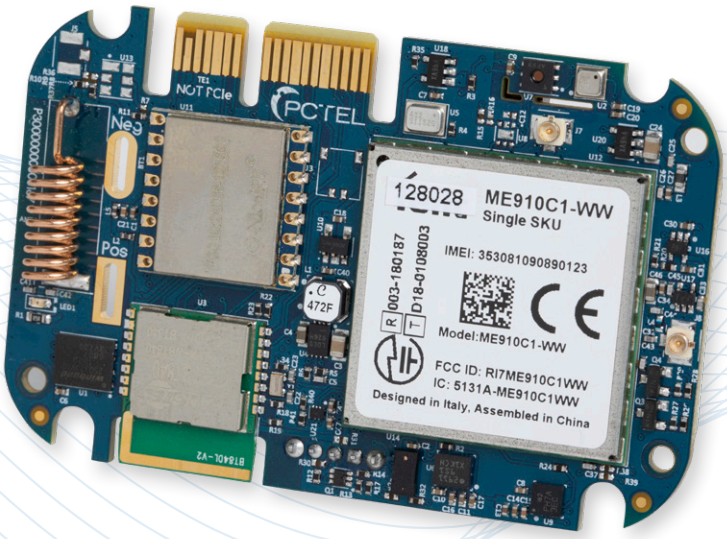
DATASHEET **INDUSTRIAL IoT DEVICES**

Wireless Sensor Core

Multi-Radio Connectivity with Integrated Sensors

WSC-1450



Connectivity

- Cellular Cat M1/NB-IoT
- Bluetooth® 5
- LoRa
- 802.15.4
- NFC

Features

- Cortex M4F 32-bit application processor with 1MB flash memory / 256K RAM
- 4MB external flash memory
- GPS receiver included in cellular radio
- LED indicator
- Card edge debug and interface connector

Sensors

- Relative Humidity and Temperature
- 6-axis / 9-axis Inertial Measurement Unit
- Gas, Air Quality, Pressure, Temperature and Humidity
- Time-of-Flight Ranging
- Microphone

PCTEL

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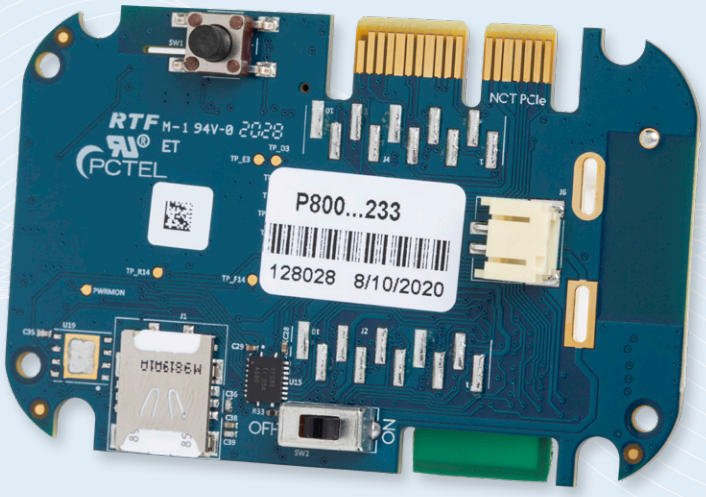

Wireless Sensor Core

Multi-Radio Connectivity with Integrated Sensors

The PCTEL® Wireless Sensor Core (WSC) family is a versatile Industrial IoT product line that offers multiple radio connectivity options including cellular, LoRa, Bluetooth® 5, NFC as well as 802.15.4 support.

In addition to several radios, the PCTEL WSC family includes several sensors to monitor a variety of physical conditions. These sensors can detect gas, air quality, temperature, relative humidity, acceleration, angular rate of change, magnetic field, range, and sound. For solution optimization, the PCTEL WSC can be ordered with a subset of radios and sensors.

With the PCTEL WSC, there is a card edge connector that provides the interfaces for external SPI and I2C devices. Also available on the connector are GPIO pins, an ADC channel, I2S, QSPI and USB. Programming and debugging through a UART and SWD are included as well.

