



# GEM-DT Wireless PIR/Microwave Transmitter

© NAPCO 1996

WI806 10/96

## GENERAL DESCRIPTION

The GEM-DT is an advanced dual-technology sensor designed for use with Napco's GEM-Series wireless receivers. The unit is powered by four 1½-volt C-size alkaline batteries (supplied). Battery life expectancy is 4 to 5½ years, depending upon the amount of activity in the protected area. When battery voltage drops below normal, a low-battery report will be sent to the receiver. Note: To conserve battery life, alarms are sent no more often than once every 5 minutes.

Coding switches are not used in the GEM-DT. Each transmitter has a unique factory-programmed RF ID code (printed on the unit) that distinguishes itself to the receiver. (Note: See control-panel instructions for entering this six-digit hexadecimal code and checksum digit into the panel; be sure to enter all numbers and/or letters, including leading zeros, if any.)

## SPECIFICATIONS

**Coverage (l x w):** 40' x 40' (12.2m x 12.2m) at 20°C (68°F), typical.

**Operating Temperature:** 0° to + 50°C (32° to 122°F)

**Self-Test Interval:** 11-16 hours

**Microwave Frequency:** 10.525GHz ± 25MHz

**Recommended Mounting Height:** 6-8', wall or corner

**Dimensions:** 5.5" x 3.25" x 2.4" (14cm x 8.3cm x 6.1cm) (HxWxD)

**Shipping Weight:** 1.2 lb (600 gm)

## LENS

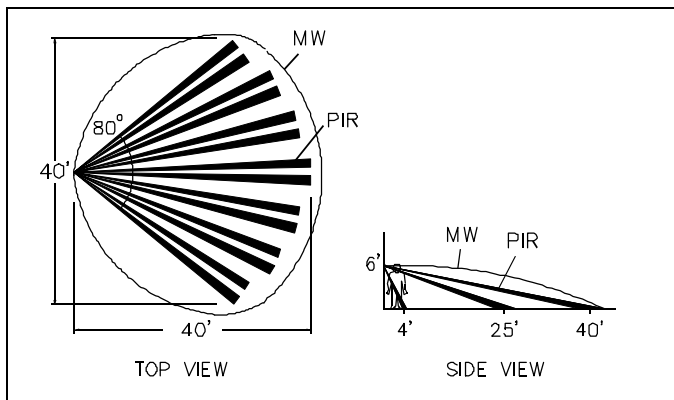


Fig. 1. Coverage pattern for 6' mounting height.

## FEATURES

- Signal Selective Processing for reliable operation
- Power-up system diagnostic tests virtually all electronics
- Microwave and PIR self test
- Watchdog microprocessor supervision
- Unique circuit design protects against false alarms due to radio-frequency interference
- Dual-element PIR sensor
- Automatic PIR operation on microwave failure
- High-efficiency, dirt-resistant grooves-in lens with "look-down" beams; large area assures high sensitivity
- Bracket-free wall or corner mountable; universal swivel-bracket (SVL-BKT) available
- Vertical and horizontal aiming capabilities
- Built-in tamper microswitch

## MOUNTING

### Open the case

To open the case, insert a screwdriver into the slot at the bottom and push up slightly while pulling the front cover out at the bottom. (To replace the front cover, engage two retainer tabs at the top into the slots in the case and push in at the bottom until it snaps into place.)

### Mount the unit

Remove the front cover as described above and proceed as follows.

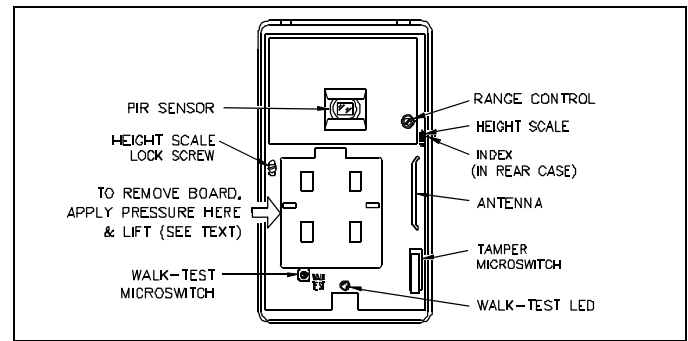


Fig. 2. GEM-DT, front cover removed.

1. Loosen the Height Scale Lock Screw fully. (This is a captive screw and won't fall out.)
2. Remove the circuit board: apply pressure against the left side of the cavity and lift out. See Fig. 2.
3. Remove the battery holder by removing the two screws "A" shown in Fig. 3.
4. An assortment of "push-thru" holes is provided in the rear case for wall or corner mounting. Open desired holes and use case to mark drill holes.
5. Select a location where intruders will pass across the field of view. Also consider the size and shape of the area, objects that may block detection, and animals within the protected area.
6. Mount unit using screws suitable for the surface material. Note: (1) Use the caulking material supplied to seal any unused mounting holes. (2) If mounting higher than 10', it may be necessary to tilt the unit downward slightly for proper microwave coverage, and to reset the Height Scale for proper PIR coverage.

### Install the batteries

1. Replace the battery holder using the screws removed in Step 3 above.
2. Install the four C batteries (supplied) over the pull ribbons, observing polarity shown in Fig. 3. (LED will start to flash. See Power-Up Procedure.)
3. Replace circuit board: slip the right side under the retaining tab in the case and push down on left side to snap the board into place.
4. Replace the Height Scale Lock Screw and set at mounted height of unit.

