



The WSR-T2-A4B7 provides a base for batteryless, wireless and low cost temperature measurement solution that is ideally suited for applications ranging from industrial to consumer markets. This Wireless Sensor Reader is a highly sophisticated SAW Sensor interrogation unit and is designed to monitor multiple sensors simultaneously. This reader is optimized to enable individual output power settings for each single sensor to meet CE and FCC regulations. Additionally, this reader can detect Partial Discharge events within a switchgear.

SenGenuity will work closely with you to adapt the WSR-T2 to meet the specific needs of your application.

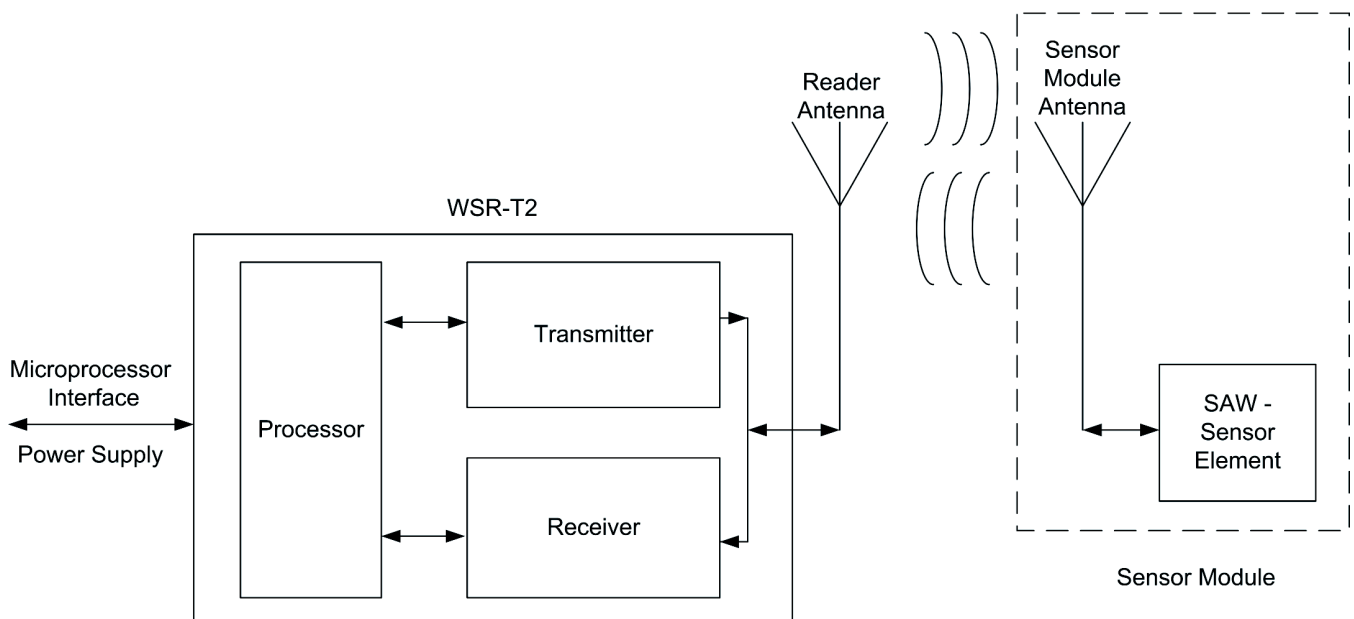
System Features

- Batteryless wireless temperature sensors
- Multiple sensor tracking capability
- Interrogation distance¹ up to 3 m
- Typical sensor temperature range: -20°C to 120°C
- CAN and RS485 interface with Custom or Modbus RTU protocol²
- Output power will be set by software to meet the CE and FCC regulations
- Highly efficient real-time algorithm to detect Partial Discharge

System Applications

- Batteryless, wireless temperature measurement for
 - Electric power grid
 - Rotating and reciprocating parts
 - High temperature industries

