i^4 Series Interface Module
COSMOD2W and COSMOD4W
*For use with COSMO-2W and COSMO-4W detectors

SYSTEM SENSOR®

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SPECIFICATIONS

Electrical Specifications

Power Supply Voltage:	Resettable power; 2-Wire: Min. 8.5 Volts DC (Power limited); Max. 35 Volts DC (Power limited); 4-Wire: Min. 10 Volts DC (Power limited); Max. 35Volts DC (Power limited)
Device Power-up Time:	200 milliseconds
Standby Current:	2-Wire: 61mA (max.), 45mA (12V In), 26mA (24V In); 4-Wire: 52mA (max.), 37mA (12V In), 22mA (24V In) (Does not include current draw from attached detectors or EOL relay)
Alarm Current:	2-Wire: 181mA (max.), 121mA (12V In), 64mA (24V In); 4-Wire: 78mA (max.), 57mA (12V In), 34mA (24V In) (Does not include reverse polarity current draw from attached detectors)
Alarm Contact Rating:	100 mA @ 36 Volts DC, resistive, 25 ohms
Maintenance Contact Rating:	100 mA @ 36 Volts DC, resistive, 25 ohms
Max. IDC Loop Wiring Resistance:	2-Wire: 50 Ohms; 4-Wire: 300 Ohms
Trigger Inputs:	Min. On Voltage: 1.5V; Max. On Voltage = Vin
Aux Power Out:	Same Voltage as Input Power (Unregulated, limited to 250mA)
Min. Reset Time:	300 milliseconds
Initial Communication Cycle:	6 minutes
EZ Walk Test Availability:	6 minutes after power up or panel reset

Physical Specifications

Operating Temperature Range:	0 - 50° C (32 - 122° F)
Operating Humidity Range:	5 - 95% RH
Storage Temperature Range:	-20 - 70° C (-4 - 158° F)
Height:	6.04 inches
Width:	6.04 inches
Depth:	1.16 inches
Shipping Weight:	0.6 lbs
Wire Gauge Acceptance:	Min: 22 AWG; Max: 14 AWG

2-wire Compatibility Requirements

Min. Loop Voltage:	12.9 Volts DC
Max. Loop Voltage:	14.5 Volts DC
Max. Loop Resistance:	50 Ohms
Max. Loop Ripple:	240 mVpp
Max. Loading Capacitance:	0.01 mF
Max. Alarm Current:	46 mA
Max. Reset Voltage:	0.30 Volts DC
Alarm Delay:	n/a
Min. Alarm Reset Time:	0.3 seconds
Max. Normal Load Current:	2.4 mA
Zone Type:	Standard
EOL Device:	3.9k Ohms (+ -5%)
Loop Style:	B and D
Compatibility Zone Identifier:	A
Detector Zone Identifier:	A
Max. Detectors Per Zone:	(12) 2-wire i^4 series model #COSMO-2W and/or i^3 series model #2WTA-B detectors

BEFORE INSTALLATION

This information is included as a quick reference installation guide. Refer to the control panel installation manual for detailed system information. If the module will be installed in an existing operational system, inform the operator and local authority that the system will be temporarily out of service. Disconnect power to the control panel before installing the module.

Notice: This manual should be left with the owner/user of this equipment. This product is intended for use in ordinary indoor locations.

GENERAL DESCRIPTION

The i^4 series module is designed to interface between compatible i^4 series combination CO/smoke detectors (Model COSMO-2W and COSMO-4W) and compatible security/fire panels. It can also be used to retrofit compatible i^4 series detectors into an existing loop of i^3 smoke detector models 2WTA-B or 4WTA-B, without adding wires. The module interprets signals and translates them into a separate smoke zone and a separate CO zone, each with alarm and trouble signals. The module will interconnect the detectors connected to it and alarm them in either Temporal 3 or Temporal 4 pattern. Optional triggers are provided to initiate multiple modules to sound. (an additional RSS-

MOD is not required) Local status indication is provided by 4 LED's and a 3 position DIP switch enables user configuration.

