

ETMW-SM

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-SM) for the USA market.

The ETMW-SM is actually a water odometer, offering Automatic Meter Reading – AMR. The ETMW-SM is 2-Way RF communicator built-in water meter. The RF capabilities enable the transmission of the meter reading and some extra information to a Collecting unit. In addition specific parameters can be programmed via the RF link.

The ETMW-SM 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-SM Description

2.1. Block Diagram

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

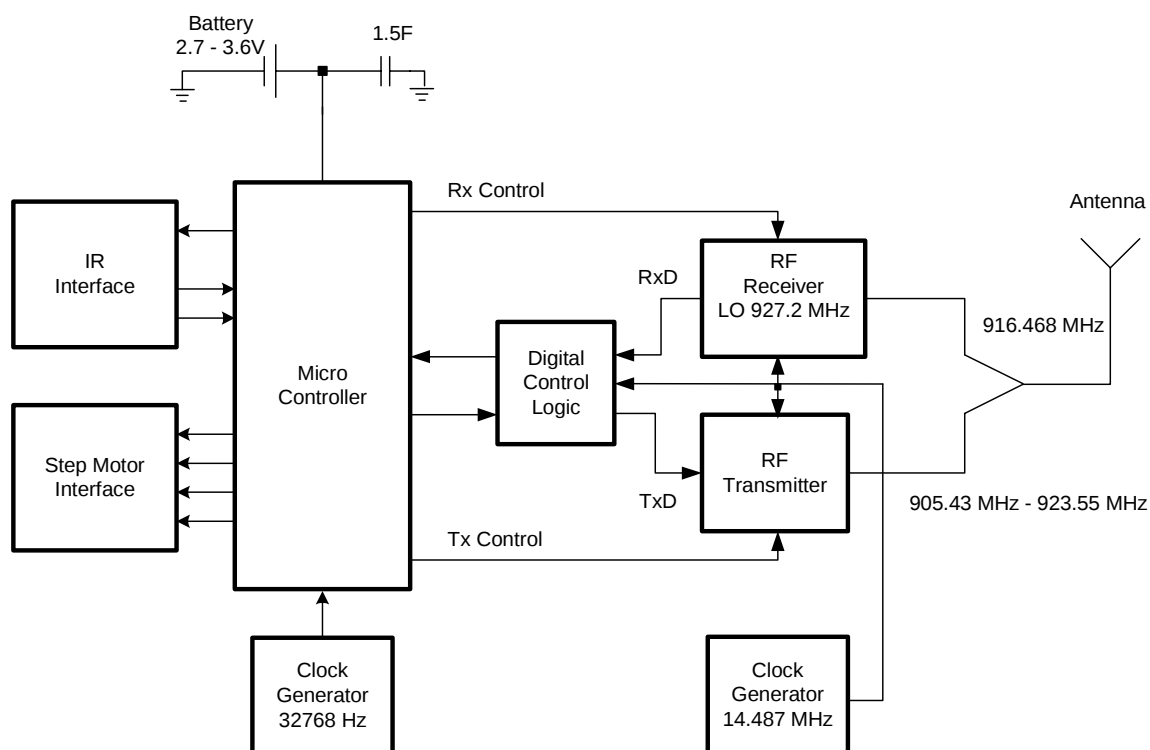


Figure 1: ETMW-SM Block Diagram

2.2. Operational Modes

Table 1 – Operational Modes						
Mode	Microcontroller	IR Interface	Stepping Motor Interface	Digital Logic	RF Receiver	RF Transmitter
Transmit	On (fast clock)	Off	Off	On	Off	On
Receive	On (fast clock)	Off	Off	On	On	Off
Stepping Motor	On (fast clock)	Off	On	Off	Off	Off
IR	On (fast clock)	On	Off	Off	Off	Off
Idle/Sleep	On (32768Hz clock)	Off	Off	Off	Off	Off

