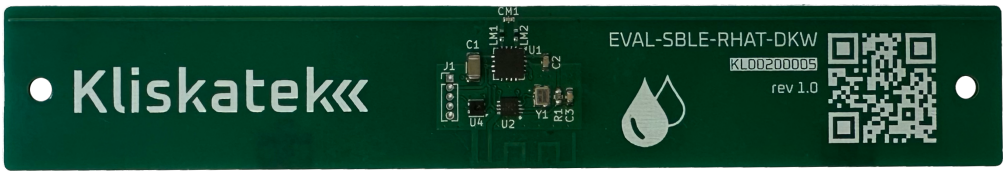
BATTERYLESS BLE HUMIDITY AND TEMPERATURE TAG

Check for samples: EVAL-SBLE-RHAT



FEATURES

- **Battery free**
- **Power harvesting from UHF**
- **Long self-powering range: 5m**
- **Bluetooth communication**
- **Data broadcast as BLE beacon**
  - **Tag type identifier**
  - **Unique serial number**
  - **Sensor data**
- **Optional AES-128 based security**
- **Relative Humidity sensor**
  - **Operation range: 0%RH to 100%RH**
  - **Accuracy: 2%RH**
  - **Resolution: 0.01%RH**
- **Ambient temperature sensor**
  - **Operation range: -40°C to 85°C**
  - **Accuracy: 0.2°C**
  - **Resolution: 0.01°C**

DESCRIPTION

EVAL-SBLE-RHAT is a wireless and battery free sensor tag that belongs to the SenseBLE (SBLE) family by Kliskatek. Built in a compact PCB format, the tag includes a relative humidity sensor and an ambient temperature.

These sensor tags are wirelessly powered by UHF power transmitters such as standard UHF RFID readers. With a 2W ERP setup, the batteryless humidity and temperature sensor can power-up to over 5 meters – 16 feet.

The SBLE family tags use Bluetooth technology to communicate. When energized, the tags broadcast BLE beacons that can be seen by any BLE compatible device.

Optionally, AES-128 based beacon authentication and payload privacy can be requested. Contact sales@kliskatek.com for security customized units.

EVAL-SBLE-RHAT is powered with UHF power transmitters. Standard ISO/IEC 18000-6 UHF RFID readers and/or simple UHF CW transmitters can be used for this purpose. The tag will not respond to any RFID command.

Unidirectional data communication is implemented with Bluetooth technology. When energized, EVAL-SBLE-RHAT will emit custom BLE beacons periodically including a the tag type identifier, version and sensor data. Sensor data is updated in every new beacon broadcast. Every tag has a unique MAC (included in the beacon) which identifies the tag unequivocally.

The structure of the beacon is as follows:

- Local Name (2 bytes): "KL"
- Manufacturer Specific Data (8 byte):
  - Company UUID: 0xFFFF (development)
  - Data (6 byte):

    * T (1 byte): tag type identifier 0x05.
    * V (1 byte): tag version.
    * AT (2 bytes): ambient temperature raw data. Data formatted as uint16 little endian. Convert to centidegrees Celsius as follows:

$$T(C) = -45 + 175 \times \frac{AT}{2^{16}}$$

    * C (1 byte): Checksum of temperature data. CRC-8 polynomial 0x31.
    * RH (2 bytes): relative humidity raw data. Data formatted as uint16 little endian. Convert to %RH as follows:

$$RH(\%) = 100 \times \frac{RH}{2^{16}}$$

    * C (1 byte): Checksum of relative humidity data. CRC-8 polynomial 0x31.

CHARACTERISTICS

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
POWER					
r_{sp}	Self-powering range [1]		5		m
COMMUNICATION					
P_{BLE}	BLE output power		0		dBm
OPERATING CONDITIONS					
T_{OP_TOP}	Operating temperature range	-40		85	°C
RELATIVE HUMIDITY SENSOR					
RH_{range}	Humidity range	0		100	%RH
RH_{acc}	Humidity accuracy				%RH
	20 %RH to 80 %RH	-4	±2	4	%RH
	0 %RH to 100 %RH	-7	±4	7	%RH
RH_{res}	Humidity resolution		0.01		%RH
AMBIENT TEMPERATURE SENSOR					
AT_{range}	Temperature range	-40		85	°C
AT_{acc}	Temperature accuracy				°C
	5 °C to 60 °C	-0.4	±0.2	0.4	°C
	-40 °C to 85 °C	-1.6	±0.8	1.6	°C
AT_{res}	Temperature resolution		0.01		°C

[1] With a 2W ERP setup

REFERENCES

The next table shows the available references of the EVAL-SBLE-RHAT.

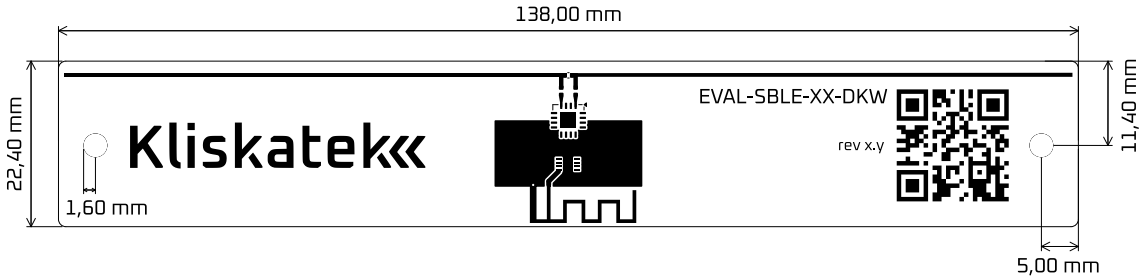
Ref.	Name	Description
KL00200005	EVAL-SBLE-RHAT-DKW	EVAL-SBLE-RHAT, dipole wideband antenna, PCB format

For custom references with other antennas and housings, please contact us at sales@kliskatek.com.

MECHANICAL DIMENSIONS

DKW

2D VIEW



3D VIEW