



C-100STE20 Installation Instructions

ADVANCED ADAPTIVE™

PIR/MICROWAVE

TECHNOLOGY SENSOR

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DESCRIPTION

BASIC OPERATION

The C-100STE20 is a state-of-the-art Dual Technology Sensor using our patented Advanced Adaptive PIR/Microwave circuitry. It has a coverage of 20' X 27'. This unit is a combination passive-infrared sensor and microwave sensor, both contained in a single package. The unit will go into alarm 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. When a beam experiences a change in heat (projected back through the lens), a pulse is generated by the sensor element. The microwave transmitter sends out short bursts of rf energy, and the receiver detects changes in the returned signal caused by motion within its coverage area.

The microwave section is unaffected by visible light, air drafts, or temperature changes (as from space heaters or air conditioners, for example), but is sensitive to motion. Strong vibrations can be troublesome. Microwave signals may pass through non-metallic walls and windows. Infrared 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.

FEATURES

- Microprocessor signal processing.
- Power-up system diagnostic tests virtually all electronics.
- Microwave and PIR self test.
- Watchdog microprocessor supervision.
- Microwave circuit supervision.
- Form-A relay.
- Automatic PIR operation on microwave failure.
- Dual-element PIR sensor
- High-efficiency, dirt-resistant grooves-in lens with "look-down" beams.
- Built-in zone locator.
- Extensive RFI and EMI filtering ensure optimum immunity to false alarms.
- Large lens area assures high PIR sensitivity.
- Horizontal as well as vertical aiming capabilities.
- Small size; modern, unobtrusive design.
- Silent operation
- Bracket-free corner or wall mountable.
- Universal Swivel Bracket Kit available

SPECIFICATIONS

- General Coverage: 20' X 20' at 20°C (68°F), typical
- Operating Temperature: -10°C to 20°C (14°F to 122°F)
- Operating Voltage: 12VDC (nominal), supplied by panel
- Current: 33mA (standby); 35 mA (alarm)
- Microwave Frequency: X Band
- Dimensions: 4.5" H X 2.5" W X 1.7" D (11.4cm H X 6.4cm W X 4.2cm D)
- Output Relay: Form A : Normally Closed
- Relay Time: Approx. 4 seconds
- Contact Ratings: 100mA, 24 VDC with internal 10 Ohm current-limiting resistor
- Self-Test Interval: 11-16 Hours
- Mounting: Wall or corner (6' to 10' max.)

DETECTION PATTERNS

Figure 1 illustrates maximum PIR and microwave detection patterns superimposed on each other. PIR detection patterns are adjustable, within limits, both vertically and horizontally (see ADJUSTING THE COVERAGE AREA for detailed adjustment procedures).

The microwave detection patterns shown are for free space. In practice, when confined by walls and ceilings, reflected waves tend to flood the area, providing volumetric coverage. Furthermore, when used in long, narrow corridors, the effective range may be extended by as much as a factor of 2 due to the guiding effect that the corridor has on microwave energy.

Insensitive Areas

The insensitive area is that area directly beneath the unit within which an intruder is undetectable. The size of the insensitive area will increase as the mounting height increases. Nevertheless, it may be necessary to increase the mounting height in order to avoid an object that could obstruct the coverage pattern.

See INSTALLATION: Reducing Insensitive Areas.

STANDARD LENS

The standard wide-angle lens pattern illustrated is adjustable, within limits, both vertically and horizontally (see ADJUSTMENTS: Aiming the Beams for detailed adjustment procedures). Settings can be quite critical. Examples shown herein are typical and will not apply to all cases. Always test the coverage pattern after the unit is installed (see TESTING THE COVERAGE AREA).

Number of Zones:
14 (3 layers: 7/4/3 zones)

Maximum Coverage:
20' long x 27' wide

Field of View: 80°

Recommended Mounting Height: 6 to 8'

Minimum Mounting Height: 6'

Maximum Mounting Height: 10'

Note: (1) Should the lens become heavily soiled, it may be cleaned using lukewarm water and a mild detergent. To dry, use a soft lint-free cloth or allow to air dry.

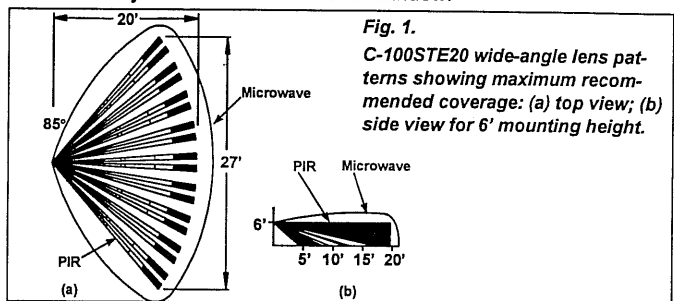
INSTALLATION

CHOOSING A SUITABLE LOCATION

The unit may be either wall mounted or corner mounted. Corner mounting is generally recommended as greater coverage may be obtained. Select a rigid surface that is relatively free of vibration.

Positioned the sensor with respect to access doors or windows so that an intruder will pass across its field of view, not directly toward or away from it. Avoid areas containing devices that may pose a chronic problem to either sensor.

