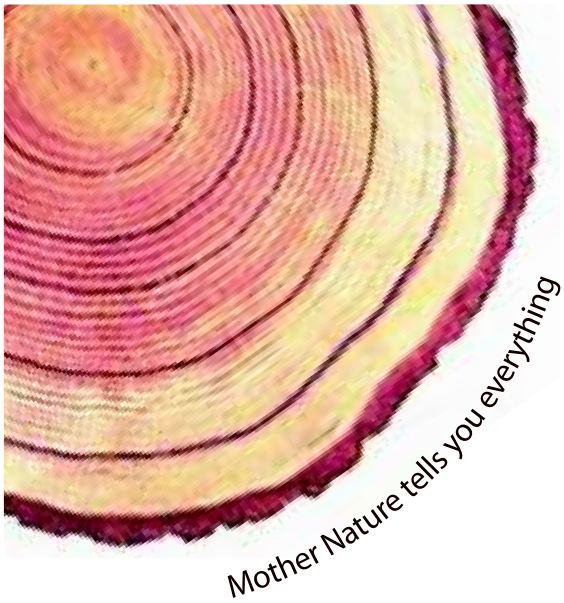


# OPERATING MANUAL

LM Pro

# LM$^{Pro}$ IN074
# Electronic Shipping Indicator
# Model No.: 9995x

English/ 2023/ Rev.1.0

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LM Pro IN074

# 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.
- There are no user serviceable parts inside. For any defect, please consult the factory or the dealer from where you bought.

## 1.3. Protecting the Environment

- Dispose of faulty rechargeable 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 electronic data loggers (observe local regulations) or return the product to G-Tek for disposal. (Dispose or recycle the LM$^{Pro}$ IN074 Electronic Shipping Indicator in accordance with the WEEE 2012/19/EU guidelines or your local regulations. For the suitable recycling, the indicator may also be returned to the manufacturer.)

LM Pro IN074

# 2 SPECIFICATIONS

## 2.1. Use

**LM$^{Pro}$ IN074** is an Electronic Shipping Indicator. It shows if a vaccine is exposed to time-temperature limits beyond stipulated by WHO/PQS/E06/TR07.4 **.** There are 4 models to choose from, based on the vaccines being transported – Type C, Type A/B, Type Rotateq and Type Prevenar. An electronic temperature sensor along with LCD display indicates "✓" if the product has remained within exposure limits. If the product is exposed beyond time-temperature limits as specified based on the type of vaccine, the display shows "X". User can see the history data of entire journey of vaccine using keyboard. Display is non flashing type for easy photocopying. It is accompanied with a Shipment Information Card.

The temperature readings are monitored and saved throughout the entire duration of measurement program.

LMViewIN-074 software needs to be installed in PC To download data to generate a report in pdf format and to export data in csv format for further use.

## 2.2 Technical Data

*Table 1 Technical Specifications*

| **Model** | **LM$^{Pro}$ IN074** |
|---|---|
| | **General** |
| Integrated Sensor | Thermistor - 10K NTC |
| Temperature Measurement Range | -30 °C to + 60 °C (-22 °F to +140 °F) |
| Accuracy | ± 0.5 °C for the range -30 °C to + 45 °C<br>± 0.7 °C otherwise |
| Resolution | 0.1 °C display and storage |
| Unit of Measurement | Data storage and display in °C |
| Calibration | Each Electronic Shipping Indicator accompanies NABL (ISO/IEC 17025) traceable certificate |
| Alarm | Visual - Temperature reading on display along with ↑or ↓ arrow, bell, alarm type symbols for high/medium/low threshold |
| Alarm Settings* | **Type C:**<br>Alarm1: High Threshold: >= 45 °C; Single event for >1 hour<br>Alarm2: Medium Threshold: >=30 ° C; cumulative exposure for >10 hours<br>Alarm3: Low Threshold: <= -0.5 °C; Single event for >1 hour |
| | **Type A/B:**<br>Alarm1: High Threshold: >= 45 °C; Single event for >1 hour<br>Alarm2: Medium Threshold: >=30 ° C; cumulative exposure for >10 hours<br>Alarm3: Low Threshold: >= 10 °C; cumulative exposure for >20 hours |

| | |
|---|---|
| | **Type Rotateq:**<br>Alarm1: High Threshold: >= 27 °C; Single event for >1 minute<br>Alarm2: Medium Threshold: >=17 ° C; cumulative exposure for >2 hours<br>Alarm3: Low Threshold: <= -25 °C; Single event for >1 minute |
| | **Type Prevenar:**<br>Alarm1: High Threshold: >= 40 °C; Single event for >1 hour<br>Alarm2: Medium Threshold: >=30 ° C; cumulative exposure for >10 hours<br>Alarm3: Low Threshold: <= -0.5 °C; Single event for >1 hour |
| Response Time | T90 < 10 minutes as per EN12830:1999 |
| Logging Interval* | Measurement interval 1 minute and<br>Data store interval 5 minutes, pre-Fixed |
| Logging Start Delay* | 60 mins after start of the device |
| **Power Requirement** | |
| Battery | Non-Replaceable 3.0 V 620 mAh; CR2450 Panasonic (or Equivalent) Coin Cell Battery |
| Battery Life | Storage before Start: 18 months<br>Recording Period: 40 days<br>Data retention period after stop: 6 months |
| **Environmental Specification** | |
| Temperature during Transportation and Storage – Device inactivated | -30 ˚C to 60 ˚C |
| Temperature during operation | -30 ˚C to 60˚C (EN12830:1999 Table3, Climatic Type C) |
| Humidity During Transportation, Storage, and usage | 0 to 95% RH non-condensing |
| **PC Interface and Software** | |
| PC Interface | Data of max. 40 days can be extracted using LMViewIN-074 software. History data of 40 days can be seen using the device keyboard and display without attaching to PC. |
| Software Compatibility | LMViewIN-074 is compatible with Windows Operating System currently supported by Microsoft |
| Connectivity | USB 2.0 Type-A Ports Compatible; Data Download Time: approx. 6 minutes for full data download |
| **Human Interface** | |
| Display Type | Character LCD Display with Min/Max, Battery Level Indication, OK/Alarm, calendar, clock, duration, delay counter, Alarm high and Low, single/cumulative alarm, Bell, REC indication and Current reading with measurement unit.<br>The display is static, which allows photocopying. |
| Memory Size | 40 days overview on the display/ PDF report at store interval of 5 minutes using LMViewIN-074 Software |
| Activation | Device activation by long press of “Start/Stop” button for more than 10 seconds. Please refer to the operating manual for more details. |
| De-Activation | Device will automatically be deactivated at the end of 40 day recording period. |

