

WIRELESS WALL ADJUSTER

INSTALLATION, OPERATION AND MAINTENANCE

Models: ADJ-W Wireless Wall Adjuster

Compatible with all Type –HC, –CW and –C
Therma-Fuser™ Diffusers

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Acutherm's Wireless Wall Adjuster provides Therma-Fuser™ diffusers with a remotely adjustable temperature control set point. The Wall Adjuster allows the occupant to easily adjust the temperature set point of the thermostat(s) located in the Therma-Fuser diffuser.

The Wireless Wall Adjuster is battery-less using power harvesting technology (photovoltaic) to run the wall unit and a wireless digital protocol to communicate with the diffuser.

DAMAGED FREIGHT CLAIM PROCEDURES

When the Wireless Wall Adjuster units are received, inspect for damage which may have occurred during shipment. If damage is evident, it should be noted on the carrier's freight bill. A written request for inspection by the carrier's agent should be made at once.

STORAGE

Do not store for prolonged times at temperatures exceeding 130°F/ 56°C. Acceptable humidity level is 5-95% relative humidity non-condensing.

INSTALLATION

Wireless Wall Adjuster Location

1. Locate the Adjuster in as bright a light as possible, but not in direct sunlight as the photovoltaic cell is optimized for fluorescent lighting. The Adjuster will operate in light levels as low as 100 lux or 10 foot-candles. OSHA recommends office lighting range between 20 to 50 foot-candles.
2. If the Room Temperature Sensor Option is installed (see Options) then locate the Adjuster on an interior wall within the space to be monitored.

Wireless Wall Adjuster Installation

The Adjuster is suitable for mounting directly onto the wall or onto a standard 2x4 electrical box.

1. Open the adjuster. Slide the adjuster up from the back plate approximately 1/4"/6mm to free the adjuster from the back plate (see Fig. 2 Opening Adjuster).

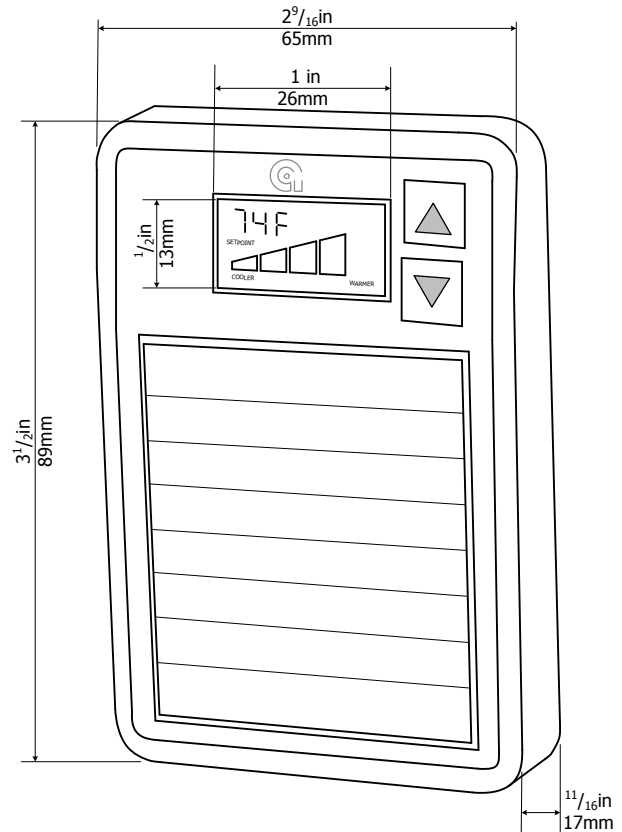


Fig. 1 – Wireless Wall Adjuster

WIRELESS WALL ADJUSTER INSTALLATION OPERATION AND MAINTENANCE

- To mount directly to the wall (see Fig. 3 Back Plate), use the back plate of the adjuster as a template to locate the holes. For drywall installation drill two $\frac{3}{16}$ "/5mm holes, insert the plastic wall anchors (included) and attach the base plate of the adjuster using the screws provided.
- To mount onto a standard 2x4 electrical box use the holes top and bottom and connect directly to electrical box (see Fig. 3 Back Plate).
- Close the adjuster. Latch the top of the adjuster on the top of the back plate and then press the bottom to snap the two together (see Fig. 4 Closing Adjuster).

