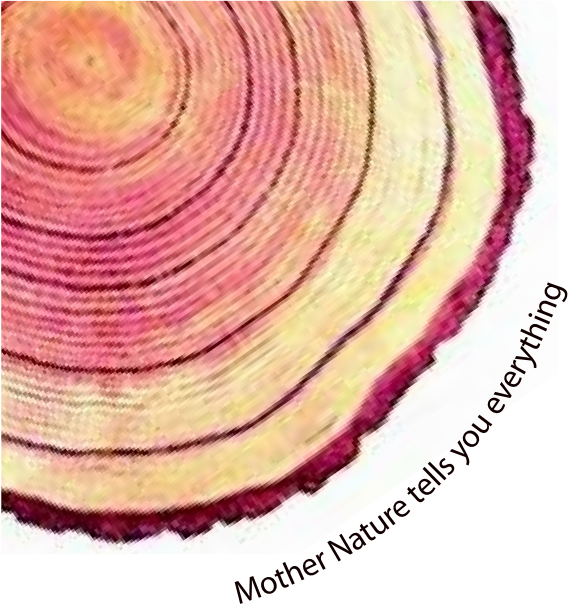

INSTALLATION MANUAL

Equiplog

Equiplog Data Logger
DL / I-EMD
with M2M Interface for
Equipment Monitoring Systems
Model No.: 9994x

English/ 2024/ Rev.0.0

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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 G-Tek 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

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 10 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

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 or absolute# 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 Settings*	For Vaccine: > 5 minutes of continuous door opening 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 > 65 db. 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 (DC adapter) or SMPS with Power output of 15 V DC, 3 A, 35 W
DC power Output	5 V, (0.8 to 1.2 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	LiFePO4 Rechargeable Battery 3.6 V, 1500 mAH
Battery Life	Operating life of 10 Years
Battery Backup	More than 30 days* with recommended operating condition for Data Logger without Display. More than 20 days* with recommended operating condition with display operated 4 min/day for Data Logger with Display.
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 or absolute# date & time, Alarm status (✓/ ✕) symbol, Temperature 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 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	1 year from the date of dispatch. 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.**

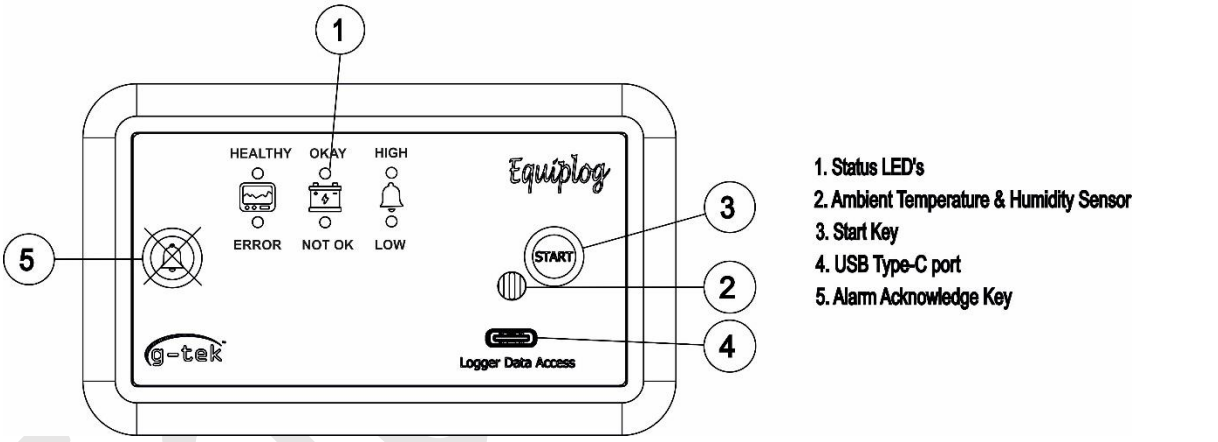


Figure 1 Front panel of Equiplog Data Logger

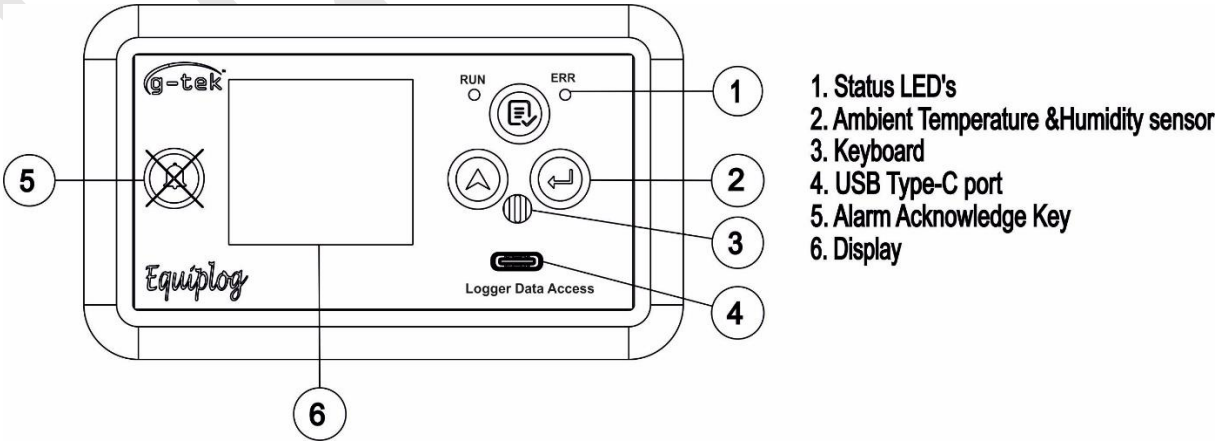


Figure 2 Front panel of Equiplog Data Logger with Display

User can select from the versions available for the Equiplog Data Logger as follows:

- 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

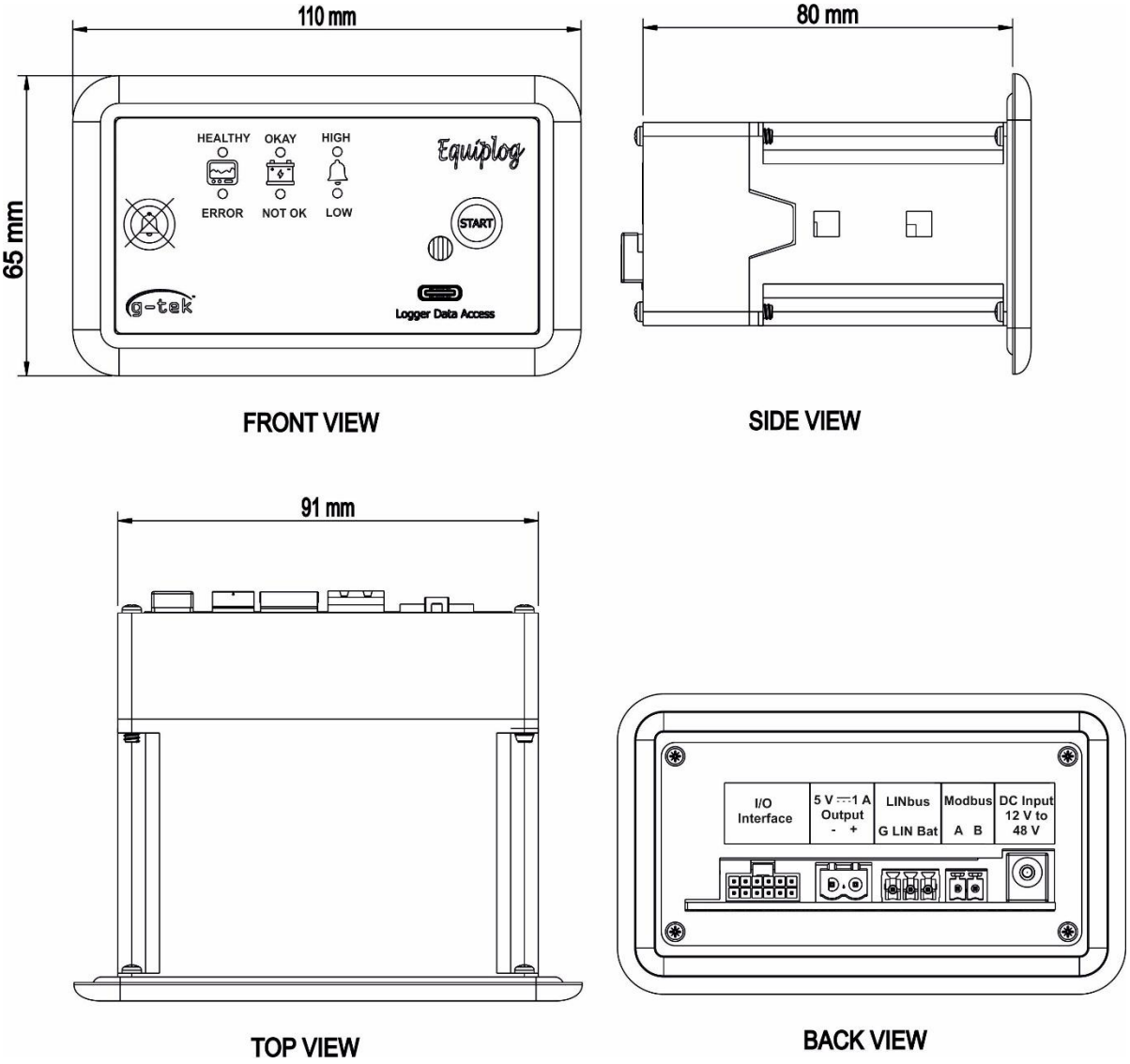


Figure 3 Overall dimensions of Equiplog Data Logger

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 fitted with the Appliance using two clamps fixing on the both sides of the data logger with the panel as shown in the figure 4.

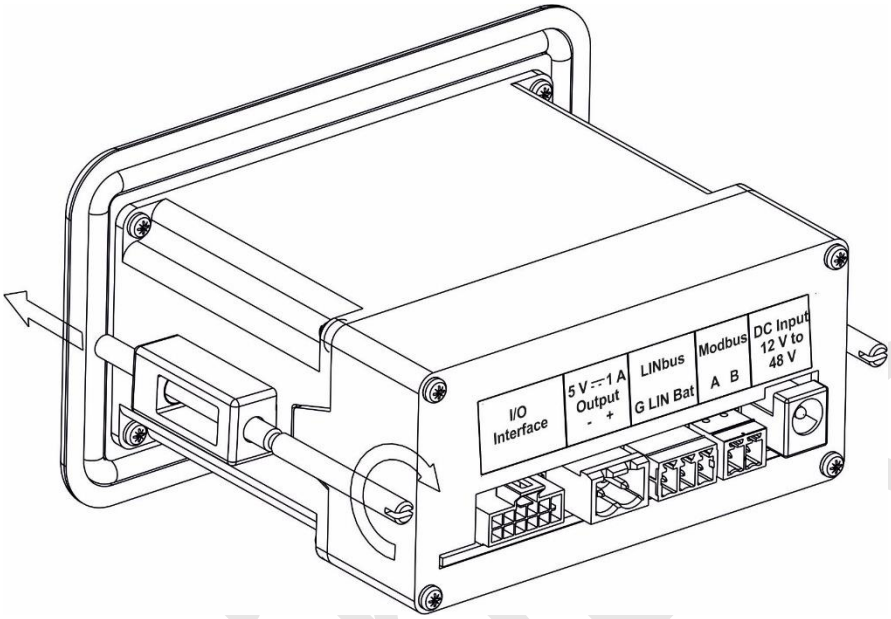
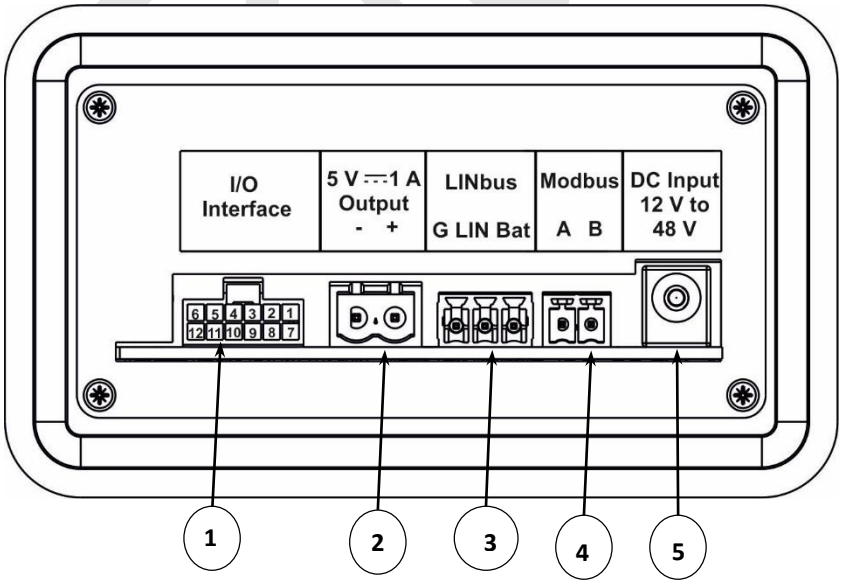


Figure 4 Panel mounting using Clamps for Integrating the Data logger with Equipment

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. **Mains Supply connector**

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

Table 2 Modbus Interface Connector

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

Table 3 LINbus Interface Connector

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

Table 4 I/O Interface Sensor connections conventions

Pin No. (Colour) Description	**Pin No. (Colour) Description**
1 (Pink) Vaccine Temperature Sensor Input1	7 (Pink) Vaccine Temperature Sensor Input2
2 (Violet) Freezer Temperature Sensor Input1	8 (Violet) 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

Please refer the table 4 for the Sensors connection notations required for Voltage/Current, temperature, door, compressor sensor inputs.

3.4.1 Temperature Sensor connections

- Vaccine and freezer temperature sensors will be inserted at the terminals provided in the table 4.
- Place the both 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.

3.4.2 Voltage and Current Sensor connection

- If Appliance supply voltage and current needs to measured and monitored, additional module is required.
- For AC/DC supply measurements, refer the specifications provided in section 2.2 Technical Data.

3.4.3 Door Sensor connection

- Connect the Door Sensor of Vaccine and Freezer compartment for the Equipment with Equiplog data logger as shown in table 4.
- The details of the door sensor is provided in the in section 2.2 Technical Data.

3.4.4 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 4.
- Compressor Run time will be measured based on the digital output data from the Comp1 and /or Comp2 sensors.

Note: If the sensor inputs are connected to the controller, 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. If the sensor inputs are connected to the controller, which sends the parameter values to the data logger via Modbus or LINbus communication, you don't need to connect the sensor terminals to the I/O interface connector.

3.4.5 Insert the Sim card

- If selected Data logger is having GSM feature, then insert the sim card during the installation.
- Turn off the supply and remove the battery if already connected to insert the sim card.
- Open the enclosure, gently push the sim card into the sim card slot provided as shown in the figure 6. Ensure that the sim card is inserted correctly.

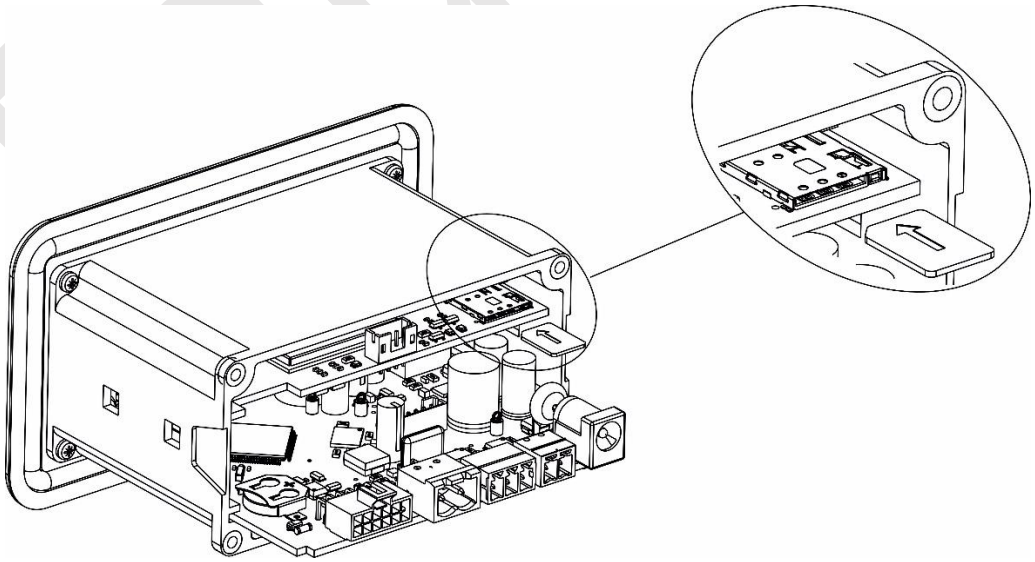


Figure 6 Insert Sim card

Note: To remove the sim card, switch off the supply. Gently press the sim card until it clicks back slightly and pull out the sim card.

