OPERATING MANUAL

=Pro

LM-H

Mother Nature tells you everything

LM^{Pro} RF
Temp. & RH Datalogger
Model No.: 6xx...

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1. INTRODUCTION

This manual is written to help the user to get familiar with the installation and operation of LM Pro RF. It is designed for reliable and convenient recording of process parameters in production, Research and Quality control applications. This device can sense the Temperature and Humidity, displaying them on LCD display ae well as sending these data via RF signal to Moderator device for monitoring on gtekNetTM.

1.1 MANUAL LAYOUT

This manual is divided into sections for quick and easy reference.

Table 1 Manual Layout

Section 1 Introduction	This gives outline of the manual, brief description about the LM Pro RF, features available and how to unpack it.
Section 2 Installation	This section gives the details of the Electrical installation.
Section 3 Operation	This section describes the operation of LM Pro RF and the output status on the LCD display.
Section 4 Troubleshooting Guide	This section describes about the most frequently asked questions and their solutions about LM Pro RF.
Section 5 Accessories	This section shows the standard accessories for the LM Pro RF.
Section 6 Specification	It describes the detailed specification of the LM Pro RF.
Section 7 Ordering Code	It describes the details of order code and comparing it with the code on the LM Pro RF, user can find out the installed options.

1.2 LM PRO RF DESCRIPTION

The LM Pro RF series of wireless data logger is a new RF based data logger measuring temperature and % RH. These data loggers are very useful in monitoring data across large facilities where wiring is difficult. Since no wiring is required, deployment is very quick and easy. Data are sent by each device directly to the centralized moderator (repeater) device and from there to gtekNetTM software over ethernet port. These data can be accessed from any network connected device using standard web browser.

The data logger consists of RF radio transmitter and receiver operating at 869.88 MHz (SRD License Free: EU Version) frequency. These data loggers form a star network with its moderator. The moderator is connected to the client-server based gtekNetTM software through ethernet. A new data logger when it is in the range of the central node – moderator, gets easily connected to the gtekNetTM. Each device transmits its data to the moderator and is captured in gtekNetTM. Any parameter of the data logger when set / changed from gtekNetTM, first goes to the moderator and then to the device. These data loggers have an internal memory of 32000 data sets. In the event of communication failure between moderator and device or moderator and gtekNetTM, after reconnection, all the missed data will be synchronized by gtekNetTM automatically. This ensures that no data is missed.

1.3 FEATURES
Following features* are available for this LM Pro RF.

- RF based data logger
- Up to 100 m range (Line of Sight)
- No wiring required
- Quick to deploy
- Quick connect / disconnect port for pressure input
- Large individual display
- Long battery life > 1year at 15min Store interval
- Resolution of 0.1
- Up to 32000 data storage
- Optional USB power source.

* Features depends on the product ordered. Please refer to the order code (Model No) of your product for exact features and capabilities.

1.4 UNPACKING AND INSPECTION OF LM PRO RF
LM Pro RF 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 LM Pro RF be examined. If there is evidence of damage, the instrument should not be operated, and the local representative contacted for instructions. Ensure that all accessories and documentation is removed from the box. If the LM Pro RF is for immediate use, you can start installing it as per following instructions. **Please preserve the original packing along with all internal packing for future transport requirements.** The figure 1 shows the front view of LM Pro RF device.

Figure 1 Front View of LM Pro RF

1.4.1 Status LEDs

There are two status LEDs available on LM Pro RF device for the indication of device status. The meaning of both the LEDs are described as below:

HBT	Heartbeat LED will be flickered at every 5 minutes for updating time of data, after that it will be OFF till next interval comes.
STR	Storage LED will be flickered with Heartbeat LED, if Batch is ON at every 5 minutes. Otherwise, Storage LED will remain in OFF state if Batch is OFF.