In selecting mounting height, aiming, and range, also consider (a) the size and shape of the area to be protected. In a large or irregularly-shaped area, the use of two or more units may be advisable for volumetric coverage; (b) the PIR lens installed; (c) objects that may block detection; (d) animals in the protected area; and (e) an intruder's likely path, usually determined by the location of a door or window.



MOUNTING THE SENSOR

Open the case by inserting a small screwdriver in the slot at the bottom and pushing up slightly. Remove the front cover.

An array of "push-thru" holes is provided in the rear case to simplify wall or corner mounting. (If corner mounting, do not use the hole at the lower-left corner, near the terminal strip.) A round push-thru hole permits cable entry at the bottom (see Fig. 3). Cutaway notches in the rear case will accommodate surface-mounted cables if the outer jacket is removed. **Note:** Any knockout that has been removed but not used should be sealed with the caulking material supplied to eliminate drafts and prevent entry by insects.

REMOVING THE LENS

The lens is "sandwiched" between the front case and a Lens Support Insert, which also serves to hold the LED jewel in place. To then lens, proceed as follows:

1. Push up on the lower edge of the Lens Support (see Fig. 2) until it is clear of its retainers, then pull out the Lens Support from the bottom. Be careful not to dislodge the LED jewel. Note: If the jewel pops out, re-insert it with the small index key positioned at the top.

2. Slide out the lens and install the replacement correctly oriented.

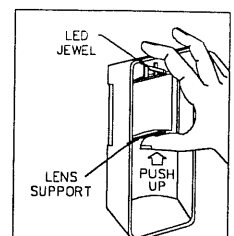


Fig. 2. Removing the lens.

3. Replace the Lens Support: Slip the Lens Support under the top lens guides with its two tabs straddling the LED jewel, then push in at the bottom until the Lens Support snaps into place.

WIRING

Remove the wire entry hole (see **MOUNTING THE SENSOR**) to gain access to the terminal strip. (Be sure to caulk around the wires where they exit the case; see previous Note.) Route wires to the terminal strip as shown in Fig. 4 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.

Alarm Relay (Form A) Contacts (Terminals 3 & 4). Normally-closed contacts rated at 100mA, 24Vdc. When the sensor is operating, either detection of an intruder or loss of power will cause the relay contacts to open.

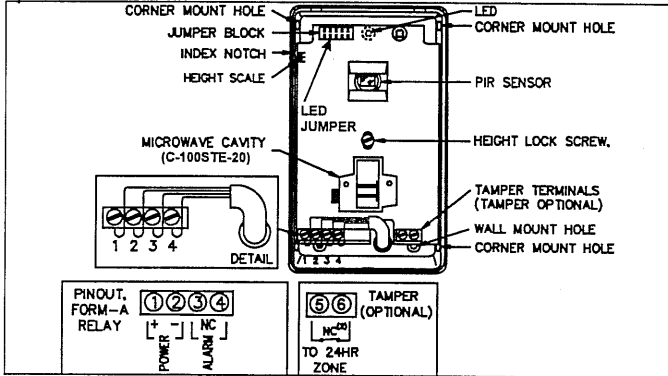


Fig. 3. Circuit board layout.

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- to 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 the alarm outputs will be held "safe". If the unit is operating properly, 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.

Setting the Height Scale

The Height Scale must be set to obtain the maximum recommended coverage. Remove the front cover. Note that the Height Scale is printed along the edge of the circuit board in the upper-left corner (see Fig. 4). The scale calibrations represent sensor mounting height (6 to 10 feet) for the standard wide-angle lens only. To set, loosen the Lock Screw shown in the illustration to slide the board up or down, and align the the index embossed into the rear case with the pointer on the scale representing the mounting height of the unit. Then tighten the Lock Screw (do not overtighten!).

Reducing Insensitive Areas

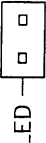
The insensitive area is a function of mounting height and Height-Scale setting. When used in a room or area that requires less range than the recommended maximum, the insensitive area may be substantially reduced by raising the circuit board, as previously described, to a Height-Scale setting higher than the actual sensor mounting height.

Lateral Beam Adjustment

PIR beams have a limited horizontal adjustment range. Lateral beam adjustment is effected by sliding the lens to the left or right within its guides.

Jumper Block

The Jumper Block (see Fig. 6) selects the operating mode as follows: LED. LED Disable. Install to disable LED Alarm indication only.



Microwave Range Adjustment

The microwave range has been set at the factory in accordance with the range of the unit and will require no further 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.

Testing the Unit

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.

COMPLETING THE INSTALLATION

To extinguish the Walk-Test LED after testing, install the LED jumper. In this position, the LED is disabled during normal operation, but is enabled for diagnostic indications.

TROUBLESHOOTING GUIDE		
SYMPTOM	PROBABLE CAUSE	REMEDY
Rapid LED Flash	Problem in circuitry or internal microprocessor memory malfunction.	Power down for 5 seconds. Power up again and wait 1 1/2 minutes. If symptom persists, return for repair.

NAPCO SECURITY LIMITED WARRANTY

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In case of defect, contact the security professional or locksmith who installed and maintains your security system. In order to exercise the warranty, the product must be returned by the security professional or locksmith, 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.

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NAPCO RECOMMENDS THAT THE ENTIRE SYSTEM BE COMPLETELY TESTED WEEKLY.

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