

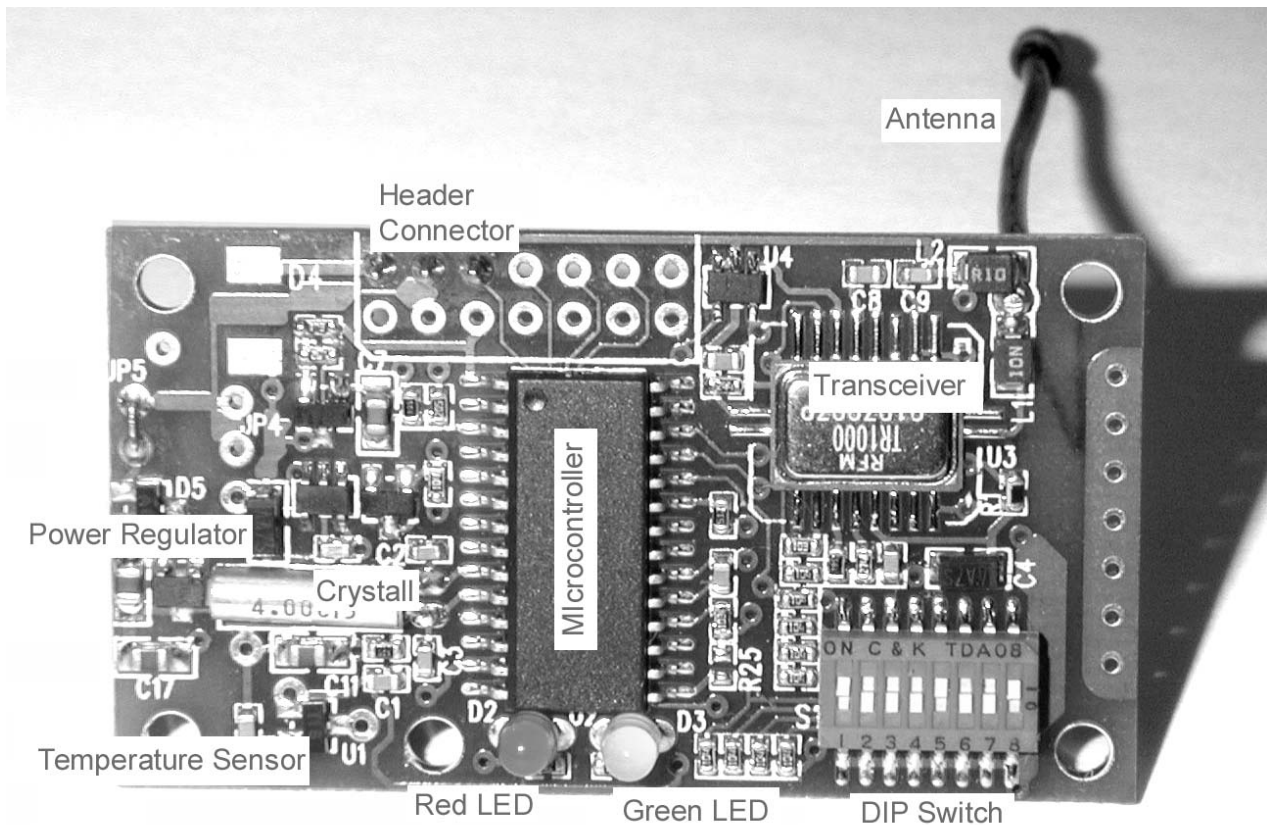
916.5 MHz Transceiver User Manual

1. Device Functions

The Basic functions of 916.5 MHz Transceiver are:

- Monitoring sensor's signals;
- Transmitting and retransmitting data within wireless network.

2. Hardware Description



The Transceiver's components are assembled on a printed circuit board. Main components are shown on the picture.

The **Microcontroller** controls RF data communication and scans signals, coming from sensors. The program stored in the controller's memory implements the device operation algorithm.

The RF part is based on amplifier-sequenced hybrid **Transceiver** TR 1000.

The transmitter section of TR 1000 employs SAW filtering to suppress harmonics, facilitating compliance with FCC 15.249 and similar regulations.

The **Power Regulator** converts the input power voltage into 3.5V required for transceiver operation.

The **Crystal** provides 4 MHz oscillation frequency to the controller.

The built in **Temperature Sensor** is used for temperature monitoring.

The **DIP Switch** is used to set the Transceiver in either Access Point or Network Node mode, and to assign the unique ID to each Transceiver.

The LEDs indicate the moments when data is being transmitted (**Red LED**) and when acknowledge message is received (**Green LED**).

The Power Supply, External Sensors and Programming Device are connected to the Transceiver using corresponding pins of the **Header Connector**.

3. Using 916.5 MHz Transceiver

The 916.5 MHz Transceiver operates as an element of a wireless network. The network has to include one Access Point Transceiver and the necessary number of Network Node Transceivers.

DIP switch setting configures a Transceiver as either an Access Point or a Network Node.

To configure a Transceiver as an Access Point, switches 4...8 should be set in "OFF" position. Otherwise a Transceiver is configured as a Network Node.

A Power Source 5...9V DC should be connected to a Transceiver via pins 2 (-) and 4 (+) of the Header Connector.

A Network Node Transceiver has two external analog inputs (pins 6 and 10 of Header), which can be used for connection to sources of analog signal in the range 0...3.5V. These signals as well as output of temperature sensor are converted into digital data using analog to digital converters built in the microcontroller. The digital information then is included in data packet messages, which are transmitted to the Access Point or another Network Node. This Network Node retransmits the received information. After a number of retransmitting, which depends on location of the source Network Node the information is brought to the Access Point.

For successful operation of the wireless network for each Transceiver must be at least one other Transceiver at a distance which no more than 30-70 feet depending on the environment.

Note To ensure the maximum permissible exposure as defined in the 47CFR 1.1310 the module should be mounted in a plastic enclosure with the distance from the antenna to the enclosure walls no less than 1cm in any direction.*

Note:

- *According to FCC under 15.249(b)(4) statement:
Systems operating under provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.*
- *According to FCC under 15.19 statement:
This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.*
- **Information to user**
 1. *According to FCC under 15.21 statement:
Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*
 2. *According to FCC under 15.105 statement:
This device has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:*
 - *Reorient or relocate the receiving antenna.*
 - *Increase the separation between the equipment and receiver.*
 - *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
 - *Consult the dealer or an experienced radio/TV technician for help.*