

WiSense Humidity and Temperature Tag (WRT20PV2)



DESCRIPTION

- Low power wireless (Sub-GHz) humidity and temperature sensor tag.
- Works with CR2032 coin cells.
- Configurable sending interval from once every sec to once a day.
- Bi-directional wireless communication between gateway and sensor nodes. This allows node behaviour to be reconfigured during installation and at any time after installation.
- WiSense Mesh compatible hardware.

SPECIFICATIONS

- **Temperature Sensor:**

- Operating Range: -25°C to +60°C
- Resolution: 14bit (0.01°C)
- Accuracy: ±0.3°C
- Repeatability: ±0.1°C
- Drift: < 0.05 °C/yr

- **Humidity Sensor:**

- 0 to 100% Relative Humidity (Non- Condensing)
- Resolution: 14bit (0.01%RH)
- Accuracy: ±2.0%RH
- Repeatability: ±0.2%RH
- Drift: < 0.5 %RH/yr (Normal condition)

- **Wireless Operating Frequency**

- India: 865 to 867 MHz
- EU: 868 MHz
- USA: 900 MHz

- **Radio Certification**

- Certified (FCC/ETSI) and non-certified radio module options available.

- **Radio max transmission power:**

- +13 dBm
- Tx power level configurable in real-time

- **Radio Antenna and range:**

- PCB Antenna
- Range: ~ 150m

- **Tag ID:**
 - ❑ 64 bit IEEE assigned globally unique id.
Ex.: 0xfc:0xc2:0x3d:0x00:0x00:0x11:0x0a:0x1e
Tag Id is printed on the back side of the enclosure.

- **Power:**
 - ❑ 2 x CR2032 coin cell (Compulsory genuine battery required)
 - ❑ Up to 1 year* of cell life (*based on transmit interval)

- **Enclosure**
 - ❑ Material: ABS, Color: White
 - ❑ Dimensions: 90 mm x 52 mm x 18 mm

FEATURES

- Very low standby mode current consumption of 2 uA allows for long battery life
- Temperature reporting options:
 1. Reports measured temperature periodically with a configurable interval - Minimum (1 sec) / Maximum (1 day).
 2. Reports measured temperature only when it changes by a configurable percentage value with respect to the prior value reported. Also, reports measured temperature if no report sent for a configurable period of time.
 3. Reports measured temperature only when it crosses a configurable high or low threshold value. High and low hysteresis values are also configurable. Also, reports measured temperature if no report sent for a configurable period of time.(WiSense can implement user-specific temperature reporting algorithm)
- WiSense gateway can support up to 64 simultaneous sensor tags in a single network.

- Other WiSense nodes can co-exist along with tags in a network.
- Each node has a unique IEEE assigned 64-bit address.

FUNCTIONALITY

Each WRT20PV2 is configured to operate as an LPWMN RFD (reduced function device). The WRT20PV2 runs a simple loop shown below -

1. On power-up, gets registered to a network coordinator (WSN1120CL)
2. Go into a deep sleep for the configured interval. In deep sleep mode, all sensors, radio and microcontroller are put into ultra low power states.
3. Wake up (after the configured interval*) and sense temperature and battery voltage. Send sensor data to the coordinator node.
4. Check if any message is pending. If a message is pending, request message from parent and act on it.
5. Go to step 2