3.4.6 Insert the Battery

- Switch off the power supply of the data logger and open the Back cover of the data logger to insert the battery as shown in figure 7.
- Make sure the correct polarity of the battery while inserting in the battery holder.

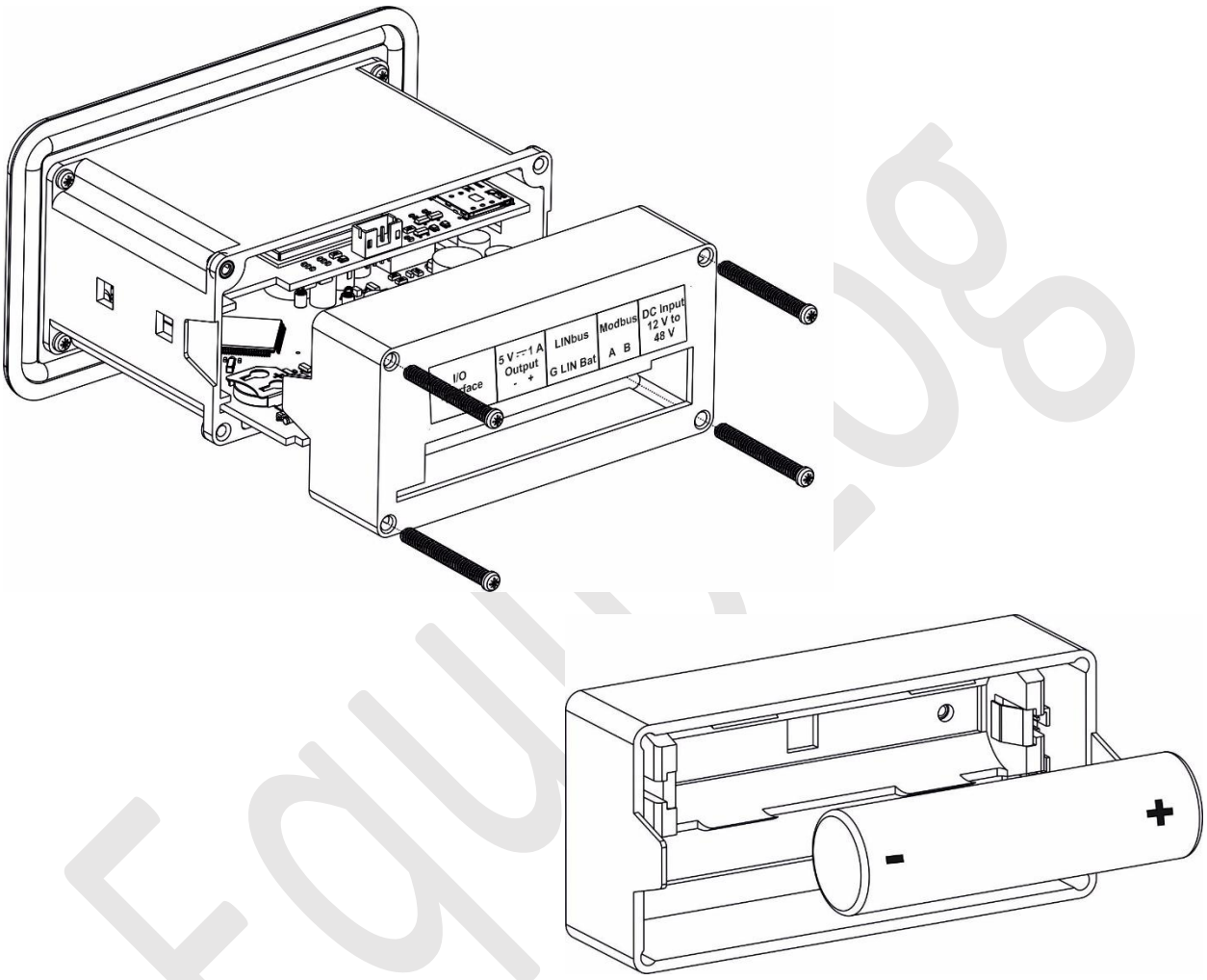


Figure 7 Inserting the Battery

3.4.7 Connect Power Supply Adaptor

- Connect the Mains supply Adapter as per power rating provided in the Technical specifications and WHO/PQS/E006/DL01.2 specification protocol.

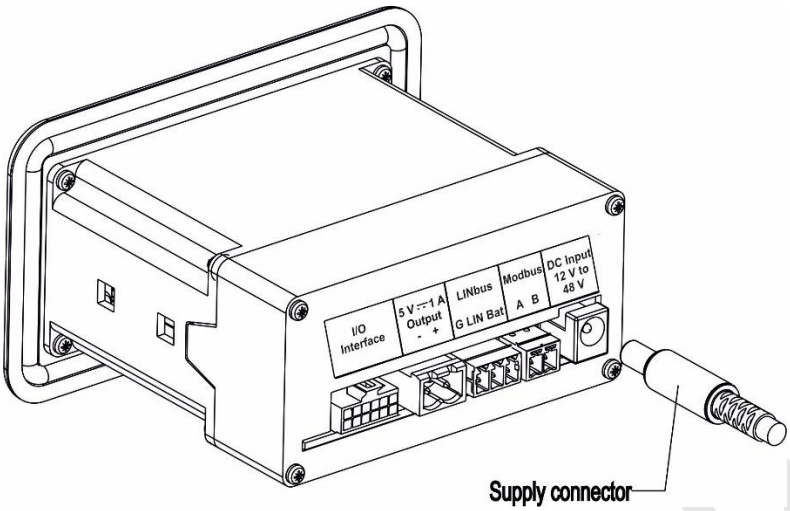


Figure 8 Inserting the Mains Supply Adapter

3.4.8 Connect USB port cover

- When USB port is not in use for data download, it should be covered by USB gasket cover as shown in figure 9.

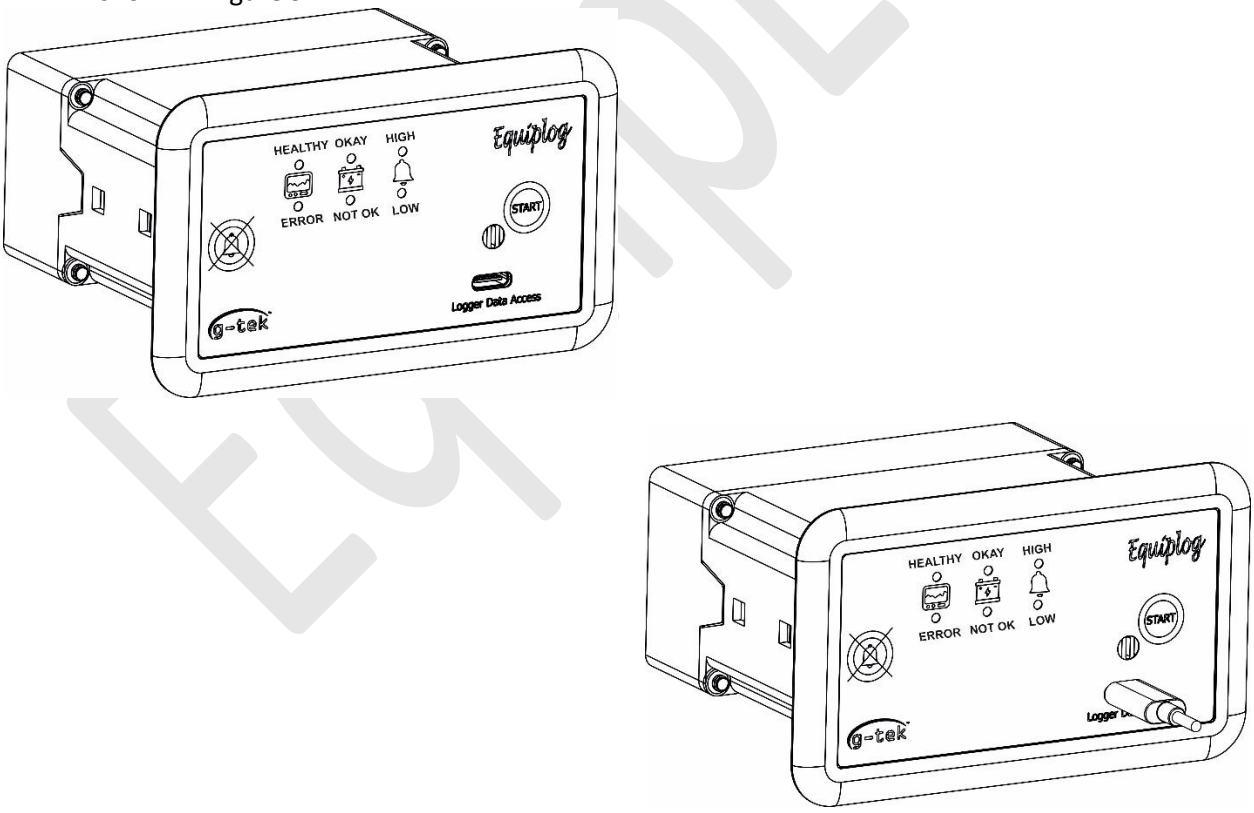


Figure 9 Inserting the USB Cover in the Data logger

4 LIST OF ABBREVIATIONS

Table 5 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

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 6 shows the indication of the status LEDs in different conditions.

Table 6 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 on Mains, 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 on Mains, 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 7 shows the indication of the status LEDs in different conditions.

Table 7 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 mains supply.

5.2 Key Functions Display (OLED) (Optional Feature)

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) (Optional Feature)

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

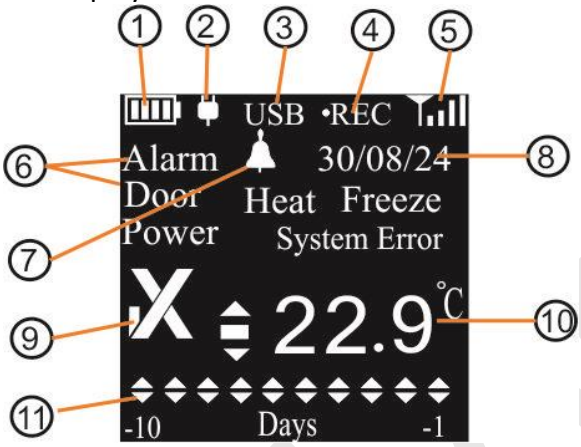


Figure 10 OLED Display format

The Home screen of the display as shown in figure 10 is divided into three parts – Header, Main Body and Footer view as follows:

- **Header:** Battery Level, Power status, USB symbol, REC status, GSM strength#
- **Main Body:** Alarm(s) messages, Alarm trigger (Bell) symbol (if any), Local or Absolute# (if GSM available) 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) Mains On/Off indication: When Mains 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 or Absolute[#] 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 per 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 INSTALLATION OF THE PRODUCT

The Equiplog data logger comes with the necessary accessories for power supply, communication, and sensor input connections. Refer to Section 3.4 for installation and connection instructions for the data logger with the appliance. There are four options for measuring appliance parameters:

1. The sensor inputs are connected to the data logger through its I/O interface connection.
2. The sensor inputs are connected to the controller, which provides the parameter values to the data logger via Modbus communication.
3. The sensor inputs are connected to the SECOP Compressor, which provides the parameter values to the data logger via LIN bus communication.
4. The sensor inputs use both the second and third options.

6.1 Configuration of the Data Logger

The Equiplog Data Logger comes pre-configured with all necessary logger information. The appliance and communication details are needs to be configured at the time of installation of the data logger with the appliance. Ensure that the appliance details are handy before starting the Configuration of the data logger.

For configuration of the data logger, the Configuration application is provided which can be used as followed:

- Connect the Equiplog data logger with computer using USB type C to type A cable and open the "**DL_Configuration**" application installed on the PC.

6.1.1 Home Page

- Home page will show the option to select the USB drive of the Data logger as shown in figure 11. Click on "Reload Drive" to fetch all the external drives connected to USB ports of the Computer into dropdown for selecting the device drive.
- Select the Device drive from the drop down list and click on "Next" Button to go on Logger Page.

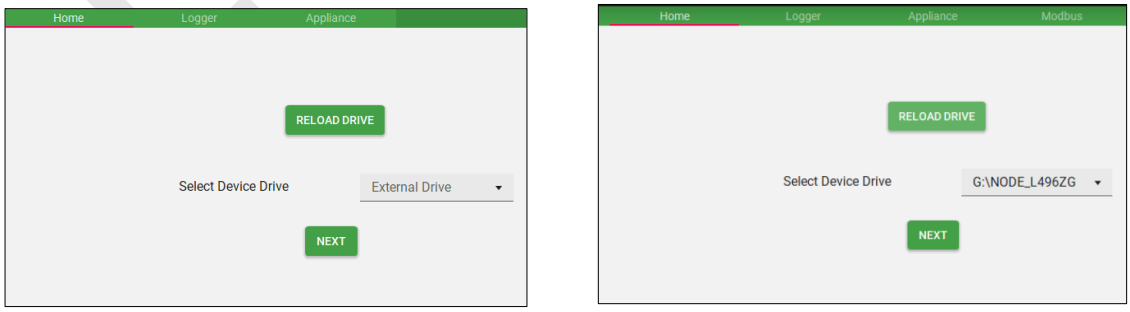


Figure 11 Connect the Data logger with Configuration Application

6.1.2 Logger Page

- The Data Logger Information will be shown in Logger page as displayed in the figure 12, verify the logger information provided by the manufacturer. In this page, the Communication type option can be selected by the user.

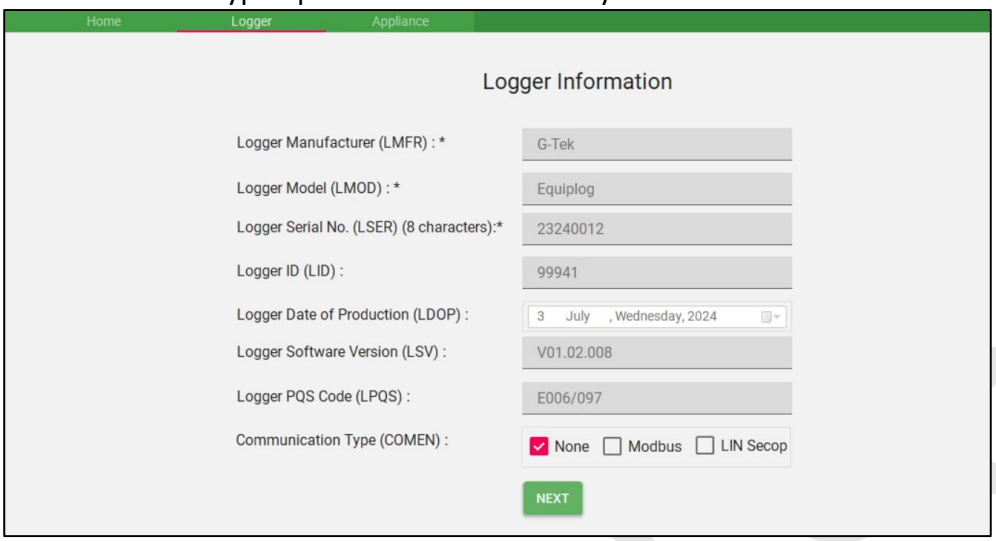
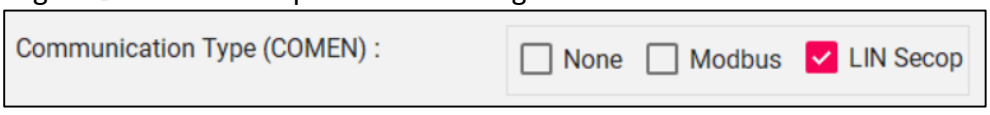


Figure 12 Communication Type options for the Data logger and Appliance

- The user has four options to select for the communication type:
  - **None**: In this case, the application creates Configuration Json file from Appliance page only.

  - **Modbus**: If user has selected Modbus option for the communication, Modbus page will be enabled for parameters setting.

  - **LIN Secop**: When the user has selected LIN Secop as communication, the LIN Secop Page will be active for parameter setting.



  - **Modbus and LIN Secop**: In case, both Modbus and LIN Secop communication are selected, both Modbus and LIN Secop pages are active for parameter setting.

