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FCC Notice

This equipment generates low level radio frequency energy. If not installed in accordance with the manufacturer's instructions, it may cause interference to radio and television reception. It has been type tested and found to comply with the specifications in Subpart J of Part 15 of FCC rules for Class B Computing Devices.If this equipment causes interference to radio or television reception — which can be determined by turning the equipment on and off — the installer is encouraged to correct the interference by one or more of the following measures: 1) Reorient the antenna of the radio/television, 2) Connect the AC power cord to a different outlet so the control panel and radio/television are on different branch circuits, 3) Relocate the control panel with respect to the radio/television.

If necessary, the installer should consult an experienced radio/television technician for additional suggestions, or send for the "Interference Handbook" prepared by the Federal Communications Commission. This booklet is available from the U.S. Government Printing Office. Washington D.C. 20402, stock no. 004-000-00450-7.

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ZONEX System Description

Introduction

Module Description

The D8125 POPEX and D8126/D8127 POPIT Modules are hardware accessories for the Radionics Zone Expansion (ZONEX) system.

The D8125 POPEX Module is a **P**oint **O**f **P**rotection **EX**pander. One or two POPEX Modules can be used to interface zone expansion loops to the D8112G series. Each POPEX Module can monitor up to 63 D8126/D8127 POPIT (**P**oint **O**f **P**rotection **I**nput **T**ransponder) Modules, and as many as 126 individual POPIT Modules can be monitored in a ZONEX system with two POPEX Modules. An unlimited number of detection devices can be connected to each POPIT sensor loop; however, annunciation is available only for the *sensor loop*.

The D8127 is a smaller version of the D8126. There are two different versions of the D8126/D8127 POPIT Modules; the D8126T/D8127T plastic enclosure, which contains a tamper switch, and the D8126U/D8127U, which comes in an untampered enclosure. Both enclosures are made of UL listed fire retardant material.

Programming

POPEX/POPIT application programs are developed using the D9300 Remote Account Manager or the Radionics D5100 Bar Code Programmer containing the *8112:AUX Product Handler* (see the *8112:AUX Program Entry Guide*). The control/communicator used for the ZONEX system must be of the D8112"G" series (referred to in this manual as "D8112G"). *The POPEX/POPIT Modules will not function with the D8112 "E" or "A" Control/Communicators.* The D8112G contains the ZONEX firmware, and has expanded memory for custom ZONEX text displays on the Radionics D1252A Command Center. (Custom alphanumeric text for each expansion point can be programmed with the *8112:PTEXT Product Handler*.) Each POPEX Module is supplied with an *8112 ZONEX System Program/Account Record Sheet*, used to record both the ZONEX subhandler program file and the physical location of each POPEX and POPIT Module.

Listing

The POPEX and POPIT Modules are UL listed for Local or Police Connected Burglar Alarm, Central Station Burglar Alarm, Household Burglar Alarm, Central Station Fire (NFPA 71), Local Fire (NFPA 72, chap.6), Remote Station Fire (NFPA 72, chap. 8), Household Fire (NFPA 74), and Electrically Actuated Transmitter applications. See *UL Applications* in the **Specifications** section of the manual to determine the appropriate POPIT module for each application. The POPEX module can be mounted in any D8112 compatible enclosure.

Operation

Each POPIT Module is assigned to report to a D8112G Control/Communicator "master zone." The POPIT can transmit three conditions to the D8112G: sensor loop open, shorted, and normal. The D8112G receives the condition signals and interprets them as: sensor loop alarm, trouble, or normal, missing POPIT module, or extra POPIT module. The D8112G "master zone" loop code program (see *8112:MAIN Program Entry Guide*, RPN 74-03762-000, **Zone Code Index** section) determines the system response to each of these sensor loop conditions. When an event occurs on a POPIT, the D1252A sequences through displays which indicate the type of event.

POPEX/POPIT Configurations

Two configurations: *horizontal* (Figure 1) and *vertical* (Figure 2) are used to *organize* points of protection. Both modes provide the ZONEX system with the maximum of 126 points of protection. The two Zone Expansion terminals are typically used to *group* POPITs in a ZONEX system.

POPEX/POPIT Configurations (cont.)

The selection of the mode is significant when only *one* POPEX Module is installed. With one POPEX module, an application which requires *no more than eight* points of protection in *as many as eight* zones can use the *horizontal* mode (Figure 1). An application which requires *more than eight* points of protection in *no more than four* zones can use the *vertical* mode (Figure 2).

