Technical Description of 200TC

General

200TC is a wireless digital temperature device which is capable of reading, displaying and monitoring current temperatures from up to 30 temperature sensors. Aside from current temperatures, the monitor's LCD screen displays a real time clock and calendar, as well as maximum and minimum pre-set temperature settings. An audible alarm sounds when temperatures fall out of the pre-programmed range. In addition to the audio alert, green and red LED lights indicate temperature status for each sensor. The delay function defers the alarm for a user specified period of 0, 15, 30, 45 or 60 minutes. Every 15 minutes, PC uploadable temperature data for each sensor is logged. Logged data is retrieved through the USB port and PC download software, as provided.

MCU circuit

U1 is the main MCU. It receives input signal from the AC detection (Q3), battery low detection circuit (R21, R22) and the keyboard (SW1 – SW4). It outputs data to the LCD and outputs the clock signal and data to the LED driver (U2). It communicates with the RF module (U17), USB interface (U201) and the EEPROM (U3) to transmit and receive data.

RF module

The RF module (U17) is a single-chip radio transceiver for the 915 MHz ISM band. The transceiver consists of a fully integrated frequency synthesiser, receiver chain with demodulator, a power amplifier, a crystal oscillator and a modulator. It has 10 frequency channels. The operating frequency range is from 903.2MHz to 926.6MHz. The modulation of nRF905 is Gaussian Frequency Shift Keying (GFSK) with a data rate of 100kbps. Deviation is ±50kHz.

Frequency Table:

Channel	Frequency (MHz)
00	903.2
01	905.8
02	908.4
03	911.0
04	913.6
05	916.2
06	918.8
07	921.4
08	924.0
09	926.6

Single chip 433/868/915 MHz Transceiver **nRF905**

FEATURES

- True single chip GFSK transceiver in a small 32-pin package (32L QFN 5x5mm)
- ShockBurst™ mode for low power operation
- Power supply range 1.9 to 3.6 V
- Multi channel operation – ETSI/FCC Compatible
- Channel switching time <650µs
- Extremely low cost Bill of Material (BOM)
- No external SAW filter
- Adjustable output power up to 10dBm
- Carrier detect for "listen before transmit" protocols
- Data Ready signal when a valid data packet is received or transmitted
- Address Match for detection of incoming packet
- Automatic retransmission of data packet
- Automatic CRC and preamble generation
- Low supply current (TX), typical 9mA @ -10dBm output power
- Low supply current (RX), typical 12.5mA

APPLICATIONS

- Wireless data communication
- Alarm and security systems
- Home Automation
- Remote control
- Surveillance
- Automotive
- Telemetry
- Industrial sensors
- Keyless entry
- Toys

GENERAL DESCRIPTION

nRF905 is a single-chip radio transceiver for the 433/868/915 MHz ISM band. The transceiver consists of a fully integrated frequency synthesiser, receiver chain with demodulator, a power amplifier, a crystal oscillator and a modulator. The ShockBurst™ feature automatically handles preamble and CRC. Configuration is easily programmable by use of the SPI interface. Current consumption is very low, in transmit only 9mA at an output power of -10dBm, and in receive mode 12.5mA. Built in power down modes makes power saving easily realizable.

QUICK REFERENCE DATA

Parameter	Value	Unit
Minimum supply voltage	1.9	V
Maximum transmit output power	10	dBm
Data rate	50	kbps
Supply current in transmit @ -10dBm output power	9	mA
Supply current in receive mode	12.5	mA
Temperature range	-40 to +85	°C
Typical Sensitivity	-100	dBm
Supply current in power down mode	2.5	µA

Table 1 nRF905 quick reference data.