- After selecting the "**Next**" button, Appliance Page will be opened.

Note: The default option for communication is selected as None.

6.1.3 Appliance Page

- In the Appliance page, configure the Administrator and Appliance parameters details properly.
- Fields with (*) are mandatory to fill before Submitting or clicking on Next button.

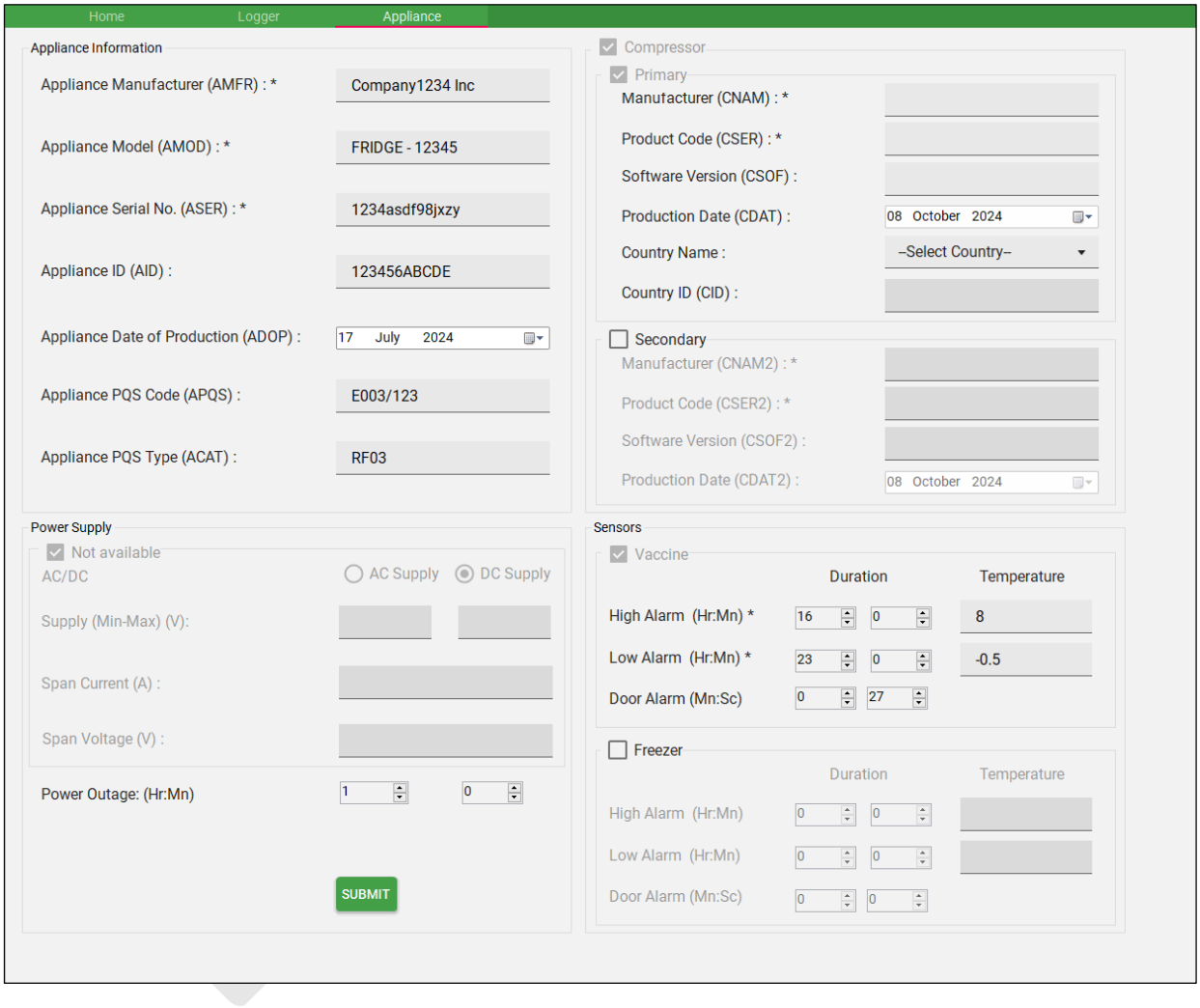
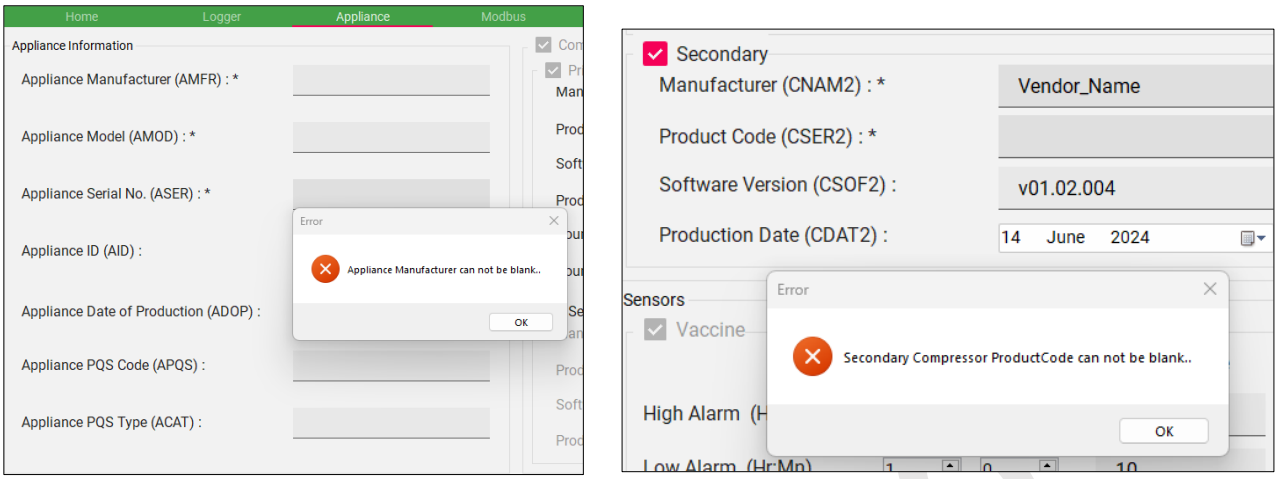


Figure 13 Appliance Information Configuration Page

- Fill up the Appliance information, Supply Information- AC/DC, Compressor information (if required), Sensor parameters selection for Vaccine and/or Freezer compartment.
- By default, Primary compressor and Vaccine Temperature compartments are selected.
- If secondary compressor, freezer compartment is selected, the mandatory fields in the corresponding section needs to be filled, else the application will pop up the error message for the field cannot be blank.



(a) (b)

Figure 14 Error message for blank field in Appliance page

- While, entering the min-max values in the supply voltage, vaccine, freezer compartment, ensure proper values to be entered as these values cannot be changed once the recording gets started.
    - E.g. if user has entered Low alarm temperature greater than the high, the application will show error message as below:

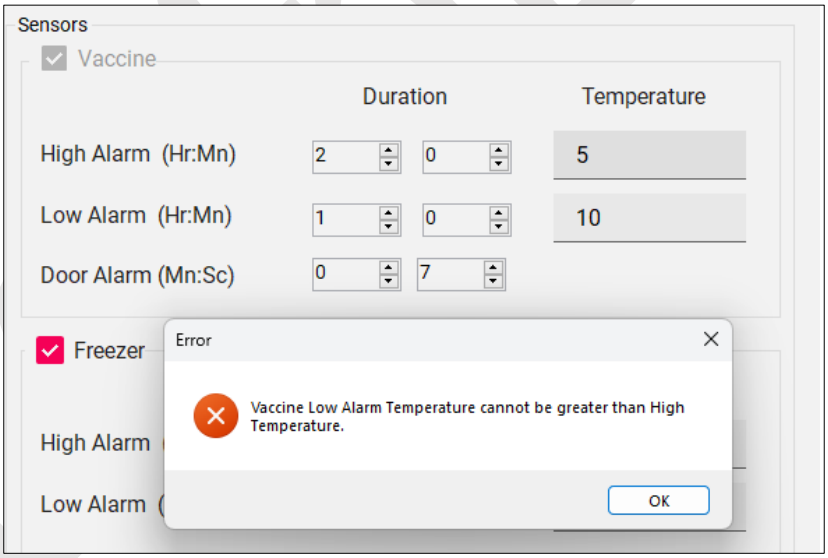


Figure 15 Error message for incorrect input value as per validation

- Once all the data are filled on the appliance page, click on "**Next**" button if Modbus and /or LINbus Secop communication is selected, else click on "**Submit**" button to write the configuration in the data logger.

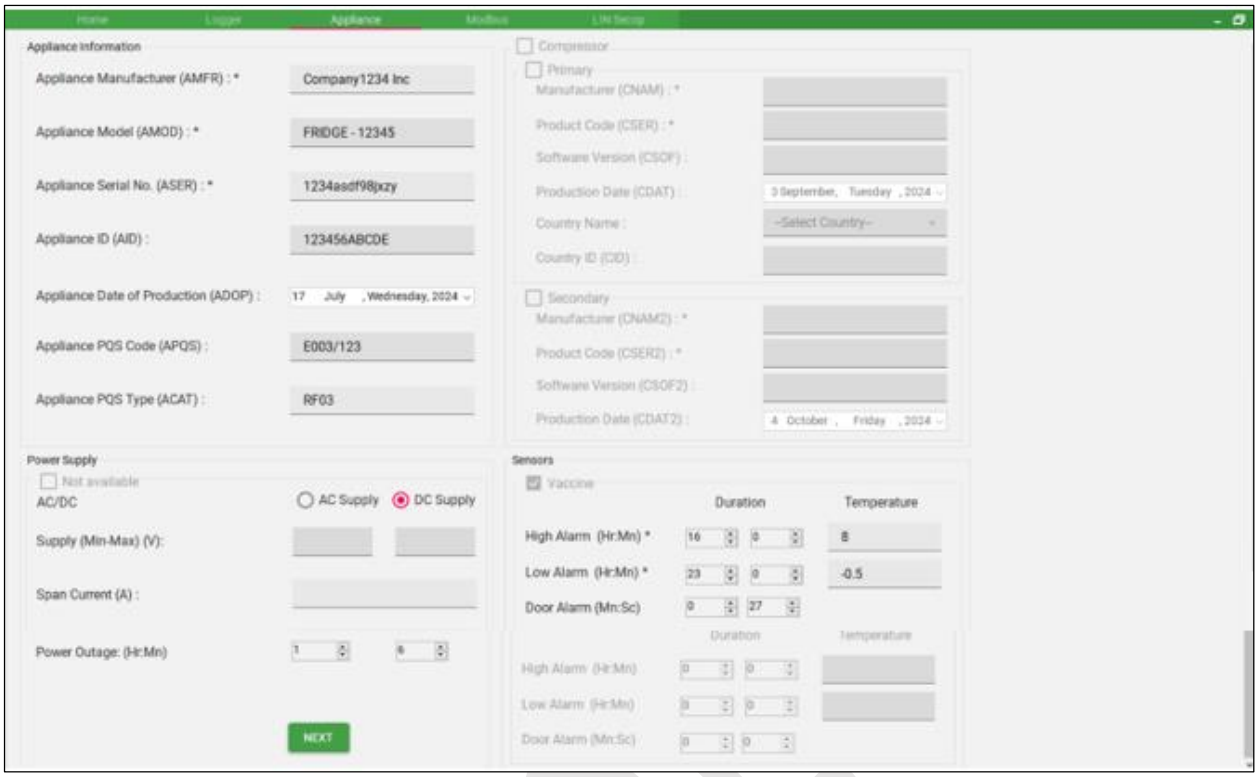


Figure 16 Sample of completely filled data in Appliance page

6.1.4 Modbus Page

- In this page, Modbus communication parameters must be entered properly so that the communication between the data logger and the appliance controller works properly.
- The communication parameters consist of following parameters:
  - Baudrate (BDR): 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
  - Parity (PRT): None, Odd, Even
  - Stopbit (STB): 1, 2
  - Slave address (SLAD): controller Modbus address (within 0 to 255 range)
- Note, that the communication parameters are mandatory to fill before Submit or Next option.
- Enter controller name for the Modbus communication in the "**Enter new template name**" field. If already entered previously, then select the template name from the drop down.

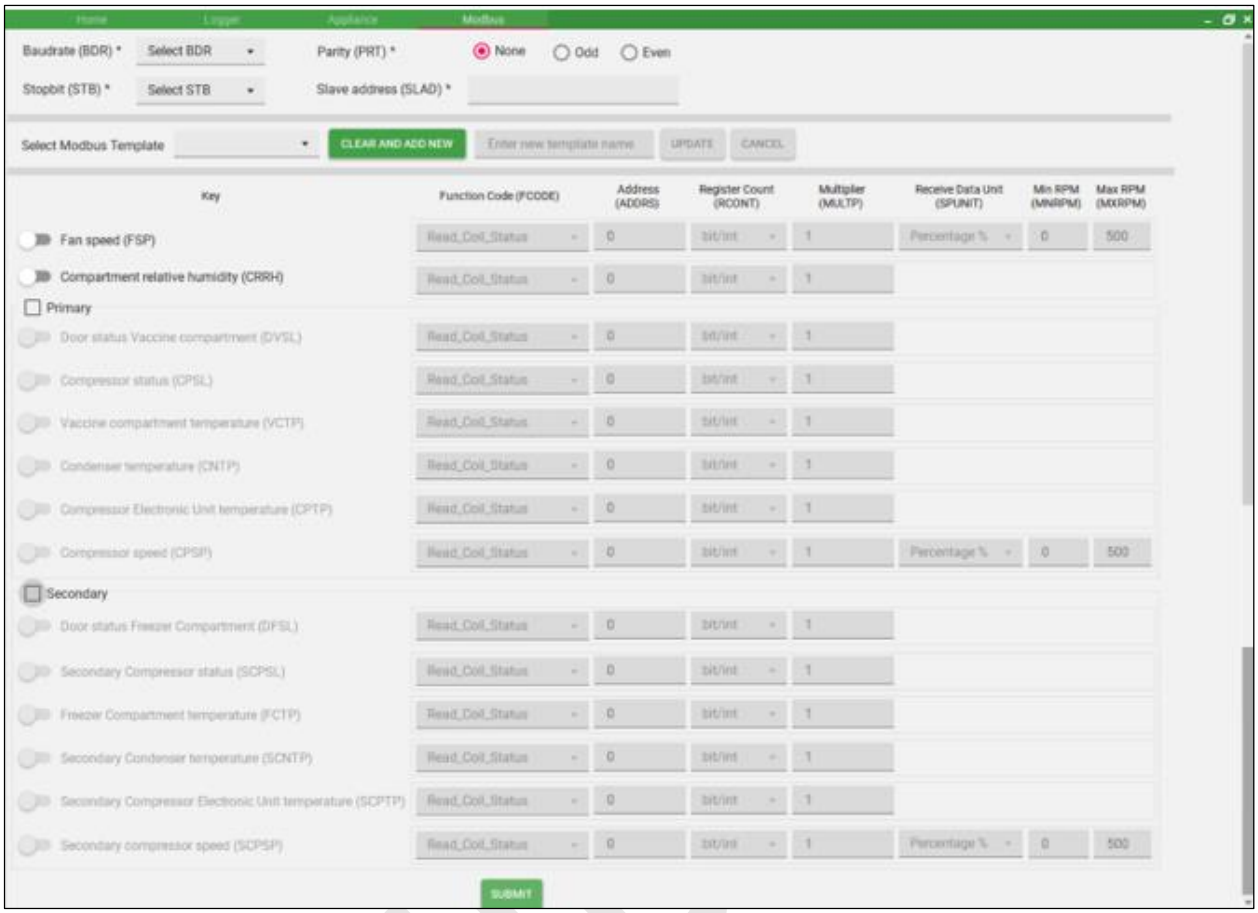


Figure 17 Modbus Communication Configuration Page

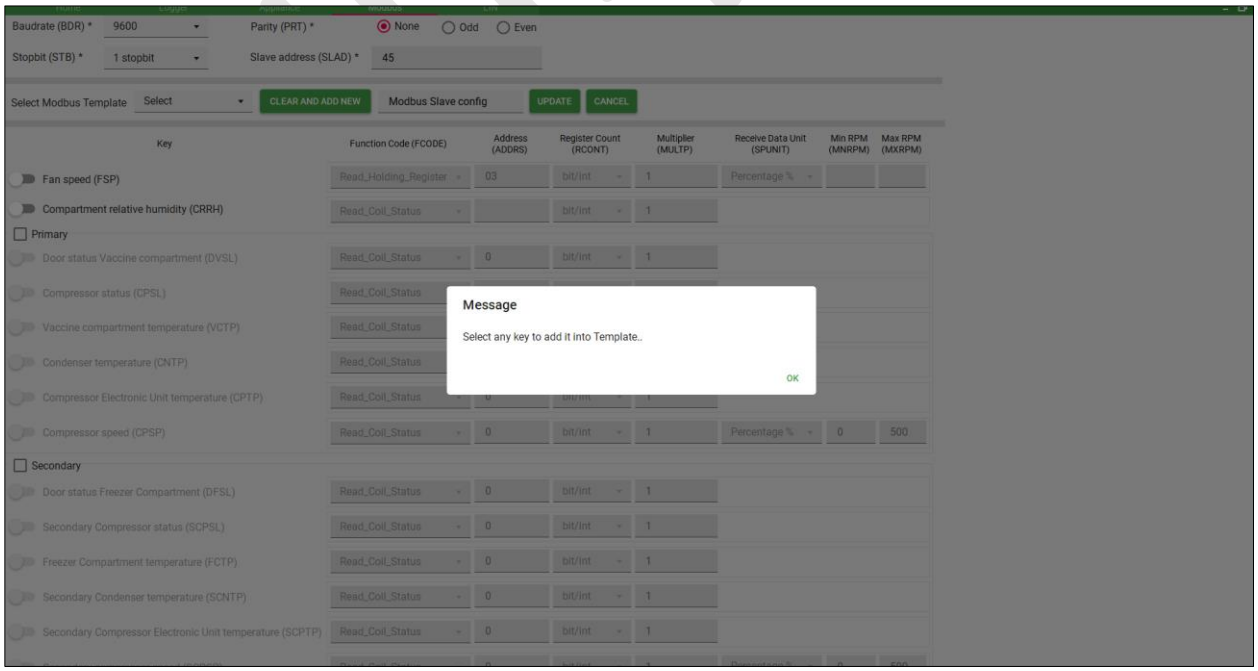


Figure 18 Sample selected Modbus Communication parameters

- The Json keys for the both primary and secondary compartments are listed in the page for the selection.
- If any of the keys has not selected, their fields in the page remains disabled and will not reflected in the configuration file for the Modbus communication.
- Once the key is selected, the parameters for the it must be filled, else the error message will pop up for blank entry.

