masibus®

User Manual

HT16UHUMIDITY-TEMPERATURE SMARTLOGGER

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(1). INTRODUCTION

The HT16u Humidity-Temperature Smart Logger is ideal for monitoring humidity and temperature of storage areas, clean rooms and buildings in Pharma and other industries. The HT16u is compact, easy to setup, accurate and most cost effective.

HT16u is available in two versions, Temperature only and Temperature with Humidity combined, at the heart of the measurement and logging is the built-in RH & Temperature digital sensor chip-highly accurate with guaranteed long term stability. The real time measurements are displayed on a custom built LCD with 0.1 resolution and engineering units, Min/Max value of current batch is displayed on demand and resets on start of new batch, Battery and Alarm status is also displayed in run time, the unit can Log up to 400,000 records with time stamp.

The unit consumes extremely low power, operates on Lithium Coin cell, is housed in an elegant compact wall mount enclosure and has two front panel keys for operation. The Humidity-Temperature Logger has a micro USB port for Logged data retrieval, device configuration and Auxiliary power operation where available.

The free SMART-HT allows configuration, viewing and downloading of logged data. The more advanced SMART-HT-21CFR generates non-editable reports and is 21CFR part11 compliant.

(2). FEATURES

- Compact RH/T Smart Logger with integral LCD display
- Selection of Unit Measurement in Celsius or Fahrenheit
- Max / Min readings with reset
- Logs up to 400,000 records with time stamp
- Hi/Lo Alarms status
- USB Port for Configuration, logged data retrieval and Aux Power
- Long Battery Life with status indication
- Operation by front keys
- Free Basic software for configuration, viewing & Logged data downloading
- Optional Advanced software version for 21CFR-part11 compliance reports

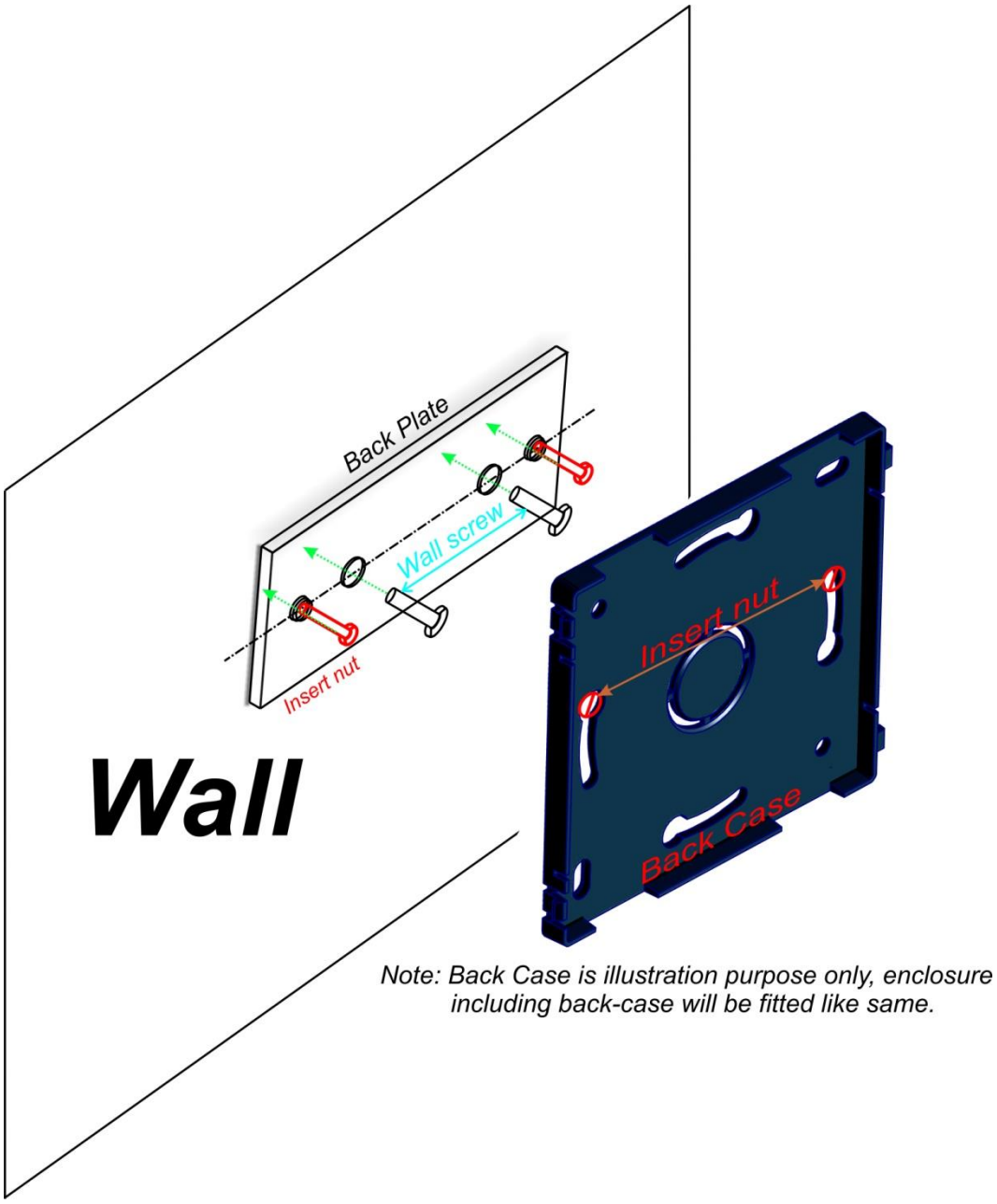
(3). APPLICATIONS

- Pharmaceutical Industry
- Clean Rooms & Warehouses
- Food Industry
- Building Automation
- HVAC Systems
- Cold Storages
- Energy Management
- Laboratory & Medical Industries