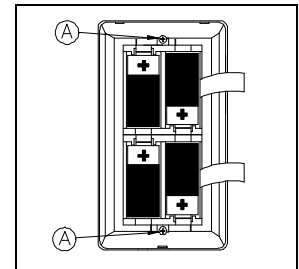


Fig. 3. Battery polarity.

## POWER-UP PROCEDURE

### LED Indications

When power is applied, the LED will display the following sequence of indications.

**Rapid flash.** For the first 5 seconds after power-up, the LED will flash rapidly to indicate that the unit has been energized.

**Slow flash.** After 5 seconds, the LED will start flashing slowly to indicate a 1-minute warmup, during which a self test is performed.

**LED off.** After the warmup/self-test interval, the LED will go off. Approximately 15 seconds thereafter, the unit is ready for operation.

### Self Test

The self-test diagnostic simulates motion and tests the PIR amplifier and related PIR circuitry, and the microwave circuitry. This test is initiated each time the unit is powered up and at 12-hour intervals after the last alarm to assure that the unit is always in operating order. At power-up, the LED will flash. If the unit is operating properly, the LED will extinguish after about 1½ minutes. If it fails the self test, a Self-Test Failure system trouble will be sent.

## ADJUSTING THE COVERAGE AREA

### Setting the Height Scale

The Height Scale must be set to obtain the maximum recommended coverage. Remove the front cover; the Height Scale is printed along the edge of the circuit board at the lower-right corner of the shield (see Fig. 2). Scale calibrations represent sensor mounting height. To set, loosen the Lock Screw and slide the board up or down, and align the the index in the case with the calibration representing the mounting height of the unit. Then tighten the Lock Screw (do not overtighten!).

### Reducing Insensitive Areas

The insensitive area is the area just beneath the sensor wherein an intruder may not be detected by the PIR beams. This 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 by sliding the lens to the left or right within its guides. Beams may be displaced up to 6° in either direction ( $\pm 1/2$  zone) using this method.

The left edge of the top lens guide functions as the index for lens alignment. Figure 4 illustrates the relative positions of the index and lens alignment notches. To align a lens, loosen the two lens clamping screws and proceed as follows. (Caution: To prevent soiling, handle the lens only with clean fingers.)

1. Be sure that the lens is installed correctly (grooved side inside).
2. To set beams to point straight out, align Notch "B" with index.
3. To set beams to deflect 6° to the right, align Notch "A" with index.
4. To set beams to deflect 6° to the left, align Notch "C" with index.

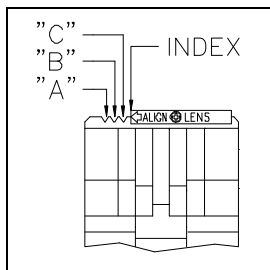


Fig. 4. Alignment notches.

#### Zone Masking

Selective zone masking may be required to deactivate a problem zone in order to preserve reliable system operation. Carefully apply a piece of zone-masking foil (supplied) to the grooved inside surface of the lens segment representing the problem zone to block signal from the offending device (refer to Figs. 5 and 6).

Figure 6 illustrates the zone-masking foil supplied; the letters in the diagram identify the lens segments to which the foil segments may be applied. Note that the foil must be accurately positioned so as not to affect adjacent zones. (Zone segments may be located by holding the lens up to the light.) Any

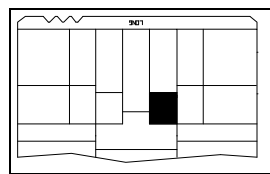


Fig. 5. Masking foil applied to a lens segment to deactivate a problem zone. Also see Fig. 6.

oil or grease on the surface of the lens (or on your fingers) will reduce the adhesive quality of the foil. **Important:** After the foil is properly applied, rub it down against the lens (using the tip of a ball-point pen, for example) to improve surface contact.

Re-aim and retest sensor after masking any zones.

- a: top layer, middle zone; use two for end zone.
- b: bottom layer, middle zone (trim as required); use two for end zone.

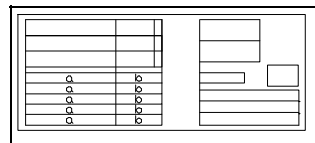


Fig. 6. Segment identification (segments not identified are not applicable to this model).

#### Microwave Range Adjustment

The RANGE control is set at the minimum required for the desired coverage. It is set so that the Walk-Test LED lights when motion is detected at maximum desired range, but not beyond. Tests must be made with the cover in place.

Set the unit to the microwave walk-test mode. Set the RANGE control at mid position and walk-test the unit. If the desired range was insufficient, advance the RANGE control slightly clockwise. Repeat as required, increasing the control until motion is detected at the desired range, but not beyond. (If the desired range was excessive, reduce the RANGE control slightly (counterclockwise) and repeat this step.)

#### 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.

#### Walk-Test Mode

The walk-test mode is entered by holding down the WALK TEST microswitch (see Fig. 2) as follows:

- Hold until LED starts to flash: Microwave/PIR walk-test mode;
- Hold until LED comes on steady: PIR walk-test mode;
- Hold until LED goes out: Microwave walk-test mode.

Direct Line to Technical Service: (800) 645-9440

### NAPCO 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.