



Arad Technologies Proprietary  
FCC ID:VIDICON240V



# ICON RF Specification



## Table of Content

|   |          |
|---|----------|
| <b>1 INTRODUCTION</b>                   | <b>3</b> |
| <b>2 ICON DESCRIPTION</b>               | <b>4</b> |
| <b>2.1 ICON Tx/Rx Board</b>             | <b>4</b> |
| <b>2.2 ICON Logic and Display board</b> | <b>6</b> |
| <b>3 ELECTRICAL PERFORMANCE</b>         | <b>8</b> |
| <b>3.1 ICON Tx/Rx Board</b>             | <b>8</b> |
| <b>3.2 ICON Logic and Display board</b> | <b>9</b> |
| <b>3.3 Environmental Conditions</b>     | <b>9</b> |



## 1 Introduction

The following document describes the technical specification of the Electricity Meter transceiver (ICON) for the USA market.

The ICON meter is single phase class 2.0 ANSI C12.20 Electricity Meter. The meter includes a Tx/Rx integrated module for RF communication.

The ICON includes the following modules:

- Sensor board – measure the power consumption (kWh). The sensor board can be 240 VAC or 120 VAC type.
- Display board – 9 digits LCD
- Tx/Rx board - RF transmitter & Receiver that operate in 916.3 MHz range.

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.

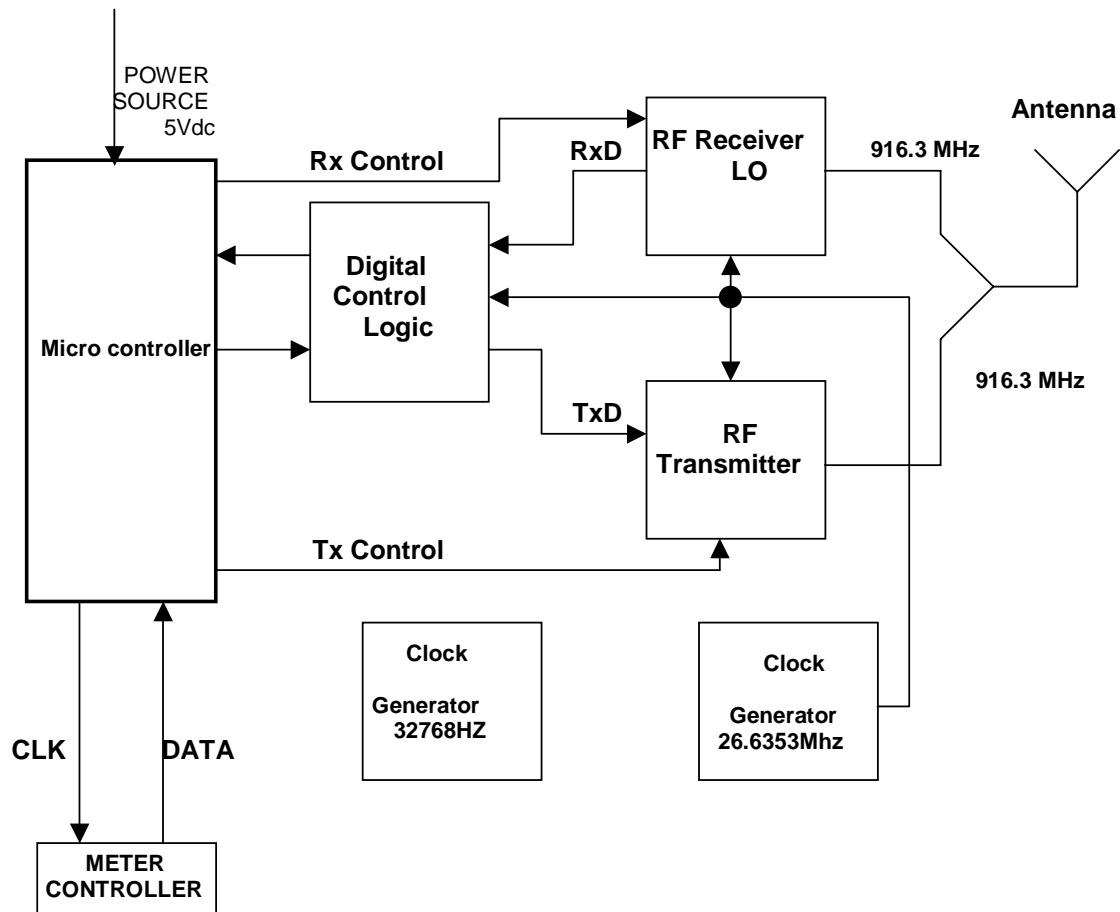
Note: The Tx/Rx module based on board LC-TMW, FCC ID: NTAXMETER10.