(4).TECHNICAL SPECIFICATIONS

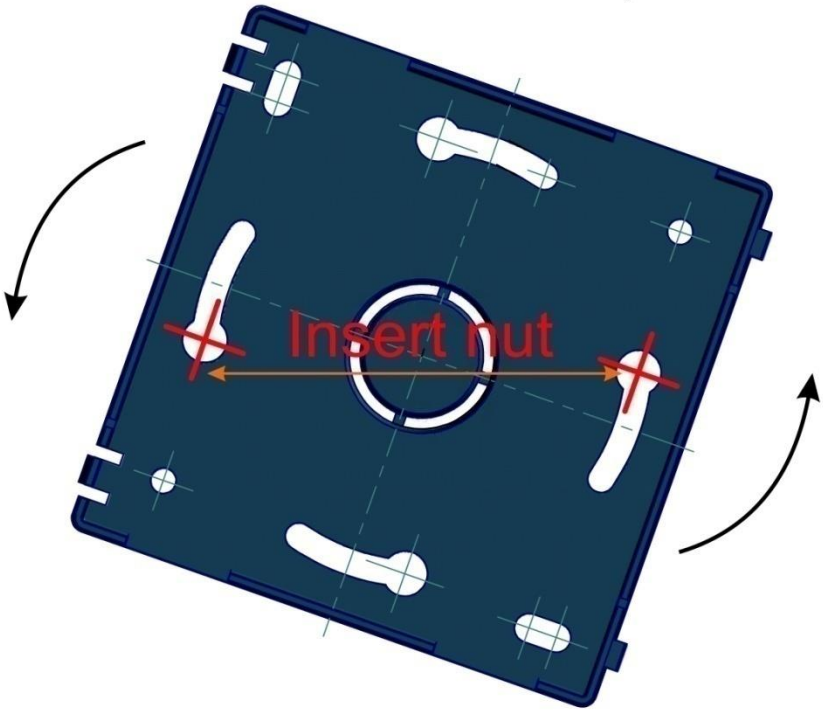
Input		
Sensor type	Integral or external sensor probe	
	Models	
Parameter	**HT16u-T**	**HT16u-TRH**
Temperature	✓	✓
Humidity	✗	✓
Temperature Measurement		
Measurement Range	0 to 60 °C / 32 to 140 °F	
Accuracy	±0.2°C typical, ±0.4°C max	
Long-term drift	<0.03°C /year max	
Humidity Measurement		
Measurement Range	0 to 100% RH	
Accuracy	±2% RH typical, ±4% RH max	
Response Time	8 sec to achieve 63% of step change in Humidity	
Long-term drift	<0.25% RH/Year typical, 0.5%RH/year max	
Display & Keys		
Display	Large LCD, 7 segments with Engineering Units	
Other Indications	Battery Status, Max/Min & Alarm status	
Keys	Two for operation	
Data Logging		
Logging Start / Stop	Manual or pre-programmed with pause facility	
Memory	64MB	
Record Fields	Date / Time / Temperature /Humidity / Alarm Status / Log Interval	
Total Records	Up to 400,000	
Record Interval	User Settable from 1 minute to 1 day	
Data Retrieval	PC software via USB port using USB cable	
Power Supply		
Battery Type	3V coin cell (CR2450 lithium)	
Battery Life	1 Year Typical (15 min interval)	
Physical		
Dimension in mm	80(H) x 80(W) x 25(D)	
Mounting	Wall mount	
Weight Approx.	80 grams approx.	
Enclosure material	Self-extinguishing ABS	
Enclosure Protection	IP20	
Environmental		
Ambient temperature	0 to 60°C	
Storage temperature	-10 to 70°C	
Humidity	0% to 100% RH (Non-Condensing)	
Standard Accessory		
Wall Mounting SS Plate & Screws (70mm x 30mm)		

(5).HT16uMOUNTING

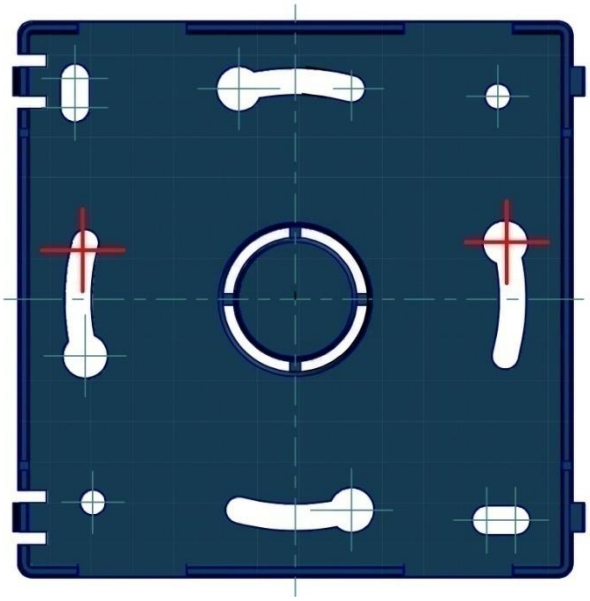


Note: Back Case is illustration purpose only, enclosure including back-case will be fitted like same.