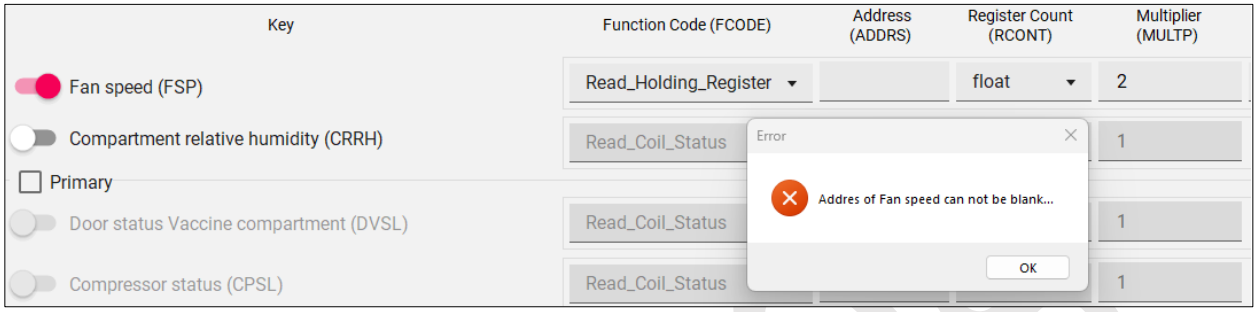
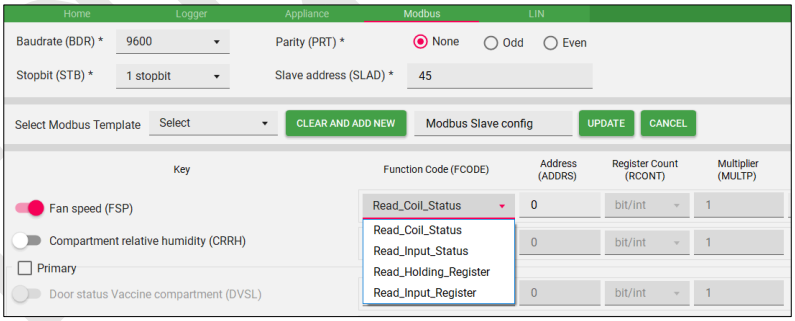


Figure 19 Error message for blank field in Modbus Page

- Each key has specific function code, register address and count, multiplier to be entered.
  - **Function code (FCODE):** Read_Coil_Status(01), Read_Input_Status(02), Read_Holding_Register(03), Read_Input_Register(04)
  - **Register Address(ADDRS):** it must be entered as per the selected key for the controller Modbus communication (ranges from 0 to 65535)
  - **Register count(RCONT):** bit/int (No. of registers to read = 1), float (No. of registers to read = 2)
  - **Multiplier (MULTP):** By default, value for multiplier for each key is 1, as per the selected key enter the value greater than 0 (zero) and less than equal to 65.



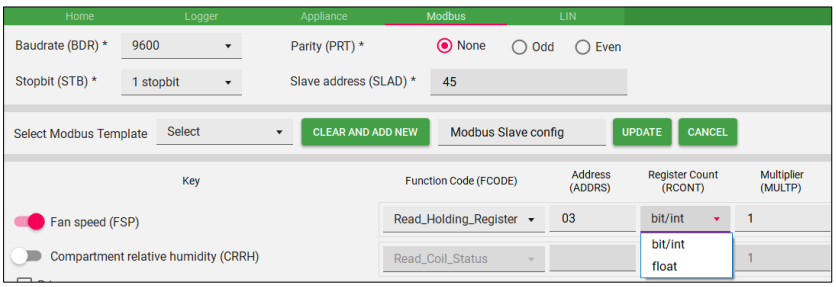


Figure 20 Modbus Communication Function code, register address, count selection sample

- If function code is selected as Read_Coil_Status or Read_Input_Status, then Register Count and Multiplier fields are disabled with bit/int and 1 default value respectively.
- With Fan speed(FSP), Primary compressor speed(CPSP) and secondary compressor speed(SCPSP), additional parameter entry Receive data Unit(SPUNIT) is provided.
    - % Percentage: Min and Max RPM fields remains disabled (Calculated %percentage of max speed will be received from the controller).
    - RPM: Min and Max value of RPM must be entered, if the controller provides value of speed instead of calculated %percentage of max speed.

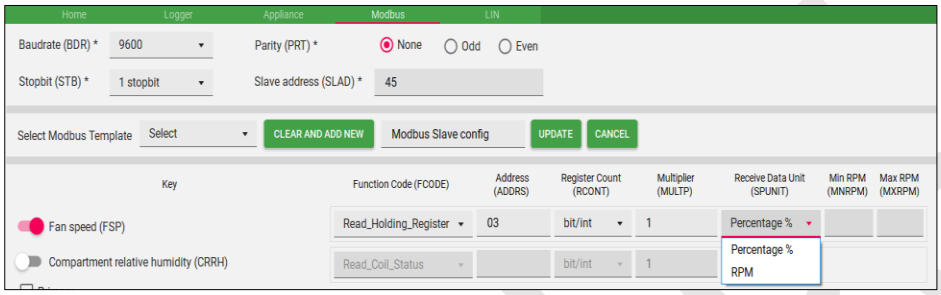


Figure 21 Fan speed with RPM option for calculation %speed

- Select the remaining keys as per the compartment inputs provided in the controller for Modbus communication with the data logger.
- Fill up all the required fields and click on “Next” or “Submit” button as per the selected communication type.

6.1.5 LIN Secop Page

- In this page, LIN Secop communication parameters with the corresponding units can be seen as displayed in figure 22.

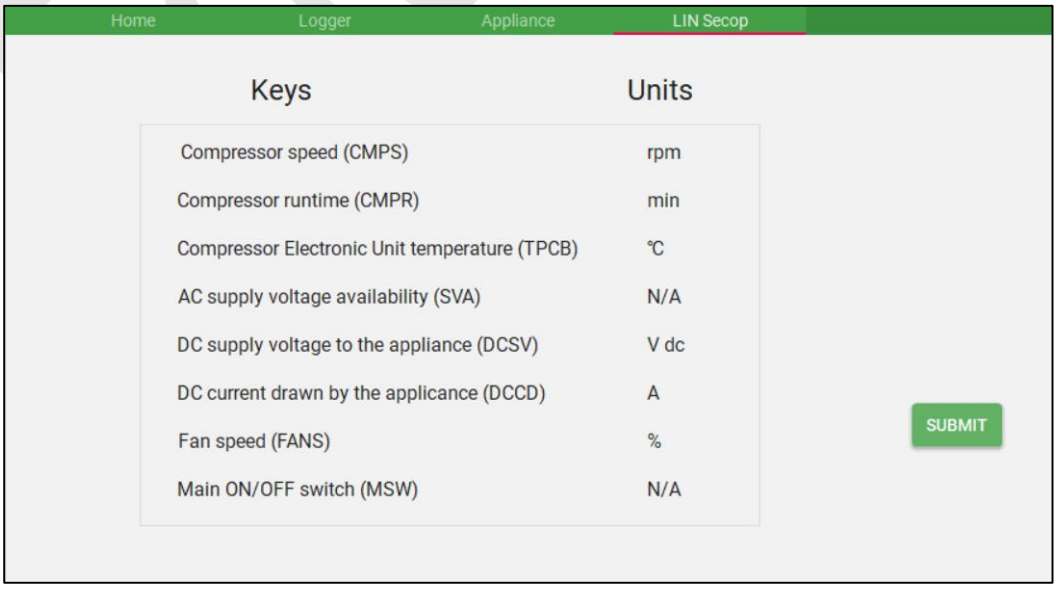


Figure 22 LIN Secop Communication Configuration Page

- Click on "**Submit**" button to create the configuration Json file for the data logger with the selected configuration parameter settings.

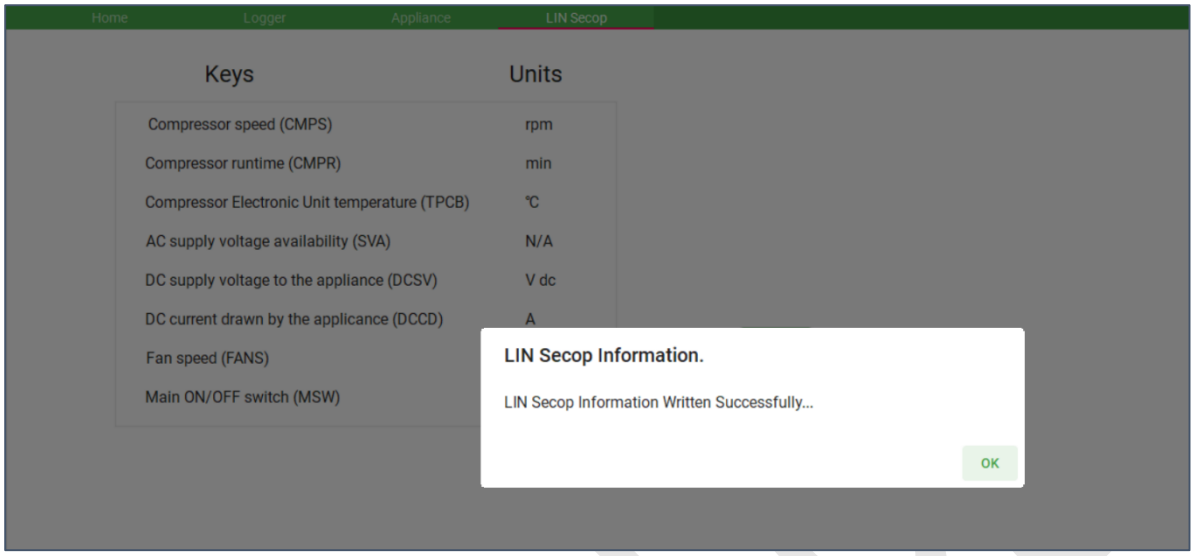


Figure 23 LIN Secop Communication Configuration Page

- Configuration file "**devConfig.json**" will be saved in the data logger USB drive as shown in figure 24.

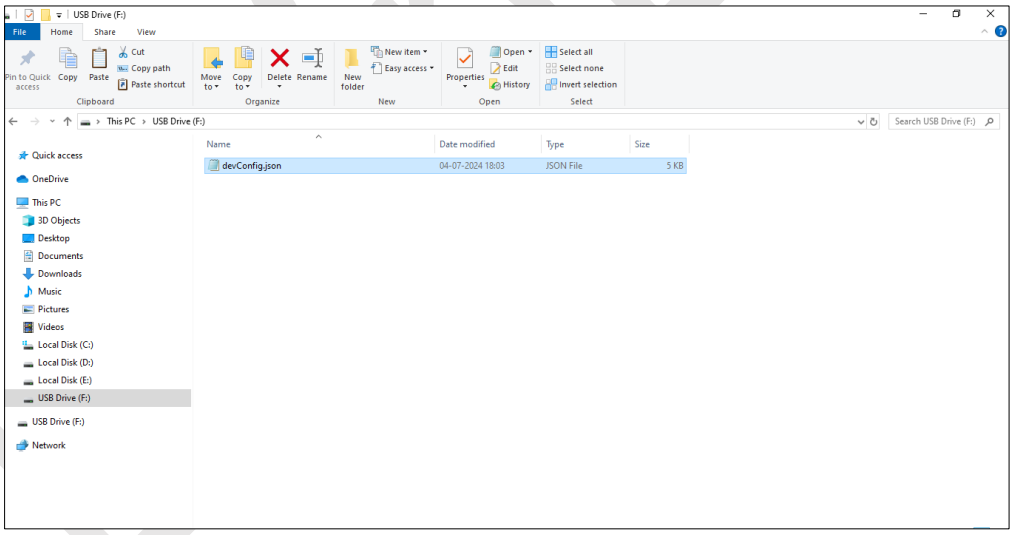


Figure 24 Device configuration Json file saved in the Data Logger

- This configuration file contains Json data for the device configuration parameters- Logger information, Appliance Information, Performance parameters for appliance, Modbus/LINbus communication settings.
- Sample Device configuration Json file is shown in figure 25.

Figure 25 Sample Device Configuration Json file

The device configuration can be updated until the data logger starts recording. Once recording begins, no further changes can be made, and the configuration file will become read-only on the USB drive.

6.2 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.

6.2.1 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 6.2.2 to 6.5 is described for the data logger with Display option.

6.2.2 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 6.2**.

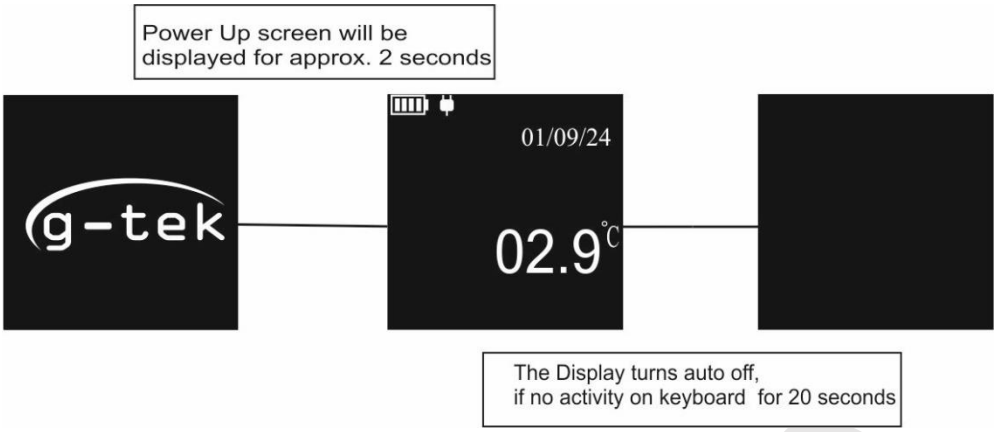


Figure 26 Power up condition of the Data logger

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 27.