Master Diffuser Installation

- Install the Diffuser(s) as per the Installation Instructions for the model of Therma-Fuser Diffuser.
- Connect 24VAC to the two screw terminals labeled 24VAC (POWER IN) (see Fig. 10 Wiring Diagram).

Note: Green light indicates power is on.

DISPLAY INDICATORS

In addition to displaying the set point there are three Indicators; INSTALL, PENDING and FAULT (see Fig. 7 Adjuster Display Indicators).

- INSTALL – displayed when the Adjuster has not been installed or Joined to a Diffuser.
- PENDING – displayed when the Adjuster is waiting to communicate with the Diffuser.
- FAULT – displayed during a Fault condition (see *Troubleshooting*).

CONFIGURATION

- Configure Display Settings. There are two (2) dip switches (see Fig. 5 Configure Adjuster Settings) on the board of the adjuster that should be checked and adjusted if required (see *Opening the adjuster Installation step 2*). Switch 1 sets the units of measurement for the set point display from °F to °C. Switch 2 enables the numerical display of the set point.
- Configure Master Diffuser Settings. There are two (2) dip switches (see Fig. 6 Configure Diffuser Settings) on the board of the Master Diffuser that should be checked and adjusted if required. Switch 1 is not used and must remain in the Off position (If left On the display will show 32). Switch 2 should only be switched On if the Master Diffuser is a model ST diffuser.

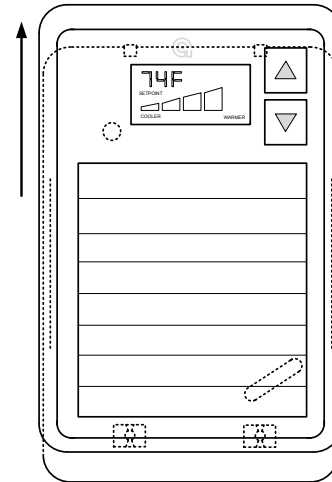


Fig. 2 – Opening Adjuster

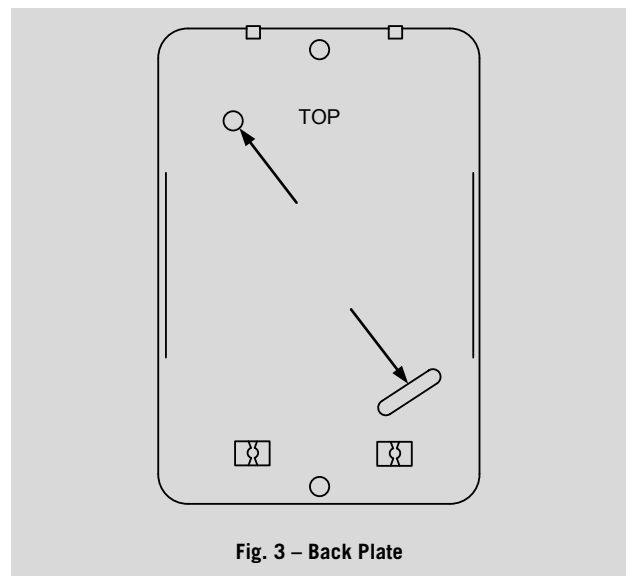


Fig. 3 – Back Plate

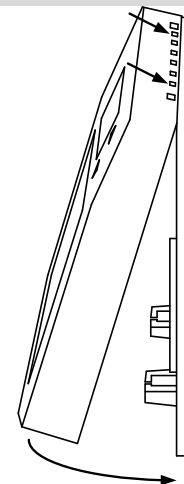


Fig. 4 – Closing Adjuster

JOINING ADJUSTER AND DIFFUSER

1. The Adjuster and the Master Diffuser must be joined to enable wireless communication between them.
2. Press and hold the Install button located under the plaque on the room side of the Diffuser (see Fig. 7 Diffuser Button and Light) for four seconds until the light starts to flash slowly.
3. While the light is flashing (approx. 30 seconds) press and hold both buttons on the Adjuster for four seconds until INSTALL flashes slowly on the screen (see Fig. 8 Adjuster Display Indicators) and then release.
4. The light on the Diffuser and the INSTALL on the Adjuster display will both stop. The Master Diffuser and Adjuster are now joined. If the light on the Diffuser or the INSTALL on the Adjuster stay on then they did not join successfully. See Erasing Program prior to trying again.

