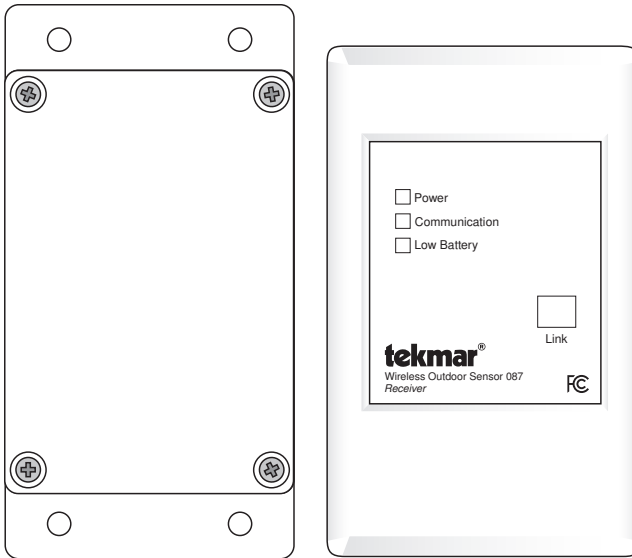




Installation & Operation Manual

The tekmar Wireless Outdoor Sensor 087 provides a simple solution to include outdoor temperature measurement in any application without exterior wiring. The transmitter and receiver are sold pre-linked and are installation-ready. With exceptional range and an 8 year battery life, the Wireless Outdoor Sensor 087 provides maximum accuracy, convenience and reliability.



Features

- Compatible with all tekmar controls and thermostats as well as other manufacturers products
- 10K (type 2 and 3), 5K, 12K and 20K resistance setting options
- Low transmitter battery status indicator on the receiver
- Power and communication indicator lights
- Transmitter temperature range of -40°F to 140°F (-40°C to 60°C)
- Long battery life (minimum 8 years) with included 1.5V Lithium AA batteries
- 5000 ft. open range
- 8 walls / 250 ft. indoor range

FCC: This product has been tested and found to comply with FCC part 15 subpart C. 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 of the device. However, there is no guarantee that interference will not occur in a particular installation. If this device 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:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- 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

Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Industry Canada: 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 under Industry Canada regulations.

Warning: FCC and IC Radiation Exposure Statement

The Transmitter device must provide a separation distance of at least 20 cm (8 inches) from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

⚠ WARNING



It is your responsibility to ensure that this control is safely installed according to all applicable codes and standards. tekmar is not responsible for damages resulting from improper installation and/or maintenance.

To avoid serious personal injury and damage to the equipment:



- Read Manual and all product labels BEFORE using the equipment. Do not use unless you know the safe and proper operation of this equipment.
- Keep this Manual available for easy access by all users.
- Replacement Manuals are available at tekmarControls.com



- Disconnect all power before opening the control.
- Do not attempt to service the control. There are no user serviceable parts inside the control. Attempting to do so voids warranty.

Step 1 - Check the Contents

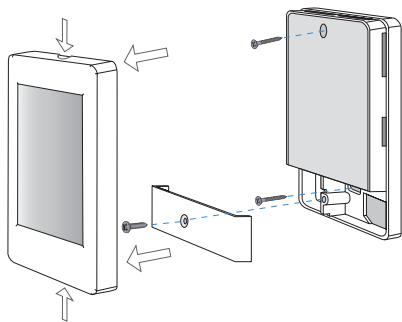
Check the contents of this package. If any of the contents listed are missing or damaged, please refer to the Limited Warranty and Product Return Procedure on the back of this brochure and contact your wholesaler or tekmar sales representative for assistance.

