

*Beckett*

PARTS & ACCESSORIES

**AquaSmart**

# AquaSmart®

## Wireless Temperature Module

### Model 7600WTM

#### Wireless Outdoor Temperature Reset

### Description / Applications



The Beckett AquaSmart® Wireless Temperature Module (WTM) is a 2-part accessory for the AquaSmart boiler control. It adds outdoor reset capability to the AquaSmart control by overriding the control's built-in HeatManager algorithm when installed. The wireless feature makes installation easy by eliminating mounting location limitations for the outdoor sensor and the need to run wires outside. Outdoor Temperature Reset

(OTR) settings like reset ratio and boost have been made easier to adjust and are accessible through the AquaSmart control's backlit LCD digital display. The WTM is backwards-compatible with all existing AquaSmart controls. The WTM may provide additional fuel savings over the built-in HeatManager algorithm with the addition of a warm weather shutdown feature that can disable the low limit. It is ideal for installations with high indirect domestic hot water demands or a large water mass (such as radiant in-floor heating).

#### **NOTICE**

This accessory is NOT intended for use on any other Non-AquaSmart Control or Equipment. Non-intended usage can cause damage to the WTM or the control being connected to and potentially alter control or system operation.

- This device is only for use in the United States and Canada.
- For information regarding installation and operation of the AquaSmart control, consult the latest revision of Beckett form no. 61738 available at [www.beckettcorp.com](http://www.beckettcorp.com).

# Table of Contents

- Features ..... 2
- Technical Specifications ..... 2
  - Electrical Ratings ..... 2
  - Environmental Ratings ..... 2
  - Approvals ..... 3
- Operation ..... 4
- Installation ..... 5
  - Initial Set-up ..... 5
  - Replacing the WTS battery ..... 7
  - Installing a new AWM or WTS ..... 7
- Navigating the Display Menus ..... 8
- Programming Basic Functions ..... 9
  - OTR ON/OFF: ..... 9
  - High OAT: ..... 9
  - Low OAT: ..... 9
  - Boost: ..... 9
- Programming Additional Options ..... 9
  - Heat Manager Efficiency Setting: ..... 9
  - Warm Weather Shut Down (WWSD): ..... 9
- Other Menu Items ..... 10
  - Current Outdoor Air Temperature (OAT): ..... 10
  - Signal Strength: ..... 10
  - Current WTS Battery Life: ..... 10
  - Adding Connections: ..... 10
  - Clearing Connections: ..... 10
  - Broadcast Once: ..... 10
- Limited Warranty Information ..... 12

# Features

- **Wireless communication**
- **10+ year battery life**
- **Up to 200 ft. range from boiler**
- **Wireless module and outdoor sensor are linked together out of the box.**
- **Simple installation - no wiring**
- **Warm weather shutdown**

# Technical Specifications

## Electrical Ratings

### AquaSmart Wireless Module:

- **Voltage:** 5 Vdc +/- 4% (from AquaSmart COM port)
- **Current:** 45 mA max (from AquaSmart COM port)
- **Line Power:** 300 mW max (in addition to AquaSmart's power consumption)

### Wireless Temperature Sensor Battery Specifications:

**NOTICE** Product will not function using a standard 1.5V AA Battery. Do not use the included battery in other devices.

- 3.6V, lithium, AA, button top, primary (non-rechargeable) battery
- Recommended replacement batteries LS14500 (Saft), TL-5903 (Tadiran)
- Do not return used or damaged batteries to the manufacturer. Disposal of spent batteries should be performed by an authorized, professional disposal company, which has knowledge in the requirements of the Federal, the State and the Local authorities regarding hazardous materials, transportation and waste disposal. Contact your local EPA office if unsure of how to dispose of batteries properly.

## Environmental Ratings

- **Storage and operating ambient temp.:** -40 °F to +150 °F (-40 °C to +65.6 °C)
- **Moisture:**
  - a. AquaSmart Wireless Module: 5 to 95% RH, non-condensing and non-crystallizing.
  - b. Wireless Temperature Sensor: 5 to 95% RH, condensing. Weatherproof. Not submersible.

### WARNING

Risk of Fire, Explosion, and Burn Hazard.



*This control must be installed, adjusted and put into operation only by a trained, licensed, qualified professional or service agency.*

- Call RWB Technical Services at 1(800)645-2876 for assistance.

