C-200AP Series PIR/Microwave Motion Sensor Installation Instructions

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WI1258A 4/07

DESCRIPTION

The C-200AP is a dual-technology sensor intended for use in residential or commercial applications where small animals may be present. It features conventional wide-angle coverage patterns that are immune to pets weighing up to a combined 100 lbs.

This unit is a combination passive-infrared (PIR) sensor and microwave sensor, both contained in a single package. The unit will go into alarm only when both sensors detect intrusion at the same time. The PIR section operates by detecting a rapid change in temperature when an intruder crosses a protected area. The microwave section operates by sending short bursts of RF energy and detecting changes in the returned signal caused by motion within its coverage area.

Microwave signals are unaffected by visible light, air drafts, or temperature changes, but is sensitive to motion (strong vibrations can be troublesome) and may pass through windows and non-metallic walls. The PIR section is virtually unaffected by vibration, and will not penetrate walls or windows.

Thus the two complementary technologies provide an inherent immunity to false alarms. Dual-technology is ideal for use in hostile environments. Since both must trip simultaneously to cause an alarm, installation is easier and requires less discipline.

ANIMAL IMMUNITY

Several factors affect the sensor's ability to ignore animals and pets. We recommend the following guidelines to attain the highest level of animal immunity:

- Correct adjustment of the microwave sensitivity is **essential** for best animal immunity. Be sure to read "Microwave Range Adjustment" further in these instructions.
- Mount the sensor so that the bottom edge of the sensor housing is at a height of 7' 6" (2.3 m) from the floor.
- Ensure that the sensor is mounted on a flat and level wall. Always use a leveling tool and position it vertically across the face of the sensor. *Severely tilted units can reduce animal immunity and/or increase false alarms*.
- Ensure that animals cannot place themselves within 6' (1.9 m) of the mounted sensor, such as by jumping on shelving or furniture.
- Choose a mounting locations that will ensure the sensor has a clear line-of-sight to all protected areas. The unit will not alarm if the PIR sensor is blocked, .
- When mounting, always aim the sensor toward the interior of the room. Do not point the sensor at moving machinery (such as cooling fans), at windows, through doorways (or similar large openings) or at any cooling/heating sources.
- To maximize the degree of animal immunity, ensure that the total combined animal weights not exceed 100 lb (45 kg). In addition, the **type of flooring** used in the protected area and the **length of the hair** of the animal will affect animal immunity by reducing the total combined animal weight, as follows:

Flooring Type: Generally, carpeted floors will achieve a higher level of immunity than a cement floor. Make allowances as follows:

Carpet:	deduct no (zero) weight
Wood:	deduct 5 lb. (2.25 kg)
Tile/Cement:	deduct 10 lb. (4.5 kg)

Animal Hair Length*: Generally, the longer the hair on the animal, the higher the level of animal immunity (the less heat is radiated).

Long Hair:	deduct no (zero) weight
Medium Hair:	deduct 5 lb. (2.25 kg)
Short Hair:	deduct 10 lb. (4.5 kg)

*Use in installations with dogs and cats. Long-haired dog examples: Huskie, Shephard, Labrador. Short-haired dog examples: Doberman, Greyhound, Weimaraner.

Always test the installation to determine the greatest degree of animal immunity, **and always re-test if the number or size of the animal(s) should ever change**.

NOTE: Animal immunity features have not been evaluated or approved by Underwriters Laboratories, Inc.

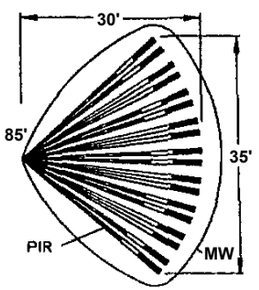
SELF-TEST

If the system electronics are not in normal working order or the microwave sensor fails to send or receive signals, the sensor's red LED will flash and the trouble output (terminal 6) will activate. Self-test is performed at power-up and every 11-16 hours after power-up. **NOTE**: To ensure proper operation, test the sensor at least yearly.

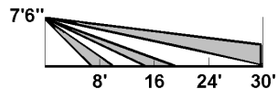
LENS PATTERNS

Wide Angle Lens with Microwave Pattern

TOP VIEW--Wall Mounted:



SIDE VIEW--Wall Mounted:



Number of Zones: 18 (3 layers 9/5/4 zones)
Number of Beams: 40 (3 layers 18/10/12)
Maximum Coverage: 30' long x 35' wide
Field of View: 85º
Mounting Height: 7 to 8'

IMPORTANT: For UL installations, the C-200 must be connected to a UL listed control unit or UL listed power supply with the ability to provide at least four hours of standby power.