- One Receiver Unit (for indoor installation)
- One Transmitter Unit (for outdoor installation)
- 2 1.5V AA Lithium batteries
- Installation hardware
- One Installation & Operation Manual

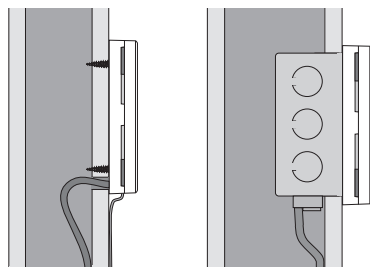
Step 2 - Install receiver

When choosing the location for the receiver unit, consider the following:

- Interior Wall.
- Keep dry. Avoid potential leakage onto the unit.
- Relative Humidity less than 90%. Non-condensing environment.
- No exposure to extreme temperatures beyond 32 to 122°F (0 - 50°C)
- Away from equipment, appliances, or other sources of electrical interference.
- Easy access for wiring
- Approximately 5 feet (1.5 m) off the finished floor.
- **DO NOT mount the transmitter or receiver in a metal enclosure, or on a surface with conductive properties. It will reduce the signal strength and affect the communication distance and reliability.**



Grasp the front cover by the fingertip grips on the top and bottom of the enclosure and pull the front cover off. Remove the wiring cover screw.



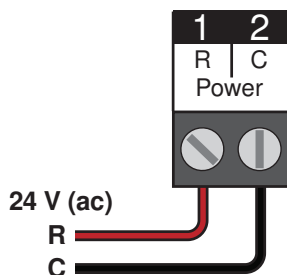
The enclosure is either mounted flush onto a wall or it can be placed onto a 2" x 4" electrical box. The mounting holes in the enclosure accept #6 screws. Wiring to the control enters the wiring chamber through the back or bottom of the enclosure.

Step 3 - Provide power

24 V (ac) Power to the receiver unit

Connect the 24 V (ac) power supply to the R and C terminals (1 and 2) on the receiver unit. Replace the cover.

Use a separate power supply for the receiver when connecting to a 24 V (ac) powered control.



Batteries in the transmitter unit

Remove the cover from the transmitter unit. Pull out the plastic tab that is keeping the batteries from making contact. Put the cover back on the base and secure with screws.

Please note: 1.5V Lithium batteries are required to provide the specified battery life and temperature range.

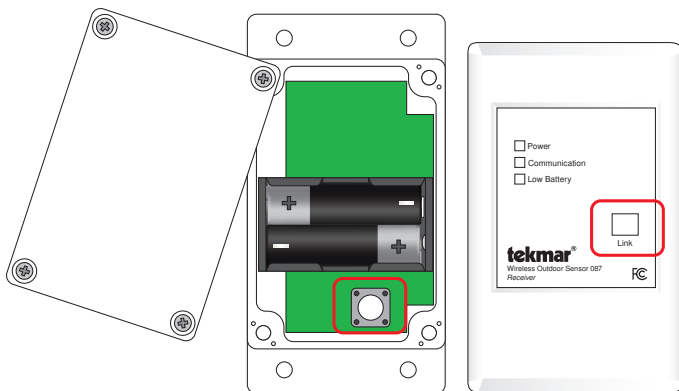
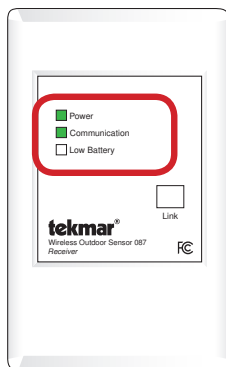


Step 4 - Confirm Link

If the communication light is displayed on the control, the transmitter is linked properly.

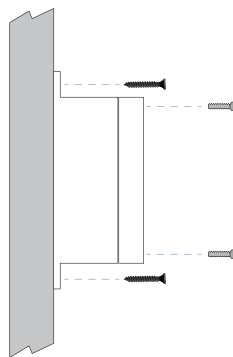
If the light is not on, the devices will need to be linked.

Remove the cover on the transmitter so that the button below the battery terminals can be accessed. Press and hold both the button on the transmitter and the button on the receiver simultaneously for 5 seconds. Linking is successful when the communication LED is on.



Step 5 - Install transmitter

- The transmitter should be mounted on an exterior wall which best represents the heat load on the building (a northern wall for most buildings and a southern facing wall for buildings with large south facing glass areas)
- In order to prevent heat transmitted through the wall from affecting the sensor reading, it may be necessary to install an insulating barrier behind the enclosure.
- The 087 should not be exposed to heat sources such as ventilation or window openings.
- The 087 should be installed at an elevation above the ground that will prevent accidental damage or tampering.
- Do not install the transmitter on a conductive surface.



