TIM Transmitter Functional Description

General Description

The TIM transmitter remains in "sleep" mode until an input event occurs. The TIM transmitter wakes up to monitor and accumulates switch closures. Events represent units of power or similar items measured. Events are monitored by closures between pins 1 and 6 of connector JP2. Events are accumulated and compared to a preset number (1 to 10,000 set at installation). When this count is reached it will trigger, transmitting a data packet containing the total accumulated count. This data is transmitted to a receiver station using FSK (Frequency Shift Keying) modulation, on 1 of 25 different frequency channels ranging from 902 to 928 MHz. The complete packet transmits within 0.057 seconds. After the data has transmitted, the transmitter returns to "sleep" mode and collects another set of data. This process is then repeated when the next preset count is reached and transmitted on the next frequency from the pseudo-random hop table that is stored in the TIM's main processor code memory. As an example, let's say the meter count is at 1000 units of gas used and the preprogrammed event count is set at 10. The TIM wakes up 10 times to advance the accumulator but will only transmit on the tenth event. At this point the accumulated count of 1010 would be sent. All 25 transmit frequency channels are used before any given frequency is repeated. The worst case or shortest delay that the firmware will allow is 0.057 seconds between channels. Accounting for switch debounce of 10ms, a wakeup time of 1ms, 9ms to setup the PLL, and .037 seconds to transmit. It takes 1.425 seconds to visit all 25 channels (0.057 x 25 = 1.425 seconds). Any one channel could be visited 7.02 times in 10 seconds (10/1.425 = 7.02). Total transmit time for any 10 second period is 7.02 x .037 for 0.260 seconds, 0.4 seconds is allowed.

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