NOTE: Prior versions of the C-200AP required an additional Pet Alley lens for large pet immunity. This pet lens is no longer needed and is no longer included in the pack.

PRODUCT SPECIFICATIONS

General Coverage with standard lens, measured indoors at 20ºC (66ºF) typical: 30'x35'
Operating Temperature: –10º to +50ºC (14º to 122ºF)
Mounting: Wall or corner, 7' to 8' max.
Output Relay: Form A, Normally Closed
Relay Time: Approximately 4 seconds
Contact Ratings: 100mA, 24VDC with internal 10Ω current-limiting resistor
Trouble Output: Open collector current sinking with 39Ω current-limiting resistor, 20mA max.
Status Input*: Panel disarmed, >5V; armed, <1.5V.
Self-Test Interval: 11—16 hours.
Power-Supply Requirements: NOTE: This unit is intended for operation from a power source that provides battery backup in the event of a power failure. For UL installations, the backup battery must be fully recharged within 24 hours and provide 4 hours of standby operation.
Filtered DC: 12VDC
Current Drain at 12VDc: Idle, 37mA; Alarm, 38mA.
Microwave Frequency: 10.525 GHz ±25 MHz
Physical Dimensions: 4.5" x 2.5" x 2.3" (HxWxD) (11.4cm x 6.4cm x 5.8cm)
Shipping Weight: 7oz (200gm)

***NOTE**: For UL installations, Status Input is to be connected only to a UL-listed control panel with a UL-tested Status line. The ULC label or listed marking on a product is the only evidence provided by Underwriters Laboratories of Canada to identify products that have been produced under the Listing and Follow-up Service.

WIRING

Remove the wire entry hole to gain access to the terminal strip. (Be sure to caulk around the wires where they exit the case). Route wires to the terminal strip as shown in Fig. 3 and connect as follows:

Power (Terminals 1 [+] & 2 [-]). Apply 12VDC to Terminals 1 [+] and 2 [-]. The power source may be regulated or unregulated. Power should be supplied from a control panel or other power source equipped with a rechargeable battery backup to maintain operation in the event of a power failure. Refer to SPECIFICATIONS for power-supply requirements.
Alarm Relay (Form A) Contacts (Terminals 3 & 4). These contacts are rated at 100mA, 24VDC and are normally closed. When the sensor is operating, either detection of an intruder or loss of power will cause the relay contacts to open. (This mode of operation is required in UL installations).

ADVANCED FEATURES

Status. Wiring to Terminals 5 (Status) and 6 (Trouble) are only required if using the special features of this unit.
Status Input. Connect to the Status terminal (Arm Lug) of the control panel. A low at Terminal 5 tells the sensor that the panel is armed.
Trouble (Terminal 6). This is an open-collector output that produces an active low to signal a trouble condition. Connect to a control panel zone programmed for 24 hour response in order to communicate trouble conditions to the Central Station.

ADJUSTING THE COVERAGE AREA

Self Test: The self-test diagnostic simulates motion and tests the PIR sensor, amplifier and related PIR circuitry, the microwave transmitter, receiver, and associated microwave circuitry. This test is initiated each time the unit is powered up and randomly at 11-16 hour intervals after the last alarm to assure that the unit is always in operating order. At power-up, the LED will come on and both the alarm and trouble outputs will be held "safe". If the unit is operating property, the LED will extinguish after about 1 minute. However, if it fails the self test, the LED will flash rapidly, indicating a need for service. After the LED goes out, indicating a successful self-test, proceed as follows:
Lateral Beam Adjustment PIR beams may be shifted up to 6º in either direction (± ½ zone for the Standard Wide-Angle lens). The left edge of the top lens guide acts as the index for lens alignment. To align a lens. proceed as follows (**Caution**: To prevent soiling, handle the lens only with clean fingers). Check that lens is installed smooth side out, grooved side in.