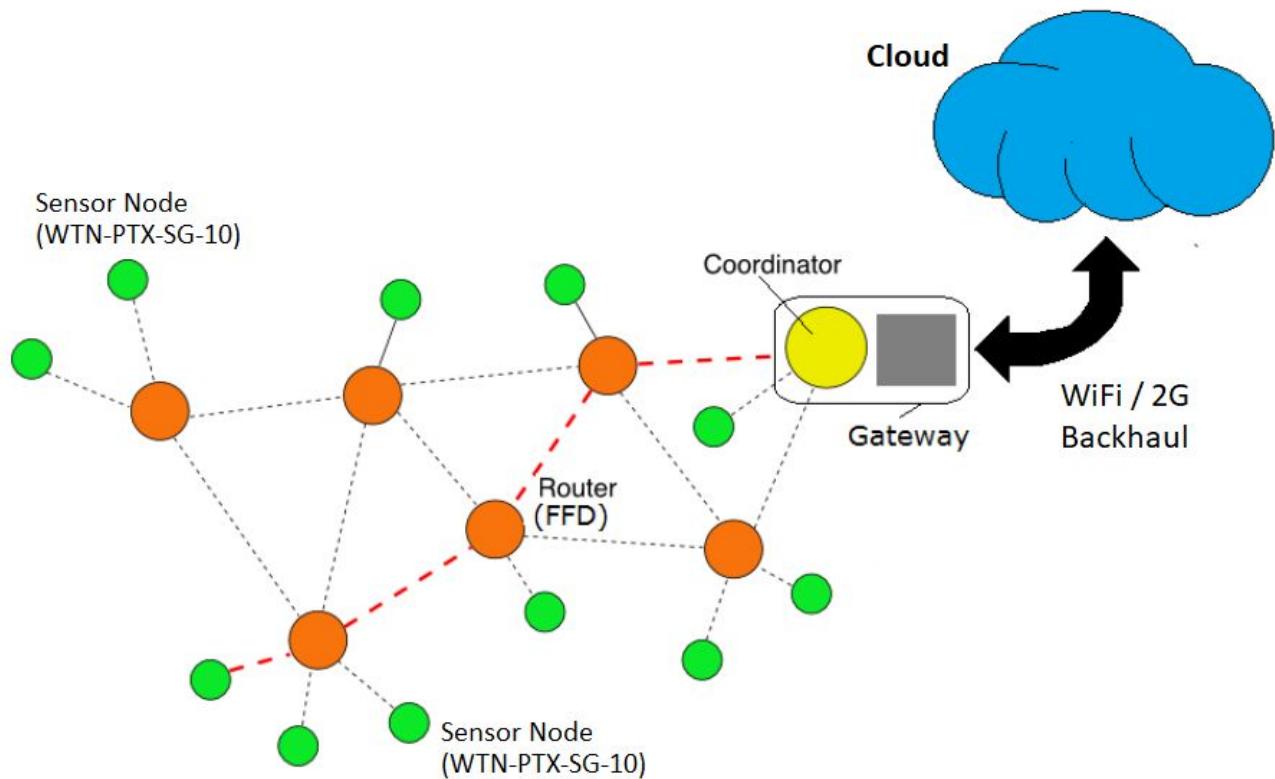
*The interval mentioned above can be 1 second to 1 day.

WiSense LPWMN and Mesh

A WiSense LPWMN (low power wireless mesh network) instance comprises:

- Exactly one Coordinator node
- One or more FFDs - full function devices which take part in mesh routing and need to be mains or solar-powered.
- One or more RFDs - reduced function devices which are in deep sleep most of the time and only wake up to sense and communicate if required. These devices/nodes are usually battery powered (a 3V coin battery, 2xAA, 2XAAA etc) and therefore energy-constrained. The WRT20PV2 is configured to operate as an RFD.

WiSense Wireless Mesh / Star Network Architecture



The WiSense Coordinator/Aggregator:

A WiSense coordinator node is required to receive data from a WRT20PV2 node. The coordinator node serves as the entry and exit point of all messages sent to and received from a WiSense LPWMN (low power wireless mesh network). The coordinator, in turn, can be interfaced to an external host (PC, Laptop, Raspberry PI, Arduino etc) over UART or over a serial to USB converter. If the latter interface is used, it will provide both power and serial connectivity to the Coordinator.

For any queries, contact:

rkris@wisense.in

**WiSense Technologies Pvt Ltd,
No. 553/A, 9th A Main,
1st Floor, Indiranagar 1st Stage,
Bengaluru 560038**

Web: www.wisense.in

Dashboard: dashboard.wisense.in

Blog: wisense.wordpress.com