If *two* POPEX Modules are installed, all points of protection are available. Some of the differences between the modes are listed below:

In the **horizontal** mode with **one** POPEX Module:

- All 8 zones of the D8112G can be used in the ZONEX system.
- Up to 8 POPITs can be assigned to D8112G master zones 1-7.
- Up to only 7 POPITs can be assigned to D8112G master zone 8.
- A maximum of 63 POPITs can be installed.

In the **horizontal** mode with **two** POPEX Modules:

- Up to 16 POPITs can be assigned to D8112G master zones 1-7.
- Up to only 14 POPITs can be assigned to D8112G master zone 8 (7 POPITs on POPEX #1 and 7 POPITs on POPEX #2).
- POPEX #1 assigns a maximum of 8 POPITs to a D8112G zone (ex., points 101-108).
- POPEX #2 assigns an additional 8 POPITs maximum, to a D8112G zone (ex., points 109-116).
- A maximum of 126 POPITs can be installed.

In the **vertical** mode with **one** POPEX Module:

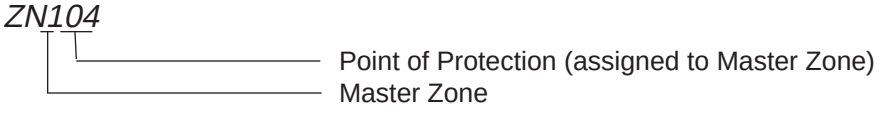
- Only 4 zones of the D8112G can be used in the ZONEX system.
- Zones must be used in groups (zones 1 through 4, or zones 5 through 8).
- Up to 16 POPITs can be assigned to D8112G master zones 1-3 or 5-7.
- Up to only 15 POPITs can be assigned to D8112G zones 4 and 8.
- A maximum of 63 POPITs can be installed.

In the **vertical** mode with **two** POPEX Modules:

- Up to 16 POPITs can be assigned to D8112G master zones 1-3 or 5-7.
- POPEX #1 assigns a maximum of 16 POPITs to D8112G zones 1 through 3.
- POPEX #2 assigns a maximum of 16 POPITs to D8112G zones 5 through 7.
- Only 15 POPITs can be assigned to D8112G zones 4 and 8.
- A maximum of 126 POPITs can be installed.

Figures 1 and 2 display all POPIT assignment switch settings for both the horizontal and vertical modes (e.g., 1 2 3 4 - -). Numbers 1 through 6 indicate switches 1-6 on the POPIT Module. The dash (-) indicates a switch is in the OFF or *open* position. These switches assign each point of protection to a master zone (see **POPIT Module Assignments** for switch settings). The tables at the bottom of these figures indicate the maximum number of POPITs that can be assigned to each D8112G master zone, with one and two POPEX Modules.

Below the switch setting is the I.D. code (e.g., ZN 104) for each POPIT. The master zone and expansion point (point of protection) are used to cross-reference the POPIT Module to an event displayed on the D1252A Command Center. For example, in the I.D. code ***ZN104***, "ZN1" indicates that the POPIT is assigned to master zone 100 of the D8112G Control/Communicator, and "04" indicates that the POPIT reports as expansion point #4.



