

WiFi Temperature

FEATURES



- NIST Traceable Platinum RTD Temperature Sensor
- 16 mw 2.4 GHz 802.11b WiFi module
- Communicates with Industry Standard Access Points
- Configurable Alarm Utility
- Local LED for Alarm Indication
- Onboard calibration table provides linear output
- Up to 5 year battery life
- Supports WEP 128 and WPA2-PSK (AES)
- Small data packets (~75 bytes)
- Temperature sampled every 15 seconds
- Supports DHCP or Static IP
- Channel agility
- FCC, CE, and IC Class B compliant

DESCRIPTION

The Point Sensor WiFi RTD-100 sensor is a Sealed, battery operated RTD temperature sensor with an integrated microprocessor controlled 2.4GHz IEEE 802.11b radio transmitter. The sensor has an on board clock that allows it to spend most of the time in a low power quiescent state. User defined, programmable transmission intervals allow the user to obtain data based on the application needs. Onboard calibration tables provide a linear temperature output and is combined with a CRC-16 error check and transmitted in a very short data packet that results in a very short transmitter on-time. This architecture allows the Point Sensor WiFi RTD-100 Temperature transmitter to consume very low energy.

Upon power up the sensor scans all available WiFi network channels (typically 1, 6, and 11) and associates with the Access Point exhibiting the strongest signal, provided the correct security and encryption setting agree. This feature can also be disabled to allow the user to operate the sensor on a fixed channel.

Alarm limits for temperature and time span are user selectable through an easy to use utility. An LED is included on the sensor to indicate the following conditions: Alarm, Alarm Acknowledgment, and Return to Normal. The Alarm Acknowledgement is indicated by a different LED flash sequence and can be reset via a return radio transmission. The Return to Normal (RTN) is used to allow the user to determine the exact duration of the alarm.

Resolution	.1° C
Accuracy 60-85 ° C	+/- .5° C
Accuracy 30-60 ° C	+/- .3° C
Accuracy 0-30 ° C	+/- .1° C
Accuracy (-40)-0 ° C	+/- .3° C
Transmission rate	User Programmable
Battery Life	87,600 Transmissions
Dimensions (enclosure)	2.56"x1.97"x1.38"
Weight	3.2 oz.
Storage Temperature	-40° to 60° C
Operating Temperature	-40° to 60° C
Battery	1.5 vdc Lithium L91 (2)

Point Six Wireless
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UDP Packet Specification

OVERVIEW

Point Six Wireless Wifi sensors send a standard sensor packet contained in a UDP wrapper. This UDP wrapper contains information about the sender. See the document "**Point Six Wireless Transmitter Packet Data Specification**" for information about the standard sensor packet.

Wifi sensors normally send UDP packets with a command of 2. The Wifi Sensor Utility has a mode where it will send UDP packets on behalf of a sensor using command 5. The host application (like Point Managers, OneSix OPC Server or other applications) will respond with the UDP Host Acknowledgment packet. The acknowledgement packet allows the Wifi Sensor Utility to confirm that a host is receiving the UDP packets. Host applications should respond with an acknowledgement if a command 5 packet is received. The Wifi Sensor Utility provides a bogus sensor packet with type 0 and sensor serial number of all zeros. This bogus sensor packet should not be processed by the host application but the UDP Host Acknowledgement packet should be sent.

Phase 1 Wifi sensors sent a UDP Packet just once for every transmit interval. Phase 1 sensors expect no host acknowledgement.

Phase 2 Wifi sensors will send a UDP Packet with a programmable number of tries (with 15 seconds between tries) until an UDP Host Acknowledgement packet was received for every transmit interval or when an alarm is fired. If an alarm is fired, the sensor will populate the "Alarm" field with the alarm state.

UDP SENSOR PACKET

Identifier		Cmd		Data1						Data2					
0	1	2	3	4	6	24	32	33	34	63	64	67	70	72	73
C3	3C	00	<i>Cmd</i> (1)	<i>PktCnt</i> (2)	<i>MAC</i> (18)	<i>Reserved</i> (8)	<i>Locator1</i> (1)	<i>Locator2</i> (1)	<i>Sensor Pkt</i> (29)	<i>Org</i> (1)	<i>Transmissions</i> (3)	<i>Max Transmissions</i> (3)	<i>Period</i> (2)	<i>Alarm</i> (1)	<i>Reserved</i> (2)

Where

C3 3C - 2 byte identifier

Cmd – (1 byte) Command: 2 – UDP Sensor Data; 5 – UDP Simulated Sensor Data (Wifi Sensor Utility).

PktCnt⁺ – (2 bytes) packet count. The device will increment this count every time it transmits a UDP PassThru packet.

MAC – (18 bytes – null terminated string) device MAC address. If the MAC address does not apply this field will contain a unique identifier for the device. If not used, this field will be set to all zeros. (ex: "00:23:b4:39:03:47") (NULL terminated)

reserved – (8 bytes) set all bytes to 0.

