

FIREFLY SOLID STATE ELECTRIC METER UNIT DESCRIPTION

MICROCONTROLLER

This section controls the operation of the unit. Under normal operating conditions, the micro keeps track of time and initiates various meter reading and RF transmission tasks according to a user definable schedule.

LOW POWER 32KHZ OSCILLATOR

The low power oscillator generates a clock signal to the microcontroller. The microcontroller uses this for timing functions. In normal mode, the microcontroller is asleep and wakes up with every 250 milliseconds and performs a scheduling task. If a task is scheduled to execute, it will execute that task and return to sleep.

NON-VOLATILE STORAGE

The EEPROM is powered by the microcontroller output line. Once powered up, communications between the microcontroller and eeprom follow the IIC protocol.

SENSOR INTERFACE

This section performs the electric meter sensing functions.

240VAC LINE INPUT

The device draws its main power from a 240VAC line feed.

CAPACITIVE POWER SUPPLY

The capacitive power supply steps down the circuit voltage and provides a regulated DC current to the system.

LCD DISPLAY

The LCD display provides a human user interface to the system, allowing direct reading of the meter.

RF TRANSCEIVER

This section has a transceiver that operates on 916.5 MHz with on-off-keyed modulation. In the normal operating mode, the unit periodically transmits a meter reading message on the RF link at 9600 bits per seconds. The radio module is manufactured by RF Monolithics. The radio transmits data in packets or messages. These messages are transmitted at a repetition rate that has been initialized into the unit. This rate may be set between 1 second and 18 hours. Also, each RF transmission has another delay that assists in avoiding collisions between nearby transmitters. This additional delay is between 0 and 0.75 seconds.

The unit may be placed into a test and initialization mode. To do this a radio message is sent to the unit to "wake" it up. After each transmission from the unit, it enables its radio receiver for a few milliseconds. During this time, if a radio message is received that is compatible in format and content, and then the unit keeps its receiver on. Once awake, a

command/response protocol is then followed with the external device initiating the commands. These commands are to configure the unit's identification, meter reading, operating mode and other user settable parameters.