1.4.2 Display LCD

The LCD display is 3 ½ digit display shows the Temperature and %RH value with its units, alarm high/low indication and Recording indication as per the operation of the device. The LCD display parts are shown in figure 2.
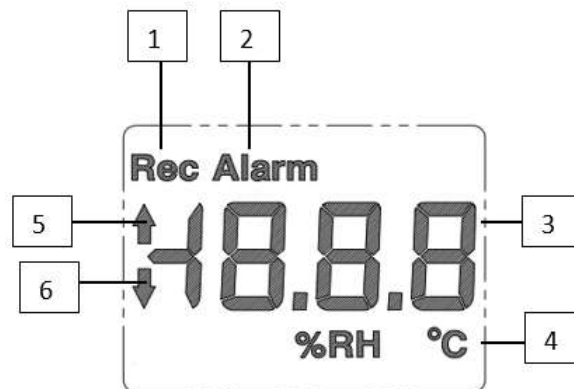

Figure 2 LCD Display

1) Measurement Program running (Batch running)
2) Alarm set limit value(s) exceeded.
3) Current reading
4) Units (%RH, °C)
5) Upper limit value exceeded
6) Lower limit value exceeded

2 INSTALLATION

For the installation, the LM Pro RF is powered ON by inserting battery in the device. Switch ON the Moderator with 5 V DC adapter. Connect Moderator device with PC using ethernet cable for communication. Please refer the schematic diagram given in figure 3 for setting up the connection.

The PC must have GtekNet application to configure the Moderator for observing the output data.
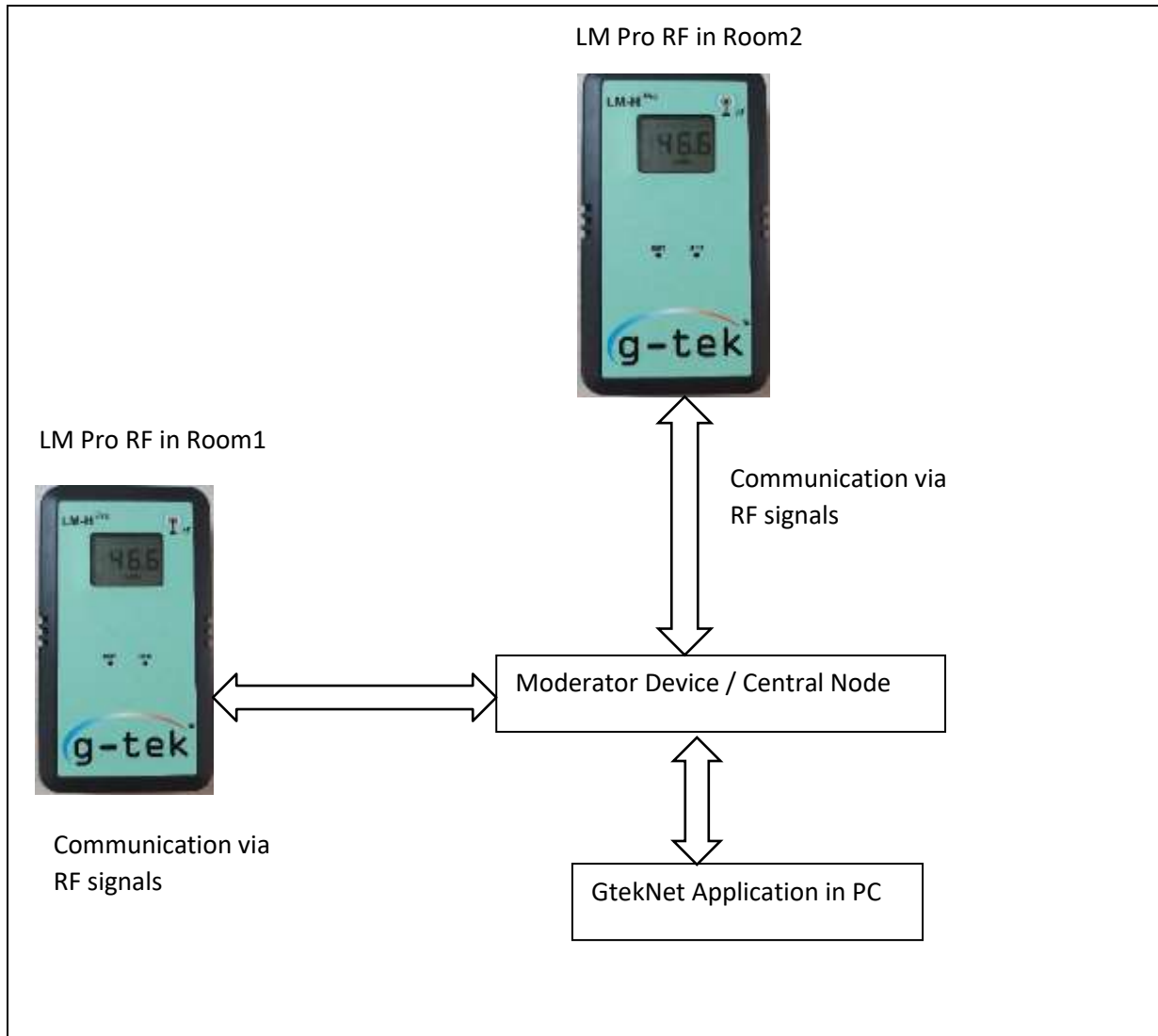