The i^4 COSMOD2W, 2-wire interface module, offers additional functionality including:

- Ability to query for a "need for maintenance" condition from 2-wire i^4 series model COSMO-2W and i^3 series model 2WTA-B smoke detectors
- One relay is available to indicate a multitude of maintenance conditions at the control panel
- All conditions are displayed at the module and at the detector
- EZ Walk test mode allows the installer to easily verify that all detectors on a loop are operational
- Allows 2-wire smoke detectors to be used on any compatible 4-wire control panel and provides Style D / Class A wiring on the detector loop
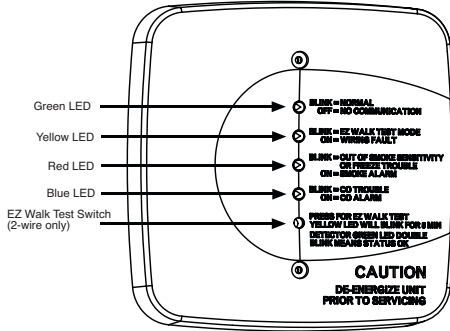
FEATURES

- Compatible with System Sensor i^4 series combination CO/smoke detectors and System Sensor i^3 Series smoke detectors models 2WTA-B or 4WTA-B.

- Allows up to 12 compatible devices including the i[4] series combination CO/smoke detector to be integrated with a panel
- Activates sounders of all detectors on loop in either Temporal 3 or Temporal 4 pattern

VISIBLE ANNUNCIATON

The i[4] series interface module has four visible LED's: The green LED is a supervisory LED; it blinks during power on, reset, and during normal operation. The yellow LED is used to indicate a loop wiring fault and will blink when it is in EZ Walk test mode. The red LED signals smoke events; it blinks during smoke maintenance events and lights constantly during smoke alarm events. The blue LED signals CO events; it blinks during CO trouble or CO end-of-life, and lights constantly during CO alarm.

FIGURE 1: MODULE FRONT VIEW

Green LED
Yellow LED
Red LED
Blue LED
EZ Walk Test Switch (2-wire only)

BLINK = NORMAL
OFF = NO COMMUNICATION
BLINK = EZ WALK TEST MODE
ON = WIRING FAULT
BLINK = OUT OF SMOKE SENSITIVITY
OR FREEZE TROUBLE
ON = SMOKE ALARM
BLINK = CO TROUBLE
ON = CO ALARM
PRESS FOR EZ WALK TEST
YELLOW LED WILL BLINK FOR 5 MIN
DETECTOR GREEN LED DOUBLE
BLINK MEANS STATUS OK

CAUTION
DE-ENERGIZE UNIT
PRIOR TO SERVICING

S0331-00

TABLE 1: OPERATION MODES

OPERATION MODE	GREEN LED	YELLOW LED	RED LED	BLUE LED
Normal (standby)	Blink 1 Sec.	OFF	OFF	OFF
No power/ Non-operational	OFF	OFF	OFF	OFF
Loop wiring fault	Blink 1 Sec.	ON	OFF	OFF
EZ Walk Test Mode (2-wire only)	Blink 1 Sec.	Blink 5 Sec.	OFF	OFF
Alarm Smoke	Blink 1 Sec.	OFF	ON	OFF
Alarm CO	Blink 1 Sec.	OFF	OFF	ON
Alarm Smoke & CO	Blink 1 Sec.	OFF	ON	ON
Maintenance (2-wire only)	Blink 1 Sec.	OFF	Blink 5 Sec.	OFF
Freeze Trouble (2-wire only)	Blink 1 Sec.	OFF	Blink 10 Sec.	OFF
CO Trouble	Blink 1 Sec.	OFF	OFF	Blink 5 Sec.

NORMAL (STANDBY)

The module is powered and detectors on the loop are operating normally.