OPTIONS

1. OPTIONAL SECONDARY DIFFUSERS. Connect any Secondary Diffusers with a simple pair of wires to the two screw terminals labeled SECONDARY DIFFUSERS (see Fig 10 Wiring Diagram).
2. OPTIONAL BUILDING AUTOMATION SYSTEM INTERFACE. Connect the BAS controller to the three screw terminals labeled 0-10V OUT, COM, and 0-10V IN (see Fig. 10 Wiring Diagram).

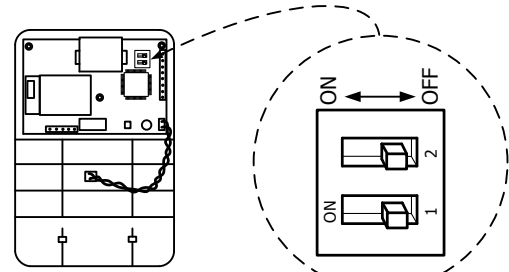
Note: The 0-10VDC BAS output is always active (see Table 1) on the 0-10V OUT terminal. An input of other than 0VDC on the 0-10V INPUT terminal will activate the BAS input. Adjustment with the buttons on the Adjuster is still possible. The last adjustment of the set point, whether by BAS or occupant, will set the control temperature.

Volts DC ±0.10	Set Point Temperature
1	68°F / 20°C
2	69°F / 20°C
3	70°F / 21°C
4	71°F / 21°C
5	72°F / 22°C
6	73°F / 22°C
7	74°F / 23°C
8	75°F / 23°C
9	76°F / 24°C

Table 1 – Set Point Temperature

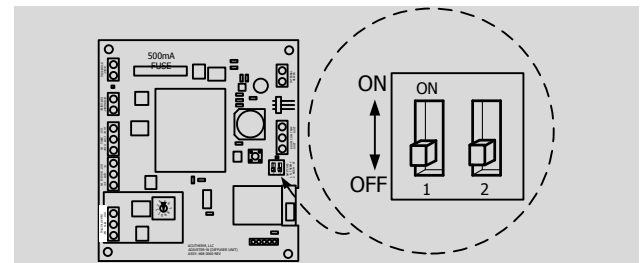
3. OPTIONAL ROOM SENSOR. A room temperature sensor may be ordered as an option for the Adjuster. The sensor is located in the Adjuster and may then

be used to display the room temperature and control the Duct Heater Option.