Figure 3 Schematic diagram of Set up of LM Pro RF

3 OPERATION

3.1 LM PRO RF INTERNAL SCHEMATICS DIAGRAM

The internal schematic of LM Pro RF consists of various blocks as shown in figure 4.
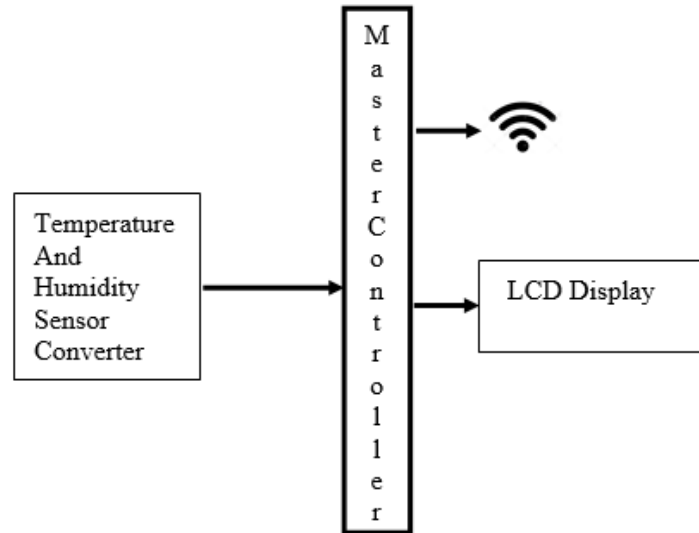

Figure 4 Internal Schematic diagram of LM Pro RF

3.2 LM PRO RF OPERATION

- Once the Setup is done as per the schematic diagram, LM Pro RF show Room Temperature and %RH on display continues Scrolling every 5 minutes.
- The HBT Led will flicker at 5 minutes time interval and display will be updated.
- The STR led will flicker with HBT Led at 5 minutes time interval, if Batch is running. Otherwise STR led will remain in OFF state.
- When the Batch is running, recording indication is shown on LCD display as **section3.4.1 LCD display**.
- If alarm condition is created in any channel (Temperature or RH), Alarm high/low indication will be shown on display as per **section3.4.1 LCD display**. Note that the display will be blinked in Alarm condition.
- The Temperature and %RH data is also sent to the Moderator via RF signal and with the help of Moderator the data will be observed on GtekNet Application.
- We can download the data in csv, pdf format using GtekNet application.