NO POWER/NON-OPERATIONAL

Power is not applied to the module or communication between the module and the detectors on the loop is unsuccessful.

LOOP WIRING FAULT

If an open circuit occurs on the loop, the module will indicate the condition by illuminating the yellow LED. 2-wire units will then power the Style-D/Class A terminals. When the wiring issue on the loop has been resolved, the module will turn the yellow LED off.

EZ WALK TEST MODE

This indicates the module and detectors are in EZ Walk Test Mode. See "EZ Walk Test" section for instructions on how to initiate and perform the EZ Walk test.

ALARM SMOKE/ALARM CO/ALARM SMOKE & CO

A smoke alarm will be indicated by the red LED. A CO alarm will be indicated by the blue LED.

A smoke alarm is not self-restoring. Once a smoke alarm has been signaled, the red LED will illuminate until the module is reset by removal of power.

Note: On some panels, resetting a smoke alarm may require additional steps at the keypad to clear the trouble conditions on CO and smoke maintenance zones due to power loss to the module.

A CO alarm is self-clearing. Once a CO alarm has been signaled, the blue LED will illuminate. Once the initiating device ceases to signal the CO event, the blue LED will turn off. If a CO alarm is signaled, and not cleared, prior to a smoke alarm condition, the module will keep both the blue and red LED's illuminated. If a smoke alarm is signaled first, the module will not be able to receive notification of a CO alarm condition and will not be able to report it to the panel.

MAINTENANCE

This condition means one or more detectors on the loop have a smoke maintenance issue. See "Smoke Maintenance Inquiry" section for further details.

FREEZE TROUBLE

This condition means one or more detectors on the loop are measuring the ambient temperature is near the freezing point. See "Freeze Trouble Inquiry" section for further details.
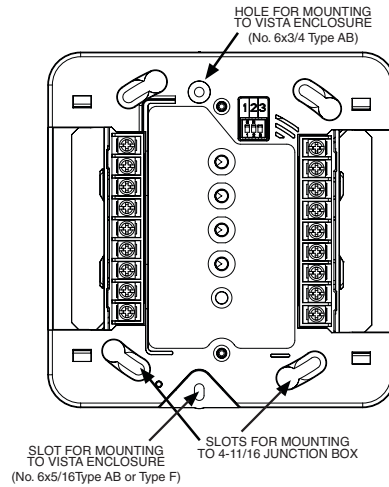
CO TROUBLE

The module can be notified of a detector with a CO trouble condition. All CO trouble conditions will be reported on the CO zone and displayed with a blinking blue LED. The module is not able to determine the number of detectors that have a CO trouble condition or which trouble condition exists.

INSTALLATION
MOUNTING

The module can be mounted to a 4-^{11}/$_{16}$ inch back box or inside a listed, dedicated enclosure. When mounting inside an enclosure with pre-stamped holes, it may be easier to align the bottom screw hole first. It is not necessary to use the module cover when mounting inside an enclosure.

FIGURE 2: MOUNTING

HOLE FOR MOUNTING TO VISTA ENCLOSURE (No. 6x3/4 Type AB)

SLOT FOR MOUNTING TO VISTA ENCLOSURE (No. 6x5/16Type AB or Type F)

SLOTS FOR MOUNTING TO 4-11/16 JUNCTION BOX

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WIRING GUIDELINES

All wiring must be installed in compliance with the NFPA 70 standards, National Electrical Code, applicable state and local codes, and any special requirements at the local Authority Having Jurisdiction (AHJ).

The screw terminals in the mounting base will accept 14-22 gauge wire. Wire connections are made by stripping approximately ¼" of insulation from the end of the feed wire, inserting it into the proper base terminal, and tightening the screw to secure the wire in place. Do not put wires more than 2 gauge apart under the same clamping plate.