JUMPER BLOCK

The Jumper Block (see Fig. 4) is used to select operating modes, as follows:

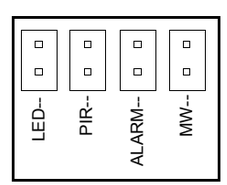


Fig. 4. Jumper block

LED. LED Disable. Install to disable LED Alarm indication only.
PIR. PIR Walk-Test Mode. LED indicates PIR trips only.
ALARM. Alarm. LED indicates simultaneous PIR and Microwave trips.
MW. Microwave Walk-Test Mode. LED indicates microwave trips only. **Important!** The alarm relay will operate only with

the LED jumper installed or the ALARM jumper installed. Therefore, after testing, be sure to replace the jumper in the ALARM position for normal LED operation, or in the LED position, which prevents the LED from lighting on an alarm condition.

Four-Pulse Mode. This is the least-sensitive mode, recommended for hostile environments where an intruder must cross several beam pairs to trip an alarm. To lock the unit into the 4-Pulse Mode while maintaining adaptive microwave operation, install both the PIR jumper and the MW jumper.

MICROWAVE RANGE ADJUSTMENT

Correct adjustment of the microwave sensitivity is essential for best animal immunity.

Important! The microwave RANGE ADJUST control should be set at the minimum required setting to achieve the desired coverage for a human-sized target. It is set so that the Walk-Test LED lights when motion is detected at the maximum desired range, but does not light (motion is not detected) beyond the maximum desired range. All tests must be made with the front cover in place.

1. Remove the front cover and install the MW jumper.
2. Set the RANGE ADJUST control at mid position. Replace the cover and walk-test the unit. (Note: Allow at least 5 seconds after trip for microwave to reset.)
3. If the desired range was insufficient, advance the RANGE ADJUST control slightly clockwise. Repeat the test as necessary, increasing the RANGE ADJUST control each time until motion is detected at the desired range, but not beyond. (If the desired range was excessive, reduce the RANGE ADJUST control slightly (counterclockwise) and repeat this step). **Note:** Return the jumper to the ALARM or LED position after adjustment.

TESTING THE COVERAGE AREA

After the unit has been mounted and set up, its coverage should be tested and, if necessary, altered to accommodate local environmental conditions (within the coverage area). Satisfactory checks may be made using the Walk-Test LED on the front of the unit. It is recommended that the coverage area be tested at least once a year or if the number or size of the animal(s) should ever change.

Because of the sensor's dual-technology features, standard walk-tests may not trigger expected results. The sensor tracks motion and interprets temperature changes in order to confirm a valid alarm condition. To observe this, take 3 to 4 steps into the coverage area then stop and observe the LED.

Testing the Unit. Complete connections to the terminal strip. The unit will require a 1-minute "settling" time to adjust itself to the surrounding temperature. After sufficient time has been allowed, proceed as follows.

Move your hand slowly across the lens to verify sensor operation. With the PIR jumper installed, the LED will light whenever a beam is disturbed. With the MW jumper installed, the LED will light as long as motion is detected. When the LED goes out, no motion is detected.

Test the range of the coverage. Install the PIR Walk-Test jumper and replace the front cover. Walk out to the maximum determined coverage distance, then walk across the field of coverage. The LED will remain lit as long as motion is detected. Repeat this test with the microwave MW Walk-Test jumper installed. Repeat once again with the ALARM jumper installed. Confirm that the LED lights at the maximum desired range, **but not beyond**.

Test the width of the coverage. Install the PIR Walk-Test jumper (Fig. 4) and replace the front cover. Walk across the coverage area and confirm LED response. Repeat with the MW Walk-Test jumper installed, and once again with the ALARM jumper installed.

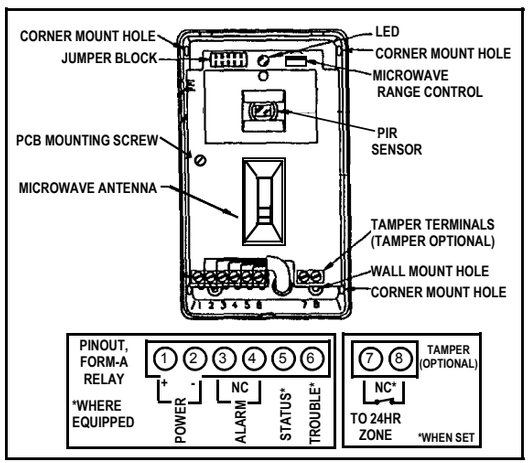


Fig. 3. Circuit board layout.

This class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe B respecte toutes les exigences du Réglement sur le matériel brouilleur du canada.

FCC Notice: 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:

* 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.