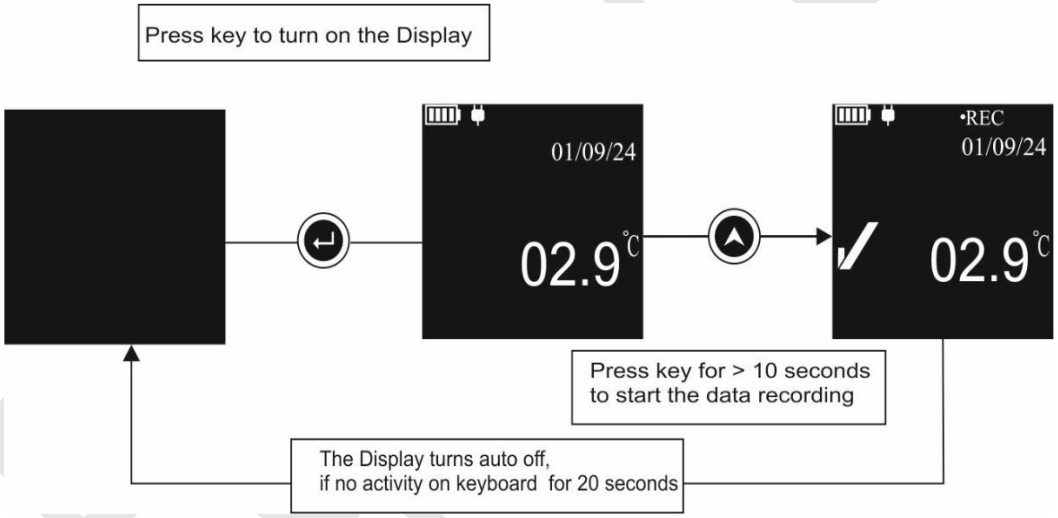


Figure 27 Start Recording of the data

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.

6.3 Home Screen Viewing

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 28.

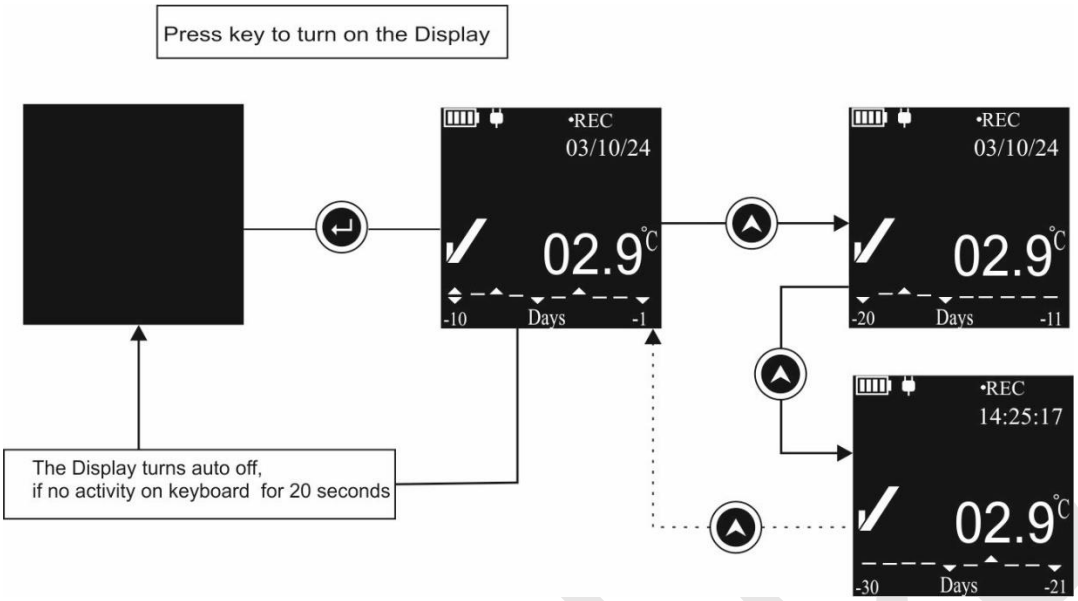


Figure 28 Viewing Home Screen Process

To view alarm marker older than last 10 days, user can press "**Up**" key once to view display with alarm markers for -11 to -20 days. Further press "**Up**" key to view -21 to -30 days alarm markers.

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 screen will be seen by pressing "**Up**" key step by step.
3. When display is turned on, the date and time will be seen alternately with 3 seconds refresh rate in **DD/MM/YY**, **HR:MN:SC** format.

6.4 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 29:

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.

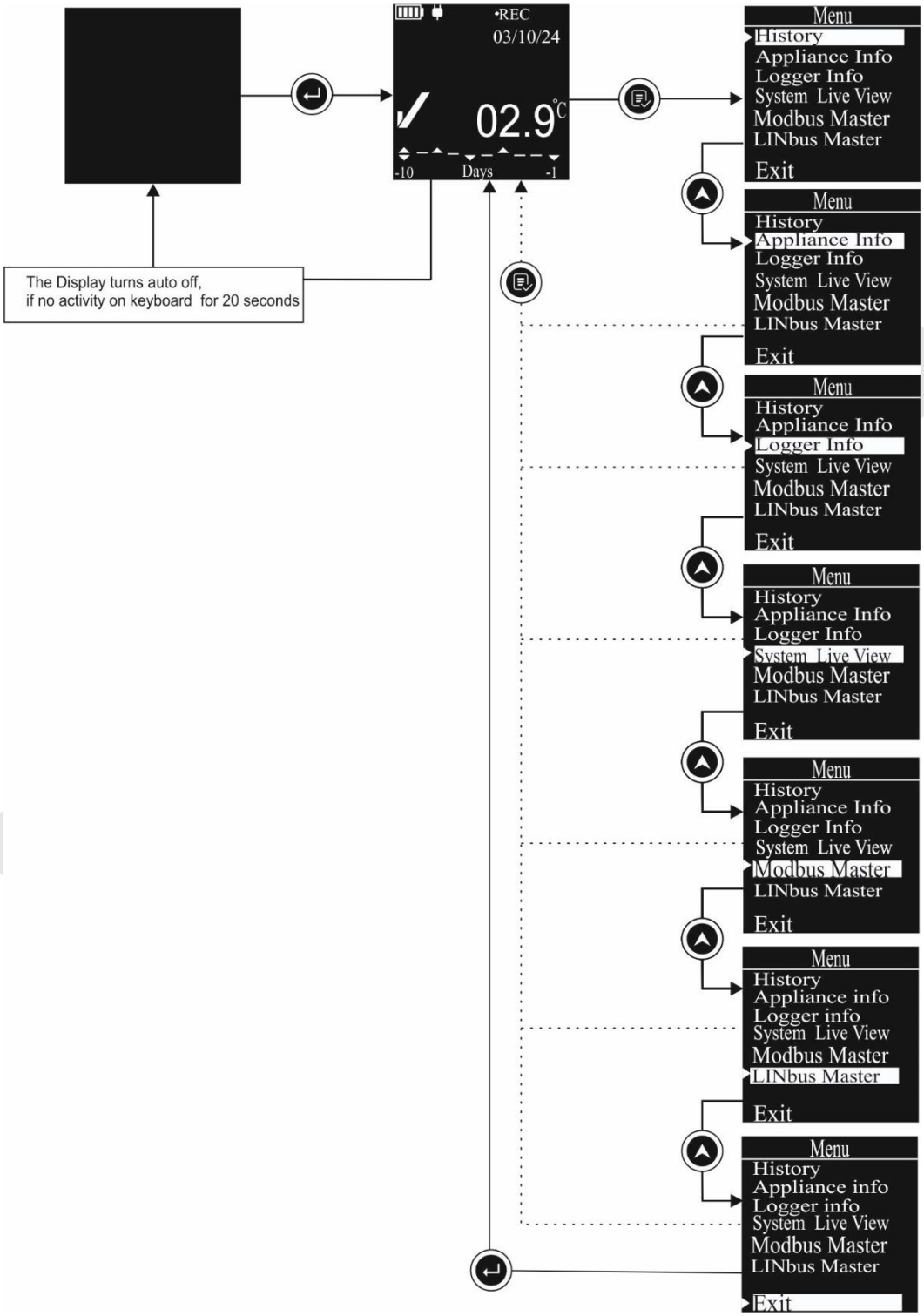


Figure 29 Main Menu Sequence

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

6.4.1 History View Menu

In this menu, History data of the data logger can be viewed for max last 30 days on the display by selecting the options as shown in figure 30. 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

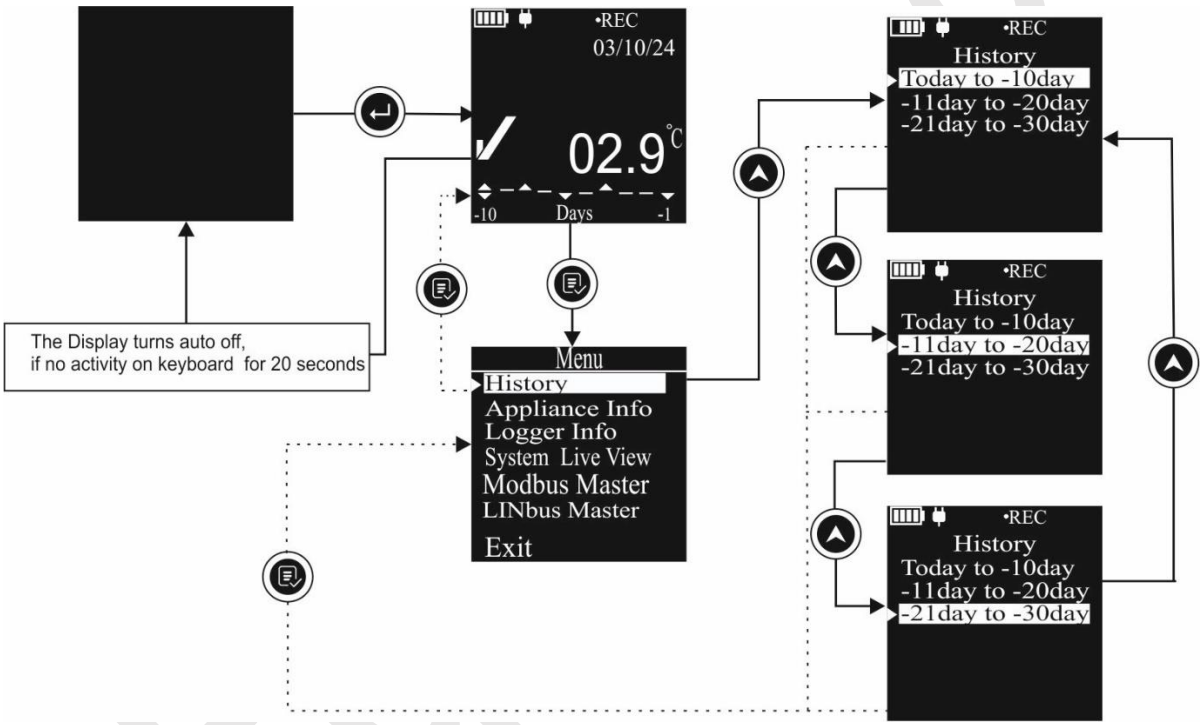


Figure 30 History View Menu

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 16.

- 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.
- Press "**Up**" key again to view "-5 day" data: Here, the date shown is 28/09/24, reading was below Freeze alarm set point for 15 minutes, which was not enough to trigger the alarm.
- Press "**Up**" key again to view "-6 day" data: Here, the date shown is 27/09/24, Alarm was triggered indicated by bell symbol with ▼ arrow and Freeze alarm was triggered and duration for freeze alarm was 4 hours.
- Press "**Up**" key again to view "-7 day" data: Here, the date shown is 26/09/24, reading was above Heat alarm set point for 4 hours 35 minutes, which was not enough to trigger the alarm.
- Press "**Up**" key again to view "-8 day" data: Here, the date shown is 25/09/24, Alarm was triggered indicated by bell symbol with ▲ arrow and Heat alarm was triggered and duration for heat alarm was 11 hours 23 minutes

- Press “**Up**” key again to view “-9 day” data: Here, the date shown is 24/09/24, the readings were within the Heat/Freeze alarm limits.
- Press “**Up**” key again to view “-10 day” data: Here, the date shown is 23/09/24, Alarm was triggered indicated by bell symbol with both ▲ and ▼ arrows and both Heat and Freeze alarms were triggered and duration for alarms were 15 hours 48 minutes and 1 hour 25 minutes respectively.

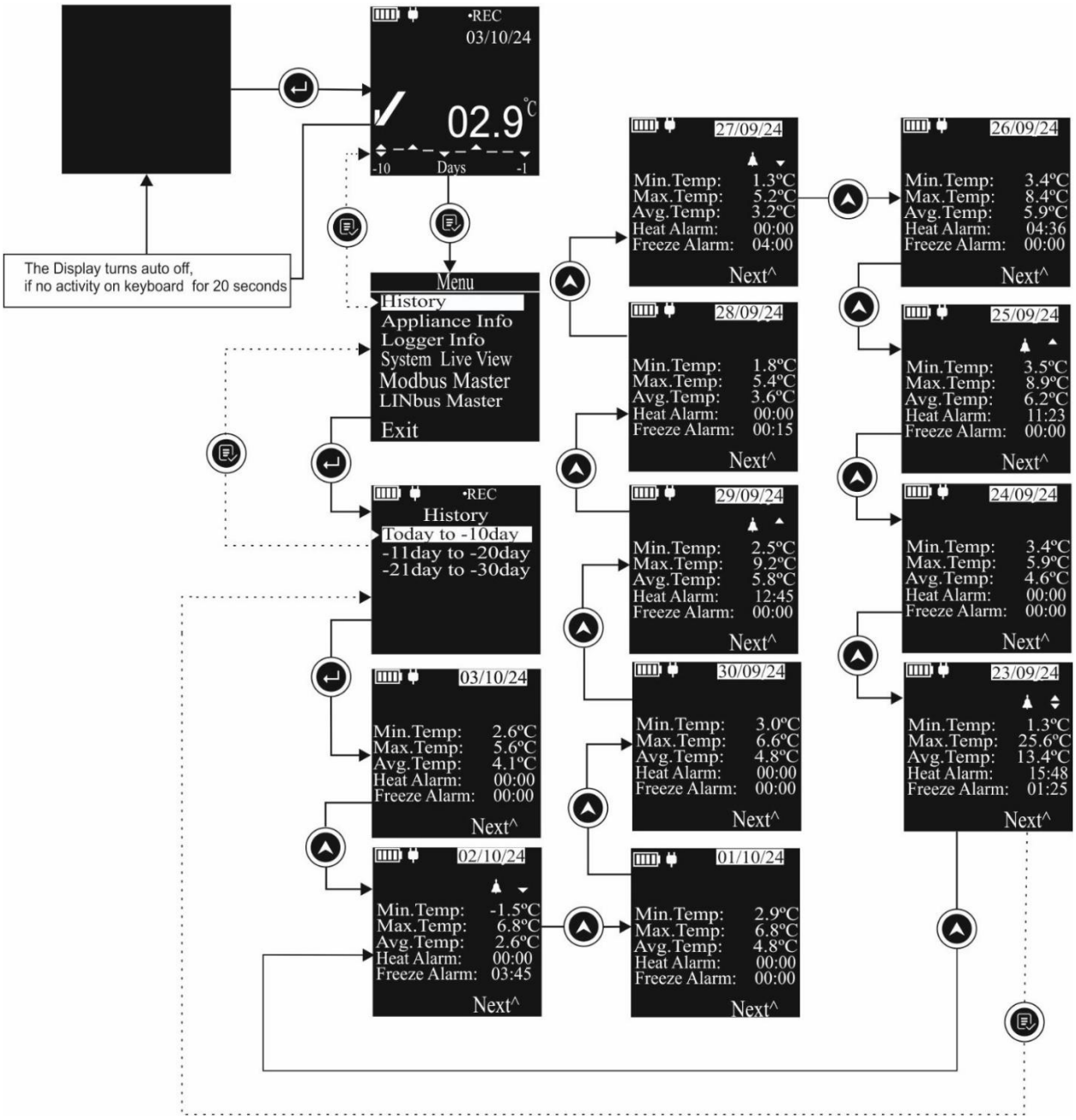


Figure 31 View History data Sequence for Today to 10 days

Pressing the "**Up**" key again returns the display to the Today screen. After the -10 days history screen, pressing the "**Review**" key exits the submenu. Press the "**Review**" key twice more to return to the home screen.

6.4.2 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 32.

