Wireless room thermo hygrometer transmitter option : external probe
WAi60

LOREME

- • **Room temperature and humidity**
- • **Remote probe in option**

- • **Bidirectional RF link**
  - 2.4Ghz band according to IEEE802.15.4
  - up to 32 transmitters in a network

- • **Optimal efficiency**
  - RF mesh network with all of transmitters (sensor)
  - Up to 8 hop for a transmitter to reach the receiver
  - Dynamic route configuration depending of environment
  - transmission efficiency > 99.999%

- • **Great autonomy**
  - > 1 year with 4 standard batteries (type AAA)
  - for a refresh time of 60 seconds
- • **Applications :**
  - - Sterile room, calibration laboratory
  - - Museums and exhibition halls
  - - Clean room, data center, warehouses
  - - Air-conditioned room, room sensors
- • **In option : remote humidity and temperature probe**
  - - with up to 10m length cable

The WAi60 is an autonomous room sensor who transmit it's measure by RF link. All sensors form a mesh network with up to 32 transmitters. The measurements can be access by Modbus-TCP on the SML160 Hub/receiver.

Description

Measures:
- Room temperature and humidity : -20…..+80°C; 0 ... 100 % HR
 in option: air duct temperature and humidity probe

Communication:
Each room sensors form a network node.
This nodes are wireless transceivers which send their own measurements and transfer data packet from their neighbouring nodes. Each node transmit packets in a series of hop until reach the final destination (SML160).
A manager (SML160) monitor continuously the network routes in order to keep redundant paths, create or delete paths between nodes according the environment, the RF efficiency, etc …
Pre-configured nodes can be add or delete of network without disturbing exchanges, this creating a high flexible and evolving system. Several network can coexist in a same site without interactions.
(max 255 different networks)

Front face / Configuration :
- 4 characters LCD display
 alternating display of temperature and humidity (local or remote *in option*),
 communication status, battery voltage and network address
- 3 push buttons are used for configuration

Serial link:
The device is also configurable with the RS232 link.
(USB - jack 3.5mm cable supplied separately)
The serial link is also use for the firmware updating
or for measure adjustment (offset Hr et T°)

Feature:
- wall mounting (vented plastic enclosure)
- protection rating (enclosure) : IP20 , conformal coating.
- DIN rail mounting with specific adapter.
- powered with 4 standard batteries type AAA

Synoptic:
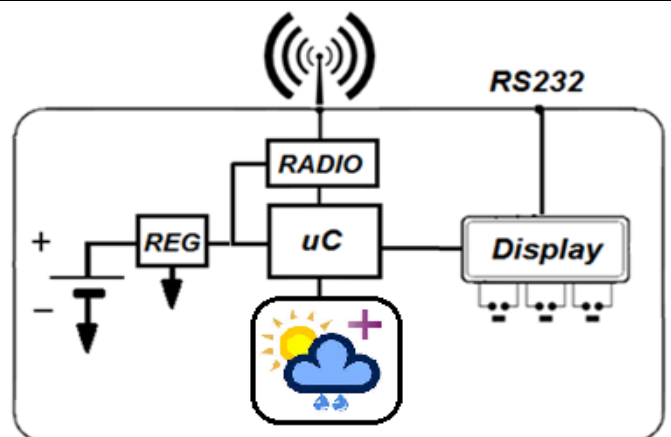
Remote probe (option) :
- For local and remote measure of temperature and humidity.
- reference : **SHL10jk**
with up to 10m length cable
(5 meters in standard)
The remote probe is connected on RS232 plug (3.5mm jack plug)
in option: JPC flange
(for air duct or through panel mounting)
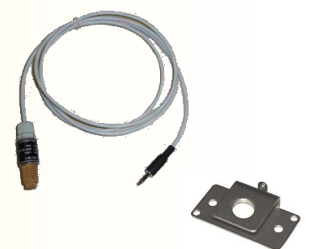
Version and order code:

Request a quote ✉

Wai60-HRT : Room temperature and humidity
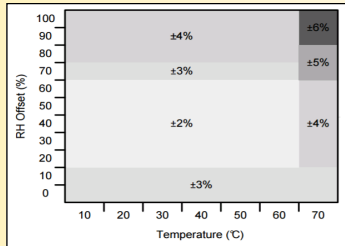
(4 alkaline AAA batteries 1200mAh includes)

SHL10jk : Remote probe (temperature and humidity)
option **-JPC :**   air duct mounting flange

Wireless room thermo hygrometer probe   E 1

MEASURES (internal sensor)

Humidity:
0 ... 100 % HR not condensed
Accuracy :

