

PASSIVE INFRARED DETECTOR  
**CX-502 , CX-502V , CX-502 AM**  
STANDARD ALARM MEMORY ANTI-MASKING



■ FEATURES

- CX-502**
- Double Conductive Shielding of the pyroelectric element - Extremely High Light and RFI Immunity (Patent listed)
  - Multifocus Optics Design (Patent listed)
  - LED On/Off Switch
  - Super Quad Zone Logic
  - Temperature Compensation
  - Sealed Optics
  - Silent Relay
  - LED Remote Control Terminal ((BE) model only)

- CX-502 AM Only**
- Advanced Anti-Masking Technology
  - Self-check
  - Alarm Memory and Initial Alarm Memory
  - LED Remote Control Terminal
  - 2 LED Indication

- CX-502 V Only**
- Alarm Memory
  - LED Remote Control Terminal

※ The CX-502 and CX-502AM are UL Listed per UL639, Intrusion-Detection Units.  
※ The CX-502V has not been investigated by UL.

OPTION

LONG RANGE LENS : CL-80N

FA-1W : Wall Mount Bracket : adjustable ±45° (Horizontally), 0-20° (Vertically downwards)

FA-3 : Compact Wall & Ceiling Bracket : adjustable ±45° (Horizontally), 0-10° (Vertically downwards)

1. INSTALLATION HINTS

①

Avoid direct sunlight.

②

Avoid mounting detector where movement of Fans or Air Conditioning Fans can be detected.

③

Avoid vapor or high humidity that can cause condensation.

④

Avoid Curtain, Screen, etc. blocking detection area.

⑤

Do not install outdoors.

⑥

**⚠ WARNING**

Never repair or modify product. It may cause accident, fire hazard or electric shock.

⑦

**⚠ WARNING**

When damage has occurred to the product, i.e. water logged, abnormal things inside product, overheating or smoking, strange smells etc., immediately stop using product and contact your supplier. Otherwise, continued use in such condition may cause electric shock or fire hazard.

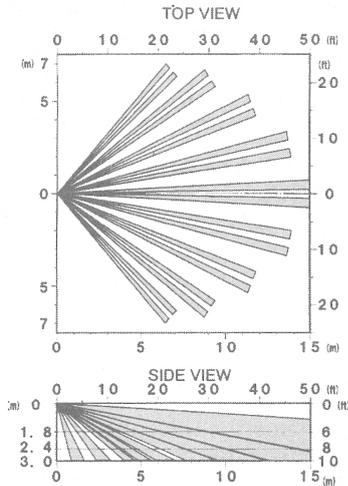
⑧

**⚠ CAUTION**

Mount securely. A falling product may cause injury.

2. DETECTION AREA

WIDE ANGLE



LONG RANGE

**IMPORTANT**

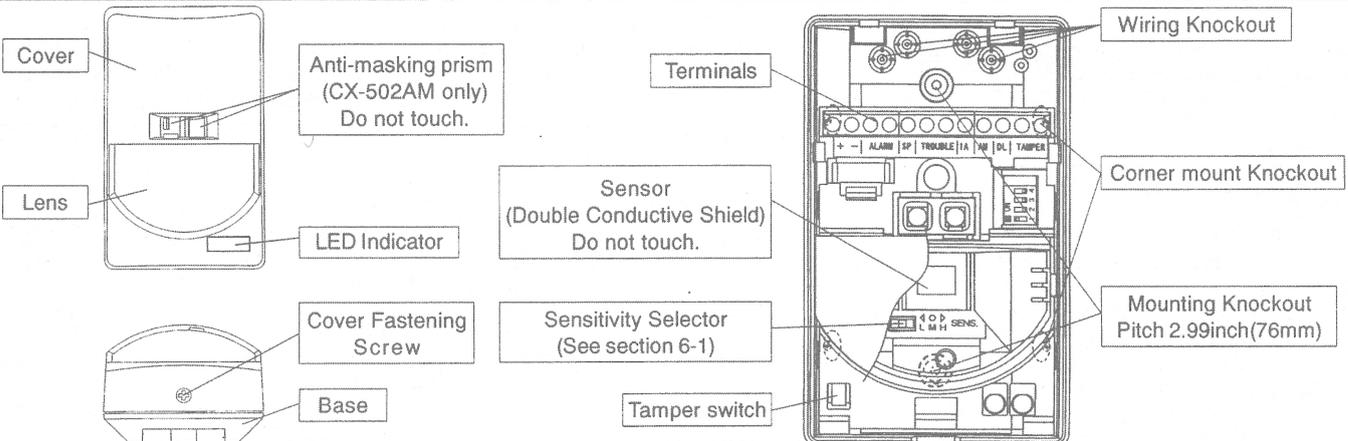
When using the optional "Long" range lens, ensure that the detection mode switch is set to the "STD" position.