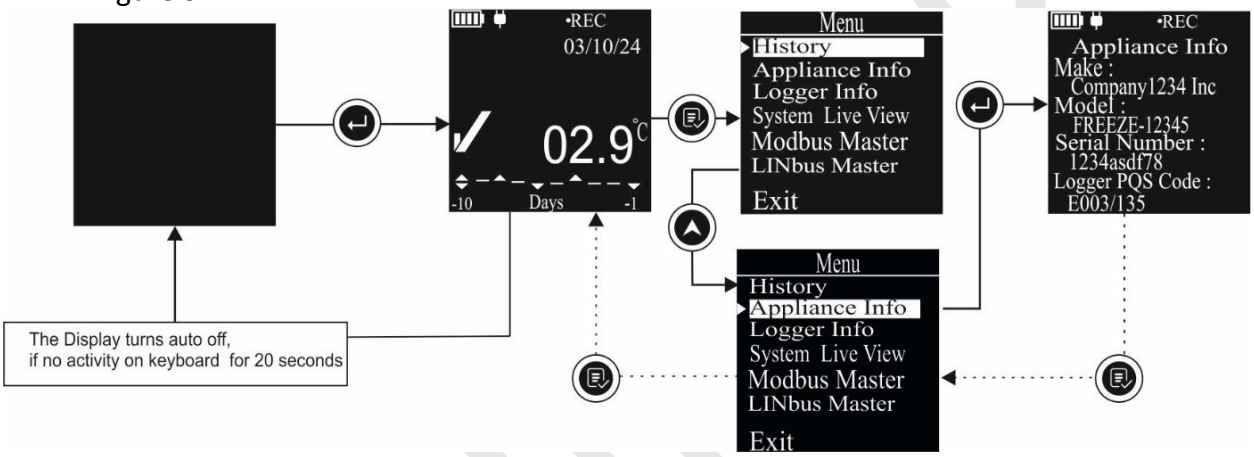


Figure 32 Appliance Information Menu

- 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 32 are for example purpose only.

6.4.3 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

- Access the main Menu and select the Logger Info option as per the steps shown in figure 33.
- To exit from the Logger menu press "**Review**" key.

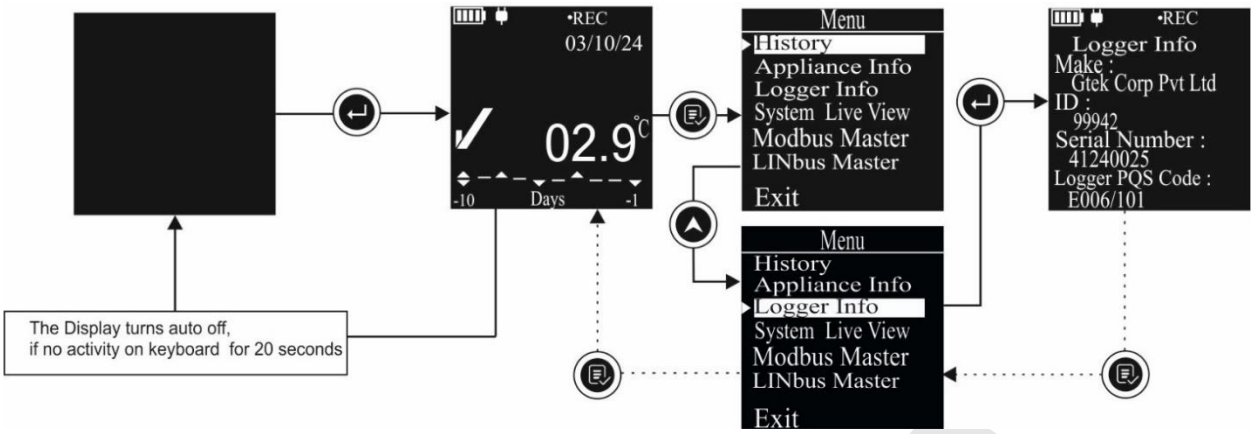


Figure 33 Logger Information Menu

- 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 33 are for example purpose only.

6.4.4 System Live View

The system Live view menu will provide the real time view of the performance parameters as well as Alarm Monitor and RTC setting Menu. Follow the steps to access this menu as shown in figure 34.

- 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 Mains supply and compressor status information
     For example, if mains supply is on, primary compressor is ON and secondary compressor is OFF.
     Power: ON
     Cooling 1 : ON
     Cooling 2 : OFF
  2. **Temp. & Door:** Selecting this option will show the current Vaccine, Freezer and Ambient Temperature reading; Door 1 and Door 2 Open/Close
  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#: OK/Error (Modbus communication is running OK/stopped)
     Linbus#: OK/Error (Modbus communication is running OK/stopped)

Sensors:

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

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

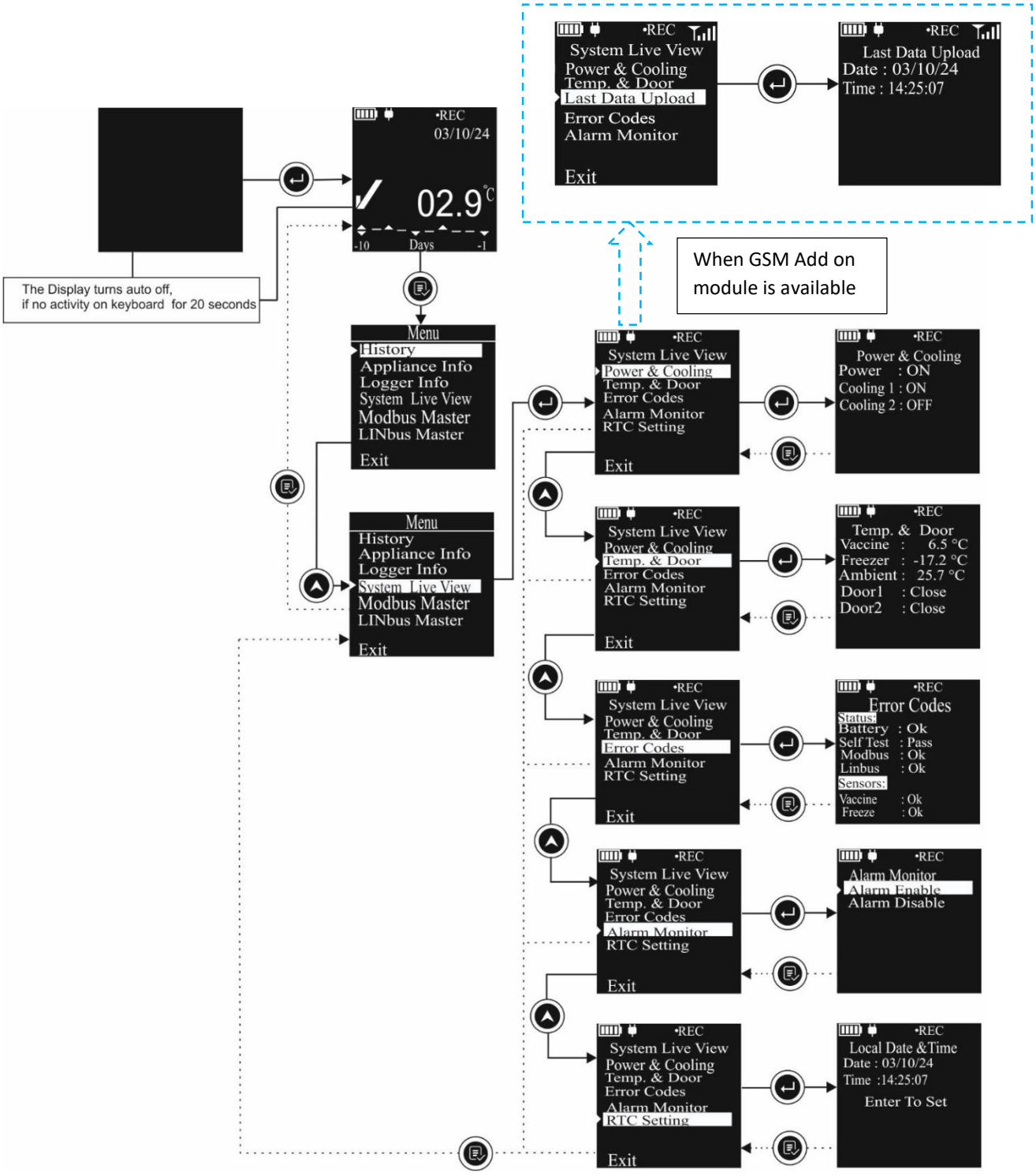


Figure 34 System Live View Menu

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 35. 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.

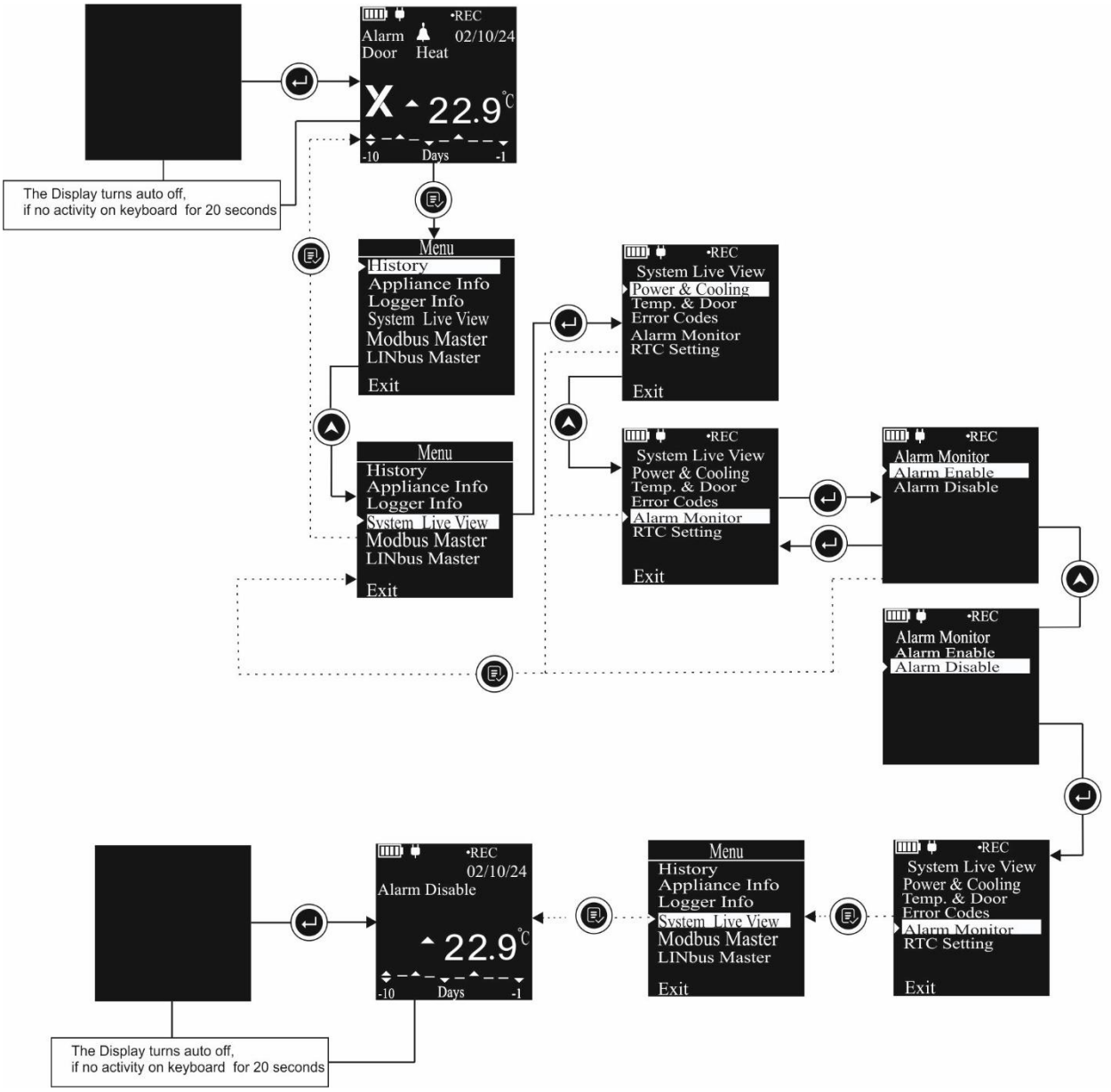


Figure 35 Alarm Monitor Selection Menu

6. **RTC Setting#:** The device has an ability to set the local date and time through RTC Setting menu as shown in figure 36. To set the Local date and time follow the steps outlined in figure 36 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.

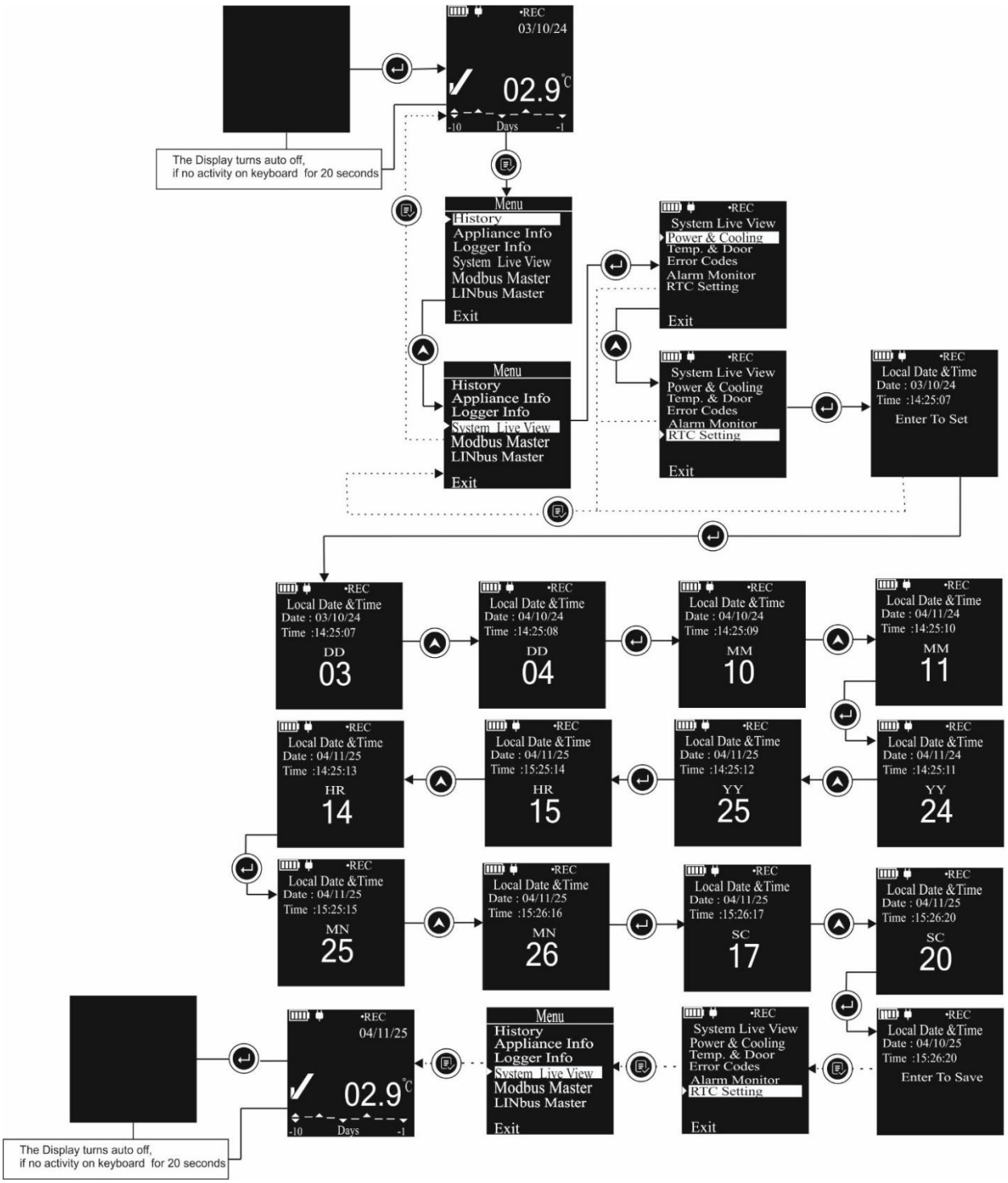


Figure 36 RTC Setting Menu

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

6.4.5 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 37 for viewing Modbus master information with example parameters.