Note: The module must be installed in the same room and within 20 feet of the panel and enclosed within conduit or equivalently protected against mechanical injury.
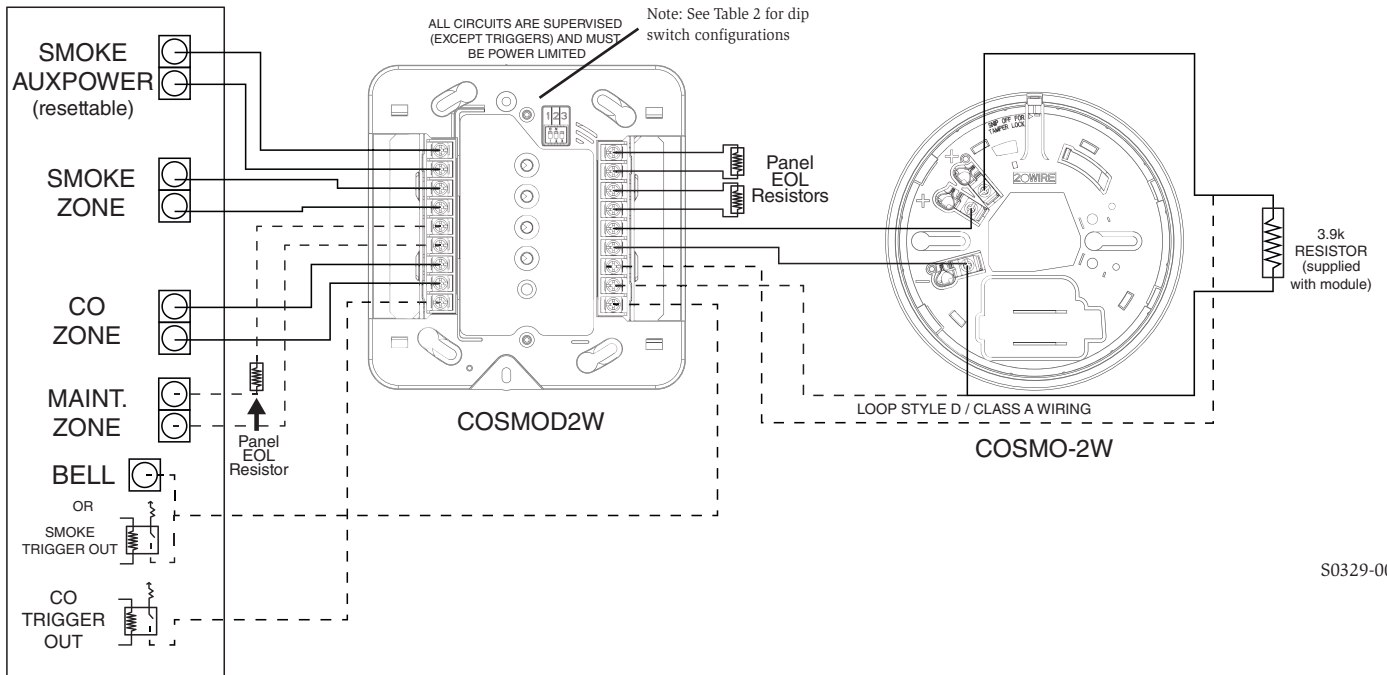
⚠WARNING

Remove power from alarm control unit or initiating device circuits before installing detectors.