2.3. Board Dimension

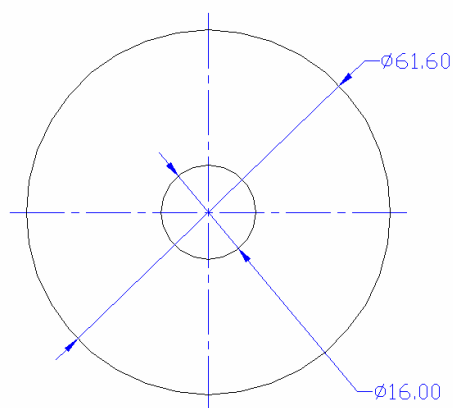


Figure 2: Board Dimension

3. Electrical Performance

3.1. Transmit Unit

Each ETMW-SM board has two transmit modes:

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

The transmit mode is controlled by the software.

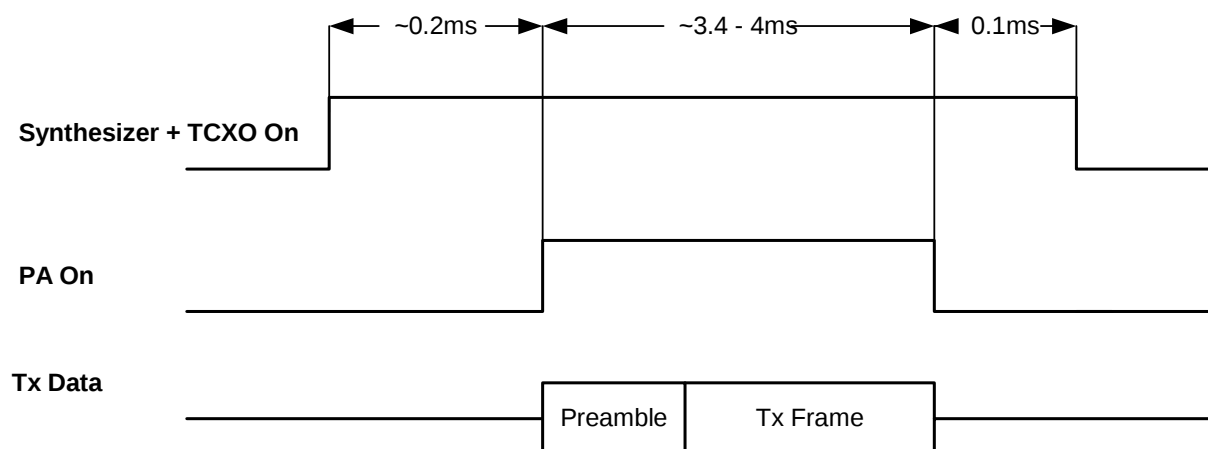
3.1.1. FSK Mode

Table 2 – FSK Transmit Parameters	
Parameter	Value
Transmit Frequency	Programmable in the range 905.43 MHz - 923.55 MHz
Modulation	Digital Modulation – Wide Band BFSK
Modulation Coding	Manchester
Bit rate (net data rate)	60.3625 kbps
Frequency deviation	190 kHz
Bandwidth (@6dB)	500 kHz – 850 kHz
Frequency stability (including initial stability, temperature and aging)	<12 ppm
Peak Output power (without Antenna)	< 16 dBm
Peak Output power spectral density (without Antenna) in any 3kHz	3 dBm to 8 dBm
Harmonics	< - 54dBm
Tx Pulse duration	~4 ms
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 905.43 MHz - 923.55 MHz
Modulation	DSSS BPSK
Bit rate	60.3625 kbps
Chip rate	905.4375 kChip/sec
Bandwidth (@6dB)	700 kHz – 1300 kHz
Frequency stability (including initial stability, temperature and aging)	<12 ppm
Output power (without Antenna)	< 20 dBm
Output power spectral density (without Antenna) in any 3kHz	2 dBm to 8 dBm
Harmonics	< - 54dBm
Tx Pulse duration	~3.4 ms
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-SM has an integral Antenna (kind of Inverted Antenna).

The Antenna is Omni Directional in horizontal plane. The max gain is 2dBi.

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%