LM Pro IN074

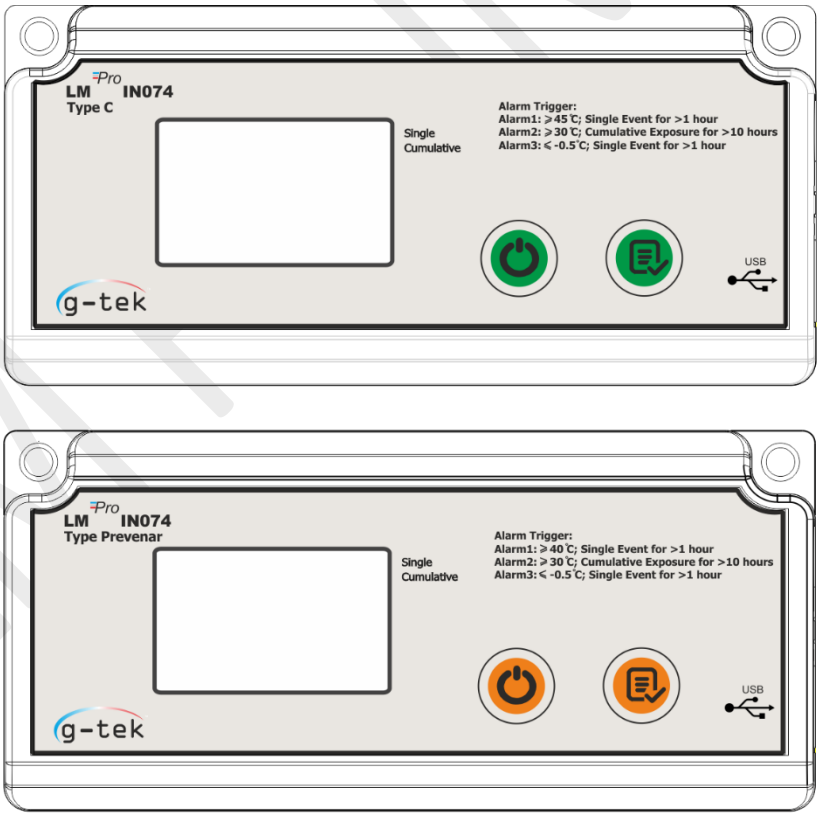
| | |
|---|---|
| | For manual deactivation of the device, press " Start/Stop " button again for 10 seconds (To avoid wrong trigger, if the button is pressed for more than 30 seconds, device will not be stopped.). |
| Type Identification | Clearly marked for Type C, Type A/B, Type Rotateq and Type Prevenar on devices with different colored casing. |
| Shipment Information Card | 14 x 14 cms; Yellow for Type C and Prevenar and Blue for Type A/B and Rotateq. Card material accepts indelible markings in ball point pen.<br>User instructions are available in English, French or Spanish as per customer request. |
| Power ON Indication | All Segments on Display turn ON at activation |
| Mounting of Device | Through moisture resistant adhesive on shipment card/ provided mounting holes on the device. Refer to operating manual for details |
| Material | Polycarbonate Plastic: non-breakable, non-corrodible housing |
| Warranty | 15 months from the date of dispatch. Refer to warranty certificate for more details. |
| Service Provision | No user serviceable parts inside. |
| **Physical Characteristics** | |
| Overall Dimension (L x W x H) mm | 128 x 60 x 16 mm |
| Weight | Approximate 100 gms |
| **Standards** | |
| Electromagnetic Compatibility | IEC 61000-6-2/6-3 |
| Resistance to Electrical Storms | IEC 61000-6-2; (IEC 61000-4-2 Basic Standard for applicability of tests) |
| IP Rating | IEC 60529: IP 65 |
| Impact Resistance | 5 drops from 1 meter onto concrete floor at room temperature with battery in place. Device does not get damaged and there is no loss of calibration. |
| Vibration | EN12830:1999 Clause 4.9.3.2 and Test Method 5.6.6 |
| RoHS | Compliant (EU directive 2011/65/EU) |
| Verification | In accordance with PQS verification protocol E006/TR07-VP.4 |

***: Current settings are pre-fixed from factory as per requirements of WHO/PQS/E006/TR07.4. Other settings are available on request.**

# 3 UNPACKING THE PRODUCT

## 3.1 Unpacking and Inspection of LM$^{Pro}$ IN074

- LM$^{Pro}$ IN074 Electronic Shipping Indicator is dispatched in a recyclable, environment friendly package specially designed to give adequate protection during transit.
- Figure 1 shows Four models of LM$^{Pro}$ IN074 Electronic Shipping Indicator Viz. Type C, Type Prevenar, Type A/B and Type Rotateq.
- 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 are taken out from the box.
- If the LM$^{Pro}$ IN074 is for immediate use, you can start installing it as per Installation instructions.
- **Please preserve the original packing along with all internal packing for future transport requirements.**



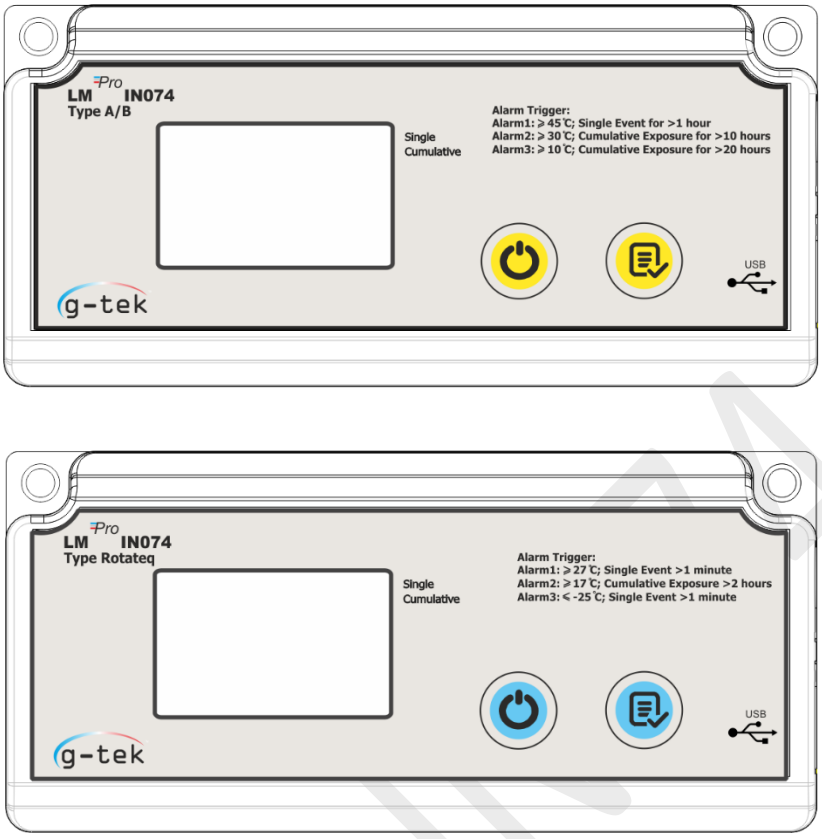



*Figure 1 LM$^{Pro}$ IN074 Electronic Shipping Indicator models*

- As per the LM$^{Pro}$ IN074 Electronic Shipping Indicator models, default alarm settings are as below:

| Alarm Type | Alarm Threshold | Period of exposure |
|---|---|---|
| **Type-C** | | |
| Alarm-1 | >= 45 °C | 1 hour continuous exposure |
| Alarm-2 | >= 30 °C | 10 hours cumulative exposure |
| Alarm-3 | <= -0.5 °C | 1 hour continuous exposure |
| | | |
| **Type-Prevenar** | | |
| Alarm-1 | >= 40 °C | 1 hour continuous exposure |
| Alarm-2 | >= 30 °C | 10 hours cumulative exposure |
| Alarm-3 | <= -0.5 °C | 1 hour continuous exposure |
| | | |
| **Type-A/B** | | |
| Alarm-1 | >= 45 °C | 1 hour continuous exposure |
| Alarm-2 | >= 30 °C | 10 hours cumulative exposure |
| Alarm-3 | >= 10 °C | 20 hours cumulative exposure |
| | | |
| **Type-Rotateq** | | |
| Alarm-1 | >= 27 °C | 1 minute continuous exposure |
| Alarm-2 | >= 17 °C | 2 hours cumulative exposure |
| Alarm-3 | <= -25 °C | 1 minute continuous exposure |

## 3.2 Mechanical Dimensions of LM$^{Pro}$ IN074

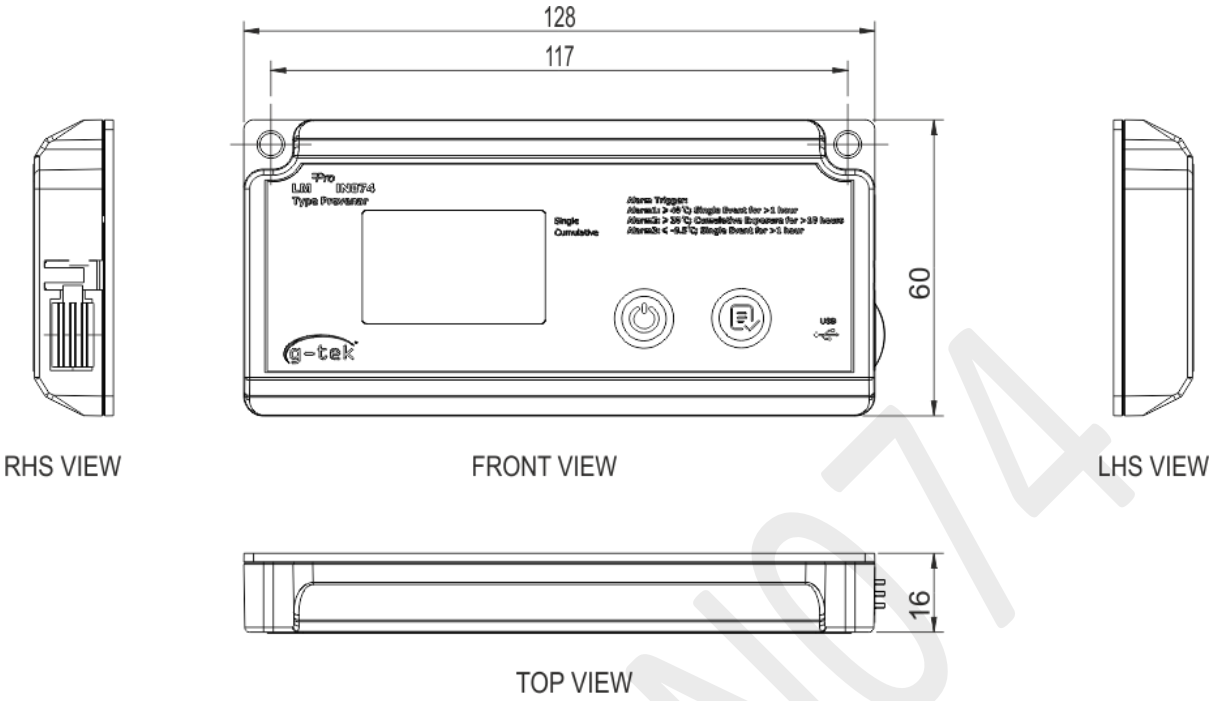



*Figure 2 Overall dimensions of LM$^{Pro}$ IN074*

| Overall Dimensions | |
|---|---|
| Dimension (L x W x H) mm | 128 x 60 x16 mm |
| Mounting | Screw Mounted |
| Weight | Approx. 100 gms |

## 3.3 Enclosure Mounting of LM$^{Pro}$ IN074

- Screw mounting through 2 holes provided on the device.