WIRING DIAGRAMS

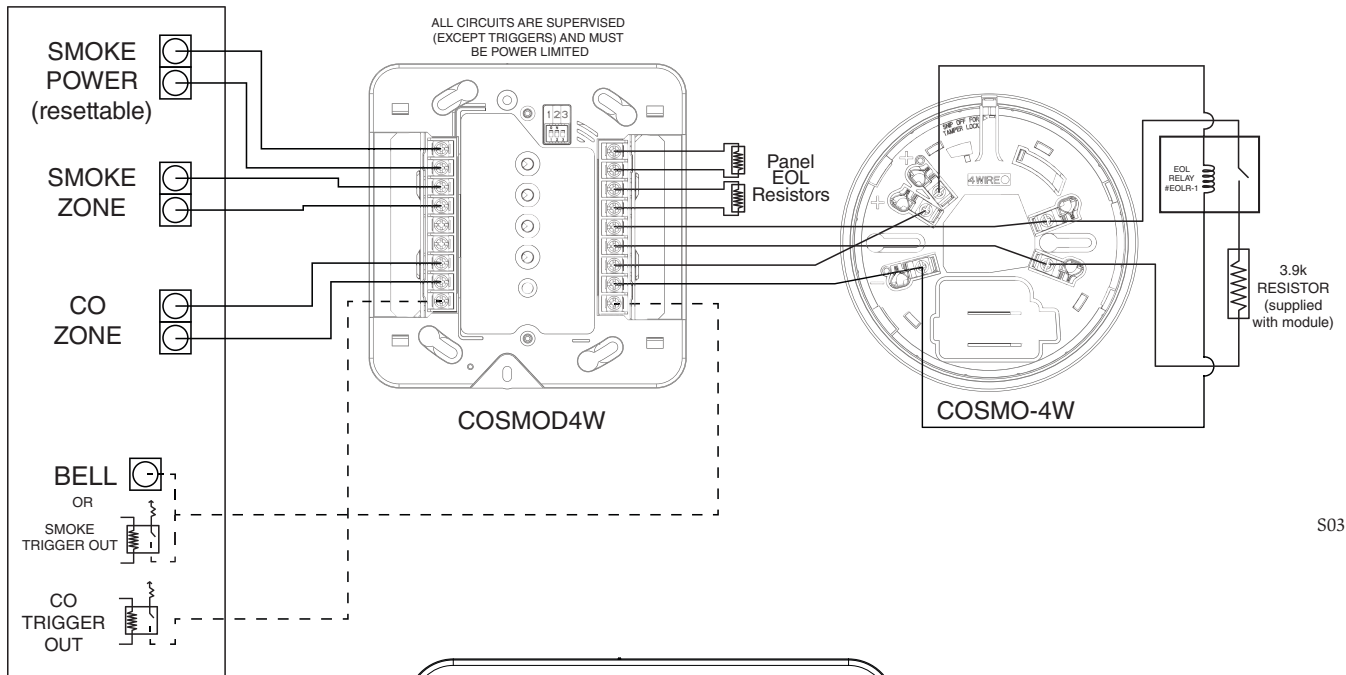Install module wiring in accordance with appropriate wiring diagrams. (Figure 3 and Figure 4)

The module relays have a maximum ON resistance of 25 ohms. This resistance plus the wiring resistance to the panel must be less than the maximum zone wiring resistance stated in the panel manual.
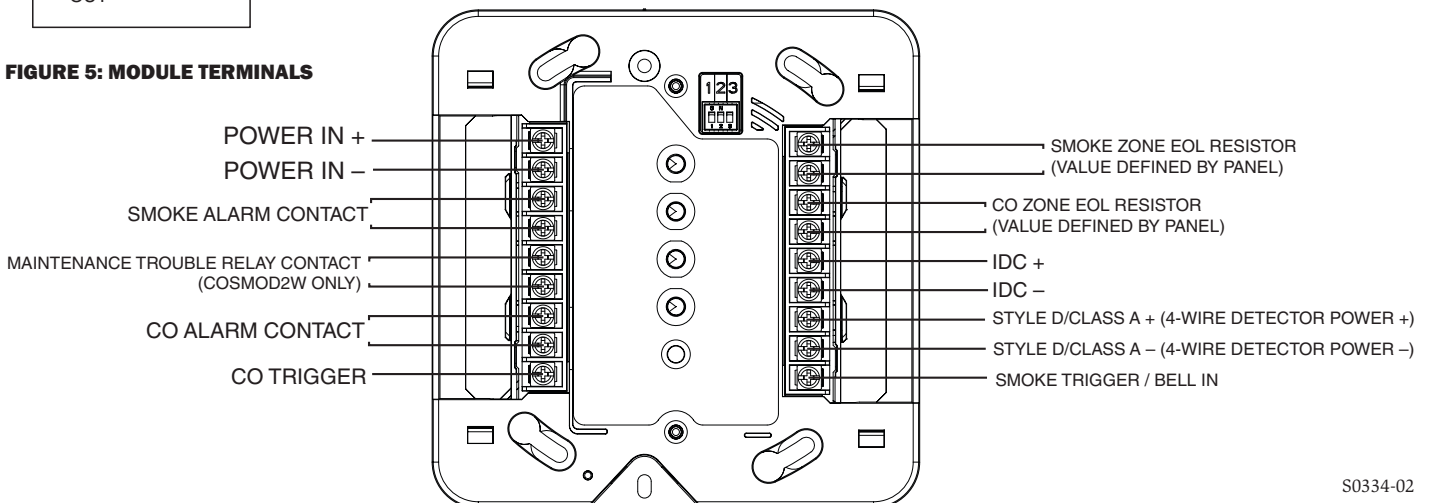
FIGURE 3: COSMOD2W WIRING DIAGRAM

