Water Sentinel System
Operational Description
Rev.03

WARNING: ***Changes or modifications not expressly approved by Custom Assemblies Ltd. could void the user's authority to operate the equipment.***

The Water Sentinel is an advanced RF controller designed to control the restriction of water in the home due to water leakage.

This unit is based on a small RISC based microcontroller, and a RF receiver, along with control circuit and relay to control a normally closed valve.

Each Water Sentinel is capable of handling up to 6 different zones, separately indicated by an LED.

Each water sensor transmitter has its own unique electronic identification number, in this way the Water Sentinel can be taught to recognize different zones.

The water sensor transmitters are equipped with a RISC based micro controller along with a transmitter, the transmitters are hybrid modules, designed to transmit at particular frequencies, this is to insure reliable transmissions when required. Sensors remain without power, until water is sensed with the probes. Sensor unit now becomes powered, sends 3 consecutive messages, for increased reliability, and then goes into a sleep mode for 2 seconds, (to conserve power) then retransmits again, this cycle continues until water is removed from sensor. Power consumption is extremely small, in the order of 10ma when fully transmitting, and less then 200uA in sleep mode.
The Water Sentinel Receiver is equipped with a RF receiver (hybrid), when this receiver detects the proper sensor signal, it removes power

from the relay, this relay in turn removes power from the water valve which is always on. The relay will remain off until it no longer receives a signal and for a time delay of thirty seconds or until someone presses PROG/RESET.

In addition to its normal function, the water sentinel keeps track of how long it has been energized, when 24 hours is reached the water sentinel removes power from relay for a few seconds, then restores power. This prevents valve from sticking, by the daily cycling of it.

This unit is also equipped with an interface for an automatic dialer unit (upcoming option).

There is also an interface for an optional temperature sensor that will shut water off in the event of freeze conditions.

Also incorporated into unit, is the ability to change firmware code without having to replace board or chip, all programming can be done on board, even in the field.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a class B digital devices, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encourage to try to correct the interference by one of more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and reveiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
    - Consult the dealer or an experienced radio/TV technician for help.

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Installation Procedure
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Initial Setup & Programming of Water Sentinel System:

1) Do not install water sensors until the unit is plugged in, plumbing has been installed, and the programming is complete.

2) To program press the PROG/RESET button once, LED LIGHT 1 should come on, with #1 LED lit, short water sensor probes together with wire or sponge with water. The LED will go out indicating that the receiver got the water sensor signal and position #1 is programmed with the unique code, by pressing the PROG/RESET button again, until next position is lit, you can continue to program remainder of the units in the same manner.

3) Once the water sensors are programmed into the Water Sentinel, install sensors in their proper locations. The LED's should be labeled to reference these locations.

4) Verify proper operation of each sensor by shorting with a sponge with water, this insures proper sensitivity to water.

5) When Unit is beeping, the PROG/RESET button can be pressed to shut signal off, or after 30 seconds unit will shut off provided that there is no more water detected.

Electrical Specifications

Water Sensor Transmitters

Internal battery operated.

Voltage 3.6 Volts ½ AA size.

Current: Less than 1ua in standby mode, no water detected.

Water Detected: 10mA Transmitting for less than 50 milliseconds every 2 seconds.

At one test every month, at an average of two seconds run per test, this would be a 10 ma for 24 seconds/year. This is less than the self-discharge rate of the battery. The self-discharge rate of the battery is 2%/year. Based on this, the battery would last at least 12 years.

Water Sentinel Receiver Unit

Volts:	110/120 Volts A.C.
Wattage:	10 WATTS
Safety:	Electronics, 0.1 Amp slo-blow Fuse. Valve: Direct Connection

Operating Frequency: 916.5 MHz
OOK Modulation. 8 byte (64 bit) address fields unlimited unique id number, 16 bit CRC checking.