## Approvals

This equipment has been tested and found to comply with the limits for a Class B digital device, 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 instructions, 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 encouraged to try to correct the interference by one or more of the following measures:

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

*This device complies with Industry Canada license - exempt RSS standard(s).*

*Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.*

*Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.*

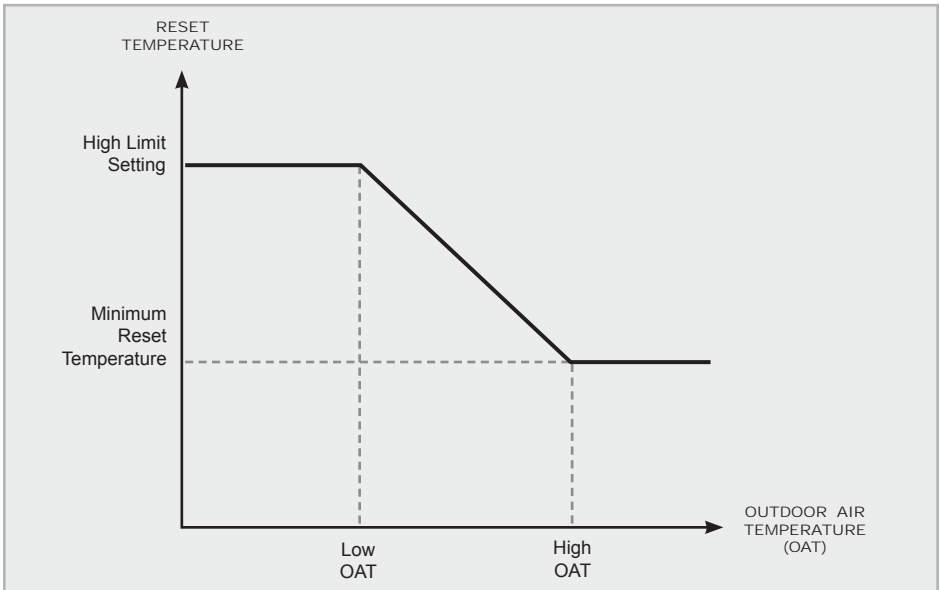
*L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

### **CAUTION**

To satisfy FCC RF Exposure requirements for mobile and base station transmission devices, a separation distance of 20cm (8") or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at closer than this distance is not recommended.

The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

**Figure 1 - Outdoor Temperature Reset Curve**



# Operation

- The Beckett 7600AWM (AquaSmart Wireless Module) dynamically adjusts the boiler high setpoint using the graph shown in **Figure 1** and inputs of the outdoor temperature and user-configurable setpoints as noted in the figure.
- The WTM algorithm overrides the HeatManager™ functionality of the base AquaSmart when enabled. If the outdoor sensor battery is depleted or if the sensor stops working for any reason, the AWM will revert the AquaSmart back to its HeatManager™ algorithm until the battery can be replaced.
- In normal operation, the WTS sends the AWM the outdoor temperature every 10 - 60 minutes. Pressing the WTS button once forces a transmission.
- The Beckett 7600WTM can help to achieve even greater fuel savings over the base AquaSmart with the following advanced features:
  - a. Warm Weather Shutdown can be enabled to turn the low limit (if used) off if the outdoor temperature is above 70°F.
  - b. The boost function can be adjusted in small increments to prevent the reset algorithm from being overridden too quickly, which can benefit systems with high water mass (such as in-floor radiant heating applications).
  - c. The outdoor reset algorithm begins economizing immediately after a Domestic Hot Water (DHW) call for heat, where the HeatManager takes time to reach full economizing after a DHW call.

**Figure 2 - AWM Installation**



**Figure 3 - How to open WTS**



## Installation

### **WARNING**

#### **Risk of Fire, Explosion, and Burn Hazard.**



- Do not attempt to recharge, disassemble, heat above 85°C, expose to water, puncture, incinerate, or short-circuit the battery.
- Keep battery out of reach of children and in original package until ready to use.
- Mount with battery at bottom position only. Failure to do so could expose the battery to water.
- Dispose of used batteries promptly.