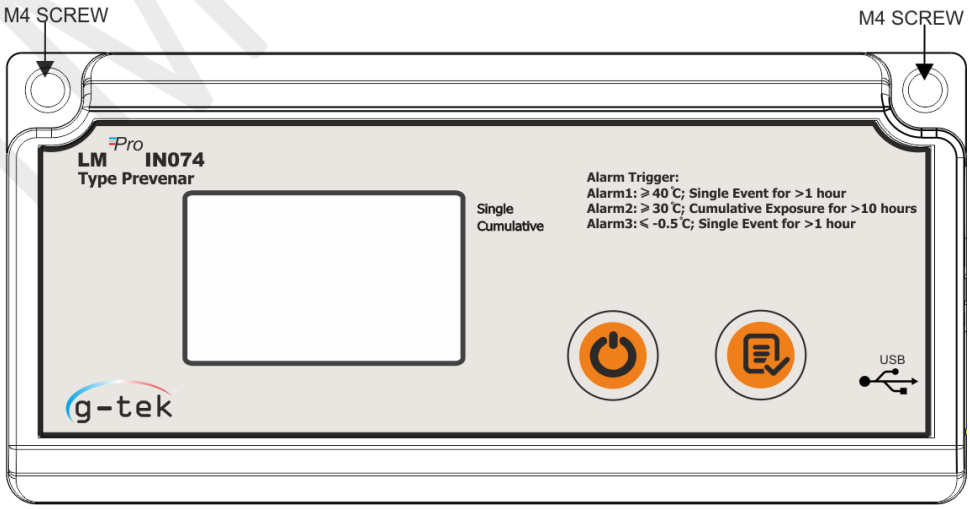



*Figure 3 Screw mounting of LM$^{Pro}$ IN074*

- Stick the device on the shipment information card as per the instruction written on it as below figure 4.

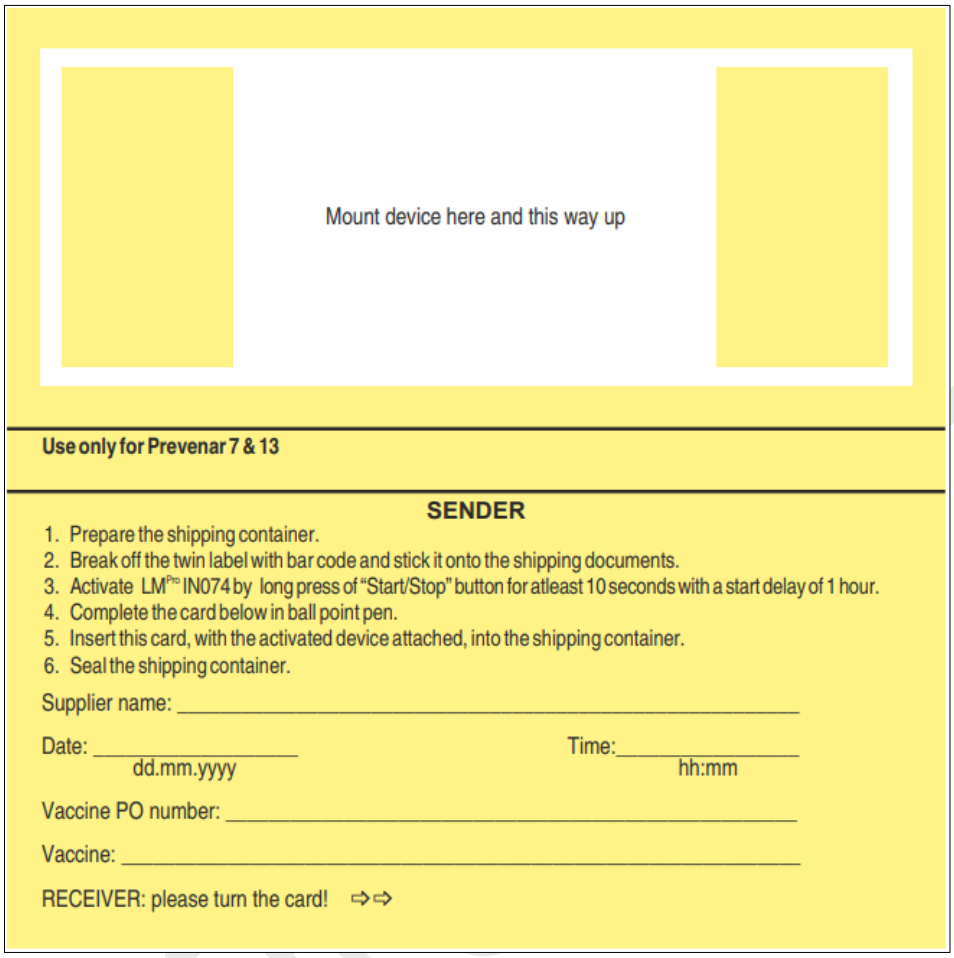



*Figure 4 Mounting of LM$^{Pro}$ IN074 on shipment information card*

# 4 TERMS AND DEFINITIONS

## 4.1 Abbreviations and its Description

*Table 2 Commonly used Abbreviations*

| Abbreviation | Description |
|---|---|
| Srt | Starting the LM$^{Pro}$ IN074 |
| Et | Elapsed time in terms of Days and Hours |
| REC | Data logging is ON |
| Stp | Data logging is stopped |
| Err | Error message for temperature out of measurement range |
| MIN | Minimum temperature |
| MAX | Maximum temperature |
| DUR | Duration in Hr:Mn |

## 4.2 Definitions

1. Cumulative Alarm: If temperature reading remains beyond its alarm trigger limit and total time for the day exceeds the alarm delay, Cumulative Alarm is triggered.
2. Single Event Alarm: If the temperature reading remains beyond its alarm trigger limit for continuous time exceeds its alarm delay, Single Event alarm is triggered.
3. Stop mode: End of the recording of temperature readings by the device.
4. Elapsed Time: Total time elapsed in Day – hour format since the start of recording of the device.
5. Day calculation: Each day signifies a cycle of 24 hours from 00:00 to 23:59. When the start delay has elapsed and the device starts recording, Day 1 begins with Et 00 00 (Day Hour). As the internal clock of the device advances from 23:59 to 00:00, Day count will increment by one and hours will change from 23 to 00 as seen on the display as “Et 01 00”.

**Note:** For explanation of functions, LM$^{Pro}$ IN074 Electronic Shipping Indicator model -Type Prevenar is used throughout the manual.

LM Pro IN074

# 5 PRODUCT DESCRIPTION

## 5.1 Display (LCD)

The multi–Character LCD Display consists of OK/Alarm, Bell, Min/Max, Battery Level indication, USB connection, Alarm high and Low, Rec, day, calendar, clock, duration, delay counter, day/time/duration text and current temperature reading with measurement unit. The position and description of each segment is shown in figure 5.