Switch	Purpose	Off	On
1	Units for Display	°F	°C
2	Numeric Display	Off	On

Fig. 5 – Configure Adjuster Settings



Switch	Purpose	Off	On
1	For future use	Off	-
2	ST Diffuser	Off	On

Fig. 6 – Configure Diffuser Settings

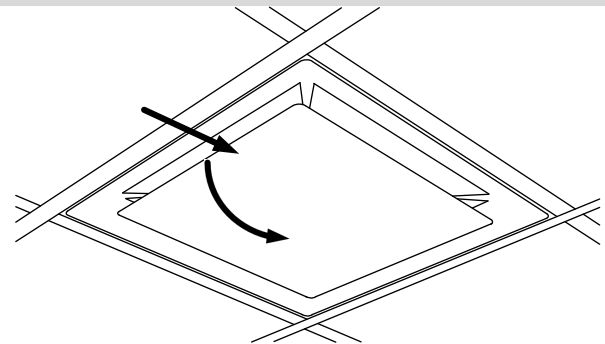


Fig. 7 – Diffuser Button and Light

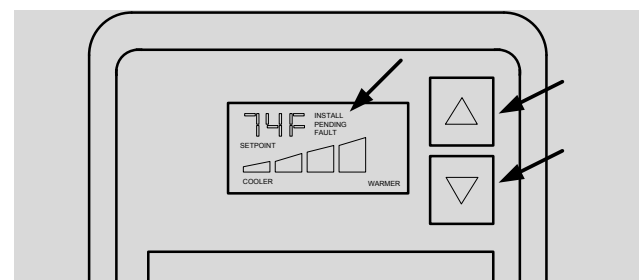


Fig. 8 – Adjuster Display Indicators

WIRELESS WALL ADJUSTER

INSTALLATION OPERATION AND MAINTENANCE

When turned ON the display on the Adjuster will show the room temperature until either button is pressed. Upon a button press, the display will show the set point and the warmer/cooler bars for approximately 30 sec before reverting back to room temperature.

To turn on/off the room sensor, reset the Adjuster by pressing and holding both buttons until INSTALL flashes rapidly (approximately 10 sec) and then releasing both buttons. The firmware version will be briefly displayed followed by either the word ON or OFF. While ON or OFF is displayed use the warmer/cooler buttons to switch the room sensor either ON or OFF.

CAUTION: If the sensor is not installed then the Adjuster must be set to OFF.

4. **OPTIONAL DUCT HEATER.** An auxiliary heat board may be ordered as an option on the Master Diffuser board and used to switch on/off an Acutherm Acu-Zone duct heater.

Note: This option requires that the Room Temperature Sensor be turned On.

Connect two wires from Acu-Zone terminals 2 and 3 (see the Acu-Zone heater wiring instructions) to the terminals (AUX HTR CTRL) on the auxiliary heat board; 2 to RTN, 3 to SW, and a jumper from HOT to SW (see Fig. 10 Wiring Diagram).

Configure the heating set point to switch on the Acu-Zone heater by turning the ten position potentiometer on the auxiliary heat board (see Fig. 9 Auxiliary Heater and Table 2).

CAUTION: If no heater is connected, the potentiometer MUST be set to '0' the OFF position.

Position	Set Point Temperature
0	OFF
1	65°F / 18°C
2	66°F / 19°C
3	67°F / 19°C
4	68°F / 20°C
5	69°F / 21°C
6	70°F / 21°C
7	71°F / 22°C
8	72°F / 22°C
9	73°F / 23°C

Table 2 – Auxiliary Heater Set Point

When the room temperature, measured by the room temperature sensor, drops below the heating set point, the heater will be turned on. When the room warms 2F°/1°C above the heating set point then the heater will be turned off.

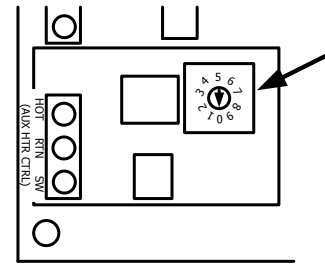


Fig. 9 – Auxiliary Heater

RESETTING PROGRAM

Use the Reset function to reset the firmware in the Adjuster and or the Diffuser. Resetting restarts the firmware, but does not erase the set point or joining.

Adjuster: Pressing and holding both buttons on the Adjuster until INSTALL flashes rapidly (approximately 10 sec) and then releasing will reset the Adjuster. Upon releasing the buttons a firmware version and radio version is briefly displayed followed by the status (either Off or On) of the temperature sensor.

Diffuser: Pressing and holding the button on the Diffuser until the LED flashes rapidly (approximately 10 sec) and then releasing will reset the diffuser board.

ERASING PROGRAM

Use the Erase function to remove the Joining between the Adjuster and or the Diffuser.

Adjuster: Pressing and holding both buttons on the Adjuster until the INSTALL is lit continuously (approximately 15 sec) and then releasing will erase the Adjuster. The Adjuster can then be joined to a different diffuser.

Diffuser: Pressing and holding the Install button (see Fig. 7 Diffuser Button and Light) on the Diffuser until the light is lit continuously (approximately 15 sec) and then releasing will erase the Diffuser board. The Diffuser can then be joined to a different Adjuster.