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ADVANTAGES

Wireless Sensor Core

Multi-Radio Connectivity with Integrated Sensors

Features and Benefits

Feature	Benefit
ARM Mbed Enabled	Faster time to market leveraging ARM Mbed OS to accelerate application software development.
ARM Pelion Enabled	Provides for the secure provisioning, connecting and managing of the endpoint reducing development time.
Integrated Debug Interface	Ease of software development using the Wireless Sensor Development System.
20-pin Common Cellular Modem Header	Core can be plugged into a variety of existing systems with this popular connector.
Nano-SIM Card Holder	Easy installation of preferred cellular provider SIM card.

Card Edge Debug and Interface Connector

WSC [generic function]	WSC [signal]	Pin	Pin	WSC [signal]	WSC [generic function]
MISO/TRACEDATA1	LoRa_MISO	B1	A1	CELL_TX	TX [from Processor]
MOSI/TRACEDATA2	LoRa_MOSI	B2	A2	CELL_RTS	RTS
SCLK/TRACECLK	LoRa_SCLK	B3	A3	CELL_RX	RX [to Processor]
SS#/TRACEDATA3	LoRa_SS#	B4	A4	CELL_CTS	CTS
GND	GND	B5	A5	GND	GND
I2C_SCL	SCL	B6	A6	I2S_WS	GPIO04
I2C_SDA	SDA	B7	A7	I2S_SCK	GPIO05
GND	GND	B8	A8	GND	GND
GPIO01/Analog1	CELL_ON_OFF	B9	A9	BT840_USB_P	USB_P
GPIO02/Analog2	SENSOR_PWR_EN	B10	A10	BT840_USB_N	USB_N
GPIO03	I2S_SD	B11	A11	BT840_VBUS	VBUS
DEBUG_TX [from Processor]	DEBUG_TX	B12	A12	VCC_33	VCC
DEBUG_RX [to Processor]	DEBUG_RX	B13	A13	VBAT	VBAT
GND	GND	B14	A14	GND	GND
QSPI_CSn	QSPI_CS#	B15	A15	BT840_SWDIO	SWDIO
QSPI_DATA1	QSPI_IO1	B16	A16	BT840_SWDCLK	SWDCLK
QSPI_DATA0	QSPI_IO0	B17	A17	BT840_RESET#	RESET#
QSPI_CLK	QSPI_CLK	B18	A18	BT840_SWO/TRACEDATA0	SWO/TRACEDATA0

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SPECIFICATIONS

Wireless Sensor Core

Multi-Radio Connectivity with Integrated Sensors

General Specifications

Parameter	Specification
Operating Temperature	-40°C to +85°C (without Time of Flight sensor) -20°C to +70°C (with Time of Flight sensor)
Storage Temperature	-40°C to +85°C
Dimensions	45mm x 70mm x 18.5mm with LoRa antenna (14mm without LoRa antenna)

Sensor Specifications

Device	Specification
Relative Humidity / Temperature	±3% RH (max) 0-80% RH / ±0.4°C (max) -10°C to +85°C
6-Axis IMU Motion Tracking Device	3-axis Accelerometer: ±2/±4/±8/±16 g linear 3-axis Gyroscope: ±250/±500/±1000/±2000 dps
9-Axis Inertial Measurement Unit	3-axis Accelerometer: ±2/±4/±8/±16 g (linear) 3-axis Angular rate: ±245/±500/±2000 dps 3-axis Magnetic position: ±4/±8/±12/±16 gauss
Time-of-Flight	Absolute range up to 2m (3% conditional accuracy)
Microphone	Frequency response: 50 Hz to 20 kHz SNR: 65 dBA, Sensitivity -26 dB FS
Environmental Gas / Air Quality	Gas (VOC): 20% tolerance; 5% accuracy
	Pressure: 300 to 1100 hPa (±0.6 hPa)
	Humidity: 10% to 90% RH (±3%) at 0°C to +65°C
	Temperature: -40°C to +85°C (±1°C), 25°C (±0.5°C)
	Air Quality Score: 0 to 500 (±15%)