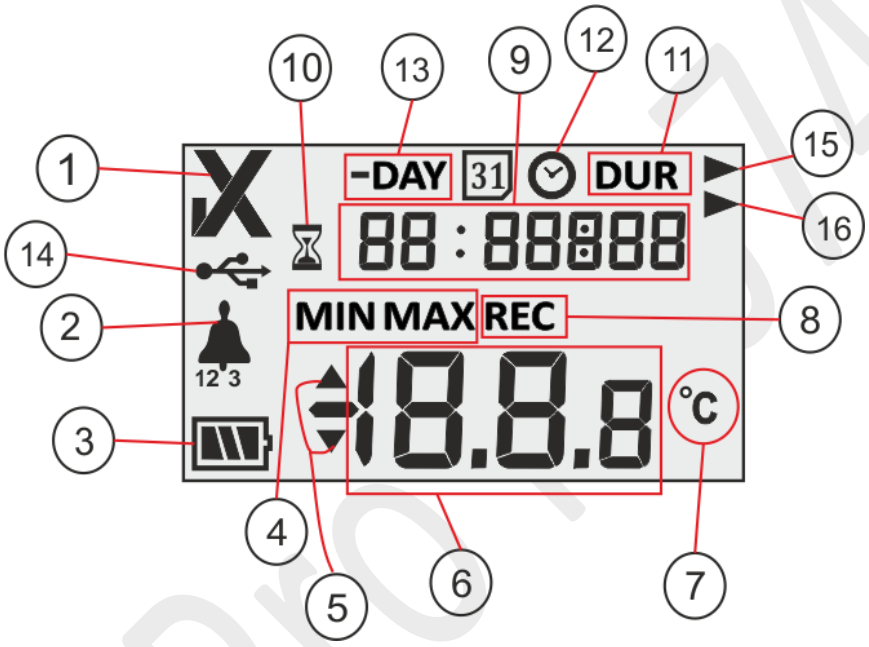



*Figure 5 LCD Display overview*

1. ✓/ **X** OK/NOK symbol:
   a. **"✓"** this is the default symbol that comes when datalogging is started in REC mode. If any time in last 40 days, alarm limits are not triggered, the OK symbol **"✓"** remains on the display.
   b. If any time in last 40 days, alarm limits are triggered, the OK symbol **"✓" will change to NOK symbol "X" and will remain even if alarm gets restored.**
2. Bell symbol for alarm trigger indication with respective alarm type. e.g., For Alarm1 '1' will be displayed below bell icon, '2' for Alarm2, '3' for Alarm3, same for all models. When temperature is beyond alarm threshold value but alarm condition not met, only respective Alarm type will be visible.
3. Battery capacity: Sufficient ; Partly empty ; Low ; Empty
4. Min: Minimum stored reading for the given day
   Max: Maximum stored reading for the given day
5. Upper ▲/ Lower ▼ limit if reading exceeded alarm limits.
6. Current temperature reading
7. Temperature Measurement unit (°C)
8. Recording state indicator: REC - Recording

9. Digits used to display various parameters like Day, time and duration
10. Delayed start indicator: when the device is activated, it will wait for 60 minutes to start logging the data. During this time, the sand clock symbol will be on.
11. DUR: Total alarm time duration symbol
12. Clock symbol: This symbol comes along with alarm trigger time displayed in digits
13. -DAY: Previous day(s) number indicator symbol for History data
14. USB connection symbol
15. Alarm type: Single Event Alarm symbol
16. Alarm type: Cumulative Alarm symbol

**Note:** For Technical reasons, the display intensity of liquid crystal display becomes lower at temperatures below 0°C. This has no influence on the measuring accuracy. For technical Reasons, the battery performance decreases at lower temperatures. The battery performance restores to original condition when data loggers are placed at room temperature after being kept at lower temperature.

## 5.2 Keys and their Function

**Start/Stop Key:** It is used to Activate the LM$^{Pro}$ IN074 and to stop the datalogging process when required, which is irreversible.

**Review key:** It is used to review the history days summary.

LM Pro IN074

# 6 USING THE PRODUCT

## 6.1 Activation of LM$^{Pro}$ IN074 Electronic Shipping Indicator

LM$^{Pro}$ IN074 Electronic Shipping Indicator is dispatched in deep sleep mode. To activate the LM$^{Pro}$ IN074, press "**Start/Stop" key** for about 10 seconds. Once it is activated, all segments of display will turn ON for 5 seconds followed by **"Srt"** – start message on the display as shown in figure 6.

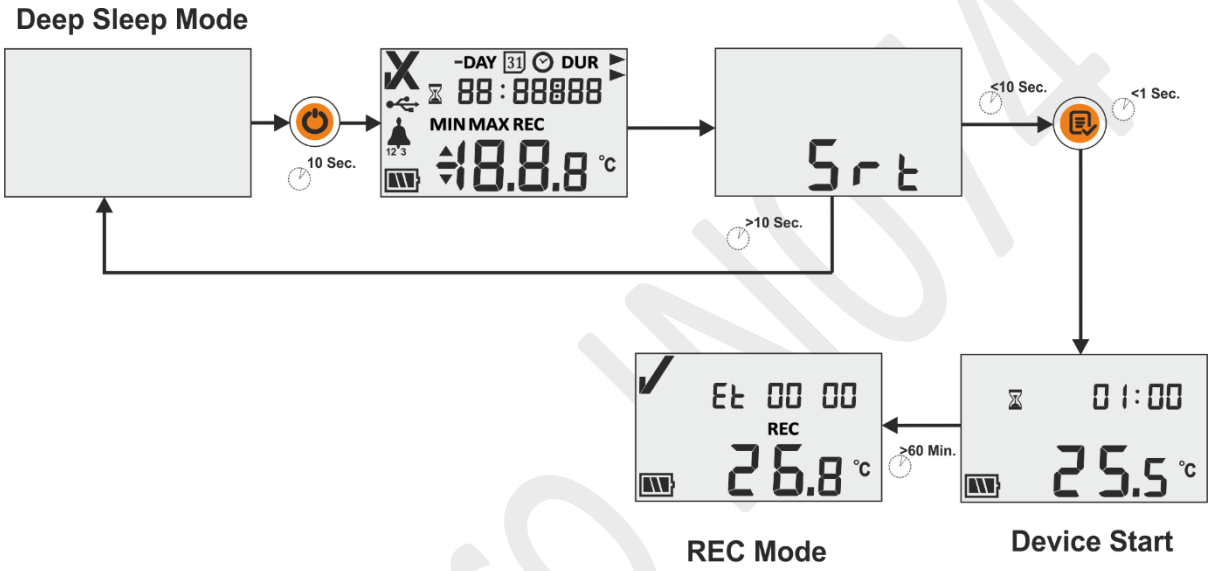



*Figure 6 Activation of LM$^{Pro}$ IN074*

## 6.2 Starting the Data logging of LM$^{Pro}$ IN074

The user must press **"Review"** key while **"Srt"** message is visible on display to start LM$^{Pro}$ IN074. If user does not press **"Review"** key while **"Srt"** message is visible, the data log LM$^{Pro}$ IN074 is returned to deep sleep mode after 10 seconds.
Once the LM$^{Pro}$ IN074 is started, the delay counter of 60 minutes is stared. The sand clock indication and corresponding delay counter in **"01:00"** (Hr:Mn) along with temperature reading and battery status will be visible on the display as shown in figure 6.

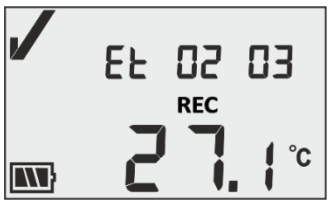
After completion of the start delay, recording will start in the LM$^{Pro}$ IN074 which is indicated by **"REC"** message on the display. In addition, Elapsed time counter will also get started specified by Et 00 00 ( refer figure 6).

## 6.3 Data Recording Mode on Display

In this example, possible circumstances for the displaying data on the LM$^{Pro}$ IN074 indicator when recording mode is ON are explained.

Data recording mode is ON which is indicated by **"REC"** message on display.

1. Temperature reading is within the Alarm threshold value.
   - The Elapsed time from the starting of the LM$^{Pro}$ IN074 is 2 days 03 hours which is indicated by **"Et 02 03"** .
   - Battery status is Ok, OK symbol **"✓"** shows the load status is OK.




2. Temperature reading is beyond the Alarm threshold value; however, the Alarm trigger condition has not been met.
   - The Elapsed time from the starting of the LM$^{Pro}$ IN074 is 12 days 6 hours which is indicated by **"Et 12 06"** .
   - Battery status is Ok, OK symbol "✓" shows the load status is OK.

3. Temperature reading is beyond the Alarm threshold value and Alarm trigger condition has met.
   - The Elapsed time from the starting of the LM$^{Pro}$ IN074 is 19 days 8 hours which is indicated by **"Et 19 08"**.
   - The bell symbol along with alarm type 1 and Up arrow indicates that the Alarm1 has been triggered as the temperature reading was >40°C continuously for more than 1 hours.
   - Battery status is Ok, NOK symbol "X" seen on the display indicates the load should be rejected.

4. When the temperature is beyond its measurement range or sensor is broken "Err" message will be seen on the display.
   - Err message Remains on the display until the temperature falls within its measurement range.