## 2 ICON Description

### 2.1 ICON Tx/Rx Board

#### 2.1.1 Block diagram

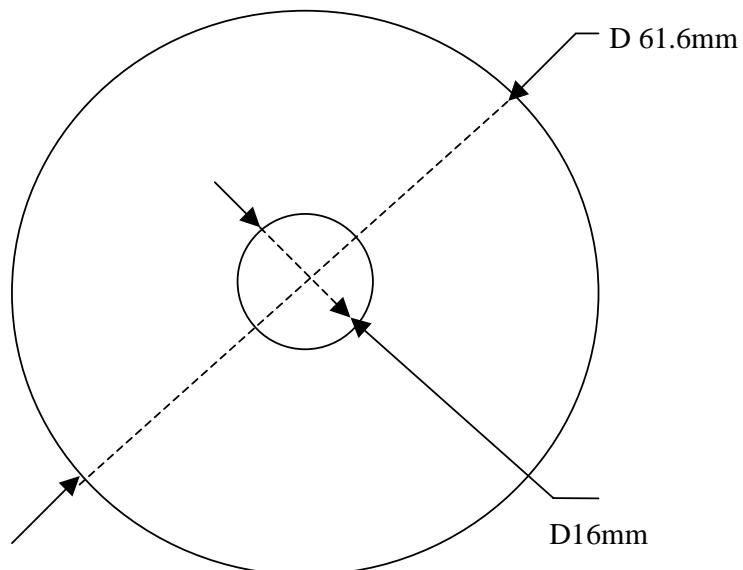




### 2.1.2 Operational Modes

| Mode       | Microcontroller     | Serial Port | Digital Logic | Receiver | Transmitter |
|------------|---------------------|-------------|---------------|----------|-------------|
| Transmit   | On (fast clock)     | Disabled    | On            | Off      | On          |
| Receive    | On (fast clock)     | Disabled    | On            | On       | Off         |
| Idle/Sleep | On (32768 Hz clock) | Disabled    | Off           | Off      | Off         |

