STW/THW Wireless Sensors

Installation Guide

CONTENTS

STW-6010 and THW-1102

STW-6014

INTRODUCTION

Complete the following steps to mount a KMC STW-6010, STW-6014, or THW-1102 wireless sensor and connect it to a Conquest™ HPO-9007NW or HPO-9007DW gateway.

KMC recommends **charging** up the sensors, **configuring** them near the gateway, and **testing** them (for signal strength, etc.) in the intended locations **BEFORE** permanently **mounting** them. **Read carefully the following sections BEFORE attempting installation.**

NOTE: The sensor begins operation as soon as the solar cell has charged the internal energy storage device. Under normal operating conditions this should be no more than a few **minutes**. However, if the sensor has been in dark storage for 36 months or more (deeply discharging the energy storage), it may take several **days** (depending on ambient light intensity) for the circuit to become fully charged and operational. Expose the sensor to adequate light sources well **before** installation as needed.

NOTE: Because the wireless sensors normally transmit only several times per hour to conserve power, **allow at least 30 minutes for transmissions to be received and all the relevant object values to be updated** when verifying normal operation.

NOTE: Sensors only transmit. They do not receive signals from a gateway.

NOTE: See the **data sheet** for specifications and other information.

SELECT MOUNTING LOCATION

Installation Factors

Proper mounting location for wireless, solar-powered sensors is far more critical than for traditional wired sensors. When picking a location to mount the sensor, the installer must be aware of optimal placement regarding **all three of the following factors**:

NOTE: Also consider the future use of the room and avoid locations that may be later used for filing cabinets, shelf units, or other large obstructions that could block air flow, light, and/or the RF signal.

Adequate RF Range/Path to the Gateway

For the RF signal, the maximum theoretical straight-line distance between the gateway and sensors is about 100 feet (30 meters). However, in practice, **the maximum distance will be substantially reduced by obstacles in the path, the shape of the room, sources of radio interference, and placement/orientation of the sensors and gateway!**

See the application guide **Planning for Wireless Sensors Application Guide** for important information about proper placement of the sensors and their gateway.

NOTE: To provide optimized placement for all three sensor location factors, repositioning the wireless gateway may be necessary.

Adequate Light for Sensor Charging

To keep the sensor properly charged, **mount the sensor in an area with a minimum illumination of 200 lux** (e.g., typical light levels of interior corridors, stairwells, storage rooms, or mechanical rooms) **for three to four hours every day.** The light source can be daylight (preferred) or artificial (dependent on type).

Artificial lighting sources are **not** as effective in keeping sensors charged as indirect daylight because of spectrum and intensity differences. LED lights (although energy efficient) are even less effective in charging sensors than incandescent or fluorescent lights. **In an interior room that has LED (only) lighting, a sensor should have a battery installed as a backup.** See **(Optional) Install Battery Backup on page 3**.

Avoid recessed areas that are not sufficiently illuminated throughout the day. Avoid mounting the sensor angled away from light sources. The **long-term illumination should not exceed 1000 lux** (equivalent to outdoors on an overcast day). The sensors can be mounted with the solar cell toward a window but **not in direct sunlight at any time of the day** since direct sunlight will give false temperature values.

If fully charged, the sensor can transmit normally for about four days in total darkness (without the backup battery). If longer periods of darkness may occur, install a battery as a backup. See **(Optional) Install Battery Backup on page 3**.

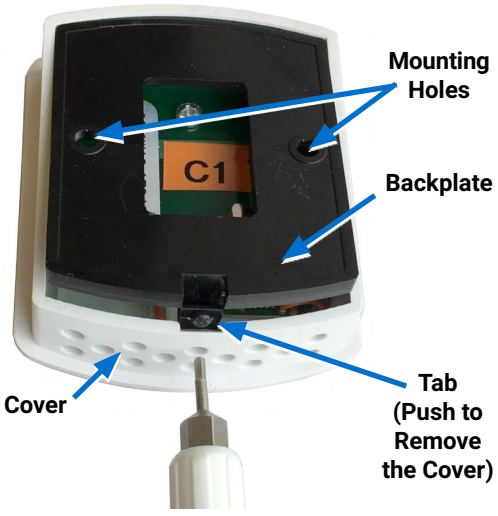
Accurate Temp/Humidity Measurement

Install the sensor on an **inside wall** where it can sense the average room temperature/humidity and be **away from direct sunlight, heat sources, windows, air vents, and air circulation obstructions (curtains, furniture, etc.).**

See the **Room Sensor and Thermostat Mounting and Maintenance Application Guide** for additional mounting and troubleshooting information for measuring temperature and humidity.