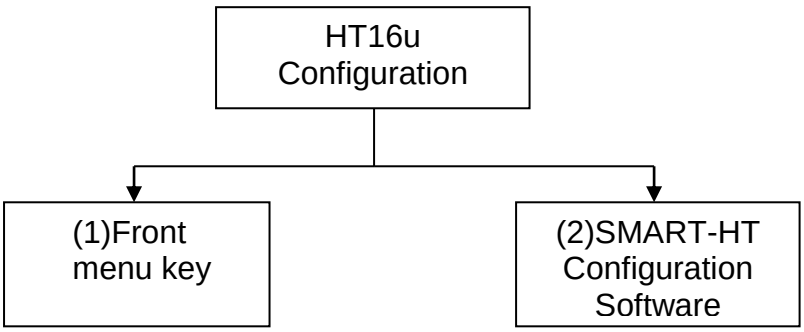
Step 1 *Match enclosure hole with insert nut as shown & rotate anticlockwise to lock position as Step 2*



Step 2 *Position locked*



(6). HT16u Configuration:



6.1Configuration via front key Panel:

Main menu is divided in total 14 categories:

(1)**`Min`(Min Value) Mode:**

(2)**`MAX`(Max Value) Mode:**

(3)**`TSPL` (Temperature Set Point Low) Mode:**

(4)**`TSPh` (Temperature Set Point High) Mode:**

(5)**`hSPL` (Humidity Set Point Low) Mode:**

(6)**`hSPh` (Humidity Set Point High) Mode:**

(7)**`dd.mm.yyyy` (Date) Mode:**

(8)**`hh.mm.ss` (Time) Mode:**

(9)**`ltmr`(Log-Timer) Mode:**

(10)**`fdsp`(Fast Display) Mode:**

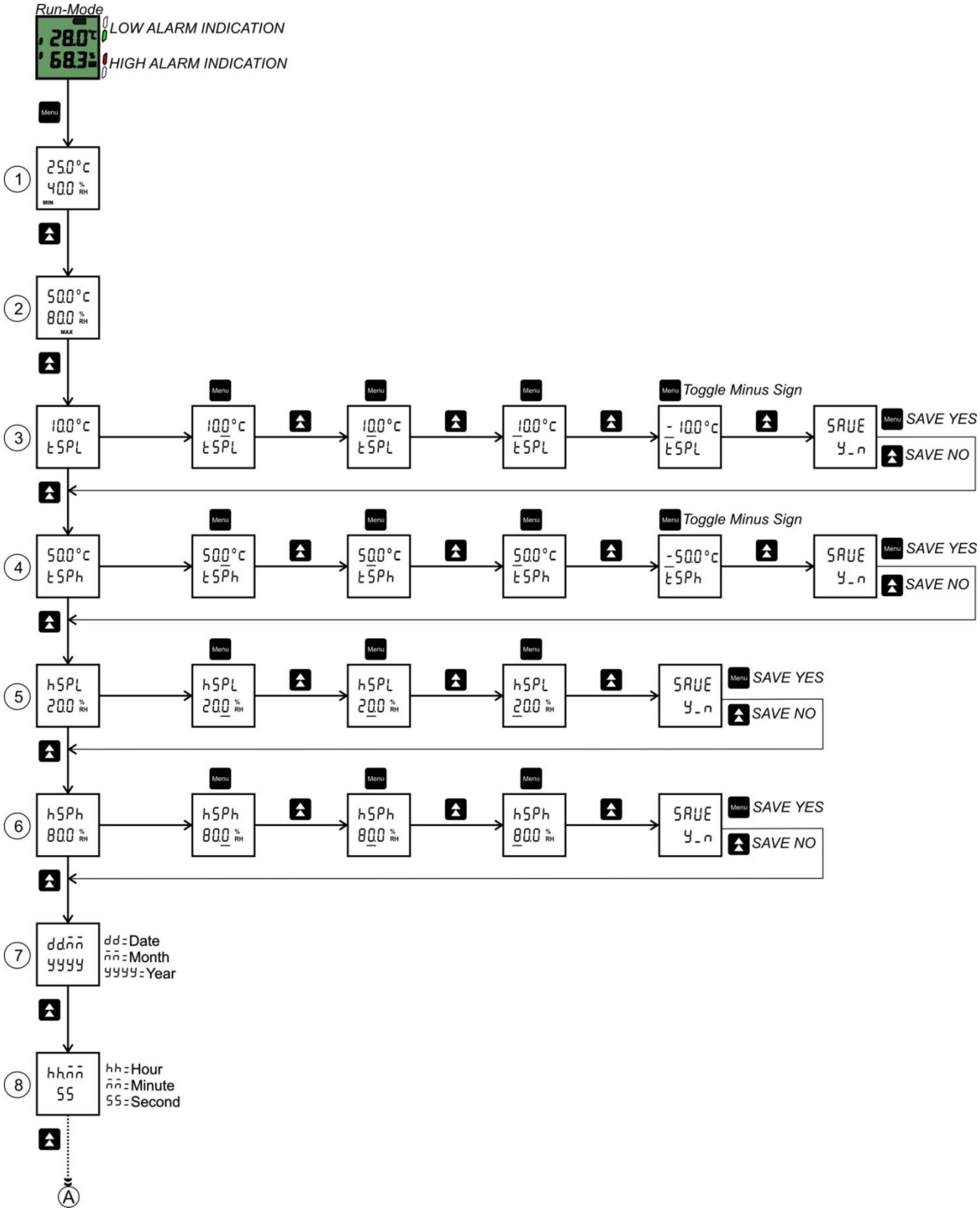
(11)**`mode`(Sensor Type) Mode:**

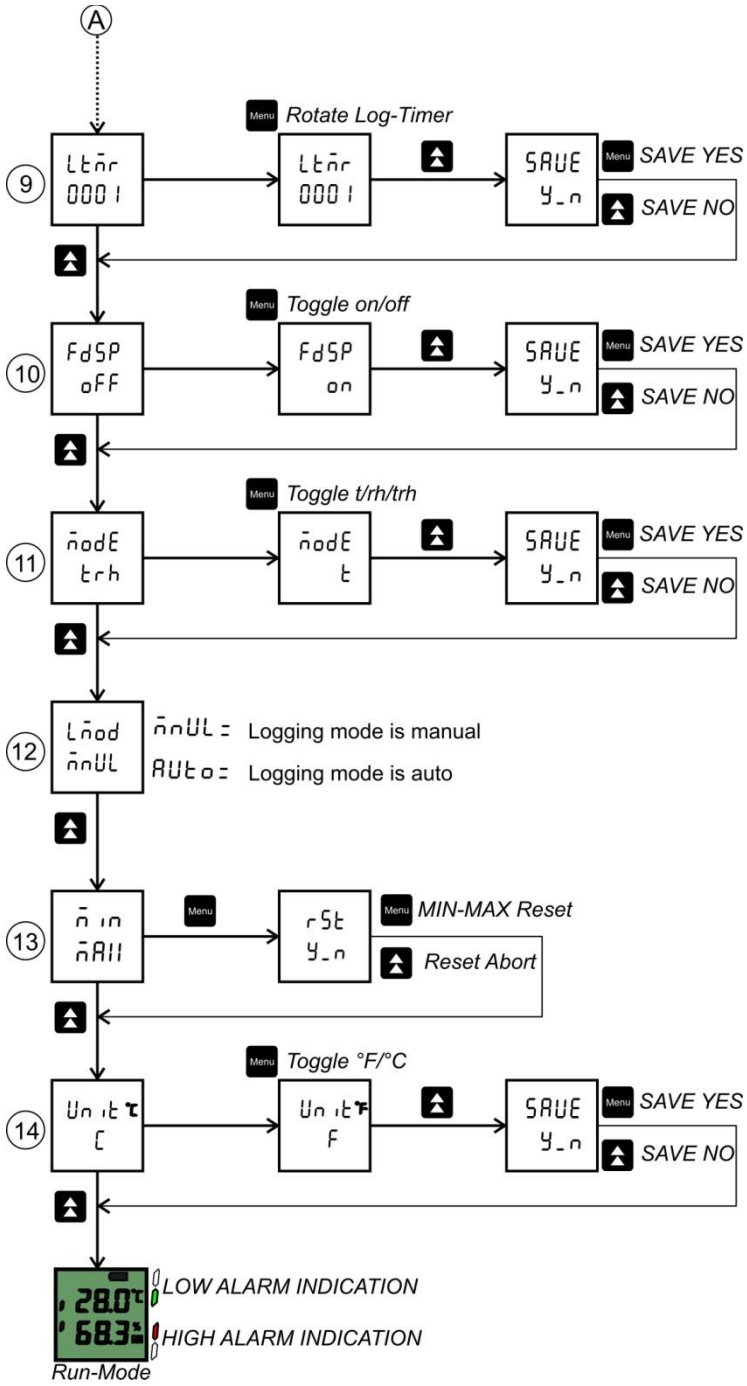
(12)**`lmod`(Logging Mode) Mode:**

(13)**`min max`(Min-Max Reset) Mode:**

(14)**`Unit`(°C/°F Type) Mode:**

6.2 Main menu Flowchart:



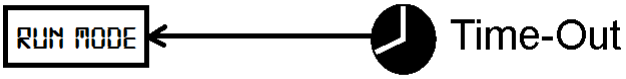


6.3 Main menu description:

RUN Mode:

After powering on the device, unit will display **Temperature and Humidity** measured by Sensor. Device also shows battery level, alarm indication& Log START/STOP Status.

When device stay inactive or user don't press any key during menu configuration, timeout signal force menu screen to jump into RUN MODE and enter in sleep to save power.



HT16u unit equipped with 2 push button key labeled as Menu key and Up key.


UP Key

Menu Key

(1)MIn Mode:
It displays minimum value of measured **Temperature and Humidity** from last records.

(2)MAX Mode:
It displays maximum value of measured **Temperature and Humidity** from last records.

(3)TSPL (Temperature Set point Low) Mode:
