

ETMW-LCD

RF Specification

Rev V1



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1. Introduction

The following document describes the technical specification of the second generation of Water Meter transceiver board (called ETMW-LCD) for the USA market.

The ETMW-LCD is actually a water odometer, offering Automatic Meter Reading – AMR. The meter readings are displayed on an internal LCD unit and are transmitted by its RF to a collecting unit. In addition specific parameters can be programmed via the RF link.

The ETMW-LCD 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. ETMW-LCD Description

2.1. Block Diagram

A block diagram of the ETMW-LCD is described below.

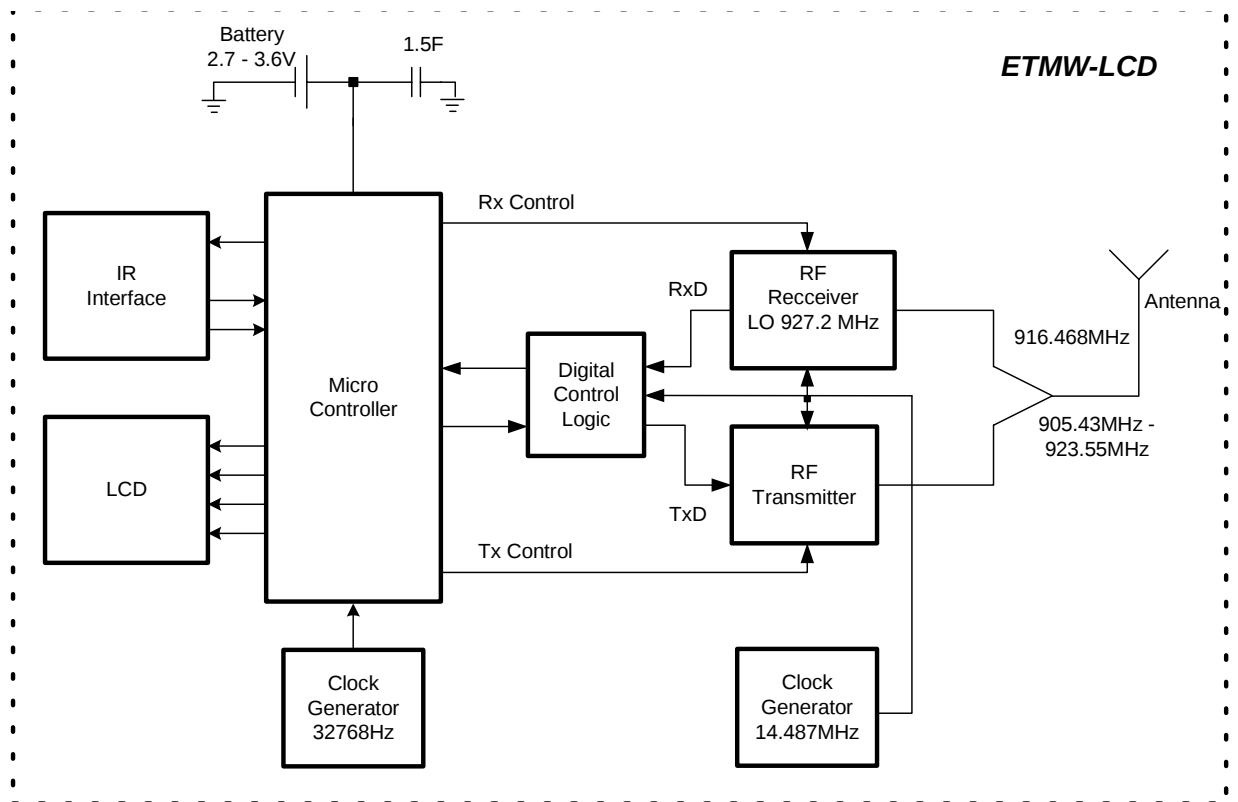


Figure 1: ETMW-LCD Block Diagram

2.2. Operational Modes

ETMW-LCD 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
IR	On (fast clock)	On	Off	Off	Off
Idle/Sleep	On (32768Hz clock)	Off	Off	Off	Off