REMOVE BACKPLATE

To permanently mount the sensor, the cover must be removed. The sensor cover is held to the black backplate by three, small, round pegs that fit in the holes of the sensor body. The bottom peg is a spring tab and snaps into the center bottom hole.



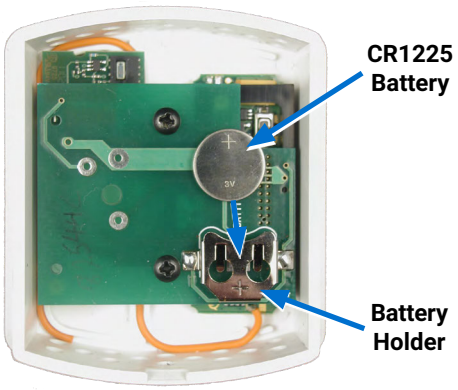
1. With a small Phillips screwdriver or hex wrench, press in and hold the tab button that snaps into the center hole on the bottom cover.

⚠ CAUTION

Insert the screwdriver into the correct hole. Do not use excessive force and deform or break the tab.

2. Carefully pull or pry the backplate from the sensor body.

(OPTIONAL) INSTALL BATTERY BACKUP



Optionally, a single **CR1225** lithium battery can be installed as a power backup for locations without sufficient light to maintain sensor operation.

1. Position the battery with the plus (+) symbol visible.

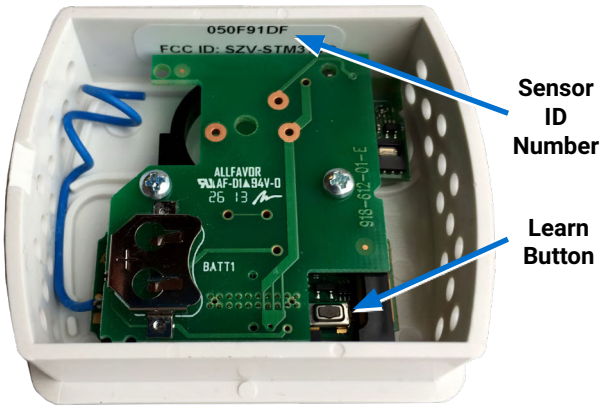
2. Slide the battery into the battery holder.

NOTE: If replacing the battery, first carefully push out the old battery using a narrow screwdriver blade through the slots in the other side of the holder.

CONFIGURATION

1. See the **HPO-9007 Series Gateways Installation Guide** for instructions on **configuring the sensors** in the software.

2. Note the **sensor identification number** (identifying that unique sensor) on a label that is inside of the sensor body.



3. Note the **Learn pushbutton** on the other side of the sensor. The button may be on the "top" of the switch body facing you or on the side, depending on the model. Use a small screwdriver to push the button for device discovery and immediate transmission updates.

NOTE: The antenna is a wire whip looped under the cover for 902 MHz models and is a helical wire for 868 MHz models.

MOUNTING

NOTE: KMC recommends **configuring** the sensors near the gateway and **testing** them (for signal strength, etc.) in the intended locations **BEFORE** permanently **mounting** them.

1. Locate the sensor identification number on the label that is inside of the sensor body.

2. Record the location of the sensor and identification number on the system plans.

3. Using the backplate as a template, drill two holes for mounting screws 1-13/32 inches (35.6 mm) apart. For the supplied screws, drill 7/64 inch (3 mm) holes.

NOTE: For drywall, plaster, or concrete mounting surfaces, plastic anchors are recommended. If anchors are used, adjust the size of the holes for the anchor.

