



Hi-G-Tek Ltd. Microelectronics & Asset Tracking Technology

Micro Reader circuit description

1. General

- 1.1. Reference documents
 - 1.1.1. Schematic , document 47C10050
- 1.2. Pages number referenced in the following description, are referred to the schematic.

2. General Description

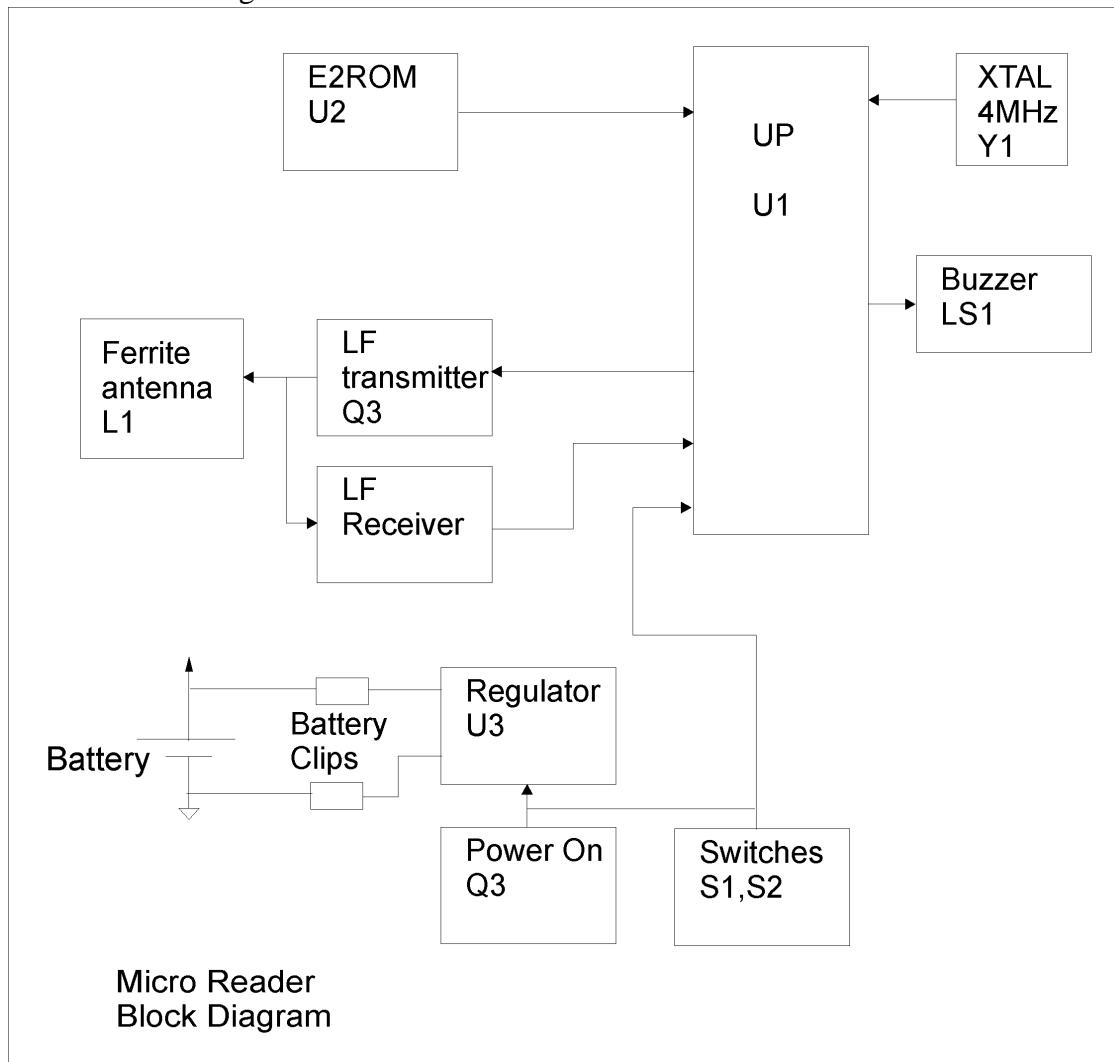
- 2.1. The Micro Reader is part of a system which includes DataSeal. The DataSeal is used to electronically seal assets during storage or shipment. The Micro Reader is used to inspect DataSeal status. The Inspector presses a button, the Micro Reader wakes up, interrogate the DataSeal, and lights an LED according to seal status. RED means seal is tampered, GREEN means seal is OK.
- 2.2. The Micro Reader is a stand-alone unit. It has a replaceable battery , it has RF receiver and transmitter and microprocessor (iP), which controls the Micro Reader operation.
- 2.3. The Micro Reader RF channel is 125KHz carrier with OOK modulated data.

3. Hardware Description

- 3.1. A PCB is mounted in pocket size enclosure, a replaceable battery 12V battery supplies power to the Micro Reader. The circuit includes micro controller, 4MHz crystal, E2ROM, power supply regulator ,125KHz transmitter and receiver.

4. Circuit description.

4.1. Block Diagram



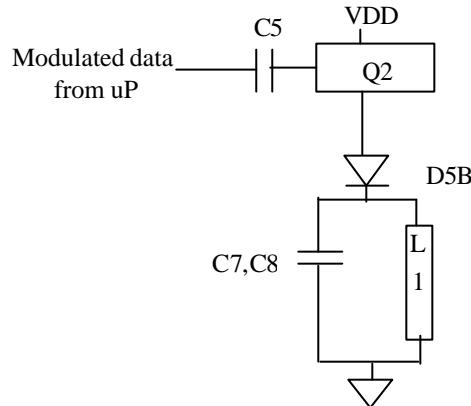
4.2. **µP (U1 Pg.2):** PIC16F876 µP timed by an 4MHz ceramic resonator (Y1).

4.3. **Buzzer (LS1 Pg.2):** generates audible signal to indicate interrogation result.

4.4. **E2ROM** (U2 Pg.2): Serial E2ROM stores unit parameters and data.

4.5. **Power management:** (Pg.2): 12V A23 type battery powers the circuit. D2 used for reverse polarity protection. U3 regulate the voltage to the all circuit. On stand by, U3 is OFF and the circuit is not powered. When one of the switches (S1,S2) is pressed, U3 is enabled thus powering the circuit. The micro controller wakes up and hold the power by Q1, until cycle is finished.

4.6. **LF Transmitter** (Q2, Pg.3): OOK modulated data comes from the uP to the driver transistor Q2, which drives a ferrite antenna (L1).



4.7. **LF Receiver** (C8 to U4 Pg.3): Data received in the ferrite antenna (L1), D7,D8,D9 and Q3 are used to limit signal amplitude. D6 used for envelope detection of the signal and data is digitized by U4.