbus Master Menu

This menu consists of

1. Slave Dev-AD: LINbus Slave device address (Device address of the Controller connected with data logger as LINbus slave),
2. Baud rate: Communication Speed in bits per seconds (bps)
3. Stop bit: Number of stop bit used in LINbus serial communication
4. Parity: Parity bit setting selected for LINbus serial communication
5. Status: Shows the LINbus communication status, whether it's working OK, closed, or if there is any error.
    a. OK: LINbus communication is working OK
    b. LN-Tout:: LINbus communication is timed out.
    c. LN-Close: LINbus communication is closed, due to Power supply is off and device is on battery.

Note: This menu option will be visible only, when LINbus communication is selected at the time of installation process.

6.4 Displaying of Readings in Different conditions

The display will show the readings of the sensors as per pre-configured parameters settings. Let us consider that the Appliance is operated on AC supply and consists of Vaccine and freezer

compartments with temperature and door sensors. The Data logger will read all these parameters by respective sensors.

Let us consider following example setting of the Appliance parameters:

Parameters	**Set point**
Vaccine Compartment Temperature	Alarm High 8 °C (Alarm High Delay 10 hours) Alarm Low -0.5 °C (Alarm Low Delay 1 hour)
Vaccine Compartment Door	Door Open Alarm trigger delay 5 minutes
Freezer Compartment Temperature	Alarm High -15 °C (Alarm High Delay 1 hour) Alarm Low -25 °C (Alarm Low Delay 1 hour)
Freezer Compartment Door	Door Open Alarm trigger delay 30 seconds
Power Outage	Power outage alarm trigger delay is 24 hours

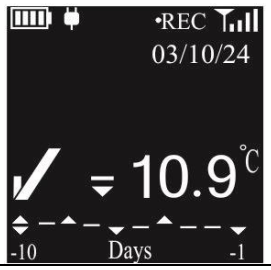
The display Home screens in different conditions are as below:

1. The vaccine temperature is within the high/low alarm limits, with no active alarms recorded in the data logger.

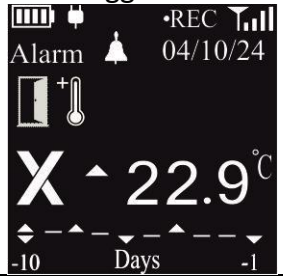
2. The USB cable is connected to the data logger for data access.

3. The Vaccine temperature is above alarm high limit, but the alarm high delay is not over yet.

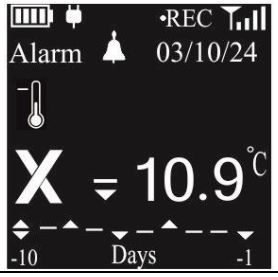
4. The Vaccine temperature is below alarming low limit, but the alarm low delay is not over yet.

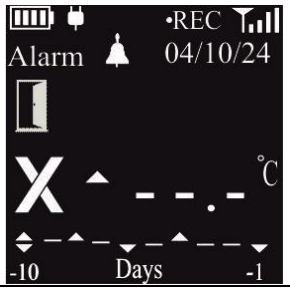


5. The vaccine temperature is above the alarm high limit, triggering the heat alarm. The vaccine/freezer door has been opened for more than its alarm delay, which triggers the door alarm.



6. The vaccine temperature is below the alarm low limit, triggering the freeze alarm.



7. The data logger's Power supply was disconnected past the alarm delay, triggering the power outage alarm, and it is now running on battery. 	8. The data logger has a system error. Please check the error codes in the System Live View menu for details. 
9. The data logger has an active heat and door alarm, which has activated the buzzer operation. The alarm has been acknowledged. 	10. The vaccine temperature sensor may be disconnected, faulty, or reading outside the measurement range. The door alarm has activated. 
11. The battery in the data logger is currently charging from the Power supply. 	12. A fault has occurred in the data logger's battery charging, possibly due to the battery being disconnected or removed. 

6.5 Buzzer Operation

- Buzzer will be operated in following conditions:

1. **Temperature Alarm High/Low (When on Power Supply):** In case, Vaccine/freezer compartment temperature goes beyond its alarm set point high/low, after alarm high/low delay, buzzer will be activated for 5 sec at store interval (Pre-fixed 15 minutes). If alarm condition persists buzzer activation will be continued. If the temperature comes within alarm high/low range, the buzzer will be deactivated.
2. **Temperature Alarm High/Low (When on Battery):** In case, Vaccine/freezer compartment temperature goes beyond its alarm set point high/low, after alarm high/low delay, buzzer will be activated for 5 sec at 1 hour interval. If alarm condition

persists buzzer activation will continue for 15 hours, after that buzzer will be deactivated until temperature gets restored in normal range and alarm condition occurs again.

Note: If the Alarm Disable option is selected by the user, the audio-visual alarm indication will be disabled. For details please refer section 6.3.4 System Live Menu, Alarm Monitor option.

6.6 Alarm Acknowledgement

- If user wants to disable/mute the buzzer during the Temperature Alarm High/Low condition, it can be done by pressing  key for 1 second.
- The buzzer will be deactivated until the temperature reading gets restored in normal range and alarm condition occurs again.

7 DATA STORAGE

The Equiplog Data logger has capacity to store 1 year of data in its memory and available for download via M2M data interface. The data storage is configured such that 1 year of most recent data is preserved at all times and the oldest data is overwritten on first in, first out basis.

The user can access the data from Equiplog Data logger using USB Type-C data cable connected as mass storage device with PC/Laptop/mobile phone.

7.1 Reading out Data on the Display

- The user can access the last 30 days history data review on the display the data logger itself, there is no need for data download.
- For reading the history data on the data logger display refer the section 6.3.1 .

7.2 Access the Data using USB host

The recorded data can be accessed by connecting USB Type C data cable with Host device (refer figure 29). There are two options for viewing the data on the host device.

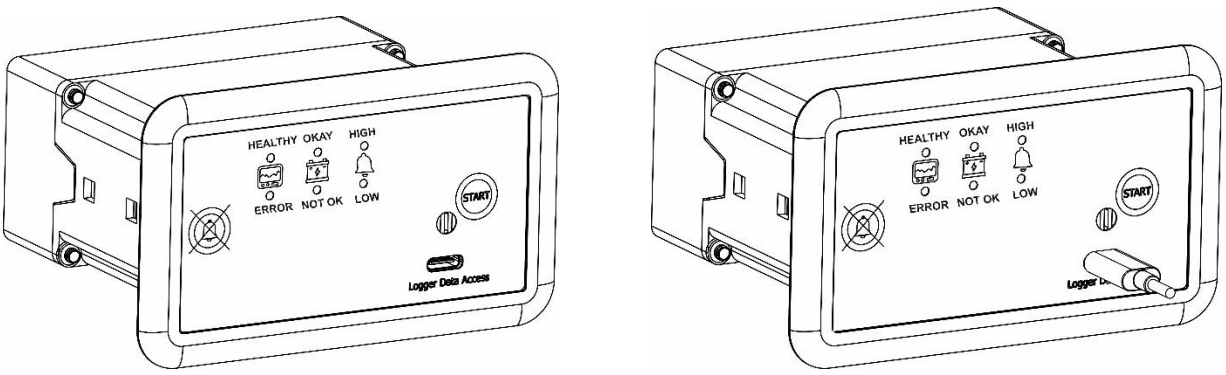


Figure 29 Connect USB Type-C Cable

1. The host device will be PC or laptop, Json data files and pdf report as specified by the WHO PQS E006 specification protocol guidelines are accessed. Here, the PDF report will consist of most recent 60 days data summary. The Json data file of the recorded data since the recording has started and sync data Json file for the last record when connecting the USB host.
2. The host device will be a mobile application, which access the Json data files and process these data to show them in tabular form in the mobile application. The data logger and Appliance must be registered to upload these data on the cloud server.

3. If the Equiplog data logger is having remote communication via GSM module, then register the device on the cloud server. The data will be sent to the server once it is registered properly.

7.2.1 Download the Data Using PC or Laptop

Connecting the Equiplog data logger with the PC or Laptop using USB type-C cable allow the user to download the current, sync data Json data files, PDF report for last 60 days history data and History Data folder as per the WHO/PQS/E006/DS01.2 standard format.

- On downloading, the root directory will consist of the mentioned Json files, PDF report and History data folder as shown in figure 30.

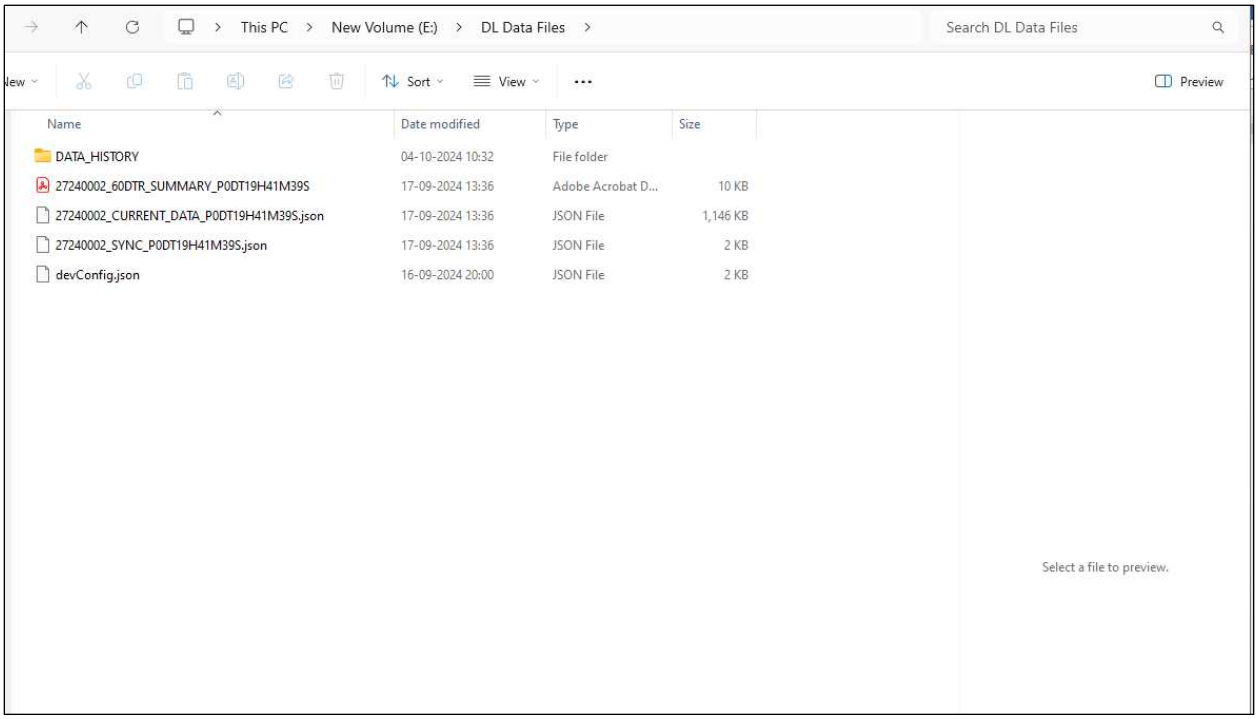


Figure 30 Downloaded Data from Equiplog Data logger

- Copy the files of the data logger to the Preferred location in the PC/Laptop to save the data.
- In this sample, the USB drive contains following contents:

  DATA_HISTORY

  This folder contains historic raw data json files for maximum 1-year record period, wherein each Json file consist 60 days history raw data.

  27240002_60DTR_SUMMARY_P0DT19H41M39S.pdf

  It is the pdf summary report for last 60 days, where 27240002 indicates Data logger serial no., **P0DT19H41M39S** is the relative timestamp at the time of USB mount.

  27240002_CURRENT_DATA_P0DT19H41M39S.json

  It is the json file for last 60 days raw data stored at 15 minutes store interval.

  27240002_SYNC_P0DT19H41M39S.json

  It is the most recent logged data json file at the time of USB mount.

- The following error conditions will be recorded in the error code JSON object, if occurred.

Abbreviation	Description
BATF	Battery Faulty Error
SETF	Self Test Fail Error
SERV	Vaccine Sensor Error
SERF	Freezer Sensor Error
MBER	Modbus Communication Error
LBER	Linbus Communication Error

- If multiple errors occur, all relevant error codes will be recorded and separated by a space.

- To disconnect the device properly, please always use the function "**Safely Remove Hardware**" on your PC.
- Right-click the icon "**Safely Remove Hardware and Eject Media**" in the Windows taskbar (lower right corner). (Choose the corresponding device to remove.)

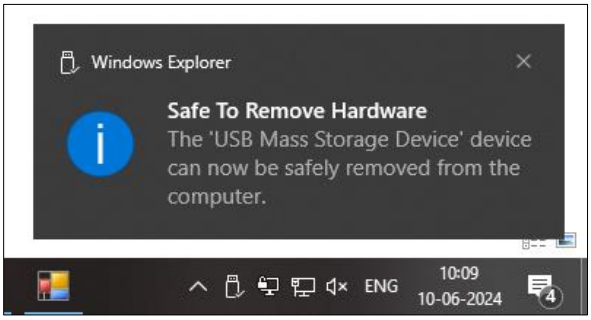
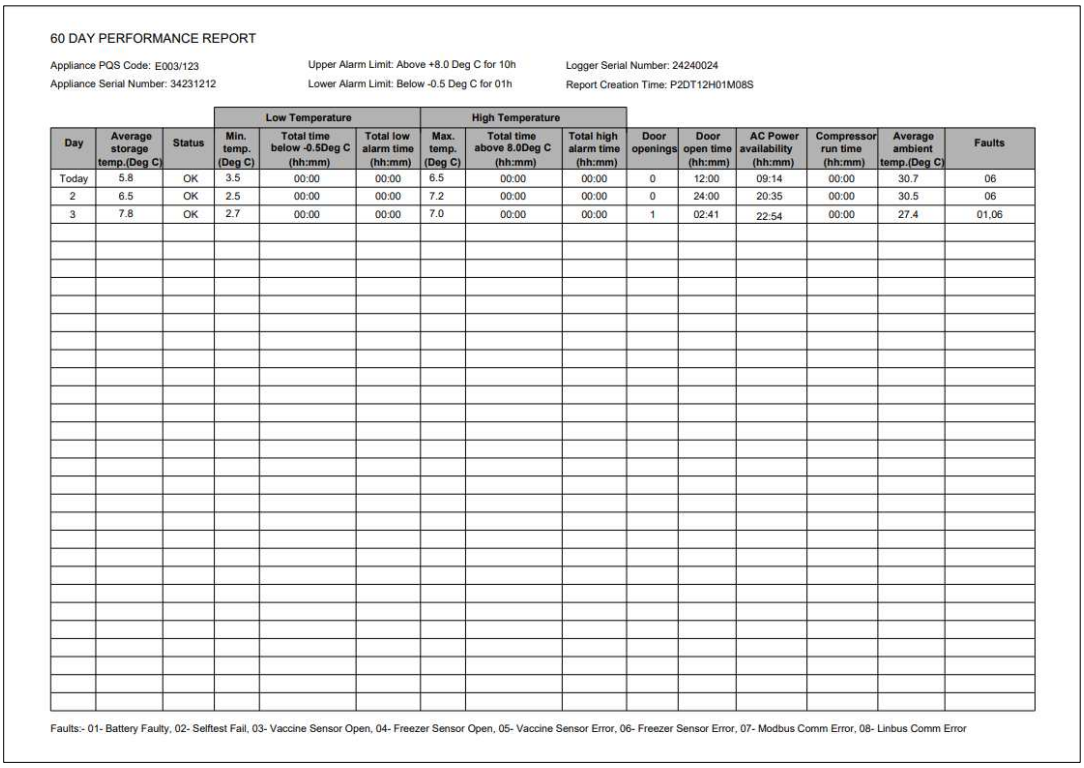


Figure 31 Safely Remove the Data logger

- Do not disconnect the device before you see the message for safely remove the device, otherwise the device can be damaged.