HORIZONTAL MODE - POPEX AND POPIT MODULES

	D8112 MASTER ZONE 1	D8112 MASTER ZONE 2	D8112 MASTER ZONE 3	D8112 MASTER ZONE 4	D8112 MASTER ZONE 5	D8112 MASTER ZONE 6	D8112 MASTER ZONE 7	D8112 MASTER ZONE 8
POPEX1 (D8112G TERMINAL 28)	1 2 3 4 5 6 ZN 101	1 2 - 4 5 6 ZN 201	1 - 3 4 5 6 ZN 301	1 - - 4 5 6 ZN 401	- 2 3 4 5 6 ZN 501	- 2 - 4 5 6 ZN 601	- - 3 4 5 6 ZN 701	- - - 4 5 6 ZN 801
	1 2 3 4 5 - ZN 102	1 2 - 4 5 - ZN 202	1 - 3 4 5 - ZN 302	1 - - 4 5 - ZN 402	- 2 3 4 5 - ZN 502	- 2 - 4 5 - ZN 602	- - 3 4 5 - ZN 702	- - - 4 5 - ZN 802
	1 2 3 4 - 6 ZN 103	1 2 - 4 - 6 ZN 203	1 - 3 4 - 6 ZN 303	1 - - 4 - 6 ZN 403	- 2 3 4 - 6 ZN 503	- 2 - 4 - 6 ZN 603	- - 3 4 - 6 ZN 703	- - - 4 - 6 ZN 803
	1 2 3 4 - - ZN 104	1 2 - 4 - - ZN 204	1 - 3 4 - - ZN 304	1 - - 4 - - ZN 404	- 2 3 4 - - ZN 504	- 2 - 4 - - ZN 604	- - 3 4 - - ZN 704	- - - 4 - - ZN 804
	1 2 3 - 5 6 ZN 105	1 2 - - 5 6 ZN 205	1 - 3 - 5 6 ZN 305	1 - - - 5 6 ZN 405	- 2 3 - 5 6 ZN 505	- 2 - - 5 6 ZN 605	- - 3 - 5 6 ZN 705	- - - - 5 6 ZN 805
	1 2 3 - 5 - ZN 106	1 2 - - 5 - ZN 206	1 - 3 - 5 - ZN 306	1 - - - 5 - ZN 406	- 2 3 - 5 - ZN 506	- 2 - - 5 - ZN 606	- - 3 - 5 - ZN 706	- - - - 5 - ZN 806
	1 2 3 - - 6 ZN 107	1 2 - - - 6 ZN 207	1 - 3 - - 6 ZN 307	1 - - - - 6 ZN 407	- 2 3 - - 6 ZN 507	- 2 - - - 6 ZN 607	- - 3 - - 6 ZN 707	- - - - - 6 ZN 807
	1 2 3 - - - ZN 108	1 2 - - - - ZN 208	1 - 3 - - - ZN 308	1 - - - - - ZN 408	- 2 3 - - - ZN 508	- 2 - - - - ZN 608	- - 3 - - - ZN 708	NOT USED
POPEX2 (D8112G TERMINAL 27)	1 2 3 4 5 6 ZN 109	1 2 - 4 5 6 ZN 209	1 - 3 4 5 6 ZN 309	1 - - 4 5 6 ZN 409	- 2 3 4 5 6 ZN 509	- 2 - 4 5 6 ZN 609	- - 3 4 5 6 ZN 709	- - - 4 5 6 ZN 809
	1 2 3 4 5 - ZN 110	1 2 - 4 5 - ZN 210	1 - 3 4 5 - ZN 310	1 - - 4 5 - ZN 410	- 2 3 4 5 - ZN 510	- 2 - 4 5 - ZN 610	- - 3 4 5 - ZN 710	- - - 4 5 - ZN 810
	1 2 3 4 - 6 ZN 111	1 2 - 4 - 6 ZN 211	1 - 3 4 - 6 ZN 311	1 - - 4 - 6 ZN 411	- 2 3 4 - 6 ZN 511	- 2 - 4 - 6 ZN 611	- - 3 4 - 6 ZN 711	- - - 4 - 6 ZN 811
	1 2 3 4 - - ZN 112	1 2 - 4 - - ZN 212	1 - 3 4 - - ZN 312	1 - - 4 - - ZN 412	- 2 3 4 - - ZN 512	- 2 - 4 - - ZN 612	- - 3 4 - - ZN 712	- - - 4 - - ZN 812
	1 2 3 - 5 6 ZN 113	1 2 - - 5 6 ZN 213	1 - 3 - 5 6 ZN 313	1 - - - 5 6 ZN 413	- 2 3 - 5 6 ZN 513	- 2 - - 5 6 ZN 613	- - 3 - 5 6 ZN 713	- - - - 5 6 ZN 813
	1 2 3 - 5 - ZN 114	1 2 - - 5 - ZN 214	1 - 3 - 5 - ZN 314	1 - - - 5 - ZN 414	- 2 3 - 5 - ZN 514	- 2 - - 5 - ZN 614	- - 3 - 5 - ZN 714	- - - - 5 - ZN 814
	1 2 3 - - 6 ZN 115	1 2 - - - 6 ZN 215	1 - 3 - - 6 ZN 315	1 - - - - 6 ZN 415	- 2 3 - - 6 ZN 515	- 2 - - - 6 ZN 615	- - 3 - - 6 ZN 715	- - - - - 6 ZN 815
	1 2 3 - - - ZN 116	1 2 - - - - ZN 216	1 - 3 - - - ZN 316	1 - - - - - ZN 416	- 2 3 - - - ZN 516	- 2 - - - - ZN 616	- - 3 - - - ZN 716	NOT USED

POPEX #1 (D8112G TERM 28)	8	8	8	8	8	8	8	7	63
POPEX #2 (D8112G TERM 27)	8	8	8	8	8	8	8	7	63

Dash (-) indicates switch is in the OFF or *open* position.