Ensure that the SENS Switch is set to the "H" position when the detector is to be used in ranges longer than 67ft(20m).

**TOP VIEW**  
0 10 20 30 40 50 60 70 80 (ft)  
0 5 10 15 20 24 (m)

**SIDE VIEW**  
0 10 20 30 40 50 60 70 80 (ft)  
0 5 10 (m)

3. DESCRIPTION AND OPERATION



## 4. INSTALLATION

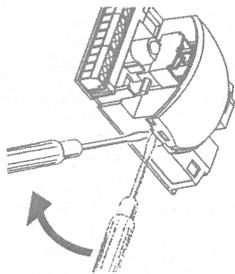
**1**  
Loosen fastening screw and remove cover.

**2**  
The main unit can be released from its base by following the procedure below.  
Push up the main unit until it is released from the claws of the base housing. Pull the unit out from the base, setting the guides on the both sides of the upper part of the main unit with the claws of the base housing.

**3**  
using a bracket, check matching knockout position before opening mounting holes.  
Lead in wires through knockouts along the wiring guide on the rear side of base. Mount base with supplied screws. When

**4**  
Wire according to Section 5.

**5** When using the "Long range" lens or to get access to the sensitivity selector switch it is necessary to remove the lens.

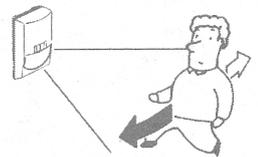


This is done by releasing it from the two notches either side of the lens and pulling away. To replace it, line up the lens with the guides on the inner cover of the detector and hook the holes back into the claws.

※ Long Range Lens CL-80N which has the number, "51-1522" engraved inside the lens.

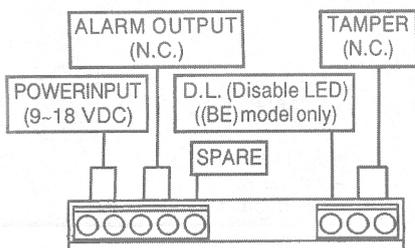
**6**  
Line up the guides on both sides of the upper part of the main unit with the claws of the base housing and slide down the main unit locking them together.

**7**  
Conduct a walktest and make adjustments. (Section 6)  
Fit cover using fastening screw.



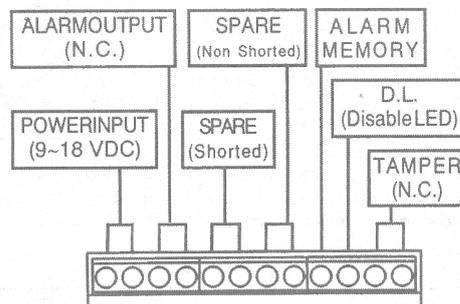
## 5. WIRING

### CX-502

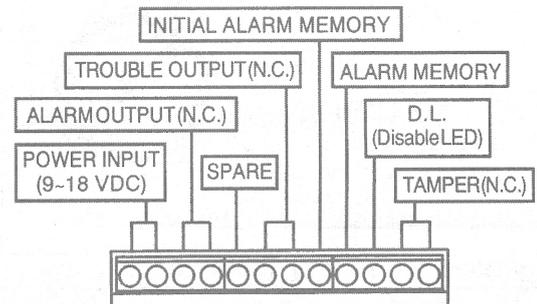


Connect tamper terminals to a 24 hour supervisory loop.

### CX-502 V



### CX-502 AM



Power wires should not exceed the following lengths.

WIRE SIZE	CX-502		CX-502V		CX-502AM	
	12V	14V	12V	14V	12V	14V
AWG 22(0.33mm <sup>2</sup> )	1600ft (480m)	3200ft (960m)	1470ft (440m)	2930ft (880m)	1060ft (320m)	2120ft (640m)
AWG 20(0.52mm <sup>2</sup> )	2500ft (750m)	5000ft (1500m)	2330ft (700m)	4670ft (1400m)	1660ft (500m)	3320ft (1000m)
AWG 18(0.83mm <sup>2</sup> )	4000ft (1200m)	8000ft (2400m)	3670ft (1100m)	7330ft (2200m)	2660ft (800m)	5320ft (1600m)

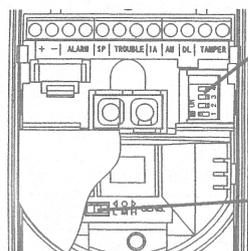
When using two or more units on one wire, the maximum length is obtained by dividing the maximum wire length listed above by the number of units used.