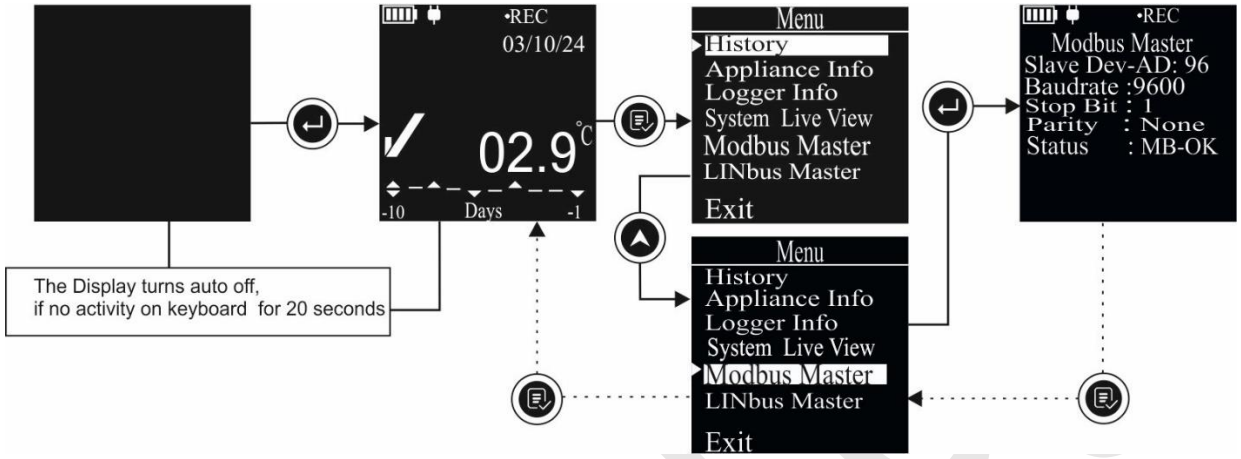
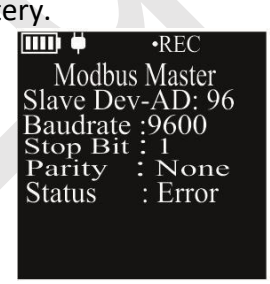


Figure 37 Modbus Master Menu

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 mains 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.

6.4.6 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 38 for viewing LINbus master information with example parameters.

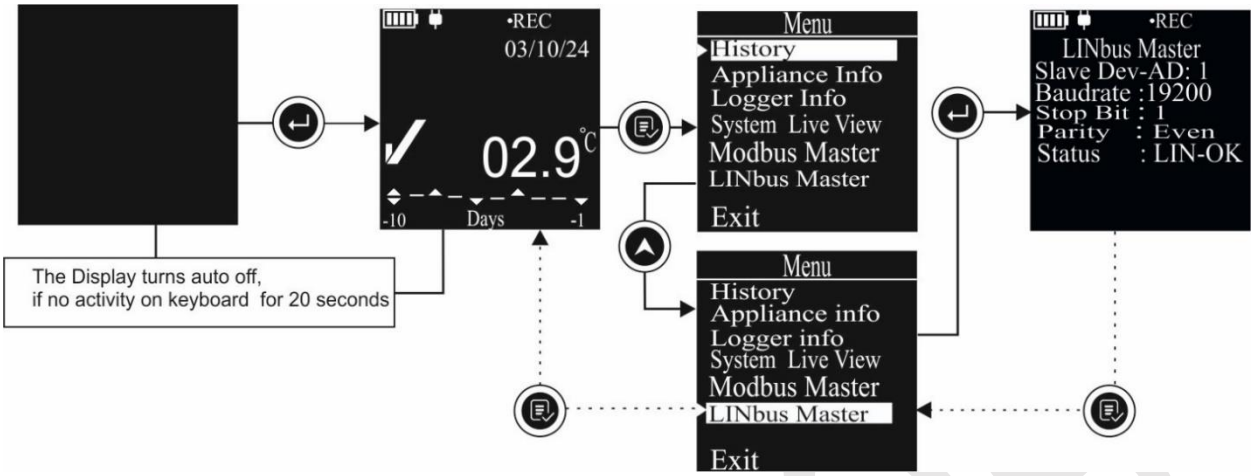


Figure 38 LINbus Master Menu

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 mains 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.

6.5 Displaying of Readings in Different conditions

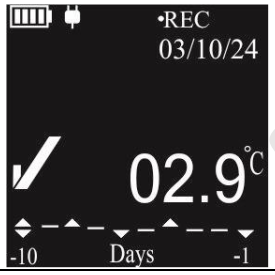
The display will show the readings of the sensors as per pre-configured parameters settings. Let us consider that the Appliance is operated on AC supply and consists of Vaccine and freezer compartments with temperature and door sensors. The Data logger will read all these parameters by respective sensors.

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 screens in different conditions are as below:

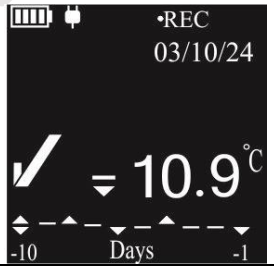
1. The vaccine temperature is within the high/low alarm limits, with no active alarms recorded in the data logger.



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

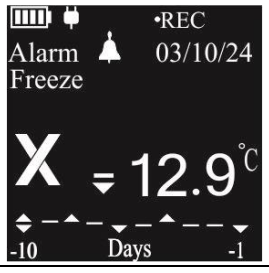
3. The Vaccine temperature is above alarm high limit, but the alarm high delay is not over yet.

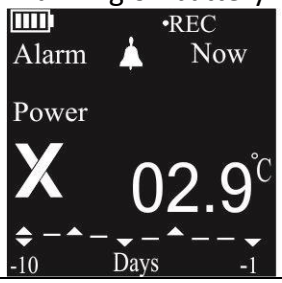
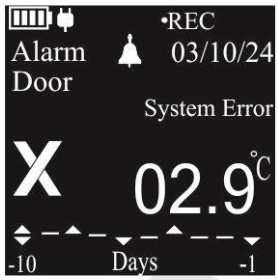
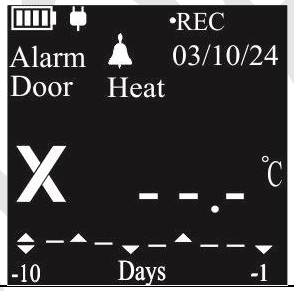
4. The Vaccine temperature is below alarm low limit, but the alarm low delay is not over yet.



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 mains 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. 
11. The battery in the data logger is currently charging from the mains supply. 	12. A fault has occurred in the data logger's battery charging, possibly due to the battery being disconnected or removed. 

6.6 Buzzer Operation

- Buzzer will be operated in following conditions:
  1. **Temperature Alarm High/Low (When on Mains 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 1 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 1 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.

6.7 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 39). There are two options for viewing the data on the host device.

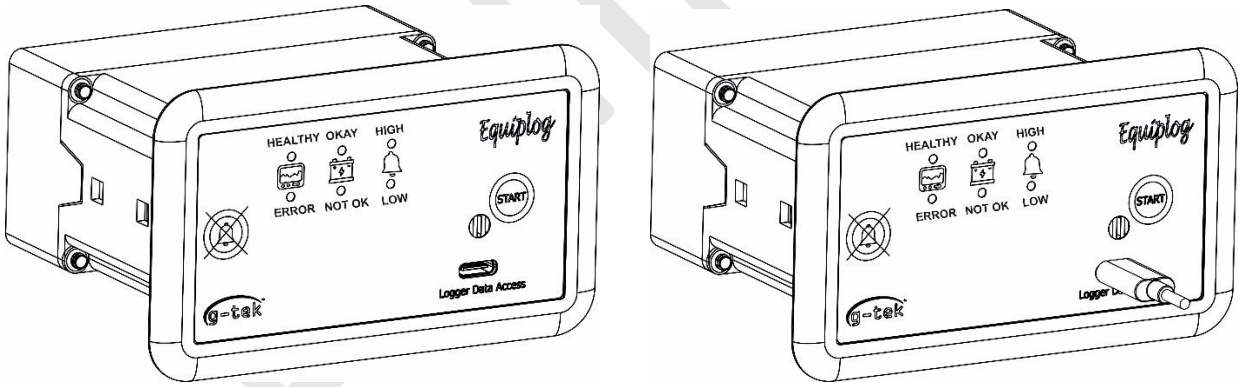


Figure 39 Connect USB Type-C Cable

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 GSM feature, then register the device on the cloud server. The data will be sent to the server once it is registered properly.

Note: The data logger with GSM feature will send the event data only in case of mains supply is disconnected and device is on battery only.

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 40.

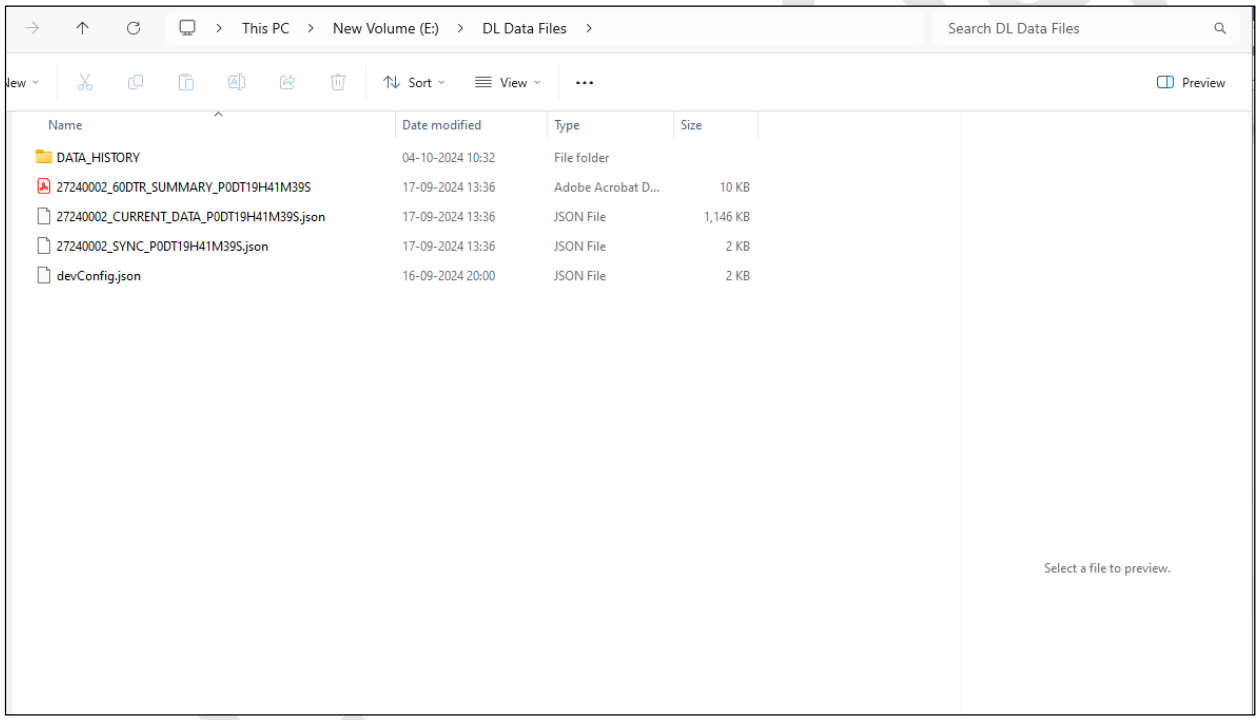


Figure 40 Downloaded Data from Equiplog Data logger

- 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.

- 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.)

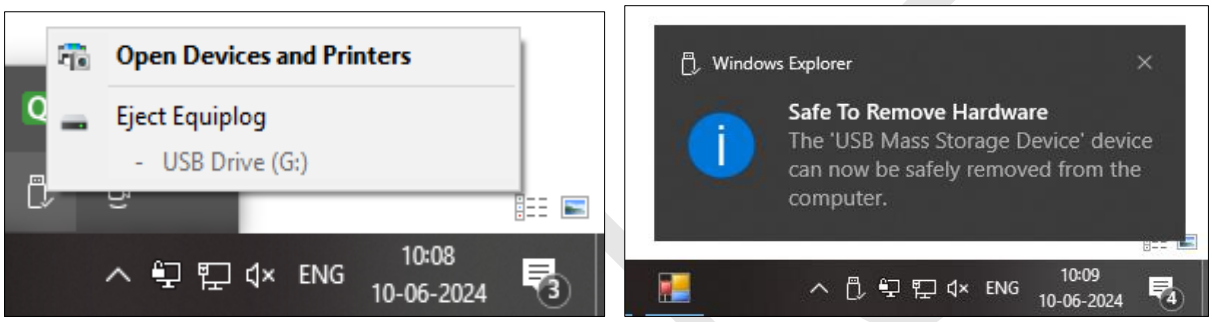


Figure 41 Safely Remove the Data logger

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

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 42 Sample PDF Report of last 30 days

The sample PDF report is shown in the figure 42 as per the WHO PQS standard format, where the data of last three days representing each row as one day.

- 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, 03- Vaccine Sensor Open, 04- Freezer Sensor Open, 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

- Install the "**EquipLog E-EMD**" Mobile application with the link shared by manufacturer.
- Open the Application and connect the data logger using USB Type C cable with OTG for mobile device.
- The home screen of the mobile application is shown in figure 43, click on the connect button to download the data from the data logger.

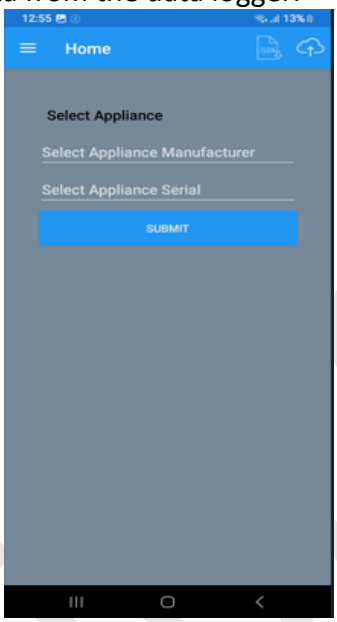


Figure 43 Mobile Application Home screen

- Once the data is downloaded, data can be viewed on the application dashboard as shown in figure 44.

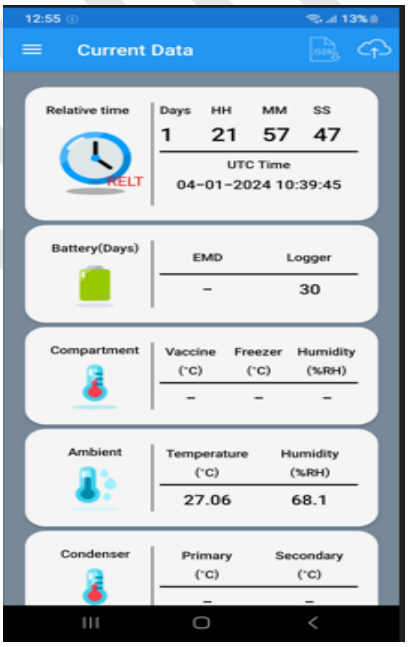


Figure 44 Current Data View on Mobile Application Dashboard

- For uploading the data on the cloud server, upload the corresponding data files for a given data logger provided that the internet connection is available.

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

7.3 Overview of Cloud Server Application

- Open the "**GtekCloud**" server as per the link and login details shared by the manufacturer as shown in the figure 45.

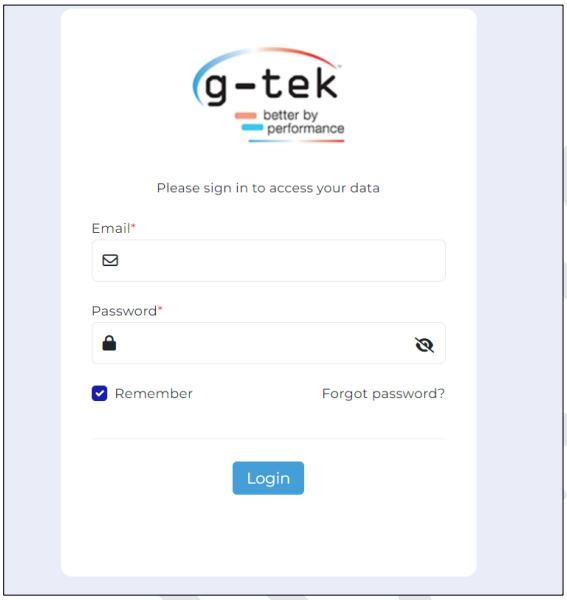


Figure 45 Login Page of the GtekCloud Server Application

- First add the Plant, Department details, then add users with permission options available in the left side panel of the application window as shown in figure 46.