4 TROUBLESHOOTING GUIDE

4.1 OPERATION TROUBLESHOOTING

Question	Possible Cause / Solution
Why is LCD display showing constant Temp or %RH value and not updated?	• Wait for 5 minutes, HRT LED will be flickered and Temp and %RH will be updated. • If HRT LED does not flicker, then contact to Gtek Corporation.
How is Alarm condition shown on LCD display?	• When Alarm occurs, it will be shown on LCD display by UP/Down arrow and "ALARM" message will be on top of the LCD display. The LCD display will be blinked on Alarm condition.
If LCD display is OFF, then what should be done?	• Check if battery is properly inserted in the device.

5 STANDARD ACCESSORIES

5.1 5 V DC @ 1.2 AMP ADAPTOR

Figure 5 5 VDC 1.2 Amp Adaptor

Input Voltage: 100-240 V AC 0.35 Amp.

Operating Frequency: 50 to 60Hz.

Output voltage: 5V DC 1.2 Amp

5.2 ETHERNET CABLE

Figure 6 Ethernet Cable

6 SPECIFICATION

The Specifications of LM Pro RF are:

Table 2 Specification of LM Pro RF

Model No	LM Pro RF
Product Code:	**Wireless RF Temperature / Humidity Datalogger**
Display and Operator Panels	
Display Type	3½ digit LCD Display
Status Indicator	Unit Indication, High and Low Alarm Indication, and storage on Indication
Analog Input Details	
Sensor Types: (PCB mounted, Internal Sensors)	
Temperature	Thermistor 10K /Solid state
%RH	Solid state
Sensor Type and Range and Accuracy	Refer to the **Table 5**
Batch Storage / Data Memory Details	
Start / Stop	Remote Start – Stop through GtekNet
Store Interval	5 minutes to 18 Hours (multiple of 5 minutes)
Memory Size	32000 records totals; Rollover
Environmental	
Temperature	*(Operation)* 5˚C to 45˚C
	(Limiting) 0˚C to 50˚C
	(Storage) -20˚C to 60˚C
Humidity	*(Operation)* 10 to 80 % RH Non-Condensing
	(Storage) 5 to 90 % RH Non-Condensing
Altitude	<2000 meter
Power Requirement	
Supply Voltage	Internal 2x1.5V 1500mAH battery size AA
Battery Life	>1 year at 15-minute store interval approx.
Power	1W Max with Maximum Configuration
Mains Operation	Through 5V Adapter; micro-USB connector
Communication	
RF Transmission	869.88 MHz (SRD License Free: EU Version)
Power	Tx: 10dBm Rx: -40dBm
Protocol	Proprietary
Range	100m (Line of Sight)
Network Topology	Star
RF Data Packet Standard	IEEE 802.15.4, open communication architecture
Antenna	Integrated on PCB Omnidirectional
Alarm Output	
Alarm Set-point	High/Low individually settable for each channel
Buzzer	Audible on alarm condition
Overall Dimension	
Dimension L x W x D (mm) approx.	140 x 75 x 30 Approx.

Table 3 Sensor types and range

Parameter	Sensor	Range	Accuracy
Temperature	Thermistor	-20 to +60 °C	± 0.5 °C
Temperature + %RH	Solid state	Temp.: -20 to +60 °C	± 0.5°C
		%RH: 0-100 %	±2% RH between 20-80 %RH ±3% RH otherwise

7 ORDERING CODE

LM Pro RF order code is as below: -

Table 4 LM Pro RF Order Code

Series		Input Type		Power Supply		Mounting Type		-	Software		Communication Interface	
6	LM Pro RF	1	Temp	0	Battery Operated	0	Handheld		4	GtekNet Non-Secure	6	Radio Frequency (RF)
		2	Temp + RH +	1	Battery + Mains operated	1	Flush Mount		5	GtekNet Secure	7	Bluetooth Low Energy (BLE)
		3	Temp + RH + Pressure			2	Wall Mount				8	RF + BLE