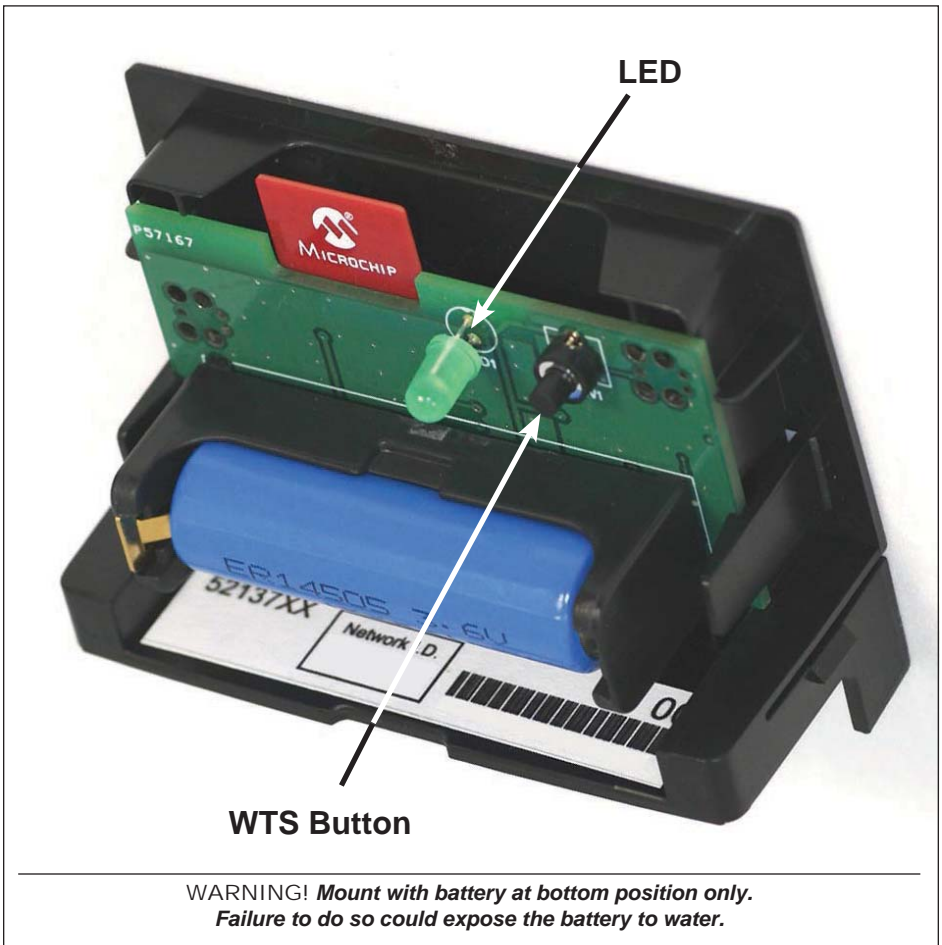
### **Initial Set-up**

1. Remove power from the AquaSmart.
2. Snap the AquaSmart Wireless Module (AWM) onto the COM Port (**Figure 2**) on the side of the AquaSmart boiler temperature control. Restore power to the AquaSmart control.
3. Remove the internal cartridge containing the

battery cell from the Wireless Temperature Sensor (WTS). Press in the plastic tabs and pull the cartridge out as shown in **Figure 3**.

4. Remove the plastic insert on the battery terminal. Make sure battery is inserted properly (see polarity mark on battery holder).
5. Mount the WTS with the two screws provided at your desired location. Mount the sensor on any exterior wall (preferably on the north face of the house), at least 6 inches below any vertical overhang, above the snow line, out of reach of children, and sufficiently far away from any vents for them not to affect temperature readings. Choose a location protected from direct sunlight. Use caution not to drill screws into any existing electrical wiring or gas lines.
6. Verify operation:
  - a. Press the WTS button once (**Figure 4**). The LED should flash five times.
  - b. Using the AquaSmart's display, navigate to Screen 1 as shown in **Figure 5**, in the **Navigating the Display Menus** Section.

**Figure 4 - WTS Internal View**



The screen should display the current outdoor temperature and show that the last transmission was received within the last few minutes. If “NOT INSTALD” appears, the AWM and AquaSmart are not communicating. Wait 30 seconds. If the error persists, power down the AquaSmart control, ensure the AWM is properly connected, and restore power to the control. If the OAT screen says “OF AS OF 18:12 AGO”, press the WTS button once. If the value does not update, there is a problem with the connectivity of the WTS. Move the WTS to a location closer to the AWM or with less interference.

