

# LC-TMW

# RF Specification

Rev V1



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## **1. Introduction**

The following document describes the technical specification of a Low Cost Water Meter transceiver board (called LC-TMW) for the USA market.

The LC-TMW is actually a water odometer, offering Automatic Meter Reading – AMR. The LC-TMW transmits its meter readings via RF to a collecting unit. In addition specific parameters can be programmed via the RF link.

The LC-TMW operates at the 900MHz ISM band. The board consists of the following units: RF Transmitter & Receiver with integral Antenna and a Microcontroller (plus simple Digital Logic), which control the operational modes of the unit.

### **1.1. Definitions, Abbreviation and Acronyms**

RFD : RF Dialog

## 2. LC-TMW Description

### 2.1. Block Diagram

A block diagram of the LC-TMW is described below.

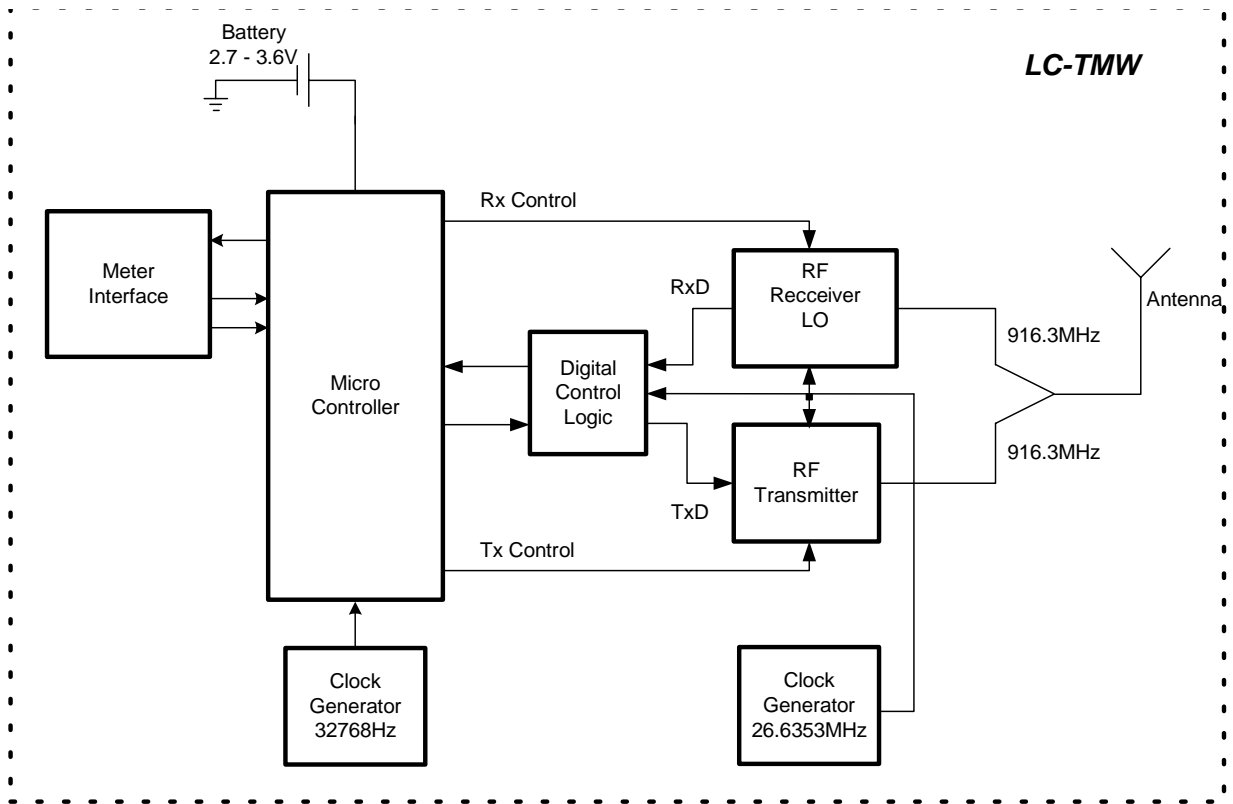
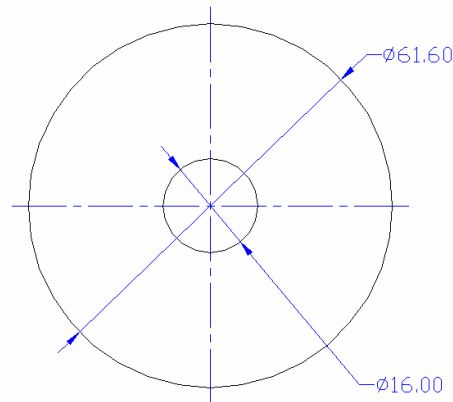


Figure 1: LC-TMW Block Diagram

## 2.2. Operational Modes

LC-TMW Operational Modes					
Mode	Microcontroller	IR Interface	Digital Logic	RF Receiver	RF Transmitter
Transmit	On (fast clock)	Off	On	Off	On
Receive	On (fast clock)	Off	On	On	Off
Idle/Sleep	On (32768Hz clock)	Off	Off	Off	Off

## 2.3. Board Dimension



**Figure 2: Board Dimension**

### 3. Electrical Performance

#### 3.1. Transmit Unit

##### 3.1.1. Transmit Parameters

FSK Transmit Parameters	
Parameter	Value
Transmit Frequency	916.3 MHz
Modulation	Digital Modulation – Wide Band BFSK
Modulation Coding	Manchester
Bit rate (net data rate)	~60kbps
Frequency deviation	190 kHz
Bandwidth (@6dB)	500kHz – 700kHz
Frequency stability (including initial stability, temperature and aging)	<50 ppm
Peak Output power (without Antenna)	< 12dBm
Peak Output power spectral density (without Antenna) in any 3kHz	< 8dBm
Harmonics	< - 54dBm
Tx Pulse duration	~4ms
Transmission duty cycle	Programmable. Less than 0.12%

### 3.2. *Receive Unit*

#### 3.2.1. *Receive Parameters*

##### Receive Parameters

Parameter	Value
Receive frequency	916.3 MHz
Sensitivity (BER 1E-3)	-90 dBm
Modulation	FSK
Frequency deviation	190 kHz
Bit rate	~20 kbps
Coding	Manchester

### **3.3. *Antenna***

The LC-TMW has an integral Antenna (kind of Inverted Antenna).

The Antenna is Omni Directional in horizontal plane. The max gain is 3dBi.

### **3.4. *Power Source***

Battery rated voltage 3.6V.

Operating voltage: 2.7-3.6V





**3.5. *Environmental Conditions***

Operating Temperature: -40° C to + 85° C

Storage Temperature: -40° C to +85° C

Humidity: Up to 95%