TROUBLESHOOTING

1. Inspect the wiring at the diffuser board and check for bad connections at terminals.
2. Check the incoming power at the diffuser board. Power across terminals 24VAC POWER (see Fig. 10 Wiring Diagram) should be 24VAC ±2VAC. If the power is out of tolerance:
 - a. Check for proper sizing of transformer and correct primary voltage.
 - b. Check for excessive voltage drop between transformer and master diffuser.

3. If the green Power LED is not lit, then check the 500mA Fuse (see Fig. 10 Wiring Diagram).
4. Check the set points on the diffuser thermostat/ actuators. Both cooling and heating should be set to 76°F/24°C.
5. Inspect contact between resistance heaters and thermostat(s) located in the Therma-Fuser diffuser. If contact is loose tighten the shrink tubing by heating it.
6. Check the Display Indicators on the Adjuster.
 - a. If the INSTALL indicator is lit then the Adjuster needs to be installed or joined to a Diffuser (see *Joining Adjuster and Diffuser*).
 - b. If the PENDING indicator is lit then the Adjuster is waiting to communicate with the Diffuser. If the PENDING indicator stays lit for an extended period of time then there is a communication problem and there may be interference with the radio signal.
 - c. If the FAULT indicator is flashing then:

Flash Code	Condition
1 long 1 short	Low Voltage – the voltage on the storage capacitor is low and may not be sufficient to allow wireless communication – allow the Adjuster some time in the light to charge
1 long 2 short	Time Out – time out occurred while accessing radio and may be due to no response from Diffuser or poor signal levels
1 long 3 short	Room Sensor Fault – there is either a short or open detected from the room temperature thermistor
1 long 4 short	Set Point Error – failure to store set point in non-volatile memory

7. Check the fault indicator on the Diffuser.
 - a. If the light on the Install button (see Fig. 7 *Diffuser Button and Light*) is flashing then:

Flash Code	Condition
1 long 1 short	Low/High AC Line Voltage – the supply voltage is either less than 21VAC or greater than 27VAC
1 long 2 short	Room Sensor Fault – there is either a short or open detected

	from the room temperature thermistor
1 long 3 short	BAS Input Fault – the BAS input voltage is greater than 9.5VDC

