RFID Reader
Theory of Operation

1. Overview

The RFID Reader is a compact module designed for use within a host device for short-range reading of high frequency (HF) tags. The module consists of a radio module, loop antenna, and a UART host interface on a single footprint of 40 mm x 40 mm x 6.5 mm.

RFID tags are passive deriving their power from the interrogating signal generated by an RFID Reader (interrogator). Power is transferred from the interrogator to the tag by a high frequency magnetic field generated by the antenna coils on the reader and the tag.

2. Implementation Overview

The RFID Reader board is based on the Texas Instruments TRF7960, which is a multi-standard 13.56 MHz RFID analog front end and data-framing reader system. The antenna is copper etched on the RFID Reader PCB.

The TRF7960 is a fully integrated RFID IC and uses, for communication, a serial 6-Pin UART asynchronous interface and has an operating voltage range of 2.7 V to 5.5 V. It supports 100 mW and 200mW output power settings.

The reader operates a 50% duty cycle. During a process in an Illumina system the RFID will do approximately one read per 1.5 days.

The TRF7960 uses a **13.56 MHz** crystal to generate the RFID carrier wave.

Below are the specs of the PCB antenna:

-Type: multi-turn loop antenna

- Dimensions: 40 mm x 40 mm

3. UART Host Communication

The communication between the host and the module can take place at 9600bps, 19200bps, 38400bps, 57600bps or 115200bps N, 8, 1. Module communicates at 115200bps,N,8,1 as default. Once the baud rate is changed using the change baud rate command, successful communication will only occur with the new baud rate.

The host first sends the command and the module executes the operation and replies with a response to the command. The host can analyze the reply to check if the operation was successful or if any error occurred during the operation.

The TM-001 should be connected to a COM port configured to the following settings:

baud rate	data bits	stop bit	parity	flow control
115200	8	1	no	no

4. Tag Requirements

Specifications:

Support Standards	ISO15693 / 18000-3
Operating Frequency	13.56 MHz