The sample PDF report is shown in the figure 32 as per the WHO PQS standard format, where the data of last three days representing each row as one day.



60 DAY PERFORMANCE REPORT

Appliance PQS Code: E003/123
Appliance Serial Number: 34231212
Upper Alarm Limit: Above +8.0 Deg C for 10h
Lower Alarm Limit: Below -0.5 Deg C for 01h
Logger Serial Number: 24240024
Report Creation Time: P2DT12H01M08S

			Low Temperature			High Temperature								
Day	Average storage temp.(Deg C)	Status	Min. temp. (Deg C)	Total time below -0.5Deg C (hh:mm)	Total low alarm time (hh:mm)	Max. temp. (Deg C)	Total time above 8.0Deg C (hh:mm)	Total high alarm time (hh:mm)	Door openings	Door open time (hh:mm)	AC Power availability (hh:mm)	Compressor run time (hh:mm)	Average ambient temp.(Deg C)	Faults
Today	5.8	OK	3.5	00:00	00:00	6.5	00:00	00:00	0	12:00	09:14	00:00	30.7	06
2	6.5	OK	2.5	00:00	00:00	7.2	00:00	00:00	0	24:00	20:35	00:00	30.5	06
3	7.8	OK	2.7	00:00	00:00	7.0	00:00	00:00	1	02:41	22:54	00:00	27.4	01,06

Faults:- 01- Battery Faulty, 02- Selftest Fail, 03- Vaccine Sensor Open, 04- Freezer Sensor Open, 05- Vaccine Sensor Error, 06- Freezer Sensor Error, 07- Modbus Comm Error, 08- Linbus Comm Error

Figure 32 Sample PDF Report of last 30 days

- The sample report consists of following data:
  1. Title of the report generated: Prefixed title “60 DAY PERFORMANCE REPORT”
  2. Appliance PQS code: Alphanumeric unique number (Max. 10 Characters) entered by the Appliance Manufacturer
  3. Appliance Serial Number: Alphanumeric unique number (Max. 20 Characters) entered by the Appliance Manufacturer
  4. Upper Alarm Limit: Above +8.0 °C for 10h
  5. Lower Alarm Limit: Below -0.5 °C for 01h
  6. Logger Serial Number: 8-digit unique number
  7. Report Creation Time: It is the relative timestamp as of the time of USB mount in ISO 8601 duration format(PnDTnHnMnS).
     - E.g. the sample report creation time: **P2DT12H01M08S** means the data recording is started since 2 days 12 hour 01 minute and 08 seconds
  8. Data Summary Table: Shows max 60 days’ summary in table; Each row consists of a day summary and columns represents its relevant data:
     1) Day: The most recent days will be displayed at the top Entry including today’s data.
     2) Average Temperature for the day
     3) Status: OK/Alarm
     4) Low Temperature:
        - Min Temperature in deg C
        - Total time below set point value (hh:mm)
        - Total low alarm time (hh:mm)
     5) High Temperature:
        - Max Temperature in deg C

- Total time above set point value (hh:mm)
- Total high alarm time (hh:mm)

6) Number of Door openings: Door opening count for the day
7) Door open time: cumulative total door open time (hh:mm) during the day
8) AC power availability: For AC supply appliances, it is the time (hh:mm) during the day when AC supply voltage is within its acceptable bounds. For DC supply appliance, this column will remain blank.
9) Compressor run time: It is the cumulative run time (hh:mm) when the compressor remains ON during the day.
10) Average Ambient Temperature for the day
11) Faults: Numeric codes for as per the Error codes generated during the day indicated by numeric values separated by comma.
    01- Battery Faulty,
    02- Self-test Fail,
    05- Vaccine Sensor Error,
    06- Freezer Sensor Error,
    07- Modbus Comm Error,
    08- Linbus Comm Error

7.2.2 Download the Data Using Mobile Application

For Level 2 Integrated EMD, users can install the mobile application to view data in both tabular and graphical formats. Additionally, the application allows users to upload data to a remote server.

- Install the " **Equiplog E-EMD**" Mobile application with the link shared by manufacturer.
- Open the Application and connect the data logger using USB2.0 Type C to C cable for mobile device.
- The home screen of the mobile application is shown in figure 33, click on the connect button to download the data from the data logger.

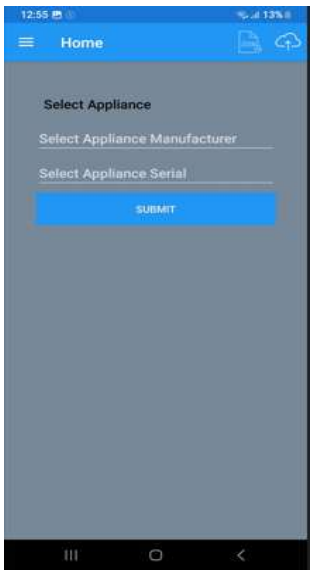


Figure 33 Mobile Application Home screen

- Once the data is downloaded, data can be viewed on the application dashboard as shown in figure 34.

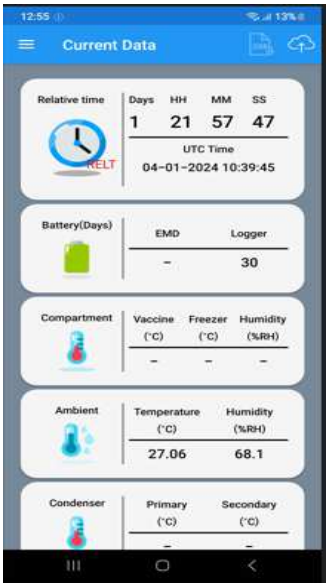


Figure 34 Current Data View on Mobile Application Dashboard

- To upload data to the cloud server, click the "**Upload"** button for the corresponding data files of a given data logger, provided an internet connection is available.

Note: The data can be uploaded to the cloud server if the data logger is registered with the cloud server.

7.2.3 Download the Data Using VARO Application

The Equiplog Data logger is compatible with the Varo Application on your smartphone, providing instant cold chain insights sent directly to your inbox.

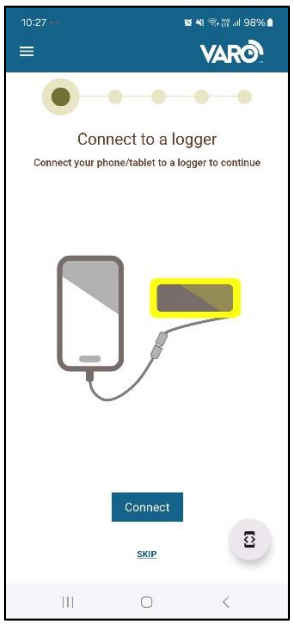


Figure 35 Varo Application Dashboard

The Varo app is a standalone equipment monitoring solution that lets you see the big picture and share the details. It works with any CCE model or manufacturer. It's a simple, free, and private way to make vital information useful.

- Connect the device with the Varo application using USB2.0 M2M Type C data access port.
- Install the "**VARO Cold Chain Reporting**" Mobile application using the app store in android OS mobile phones.
- Open the Varo Application and connect the data logger using USB2.0 Type C to C cable for mobile device. Allow the USB access permission and device location permission.
- The home screen of the mobile application is shown in figure 35, click on the connect button to download the data from the data logger. The data will be downloaded in approx. 1 minute.
- Search for specific EMS data files: Raw data ("CURRENT"), Sync data ("SYNC"), Historical data ("DATA" in "DATA_HISTORY"), 60-day summary report (PDF)
- If EMS data is found, copy files and return control to the user for report creation.
- Follow the steps further to share the data and report in the mail with specific information regarding the Appliance.

7.3 Equiplog Data Logger with Remote Communication

The Level 3 Integrated EMD supports remote communication through a GSM add-on module, which enables data transmission to a remote server. To begin transmitting data to the cloud application, the Integrated EMD must first be registered.

Once registered, the GSM module will: Periodically send stored data to the cloud application based on the configured storage interval. Instantly transmit real-time data whenever an event is generated in the data logger.

- During Power Outage, the logger operates on a rechargeable battery, storing all recorded data. It switches to power-saving mode, where remote communication occurs at least once every 24 hours. In case of an event, data is transmitted immediately, despite power-saving mode.
- When Power Supply is Restored, the GSM module transmits all stored data to the cloud application, ensuring no data loss.
- In Case of weak GSM signal, if the signal strength is too low for data transmission, the logger retains the data. Once a stable signal is available, the stored data is automatically sent to the cloud application.
- The logger can store up to 30 days of data if transmission fails due to poor GSM signal. Once the signal improves, all pending data will be transmitted.
- The battery backup duration depends on the frequency of events generated during power outage, as event-based transmissions consume additional power.

7.4 Overview of Cloud Server Application

The EMS Cloud application is a remote data system for accessing data from the Integrated EMD via GSM communication. This remote application includes functionalities such as user

management, device registration, device data basic analysis, KPI tracking, graphical analysis, data summaries; remote alarm threshold adjustment, alarm muting, alarm monitoring enable/disable, audit trail, and more. The Cloud server application has Multi-language (Arabic, English, French, Mandarin, Russian, and Spanish) options available.

For more details about the EMS Cloud Application, please check the Help menu within the app.

7.4.1 Login to EMS Cloud Application

- Open the "**EMS Cloud**" server as per the link and login credential details shared by the manufacturer as shown in the figure 36.

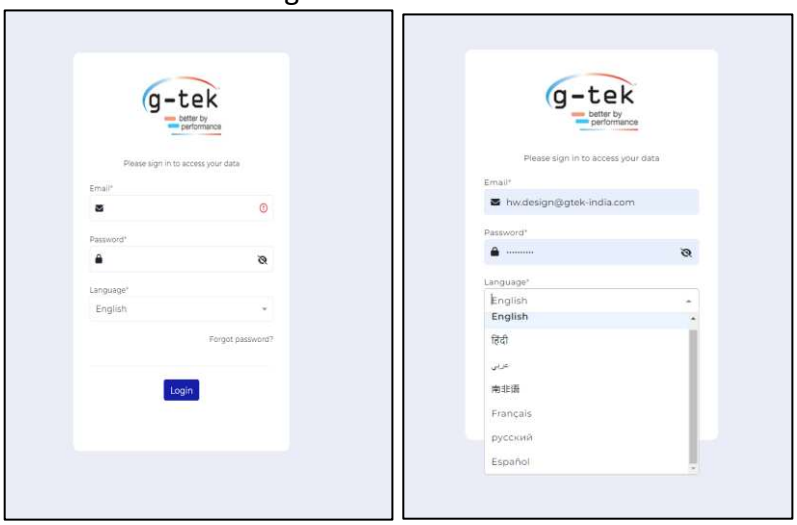


Figure 36 Login Page of the EMS Cloud Server Application

- Company login subscription and related information are shared by the EMS to Appliance Manufacturer.
- After Logging in, dashboard will appear as shown in figure 37, where User can see the stats regarding their company plants, department, users and Devices.

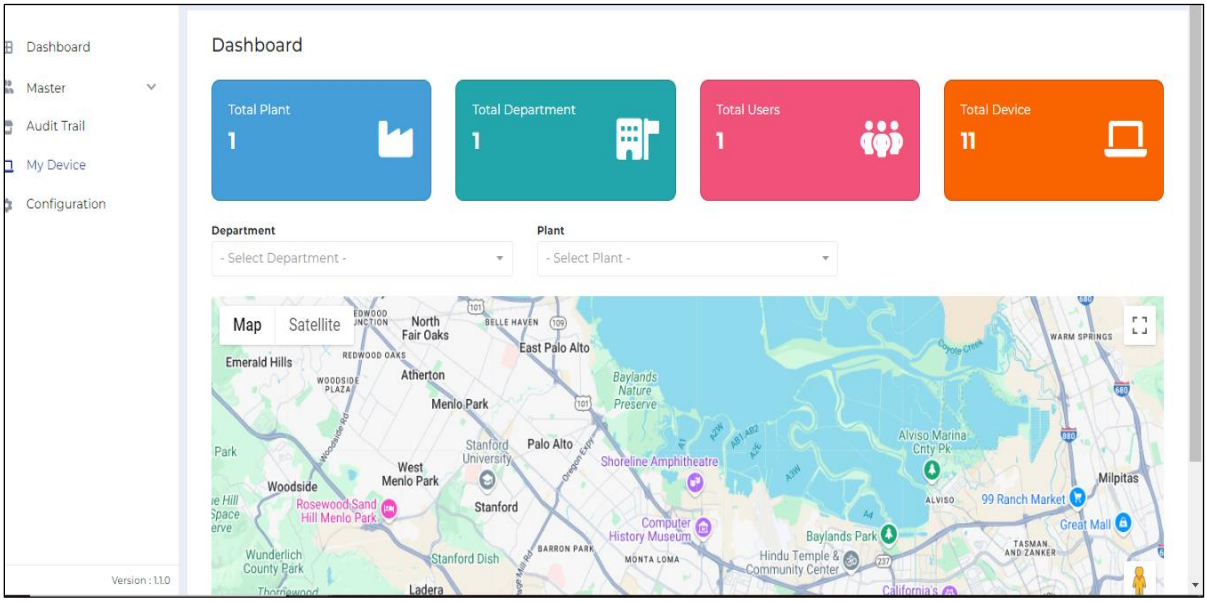


Figure 37 EMS Cloud Application Dashboard

7.4.2 Add Plant and Department Details

- After logging in as the company super admin, create users and assign their roles and responsibilities.

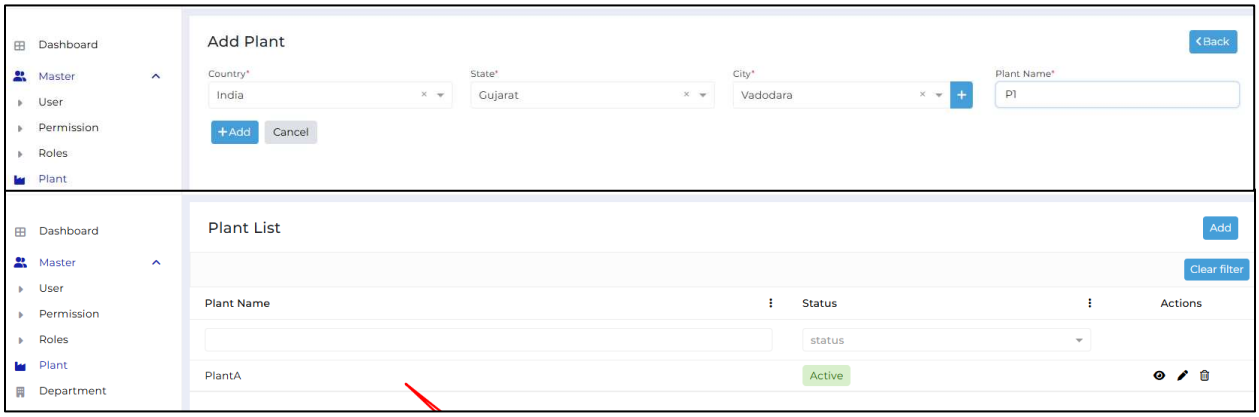


Figure 38 Add Plant in EMS Cloud Application

- Click on the Master tab to view the available options in the list.
- First, add the Plant with the required details using the left-side panel of the application window, as shown in figure 38.
- Similarly, add department with the details as shown in the figure 39.

