OPERATIONAL DESCRIPTION

Equipment Tested (Company, Model)	*FCC ID:*
Digital Design, Inc., WM-315	**2B8USAWM-315**

Manufactured by: Digital Designs Inc.
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Croydon, PA 19021
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Date: 05/21/01

The WM-315 transmitter is a small transmitter, designed to permanently mount. The transmission frequency is 315MHZ* controlled by a stable SAW-based architecture, utilizing a prepackaged transmitter (TMX-315-LC) manufactured by **LINX Technologies. The transmission is on off pulse-encoded packets with a width of 24ms and an off time between packets of 6ms and a duty cycle of 38%. The code pattern consists of 20-bits of information, 16-bits are used for transmitter identification and 4-bits are used for operational mode identification, e.g. Low battery, Restore and supervise. The transmitter is encoded with a microcontroller chip (PIC 12C508A). The WM-315 is battery powered by a 3V lithium battery and sealed in a watertight enclosure.

Transmission is activated by either the push button on the front of the unit, a pull-cord, and contact closure or via a magnet external to the unit. Transmission duration is limited to Five (5) seconds regardless of how long the button is pushed, pull-cord is pulled, contacts are closed or the magnet is present. The reed relay has two functions. 1) Activate the transmitter via a magnet, e.g. door magnet and 2) Program the 16-bit code number via an external magnetic field. Typical activation would be via the push button or pull-cord.

The WM-314 has several modes of operation. 1) Normal mode, 2) Normally Closed (reed) mode, 3) Restore mode and 4) Supervised mode. All modes of operation are programmed via an external magnetic field with the reed relay. The following is a description of the modes of operation.

1) Normal Mode: No other modes of operation are set and activation will occur only if the push button is pressed or a magnet is present.
2) Normally Closed Mode: Activation will occur only when a magnetic field is removed.
3) Restore Mode: Activation will occur when a magnetic field is present and again when the field is removed. A mode bit is set when the field is removed or if Mode 2 is set, when the field is applied.
4) Supervised Mode: An automatic transmission will occur once every 3.5 hours, the duration of which is limited to two (2) seconds. A mode bit is set when this transmission occurs.

In all modes of operation pressing the push button, pulling the pull-cord, or contact closure will cause a transmission. All transmissions are limited to five (5) seconds, with the exception of a Supervised transmission, which is limited to two (2) seconds. Another transmission will only occur when the activating condition is cleared and reactivated, with the exception of the Supervised transmission, which occurs automatically once every 3.5 hours.

*Note: Min. Freq. = 314.925MHZ, Max. Freq. = 315.075MHZ, Typical = 315.0MHZ

** LINX Technologies, Inc. is located at 575 SE Ashley Place, Grants Pass, OR 97526
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Description of Switch and Timing of Transmission

The user pressing a switch activates the WM-315. Once pressed the transmission is limited to a maximum of 5 seconds regardless of how long the switch is depressed and will not retransmit until the switch is released and depressed again. The duration of the transmission is controlled by the microprocessor. The microprocessor has an internal calibrated 4 MHz RC clock, which controls the timing. The clock has a combined, voltage and temperature variation of +/- 7.5% and the nominal duration of this time period is 4.6 seconds. This results is a maximum duration of 4.945 seconds @ +85C and a voltage of 3.5 volts. Power is provided by a single lithium coin cell (CR2032) with a nominal voltage of 3V. The low end of the voltage/temperature tolerance is 4.25 seconds at –40C and 2.5V.

The switch when depressed is recognized by the microprocessor; the microprocessor in turn starts it operation and generates a code pattern (previously described) by turning the transmitter (LINX chip) on and off accordingly. Once the time period of the entire transmission is up (determined by firmware) the transmission stops. If the manual switch is still depressed the transmission will not begin again until the switch is released and pressed again.

The time duration was measured at 4.608 seconds with the voltage at 3.0 volts and the temperature at 25C. The microprocessors internal clock provides the timing as described above.

The timing of the 2 second supervised transmission is also via the microprocessors internal clock as described above. Here the nominal measured duration was 1.992 seconds at 25C and 3 volts. Adjusting this to the maximum duration at 85C and 3.5V the maximum duration would be 2.15 seconds every 3.5 hours. The microprocessor internal clock also determines the 3.5-hour time duration and adjusting this for the worst case would be a minimum of 3.237 hours at –40C and 2.5 volts, however at this temperature and voltage the 2-second period would also reduce to 1.85 seconds.