

# WiSense Temperature Sensor Tag (WTN2P1)



## **DESCRIPTION**

- Low power wireless (Sub-GHz) humidity and temperature sensor tag.
- Works with CR2032 coin cells.
- Configurable transmission 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: 12bit (0.06°C)
  - Accuracy: ±0.25°C to ±0.5°C
  
- **Wireless Operating Frequency**
  - India: 865 to 867 MHz
  - EU: 868 - 870 MHz
  - USA: 902 - 928 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.  
Example: 0xfc:0xc2:0x3d:0x00:0x00:0x11:0x0a:0x1e  
Tag Id is printed on the back side of the enclosure.
  
- **Power:**
  - 2 x CR2032 coin cells

- Battery life will depend on transmission 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 WTN2P1 is configured to operate as an LPWMN RFD (reduced function device). The WTN2P1 runs a simple loop shown below -

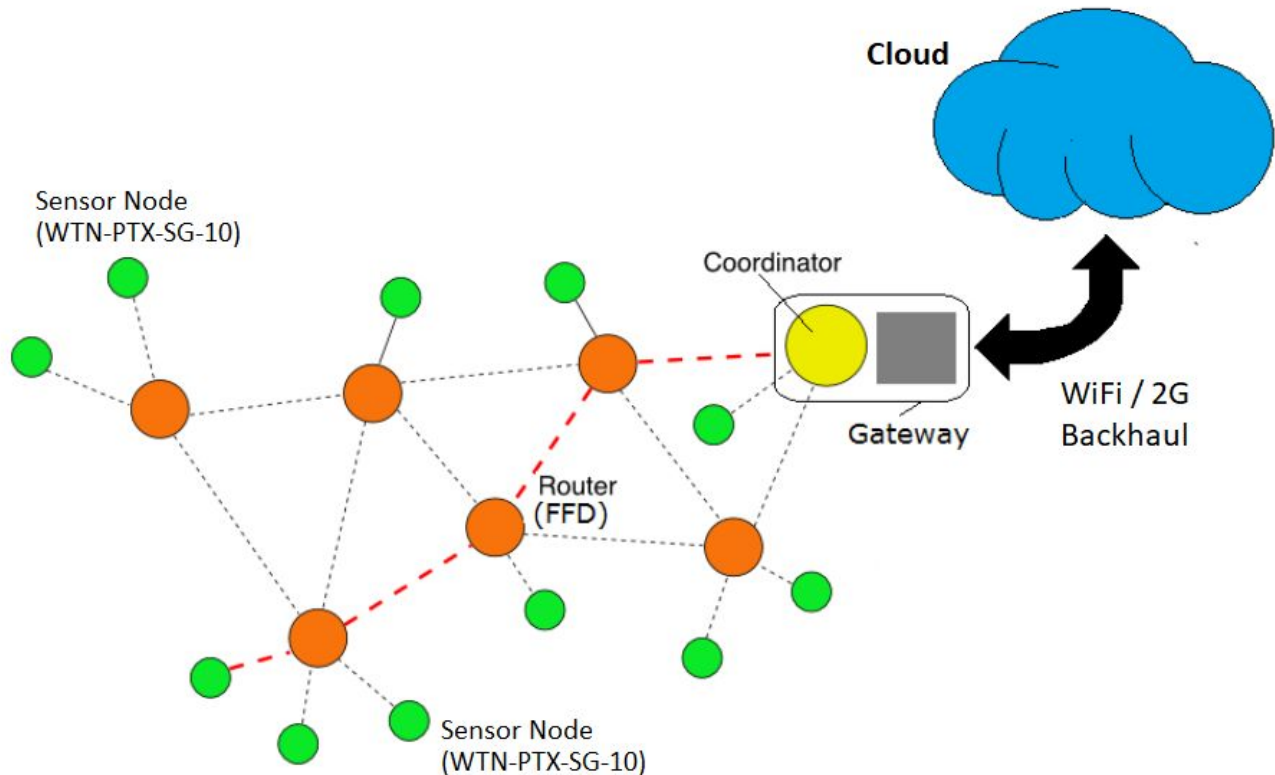
1. Go into a deep sleep for the configured interval. In deep sleep mode, all sensors, radio and microcontroller are put into ultra low power states.
2. Wakes up (after configured interval\*), senses temperature and battery voltage and sends sensor data to the coordinator node.
3. Listen for configuration message from coordinator node.
4. Go to step 1

## **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 WTN2P1 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 WTN2P1 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.

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