2.3. Board Dimension

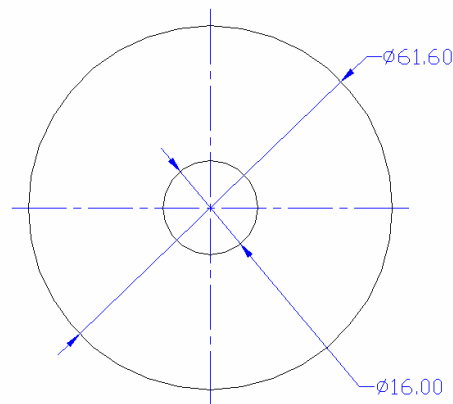


Figure 2: Board Dimension

3. Electrical Performance

3.1. Transmit Unit

Each ETMW-LCD board has two transmit modes:

- FSK (see table 2)
- PSK (see table 3)

The transmit mode is controlled by the software.

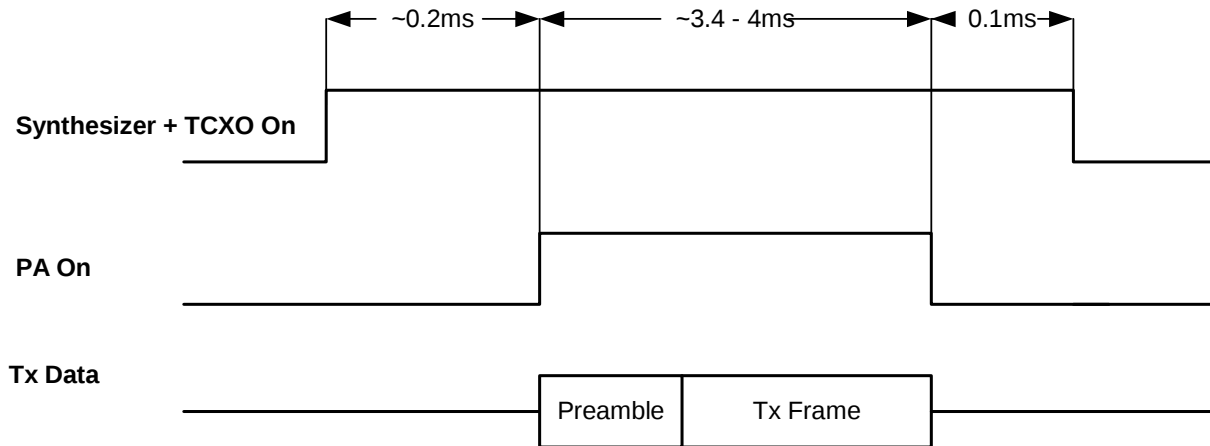
3.1.1. FSK Mode

Table 2 – FSK Transmit Parameters	
Parameter	Value
Transmit Frequency	Programmable in the 916.3 MHz only
Modulation	Digital Modulation – Wide Band BFSK
Modulation Coding	Manchester
Bit rate (net data rate)	60.3625 kbps
Frequency deviation	190 kHz
Bandwidth (@6dB)	500kHz – 900kHz
Frequency stability (including initial stability, temperature and aging)	<12 ppm
Peak Output power (without Antenna)	< 18dBm
Peak Output power spectral density (without Antenna) in any 3kHz	3dBm to 8dBm
Harmonics	< - 54dBm
Tx Pulse duration	~4ms
Transmission duty cycle	Programmable. Less than 0.10%

3.1.2. PSK Mode

Table 3 – PSK Transmit Parameters	
Parameter	Value
Transmit Frequency	Programmable in the range 905.43MHz - 923.55MHz
Modulation	DSSS BPSK
Bit rate	60.3625 kbps
Chip rate	905.4375 kChip/sec
Bandwidth (@6dB)	700 kHz – 1300kHz
Frequency stability (including initial stability, temperature and aging)	<12 ppm
Output power (without Antenna)	< 20dBm
Output power spectral density (without Antenna) in any 3kHz	2dBm to 8dBm
Harmonics	< - 54dBm
Tx Pulse duration	~3.4ms
Transmission duty cycle	Programmable. Less than 0.10%

3.1.3. Tx Timing





3.2. Receive Unit

3.2.1. Receive Parameters

Table 6 – Receive Parameters

Parameter	Value
Receive frequency	916.468 MHz
Sensitivity (BER 1E-3)	-90 dBm
Modulation	FSK
Frequency deviation	190 kHz
Bit rate	41.156 kbps
Coding	Manchester



3.3. *Antenna*

The ETMW-LCD 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%