Loss of Communication Troubleshooting

If the Communication LED is not on, please try the following:

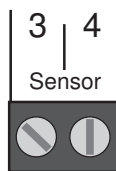
1. Confirm that the receiver is powered with 24 V (ac) by observing that the green Power LED is on.
2. Confirm that batteries are still good. If the batteries are dead, the Communication and Low Battery LEDs will be off.
3. Try re-linking the devices, as described on page 4.
4. Reset the receiver by pressing the link button momentarily.
5. If the communication LED remains off, please call Technical Customer Support at (250) 545-7749 or email tekmar.customerservice@wattswater.com.

LED Operation

LED Indicator	Status	Description
Power	On (Green)	Normal operation
	Off	No power. Check that the wires are securely connected to the device.
Communication	On (Green)	Signal is good.
	Off	No signal. There is a loss of communication or the transmitter battery is dead, resulting in an open circuit error on the control.
	Flashing	Signal is weak. Consider relocating a device to obtain a stronger signal.
Low Battery	On (Red)	Battery life is low. Replace within 3 months.
	Off	Battery is good.

Sensor terminal wiring

Connect 2-conductor wire between the control or device that requires an outdoor temperature reading and the sensor terminals (3 and 4) on the receiver. This connection is not polarity sensitive. Set the DIP switches to match the type of resistance reading required.

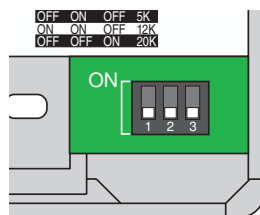


To outdoor sensor terminals
on tekmar or other
manufacturers control

Sensor Resistance Settings

DIP switches in the right side of the wiring chamber are configured to match the sensor requirements of the connected control.

'10K Type 2' is the default setting that works with all tekmar controls and thermostats with outdoor sensor inputs. To determine the correct setting for other control types, refer to the following temperature resistance charts.



10K Type 2 (tekmar)



Resistance	Temperature
336095	-40°C
242426	-35°C
176801	-30°C
130307	-25°C
97007	-20°C
72910	-15°C
55303	-10°C

Resistance	Temperature
42316	-5°C
32651	0°C
25395	5°C
19903	10°C
15714	15°C
12493	20°C
10000	25°C

Resistance	Temperature
8056	30°C
6530	35°C
5325	40°C
4367	45°C
3601	50°C
2985	55°C
2487	60°C

10K Type 3



Resistance	Temperature
239686	-40°C
179200	-35°C
135185	-30°C
102861	-25°C
78913	-20°C
61020	-15°C
47543	-10°C

Resistance	Temperature
37313	-5°C
29490	0°C
23457	5°C
18780	10°C
15130	15°C
12263	20°C
10000	25°C

Resistance	Temperature
8194	30°C
6752	35°C
5592	40°C
4655	45°C
3893	50°C
3271	55°C
2760	60°C

5K

ON



Resistance	Temperature
168243	-40°C
121342	-35°C
88487	-30°C
65210	-25°C
48540	-20°C
36479	-15°C
27666	-10°C

Resistance	Temperature
21166	-5°C
16325	0°C
12698	5°C
9952	10°C
7857	15°C
6247	20°C
5000	25°C

Resistance	Temperature
4028	30°C
3265	35°C
2663	40°C
2184	45°C
1801	50°C
1493	55°C
1244	60°C

12K

ON



Resistance	Temperature
309396	-40°C
229504	-35°C
171839	-30°C
129824	-25°C
98932	-20°C
76018	-15°C
58878	-10°C

Resistance	Temperature
45953	-5°C
36129	0°C
28606	5°C
22804	10°C
18297	15°C
14773	20°C
12000	25°C

Resistance	Temperature
9803	30°C
8053	35°C
6651	40°C
5522	45°C
4607	50°C
3862	55°C
3252	60°C

20K

ON



Resistance	Temperature
806800	-40°C
574400	-35°C
413400	-30°C
300400	-25°C
220600	-20°C
163500	-15°C
162280	-10°C

Resistance	Temperature
92240	-5°C
70160	0°C
53780	5°C
41560	10°C
32340	15°C
25360	20°C
20000	25°C

Resistance	Temperature
15892	30°C
12704	35°C
10216	40°C
8264	45°C
7220	50°C
5498	55°C
4520	60°C