※ UL requires CX-502, CX-502AM to be connected to a UL listed power supply capable of providing a nominal input of 12VDC 12mA(max.) [CX-502], 12VDC 19mA(max.) [CX-502AM] and battery standby time of 4 hours.

※ For UL Listed systems, do not connect field wiring more than 25 feet to IA, AM, and DL terminals.

※ The equipment shall be installed in accordance with the National Electrical Code, NFPA 70.

## 6. FUNCTIONS



### DIP SWITCH

- TROUBLE OUTPUT SELECTOR
- POLARITY SELECTOR
- DETECTION MODE
- LED ON/OFF

### SENSITIVITY SELECTOR

### CAUTION!

Always conduct a walk test after changing the position of this switch to ensure the detector is still providing optimum coverage.

### 1. SENSITIVITY SELECTOR

To adjust the sensitivity, first remove the lens (as this covers the sensitivity switch). See the procedure on 4-5.

This switch may be used where:

- Turn the switch to "L" (Low) position when the detector is installed in a hostile area, which may cause a false alarm. It may be used in situations where the area of coverage may be small or narrow. Where small animals may be present or where there may be sudden temperature changes.
- Turn the switch to "H" (High) position when greater sensitivity is required, example (in Long Range applications exceeding 67ft (20m), areas with high temperatures which reduce the temperature difference between the target and background, or when the detector is mounted at higher than 9ft (2.7m).

### 2. LED ON / OFF

Dip SW 1 - Switches the LED "ON" or "OFF".

CX-502 The Alarm LED indicator can be switched either "ON" or "OFF"

CX-502V / CX-502AM

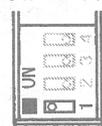
1) When the system is armed, the Alarm LED and Trouble LED (CX-502AM only) will not work regardless of the position of this DIP Switch.

2) When the system is disarmed, the Alarm LED and Trouble LED (CX-502AM only) can be selectable to be either "ON" or "OFF".

See the section 6-5 as to the setting of "Arm / Disarm".

When in warm-up mode, the LED's are activated regardless of the DIP Switch's position.

ON ↔ OFF



\* D.L. terminal / LED remote control terminal (CX-502(BE) / CX-502V / CX-502AM only) LED can be enabled or disabled remotely from control panel by D.L. terminal.

※ Ensure to switch off the LED's "ON / OFF" switch

\* Polarity of CX-502(BE) model is always set as "NEGATIVE".

See the explanation of the Polarity Selector (6-5) for the control of "ON / OFF".

### 3. DETECTION MODE (PULSE COUNT)

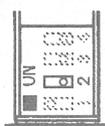
The Detection Mode can be switched to either "Standard" or "Special" mode depending on the environmental conditions of the installation.

\*Ensure that the "STD" position is used when the "Long" range lens is fitted.

STD : For normal applications.

SP : For use in hostile areas where there may be movement from small animals or other objects such as fax machines or curtains.

SP ↔ STD



When the "SP" is selected, the detector's sensitivity may seem sluggish. It is therefore important to always conduct a walk test to ensure that the desired coverage is given.

※ For UL Listed systems, do not set the detector with Pulse Count : SP and Sensitivity Selector : Low.

### 4. ALARM MEMORY and INITIAL ALARM MEMORY

Alarm Memory (CX-502V, CX-502AM only)

This function is used to indicate if the detector was activated while the panel was armed. It will cause the red LED on the Detector to illuminate once the panel has been disarmed.

Initial Alarm Memory (CX-502AM only)

When several detectors are on the same loop with the alarm memory function, after disarming:

- 1) The first detector to be activated flashes its LED.
- 2) On any subsequent detectors that became activated the red LED will stay on.

Operation

The LED display for the Alarm Memory and the Initial Alarm Memory turns "ON" only when the LED SW or remote control by the DL terminal is "OFF" while the system is in the disarm condition.

- Alarm Memory and Initial Alarm Memory will not activate while system is disarmed.
- After Alarm Memory and Initial Alarm Memory latches, Alarm Output operate normally during armed period.

RESET

Alarm Memory resets automatically when system is re-armed.

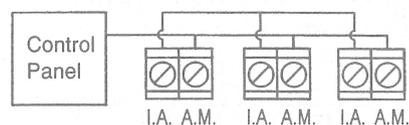
●Wiring of Alarm Memory

Compatible Control Panel is required for Alarm Memory. Connect A.M. terminal to Control Panel's Control Voltage Signal terminal (System Arming Status Voltage Output). See the section 6-5 as to the switching of System Status.