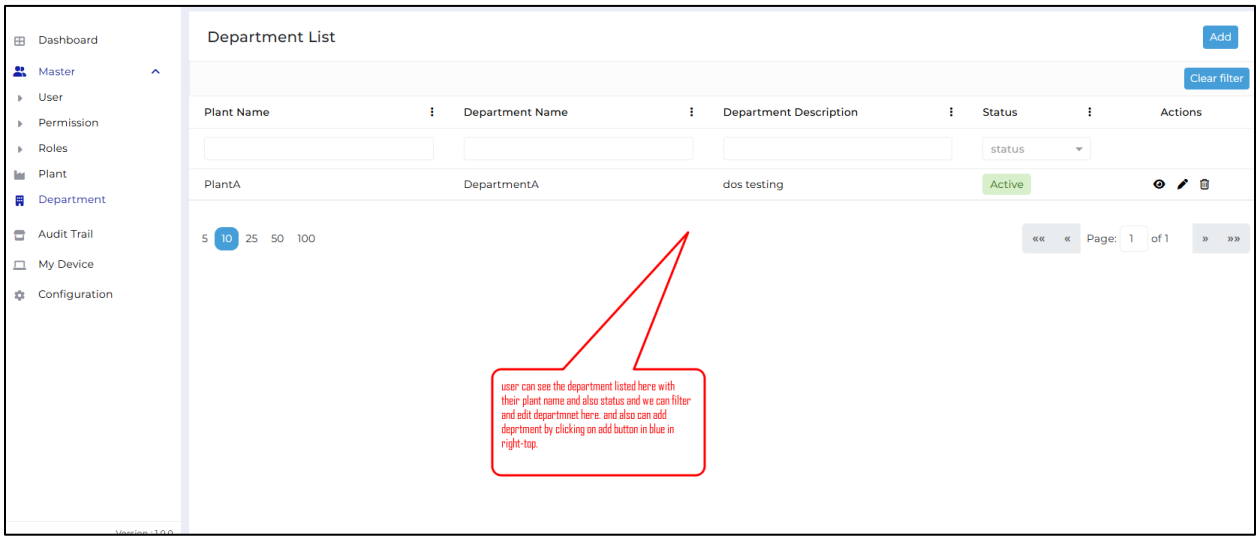


Figure 39 Add Department in EMS Cloud Application

7.4.3 Add Roles and Assign Permissions

- The default roles available are Admin, Plant Manager, Department Manager and Device Operator.
- The existing role names can be edited and updated by clicking on the edit option.
- New role can be added , if required by clicking on the Add button shown in the figure 40.

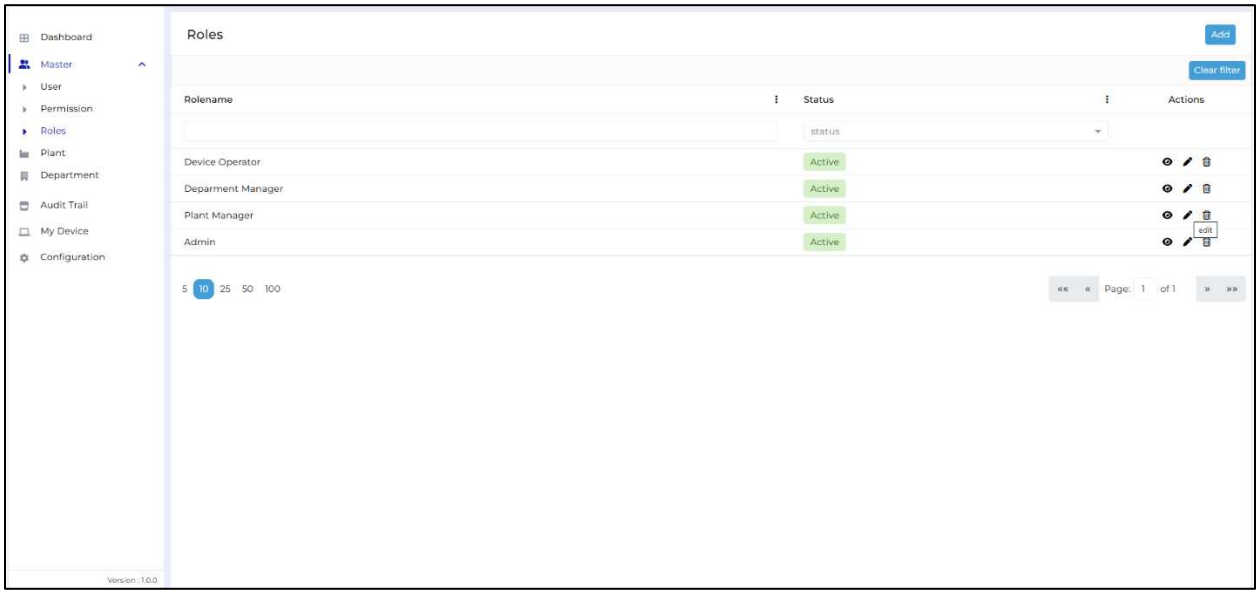


Figure 40 Add/Update Roles in EMS Cloud Application

- Assign/edit the permission for each role using permission tab as shown in the figure 41.

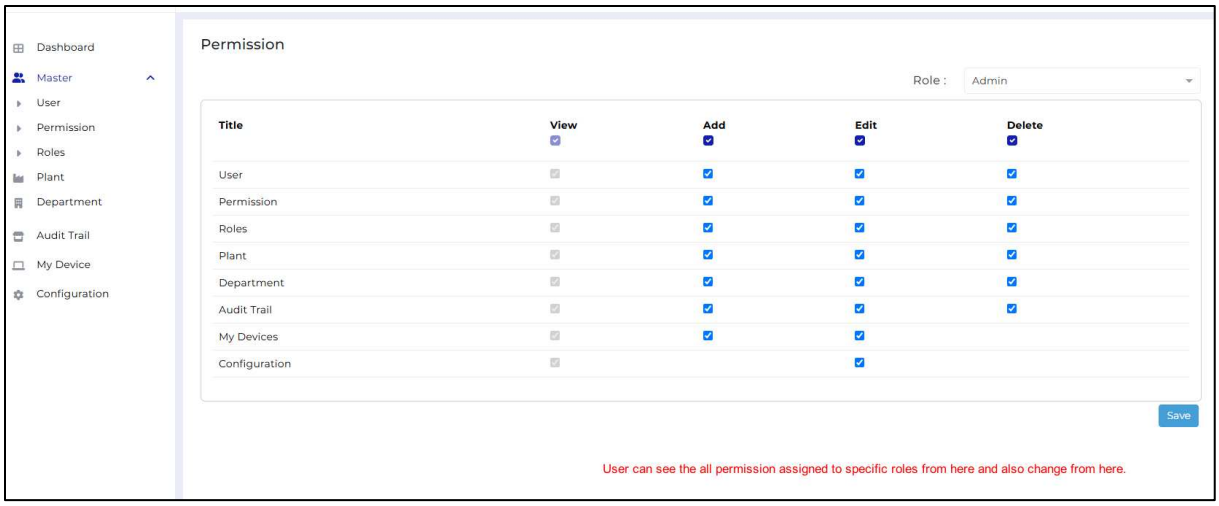


Figure 41 Assign Permissions to Roles in the EMS Cloud Application

7.4.4 Add Users and Assign Permissions

- Add User with assigning proper role, Plant and department to the user with all the mandatory fields and valid mobile number and email id.
- User has to verify the link sent on their email id and generate sign in password for login to the EMS Cloud application.

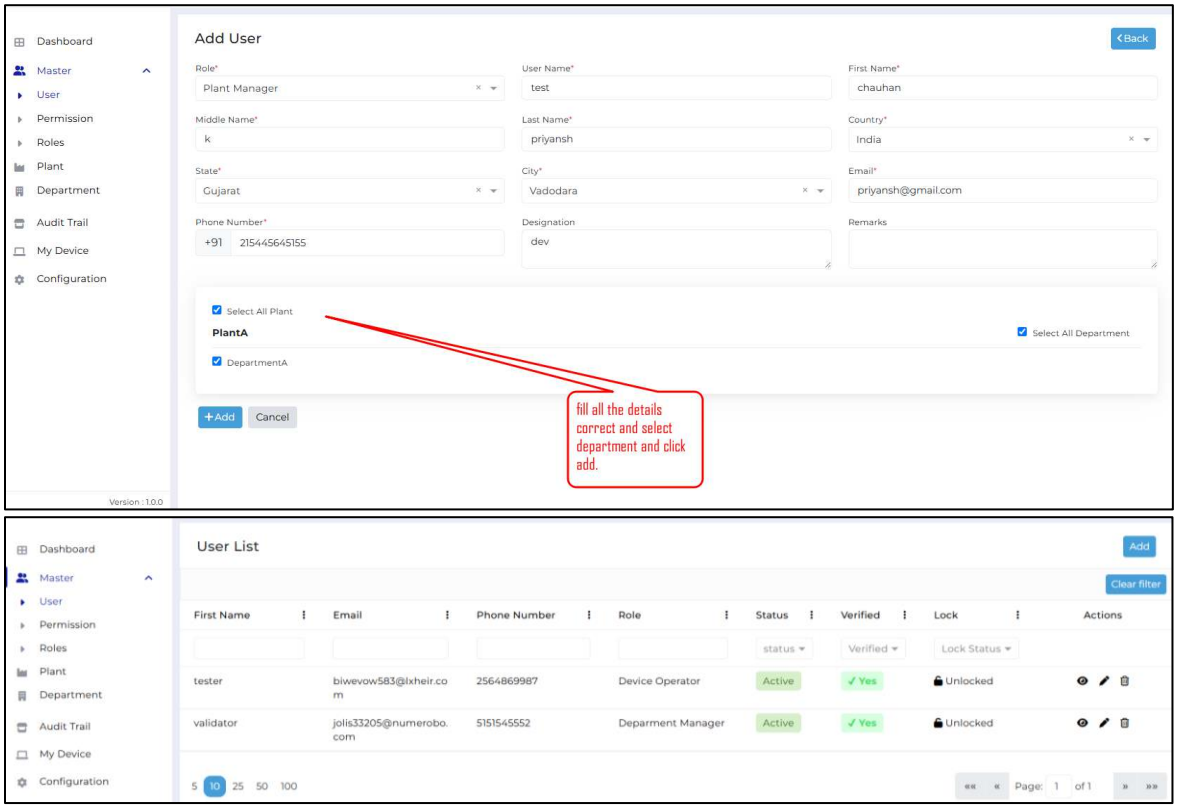


Figure 42 Add Users in the EMS Cloud Application

- Once the user has been verified, user can login using their user id and password.
- If a user enters an incorrect password more than three times while logging in, the account will be locked for one hour. After this period, the user can log in again using a valid user ID and password.
- The user's status, whether locked or unlocked, is displayed in the user list, as shown in figure 42.

7.4.5 Audit Trail For activity logs

- The user with Admin role will have the access to audit trail option in the application as shown in figure 43.
- In the audit trail, the activity list includes: login, changed password, updated configuration, view user, add user, edit user, delete user, updated permission, view role, add role, edit role, delete role, view plant, add plant, edit plant, delete plant, view department, add department, edit department, delete department, view audit trail, add device, and edit device.
- Various filter options - From Date, To Date, Activity Name, User Name, and IP Address are available for searching the required audit trail logs. A PDF report can also be generated for the same.

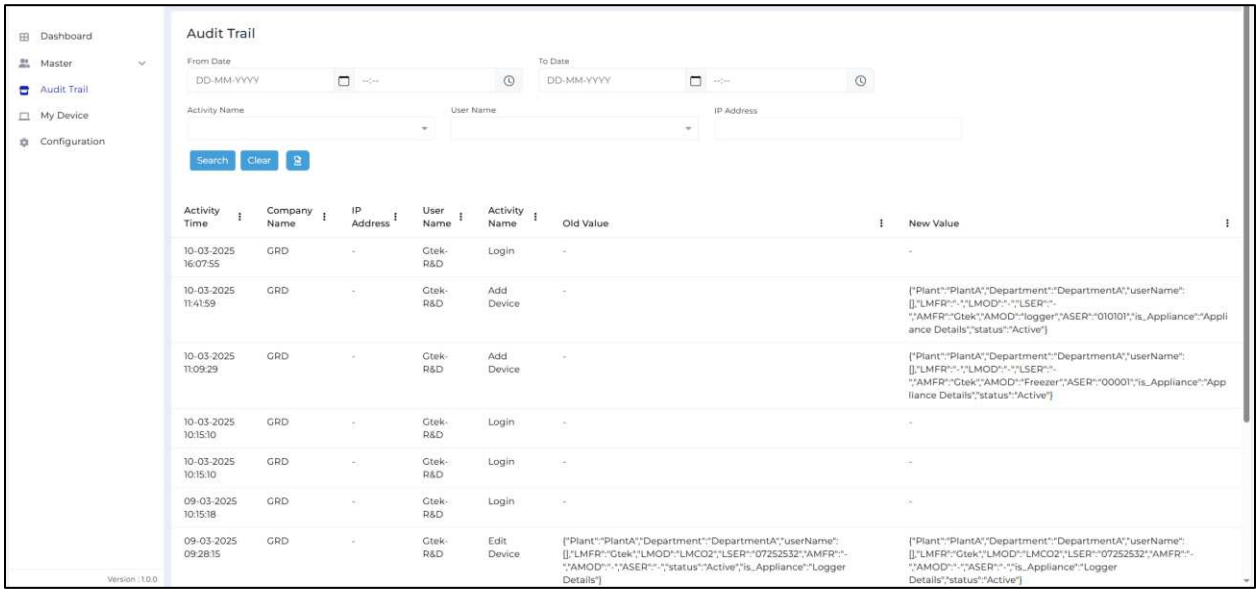


Figure 43 Audit Trail for activity logs in the EMS Cloud Application

7.4.6 Configuration Menu

- The Configuration Menu consists Password management, date format and session time out settings as shown in figure 44.
- Password Management includes two configurable parameters for ensuring better security:
  - **Password Expiry days:** A numeric value defining the number of days before a password expires. Set to 0 for passwords that never expire. Users must change their password once it expires.
  - **Password can not be same:** A numeric value specifying the number of previous passwords that cannot be reused.

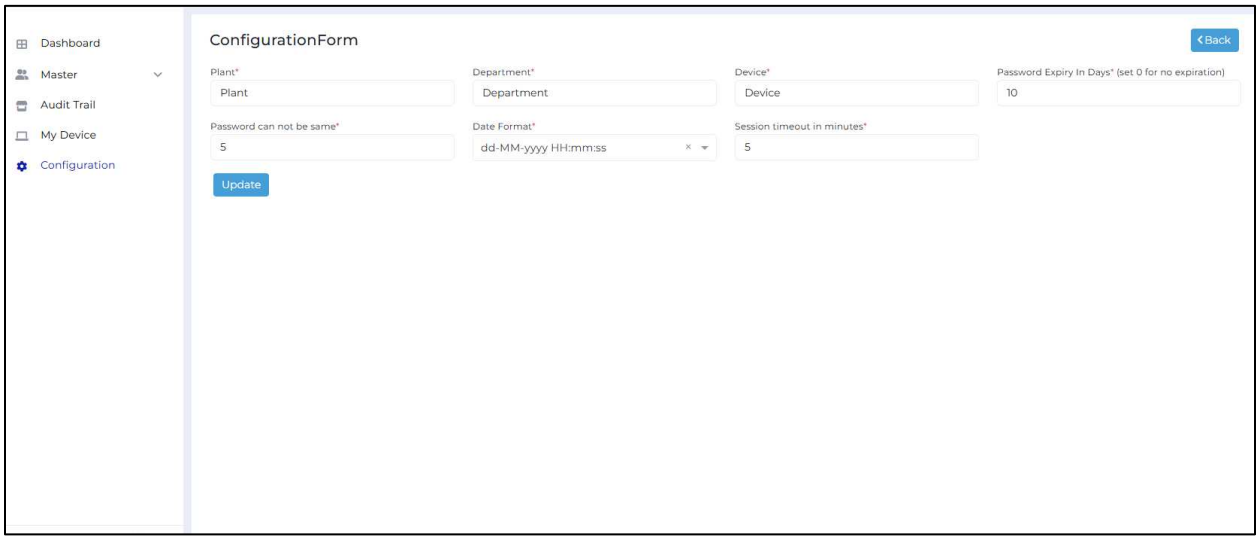


Figure 44 Configure Menu in the EMS Cloud Application

- **Date Format** - The selected date-time format will be applied throughout the application for all users under the company account.

