WiFi RTD Transmitter 00C30S109A-02

- Universal Temperature Transmitter with logging
- Compatible with all Victory RJ11 remote RTD probes
- Single (p/n 3008-02-V6) or Dual Channel (p/n 3008-02-V6-2)
- Communicates with Industry Standard Access Points
- Wireless Configuration
- Configurable Alarm Utility with Audible and Visual Alarm Indication
- Up to 3-4 year battery life
- Supports WEP128, WPA-PSK (TKIP), and WPA2-PSK (AES)
- Small data packets (~75 bytes)
- Temperature Channel(s) sampled every 15 seconds
- Programmable log rates (2 minutes to 1 hour)
- Supports DHCP or Static IP
- Channel agility
- Optional external power adapter (2-3.6vDC)
- FCC, CE, and IC Class B compliant

DESCRIPTION

The Point Sensor WiFi RTD Sensor is a battery operated digital temperature/ humidity sensor with a microprocessor controlled IEEE 802.11b/g radio transceiver. The sensor has an on board clock that allows it to spend most of the time in a low power quiescent state. Onboard calibration tables provide a linear temperature output. This information 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 Sensor 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.

The Point Sensor WiFi RTD sensor also has onboard memory allowing it to function as a data logger. The sensor has programmable log rates ranging from 2 to 60 minutes. The sensor can store up to 3,072 data and/or event records.

Alarm limits for temperature and time span are user selectable through an easy to use utility and can be configured wirelessly. An LED is included on the sensor to indicate an alarm condition. In addition to the LED for visual alarm indication, an audible alert is included to alert the user to an alarm condition when the sensor is not in the line of sight. The audible alarm can be silenced by depressing the reset button on the face of the enclosure. The alarm utility includes a “Return-to-Normal” transmission state so the user can tell the exact duration of the alarm. The alarm can be acknowledged by sending a radio packet back to the sensor or by a user selectable time-out. Upon acknowledgement, the LED displays a different flash sequence.

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Installation and Operation Instructions

Specifications

Parameter	Standard RTD
Measuring Current	300 micro Amp. @ 2% duty cycle
RTD Power on Duty Cycle	2%
Resolution	.1° C
Transmission rate	User Programmable
Log rate	User Programmable
Battery Life	Up to 157,680 Transmissions
Dimensions (enclosure)	4.625”x2.85”x1.0”
Weight	5.0 oz.
Storage Temperature	-40° to 60° C
Battery	3.6 v Lithium Thionyl Chloride (2)

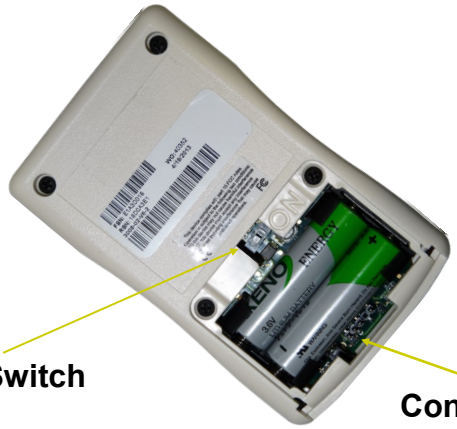
WiFi RTD Transmitter

The Point Sensor WiFi RTD sensor transmits a temperature and a unique serial number to a WiFi Access Point. The Point Sensor WiFi RTD sensor is enclosed in a high impact ABS enclosure for direct surface mounting in the environment to be measured. The Point Sensor WiFi RTD sensor is battery operated and transmission times are user programmable.

Application: Apply the sensor to the surface to be monitored with double-sided adhesive tape or use optional wall mounting bracket (1000-15).

Start/Stop Function: The sensor is started when the On/Off switch is moved to the ON position The Sensor has surface pushbutton (Service Switch) that can be activated to send “service” packets. Momentarily activating this button will cause the device to transmit a special installation status mark in the data packet immediately after the button is released. The immediate transmission of temperature, ID, and installation status mark will occur anytime the service switch is activated. The Point Sensor WiFi RTD sensor may be placed in a quiescent state (no transmission) by sliding the On/Off switch off.