Figure 1: Horizontal Mode - POPEX and POPIT Modules

VERTICAL MODE - POPEX AND POPIT MODULES

POPEX 1 (D8112G TERMINAL 28)				POPEX 2 (D8112G TERMINAL 27)			
D8112 MASTER ZONE 1	D8112 MASTER ZONE 2	D8112 MASTER ZONE 3	D8112 MASTER ZONE 4	D8112 MASTER ZONE 5	D8112 MASTER ZONE 6	D8112 MASTER ZONE 7	D8112 MASTER ZONE 8
1 2 3 4 5 6 ZN 101	1 - 3 4 5 6 ZN 201	- 2 3 4 5 6 ZN 301	- - 3 4 5 6 ZN 401	1 2 3 4 5 6 ZN 501	1 - 3 4 5 6 ZN 601	- 2 3 4 5 6 ZN 701	- - 3 4 5 6 ZN 801
1 2 3 4 5 - ZN 102	1 - 3 4 5 - ZN 202	- 2 3 4 5 - ZN 302	- - 3 4 5 - ZN 402	1 2 3 4 5 - ZN 502	1 - 3 4 5 - ZN 602	- 2 3 4 5 - ZN 702	- - 3 4 5 - ZN 802
1 2 3 4 - 6 ZN 103	1 - 3 4 - 6 ZN 203	- 2 3 4 - 6 ZN 303	- - 3 4 - 6 ZN 403	1 2 3 4 - 6 ZN 503	1 - 3 4 - 6 ZN 603	- 2 3 4 - 6 ZN 703	- - 3 4 - 6 ZN 803
1 2 3 4 - - ZN 104	1 - 3 4 - - ZN 204	- 2 3 4 - - ZN 304	- - 3 4 - - ZN 404	1 2 3 4 - - ZN 504	1 - 3 4 - - ZN 604	- 2 3 4 - - ZN 704	- - 3 4 - - ZN 804
1 2 3 - 5 6 ZN 105	1 - 3 - 5 6 ZN 205	- 2 3 - 5 6 ZN 305	- - 3 - 5 6 ZN 405	1 2 3 - 5 6 ZN 505	1 - 3 - 5 6 ZN 605	- 2 3 - 5 6 ZN 705	- - 3 - 5 6 ZN 805
1 2 3 - 5 - ZN 106	1 - 3 - 5 - ZN 206	- 2 3 - 5 - ZN 306	- - 3 - 5 - ZN 406	1 2 3 - 5 - ZN 506	1 - 3 - 5 - ZN 606	- 2 3 - 5 - ZN 706	- - 3 - 5 - ZN 806
1 2 3 - - 6 ZN 107	1 - 3 - - 6 ZN 207	- 2 3 - - 6 ZN 307	- - 3 - - 6 ZN 407	1 2 3 - - 6 ZN 507	1 - 3 - - 6 ZN 607	- 2 3 - - 6 ZN 707	- - 3 - - 6 ZN 807
1 2 3 - - - ZN 108	1 - 3 - - - ZN 208	- 2 3 - - - ZN 308	- - 3 - - - ZN 408	1 2 3 - - - ZN 508	1 - 3 - - - ZN 608	- 2 3 - - - ZN 708	- - 3 - - - ZN 808
1 2 - 4 5 6 ZN 109	1 - - 4 5 6 ZN 209	- 2 - 4 5 6 ZN 309	- - - 4 5 6 ZN 409	1 2 - 4 5 6 ZN 509	1 - - 4 5 6 ZN 609	- 2 - 4 5 6 ZN 709	- - - 4 5 6 ZN 809
1 2 - 4 5 - ZN 110	1 - - 4 5 - ZN 210	- 2 - 4 5 - ZN 310	- - - 4 5 - ZN 410	1 2 - 4 5 - ZN 510	1 - - 4 5 - ZN 610	- 2 - 4 5 - ZN 710	- - - 4 5 - ZN 810
1 2 - 4 - 6 ZN 111	1 - - 4 - 6 ZN 211	- 2 - 4 - 6 ZN 311	- - - 4 - 6 ZN 411	1 2 - 4 - 6 ZN 511	1 - - 4 - 6 ZN 611	- 2 - 4 - 6 ZN 711	- - - 4 - 6 ZN 811
1 2 - 4 - - ZN 112	1 - - 4 - - ZN 212	- 2 - 4 - - ZN 312	- - - 4 - - ZN 412	1 2 - 4 - - ZN 512	1 - - 4 - - ZN 612	- 2 - 4 - - ZN 712	- - - 4 - - ZN 812
1 2 - - 5 6 ZN 113	1 - - - 5 6 ZN 213	- 2 - - 5 6 ZN 313	- - - - 5 6 ZN 413	1 2 - - 5 6 ZN 513	1 - - - 5 6 ZN 613	- 2 - - 5 6 ZN 713	- - - - 5 6 ZN 813
1 2 - - 5 - ZN 114	1 - - - 5 - ZN 214	- 2 - - 5 - ZN 314	- - - - 5 - ZN 414	1 2 - - 5 - ZN 514	1 - - - 5 - ZN 614	- 2 - - 5 - ZN 714	- - - - 5 - ZN 814
1 2 - - - 6 ZN 115	1 - - - - 6 ZN 215	- 2 - - - 6 ZN 315	- - - - - 6 ZN 415	1 2 - - - 6 ZN 515	1 - - - - 6 ZN 615	- 2 - - - 6 ZN 715	- - - - - 6 ZN 815
1 2 - - - - ZN 116	1 - - - - - ZN 216	- 2 - - - - ZN 316	NOT USED	1 2 - - - - ZN 516	1 - - - - - ZN 616	- 2 - - - - ZN 716	NOT USED