Temperature:
-20…..+80°C
Accuracy :
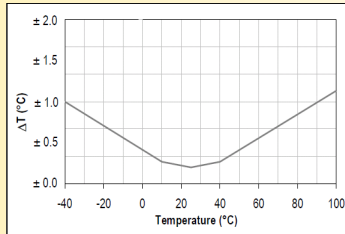
Response time Hr and T°	15 seconds typical (63%)
Repeatability	+/- 0.1% Hr ; +/- 0.1°C
Linearity	< 0.2 %
Hysteresis	+/- 1% Hr
Long term stability	+/- 0.25%HR /year ; +/- 0.04°C /year

Test - Qualification :
- Great life time, about 1000 h, in harsh environment,
   (temperature at 60°C, 93% humidity)
- Return time about 10 seconds
   (after 150 hours condensation)
- Humidity hysteresis < +/-1.5%.
- Long term stability better than 0.5 % / year.
- Linearity better than 2% on the range 10% to 90% Hr.

RF COMMUNICATION

Bidirectional 2.4Ghz radio link conform to IEEE802.15.4 synchronized wakeup of transmitters 10 to 40ms activity in 10 second period (function of number of Hop). This allowing a significant reduction of consumption, and preserving advantage and reliability of the bidirectional link.
The information (data packets) loss ratio < 1/100 000.
omni-directional quarter wave whip antenna, 2dBi gain.
free field range > 200 meters
Maximum output power: 8dBm

POWER SUPPLY

4 alkaline AAA batteries, operating from 6v to 3.2v
average consumption : < 100uA (refresh rate of 1 minute)
batteries life time (1200 mAh) : 10 000 hrs @ 20°C

ENVIRONMENT

Operating temperature	- 20 °C to + 80 °C
Storage temperature	- 40 °C to + 85 °C
Thermal drift	0.05 % / °C (measure Hr)
Humidity	95 % not condensed
Weigh	~ 100 g
Protection	IP20
MTBF (MIL HDBK 217F)	> 1000 000 Hrs @ 25°C
Life time	> 170 000 Hrs @ 30°C

| Electromagnetic compatibility 2014/30/UE / Low Voltage Directive 2014/35/UE		
Immunity standard for industrial environments EN 61000-6-2		Emission standard for industrial environments EN 61000-6-4
EN 61000-4-2 ESD	EN 61000-4-8 AC MF	EN 55011
EN 61000-4-3 RF	EN 61000-4-9 pulse MF	
EN 61000-4-4 EFT	EN 61000-4-11 AC dips	group 1 class A
EN 61000-4-5 CWG	EN 61000-4-12 ring wave	
EN 61000-4-6 RF	EN 61000-4-29 DC dips	CE

WIRING AND OUTLINE DIMENSIONS
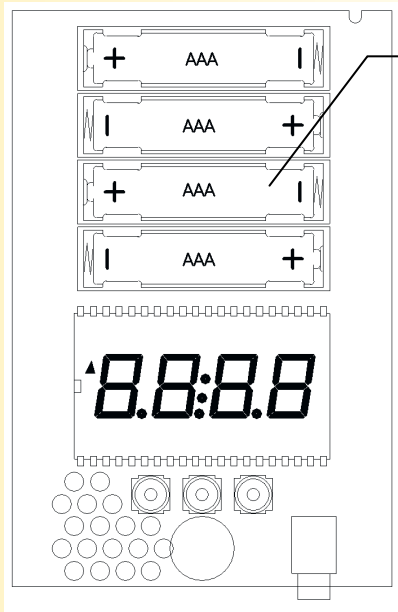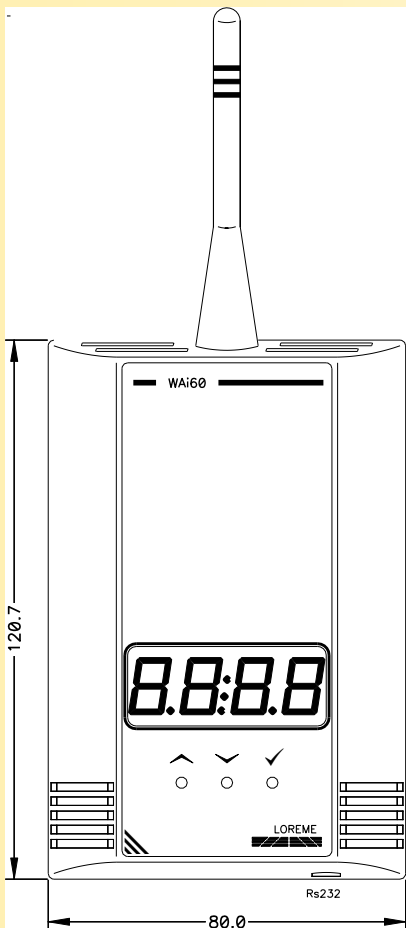
Replacement of 4 x AAA batteries, after unclipping the PCB board from the case. Pay attention to the passage of antenna cable when clipping the PCB in the case.
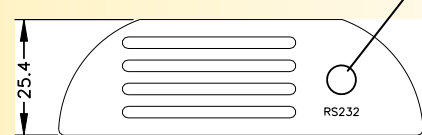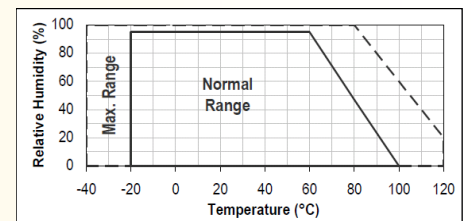
Connection of remote probe. Type: SHL10jk