Battery: Two 3.6 Volt lithium Thionyl chloride batteries power the wireless temperature sensor. The device will transmit data for as long as 4 years.



This device contains transmitter module
FCC ID: T9J-RN171
IC: 6514A-RN171
US Patent: 6721546 B1

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES, OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESERED OPERATION

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UDP Packet Specification

OVERVIEW

Victory Wireless Wifi sensors send a standard sensor packet contained in a UDP wrapper. This UDP wrapper contains information about the sender. See page 5 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.

Victory Wireless Wifi sensors will send a UDP Packet with a programmable number of tries (with 30 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	*Cmd (1)*	*PktCnt* (2)	*MAC* (18)	*Reserved* (8)	*Locator1* (1)	*Locator2* (1)	*Sensor Pkt* (29)	*Org (1)*	*Transmis-sions (3)*	*Max Transmis-sions (3)*	*Period (2)*	*Alarm (1)*	*Reserved (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 "**Vicotry 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

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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 – *Transmissions*/ *Max Transmissions**100
Estimated Battery Expiration = CurrentTime + (*Max Transmissions* – *Transmissions*)* *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

Where

C3 3C - 2 byte identifier

00 06 – (2 bytes) UDP Host Acknowledgement

Identifier		Cmd	
0	1	2	3
C3	3C	00	06

"DualAnalog" (75/76)

IDSSSSSSSSnneeaaaaAAAACCCCKK<CR>

Note: All fields are in ASCII Hex

"ID"
The device type field: DualAnalog has device type 76 hex. A 75 hex when in service mode.

"SSSSSSSS"
The MS-30 bits of these 4-bytes are the serial number of the DualAnalog device. The LS-2 bits are set to zero.

"nn"
Bits 0 and 1: The number of I/O points (1 byte field: 1 or 2). Bits 2 –7: enumerated Engineering units for 2nd Analog.

"ee"
Bits 0-5: enumerated Engineering units for 1st Analog. Bits 6 and 7: reserved (always 0).

"aaaa"
This is the second analog data field and is populated when the number of I/O points is 2. This field is signed 16 bits stored MSB first (bits 15-8) and LSB last (bits 7-0) from left to right. This field has a possible range of –32768 to 32767. This is a general purpose field and may contain 8 bit or 12 bit data.

"AAAA"
This is the first analog data field and always exists. This field is signed 16 bits stored MSB first (bits 15-8) and LSB last (bits 7-0) from left to right. This field has a possible range of –32768 to 32767. This is a general purpose field and may contain 8 bit or 12 bit data.

"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>.

Packet Example:
76E203C004F23C0825075ED1F2A9
SN = E203C004 ; No of I/O = 02H; EEU1 = 3CH/60D; EEU2 = 3CH/60D; Channel2 = 0825H = 3.7C; Channel1 = 075EH = -15.7C; CRC16 =4CBEH; C6 - Checksum

Enumerated Engineering Units
"DualAnalog" and "CounterAnalog" have attributes as part of their packets that are an enumerated value that describes the scale/offset and engineering units of an analog I/O point. These attributes are 6 bits and therefore can describe up to 64 enumerations. Victory reserves enumerated values 0 and 33 through 63. Enumerated values 1 through 32 are user defined. If a host application does not recognize an enumeration, then it should default to the scale/offset/engineering units as defined by enumeration 0. The follow table defines the Victory enumerations.

Enum	*Bin1*	Engr1	Bin2	Engr2	Scale	Offset	Units	Description
0	0	0	4095	100	0.0244	0	%	Generic
63	0	-40	4095	85	0.030525	-40	degC	Temperature
62	0	-40	4095	185	0.0549	-40	degF	Temperature
61	0	0	4095	100	0.0244	0	%RH	Humidity
60	0	-200	4095	200	0.0977	-200	DegC	Temperature (+/- 200 C)
59	0	0	4095	4095	1.0	0	ppm	CO_2

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