## 6.4 Stopping the Data logging of LM$^{Pro}$ IN074

There are two methods to stop the recording of the LM$^{Pro}$ IN074 :

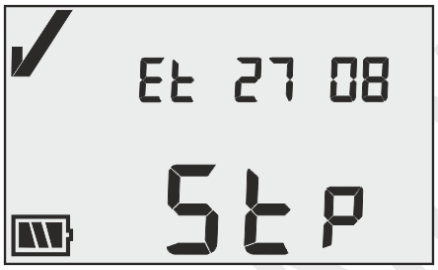
1. After 40 days since datalogging has started, the LM$^{Pro}$ IN074 automatically stops data recording.
2. Press **"Start/Stop"** key for at least 10 second, flashing **"Stp"** message will appear on display, if user releases **"Start/Stop"** key, it becomes steady. Stopping the recording of LM$^{Pro}$ IN074 is an irreversible process.

**Note:** If the **"Start/Stop"** key is kept pressed for more than 30 seconds, LM$^{Pro}$ IN074 will not be stopped and continue to be in recording state.

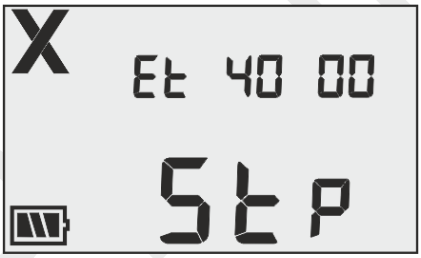
### 6.4.1 Stopped condition Display

In Stopped mode of the LM$^{Pro}$ IN074, Elapsed counter is stopped, display shows **"Stp"** message instead of the temperature reading and **"REC"** indication disappeared. There can be two possible scenarios as explained in examples below:

1. Data logging stopped manually on 27 days at 8 hours with OK symbol **"✓"** on the display implies that No alarm occurred during the recording in the data log LM$^{Pro}$ IN074.




2. Data logging has stopped automatically after 40 days with NOK symbol **"X"** on the display indicates that Alarm(s) has occurred during the recording in the LM$^{Pro}$ IN074.

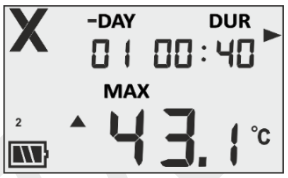
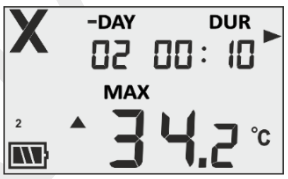


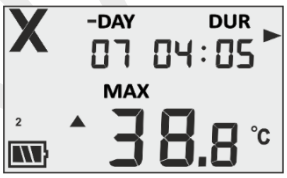
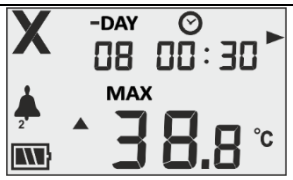
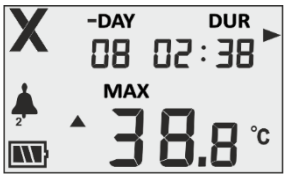

For details of alarm, refer section 6.4 – Reviewing Statistical Data on Display.

## 6.5 Reviewing Statistical Data on Display

The user can review the history data on the display by pressing **"Review" key** in steps, starting with day 1. For reviewing statistical data on display, LM$^{Pro}$ IN074 model: Type Prevenar is taken as an example, where day wise history is explained in detail.
For given day, if temperature cross over the alarm threshold values its alarm history will be seen in sequence with corresponding min/max temperature. In case, temperature remains within alarm threshold values for given day , only day no. is seen on the display.

**Note:** To exit from the review mode, either user can press **"Start/Stop"** and **"Review"** keys simultaneously for 1 sec or continue reviewing history data until last elapsed day.

| -DAY | Temperature conditions and alarm status | Display |
|---|---|---|
| Day1 | Press Review key for 1 second.<br>Alarm-1 limit was crossed for 26 minutes on day 1 with max temperature 43.1 °C, the duration not enough to trigger the alarm.<br><br>Press Review key for 1 second.<br>Alarm-2 limit was crossed for 40 minutes on day 1, duration not enough to trigger the alarm. | <br>  |
| Day2 | Press Review key for 1 second.<br>Alarm-2 limit was crossed for 10 minutes on day 2 with max temperature 34.2 °C, the duration not enough to trigger the alarm. |  |
| Day3 | Press Review key for 1 second.<br>No alarm excursions were occurred on day 3. | |
| Day4 | Press Review key for 1 second.<br>Alarm-1 was triggered on day 4 at 14 hr 35 min with max temperature 45.5 °C indicated by bell-1 symbol.<br><br>Press Review key for 1 second.<br>The temperature remained beyond alarm-1 for 1 hr 20 min on day 4.<br><br>Press Review key for 1 second.<br>Alarm-2 limit was crossed for 4hr 35 min on day 4 with max temperature 45.5 °C, duration not enough to trigger the alarm. | <br> <br> |

| | | |
|---|---|---|
| Day5 | Press Review key for 1 second.<br>No alarm excursions were occurred on day 5. | |
| Day6 | Press Review key for 1 second.<br>On day 6, alarm-3 was triggered at 8 hr 50 min with min temperature -2.8 °C indicated by bell-3 symbol.<br><br>Press Review key for 1 second.<br>The temperature remained beyond alarm-3 for 1 hr 50 min on day 6. | <br> |
| Day7 | Press Review key for 1 second.<br>Alarm-2 was crossed for 4 hr 5 min with max temperature 38.8 °C on day 7, duration not enough to trigger the alarm. |  |
| Day8 | Press Review key for 1 second.<br>On day 8, alarm-2 was triggered at 0 hr 30 min with max temperature 38.8 °C indicated by bell-2 symbol.<br><br>Press Review key for 1 second.<br>The temperature remained beyond alarm-2 for 2 hr 38 min on day 8.<br>Here, Alarm-2 is triggered as collective duration of since day 1 has exceeded the cumulative exposure time. |  <br>  |
| Day9 | Press Review key for 1 second.<br>Alarm-3 was crossed for 45 min with min temperature -3.6 °C on day 7, duration not enough to trigger the alarm. | |
| Day10 | Press Review key for 1 second.<br>No alarm excursions occurred on day 10. | |

## 6.6 Measurement

### Starting Measurement

With Default Configuration of the LM$^{Pro}$ IN074 indicator, the measurement program will be started automatically after 60 minutes of start up. The Configuration parameters are prefixed as per **WHO Specification reference WHO/PQS/E006/TR07.4** Issue date **16 October 2014** and user cannot change them from device menu.

- The LM$^{Pro}$ IN074 switches to recording mode showing **"✓", "Et 00 00", "REC",** message on display after completing 60-minute start delay.
- Temperature Data is logged at prefixed logging interval of 5 minutes.

## Tag Events

- In temperature measurement, an Alarm Set Tag event with a time stamp is logged when an Alarm condition(s) occurs based on the Alarm settings of the selected LM$^{Pro}$ IN074 model.
- When the temperature is restored within Alarm condition(s) during temperature measurement, an Alarm Reset Tag event with a time stamp is logged.

| Tag ID | Tag Event | Description |
|---|---|---|
| A1 | Alarm 1 Set | High Threshold is triggered |
| R1 | Alarm 1 Reset | High Threshold is restored |
| A2 | Alarm 2 Set | Medium Threshold is triggered |
| R2 | Alarm 2 Reset | Medium Threshold is restored |
| A3 | Alarm 3 Set | Low Threshold is triggered |
| R3 | Alarm 3 Reset | Low Threshold is restored |

**Note:** Number of data records get reduced according to number of Tag data events. Tag Event(s) can be seen in software application and generated pdf report after downloading data.

## 6.7 Reading out Data

### 6.7.1 Connecting with the Software Application

### Displaying a measurement data report

- Connect the LM$^{Pro}$ IN074 to Windows PC via the USB Type-A port, as shown in figure 7.
- After connecting the LM$^{Pro}$ IN074 with PC, display remains ON and it shows USB port symbol along with the other values.