- **Session Timeout in minutes** – A numeric value defining the inactivity period (in minutes) after which the user is automatically logged out and redirected to the login page.

7.4.7 Add Device in EMS Cloud Application

User can login with their credentials and add the device to register the device details. Note that the user can assign the device to other users too. The top-level user can view/edit the device related details.

- Add the device by selecting the "My Device" tab on left side of the dashboard as shown in figure 45.

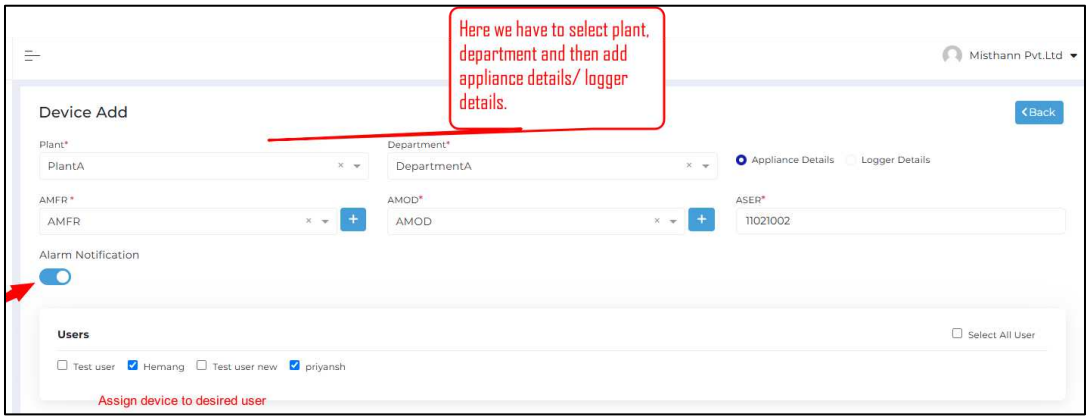


Figure 45 Add device in EMS Cloud Application

- The existing device list will be seen on the dashboard, if already added, else click on the Add button to register the device.
- A device can be added using either Appliance or Logger details. Ensure all mandatory fields are filled correctly to enable proper data reception from the Integrated EMD device.
- Once data reception from the device begins, the device details in the registration cannot be modified.
- After successfully adding the device, it will appear in the Device List, as shown in figure 46.

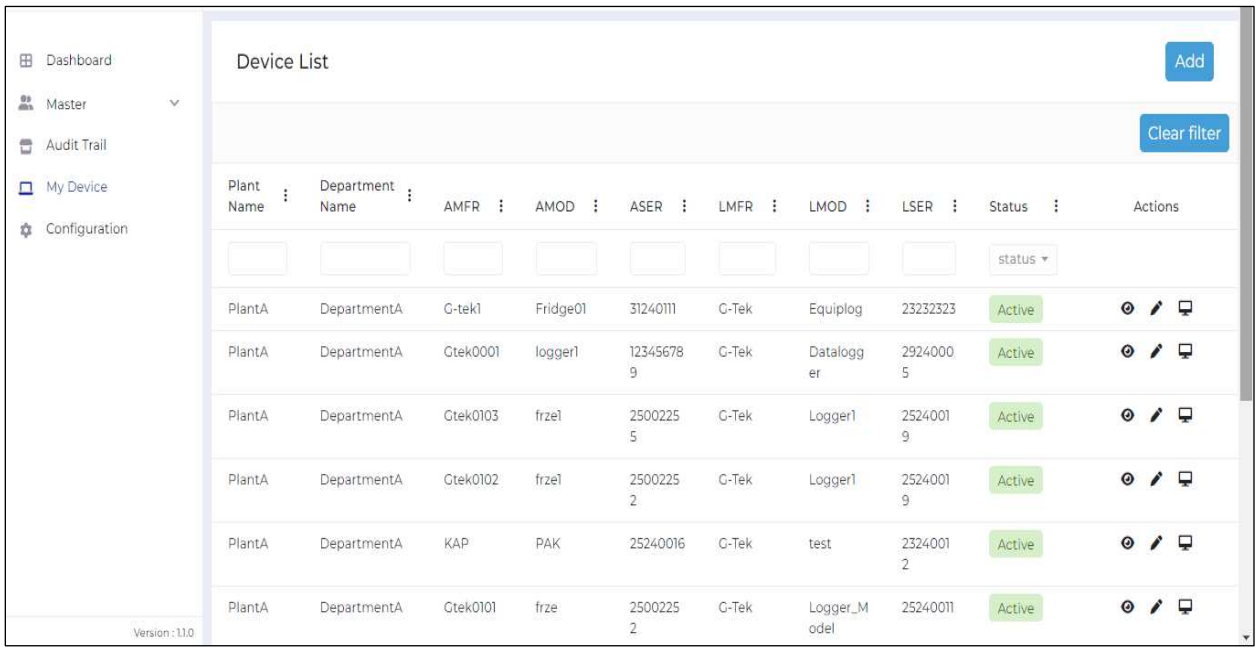


Figure 46 Added device in Device list of EMS Cloud Application

- From this list, users can view or edit device details and access detailed device data logs by clicking the respective icons next to the device row.

7.4.8 Navigate through Device Dashboard Options

On selecting, the device detailed data log, dashboard for the selected device is opened, where device details are provided with Appliance and logger administrator details as shown in figure 47.

By default, the graph dashboard for the device is visible and on the top of the dashboard various icons are available for device data analysis.

Figure 47 Device Dashboard view in EMS Cloud Application

7.4.8.1 KPI Calculations Dashboard for Device Data

- Click on  icon to view KPI (Key Performance Indicators) calculations dashboard for the selected device in the cloud application as shown in figure 48.

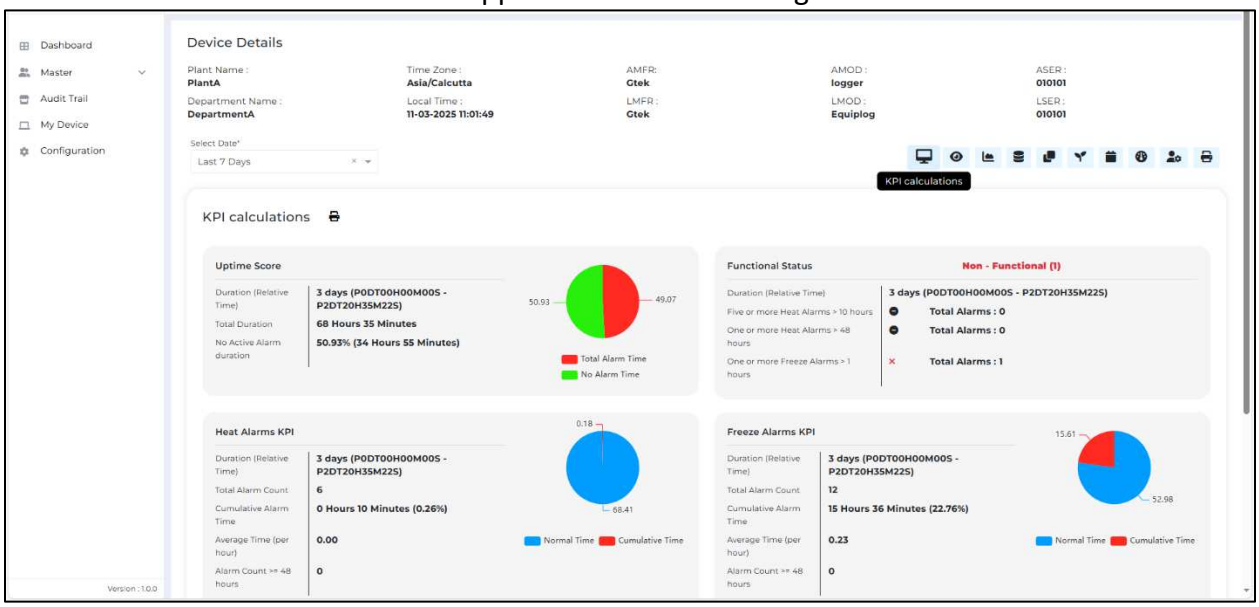
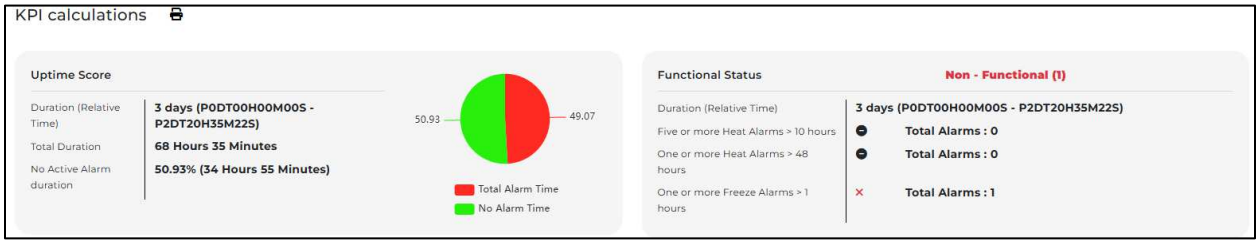
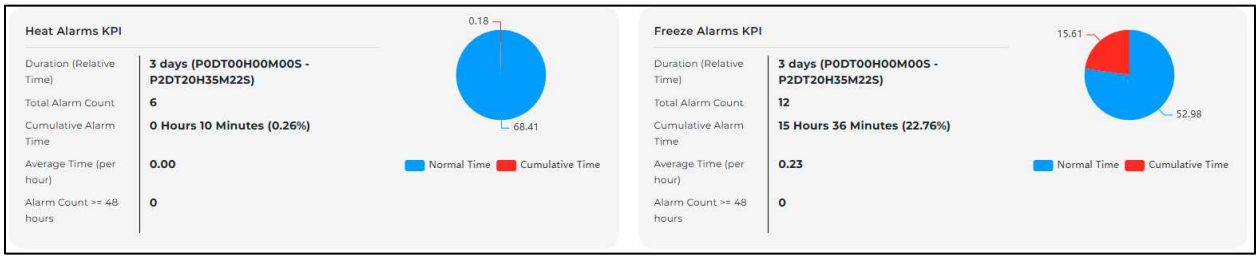


Figure 48 KPI Calculations view Dashboard for selected device

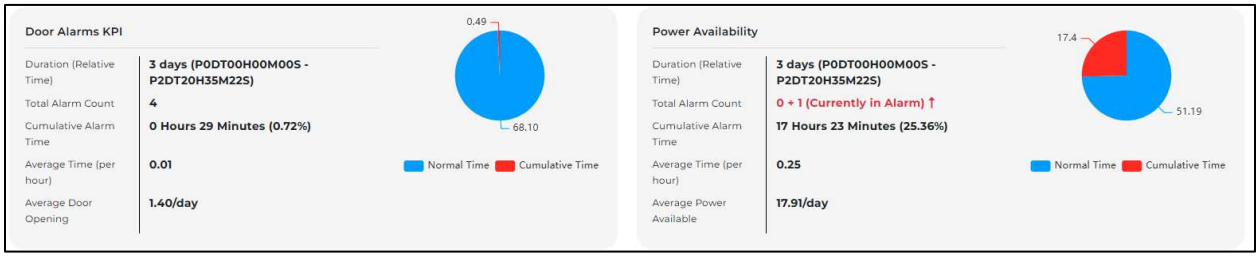
- KPI calculations for the device data are as per WHO/PQS/E006/DS01.2 data standard for cold chain equipment monitoring. It consists of



- **Uptime score:** Shows percentage of time in the past 30 days when there was no active alarm condition.
- **Functional Status:** "1" for functional, "0" for non-functional; a refrigerator is deemed 'non-functional' if any of the following conditions are met for the last 30-day time period:
  - Five or more heat alarms > 10 hours duration
  - One or more heat alarms > 48 hours duration
  - One or more freeze alarms > 1 hour duration



- **Heat Alarm KPI:** Number of heat alarms in the past 30 days
  - Cumulative Alarm Time (per hour)
  - Average Time (per hour)
  - Alarm Count > = 48 hours
- **Freeze Alarm KPI:** Number of heat alarms in the past 30 days
  - Cumulative Alarm Time (per hour)
  - Average Time (per hour)
  - Alarm Count > = 48 hours



- **Door Alarms KPI:** Average number of door openings per day in the past 30 days
  - Cumulative Alarm Time (per hour)
  - Average Time (per hour)
  - Alarm Door opening Counts (hours per day)
- **Power Availability Alarms KPI:** Average time of available power per day for the past 30 days

- Total Alarm count
- Cumulative Alarm Time
- Average Time (per hour)
- Alarm Power Available (hours per day)

7.4.8.2 My View Dashboard for Device Data

By selecting **"My View"** icon, user can choose data to viewed on the dashboard from the list of device data. This allows user to get the customized view of device data, shown in the figure 49.

User can add/remove the parameters for the data analysis of the required device performance on single page.