TSPL stands for Temperature Set Point Low. It is user input menu, user can simply enter 2 Digit Temperature Set Point Low value followed by 1 decimal point value with the help of menu key &up key. If Actual Temperature goes low below TSPL set value then it will send Temperature low alarm indication on LCD. Temperature Low Alarm indication appear as symbol '**i**' ahead of temperature reading during run-mode.

(4)TSPh (Temperature Set Point High) Mode:
TSPh stands for Temperature Set Point High. It is user input menu, user can simply enter 2 Digit Temperature Set Point High value followed by 1 decimal point value with the help of menu key &up key. If Actual Temperature goes high above TSPH set value then it will send Temperature High alarm indication on LCD. Temperature High Alarm indication appear as symbol '**i**' ahead of temperature reading during run-mode.

(5)hSPL (Humidity Set Point Low) Mode:
hSPL stands for Humidity Set Point Low. It is user input menu, user can simply enter 2 Digit Humidity Set Point Low value followed by 1 decimal point value with the help of menu key &up key. If Actual Humidity goes low below HSPL set value then it will send Humidity low alarm indication on LCD. Humidity Low Alarm indication appear as symbol '**i**' ahead of humidity reading during run-mode.

(6)hSPh (Humidity Set Point High) Mode:
hSPh stands for Humidity Set Point High. It is user input menu, user can simply enter 2 Digit Humidity Set Point High value followed by 1 decimal point value with the help of menu key &up key. If Actual Humidity goes high above HSPH set value then it will send Humidity high alarm indication on LCD. Humidity High Alarm indication appear as symbol '**i**' ahead of humidity reading during run-mode.

(7)dd.mm.yyyy (Date) Mode:
This mode shows the current date, month & year of data-logger. User can set date, month & year via SMART-HT configuration software.

(8)`hh.mm.ss` (Time) Mode:
This mode shows the current hour, minute& second of data-logger. User can set hour, minute & second via SMART-HT configuration software.