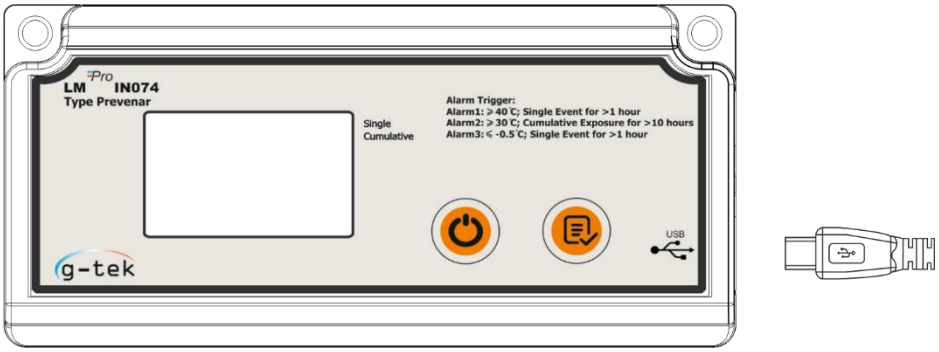



*Figure 7 Micro-USB Attachment*

## 6.7.2 Generating PDF report

- Open LMViewIN-074 software Application to carry out analysis for process readings. The pop-up window will appear as shown in figure 8. Select the appropriate file path and batch file name for saving the data file and press Save button.

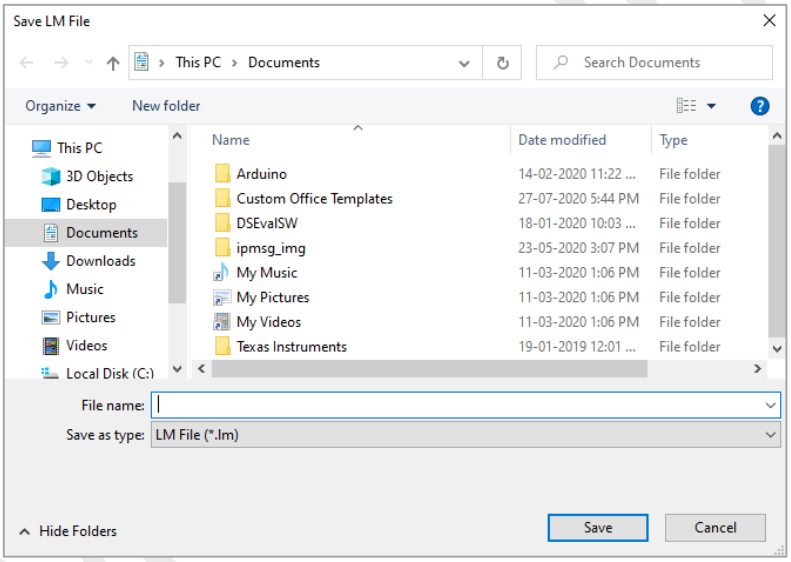



*Figure 8 Selecting file location for saving data summary*

- Downloading of data will be completed after some time and downloaded data can be seen in tabular form as shown in figure 9.

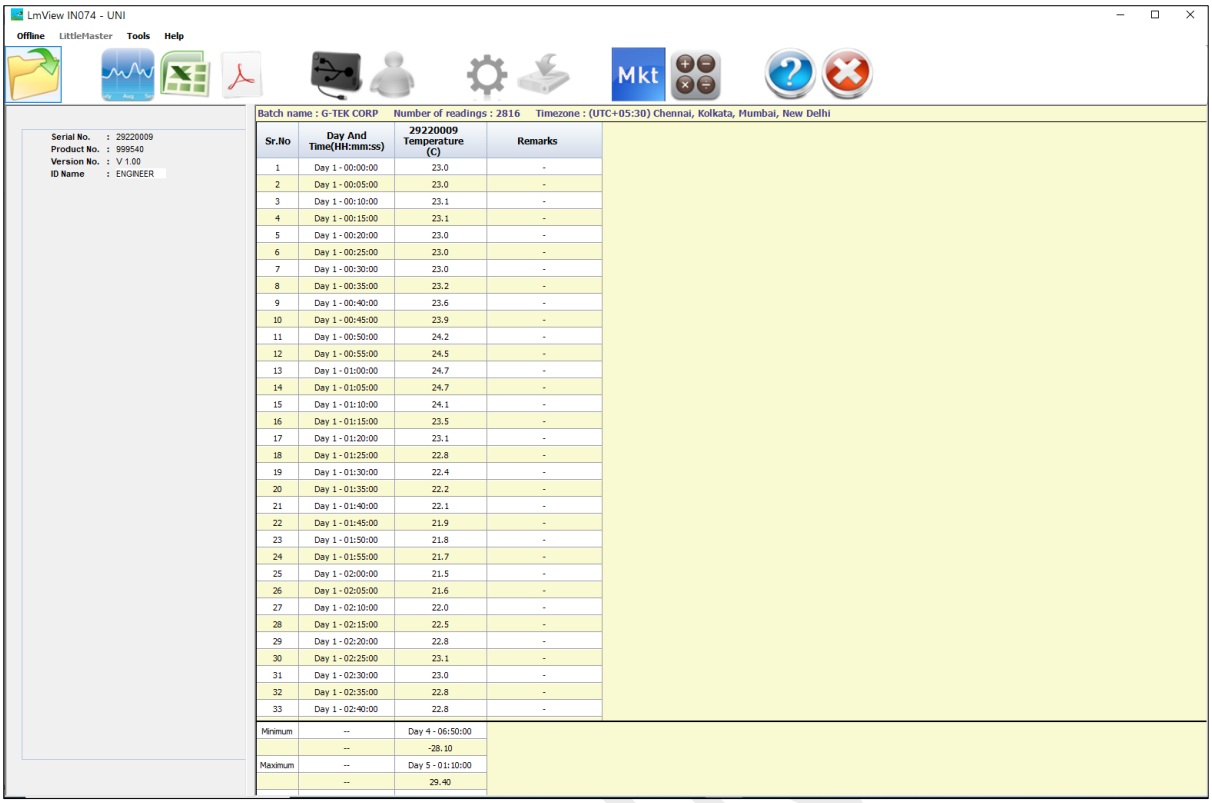



*Figure 9 Downloaded data summary*

- Generate the PDF report of data summary by clicking on icon. A pop-up window will appear for selecting the file path and filename of report to be generated as shown in figure 10.