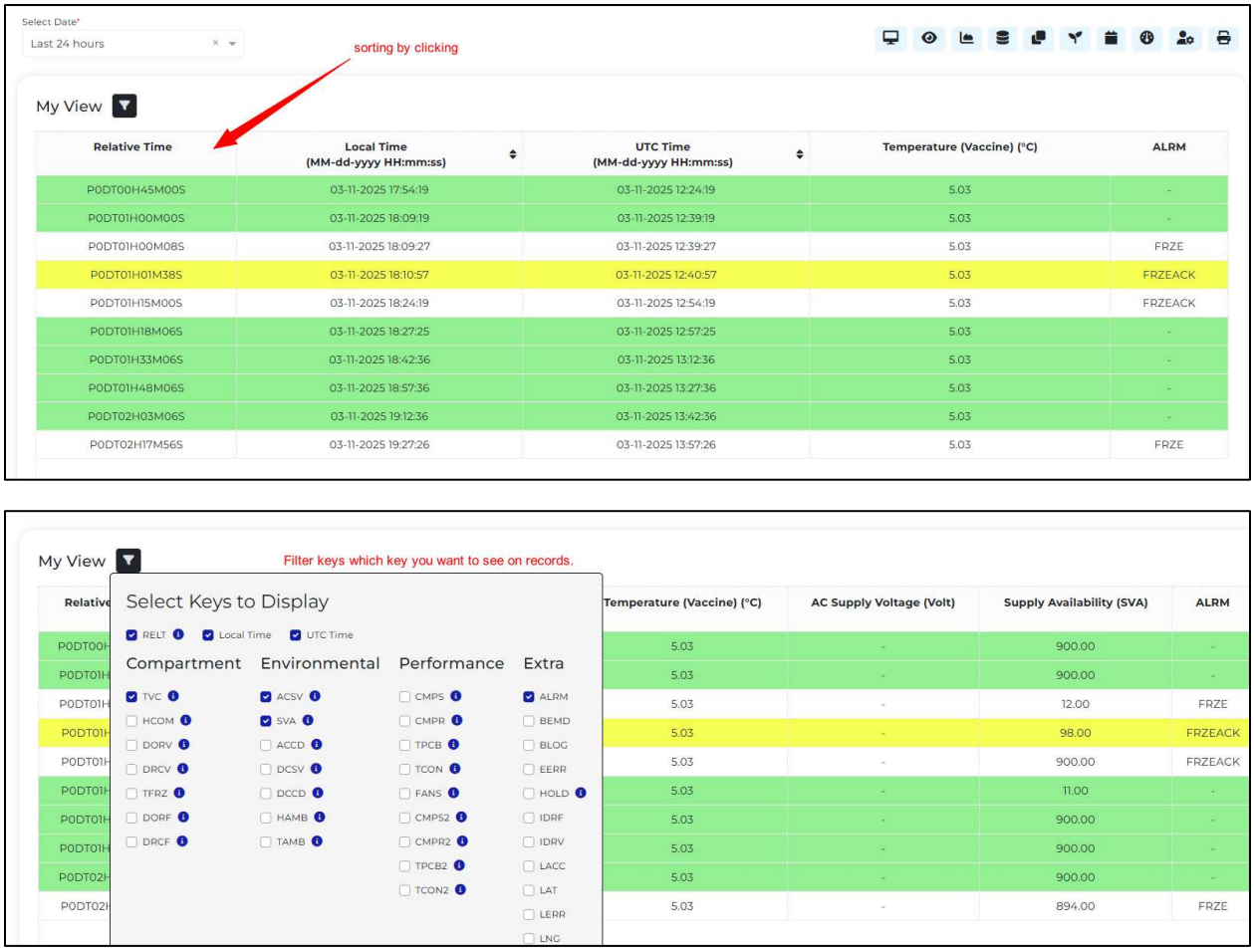


Figure 49 My View Dashboard for selected device

7.4.8.3 Graph Dashboard for Device Data

The Graph Dashboard displays device data in a graphical view for the selected time period, as shown in figure 50. By default, the time period is set to the last 24 hours.
Users can filter the time period using the available options: Last 24 hours, Last 7 days, Last 30 days, This Month, Last Month, or a Custom filter.

- Graphs can be customized by selecting the required JSON data keys to be plotted, with a maximum of two parameters per graph.
- In this example, vaccine and freeze temperature data are plotted on one graph, while ambient temperature and humidity are plotted on another for the last 7 days.
- The graph can be zoomed in and out using the slider below the graph or by hovering the mouse over it.

Figure 50 EMS Cloud Graph view Dashboard for selected data logger

- The graph can be saved as an image file in PNG format using the right-click and download options.

7.4.8.4 Current Data Dashboard for Device

- Most recent data record for the device is shown as current data on the dashboard in cloud application as seen in the figure 51.

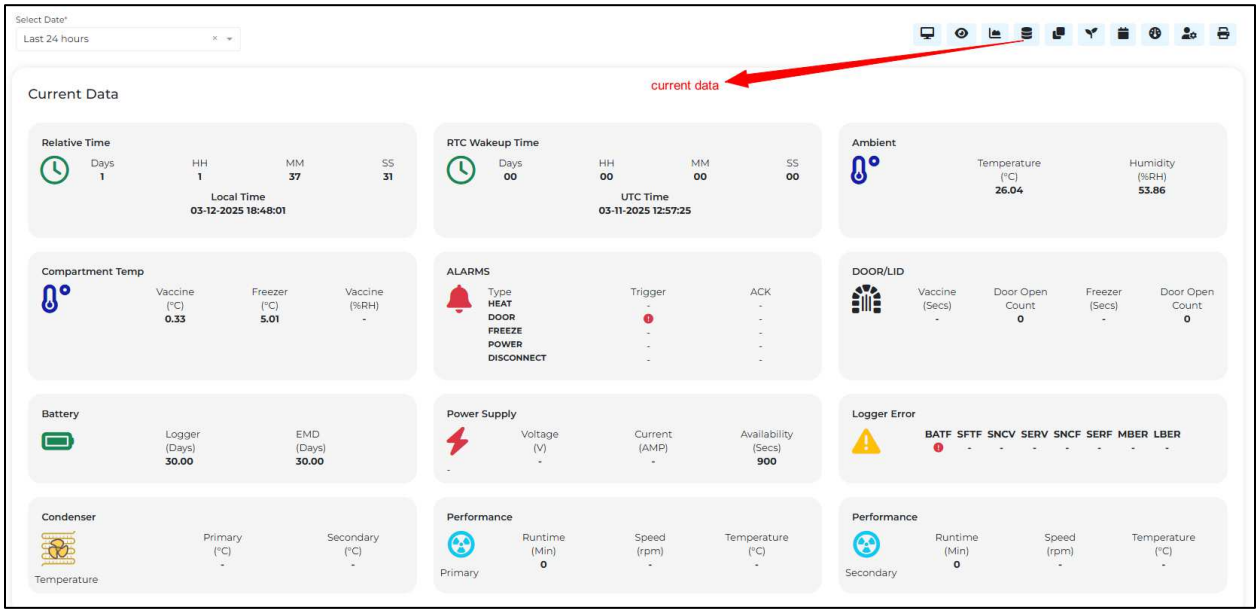


Figure 51 Current Data view Dashboard for selected device

- This dashboard offers users a comprehensive overview of essential device data in a single view. It highlights key metrics, ensuring quick access to critical information.
- Additionally, it displays any active alarms and error codes in real-time, allowing users to promptly identify and address potential issues.

7.4.8.5 Compartment Data Dashboard for Device

- The Compartment Data Dashboard provides data view options for both the vaccine and freezer compartments of the appliance.
- Data is displayed in a table format with reference to relative time, local time, and UTC time.

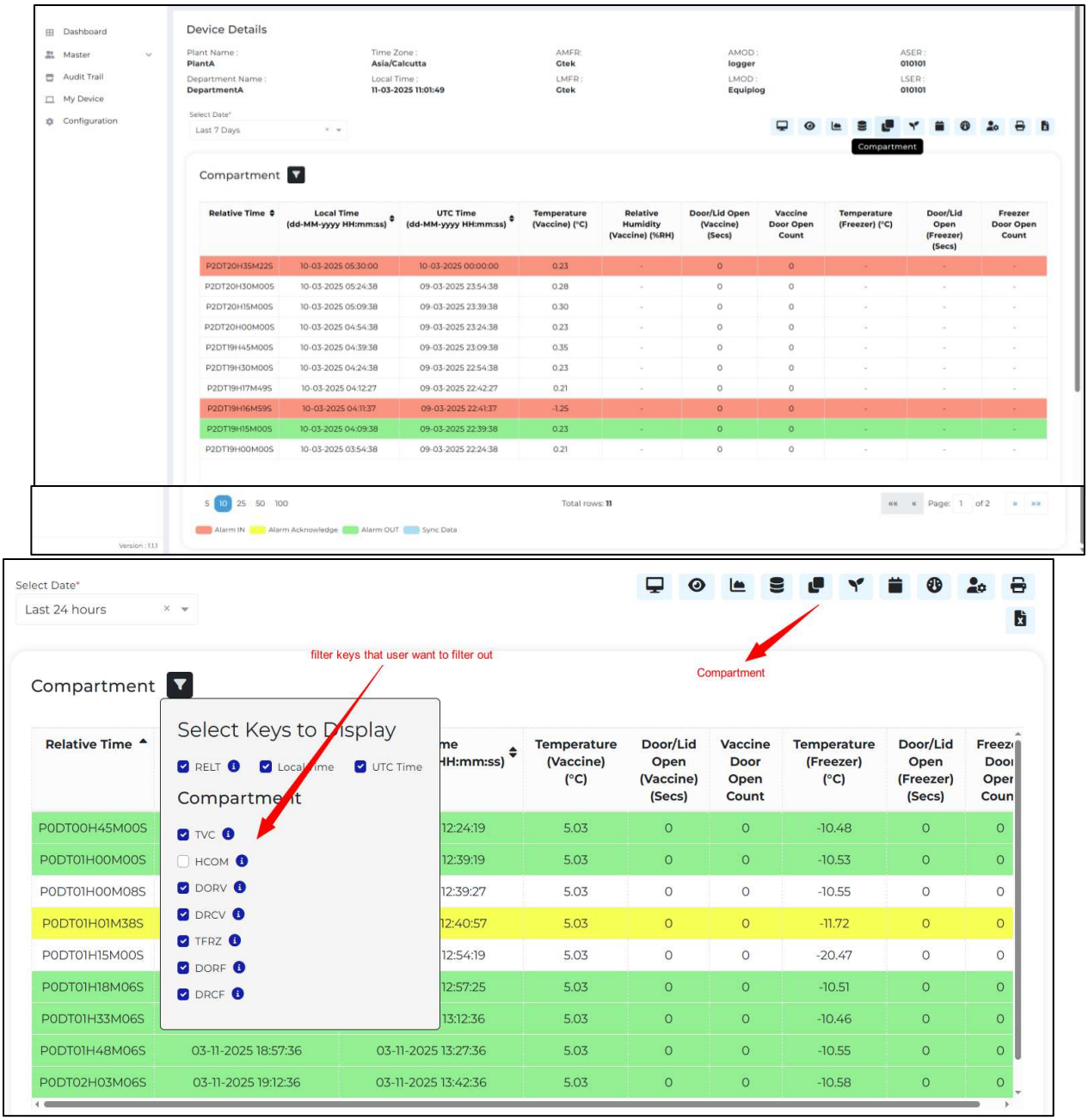


Figure 52 Compartment Data Dashboard for selected device

- Users can filter the required parameters for better readability, as shown in figure 52.
- Here, depending on the data condition, whether alarm triggered/ restored, Alarm acknowledgement and sync data, the data row is highlighted in relevant colour.
    - Red for Alarm IN - Alarm trigger condition
    - Yellow for Alarm Acknowledgement
    - Green for Alarm OUT - Alarm restore condition
    - Blue for Sync Data

7.4.8.6 Environmental Data Dashboard for Device

- The Environmental Data Dashboard displays data for AC/DC power supply, ambient temperature, and humidity for the appliance.
- Data is displayed in a table format with reference to relative time, local time, and UTC time.

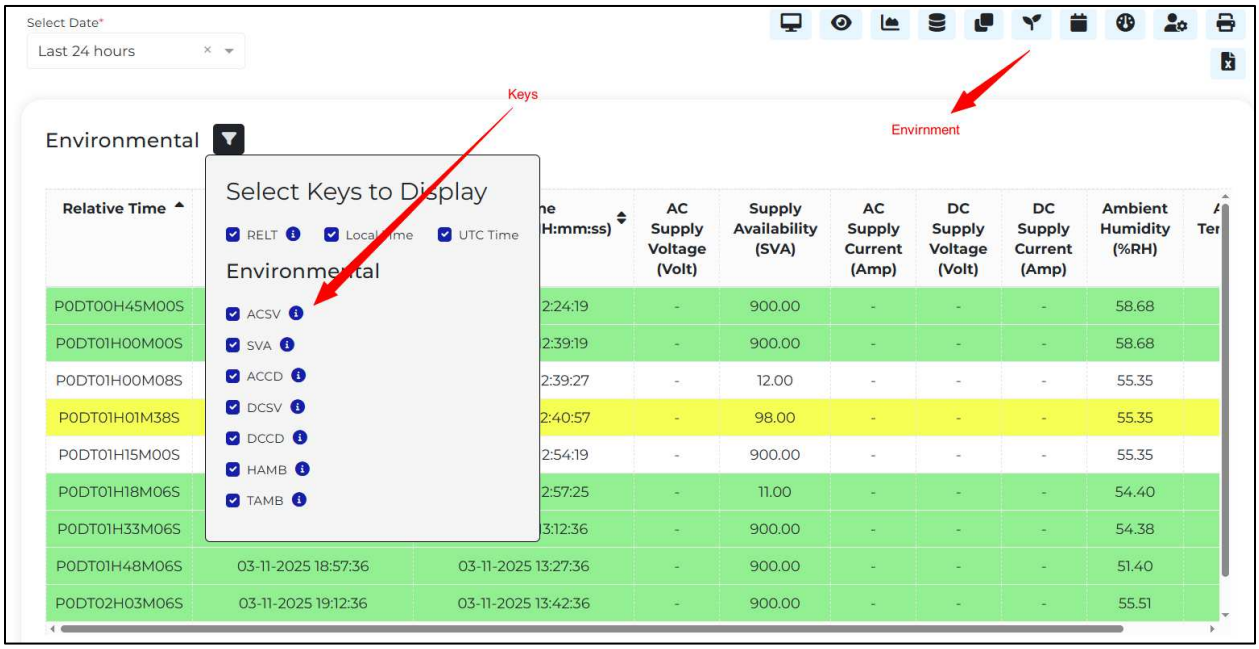


Figure 53 Environmental Data Dashboard for selected device

- Users can filter the required parameters for better readability, as shown in figure 53.

7.4.8.7 Events Data Dashboard for Device

- The Events Dashboard displays a list of events generated by the appliance, along with a brief description of each event.
- Data is presented in a table format with references to relative time, local time, and UTC time as shown in figure 54.