(9)`ltmr`(Log-Timer) Mode:
This mode shows recording interval of data-logger, user can change record interval via menu key. User can only configured **`lTMR`** value from below set:

{1,5,10,15,30,60,120,180,240,360,480,720,1440} this values are in minutes.

(10)`fdsp`(Fast Display) Mode:
When **`fdsp on`** sensor update data on LCD at every 15sec irrespective of **`LTMR`**value(record interval).when user START data-logging fast display status change to **`fdsp off`** and display update at interval of **`LTMR`** value(record interval).

(11)`mode`(Sensor Type) Mode:
This mode is for sensor selection. Sensor type of data-logger can be change with this mode. User can change sensor type among this combination **`t`**(Only Temperature), **`rh`**(Only Humidity)& **`trh`**(Temperature+Humidity)

(12)`lmod`(Logging Mode) Mode:

- Manual Start:

Device needs to be started by pressing Start/Stop button from SMART-HT configuration software or by front key panel of data-logger.

- Auto Start:

Device automatically starts recording on the specific date/time preset, no need to press Start/Stop button after configuration.

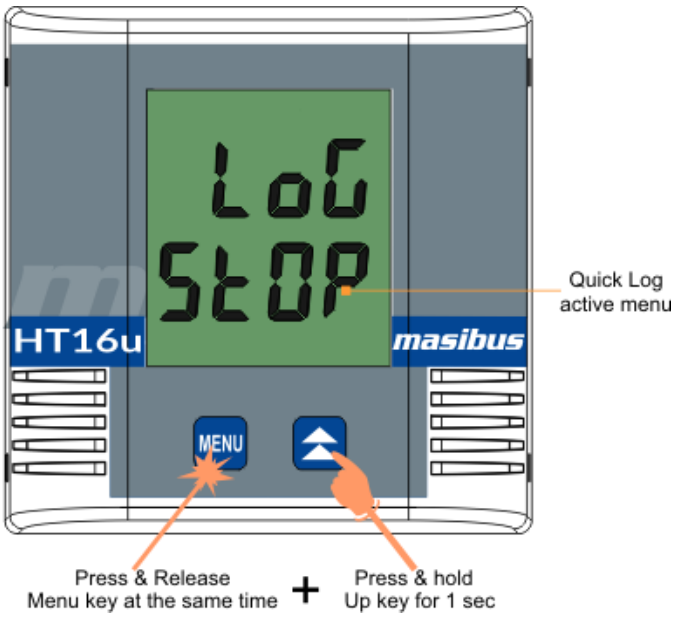
(13)`min max`(Min-Max Reset) Mode:
This mode clears min-max value of temperature & humidity from data-logger. After min-max reset data-logger start sorting new fresh min & max value from sensor.

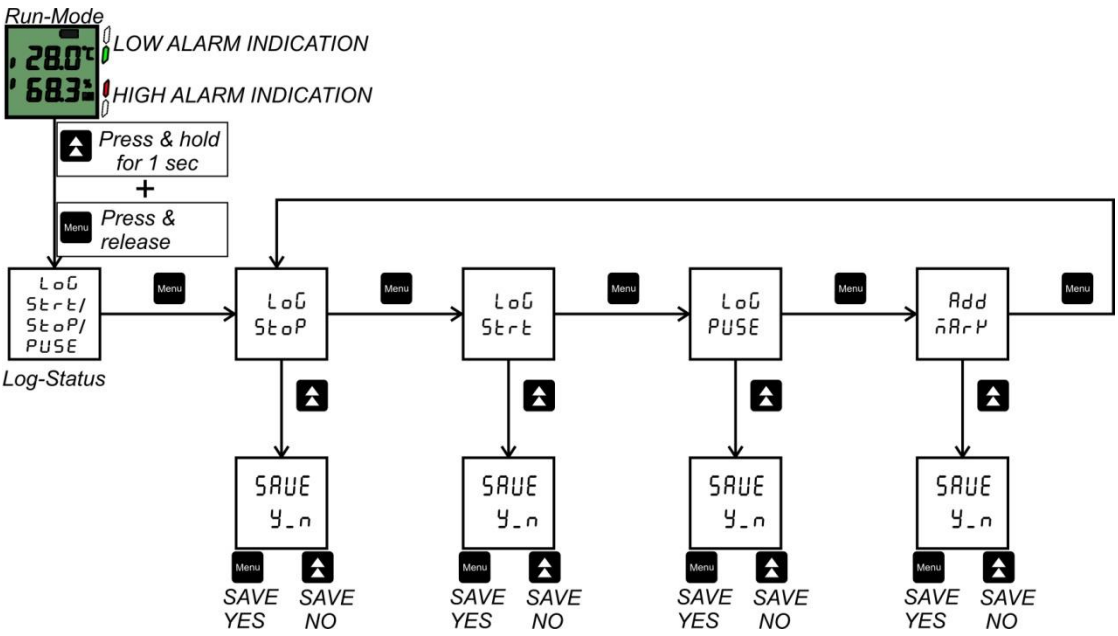
(14)`unit`(°C/°F Type) Mode:
This mode is for temperature unit selection. Temperature unit type of data-logger can be change with this mode. User can change unit type either °**`C`**(Celsius) or°°**`f`**(Fahrenheit) before starting logging.

6.4 Quick Log Active Menu Flowchart:

This Quick-shortcut menu specially designed to START, STOP & PAUSE device Logging. User can also add time mark for important event indication. Mark event would be written in logger every time mark added. User can enter in this menu quickly with following key-combination.

As shown in figure user can enter in quick log active menu via up & menu key combination. To enter in this menu user have to press & hold up key for a 1 sec and at the same moment press & release of menu key activates quick log active menu.