POPEX #1 (D8112G TERM 28)	16	16	16	15	N/A	N/A	N/A	N/A	63
POPEX #2 (D8112G TERM 27)	N/A	N/A	N/A	N/A	16	16	16	15	63

Dash (-) indicates switch is in the OFF or *open* position.

Figure 2: Vertical Mode - POPEX and POPIT Modules

Installation

POPEX Module Installation

The POPEX Module is installed in the D8112G enclosure, and is connected to the control/communicator with a four-conductor cable. For proper POPEX installation, follow the steps below.

1. Align the D8125 POPEX Module with any of the four mounting locations (see Figure 3). Fasten the module in place with the three mounting screws provided.
2. Remove AC and DC power from the D8112G Control/Communicator.
3. Connect D8112G terminal 4 to the POPEX **GND** terminal (see Figure 5).
4. Connect D8112G terminal 3 to the POPEX **AUX** terminal.
5. Connect D8112G terminal 31 to the POPEX **IN** terminal.
6. Installing only *one* POPEX:

   Horizontal Mode: Connect the POPEX **OUT** terminal to the D8112G terminal 28; then go to step 8.

   Vertical Mode: Connect the POPEX **OUT** terminal to the D8112G terminal 27 or 28; then go to step 8. If an Independent Zone Control (IZC) (D279 or D268/D269) is used, it is recommended that the POPEX be connected to terminal 27 on the D8112G2 and the IZC be attached to zone 1, 2, 3, or 4. This will allow you to maximize your COMEX ID Groups 6-8. For information concerning COMEX refer to the *COMEX Program Entry Guide* (part# 74-05073-000).

   Note: If the vertical mode is used, POPEX #2 can be installed without installing POPEX #1.
7. Installing *two* POPEX Modules (in the horizontal **or** vertical mode):

   Repeat steps 3 through 5 for POPEX #2; then connect D8112G terminal 27 to POPEX #2 **OUT** terminal. **Important:** Step 7 is for POPEX #2 only!

Caution

Before powering up the D8112, check terminals 3 and 4 for correct wiring. Reverse polarity WILL damage the POPEX module.