- c. Navigate to screen 2. The signal strength screen indicates the strength of the connection between the AWM and WTS. At least 3 darkened bars are recommended for operation, with 6 or more indicating a good connection. Moving the WTS closer to the AWM or away from large metal object can improve the connection.
6. On older AquaSmart controls, the OTR may be off by default. Refer to the OTR ON/OFF section of the **Programming Basic Functions Section** to make sure it is turned on.
7. If modifying the default settings is desired, refer to the **Programming Basic Functions Section**.

## Replacing the WTS battery

1. To determine if battery needs replaced:
  - a. Navigate to Screen 3 as shown in **Figure 5 (Navigating the Display Menus)**. If the screen says "REPLACE", the battery needs replaced.
  - b. If the OAT Screen (screen 1) reads "AS OF 18:20 AGO" the AWM is not receiving transmissions from the WTS, and the battery should be replaced.
2. To replace battery:
  - a. Remove old battery from Wireless Temperature Sensor. The lithium battery should be recycled.
  - b. Press button on Wireless Temperature Sensor once. This step is extremely important to make sure the power from the old battery is depleted so that the sensor will know it has a new battery.
  - c. Insert new 3.6V lithium battery. See **Technical Specifications** Section for battery specifications and replacement part number. Make sure battery is inserted properly (see polarity mark on battery holder).

## Installing a new AWM or WTS

1. If the pre-linked AWM or WTS must be replaced for any reason, the new pair of devices must be linked before use. Follow the steps below to link the new devices.
2. Installing a new AWM

Remove power from the AquaSmart control. Remove the old AWM from the control by gently squeezing the sides of the device at the indentations marked with arrows and then pull away from the AquaSmart.

- a. Snap the new AquaSmart Wireless Module onto the COM Port on the side of the AquaSmart boiler temperature control. Restore power to the control.
- b. Clear the old link from the Wireless Temperature Sensor: Hold the button of the WTS for five seconds. The LED should turn on. Within 5 seconds, press the button once more to confirm the clearing. Once the link is cleared, the LED will flash quickly for 2 seconds.
- c. Proceed to **Step 4**.

3. Installing a new WTS
  - a. Remove the battery from the old WTS and discard both. The lithium battery should be recycled.
  - b. In the new Wireless Temperature Sensor, remove the plastic insert on the battery terminal. Make sure battery is inserted properly (see polarity mark on battery holder).
  - c. Mount the new Wireless Temperature Sensor with the two screws provided at same location as the old WTS.
  - d. Clear the old link for the AquaSmart Wireless Module: Navigate to Screen 10 as shown in **Figure 5 (Navigating the Display Menus)**. Press **ENTER** to begin clearing connections, and press **ENTER** again to confirm.
  - e. Proceed to **Step 4**.
4. Linking the AWM and WTS