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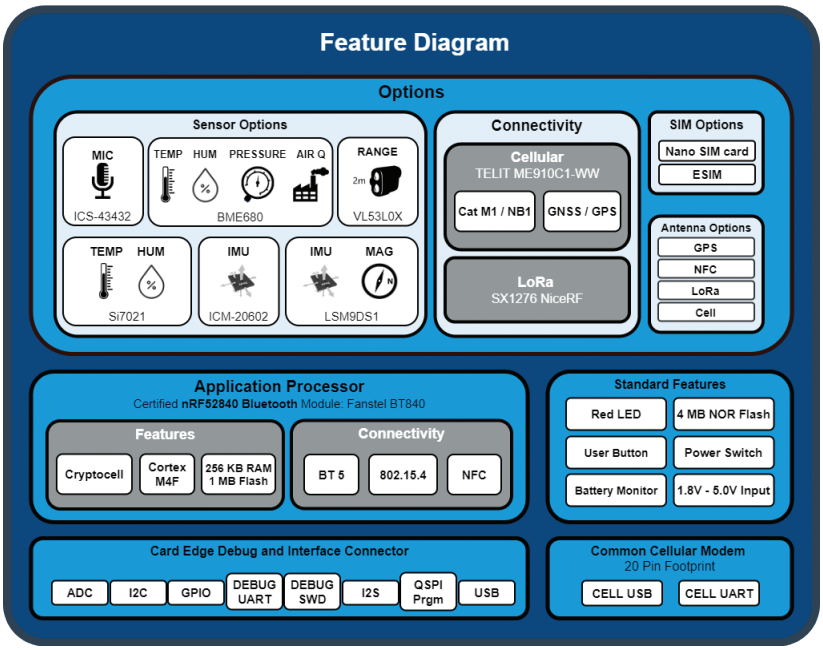

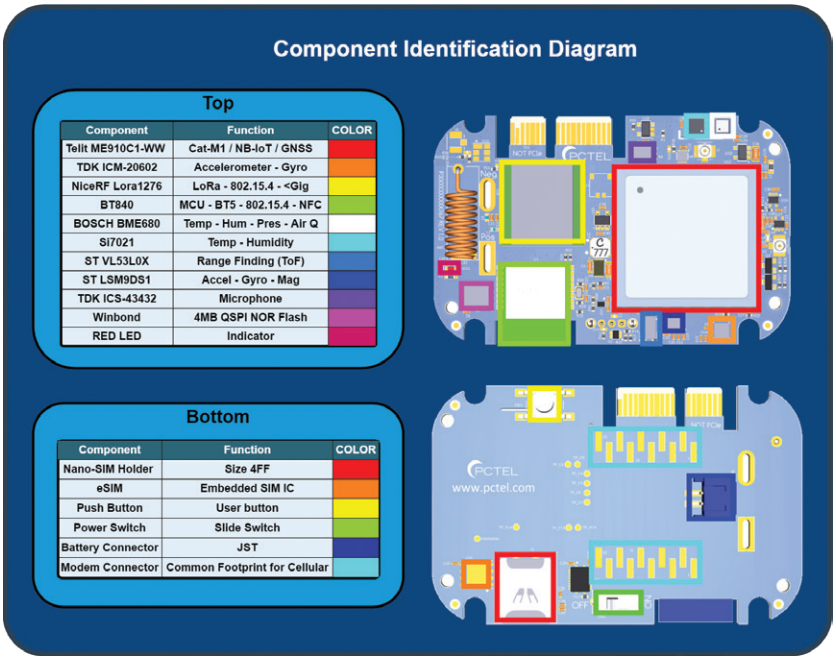

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CONTACT US

For more information about this product contact your sales representative or visit
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Solving Complex Wireless Challenges

PCTEL is a leading global provider of wireless technology, including purpose-built Industrial IoT devices, antenna systems, and test and measurement solutions. Trusted by our customers for over 25 years, we solve complex wireless challenges to help organizations stay connected, transform, and grow.

PCTEL

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