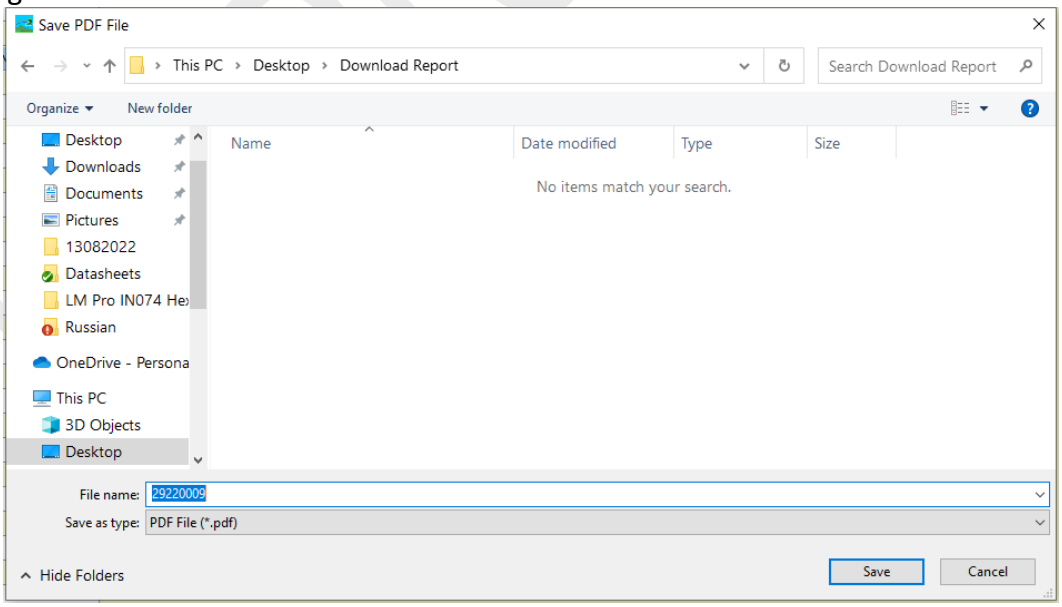
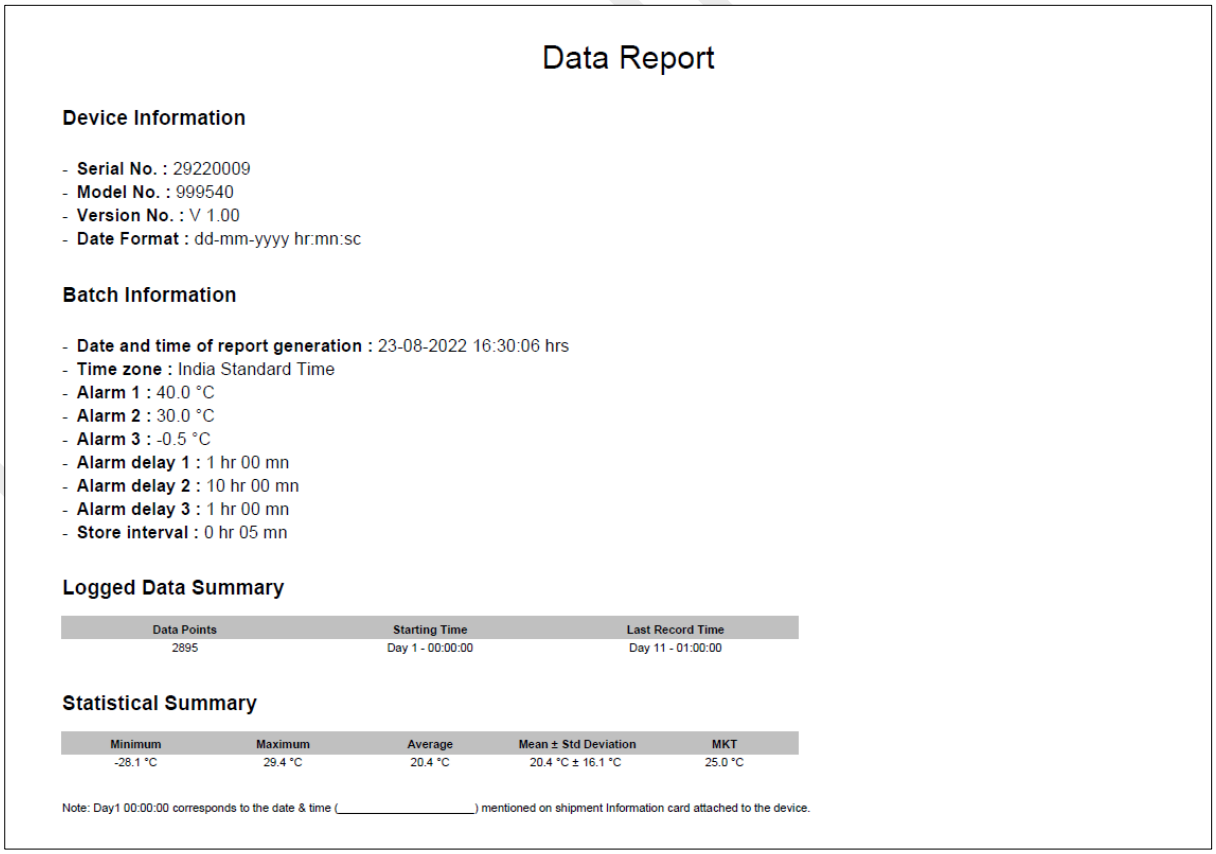



*Figure 10 Selecting file location for saving PDF report*

## 6.7.3 PDF Report Explanation

- Sample PDF file generated from LM$^{Pro}$ IN074 indicator for 22 days recorded data is shown in figure 11, figure 12 and figure 13. This report consists of following data:

1. Title of the report generated – Prefixed title
2. Device Information – Shows the device identification details
3. Batch Information – displays Prefixed alarm settings & store interval and report generation date and time with time zone
4. Logged Data Summary – consists total data points captured, starting and last record time
5. Statistical Summary – Statistical analysis of the total logged data
6. Data Summary – Shows max 40 days summary in table(Figure 12); Each row consists of a day summary:
   - Day: Entry of day is in **ascending order**
   - Min Temperature for the day
   - Max Temperature for the day
   - Alarm 1: Alarm 1 duration and trigger time
   - Alarm 2: Alarm 2 duration and trigger time
   - Alarm 3: Alarm 3 duration and trigger time
   - Alarm Status: OK / ALARM
   - Signature/Remarks/Action taken
7. Graph for the logged data –Graph for temperature data versus day and time; Graph title shows total day span for logged data.



Data Report

**Device Information**

- **Serial No.** : 29220009
- **Model No.** : 999540
- **Version No.** : V 1.00
- **Date Format** : dd-mm-yyyy hr:mn:sc

**Batch Information**

- **Date and time of report generation** : 23-08-2022 16:30:06 hrs
- **Time zone** : India Standard Time
- **Alarm 1** : 40.0 °C
- **Alarm 2** : 30.0 °C
- **Alarm 3** : -0.5 °C
- **Alarm delay 1** : 1 hr 00 mn
- **Alarm delay 2** : 10 hr 00 mn
- **Alarm delay 3** : 1 hr 00 mn
- **Store interval** : 0 hr 05 mn

**Logged Data Summary**

| Data Points | Starting Time | Last Record Time |
|---|---|---|
| 2895 | Day 1 - 00:00:00 | Day 11 - 01:00:00 |

**Statistical Summary**

| Minimum | Maximum | Average | Mean ± Std Deviation | MKT |
|---|---|---|---|---|
| -28.1 °C | 29.4 °C | 20.4 °C | 20.4 °C ± 16.1 °C | 25.0 °C |

Note: Day1 00:00:00 corresponds to the date & time (_____) mentioned on shipment Information card attached to the device.

*Figure 11 Sample PDF report part -1*

**Data Summary**

| | | | | Alarm 1 | | Alarm 2 | | Alarm 3 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Day | Min Temperature | Max Temperature | Duration | Alarm Trigger Time | Duration | Alarm Trigger Time | Duration | Alarm Trigger Time | Alarm Status | Signature / Remarks / Action taken |
| 1 | Day 1 | 21.5 °C | 27.7 °C | 0 hr 0 mn | - | 0 hr 0 mn | - | 0 hr 0 mn | - | OK | |
| 2 | Day 2 | 23.1 °C | 28.3 °C | 0 hr 0 mn | - | 0 hr 0 mn | - | 0 hr 0 mn | - | OK | |
| 3 | Day 3 | -27.1 °C | 27.5 °C | 0 hr 0 mn | - | 0 hr 0 mn | - | 1 hr 9 mn | 23 hr 51 mn | ALARM | |
| 4 | Day 4 | -28.2 °C | 28.3 °C | 0 hr 0 mn | - | 0 hr 0 mn | - | 23 hr 11 mn | - | ALARM | |
| 5 | Day 5 | 22.2 °C | 29.4 °C | 0 hr 0 mn | - | 0 hr 0 mn | - | 0 hr 0 mn | - | OK | |
| 6 | Day 6 | 22.1 °C | 26.9 °C | 0 hr 0 mn | - | 0 hr 0 mn | - | 0 hr 0 mn | - | OK | |
| 7 | Day 7 | 23.6 °C | 27.1 °C | 0 hr 0 mn | - | 0 hr 0 mn | - | 0 hr 0 mn | - | OK | |
| 8 | Day 8 | 23.2 °C | 28.6 °C | 0 hr 0 mn | - | 0 hr 0 mn | - | 0 hr 0 mn | - | OK | |
| 9 | Day 9 | 22.8 °C | 28.9 °C | 0 hr 0 mn | - | 0 hr 0 mn | - | 0 hr 0 mn | - | OK | |
| 10 | Day 10 | 22.9 °C | 27.2 °C | 0 hr 0 mn | - | 0 hr 0 mn | - | 0 hr 0 mn | - | OK | |
| 11 | - | - | - | - | - | - | - | - | - | - | |
| 12 | - | - | - | - | - | - | - | - | - | - | |
| 13 | - | - | - | - | - | - | - | - | - | - | |
| 14 | - | - | - | - | - | - | - | - | - | - | |
| 15 | - | - | - | - | - | - | - | - | - | - | |
| 16 | - | - | - | - | - | - | - | - | - | - | |
| 17 | - | - | - | - | - | - | - | - | - | - | |
| 18 | - | - | - | - | - | - | - | - | - | - | |
| 19 | - | - | - | - | - | - | - | - | - | - | |
| 20 | - | - | - | - | - | - | - | - | - | - | |
| 21 | - | - | - | - | - | - | - | - | - | - | |
| 22 | - | - | - | - | - | - | - | - | - | - | |
| 23 | - | - | - | - | - | - | - | - | - | - | |
| 24 | - | - | - | - | - | - | - | - | - | - | |
| 25 | - | - | - | - | - | - | - | - | - | - | |
| 26 | - | - | - | - | - | - | - | - | - | - | |
| 27 | - | - | - | - | - | - | - | - | - | - | |
| 28 | - | - | - | - | - | - | - | - | - | - | |
| 29 | - | - | - | - | - | - | - | - | - | - | |
| 30 | - | - | - | - | - | - | - | - | - | - | |
| 31 | - | - | - | - | - | - | - | - | - | - | |
| 32 | - | - | - | - | - | - | - | - | - | - | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 33 | - | - | - | - | - | - | - | - | - | - | |
| 34 | - | - | - | - | - | - | - | - | - | - | |
| 35 | - | - | - | - | - | - | - | - | - | - | |
| 36 | - | - | - | - | - | - | - | - | - | - | |
| 37 | - | - | - | - | - | - | - | - | - | - | |
| 38 | - | - | - | - | - | - | - | - | - | - | |
| 39 | - | - | - | - | - | - | - | - | - | - | |
| 40 | - | - | - | - | - | - | - | - | - | - | |