SMOKE AUXPOWER (resettable)

SMOKE ZONE

CO ZONE

MAINT. ZONE

Panel EOL Resistor

BELL

OR

SMOKE TRIGGER OUT

CO TRIGGER OUT

ALL CIRCUITS ARE SUPERVISED (EXCEPT TRIGGERS) AND MUST BE POWER LIMITED

Note: See Table 2 for dip switch configurations

COSMOD2W

Panel EOL Resistors

3.9k RESISTOR (supplied with module)

2 WIRE

LOOP STYLE D / CLASS A WIRING

COSMO-2W

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FIGURE 4: COSMOD4W WIRING DIAGRAM

SMOKE POWER (resettable)

SMOKE ZONE

CO ZONE

BELL

OR

SMOKE TRIGGER OUT

CO TRIGGER OUT

ALL CIRCUITS ARE SUPERVISED (EXCEPT TRIGGERS) AND MUST BE POWER LIMITED

COSMOD4W

Panel EOL Resistors

4 WIRE

EOL RELAY #EOLR-1

3.9k RESISTOR (supplied with module)

COSMO-4W

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FIGURE 5: MODULE TERMINALS

POWER IN +

POWER IN –

SMOKE ALARM CONTACT

MAINTENANCE TROUBLE RELAY CONTACT (COSMOD2W ONLY)

CO ALARM CONTACT

CO TRIGGER

SMOKE ZONE EOL RESISTOR (VALUE DEFINED BY PANEL)

CO ZONE EOL RESISTOR (VALUE DEFINED BY PANEL)

IDC +

IDC –

STYLE D/CLASS A + (4-WIRE DETECTOR POWER +)

STYLE D/CLASS A – (4-WIRE DETECTOR POWER –)

SMOKE TRIGGER / BELL IN

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INPUT TRIGGERS/SOUNDER ACTIVATION

Many panels can be programmed with triggers which are auxiliary relays that activate upon an alarm condition. Two inputs are used to signal the module to activate device sounders. The first is configurable by DIP switch to one of two modes; bell in or smoke trigger. When in the bell mode, the module will follow a valid coded signal from a Bell Out/NAC circuit consisting of high to low, then low to high for less than 1.9 seconds each. In smoke trigger mode, while the input is held high, the module will synchronize the detectors in a Temporal 3 pattern.

The second input is for a CO trigger ; the CO trigger input allows a single module to have CO silence/hush capability and allows multiple module installations to have all sounders activated in Temporal 4 in the event of a CO alarm. While the CO trigger is held high, with a positive voltage input, the module will synchronize the detectors in a Temporal 4 pattern. After 30 minutes in Temporal 4 alarm, the time period between the Temporal 4 pulse will change from 5 seconds to 60 seconds.