8. Re-connect AC and DC power to the D8112.

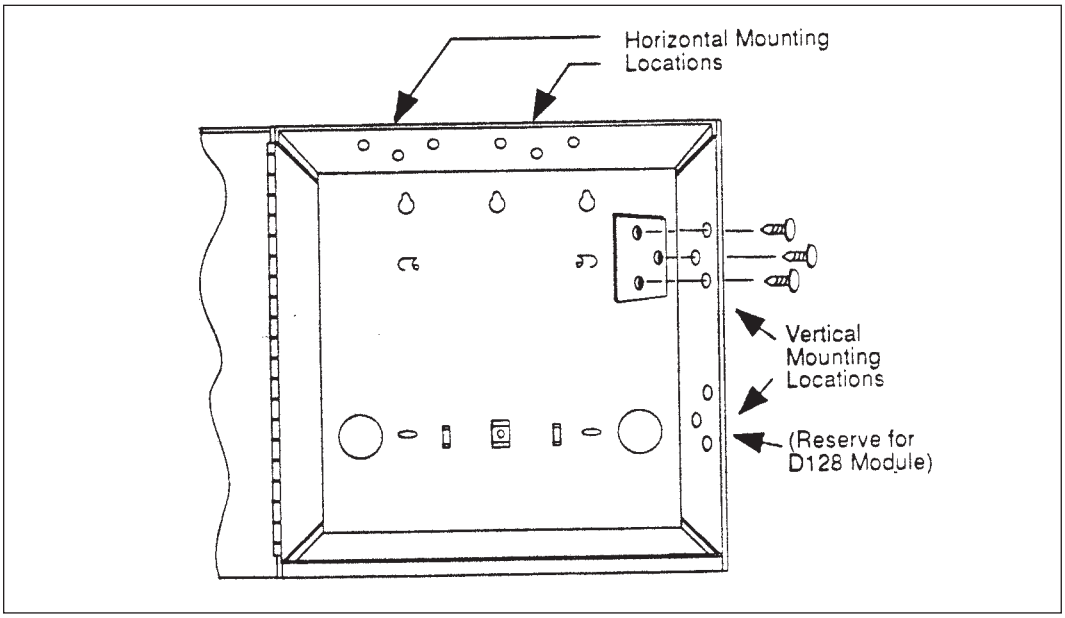


Figure 3: POPEX Installation

POPIT Module Installation

Wiring POPITs to the Expansion Loop

The *zone expansion loop* is a two-conductor wire inter-connecting all POPIT Modules assigned to a single POPEX (see Figure 5). **Up to three zone expansion loops can be connected to one D8125 when using shielded or unshielded cable**.

The required wire gauge for the zone expansion loop(s) (up to three max.) can be determined using Figure 4. When using **unshielded** cable each zone expansion loop can be up to the distance shown in Figure 4. For **shielded** cable the *combined total length* of all zone expansion loops cannot be more than shown in Figure 4.

If it is suspected that AC induction may be a problem, use shielded cable and make sure the POPEX module is grounded to terminal 4 on the D8112G.The shield drain wire should only be attached to ground at terminal 4 (there should only be one ground on the shield). Any splices along the zone expansion loop must have the drain wires soldered together and isolated from ground.

Hint: AC induction or RF interference may occur when a ZONEX system is installed in or near the following:

- Radio station transmitter site or other broadcast station.
- Ham radio transmitter site.
- Computer network system.
- Heavy machinery and motors.
- PBX telephone system.
- Welding shop
- High voltage electrical equipment or transformers.
- Public service (police, fire department, etc.) using radio communications.
- When wires must be run close to electrical lines, fluorescent fixtures or telephone cabling.

POPIT Modules do not need to be wired in any particular order on the zone expansion loop. A switch setting on each POPIT (see **POPIT Module Assignments**) identifies the point of protection, regardless of its physical location. D8126T/D8127T POPIT modules must be mounted at least three inches apart. This will prevent the tamper magnets from interfering with each other.

Important: The POPIT modules should be connected to one another in parallel (see Figure 5).

Maximum Length of Each Zone Expansion Loop

AWG	25 POPITs	40 POPITs	63 POPITs
26	900 ft.	600 ft.	400 ft.
24	1,700	1,000	600
22	2,500	1,500	900
20	3,800	2,400	1,500
18	6,400	4,000	2,500
16	9,600	6,200	4,000
14	16,700	10,000	6,000

Figure 4: Zone Expansion Loop Wiring Specifications

Remember: Up to 63 POPIT modules can be connected to one POPEX module.

1. Connect the positive (**+**) Data terminal from one POPIT to the positive (**+**) Data terminal on the next POPIT.
2. Follow step 1 above to connect all POPITs on the same zone expansion loop.
3. Connect the negative (**-**) Data terminal from one POPIT to the negative (**-**) Data terminal on the next POPIT.
4. Follow step 3 above to connect all POPITs on the same zone expansion loop.