●Wiring of Initial Alarm Memory

Connect I.A. terminals of the detectors in one loop. (Parallel Connection)

NOTE: Maximum 40 detectors can be connected in one loop for initial alarm memory.



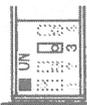
### 5. POLARITY SELECTOR (CX-502V, CX-502AM only)

This allows detector to be used with a variety of control panel memory latch outputs for either + or - switching. The memory latch from the panel may be used with either the DL function or the Alarm Memory.

(Please note that you cannot set the polarities of these two functions separately.)

Please select "+" or "-" to meet with that of the control panels memory latch output.

POSIT ↔ NEGAT



Switch Position	Terminal input status	DL operation	ALARM MEMORY operation
POSITIVE	OPEN or +5~18VDC	ON	Armed
	0~1VDC(grounded)	OFF	Disarmed
NEGATIVE	OPEN or +5~18VDC	OFF	Disarmed
	0~1VDC(grounded)	ON	Armed

"grounded" = A.M. and D.L. terminals are electrically connected with power supply terminal (ground).

### 6. ANTI-MASKING and SELF-CHECK (CX-502AM only)

The Anti-Masking function protects the detector's lens from being covered by either an object or from hostile substances such as spray, therefore allowing it to detect to its specifications.

The Self-Check function is an onboard circuit, which checks the operation of Detector at regular 5 hour intervals. This ensures that the unit is always Working correctly.

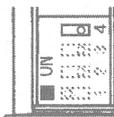
Trouble output: (TO)

This output activates if there is either an Anti-masking detection or a Self-Check problem.

Switching the Trouble Output

In the Event of either a Masking or Self-Check problem, then the unit may be set to either activate just the Trouble output or the Trouble and the Alarm outputs. Using DIP Switch 4 makes this selection.

T. O. +ALARM ↔ T. O.



SWITCH POSITION	OUTPUT TERMINAL
OFF	TROUBLE(T.O.)
ON	TROUBLE(T.O.) and ALARM

LED display

As well as the trouble output, the yellow LED on the detector will also display the trouble condition.

Type of trouble	Yellow LED Indication
Anti-Masking	Blinks slowly (0.5sec)
Self-Check	It lights constantly
Anti-Masking and Self-Check	Blinks fast (0.2sec)

This function is displayed only when the LED ON / OFF switch or the Remote Control from the DL terminals is "ON" while the system is disarmed.

Anti-Masking

If an object is placed within 10cm in front of the detector, for a period of more than 10 seconds then the Anti-Masking circuit will activate, triggering the Trouble output.

When the object is removed away from the lens, and then the Anti-Mask circuit will automatically be reset after one second, switching off the LED indication as well as the Trouble output.

Caution on Installation.

Since the accuracy of the anti-masking detection is very critical, please take note of the following points.

1) Installation.

Avoid locating the detector where any objects can be within 1 meter from the detector such as by doors, hanging signs or curtains. Also avoid locating the detector where it may be in direct or reflected sunlight.

2) Powering up the Detector.

This type of detector sets its optimum level of performance automatically during warm-up period. This enables it to be set up correctly to provide reliable performance with the minimum of fuss.

To ensure that this setting up is carried out properly, please follow the following instructions carefully.

A)- Keep at least 1 meter away from the detector when first applying the power to the unit.

B)-Keep at least 1 meter from the detector clear of any objects when first applying the power.

Testing the Detector

- 1) Ensure that all of the above procedures have been carried out, then apply power to the detector.
- 2) The detector will go through a warm-up period during which the display LED's will blink. (The Anti-Masking circuit will also start to set itself to its optimum level at this point).
- 3) When the LED's stop blinking the detector is set and ready for use. (If the LED's continue to blink then refer to the trouble shooting section).
- 4) Place an obstacle such as hand within 10cm in front of the detector for more than 10 seconds.
- 5) The detector works correctly if the yellow LED starts to blink slowly, indicating that it has been masked.
- 6) Remove the obstruction and the yellow LED should stop flashing. This completes the set up procedure.