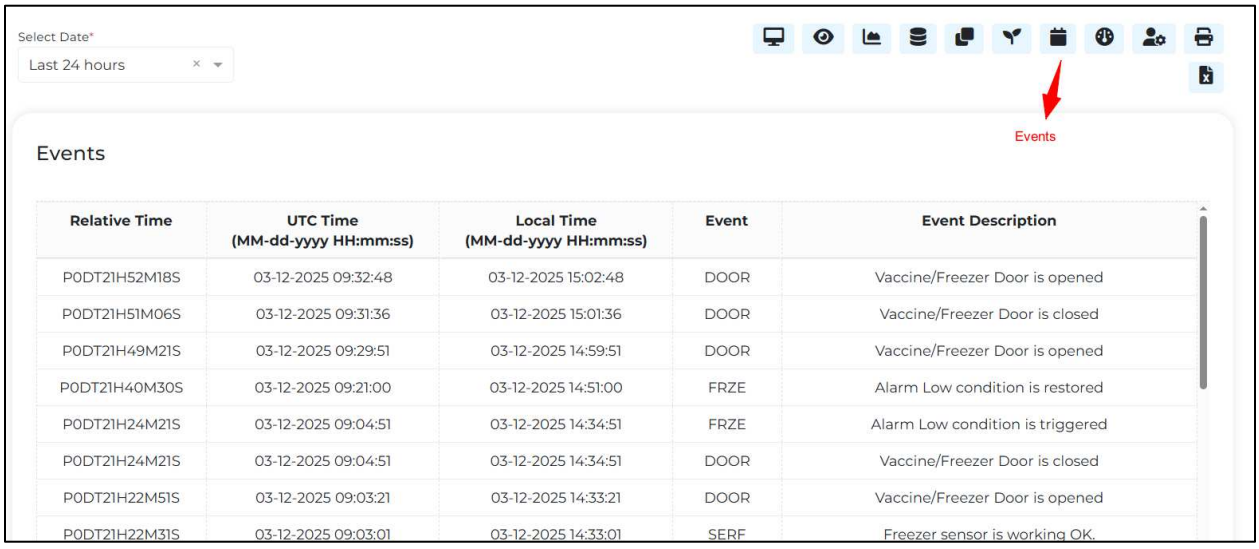
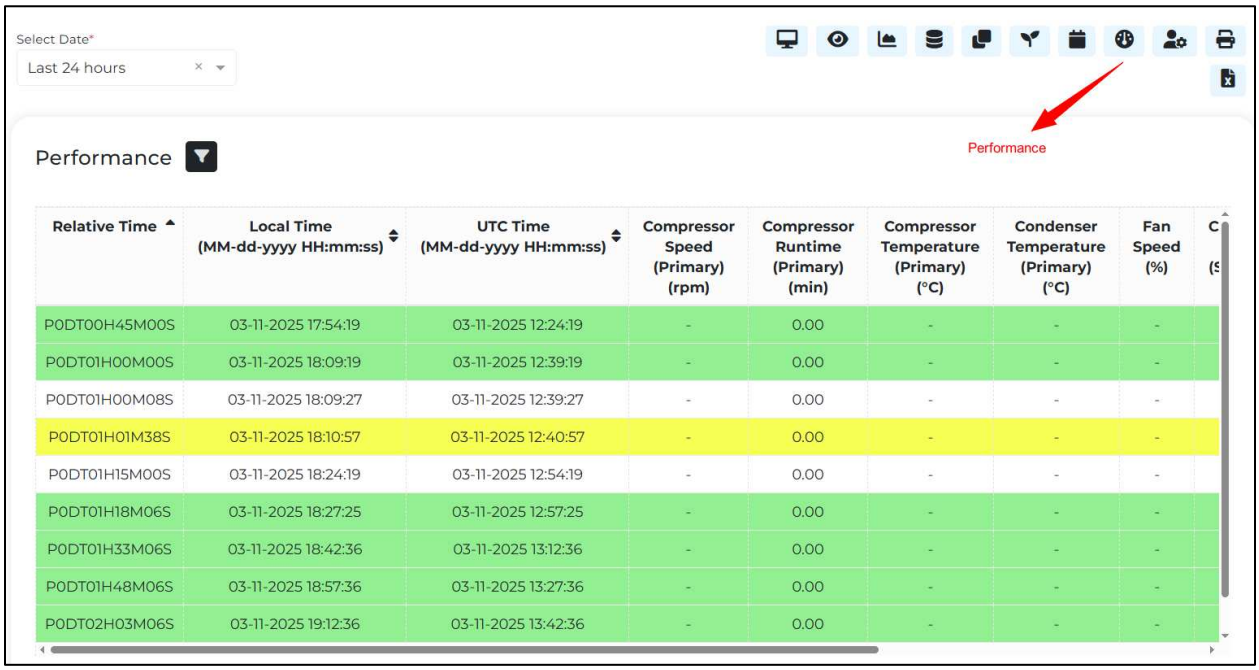


Figure 54 Event Data Dashboard for selected device

7.4.8.8 Performance Data Dashboard for Device

- The Performance Data Dashboard displays compressor unit parameters, including compressor speed, run time, temperature, fan speed, and condenser temperature. It also includes secondary compressor parameters if available for the appliance.
- Data is displayed in a table format with reference to relative time, local time, and UTC time.



Relative Time	Local Time (MM-dd-yyyy HH:mm:ss)	UTC Time (MM-dd-yyyy HH:mm:ss)	Compressor Speed (Primary) (rpm)	Compressor Runtime (Primary) (min)	Compressor Temperature (Primary) (°C)	Condenser Temperature (Primary) (°C)	Fan Speed (%)	C
P0DT00H45M00S	03-11-2025 17:54:19	03-11-2025 12:24:19	-	0.00	-	-	-	
P0DT01H00M00S	03-11-2025 18:09:19	03-11-2025 12:39:19	-	0.00	-	-	-	
P0DT01H00M08S	03-11-2025 18:09:27	03-11-2025 12:39:27	-	0.00	-	-	-	
P0DT01H01M38S	03-11-2025 18:10:57	03-11-2025 12:40:57	-	0.00	-	-	-	
P0DT01H15M00S	03-11-2025 18:24:19	03-11-2025 12:54:19	-	0.00	-	-	-	
P0DT01H18M06S	03-11-2025 18:27:25	03-11-2025 12:57:25	-	0.00	-	-	-	
P0DT01H33M06S	03-11-2025 18:42:36	03-11-2025 13:12:36	-	0.00	-	-	-	
P0DT01H48M06S	03-11-2025 18:57:36	03-11-2025 13:27:36	-	0.00	-	-	-	
P0DT02H03M06S	03-11-2025 19:12:36	03-11-2025 13:42:36	-	0.00	-	-	-	

Figure 55 Performance Data Dashboard for selected device

- Users can filter the required parameters for better readability, as shown in figure 55.

7.4.8.9 Administrator Data Dashboard for Device

- The Administrator Data Dashboard displays Appliance, Logger, EMD and compressor unit admin information for the device as shown in figure 56.

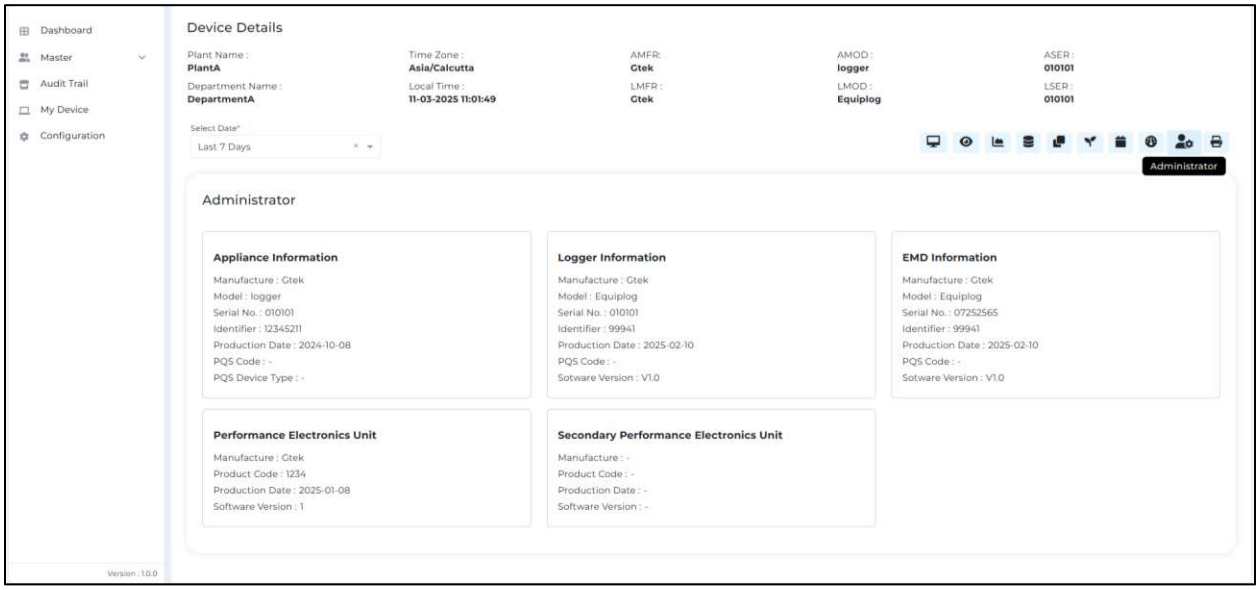


Figure 56 Administrator Data Dashboard for selected device

7.4.8.10 PDF Report Generate for Device Data

- User can generate PDF data report for Compartment, Environment, Events, and Performance data for the selected time period filter as shown in figure 57.

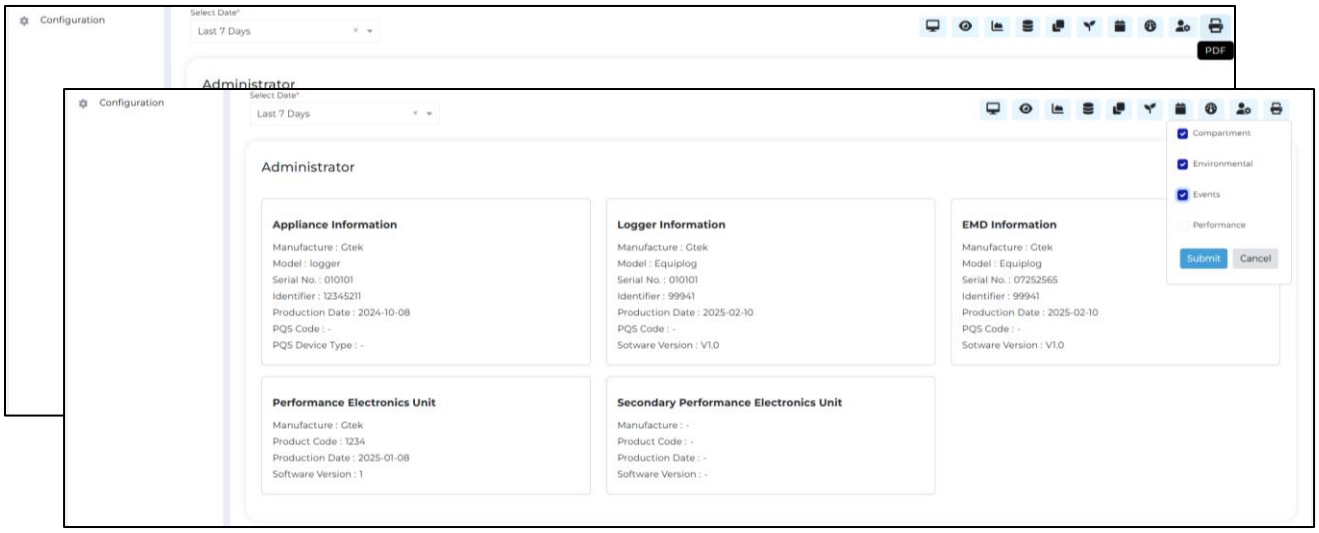


Figure 57 Generate PDF Data Report for selected device

- The PDF report consists of the selected data table along with its graph for selected time period filter as shown in figure 58.

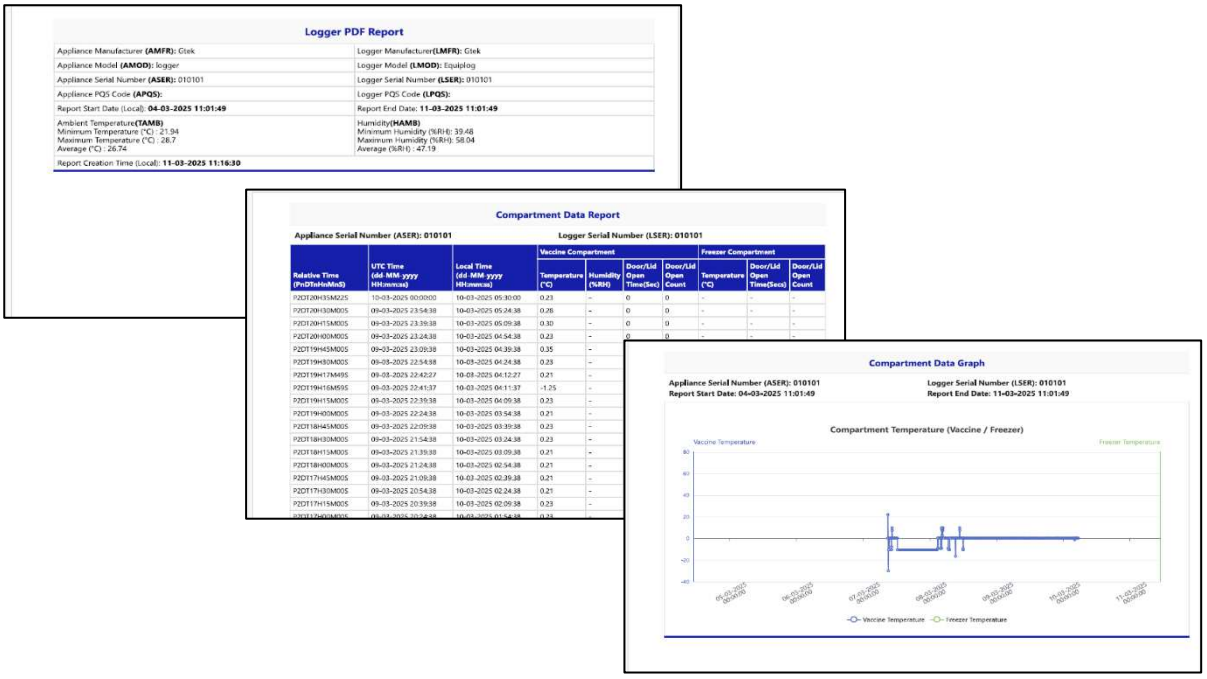


Figure 58 Generate PDF Data Report for selected device

7.4.8.11 Excel Export for Device Data

- The Excel export option becomes visible when the Compartment, Environment, Events, or Performance data dashboard is selected for viewing.

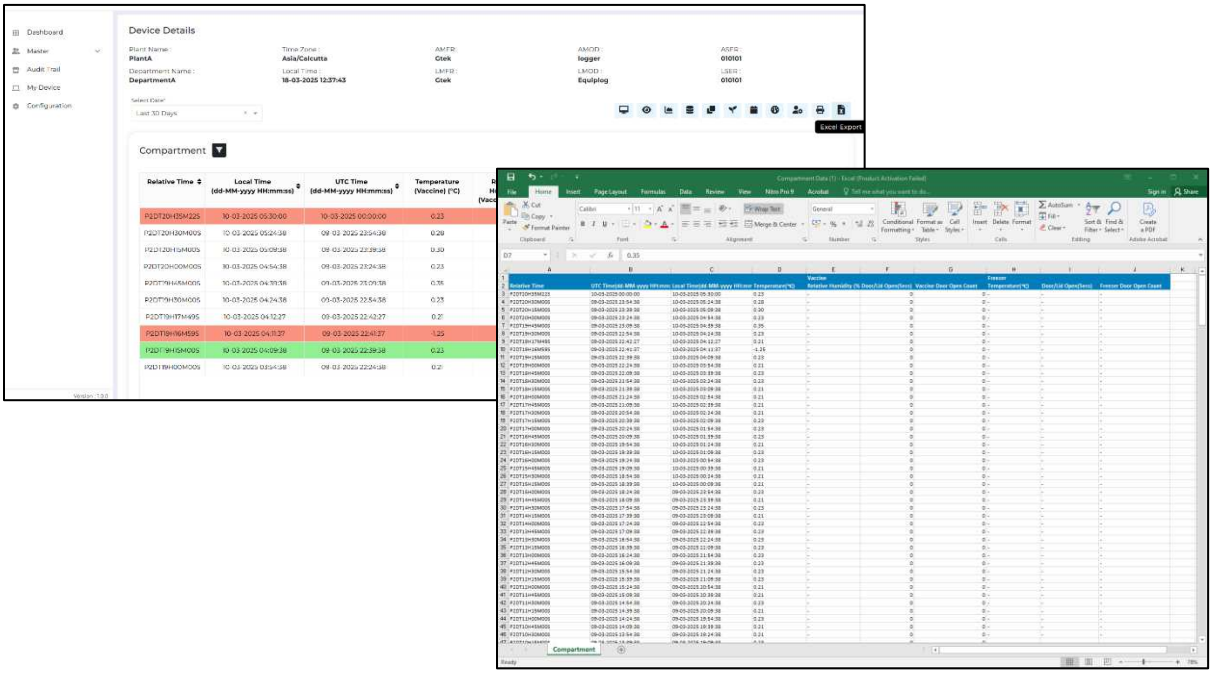


Figure 59 Export Excel Data file for selected device compartment data

- The exported Excel file will contain data from the currently active dashboard, filtered by the selected time period, as shown in figure 59.