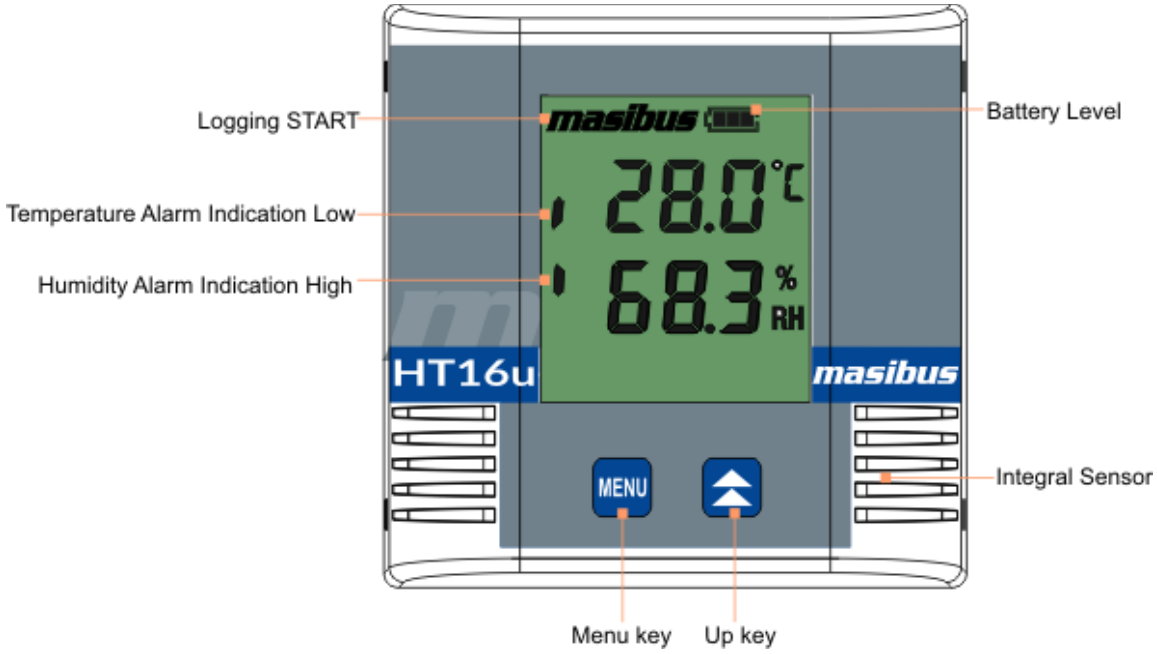




6.5 LCD Messages:

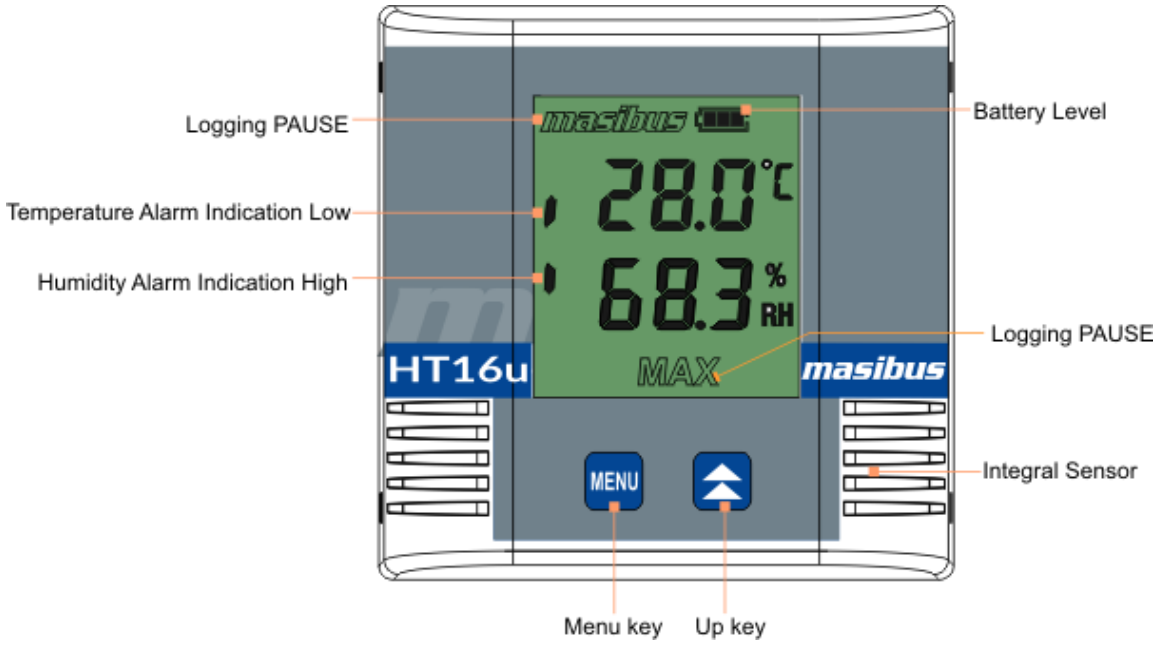
(1)Logging START Indication:

Example below represent Logging START indication. As shown in LCD ***masibus*** above left most digit indicates Logging is Started. When data logging start by key-panel or SMART-HT configuration software unit will punch event log as START in data-report.