*Figure 12 Sample PDF report part -2*

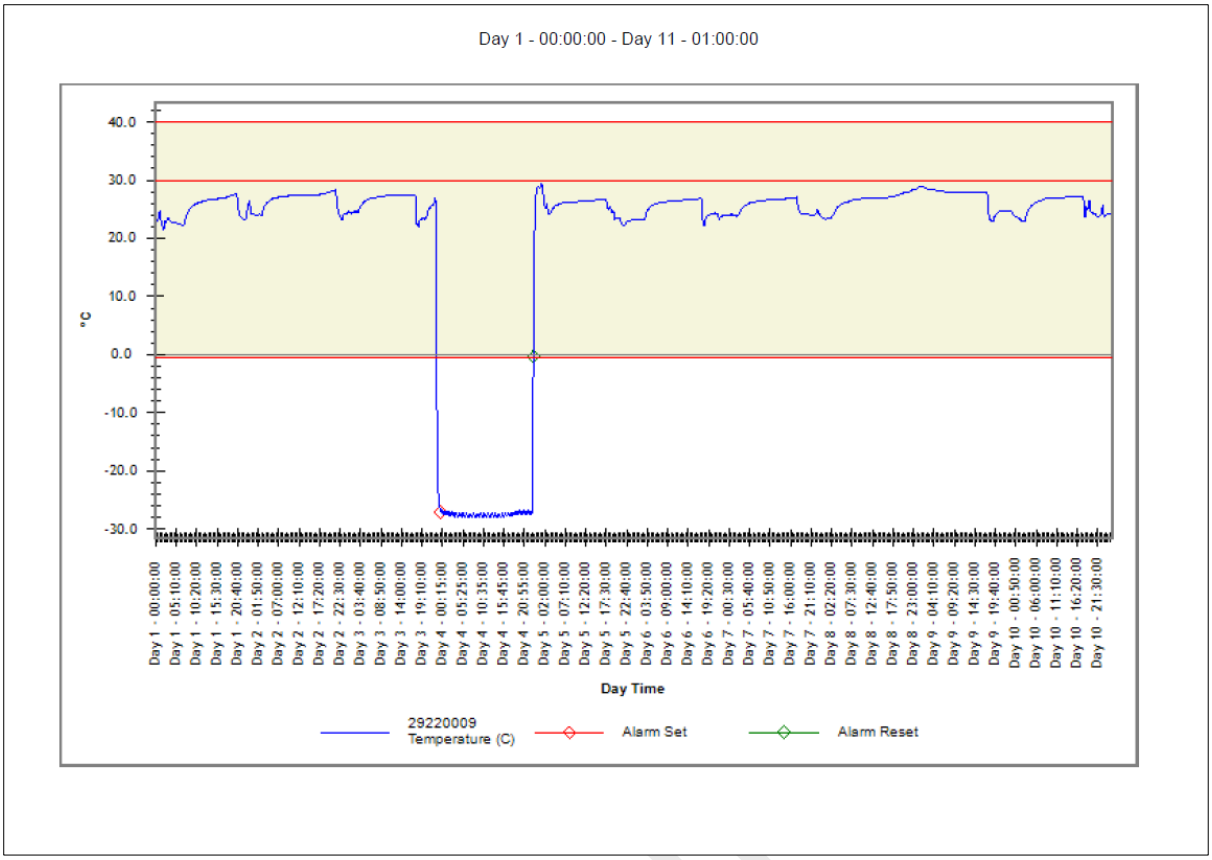



*Figure 13 Sample PDF report part -3*

- Solid red lines in the graph shows Alarm 1 (40 °C) , Alarm 2 (30 °C) and Alarm 3 (-0.5 °C ) limits. Tag event indications for alarm trigger, alarm restore, are specified in graph labels as shown in figure 13.

## 6.7.4 Definition of Important Terms in PDF Report

1. **MKT (Mean Kinetic Temperature):** It is a simplified way of expressing the overall effect of temperature fluctuations during storage or transit of perishable goods. In other words, MKT is a calculated, single temperature that is analogous to the effects of temperature variations over a period.
2. **Mean ± Std Deviation:** The mean and the standard deviation of a set of data are usually reported together. A low std deviation indicates that the data points tend to be very close to the mean; a high std deviation indicates that the data points are spread out over a large range of values.
3. **Duration:** Actual daily time duration for below/above the temperature limit.
4. **Alarm Trigger time:** Time at which alarm high/low triggers after corresponding alarm delay.

**Note:** Refer the help menu for detailed description of data analysis in LMViewIN-074 software application.

# 7 MAINTAINING THE PRODUCT

## 7.1 Accessories

- USB cable
- LM$^{Pro}$ IN074 calibration certificate

## 7.2 Cleaning of LM$^{Pro}$ IN074 Indicator

**Ensure that no liquids enter the housing.**

- If the housing of LM$^{Pro}$ IN074 Indicator 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.

## 7.3 Battery

- The LM$^{Pro}$ IN074 Indicator contains a Lithium Battery and battery status is displayed by battery symbol on the display. The end of the battery life is specified by a low battery symbol on the display.
- The expected battery life is declared based on the assumption that the LM$^{Pro}$ IN074 Indicator storage and operation are inside the recommendations of manufacturer.
- Dispose or recycle the battery in accordance with your local regulations.
- Do not expose the LM$^{Pro}$ IN074 to extreme temperatures as it may lead to the destruction of the battery and may cause injuries.

**"Warning, Battery may explode if mistreated. Do not recharge, disassemble, or dispose in fire."**

LM Pro IN074

# 8 TIPS AND ASSISTANCE

*Table 3 Frequently Asked Questions(FAQs)*

| Questions | Cause/Solution |
|---|---|
| How to activate LM$^{Pro}$ IN074? | ▪ Press **Start/Stop key** for 10 seconds. All segments on the device display will be ON for 5 sec, after that "**Srt**" message will be displayed for 10 Sec, if **Review** key is not pressed, LM$^{Pro}$ IN074 will go into deep sleep mode.<br>▪ Press key before 10 sec while **"Srt"** is displayed, delay start counter will be started. |
| What does "Et 01 09" means on display? | ▪ Et is Elapsed time, 01- day, 09 – hours ; 1 day 9 hours has passed since the start of data logging. |
| Display Shows "Err" message. | ▪ Sensor might be broken/temperature is beyond measuring temperature range. |
| For how much time, the display remains ON after device activation? | ▪ Once the datalogging is started, the display remains ON until battery dies. |
| How to view History data? | ▪ Press key for 1 second, Day-1 alarm trigger time data will open. Press again to view Day-1 alarm duration data. |
| How to exit from History data view? | ▪ History data view can be exit by either pressing both & key at same time, or by continuing to press key until display arrives at **"REC"** mode display. |
| How to stop batch? | ▪ Keep key pressed for more than 10 seconds, after 10 seconds display will flash **"Stp"** message on display. Release key, batch will be stopped. |
| When will the batch stops in the LM$^{Pro}$ IN074? | ▪ Batch stops automatically after 40 days of data logging or If user has manually stopped the batch. |
| LM$^{Pro}$ IN074 is not connected in Application. | ▪ If USB cable is connected. USB Symbol must be seen on Display.<br>▪ USB symbol and connection auto disables after 5 minutes of no activity on software application. Try to reconnect Micro USB data cable.<br>▪ Micro USB cable might be faulty. Replace the cable.<br>▪ In case of USB Type C port, use USB Type C to Type A female cable for connecting the device. |
| How to know if an alarm has triggered and which type of alarm it is? | ▪ If an alarm has triggered in LM$^{Pro}$ IN074, NOK sign "X" will come on the display.<br>▪ The bell symbol means alarm has triggered, with number below it is indicating which alarm it is, 1 for alarm-1, 2 for alarm-2, 3 for alarm-3.<br>▪ On right top corner of display, there will be right pointing ▶ arrow/s indicating which type of alarm it is, Single event or Cumulative type. |

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