• Bidirectional RF link

2.4Ghz band according to IEEE802.15.4
Up to 32 transmitters per receiver on one network
Several networks can coexist
Integrated or remote antenna

• Communication

- Modbus TCP (Ethernet) 6 concurrent connections
- Embedded web server (viewing and configuration)

• Power supply by Ethernet cable

- Power over Ethernet (PoE)

• Indoor or outdoor use

- Integrated antenna
- IP66 waterproof

The SML160 is a wireless receiver with Ethernet connection. this unit concentrates measurements from radio transmitters in a single point, and make them available trough a standard communication protocol (Modbus-TCP) on Ethernet.

DESCRIPTIF:
The HUB/receiver is an integral part of wireless network,
it manage the routing of data packets, collects measurement, network statistic, and monitor all data transfers. This information are accessible via the ethernet link and dedicated web page.

Operation :
- Two operating mode are possible:
1) "installation" mode, all within range transmitters join automatically the network and declare themselves in the equipment list of the site.
2) "operation" mode, Only the transmitters declared in the receiver list may join the network. (possibility to have several networks on same time on a wide site). The operation mode can be modified after the commissioning. Each transmitters have an unique serial number (MAC address).
- The web pages on receiver are useful to see measurement, network statistic (number of hop, signal quality, battery voltage) and the configuration of network transmitters.
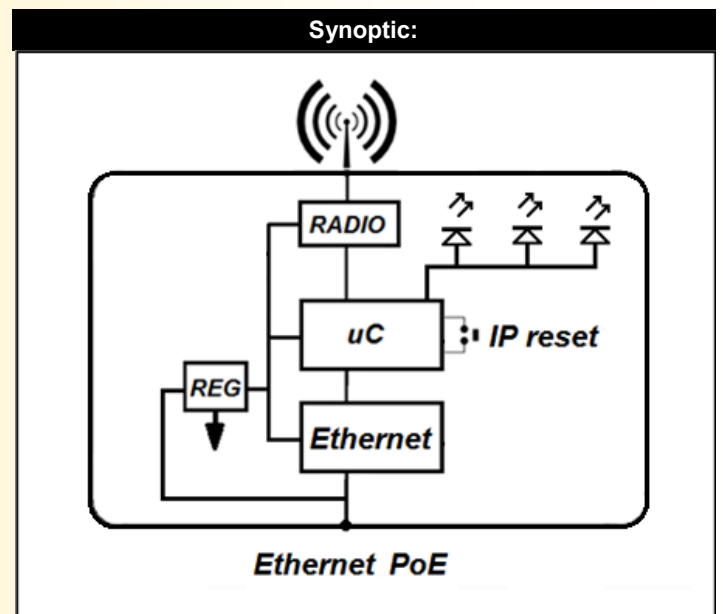
Feature:
- Wall mounting (hinged screw covers)
- Waterproof ABS plastic case + conformal coating for electronic,
- Protection rating IP66, cable gland entry
- Power supply by Ethernet (PoE)

Front face:
Three LED for rapid diagnose.
- Blue Led for supply power presence
- Red Led for transmitter missing or failed.
- Green Led for "OK" Operation is compliant to configuration.

Configuration:
IP address : two possibility:
1) with BOOTP protocol by enter the MAC address (found inside the device). Require a BOOTP server in network.
2) Fixe address IP: setting with the embedded web server.
If IP address is unknown, an internal button can be used to reset the device with it's default parameter: 192.168.0.253 (long press confirmed by buzzer).

Communication:
Ethernet 10/100 T base (RJ45)
Powered by switch PoE (power over Ethernet) according to IEEE802.3af
Protocols available: Modbus-TCP, web server.
Firmware update by Ethernet link.

Synoptic:

Ethernet PoE

Version and order code:

SML160 :   Hub receiver for 32 transmitters

TECHNICAL SPECIFICATIONS

RF COMMUNICATION

Bidirectional radio link 2.4Ghz according to IEEE802.15.4
Swivel omni-directional quarter wave whip antenna,
5dBi gain, free field range > 200 meters.