4. With the plastic tab button on the bottom, attach the backplate to the wall using two #6 self-threading screws.

5. Place the top of the cover over the top of the backplate and gently push the bottom part of the cover toward the wall until the cover snaps onto the backplate.

OPERATION

The sensor will begin operation as soon as the solar cell has charged the internal energy storage device. Under normal operating conditions this should be no more than a few minutes with adequate illumination. However, if the sensor has been in dark storage for 36 months or more (deeply discharging the energy storage), it may take several **days** (depending on ambient light intensity) for the circuit to become fully charged and operational. Expose the sensor to adequate light sources well **before** installation as needed.

TROUBLESHOOTING

Erratic Temperature Readings

- Reposition the sensor. See the Mounting for Optimal Temperature Sensing section in the **Room Sensor and Thermostat Mounting and Maintenance Application Guide**.

Sensors Not Discovered

- Bring the sensor close to the gateway and press the Learn button. See **Configuration on page 3**.
- Check that the sensor and gateway are the same frequency (models DW vs. NW).
- Check that controller firmware and software tool versions are current. See the Software and Firmware Requirements section in the **HPO-9007 Series Gateways Installation Guide**.
- Allow adequate time for sensor to charge or add the optional backup battery to the sensor. See **(Optional) Install Battery Backup on page 3**.

Sensor Signals or Values Erratic or Lost

- Check area for new or changing obstructions.
- Add a battery backup to the sensor.
- Reposition the sensor.
- Add a repeater or an additional gateway. See the Adding Gateways or Repeaters to Extend Coverage section in the **Planning for Wireless Sensors Application Guide**.

NOTE: The AV in a KMC Conquest controller associated with a sensor's value maintains the last received value until it is refreshed by a new signal.

NOTE: If the HPO-9007 is momentarily unplugged or the controller momentarily loses power, sensor values will temporarily return to 0 until updated by a later sensor transmission. The sensors may also need to be discovered again to see the icon and EEP in the Gateway Sensor List section of the EnOcean Sensor Port object. See the Add Sensors section in the **HPO-9007 Series Gateways Installation Guide**. (Restarting the controller through software may also cause a temporary loss of values but should not require a new discovery of the sensors.)

NOTE: Creating an alarm for a lost signal event may be desired. For example, if the time since the last received transmission exceeds 3600 seconds (at least two missed signals), an alarm is generated.

NOTE: Some lost signals may be self-correcting, such as a sensor in a darkened office during a long, holiday weekend that recharges the next open business day.

Setpoint Adjustment Does Not Work

- Check the configuration. See **Configuration on page 3**.
- Check the Control Basic programming.
- Verify that the objects are not being overwritten by other sources.
- Check the HVAC/BAS system.

Wrong Values

- Check the configuration. See **Configuration on page 3**.
- Allow enough time for sensor transmissions.

NOTE: Because the wireless sensors normally transmit only several times per hour to conserve power, **allow at least 30 minutes for transmissions to be received and all the relevant object values to be updated** when verifying normal operation.

Other Issues

- If an HPO-9001 distribution module is being used on the controller, see the "Use of HPO-9001 Distribution Module" section in the **HPO-9007 Series Gateways Installation Guide**.
- Contact KMC Controls for assistance.

MAINTENANCE

Careful installation will help ensure long-term reliability and performance.

To maintain accurate temperature and humidity sensing, remove dust as necessary from the ventilation holes in the top and bottom of the cover.

To clean the cover, use a soft, damp cloth (and mild soap if necessary). Do not spray any liquids on the cover.

Replace the optional lithium battery every three years or as needed by actual use.*

***NOTE:** Factors that shorten battery life include:

- Installation in interior spaces with only artificial light (which charges sensors less efficiently than indirect daylight).
- Lengthy periods of darkness (which increases the reliance on the battery).
- Adding setpoint adjustment or humidity to a temperature sensor (which requires more power).
- Frequent changes (beyond their respective thresholds) in measured temperature, humidity, or setpoint values (which makes transmissions more frequent).

IMPORTANT NOTICES

NOTE: Contains FCC ID SZV-STM332U. 902 MHz devices comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (i.) these devices may not cause harmful interference and (ii.) these devices must accept any interference received, including interference that may cause undesired operation.

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