Note: CO trigger may only be used with UL 864 panels that have been evaluated to confirm CO services: A) The control unit shall be capable of distinctively indicating the activation of a CO detector as a carbon monoxide alarm signal B) The visible annunciation of an activated carbon monoxide detector at the control unit shall not be canceled when the carbon monoxide audible alarm signal is deactivated, For installations other than residential applications, the interconnected control unit must produce the T4 alarm pattern via separate NAC(s).

TABLE 2: DIP SWITCH CONFIGURATIONS

	DIP SWITCH # 1	DIP SWITCH # 2	DIP SWITCH # 3
ON (DEFAULT)	Bell In	Smoke Maint on Smoke Trouble and Form-B Maint Relay (COSMOD2W only)	Unused
OFF	Smoke Trigger	Smoke Maint on Form-B Smoke maintenance Relay only (COSMOD2W only)	Unused

POWER UP AND COMMUNICATIONS
COMMUNICATIONS CHECK (2-WIRE ONLY)

Upon power up, the module will send a request for communication check. All compatible detectors on the loop that understand the communication protocol will respond. If all detectors respond correctly, the green LED will blink once every 1 second. If the module does not get a response, it will turn off the green LED and continue to try every 2 minutes until a response is received.

SMOKE MAINTENANCE INQUIRY

The module sends a smoke maintenance inquiry to the detectors every 24 hours. (Compatible 2-wire detectors only) If a response indicating a maintenance problem is received, the red LED on the module will blink once every 5 seconds and a smoke maintenance condition will be indicated to the panel. It is likely that the detector needs to be cleaned or replaced, refer to the detector instruction manual for maintenance instructions.

FREEZE TROUBLE INQUIRY

The module sends a freeze trouble inquiry to the detectors every four hours. (Compatible i³ Series 2-wire smoke detectors only) If a response indicating a freeze problem is received, the red LED on the module will blink once every 10 seconds and a smoke maintenance condition will be indicated to the panel.

TESTING

Modules must be tested after installation and following periodic maintenance. Testing should be performed at least once per year.

NOTE: Before testing, notify the proper authorities that the system will be temporarily out of service. Disable the zone or system to prevent any unwanted alarms.

EZ WALK TEST

The communication loop between the 2-wire modules and detectors can be manually tested by putting the module and detectors into EZ Walk test mode. This feature is for use with System Sensor detectors (i⁴ series model COSMO-2W and i³ series model 2WTA-B) installed with the model COSMOD2W module.

The EZ Walk loop test verifies the initiating loop wiring and provides visual status indication at each detector:

1. Ensure proper wiring and power is applied. Wait approximately 6 minutes from power-up before performing the EZ Walk test. The green LED on the module must be blinking indicating the module is in ready/ standby mode to start the EZ Walk mode.

2. Locate the EZ Walk recessed test switch located behind the module cover (See Figure 1). Depress the test switch with a small screwdriver. The yellow LED will blink showing that the module and detectors are in EZ Walk mode for 5 minutes.

3. Observe the LEDs at each detector to make sure the green LED is double blinking every 5 seconds as listed in Table 3.

4. At the end of the five minute period, the module will terminate EZ Walk and the yellow LED will stop blinking. The EZ Walk test period can be extended by pressing the test switch multiple times. Each press will add 5 minutes of additional time.

If a module or detector fails the test, its wiring should be checked. If the module still fails, it should be replaced. Notify the proper authorities when all testing has been completed.

NOTE: The EZ Walk loop test should not be used in lieu of functional testing (alarm, trouble and other functional tests) of the system.

TABLE 3: EZ WALK TEST DETECTOR MODES

	DETECTOR GREEN LED	DETECTOR RED LED
PROPER OPERATION	Double Blink 5 Seconds	OFF
OUT OF SENSITIVIY	OFF	Double Blink 5 Seconds
FREEZE CONDITION	OFF	Double Blink 10 Seconds