## 7.TROUBLE SHOOTING

PROBLEM	PROBABLE CAUSE	REMEDY
RED LED does not light.	Improper power supply voltage. (disconnection, low voltage)	Correct supply voltage to 9~18V DC.
	Improper detection area.	[See Section 2~4].
	LED switch is OFF.	Turn on the switch.
	Improper polarity to detector.	Switch positive and negative at terminal.
RED LED lights even though no person within area.	Moving object within area. (curtain, wall hanging, etc.)	Remove the sources from the detection area.
	Temperature of object within area changing rapidly (heater, air conditioning, etc.)	Remove object from detection area. Check load of output.
RED LED lights but signal is not sent.	Relay contact is stuck or damaged due to overloading.	The unit needs repair or replacement.
	Faulty wiring.	Wire correctly.
Red LED does not stop flickering (warm-up)	Insufficient power supply.	Correct supply voltage to 9~18V DC.
Yellow LED flickers (CX-502AM only)	Detector is masked.	Remove masking material and continuous double flickering of Red LED stops after several seconds.
	Strong light, electrical noise cause anti-masking false alarm.	Remove such causes.
Red and Yellow LED does not stop flickering. (warm-up)	Incorrect initialization.	Initialize correctly according to [Section 6-6].
	Insufficient power supply.	Correct supply voltage to 9~18V DC.

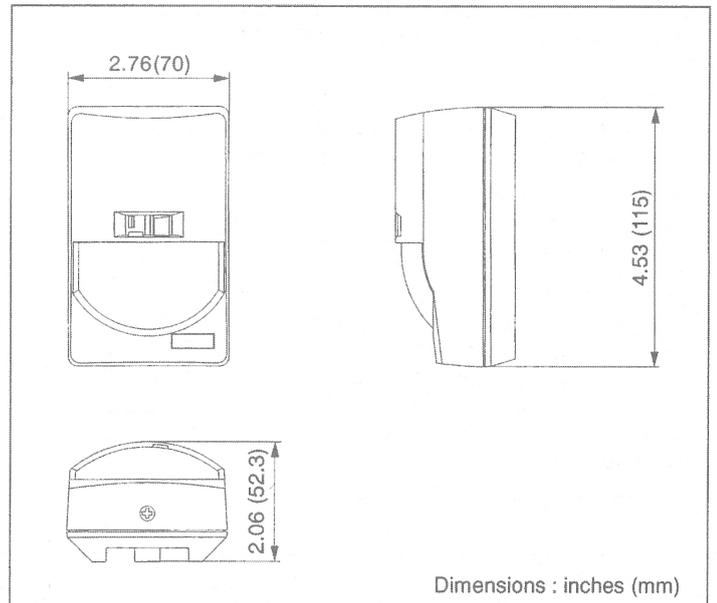
## 8.SPECIFICATIONS

Model	CX-502
Detection method	Passive infrared
Coverage	Wide angle 85° wide 50ft x 50ft (15m x 15m)
Detection zones	82 zones
Mounting height	6 ~ 10ft (1.8 ~ 3.0m)
Sensitivity	3° F (1.6° C) at 2ft / sec (0.6m/sec)
Detectable speed	1 ~ 5ft / sec (0.3 ~ 1.5m/sec)
Power input	9 ~ 18VDC
Current draw	5mA (normal) / 12mA (max.)
Alarm period	2.0 ± 0.5sec
Alarm output	N.C. 28VDC 0.2A max.
Tamper switch	N.C. Opens when cover is removed. 28VDC 0.1A max.
Warm-up period	Approx. 1 min. (LED blinks)
LED indicator	LED is blinking during warm-up period. Alarm condition
D.L.terminal ((BE) Only)	See Section6-2
RF interference	No alarm 30V/m
Operating temperature	-4°F ~ +122°F (-20°C ~ +50°C)
Environment humidity	95% max.
Weight	4.2oz (120g)

Model	CX-502V
Current draw	5mA(normal) / 13mA(max.)
Alarm Memory	See Section6-4
D.L.terminal	See Section6-2
Weight	4.2oz(120g)

CL-80N ( Optional lens for long range curtain pattern )	
Coverage	80ft x 7.7ft (24m x 2.3m)
Detection zones	22 zones

Model	CX-502AM
Current draw	7mA(normal) / 19mA(max.)
Alarm Memory	See Section6-4
Initial Alarm Memory	See Section6-4
LED Indicator	Red and Yellow LED is blinking during warm-up period. Red LED-Alarm, Alarm Memory and Initial Alarm Memory indicator Yellow LED-Anti Masking, Self-check indicator
D.L.terminal	See Section6-2
Trouble output	N.C. 28VDC 0.2A max.
Weight	4.8oz(135g)



\*Specifications and design are subject to change without prior notice.

### NOTE

This unit is designed to detect movement of an intruder and activate an alarm control panel.

Being only part of a complete alarm system, we cannot accept responsibility for any damages or other consequences resulting from an intrusion.

This product conforms to the EMC Directive 89/336 EEC.



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