Locator1 – character that represents where a sensor packet entered the repeater network. (" ", "a"- "z" and "A"- "Z"). Normally set to NULL(0) for Wifi sensors.

Locator2 - character that represents where a sensor packet entered the repeater network. (" ", "a"- "z" and "A"- "Z"). Will be identical to Locator1. Normally set to NULL(0) for Wifi sensors.

Sensor Pkt – (29 bytes) sensor packet. (includes the CR terminator) See the document "**Point Six Wireless Transmitter Packet-Data Specification**" for more information about specific sensors.

Org – originator type that generated the packet. 0 – Wifi Sensor; 1 – Point Manager; 2 – Ethernet Point Repeater; 3 - Application

Transmissions⁺ – (3 bytes) number of transmissions since last battery reset. 0 if no battery support

UDP Packet Specification

Max Transmissions⁺ – (3 bytes) maximum number of transmissions for the power source (0 to 16777216 where 0 is unlimited)

Period⁺ – (2 bytes) transmit interval in seconds.

Alarm – (1 byte) sensor is in alarm state: 0 – no alarm

Bit 0: I/O 1 – low alarm

Bit 1: I/O 1 – high alarm

Bit 2: I/O 2 – low alarm

Bit 3: I/O 2 – high alarm

Bit 4: I/O 1 – low alarm reset: 0 - reset

Bit 5: I/O 1 – high alarm reset: 0 - reset

Bit 6: I/O 2 – low alarm reset: 0 - reset

Bit 7: I/O 2 – high alarm reset: 0 - reset

Reserved – (2 bytes) set all bytes to 0.

⁺ Most significant byte is first.

Note: UDP Sensor Packets that include only Data1 are 63 bytes. UDP Sensor Packets that include Data1 and Data2 are 75 bytes. Older sensors contained Data1 but not Data2. Newer sensors include Data1 and Data2.

Example:

```
0000 c3 3c 00 02 41 f7 30 30 3a 30 36 3a 36 36 3a 37
0010 37 3a 30 33 3a 32 41 00 00 00 00 00 00 00 00 00
0020 00 00 35 33 37 31 31 36 31 30 30 38 30 30 30 30
0030 30 30 30 30 46 33 38 31 34 38 36 38 31 36 0d 00
0040 00 15 5a 01 56 30 01 00 00 00 00
```

Battery Usage Indicator

Estimated Battery Life Percentage = $100 - \text{Transmissions} / \text{Max Transmissions} * 100$

Estimated Battery Expiration = $\text{CurrentTime} + (\text{Max Transmissions} - \text{Transmissions}) * \text{Period}$

If battery usage information is not supported by the sensor or device, then *Transmissions*, *Max Transmissions* and *Period* will all be zero.

Battery Usage Indicator is reset by pressing “Service” button while turning the sensor On.

UDP Host Acknowledgement

Identifier		Cmd	
0	1	2	3
C3	3C	00	06

Where

C3 3C - 2 byte identifier

00 06 – (2 bytes) UDP Host Acknowledgement

UDP Packet Specification

FUTURE EXPANSION

The UDP Sensor Packet may be expanded in one of two ways: 1) Append additional data fields to the original 75 bytes. An application should accept packets of 75 bytes or greater. When it receives the packet it should process the 75 bytes and if the packet is longer, optionally process the additional bytes. 2) Additional "Cmd" parameters will be created with unique packet formats for the new commands.

CURRENT WIFI SENSORS

The following is list of the current types of sensors with their corresponding standard sensor packet types. See the document "**Point Six Wireless Transmitter Packet Data Specification**" for information about the standard sensor packet.

Description	Point Six Wireless Packet Device ID Name	Point Six Wireless Packet Device ID/Service ID
RTD	TEMP	54/53
Dual RTD	DUALANALOG	76/75
Humidity/Temperature	HUMIDITY2	52/51
Vibration	DUALANALOG	76/75

Wireless Transmitter Packet-Data Specification

Temperature Sensor Data Format (Legacy Packet)

“Temp” (54/53)

IDSSSSSSSSSSSSSSSSSTTTTCCCCKK<CR>

Note: All fields are in ASCII Hex

“ID”

This field is the device ID; 54 indicates normal mode, 53 indicates service mode; (service mode button has been pushed).

“SSSSSSSSSSSSSSSS”

This field is the 64 bit unique serial number of the 1-Wire temperature sensor.

“TTTT”

This is the temperature data field; two's compliment 16-bit data stored MSB first in 1/16 deg. C units.

“CCCC”

This field is the CRC-16 error check as was originally received and checked. This CRC is over the first 11 bytes of the packet starting with the device type and ending with but not including CRC-16.

“KK”

This field is the mod 256 sum of all the binary data values as represented by the ASCII hex values in the response but does not include the <CR>.

Example:

53282764080000003F0160716483

SN=282764080000003F; Temp=0160 – 22.0 degC; CRC16 =7164; Checksum=83