7.5 Remote Alarm Notification through Device Dashboard

- The user can enable SMS/Email notifications for alarm trigger conditions by selecting the "**Alarm Notification**" button after registering the device in the cloud application.

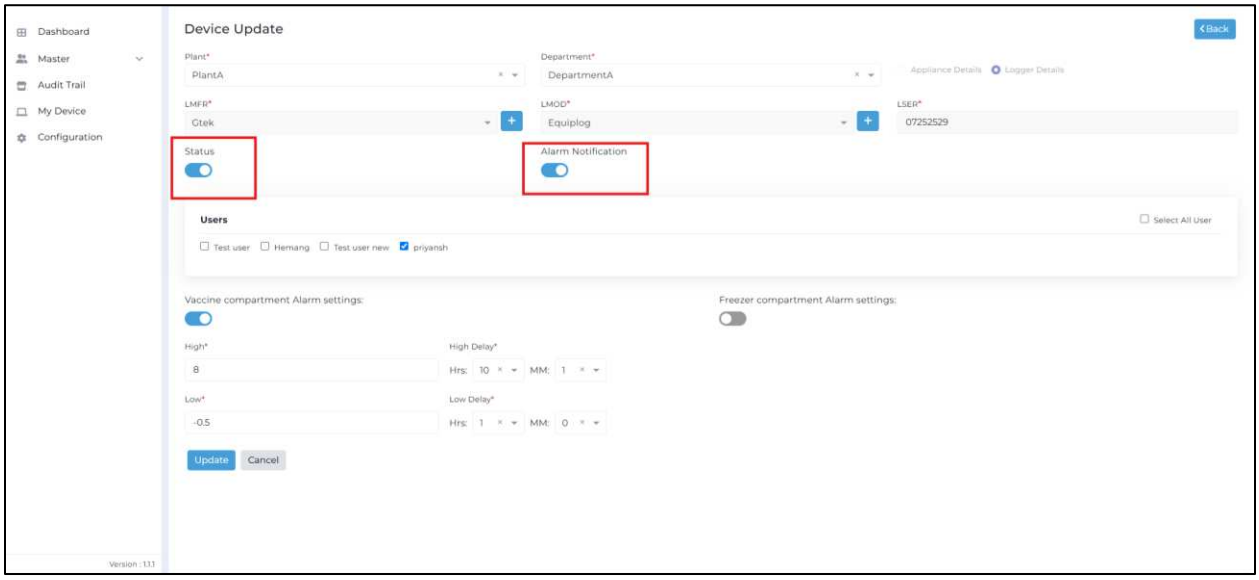


Figure 60 Alarm Notification enable/disable for selected device

- Similarly, for device active/inactive status updates, notifications can be enabled by clicking the "**Status**" button as shown in figure 60.
- Note that the user must enter the correct mobile number and email ID during user registration to receive SMS/Email notifications.

7.6 Remote Alarm Muting through Device Dashboard

In case of an alarm condition, the user can mute the alarm remotely using any of the following methods:

1. By sending the SMS response
2. Through Device dashboard on cloud application

7.6.1 Remote Alarm Muting through SMS Response

- The device alarm can be remotely muted by an authorized user by sending SMS in the specified format to the designated number provided by the service provider.
- Once the SMS is sent, the cloud application processes the request and performs the alarm-muting operation.

- The Alarm Muting SMS must include the following details:

  "12345678 mute"

  - Logger/Appliance Sr No.: The number used for device registration on the Cloud Application.
  - Phone No.: The valid mobile number used during user registration on the cloud application.

- The user will also receive an SMS confirming successful completion of the operation.

  Alarm updated successfully for 12345678 . Update on status change may take upto 15 minutes.
  Regards,
  Service Provider Name

- If the user is not authorized or if any information in the SMS is incorrect, the muting operation will not be executed and user will get following SMS.

  12345678 is invalid or you are not authorized to update alarm status.
  Regards,
  Service Provider Name

Note : If the user is not authorized or if any information in the SMS is incorrect, the muting operation will not be executed.

7.6.2 Remote Alarm Muting through Device Dashboard

- In case of an alarm condition, the user can mute the alarm remotely by logging into the cloud application.
- On the Home page dashboard, a list of devices with active alarm conditions will be visible.
- To mute the alarm for a specific device, click on the Bell icon provide adjacent to the device row as shown in the figure 61.
- A message box will pop up, asking for a reason for alarm muting. Enter a valid message, as the message box cannot be left blank.
- Click the "Mute" button after entering the message.
- The command will be sent to the device when the next data from the device received from the device to the cloud server.

- On receiving the command from the cloud server, the device will disable the alarm monitoring.

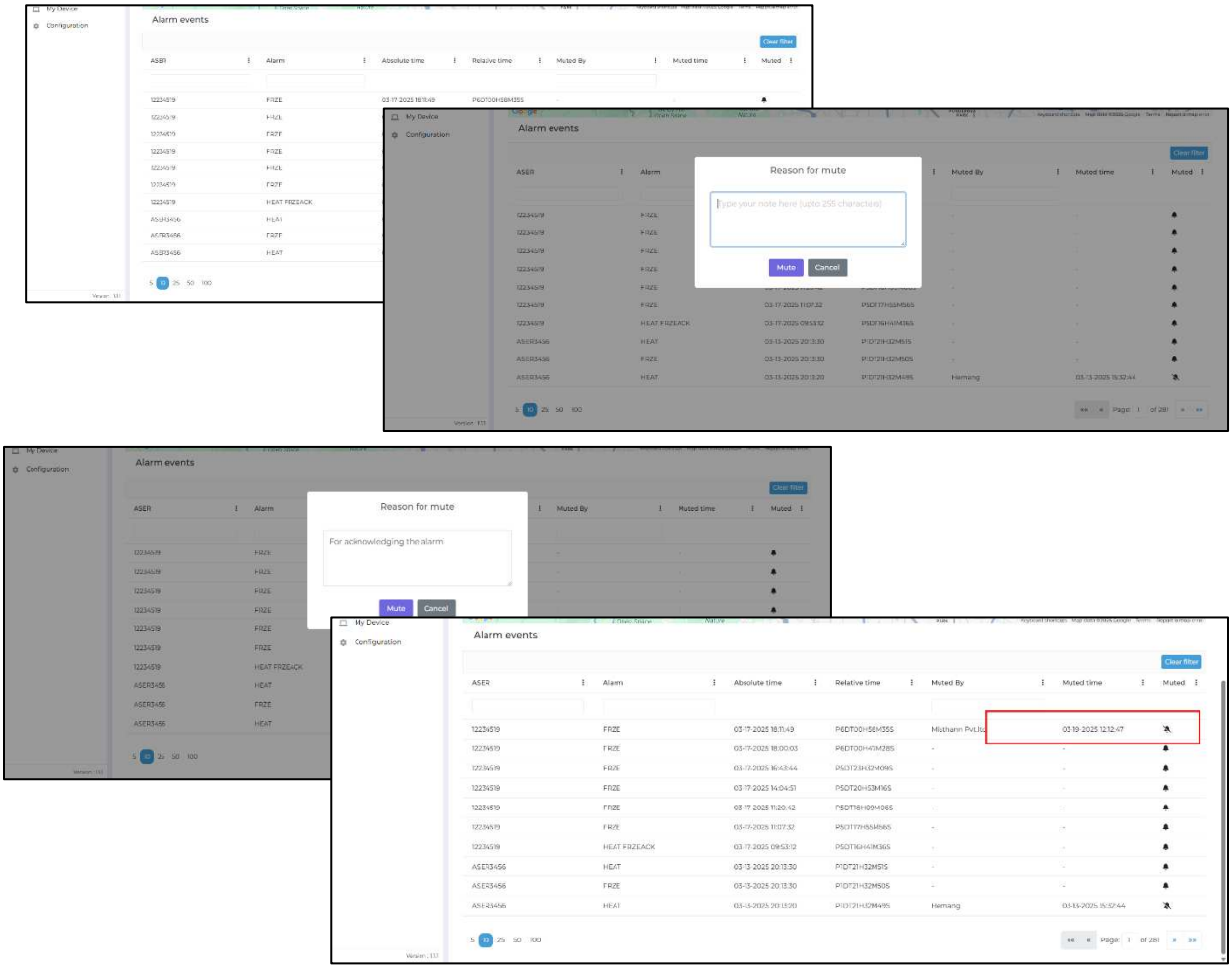


Figure 61 Alarm Muting Remotely for selected device

7.7 Remote Alarm Monitor Disable/Enable through Device Dashboard

Sometimes it is required to disable the alarm monitoring for indefinite time in the event of appliance inactive or not storing vaccines.
This can be done using any of the following methods:

1. By sending the SMS response
2. Through Device dashboard on cloud application

7.7.1 Remote Alarm Monitor Disable/Enable through SMS Response

- The device alarm monitoring can be disabled/enabled by an authorized user by sending SMS in the specified format to the designated number provided by the service provider.
- Once the SMS is sent, the cloud application processes the request and performs the alarm-muting operation.
- The Alarm Monitoring Disable SMS must include the following details:

  "12345678 disable"

  - Logger/Appliance Sr No.: The number used for device registration on the Cloud Application.
  - Phone No.: The valid mobile number used during user registration on the cloud application.
- The user will also receive an SMS confirming successful completion of the operation.

  Alarm updated successfully for 12345678 . Update on status change may take upto 15 minutes.
  Regards,
  Service Provider Name
- If the user is not authorized or if any information in the SMS is incorrect, the operation will not be executed and user will get following SMS.

  12345678 is invalid or you are not authorized to update alarm status.
  Regards,
  Service Provider Name
- Similarly Alarm Monitoring can be enabled for the device.

Note : If the user is not authorized or if any information in the SMS is incorrect, the operation will not be executed.

7.7.2 Remote Alarm Monitor Disable/Enable through Device Dashboard

- Sometimes it is required to disable the alarm monitoring for indefinite time in the event of appliance inactive or not storing vaccines.
- In such cases, the alarm monitoring can be disabled remotely through device edit option from the device list dashboard.

- In the device edit option, user can disable alarm monitoring by clicking on the slider button for Vaccine and/or Freezer Compartment Alarm settings and clicking on the "**Update**" button to send the command to the device as shown in figure 62.
- The command will be sent to the device when the next data from the device received from the device to the cloud server.
- On receiving the command from the cloud server, the device will disable the alarm monitoring.
- The same process can be done for sending Alarm monitoring enable command to the device.

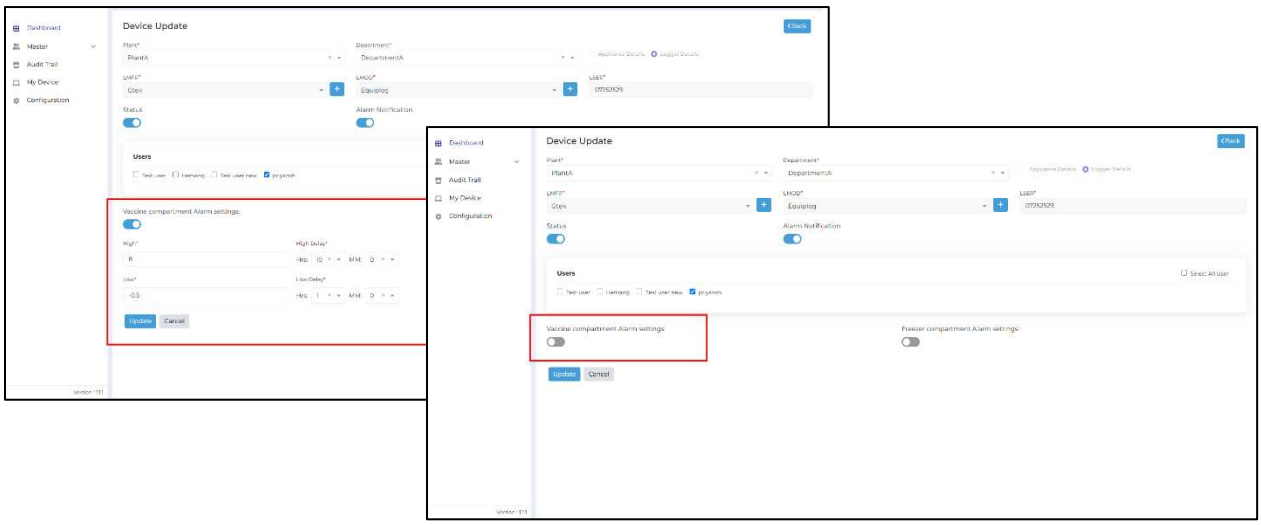


Figure 62 Alarm Monitor Disable/Enable for selected device

7.8 Remote Alarm Threshold Adjusting through Device Dashboard

- If the user needs to adjust the High/Low Alarm threshold setting for Vaccine and or Freezer compartment, it can be done remotely through device edit option in the device list dashboard.

- In the device edit option, user can adjust/update the alarm setting parameters for High and Low Alarm set point and its alarm delay for vaccine and or Freezer compartment as shown in figure 63.

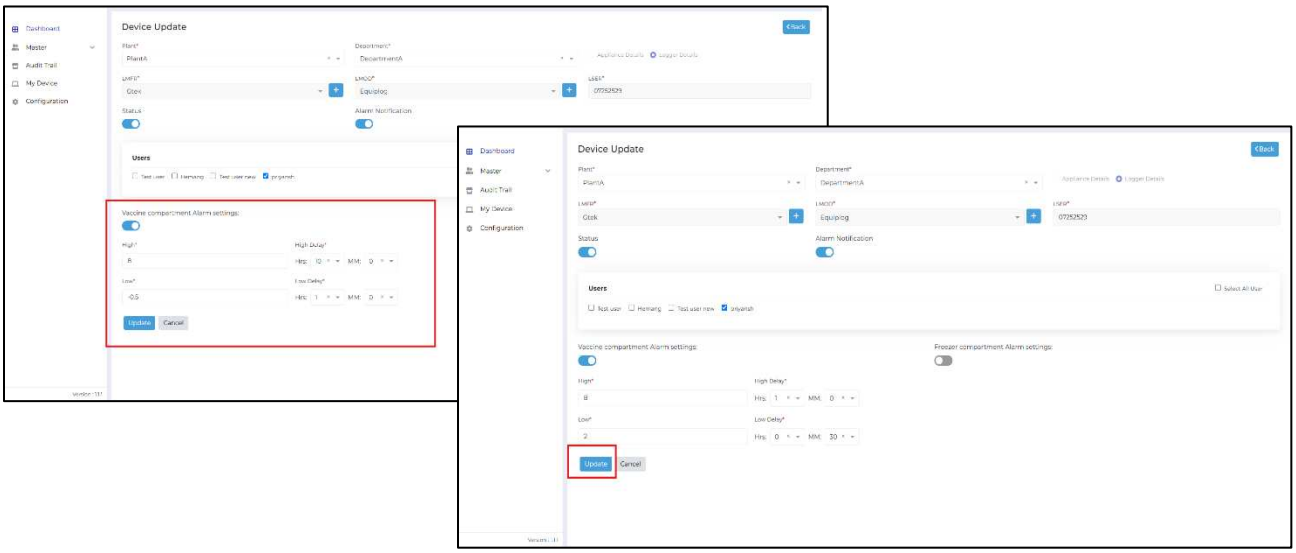


Figure 63 Alarm Threshold Adjusting for selected device

- The command will be sent to the device when the next data from the device received from the device to the cloud server.
- On receiving the command from the cloud server, the device will update the Alarm thresholds accordingly.