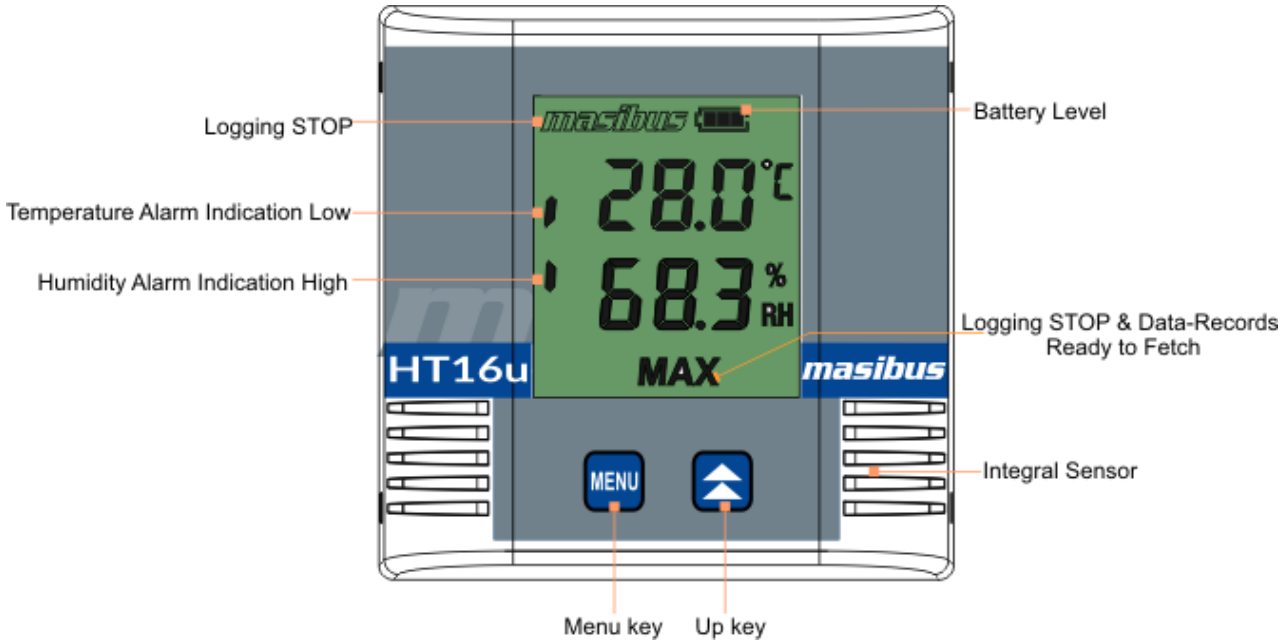
(2)Logging PAUSE Indication:

Example below represent Logging PAUSE indication. As shown in figure ***masibus*** & ***MAX*** symbol disappear from LCD screen indicates data-logger is in PAUSE state. When data logging pause by key-panel or SMART-HT configuration software unit will punch event log as PAUSE in data-report.



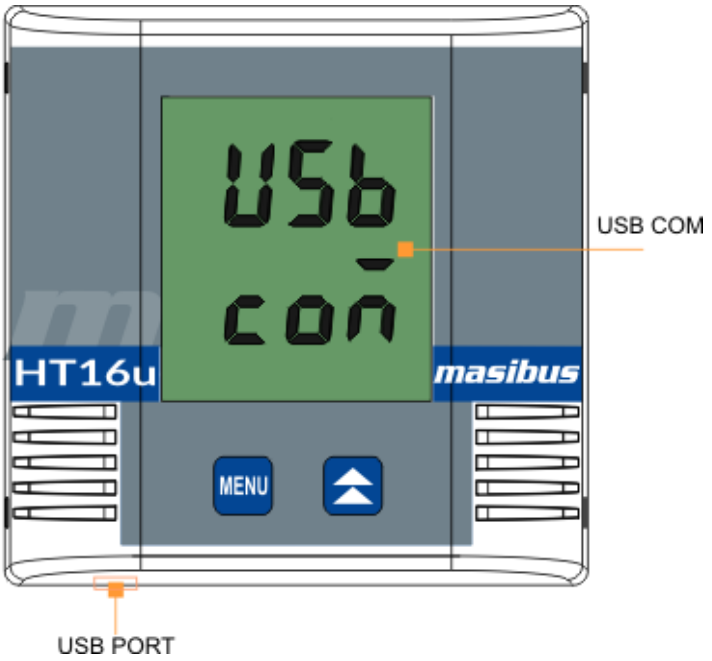
(3)Logging STOP Indication:

Example below represents Logging STOP indication. As shown in figure ***MAX*** symbol on LCD indicates data-records are ready to fetch and data-logger is in STOP mode shown by disabling ***masibus*** symbol. When data logging stop by key-panel or SMART-HT configuration software unit will punch event log as STOP in data-report.



(4)USB Connection Indication:

Example below represents USB communication indication. When data-logger connected to SMART-HT configuration software via USB data cable following message appear on LCD screen.



(7). HT16u Battery Replacement:

Remaining battery life displays on home screen, logger would stop working after battery life ran out. Make sure to check battery status before starting new recording.

1. Lift up back-case from enclosure by detaching back-case. If necessary, use a small, flat object, such as a flat-tip screw driver or tweezers to lift the back-case.

2. Turn off switch no. 1 before applying new batteries.

3. Lift the battery from the battery compartment by gently pressing metal latch . If necessary, use a small, flat object, such as a flat-tip screw driver or tweezers to lift the battery from the compartment.

4. Insert the new battery with the positive polarity (+) facing up, at an angle under the metal latch. Push the end in until you hear a click.

5. Turn on switch no. 1 after applying new batteries. Make sure LCD screen displaying data, if LCD fail to glow up, check battery polarity.