Technical Data

Wireless Outdoor Sensor 087

Literature	087_D, 087_C
Dimensions	Transmitter: 130mm x 68mm x 50mm Receiver: 120mm x 74mm x 23mm
Approvals	FCC and IC
Operating range	Transmitter: -40 to 140°F (-40 to 60°C) Receiver: 32 to 122°F (0 to 50°C)
Receiver power	24 V (ac) +/- 10%, 1 VA

Limited Warranty and Product Return Procedure

Limited Warranty *The liability of tekmar under this warranty is limited. The Purchaser, by taking receipt of any tekmar product ("Product"), acknowledges the terms of the Limited Warranty in effect at the time of such Product sale and acknowledges that it has read and understands same.*

The tekmar Limited Warranty to the Purchaser on the Products sold hereunder is a manufacturer's pass-through warranty which the Purchaser is authorized to pass through to its customers. Under the Limited Warranty, each tekmar Product is warranted against defects in workmanship and materials if the Product is installed and used in compliance with tekmar's instructions, ordinary wear and tear excepted. The pass-through warranty period is for a period of twenty-four (24) months from the production date if the Product is not installed during that period, or twelve (12) months from the documented date of installation if installed within twenty-four (24) months from the production date.

The liability of tekmar under the Limited Warranty shall be limited to, at tekmar's sole discretion: the cost of parts and labor provided by tekmar to repair defects in materials and / or workmanship of the defective product; or to the exchange of the defective product for a warranty replacement product; or to the granting of credit limited to the original cost of the defective product, and such repair, exchange or credit shall be the sole remedy available from tekmar, and, without limiting the foregoing in any way, tekmar is not responsible, in contract, tort or strict product liability, for any other losses, costs, expenses, inconveniences, or damages, whether direct, indirect, special, secondary, incidental or consequential, arising from ownership or use of the product, or from defects in workmanship or materials, including any liability for fundamental breach of contract.

The pass-through Limited Warranty applies only to those defective Products returned to tekmar during the warranty period. This Limited Warranty does not cover the cost of the parts or labor to remove or transport the defective Product, or to reinstall the repaired or replacement Product, all such costs and expenses being subject to Purchaser's agreement and warranty with its customers.

Any representations or warranties about the Products made by Purchaser to its customers which are different from or in excess of the tekmar Limited Warranty are the Purchaser's sole responsibility and obligation. Purchaser shall indemnify and hold tekmar harmless from and against any and all claims, liabilities and damages of any kind or nature which arise out of or are related to any such representations or warranties by Purchaser to its customers.

The pass-through Limited Warranty does not apply if the returned Product has been damaged by negligence by persons other than tekmar, accident, fire, Act of God, abuse or misuse; or has been damaged by modifications, alterations or attachments made subsequent to purchase which have not been authorized by tekmar; or if the Product was not installed in compliance with tekmar's instructions and / or the local codes and ordinances; or if due to defective installation of the Product; or if the Product was not used in compliance with tekmar's instructions.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, WHICH THE GOVERNING LAW ALLOWS PARTIES TO CONTRACTUALLY EXCLUDE, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, DURABILITY OR DESCRIPTION OF THE PRODUCT, ITS NON-INFRINGEMENT OF ANY RELEVANT PATENTS OR TRADEMARKS, AND ITS COMPLIANCE WITH OR NON-VIOLATION OF ANY APPLICABLE ENVIRONMENTAL, HEALTH OR SAFETY LEGISLATION; THE TERM OF ANY OTHER WARRANTY NOT HEREBY CONTRACTUALLY EXCLUDED IS LIMITED SUCH THAT IT SHALL NOT EXTEND BEYOND TWENTY-FOUR (24) MONTHS FROM THE PRODUCTION DATE, TO THE EXTENT THAT SUCH LIMITATION IS ALLOWED BY THE GOVERNING LAW.

Product Warranty Return Procedure All Products that are believed to have defects in workmanship or materials must be returned, together with a written description of the defect, to the tekmar Representative assigned to the territory in which such Product is located. If tekmar receives an inquiry from someone other than a tekmar Representative, including an inquiry from Purchaser (if not a tekmar Representative) or Purchaser's customers, regarding a potential warranty claim, tekmar's sole obligation shall be to provide the address and other contact information regarding the appropriate Representative.

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. **For more information: Watts.com/prop65**



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