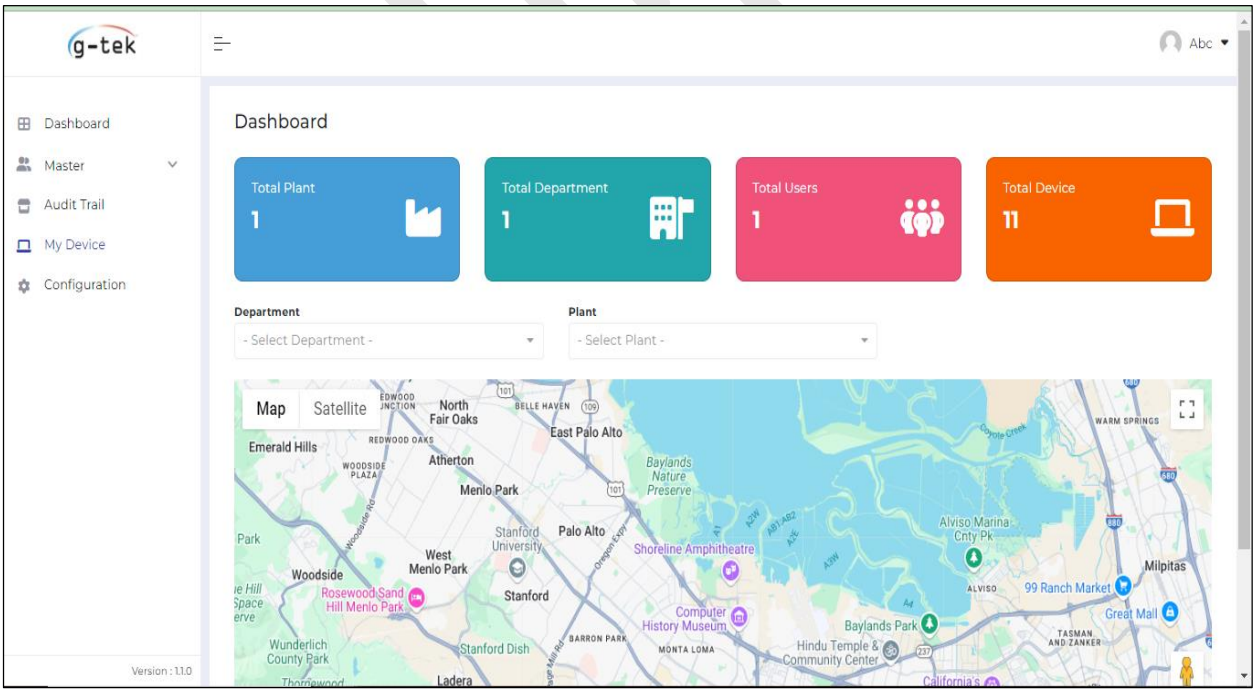


Figure 46 GtekCloud Application Dashboard

➢ Add the data logger details by selecting the “Total Devices” icon on the application window. Click on the Add button to fill up the appliance and logger information as shown in the figure 47.

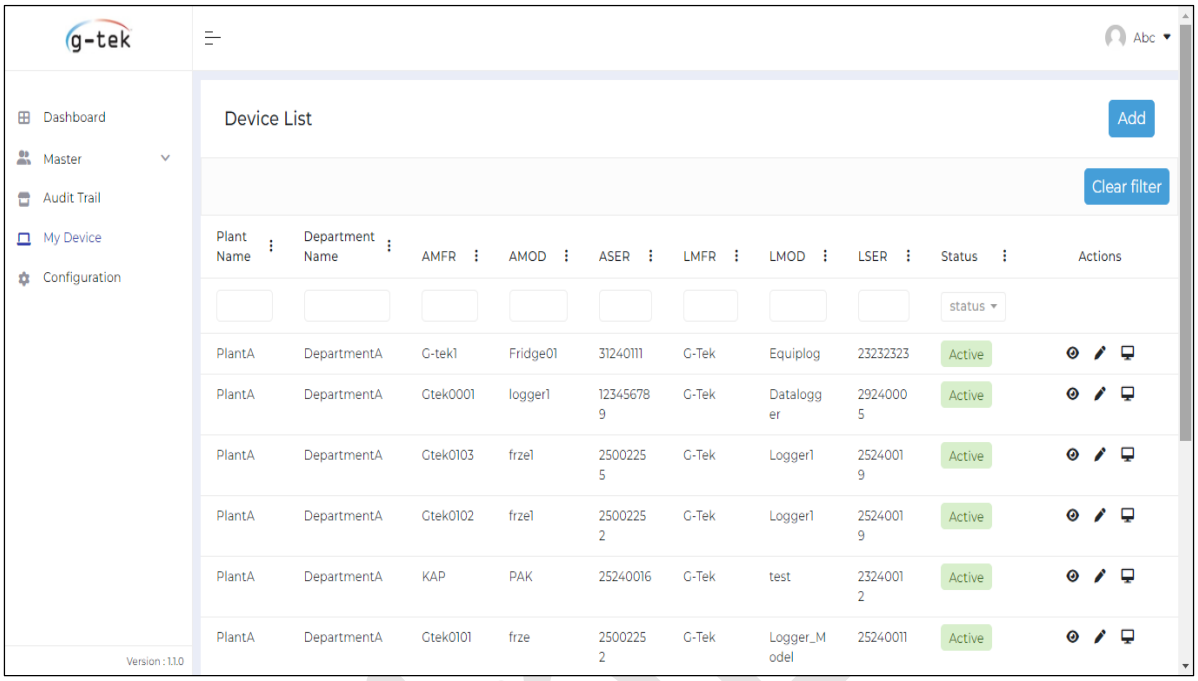


Figure 47 Add device in GtekCloud Application

➢ Download the data of registered data logger using mobile application.
➢ Once the data is downloaded, data can be viewed on the application dashboard as shown in figure 48.

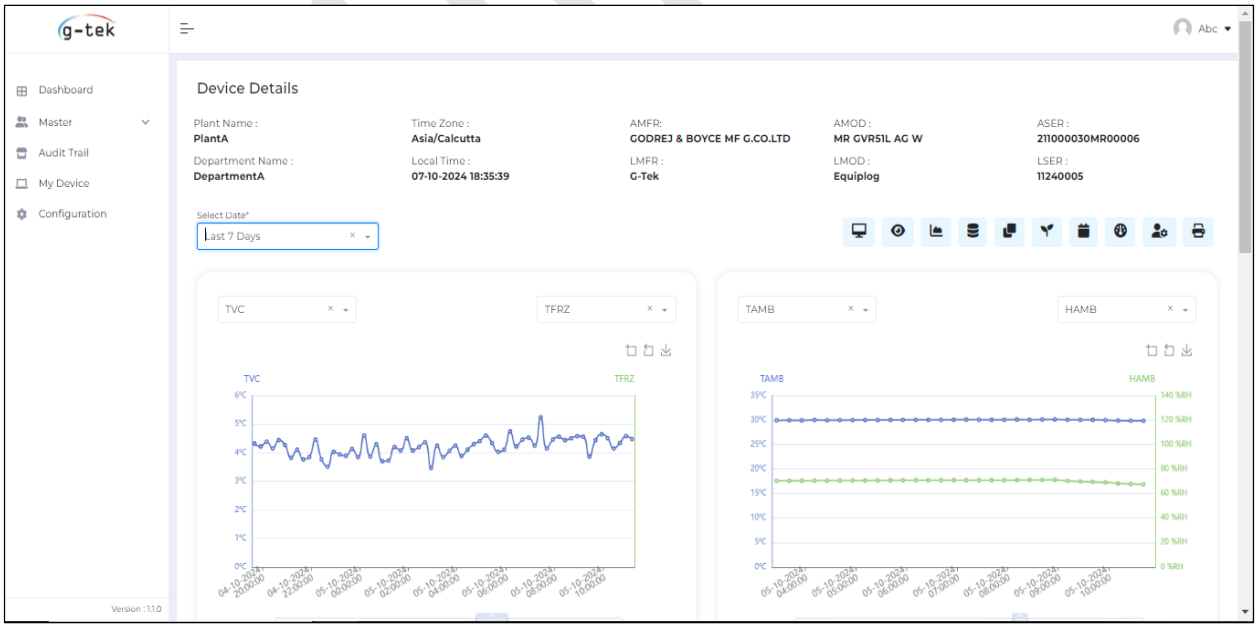


Figure 48 Gtek Cloud Graph view Dashboard for selected data logger

➢ Click on  icon to view KPI dashboard for the selected device in the cloud application as shown in figure 49.

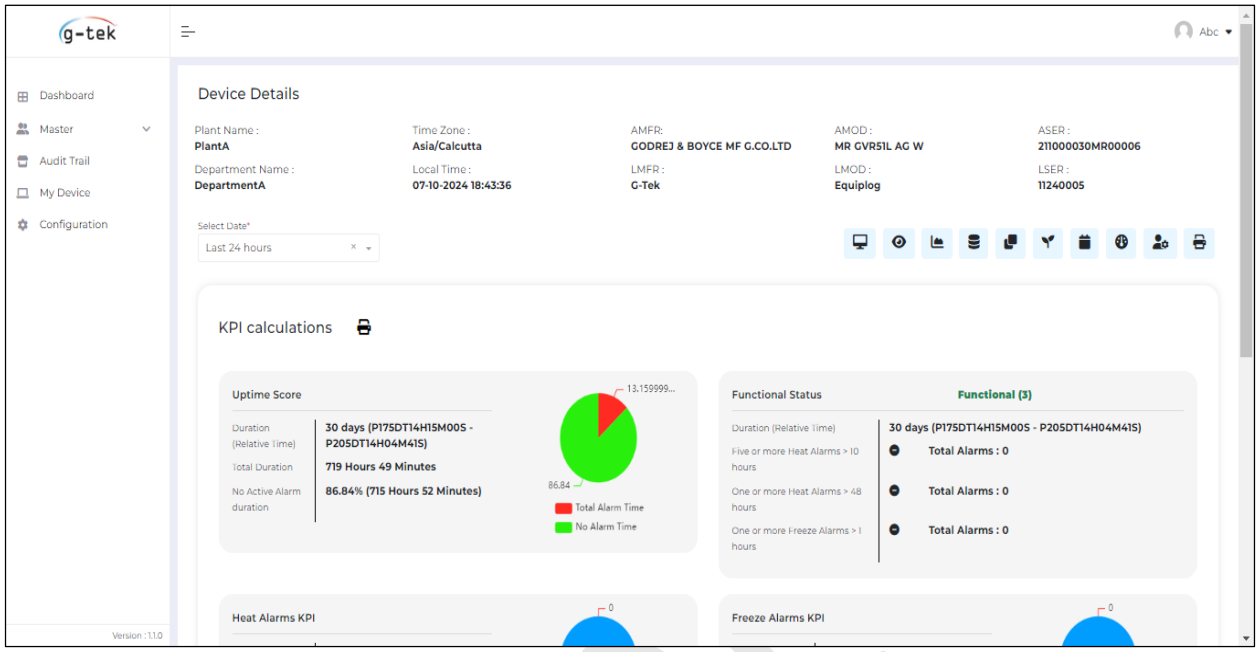


Figure 49 Gtek Cloud KPI Calculation view Dashboard for selected data logger

➢ Most recent data record is shown as current data on the cloud application as seen in the figure 50.

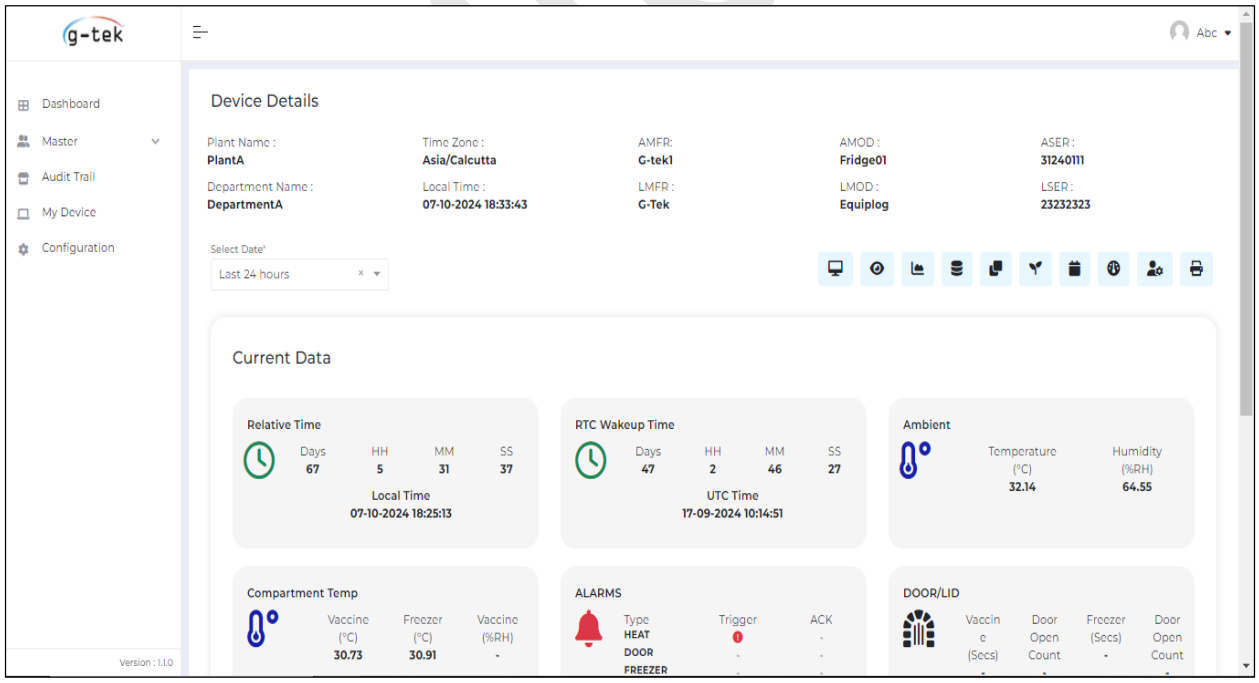


Figure 50 Gtek Cloud Current Data Dashboard for selected data logger

➢ For detailed operation of the Gtek Cloud application, refer Help file of the application.

7.4 GSM Functionality in the Data Logger

When the Data logger includes GSM Add-on module, Data logger needs to be registered on the Gtek cloud application first.

Once registered, the GSM module will send the stored data on the cloud application as per the store interval and transmit instantaneous data whenever an event generated in the data logger.

- When the data logger's Mains supply is disconnected, and it operates on battery, only event data are sent on the cloud application and for remaining time GSM will be in sleep mode to sustain the Battery.
- When mains power is restored, the GSM module sends all logged data to the cloud application, ensuring no data is lost.
- In case, the GSM signal is not good enough for sending the data on the cloud application, when signal strength comes that data will be sent on the application.

Note: With GSM add-on, battery backup will depend on the number of events generated during the data logging, in case of power outage condition.

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, 35 W
- Cable Assembly for Analog/Digital Interface
- Cable Assembly for Power port

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

8.2 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.

8.3 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. 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

- Avoid exposing the data logger to high temperatures or open flames, as these conditions may lead to the battery exploding.
- Ensure that the Data logger is securely fitted with the appliance at all the times.
- The back panel of the data logger should be opened with care to protect the battery and sensor wiring.
- Avoid allowing the sensor cables to come into contact with sharp objects.
- The USB Type C port is provided for M2M data connection, not for power output to other Devices.

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 Maintenance Tasks

- Daily
  - Every morning and afternoon:
    - Check the temperature of the compartment(s)
    - Fill in the daily record sheet
- Weekly
  - On the first day of every week:
    - Wipe away any moisture builds up around cabinet lid
    - Clean the solar array (In case of DC supply input from solar array)
- Monthly
  - On the first day of every month:
    - Clean the refrigerator, condensers and compressors and drain any water from the bottom of the cabinet using the inbuilt drain
    - Check the solar array is not shaded between 7am and 5pm
- Half yearly
  - Every 6 months:
    - Check all mechanical fixings and electrical connections (including the array)

10 TIPS AND ASSISTANCE

Table 8 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.
Temperature reading on the display Shows "- -.- °C ".	▪ Sensor cable might not be inserted properly. ▪ Sensor cable might be broken or input value is out of measuring range.
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 6.6 .
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 6.4.4 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 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 mains power of the logger is OFF?	▪ NO. If the mains power is disconnected and device is on battery, then both Modbus and LINbus communication will not run.
If communication breaks or mains power 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 batch has started?	▪ No, the user cannot change the configuration parameters after the batch has started.

11 ORDER CODE

The user can choose the Equiplog Data logger from available options as shown in the table 8.

Table 9 Order Code

Order Code	Description
99943	Level-1: Data Logger with M2M Interface
99942	Level-2: Integrated EMD with Local communication
99941	Level-3: Integrated EMD with Local and remote communication
99949	Level-3: Integrated EMD with Local and remote communication (GSM International Add ON)