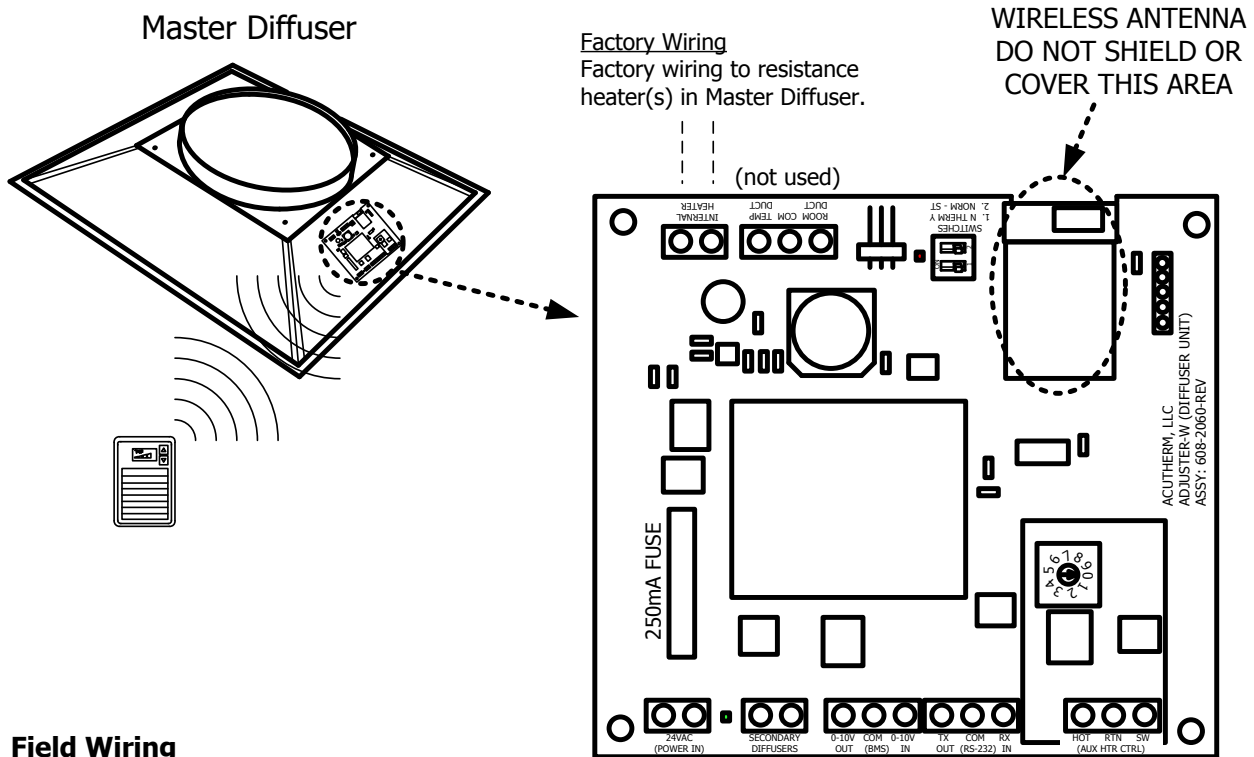
8. Adjust the set point up to the warmest setting (76°F/24°C) and measure the DC voltage across terminals INTERNAL HEATER. Voltage should be less than 1VDC.
9. For secondary diffusers also measure the DC voltage across terminals 3 and 4. Voltage should be less than 1VDC.
10. Adjust the set point down to the coolest setting (68°F/20°C) and measure the DC voltage across terminals INTERNAL HEATER. Voltage should be 12-16 VDC (17-24 VDC for Model ST diffusers).
11. For secondary diffusers also measure the DC voltage across terminals 3 and 4. Voltage should be 12-16 VDC (17-24 VDC for Model ST diffusers).
12. Remove wires from terminals INTERNAL HEATER (see Fig. 10 Wiring Diagram) on the diffuser board. Measure resistance across the wires connected to the heaters. Resistance should be:
 - a. 500 Ω ± 50 Ω for Model TF-HC and TK-HC diffusers.
 - b. 1000 Ω ± 100 Ω for all other diffusers.

TWO YEAR WARRANTY

Acutherm warrants that its Wireless Wall Adjuster, exclusive of any options and accessories (whether factory or field installed) shall be free from defective material or workmanship for a period of two (2) years from the date of shipment and agrees to repair or replace, at its option, any parts that fail during said two (2) year period due to any such defects which would not have occurred had reasonable care and proper usage and all parts and controls remain unaltered. Acutherm makes NO WARRANTY OF MERCHANTABILITY OF PRODUCTS OR OF THEIR FITNESS FOR ANY PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY WHICH EXTENDS BEYOND THE LIMITED WARRANTY ABOVE. ACUTHERM'S LIABILITY FOR ANY AND ALL LOSSES AND DAMAGES RESULTING FROM DEFECTS SHALL IN NO EVENT EXCEED THE COST OF REPAIR OR REPLACEMENT OF PARTS FOUND DEFECTIVE UPON EXAMINATION BY ACUTHERM. IN NO EVENT SHALL ACUTHERM BE LIABLE FOR INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR DAMAGES FOR INJURY TO PERSONS OR PROPERTY. Acutherm shall not be responsible for freight to or from its plant in connection with the inspection, repair or replacement of parts under the terms of this limited warranty nor for cost of removal or installation.

WIRELESS WALL ADJUSTER INSTALLATION OPERATION AND MAINTENANCE

FORM 040.202 REV 1912
(Supersedes FORM 040.202 REV 1909)



Field Wiring

Terminals **24VAC (POWER IN)**

24 VAC \pm 2 VAC

Wiring and transformer by others

Power requirements vary with the number of diffusers:

1.0 VA per TF-HC, TK-HC and 4-slot linear diffusers

0.65 VA per ST diffuser

0.5 VA per TF, TK, TB types -C & -CW & 1&2-slot linear diffusers

Note: Typically transformers supplied with other equipment are sized for only that equipment. A separate transformer dedicated to the diffusers is recommended.