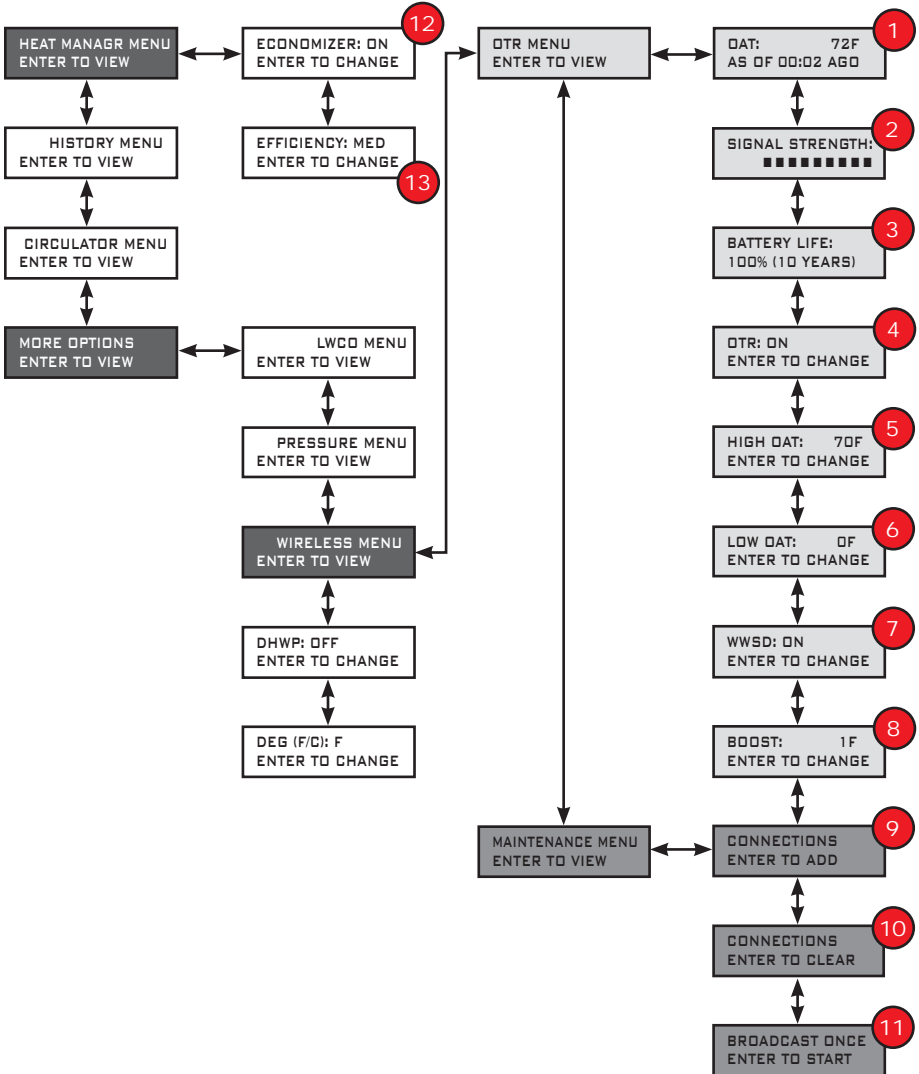
- a. Put the WTS in discovery mode: press the WTS button twice. The LED will flash slowly until it finds the AWM (for up to 3 minutes).
- b. While the WTS is still in discovery mode, put the AquaSmart Wireless Module in discovery mode: Navigate to Screen 9 as shown in **Figure 5 (Navigating the Display Menus)**. Press **ENTER** to begin searching for new connections. The screen will read "SEARCHING... 3:00" and count down from 3 minutes.
- c. Once the AWM sees the WTS, the 4-digit Network I.D. of the WTS will appear on the 2nd line of the AquaSmart's display. Pressing up or down will cycle through multiple device I.D.s if more than one WTS is found. Press **ENTER** twice on the AquaSmart display to accept the connection with the WTS. Once the two are linked, the LED on the WTS will flash quickly for 10 seconds and the AquaSmart's screen will read "CONNECTED: XXXX", where XXXX is the Network I.D. of the WTS.

# Navigating the Display Menus

Use the following screen structure to navigate through the AquaSmart Wireless Module screens available on the AquaSmart display. When navigating, always use the keypad as follows:

- **ENTER (RESET)** – Enter menu
- **CANCEL (BACK)** – Navigate up one level in menu structure
- **Up / Down Arrows** – Flip through available screens in current menu
- **Note:** Once in the wireless menu, the AquaSmart display is taken over by the AWM. The screens may take a few seconds to update, and the buttons may have to be pressed more deliberately. This is normal.

**Figure 5 - Navigation Screen Menu**





# Programming Basic Functions

## **OTR ON/OFF:**

1. Navigate to Screen 4 as shown in **Figure 5 (Navigating the Display Menus)**.
2. Pressing **ENTER (RESET)** on this screen will toggle the setting on and off.
3. ON (default) indicates that the outdoor reset algorithm will override the HeatManager™ algorithm.
4. OFF indicates that the HeatManager™ algorithm will be used.
5. NOTE – the Economizer must be set to ON for either algorithm to be used (see Screen 12).

## **High OAT:**

1. Navigate to Screen 5 as shown in **Figure 5**.
2. Press **ENTER (RESET)** on this screen and follow the on-screen instructions to change this setting.
3. This number specifies the outdoor temperature at which the boiler reset temperature will be at its minimum value. See **Operation Section** for further description of what this value indicates.
4. Default is +70°F (+21°C). Range is +40°F to +70°F (+4°C to +21°C)
5. NOTE – the minimum reset temperature value that the AquaSmart will economize to is determined by a number of factors, including the low limit setting and the efficiency setting (**Programming Additional Options Section**). A lower efficiency setting can raise this minimum temperature if needed for comfort.