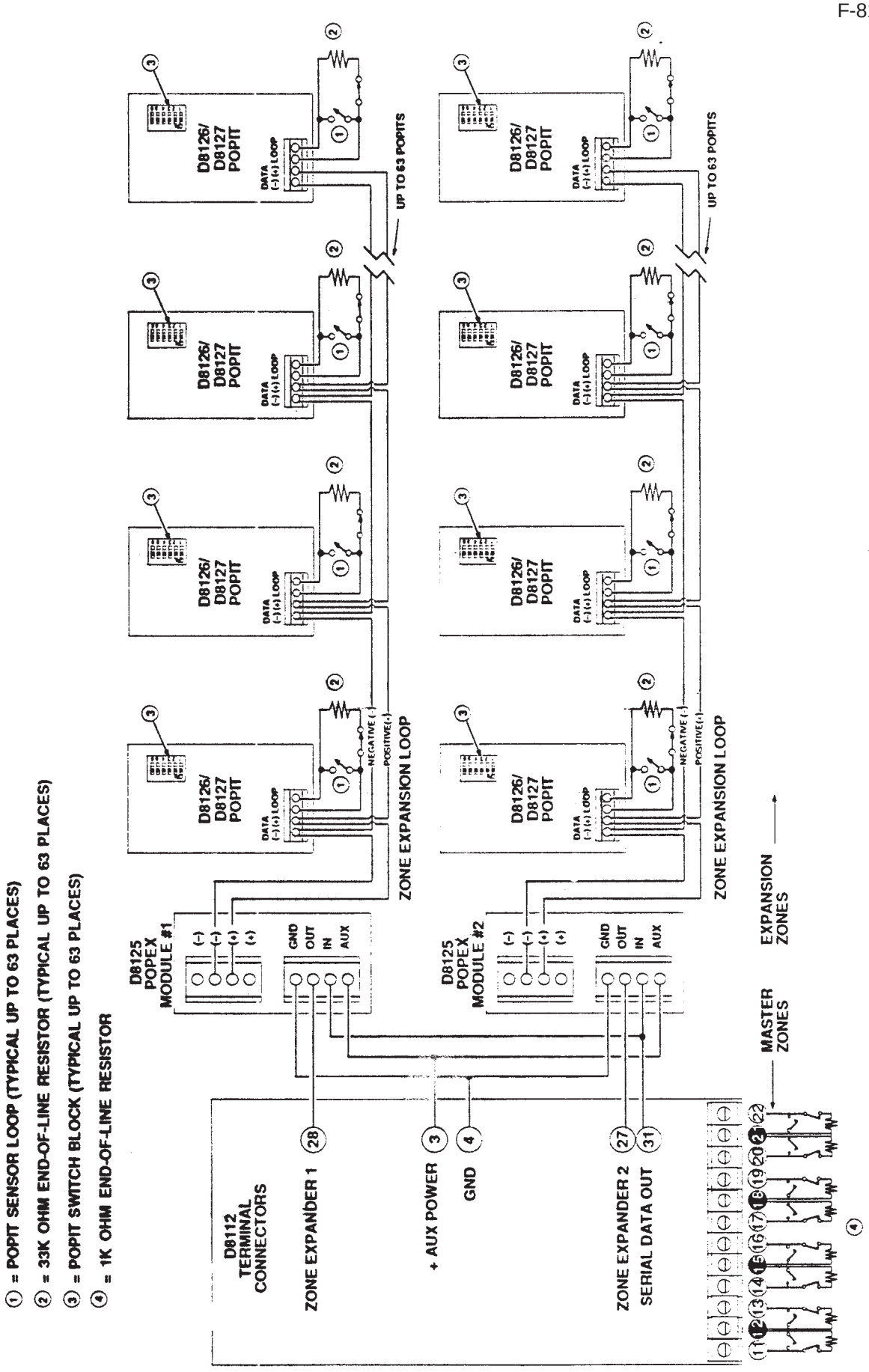


Figure 5: POPEX and POPIT Module Installation

Wiring POPITs to a POPEX Module

Two positive (+) and two negative (-) zone expansion loop terminals are provided on each POPEX Module for wiring convenience.

Important: When using two POPEX Modules, each module must have its own expansion loop (e.g., POPIT Modules assigned to POPEX #1 cannot be placed on the POPEX #2 zone expansion loop). Limit your zone expansion loop coming back to the POPEX module, to a maximum of three data runs.

Remember: Up to 2 POPEX modules can be connected to one D8112G Control/ Communicator.

When connecting the zone expansion loop to the POPEX Module, follow the steps below:

1. Connect the positive (**+**) wire from the zone expansion loop to the POPEX Module positive (**+**) loop input.
2. Connect the negative (**-**) wire from the zone expansion loop to the POPEX Module negative (**-**) loop input.

Wiring POPIT Sensor Loop

Each POPIT Module can supervise an unlimited number of detection devices on its two-wire sensor loop. Each POPIT can monitor normally-open devices wired in parallel, normally-closed devices wired in series, or a combination of devices wired in parallel and series. Open, closed, and normal circuit conditions can be detected and transmitted to the D8112G. A system cannot be armed normally if any of the sensor loops are faulted. (A system with loop faults can be *force-armed*, however.)

All POPIT sensor loops must be terminated with a 33K ohm end-of-line resistor, Radionics Model# D106F, supplied with each POPIT module.

Important: The maximum length of 22AWG cable used for each sensor loop is determined by voltage drop. Radionics recommends the use of twisted-pair wire in all POPEX-POPIT installations. If a noisy or unstable environment is suspected, or if a long sensor loop wire run is used, the cable must be shielded against AC induction. Refer to the AC induction hint in **Wiring POPITs to the Expansion Loop** in this section for more information.

POPIT Module Assignments

Six switches provided on each POPIT assign the module to a D8112G master zone. These switches provide a unique expansion point identification for each POPIT Module . In Figures 1 and 2, numbers indicate which switches must be placed in the ON position for each POPIT. Switches indicated by a dash (-) must be placed in the OFF position.

