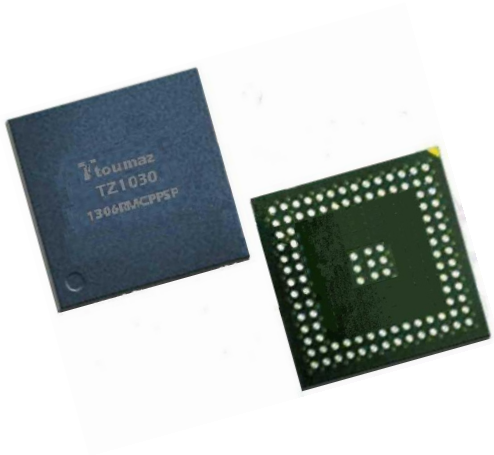
TZ1030
Ultra Low Power Smart Sensor interface and Transceiver Platform

Description

The Sensium™ TZ1030 is an ultra low power wireless sensor interface platform for a wide range of applications in healthcare and lifestyle management. The device includes a reconfigurable sensor interface, digital block with 8051 processor and RF transceiver. On-chip program and data memory permits local processing of signals. This capability can significantly reduce the transmit data payload.

The Sensium™ together with an appropriate external sensor provides ultra low power monitoring of ECG, temperature, physical activity, blood glucose and oxygen levels. It can also interface to 3 axis accelerometers, pressure sensors and monitor temperature on chip or on an external sensor.



TZ1030 chip

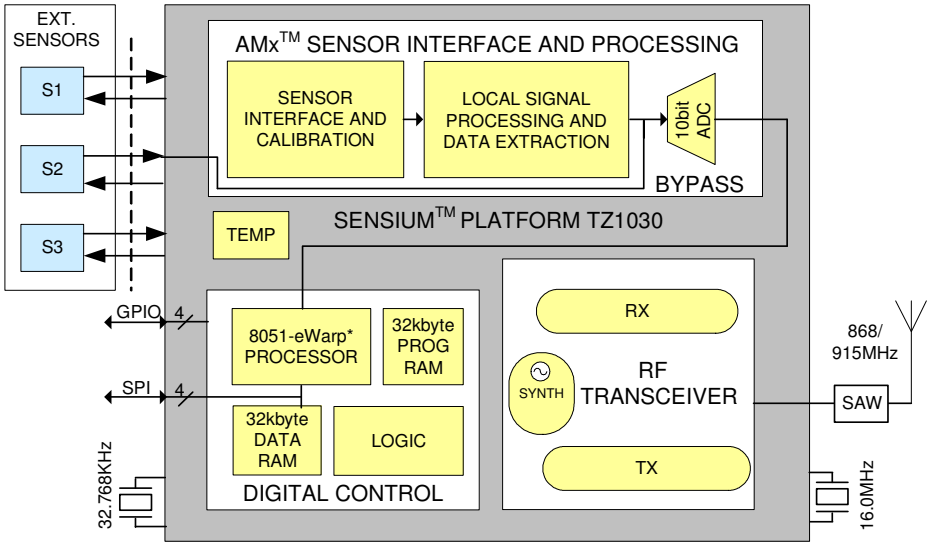
Features

- 1.0–1.5Volt (zinc air battery compatible)
- Single lead ECG interface
- 3 axis accelerometer interface
- Amperometric/Isfet sensor interfaces
- Ultra Low Power – transmit or receive power 2.5nW at 1.0V @1 reading/day
- Remote programming from base station
- Package 121 WFSGA 6x6x0.8mm

Applications

- ECG/Cardiac monitoring
- Temperature monitoring
- Physical activity monitoring
- Home, hospital and ICU monitoring
- Diabetes/blood glucose monitoring.
- Personalised healthcare
- Treatment compliance

Block Diagram of TZ1030



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The application focus of the Sensium™ is sensor data collection, intelligent local processing and wireless transmission of vital signs and other health status information. For such an application, the system architecture can be split into three units as illustrated in Figure 1.

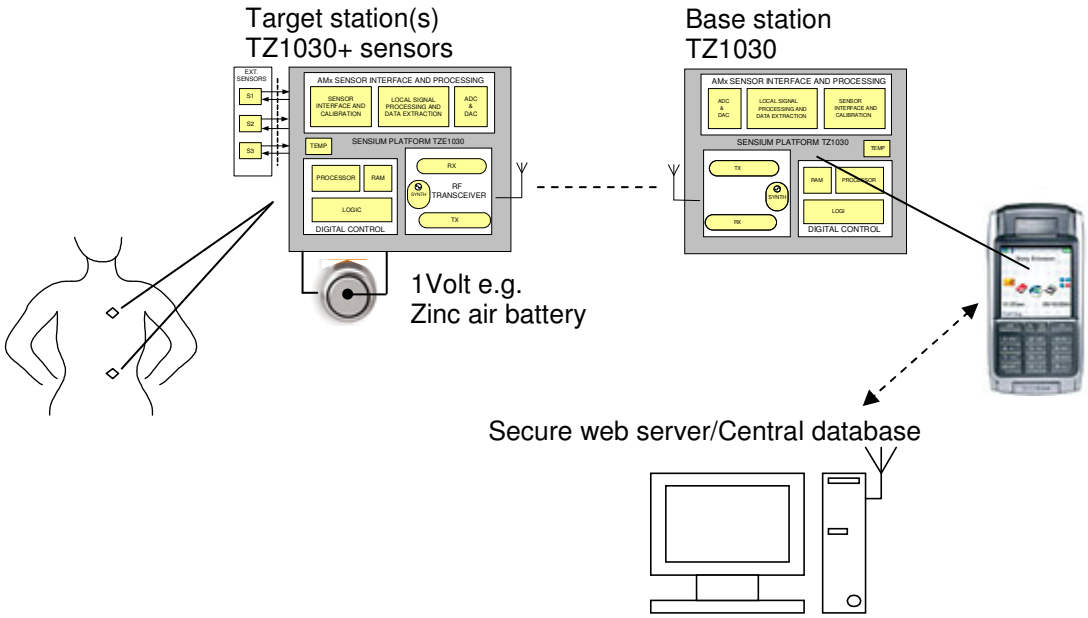

Figure 1 System Architecture for Wireless Body Monitoring

Wearable sensor nodes (target stations) support a range of sensors generating data at rates up to 50kbps. Very low level analog signals from the sensors are pre-processed by micro power circuitry (amplification, filtering, data conversion, data compression, modulation etc.) before being transmitted as an RF signal. This low power RF signal is then transmitted to the basestation. The basestation can be linked to up to 8 target stations, each monitoring multiple physiological signals on the body.

Table 1: Preliminary Sensium™ Specification 0-70deg C

Parameter	Value			Units	Notes
	Min	Typ	Max		
Supply voltage	1.0	1.2	1.5	V	
Supply current: transceiver		3		mA	Continuous Tx/Rx mode
Prog. reference voltage	400		750	mV	50mV steps for ISFET and amperometric sensors
Prog. bias current	0		155	µA	ISFET bias in 5µA steps
ECG sensor input signal bw			500	Hz	Min. set by ext. high pass filter
Transmission distance		3		m	
TX power		-10		dBm	
Data rate			50	kbps	
Sensitivity		-97		dBm	BER 0.1%
Bandwidth		200		KHz	Binary FSK modulation
Carrier frequencies: ISM Europe ISM USA	 862 902		 870 928	 MHz MHz	

The Sensium in receive mode is a class 3 SRD receiver as defined by table 1 ETSI EN300220.

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