## **Low OAT:**

1. Navigate to Screen 6 as shown in **Figure 5**.
2. Press **ENTER (RESET)** on this screen and follow the on-screen instructions to change this setting.
3. This number specifies the outdoor temperature at which the boiler high limit will be at its maximum value. See **Operation Section** for further description of what this value indicates.

4. Default is 0°F (-18°C). Range is 0°F to +40°F (-18°C to +4°C)
5. NOTE – the maximum high limit value is determined by the high limit setting of the AquaSmart

## **Boost:**

1. Navigate to Screen 8 as shown in **Figure 5**.
2. Press **ENTER (RESET)** on this screen and follow the on-screen instructions to change this setting.
3. This number specifies the value to be added to the reset temperature every 10 consecutive minutes of a call for heat. This can help to ensure the heating demand of the house will be met even if the reset temperature is not high enough to satisfy the heating demand
4. Default is 0°F. Range is 0°F to 10°F (0°C to 6°C)

# Programming Additional Options

## **Heat Manager Efficiency Setting:**

1. Navigate to Screen 13 as shown in **Figure 5**.
2. Pressing **ENTER (RESET)** on this screen will toggle the setting between HI, MED, and LOW.
3. This value can adjust the minimum high limit value that the AquaSmart will economize to if needed for comfort.

## **Warm Weather Shut Down (WWSD):**

1. Navigate to Screen 7 as shown in **Figure 5**.
2. Pressing **ENTER (RESET)** on this screen will toggle the setting on and off.
3. ON will turn the low limit of the AquaSmart off when the outdoor temperature is above 70°F (21°C). Turning this feature on can help to increase fuel savings.
4. OFF (default) will not turn the low limit off based on outdoor temperature.

# Other Menu Items

## **Current Outdoor Air Temperature (OAT):**

1. See Screen 1 shown in *Figure 5*.
2. This screen displays the most recent outdoor temperature received from the WTS, and the hours and minutes since the last transmission received.

## **Signal Strength:**

1. See Screen 2 shown in *Figure 5*.
2. This screen displays a visual representation of the connection strength between the AWM and WTS. The number of darkened bars (between 0 and 16, with 16 being the strongest) indicates the strength. A minimum of 3 bars are recommended for reliable operation, while at least 6 indicate a good connection. Pressing the WTS button once will update this value.

## **Current WTS Battery Life:**

1. See Screen 3 shown in *Figure 5*.

2. This screen displays the most recent report of the battery life of the WTS in percentage of battery life left and estimated years of service left. If less than a year of service life is expected, the screen will say "REPLACE".

## **Adding Connections:**

1. See Screen 9 shown in *Figure 5*.
2. This screen is used when linking two devices when a new one has been added (see *Installation Section*).

## **Clearing Connections:**

1. See Screen 10 shown in *Figure 5*.
2. This screen is used when clearing a link between two devices that is no longer needed (see *Installation Section*).

## **Broadcast Once:**

1. See Screen 11 shown in *Figure 5*.
2. This screen may be used in linking procedures with future Beckett wireless products.



# Limited Warranty Information

The R. W. BECKETT CORPORATION ("Beckett") warrants to persons who purchase its "Products" from Beckett for resale, or for incorporation into a product for resale ("Customers"), that its equipment is free from defects in material and workmanship. To qualify for warranty benefits, products must be installed by a qualified service agency in full compliance with all codes and authorities having jurisdiction, and used within the tolerances of Beckett's defined product specifications.

To review the complete warranty policy and duration of coverage for a specific product, or obtain a written copy of warranty form 61545, please choose one of the following options:

1. Visit our website at: [www.beckettcorp.com/warranty](http://www.beckettcorp.com/warranty)
2. Email your request to: [rwb-customer-service@beckettcorp.com](mailto:rwb-customer-service@beckettcorp.com)
3. Write to: R. W. Beckett Corporation, P. O. Box 1289, Elyria, OH 44036

**NOTE: Beckett is not responsible for any labor cost for removal and replacement of equipment.**

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