6. Reattached back-case by aligning to enclosure connector. Repack back-case properly.

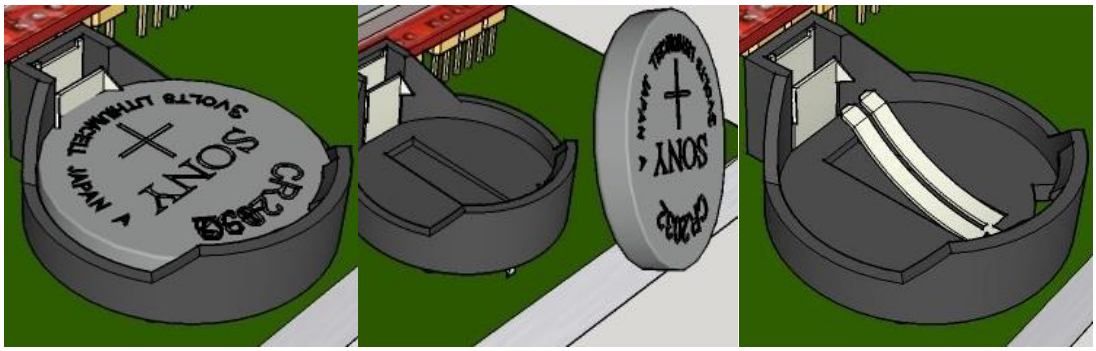


Image simulated here is illustration purpose only.

Caution:

(1)Make sure that the battery is fully inserted under the plastic tabs. If the battery is not fully inserted, damage can occurs.

(2)Make sure to replace fully new cell for longer battery life.

(3)Battery replacement cause losing the clock and calendar data.

(8). HT16u External Sensor Probe:

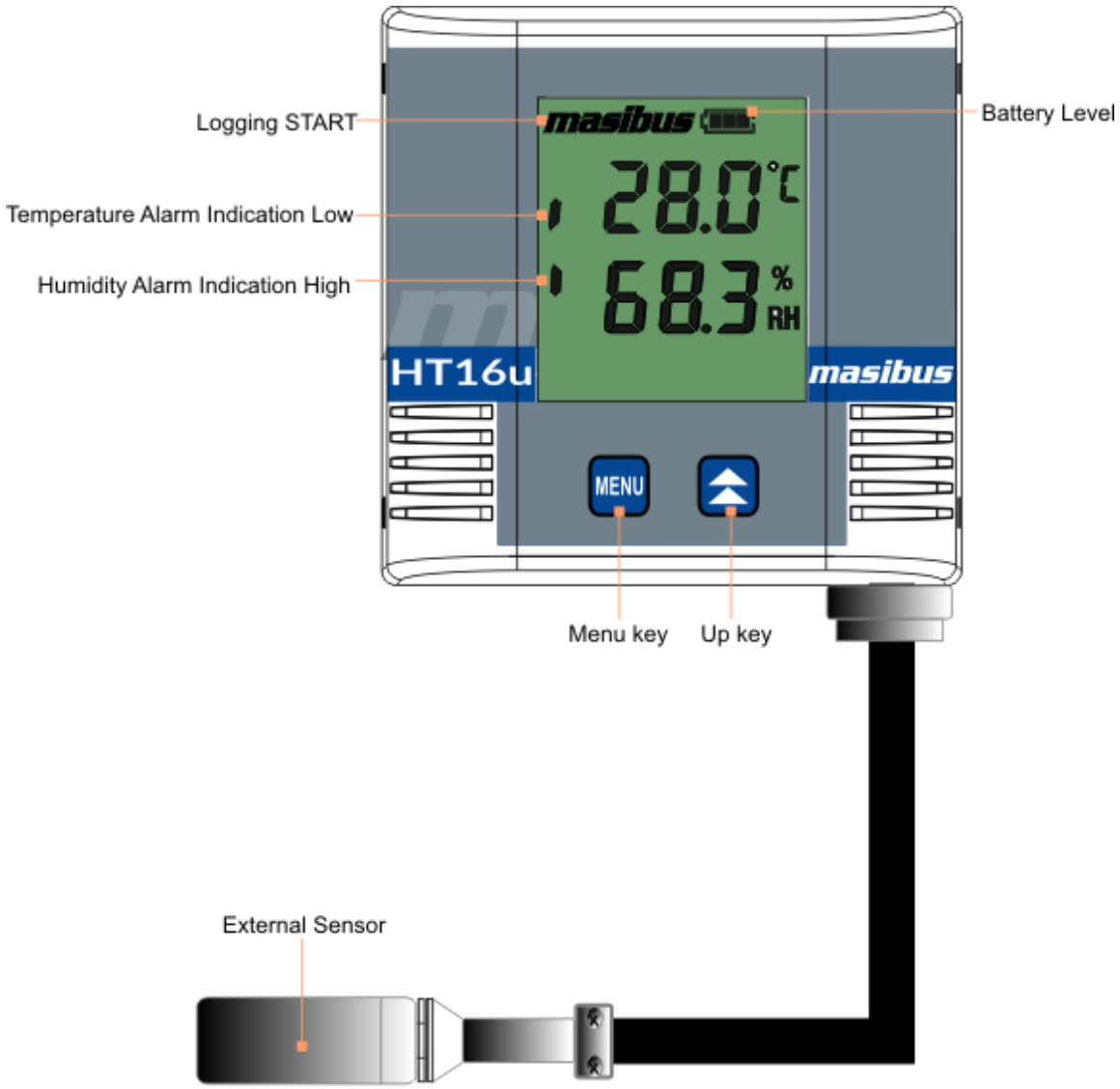
External sensor probe comes with high quality sintered filter along with 2 meter cable length.

Caution:

(1)Make sure external probe located at optimal air flow position. Avoid probe from direct exposure to heating source, humidifier or steam injector for better measurement.

(2)Prevent probe from external harsh environment like strong cleaning agent, accumulation of condensation water, volatile organic compound & from acid & corrosive substances.

(3)Handle external probe carefully as sensor delicate to mechanical shocks & pressure.



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