### 2.1.3 Board Dimension

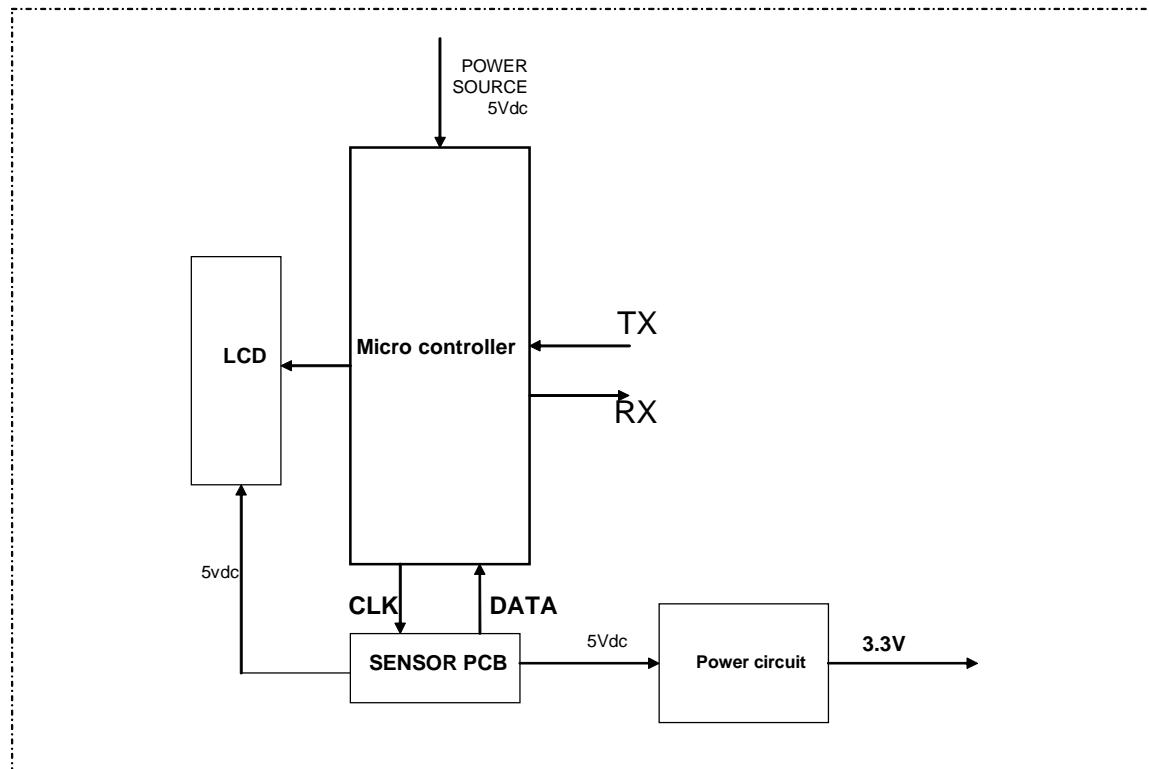




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## 2.2 *ICON Logic and Display board*