POWER SUPPLY

Powered by the switch (power over Ethernet)
from 36Vdc to 57Vdc according to IEEE802.3af (2 watts)

COMMUNICATION

Ethernet 10/100 T base (RJ45)
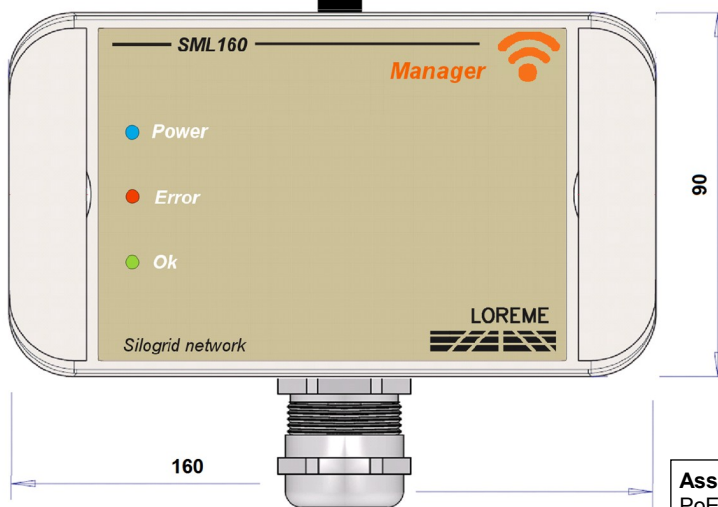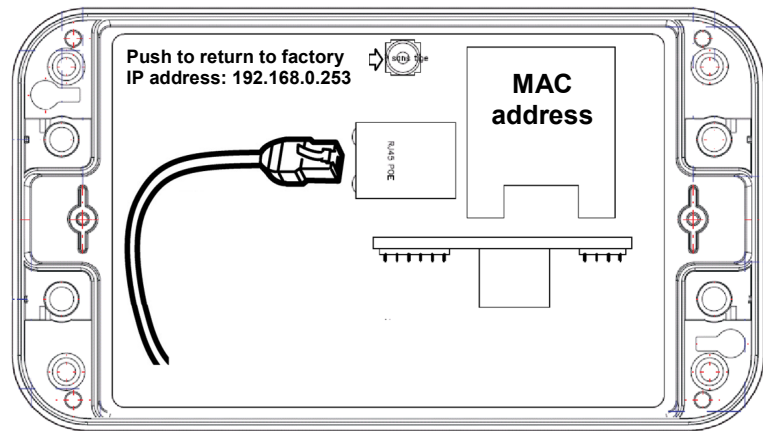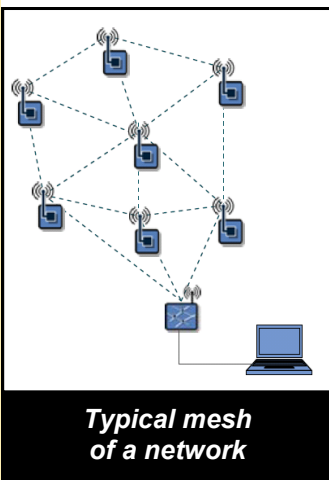Protocol : Modbus-TCP, web server.

ENVIRONMENT

Operating temperature	-25 to +60 °C
Storage temperature	-40 to +85 °C
Humidity	100 %
Weigh	~ 350 g
Protection	IP 66 indoor / outdoor use
MTBF (MIL HDBK 217F)	> 500 000 Hrs @ 25°C
Lifetime	> 170 000 Hrs @ 30°C

Electromagnetic compatibility 2014/30/UE / Low Voltage Directive 2014/35/UE

Immunity standard for industrial environments EN 61000-6-2		Emission standard for industrial environments EN 61000-6-4	
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EN 61000-4-5 CWG	EN 61000-4-12 ring wave	class A	
EN 61000-4-6 RF	EN 61000-4-29 DC dips		

WIRING, OUTLINE DIMENSIONS and OPEN COVER VIEW :

Typical mesh of a network

Push to return to factory
IP address: 192.168.0.253

MAC address

SML160
Manager

● Power
● Error
● Ok

Silogrid network

LOREME

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Implementation :
- Mount the receiver in the environment of transmitters, more the hop is limited (hop is a data packet transfer by and to transmitters before reach the receiver), the better is the battery life.
- Keep away as much as possible the receiver from power cables and high voltage circuits. The reception quality also optimize the battery life (less reiteration).

Associated product:
PoE injector for powered the SML160 by Ethernet. For switch which do not have PoE

Reference : **AL36 PoE**
DIN rail mounted
According to IEEE 802.3af.
http://www.loreme.fr/fichtech/AL36poe.pdf