Block Diagram System



Performance Specifications

Parameter	Min	Typical	Max	Units	Condition
Frequency range ³	428		439.5	MHz	Refer to FCC/CE Certification detail in Notes
Receiver input sensitivity		-95		dBm	
Operating temperature range	-20		+70	°C	for WSR-T2
Resolution	-32		+32	Hz	
Initial accuracy	-1.5		+1.5	kHz	@25°C and -75 dBm input power at time of shipment
Accuracy referenced to +25°C	-0.5		+0.5	kHz	vs. operating temperature range
Accuracy referenced to time of shipment	-1.5		+1.5	kHz	vs. aging / 5 years
Measurement time		50		ms	depends on settings and number of interrogations per measurement
Number of sensors	1		32	pieces	6 Sensor System: 6 sensors per antenna 12 Sensor System: 2x 12 and 1x 8 sensors
Power Supply Possibilities					
Supply voltage	+4.0	+5.0	+5.5	VDC	CAN connector Pin S2/1
Supply voltage ⁴	+4.75	+5.0	+5.5		screw terminal Pin 1
Supply voltage ⁴	+9	+12	+30	VDC	screw terminal Pin 2
Power consumption CAN		0.95	1.2	W	at 5 V (unisolated)
Power consumption screw term.		1.2	1.5	W	at 5 V or 12 V (isolated)
Power consumption screw term.		1.3	1.6	W	at 24 V (isolated)
Mechanical Specifications Reader unit					
Length		96		mm	
Height		45		mm	
Width		57		mm	
Weight		120	140	g	
Pinning and connectors					
Interface connector	CAN			plug in to Tyco Electronics 280378-2	
Interface connector	RS485			screw terminals	

Partial Discharge Function

Required firmware

- Starting at firmware version 11.11. 2015 or more recent

Basic Functionality

The purpose of this functionality is to detect Partial Discharges within a switchgear via the Reader with the connected Antenna, which is also used for regular Temperature Sensor readings. It is intended to detect long-term degradation of the switchgear Isolation system and does not allow for detailed analysis regarding the source of the Partial Discharges.

The Reader will listen via the connected Antenna for Partial Discharges at multiple Frequencies within 428-439.5 MHz.

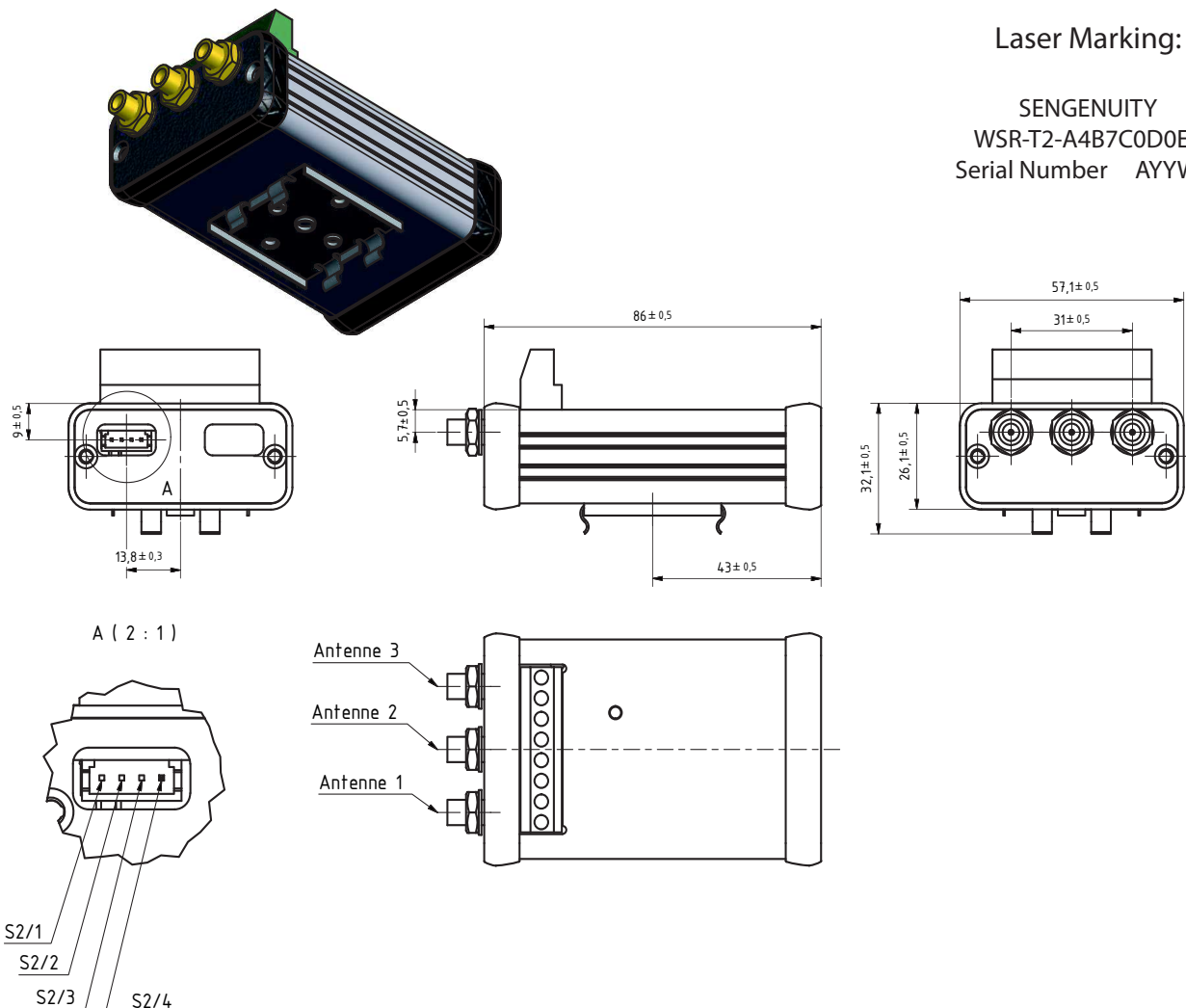
Each listen phase consists of multiple observation cycles. The highly efficient real-time algorithm will analyse the signal patterns and report the number of Partial Discharges and Noise cycles. During a Noise cycle no Partial Discharge can be detected. The reported number of PD's might differ from the actual number of PD's, however it will provide a good indication on the real number of PD's.