8 MAINTAINING THE PRODUCT

8.1 Accessories*

- Temperature Sensor(s)
- Calibration certificates for Temperature Sensor and Device
- USB Type-C to C cable
- 15 V DC, 2A Power Supply Adaptor
- SMPS with Power output of 15 V DC, 3 A, 45 W
- Cable Assembly for Analog/Digital Interface
- Cable Assembly for Power port
- Compressor Monitor Mains Add on module

8.2 List of Spare Parts with Part Number

Table 9 List of Spare parts

Sr. No.	Part Details	Part Number	Quantity
1	LiFePO4 Rechargeable Battery 3.2 V, 2000 mAH	201318	1
2	SMPS with Power output of 15 V DC, 3 A, 45 W	201397	1
3	Barrel-type DC power jack connector Cable with a 2.1 mm ID / 5.5 mm OD jack on one end; length 600 mm	201410	1
4	15 V DC, 2A Power Supply Adaptor	200661	*
5	USB Type-C to C cable	201377	1
6	Temperature Sensor	2012070	1
7	Cable Assembly for Analog/Digital Interface	420318	1
8	Compressor Monitor Mains	99930	*
9	LINbus Connector (CONN TERM BLOCK PLUG 3POS 3.81MM)	134011	1
10	Modbus Connector (CONN TERM BLOCK PLUG 2POS 3.81MM)	134022	1
11	5 V Output Terminal connector (CONN TERM BLOCK PLUG 2POS 5.08MM)	200451	1
12	Cable Assembly for Power port (Cable Assembly 2.1mm Plug cable flat 6.6")	201382	*
13	CR1220 coin cell battery	201371	*

***: Accessories will be provided as per the request and selected order code for the data logger.**

8.3 Cleaning the Data Logger

Ensure that no liquid enters inside the housing.

- If the housing of Data logger gets dirty, clean it with damp cloth.

- Do not use any aggressive cleaning agents or solvents.
- When USB port is not in use, cover the USB port properly.

8.4 Battery Life, use and precautions

The Equiplog data logger contains a LiFePO4 Rechargeable Battery. When the battery is low, it is indicated by low battery symbol on the display. The user should recharge the battery, when the battery low indicated on the device.

Dispose or recycle the battery in accordance with your local regulations. Do not expose the Data Logger to extreme temperatures as it may lead to the destruction of the battery and may cause injuries.

To prevent the possibility of the battery from leaking, heating, explosion, please observe the following precautions:

- Do not use or leave the battery in very high temperature conditions (e.g., strong direct sunlight or a vehicle in extremely hot conditions). Otherwise, it can overheat or catch fire or its performance will degenerate and its service life will be decreased.
- Do not short circuit, over-charge or over-discharge the cell.
- Do not disassemble or modify the cell.
- Do not short circuit, over-charge or over-discharge the cell.
- Do not transport or store the battery together with metal objects.
- Make sure the cell is not with conspicuous damage or deformation.
- Mixed use of batteries of different types is not allowed.
- Do not directly solder the battery and pierce the battery with a nail or other sharp object.
- Do not strike, throw or trample the battery.
- Use of damaged battery is not permitted.
- Battery should be removed from the device immediately and not used again if they are overheating, give off odor, discolor or deform, or appear abnormally in any way during use, charging and storage.
- Dissembling Battery should be under the guidance of professional technicians.
- Battery must be charged at operating temperature range 0 to 50 °C (preferred to be charged at room temperature).
- Please check the positive and negative polarity before placing the cell.
- When the Battery is not charged after long exposure to the charging, discontinue charging.
- When the Battery life span is over after the long usage, please replace/recharge with new one.

9 PRECAUTIONS AND MAINTENANCE

9.1 General Safety Precautions

✅ **Before performing diagnostics or repairs:**

- Keep the data logger away from high temperatures and open flames to prevent battery hazards.
- Ensure the data logger is securely attached to the appliance at all times.
- Power off and unplug the data logger before maintenance.
- Use insulated tools and handle the back panel carefully to protect the battery and sensor wiring.
- Ground yourself to discharge static before handling internal components.
- Handle the LiFePO4 battery with care - avoid puncturing, short-circuiting, or exposing it to extreme heat.
- Keep sensor cables away from sharp objects.
- The USB Type-C port is for M2M data connection only, not for powering other devices.

❌ **Do Not:**

- Perform repairs in high moisture or electrically unstable environments.
- Bypass fuse or circuit protection during troubleshooting.
- Use unauthorized replacement parts, as this may impact device performance and safety.

9.2 Care and Maintenance

- Clean the surface of the Data logger with dry cloth and avoid contact with water.
- If you need to replace any spare parts, contact the manufacturer's representative for the right spare part.
- For warranty related information and any technical support, please contact manufacturer's representative.

9.3 Proper Handling to Prevent Logger, M2M or Appliance Damage & Ensure Safety

1. General Handling Precautions

✅ **Do :**

- Handle the logger and M2M device with dry, clean hands to prevent electrostatic discharge (ESD).

- Ensure power is turned OFF before connecting or disconnecting the device.
- Use only approved accessories and cables to avoid malfunction.
- Install the device in a stable, vibration-free location to prevent mechanical damage.

❌ **Do Not:**

- Drop, strike, or apply excessive force to the device.
- Expose the unit to direct sunlight, rain, or high humidity outside its rated conditions.
- Modify, disassemble, or attempt unauthorized repairs, as this voids the warranty.

2. Electrical Safety

✅ **Do:**

- Always use the recommended power supply voltage to avoid electrical damage.
- Ensure proper grounding and isolation when connecting to industrial equipment.
- Disconnect the device from power before performing maintenance.

❌ **Do Not:**

- Use damaged power cables.
- Connect the device to a higher voltage than specified, as this can cause permanent damage.
- Operate the device in wet conditions unless it is explicitly rated for such environments.

3. Installation and Environmental Considerations

✅ **Do:**

- Mount the logger in a well-ventilated area away from heat sources.
- Ensure proper cable routing to avoid tripping hazards and accidental disconnections.
- Secure connectors properly to prevent loose connections and signal loss.

❌ **Do Not:**

- Install the device in areas with high electromagnetic interference (EMI) unless properly shielded.
- Place the unit near strong magnetic fields that may affect operation.
- Block ventilation openings, as this can lead to overheating.

4. Transport and Storage

✅ **Do:**

- Store the device in a dry, cool environment within the specified temperature and humidity range.
- Use anti-static packaging during transportation to prevent ESD damage.

- Ensure the device is securely packed to avoid mechanical shocks.

❌ **Do Not:**

- Store the device in extreme temperatures or high humidity.
- Transport the unit without proper cushioning, as vibration may damage internal components.

5. Handling During Maintenance

✅ **Do:**

- Follow the manufacturer's servicing guidelines.
- Use insulated tools to prevent electrical hazards.
- Ensure the battery is disconnected before attempting internal inspections.

❌ **Do Not:**

- Perform maintenance in a high static environment without grounding.
- Use cleaning solvents or liquids unless specified in the manual.
- Replace components with non-approved parts, as this may compromise safety and performance.

6. Emergency Procedures

In case of **fire, smoke, or unusual operation**:

- Immediately power off the device and disconnect all external connections.
- Move to a safe location if overheating or sparks are observed.
- Contact technical support before reusing the device.

9.4 Preventive Maintenance Tasks

- Daily - Every morning and afternoon:
  - Check the temperature of the compartment(s) are within the alarm range.
  - Fill in the daily record sheet
- Weekly - On the first day of every week:
  - Wipe away any moisture builds up around cabinet door/lid with a soft cloth – do not use abrasive or scrubbing materials.
  - Ensure the door seals are clean and free from obstacle or damage.
  - Clean the solar array (In case of DC supply input from solar array)
- Monthly - On the first day of every month:
  - Keep the condenser clean and ensure proper airflow over the condenser and compressor.
  - Do not remove the top cover. If excessive dust is present, unplug the unit and use a plastic tube to clear dust through the ventilation slots.

        - Check the solar array is not in the shade between 7am and 5pm (In case of DC supply input from solar array)
        - Check that the electrical cable drapes free and not damaged.
    - Half yearly - Every 6 months:
        - Inspect all mechanical fixings and electrical connections, including the array, for any necessary repairs or maintenance.

10 DIAGNOSTIC AND REPAIR PROCEDURE

10.1 Common Issues and Troubleshooting Steps

Table 10 Common Issues and Troubleshooting steps

Common Issues	Possible Causes & solutions
Device Does Not Power On	1. NO DC Input power • Check the Power input cable is properly connected • Verify that the power switch is ON • Test the power cable & connector with another working device. • Inspect SMPS input and output voltages. 2. Battery Related issue • Ensure the battery is properly connected in the device. • Check the battery voltage - it should be above 3 V under normal condition • If the battery is older than 5 years, replace it as per maintenance schedule.
Display Not Working	1. Loose OLED display connections • Check the Display module is properly fitted in the Device. 2. Low battery voltage in backup mode • If operating on battery, check if the battery charge is too low. • Replace the battery if it does not hold charge.
Temperature reading on the display Shows "- -.- °C ".	1. Sensor cable damage • Inspect the sensor cable for any cuts, twists or brakeage. • Check whether the sensor is properly placed in the Appliance compartment as per installation process. • Ensure the sensor cable is properly connected in the logger 2. Sensor open • Inspect the sensor is properly connected 3. Sensor reading beyond operating range • Place the sensor properly Appliance compartment as per installation process
Device not transmitting the data to cloud server	1. Low/ No Signal strength of GSM • Check the signal strength of the GSM SIM card • Ensure the Appliance installation place has network availability • Check the SIM card is recharge/validity is not over • Open the Back cover of the device and verify that power status LED of the GSM Module is ON. 2. The device working on battery only

	• When the device is running on battery power during a power outage, the display may show a "**No SIM card"** indication. • In this condition, data is transmitted at least once every 24 hours and whenever an event occurs. • At other times, the GSM module remains in sleep mode to conserve battery. for other time GSM remains in sleep mode.
Date and Time difference between Level 2 and Level 3 Devices display	1. Difference in the date time showing • Level 2 Device has local date and time, set by RTC setting menu, so showing the local date and time on the home screen. • Level 3 Device has absolute time synced with Internet time, so it will show Local date and time (as per synced GSM network) on the home screen.
Device are not transmitting the data to cloud server even when connected back on Power supply.	1. GSM Network connectivity issue • Ensure the device has a stable network cellular connection. 2. Server Connection Failure: • Verify if the cloud server is operational and accessible. • Check server logs for any connection errors.

10.2 Frequently Asked Questions

Table 11 Frequent Asked Questions (FAQs)

Questions	Possible Cause/ Solution
Device display is off	▪ Display is normally off if no activity on keyboard for more than 20 seconds. ▪ Ensure that the supply/battery are connected properly.
How Sensor open/broken error is detected on the device without display?	▪ Please refer section 5.1 for status LEDs indication for the sensor open/broken error.
Device is not connected in host PC or mobile device.	▪ USB Symbol must be shown on Display, during insert of USB cable to host device. ▪ USB Type C cable might be faulty. Replace the cable. ▪ Try to reconnect USB Type C data cable.
Should we scan the device drive when connecting it to a PC?	▪ It is recommended not to scan the device's USB drive when connecting to a PC. Instead, choose to continue without scanning.
High LED on the device is blinking. Why?	▪ Vaccine/Freezer Temperature Alarm high has been triggered, and it is indicated by High LED blinking.
What are the conditions for buzzer activation?	▪ Please refer the Buzzer operation conditions in section 6.5 .

How to acknowledge the Alarm condition and mute the Buzzer?	▪ Buzzer can be acknowledged by pressing  key for 1 second. ▪ Buzzer will remain muted until a new alarm condition occurs.
Can I Enable/Disable the audio-visual Alarm indication for the device?	▪ Yes, user can Enable/Disable the audio-visual alarm indication using the Alarm Monitor menu as described in section 6.3.4 System Live Menu.
Why RTC setting option is not visible in the System Live menu of the device?	▪ Your device must be having GSM add on module, in which date and time are synced through GSM as per UTC time.
I tried to read data from Modbus register 40004, but the data was not properly received. Why?	To read address 40004, you need to change the register address in the configuration file to 03 and select the function code "Read input register." ▪ For example, in the Modbus protocol, you need to query register 03 because 40004 - 40001 = 03.
Is the value for the vaccine compartment door and the freezer compartment door fixed for runtime calculation?	▪ YES. If both doors are read from Modbus/LIN, consider the door open if the value received is 1 and the door closed if the value received is 0.
Are the run status values for Compressor 1 and Compressor 2 fixed for runtime calculation?	▪ YES. If both compressors are read from Modbus/LIN, consider the compressor running if the received value is 1 and off if the received value is 0.
Does communication still run if the power supply of the logger is OFF?	▪ NO. If the power supply is disconnected and device is on battery, then both Modbus and LINbus communication will not run.
If communication breaks or power supply is OFF, what is the effect on data in JSON?	▪ In the JSON, all relevant data parameters are written as "NULL".
Is there any indication if communication breaks?	▪ The ERR LED on the device will start blinking for communication break. ▪ If the device has a display, from the menu options the Communication Error will be reflected. ▪ Verify all physical connections and ensure that the slave device is powered on and operational.
If communication breaks and the door remains open for 5 minutes during the current 15-minute interval, how is this timing represented in the JSON?	▪ In the JSON, the current 15-minute record will indicate 5 minutes of Door open time, while the subsequent 15-minute record will display "null."
If communication breaks and the compressor runs for 5 minutes in the current 15-minute interval, what timing is reflected in the JSON as running?	▪ In the JSON, the current 15-minute record will show 5 minutes of Compressor run time, and the next 15-minute record will show "null".

Can we read the data from all connected sensors through I/O interface, if we select all sensors inputs from Modbus/LINbus?	▪ No. If you want to read the data of sensors from I/O interface connections, you will need to change the communication type in the Configuration Application.
Can we read some key data from Modbus and some from LINbus at the same time?	▪ Yes. You can select any query from LINbus/Modbus using the configuration app. However, the same query should not be selected from both communications; the last selected query is considered. In this case, the user needs to select both Modbus and LIN Secop options in the communication type from the configuration app.
Can the user change the communication configuration after the device recording has started?	▪ No, the user cannot change the configuration parameters after the batch has started.

11 Order Code, Warranty and Contact Information

11.1 Order code Details

The user can choose the Equiplog Data logger from available options as shown in the table 12.

Table 12 Order Code

Order Code	Description
99943	Data Logger With M2M Interface
99942	Data Logger With M2M Interface, Display and Alarm
99949	Data Logger With M2M Interface, Display and Remote Communication
99941	I-EMD with Data Logger, M2M Interface, Display and Remote Communication

11.2 Warranty and Contact Information

Manufacturer: G-Tek Corporation Private Limited
Company Website: www. gtek-india.com
Company Address: G-Tek Corporation Private Limited
"Gunaji House", Plot No. 25/1, Besides Status Bungalow,
Padra Road, Vadodara – 391410, Gujarat, India.
Company Email Id: info@ gtek -india.com , support@ gtek -india.com
Warranty : Refer to warranty certificate for more details.

12 REVISION HISTORY

Table 13 Revision History

Revision History:			
Date:	Revision No.	Change Summary	Reason for Change
07-08-2025	Rev 0.0	-	Initial Version
18-03-2026	Rev 1.0	1. Section 7.6 and 7.7 updated for adding remote alarm mute/disable through SMS response	1. Added feature details as per WHO PQS inputs for EMS standard