Terminals **SECONDARY DIFFUSERS**

Optional Secondary Diffuser(s)

Wiring by others.

Up to 4 Secondary diffusers may be wired (daisy chain or home run) to each Master diffuser.

Wiring 20 AWG min.

35ft / 10.5m max each diffuser.

Terminals **0-10V OUT COM (BMS) 0-10V IN**

Optional Building Automation System Interface

Wiring by others.

0-10 VDC input signal for set point adjustment.

0-10 VDC output signal for reading the set point.

Terminals **HOT RTN SW (AUX HTR CTRL)**

Optional Acu-Zone Duct Heater Control

Wiring by others.

Requires Room Temperature Sensor Option to be installed and then will switch on and off Acu-Zone Duct Heater.

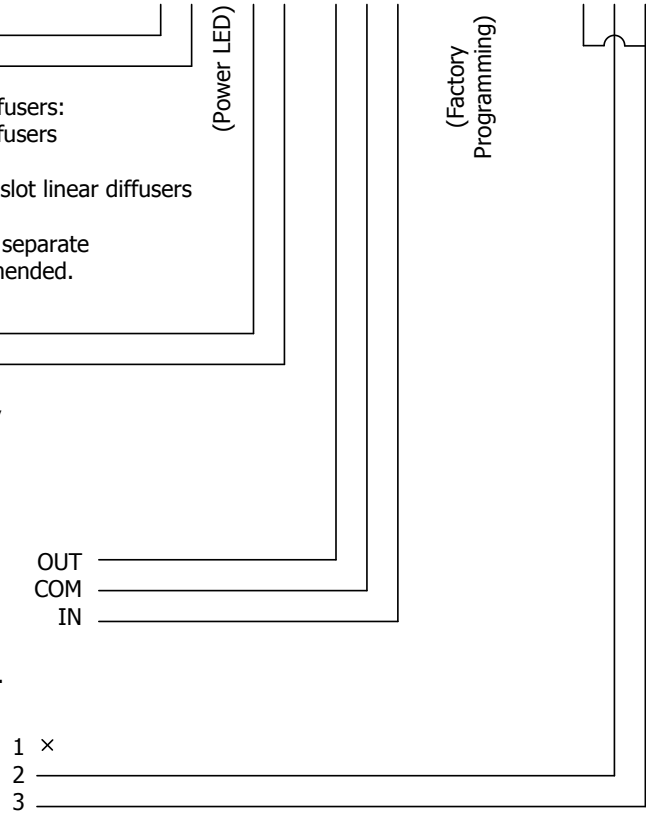


Fig. 10 – Wiring Diagram

WIRELESS WALL ADJUSTER INSTALLATION OPERATION AND MAINTENANCE

FORM 040.202 REV 1912
(Supersedes FORM 040.202 REV 1912)

REGULATORY STATEMENTS, PRECAUTIONS AND WARNINGS

U.S. and Canada

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.

This module generates RF energy. DO NOT use this module in any application where in normal operation, the antenna will be located within 20cm of the head or body of the operator.

This device must not be co-located or operated in conjunction with any other antenna or transmitter.

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

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of 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. If not installed and used in accordance with the instructions, it 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 and correct the interference by one or more of the following measures:

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

Australia and New Zealand



N30130

India

ETA Certificate No. 1323/2011/WRLO

Japan



007-AA0075

日本電波法承認の証明番号007-AA0075が含まれています
(Contains Japan Radio Law Approval Certification number 007-AA0075)

Korea

이 기기는 가정용(B급) 전자파적합기기로서 주로
가정에서 사용하는 것을 목적으로 하며, 모든 지역에서
사용할 수 있습니다.

(This unit residential (B grade) primarily as EMC devices intended to be used at home and in all regions Can be used.)

Applicant Crosby Engineering Services

Equipment 2.4 GHz Zigbee RF Module

Model RFM2530

Manufactured by Crosby Engineering Services

Country of Origin USA