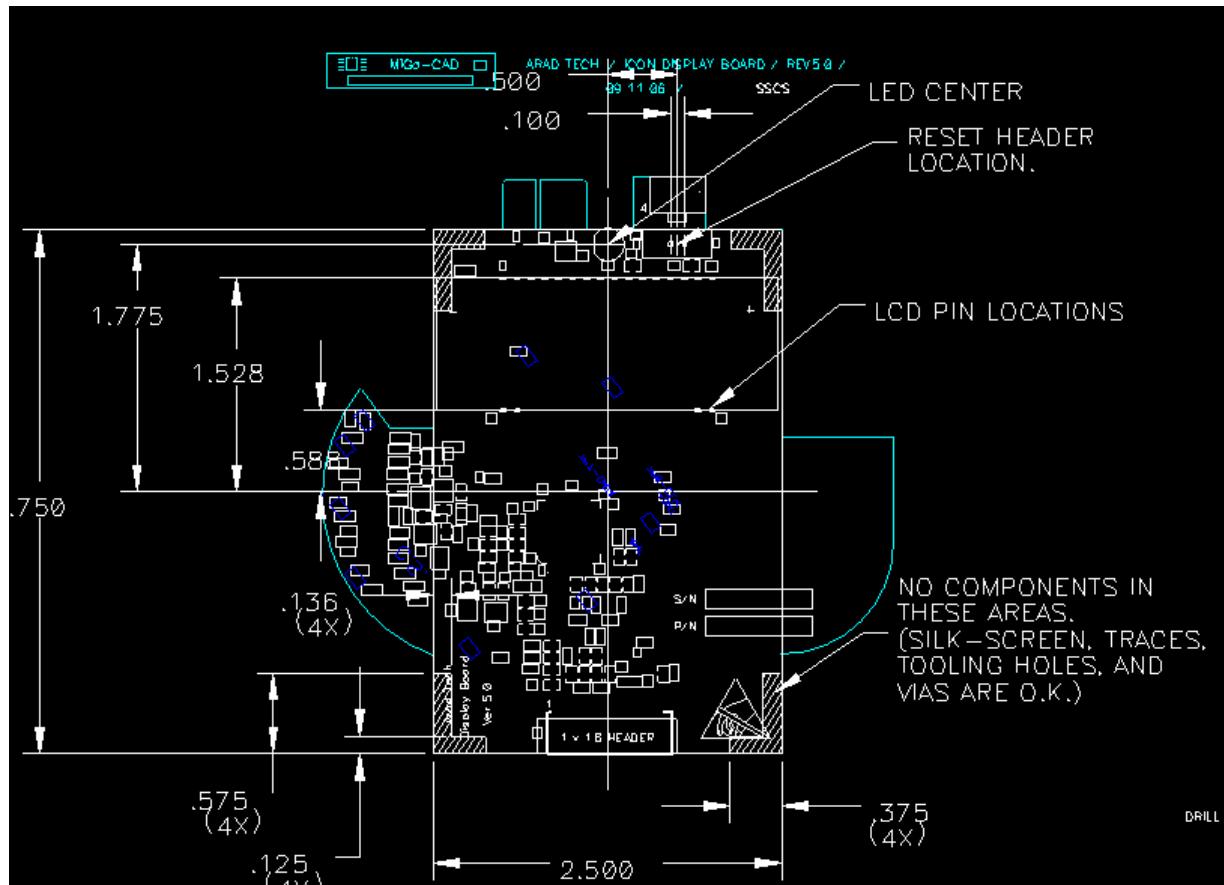
### 2.2.1 Block diagram





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## 2.2.2 Board Dimension





### 3 Electrical Performance

#### 3.1 *ICON Tx/Rx Board*

##### 3.1.1 Transmitter

| Parameters  | Value                               |
|---|-------------------------------------|
| Transmit frequency                                  | 916.3 MHz                           |
| Modulation  | Digital Modulation – Wide Band BFSK |
| Coding  | Manchester                          |
| Net bit rate  | 59.45 kbps                          |
| Frequency deviation                                 | 175 kHz                             |
| Bandwidth @ 6 dB                                    | 500 kHz – 700 kHz                   |
| Frequency stability including temperature and aging | <50ppm                              |
| Peak Output Power without Antenna                   | 9.0 dBm                             |
| Peak Output Power spectral density                  | <8 dBm in any 3 khz                 |
| Harmonics   | < -54 dBm                           |
| TX Pulse duration                                   | 4 ms                                |
| Transmission rate                                   | Programmable. Less than 0.12%       |

##### 3.1.2 Receiver

| Parameters             | Value      |
|------------------------|------------|
| Receive frequency      | 916.3 MHz  |
| Sensitivity (BER 1E-3) | -90 dBm    |
| Modulation             | FSK        |
| Frequency deviation    | 175 kHz    |
| Net bit rate           | 20 kbps    |
| Coding                 | Manchester |



### 3.2 ***ICON Logic and Display board***

#### 3.2.1 **Serial communication/ Digital circuits**

The ICON board based on PIC Micro Controller and LCD and Power Supply circuits.

The ICON board communicates with Tx/Rx board by standard UART communication, (clk&data).

#### 3.2.2 **Power source**

The Icon board includes 5 vdc power source for Display board and 3.3 vdc power for Tx/Rx board

#### 3.2.3 **Antenna**

The ICON has an integral Antenna. The antenna located on ICON board and connected to the Tx/Rx board.

The Antenna type is PCB FPIFA – Printed Circuit Board Folded Planar Inverted "F" Antenna. The Antenna is Omni Directional in horizontal plane. The maximum gain is 4 dBi.

### 3.3 ***Environmental Conditions***

- Operating Temperatures: -40° C to +85° C
- Storage Temperature: -40° C to +85° C
- Humidity: Up to 95%