This equipment has been certified to comply with the limits for a class B computing device, pursuant to FCC Rules. In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

IC Notice: 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.

This device requires a radio license, unless it is installed totally inside a building. (User must obtain this license).

Une licence est requise pour ces dispositifs, sauf pour ceux installés tout à fait à l'intérieur d'un bâtiment. (Il faut que l'utilisateur obtienne cette licence).

LIMITED WARRANTY

NAPCO SECURITY SYSTEMS, INC. (NAPCO) warrants its products to be free from manufacturing defects in materials and workmanship for *thirty-six months* following the date of manufacture. NAPCO will, within said period, at its option, repair or replace any product failing to operate correctly without charge to the original purchaser or user.

This warranty shall not apply to any equipment, or any part thereof, which has been repaired by others, improperly installed, improperly used, abused, altered, damaged, subjected to acts of God, or on which any serial numbers have been altered, defaced or removed. Seller will not be responsible for any dismantling or reinstallation charges.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. THERE IS NO EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR A WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. ADDITIONALLY, THIS WARRANTY IS IN LIEU OF ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF NAPCO.

Any action for breach of warranty, including but not limited to any implied warranty of merchantability, must be brought within the six months following the end of the warranty period.

IN NO CASE SHALL NAPCO BE LIABLE TO ANYONE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES FOR BREACH OF THIS OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, EVEN IF THE LOSS OR DAMAGE IS CAUSED BY THE SELLER'S OWN NEGLIGENCE OR FAULT.

In case of defect, contact the security professional who installed and maintains your security system. In order to exercise the warranty, the product must be returned by the security professional, shipping costs prepaid and insured to NAPCO. After repair or replacement, NAPCO assumes the cost of returning products under warranty. NAPCO shall have no obligation under this warranty, or otherwise, if the product has been repaired by others, improperly installed, improperly used, abused, altered, damaged, subjected to accident, nuisance, flood, fire or acts of God, or on which any serial numbers have been altered, defaced or removed. NAPCO will not be responsible for any dismantling, reassembly or reinstallation charges.

This warranty contains the entire warranty. It is the sole warranty and any prior agreements or representations, whether oral or written, are either merged herein or are expressly cancelled. NAPCO neither assumes, nor authorizes any other person purporting to act on its behalf to modify, to change, or to assume for it, any other warranty or liability concerning its products.

In no event shall NAPCO be liable for an amount in excess of NAPCO's original selling price of the product, for any loss or damage, whether direct, indirect, incidental, consequential, or otherwise arising out of any failure of the product. Seller's warranty, as hereinabove set forth, shall not be enlarged, diminished or affected by and no obligation or liability shall arise or grow out of Seller's rendering of technical advice or service in connection with Buyer's order of the goods furnished hereunder.

NAPCO RECOMMENDS THAT THE ENTIRE SYSTEM BE COMPLETELY TESTED WEEKLY.

Warning: Despite frequent testing, and due to, but not limited to, any or all of the following; criminal tampering, electrical or communications disruption, it is possible for the system to fail to perform as expected. NAPCO does not represent that the product/system may not be compromised or circumvented; or that the product or system will prevent any personal injury or property loss by burglary, robbery, fire or otherwise; nor that the product or system will in all cases provide adequate warning or protection. A properly installed and maintained alarm may only reduce risk of burglary, robbery, fire or otherwise but it is not insurance or a guarantee that these events will not occur. CONSEQUENTLY, SELLER SHALL HAVE NO LIABILITY FOR ANY PERSONAL INJURY, PROPERTY DAMAGE, OR OTHER LOSS BASED ON A CLAIM THE PRODUCT FAILED TO GIVE WARNING. Therefore, the installer should in turn advise the consumer to take any and all precautions for his or her safety including, but not limited to, fleeing the premises and calling police or fire department, in order to mitigate the possibilities of harm and/or damage.

NAPCO is not an insurer of either the property or safety of the user's family or employees, and limits its liability for any loss or damage including incidental or consequential damages to NAPCO's original selling price of the product regardless of the cause of such loss or damage.

Some states do not allow limitations on how long an implied warranty lasts or do not allow the exclusion or limitation of incidental or consequential damages, or differentiate in their treatment of limitations of liability for ordinary or gross negligence, so the above limitations or exclusions may not apply to you. This Warranty gives you specific legal rights and you may also have other rights which vary from state to state.