The magnitude of the Partial Discharges (pC) is not reported since it is a function of the intensity AND the distance of the Partial Discharges to the Antenna.

Absolute Maximum Ratings

Parameter	Min	Typical	Max	Units	Condition
Humidity			80	%	Non condensation
Operable Temperature Range	-30		+70	°C	
Storage Temperature Range	-40		+70	°C	
CAN Interface Pin S2/1	0		+6	V	Supply
CAN Interface Pin S2/2		NA			Ground
CAN Interface Pin S2/3	-6		+15	V	CANL
CAN Interface Pin S2/4	-6		+15	V	CANH
Screw Terminal, Pin1	0		+7	V	Supply
Screw Terminal, Pin2	0		+30	V	Supply
Screw Terminal, Pin 3+4		NA			GND
Screw Terminal, Pin5+8	-60		+60	V	RS485A+ „hot swap / plug“ capable
Screw Terminal, Pin 6+7	-60		+60	V	RS485 B- „hot swap / plug“ capable

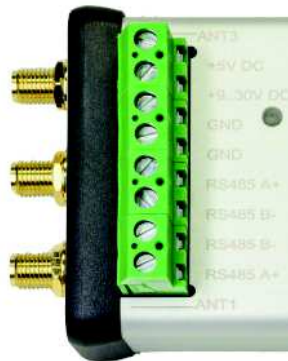
Outline Drawing / Enclosure Option E2



Pin connections

Pin Connections CAN

S2/1	+ 5 V
S2/2	Ground
S2/3	CANL
S2/4	CANH



Pin Connections Screw Terminals

1	+ 5 V DC
2	+9...+30 V DC
3	GND
4	GND
5	RS485 A+
6	RS485 B-
7	RS485 B-
8	RS485 A+

Ordering Information

WSR - T2 - A4 B7 C0 D0 E2

Product Family

WSR: Wireless Sensor Reader

WSR -Version T2

Supply Voltage Required Option

A4: 5 V and 9..30 V DC Isolated

Additional Interface

B7: RS485 Half duplex 2 Terminals per signal, Isolated (± 60 V)

Package

E2: with housing and Clip for TS-35

Display Connector

D0: no display connector

Analog Outputs

C0: No analog output

Item Number	Description
713200225	WSR-T2-A4B7C0D0E2
713200226	WSR-T2-A4B7C0D0E2 + Converter Cable 1.8m USB to RS485

Notes:

- 1) Dependent on RF environment and output power
- 2) Ask SenGenuity for software manuals
- 3) FCC/CE Certification refer to: ADVISORY for COMPLIANCE to COUNTRY DIRECTIVE(S)
- 4) Power supply must be able to provide 500mA start-up-current

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Vectron is advising customers that this shipment may contain product that is compliant to certain directives as indicated by appropriate marking (e.g. FCC and/or CE marking as appropriate) or un-marked product that is being sold as a “component” or “sub- assembly”.

Product with FCC and/or CE markings must not be altered in any way and must be used in accordance with the requirements of the standards that the product has been tested to comply with (Refer to the User Manual/ Instructions and safety precautions). A declaration of conformity can be provided upon request or obtained from SenGenuity’s web site

<http://www.sengenuity.com/tempsensorresources.html>

Further, if the customers integrate such certified product into their end-product which they intend to put on the market in their own country or any other country, they are ultimately responsible for ensuring compliance to the respective EMC directives or regulations as applicable in those countries.

Un-marked product is intended for further processing and assembly by customers (manufacturers) into their own products with a view to putting such product on the market for service or end-use under their name. If the shipment contains unmarked product (e.g. without FCC and/or CE marking), customers are advised and cautioned that, as the “manufacturer” of the product, they are ultimately responsible for ensuring compliance to the respective EMC directives or regulations as applicable in those countries when they put their end-product incorporating the Vectron product on the market.

For further guidance on this subject, please refer to:

http://ec.europa.eu/growth/sectors/electrical-engineering/emc-directive/index_en.htm

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