Programming Notes: The points of protection must be assigned *sequentially*. Example: If 12 points of protection are assigned to master zone 4, the 12 POPITs must have switch settings corresponding to I.D. codes 401 through 412.

POPIT Labels

Four sets of POPIT I.D. labels (similar to Figures 1 and 2) are provided with each POPEX Module. Each set is associated with either POPEX #1 (PX 1) or POPEX #2 (PX 2), and with either the horizontal or vertical mode. In every POPEX/POPIT installation, at least two sets of these labels are NOT used. For example, when installing a vertical mode ZONEX system, all horizontal mode labels should be discarded. If the ZONEX system uses only one POPEX Module, discard all the POPEX #2 labels.

POPIT Labels (cont.)

Important: Do NOT mix the horizontal and vertical labels. The system can be programmed for only *one* mode. Do NOT use both types of labels in the same ZONEX system. A label should be attached to each POPIT Module when the switches are set, thereby preventing duplicate switch settings. Do NOT place labels on POPIT covers, attach them directly to the circuit board. This will help to prevent points from being labeled or set incorrectly.

POPIT Displays

The status of each POPIT Module is transmitted to the D8112G Control/Communicator. The status is recorded and held in the D8112G memory buffer until the system is armed and the exit delay time has expired. The D1252A Command Center displays both the current status and the event memory with a special code. For a complete list of D1252A displays, refer to the *D1252A Security System User's Guide* (part# 71-04415-000).

Here is an example of a POPIT display:

ZN101S2

Memory of Previous Events: The D1252A displays a memory code to annunciate events which have taken place since the system was last armed.

1 = Alarm Memory
2 = Trouble Memory
3 = Alarm and Trouble Memory
4 = Missing Memory
5 = Alarm Memory and Missing
6 = Trouble Memory and Missing
7 = Alarm & Trouble Memory and Missing

Current State of Sensor Loop:

O = Sensor loop electrically open or grounded
S = Sensor loop electrically shorted
(blank) = Sensor loop electrically normal
M = Missing POPIT Module (POPIT is programmed to be in the system, but is not responding to polling)
X = Extra POPIT Module (POPIT is responding to polling, but is not programmed to be in the system)

POPIT Expansion Point: This is the identification number of the Module transmitting the event (ex., point 01).

Master Zone Number: The D8112G master zone number assigned to the POPIT (ex., master zone 100).

Zone: This identifies the display as a POPIT status display.

When an event occurs, the POPIT sends a signal to the Control/Communicator via the POPEX Module. The D8112G decodes the event signal, displays an event status code, and initiates the appropriate system response. The D1252A Command Center can be programmed to display two types of information: programmable and standard. Instructions for programming D1252A Command Center displays are found in the *8112:MAIN Program Entry Guide* (Program Items 105 through 120) and the *8112:PTEXT Program Entry Guide*.

Alarm Condition Displays

When an event occurs in the system (an open or shorted loop) that the D8112G interprets as an alarm, the system initiates an alarm response, and the D1252A sequences through the following displays:

ALARM WATERFLO
- **Programmed** display* (8112:MAIN).
- **Standard** D8112G alarm display.

ZN102S1 RISER#2
- **Programmed** display (8112:PTEXT).
- **Standard** POPIT status code for POPIT #102.

****
(Row of stars.)

Fault Condition Displays

When a loop fault occurs, the following displays can appear on the D1252A (rows of stars separate displays pertaining to individual points of protection):

FAULTED DOORS
- **Programmed** display* (8112:MAIN).
- **Standard** display indicating a faulted condition exists on this zone.

ZN204O FRONT
- **Programmed** display (8112:PTEXT).
- **Standard** POPIT status code for POPIT #204.

****
(Row of stars.)

Trouble Condition Displays

When a loop trouble occurs, the following displays can appear on the D1252A (rows of stars separate displays pertaining to individual points of protection):

SERVICE WINDOWS
- **Programmed** display* (8112:MAIN).
- **Standard** display indicating a troubled zone.

ZN301S2 KITCHEN
- **Programmed** display (8112:PTEXT).
- **Standard** POPIT status code for POPIT #301.

****
(Row of stars.)

NOT READY TO ARM **Standard** display indicating an abnormal loop condition.

* This programmed display will appear for all points on this master zone.

Central Station Reports

Pulse and BFSK Reporting

When a POPIT initiates an alarm or trouble report, the D8112G transmits the reports indicating the D8112 master zone tripped. Two POPIT reports to the central station (in addition to alarm, trouble, and restral reports for each master zone) are supported.

`TROUBLE ZONE D` indicates a "missing" POPIT condition.

`RESTORAL ZONE D` indicates that a "missing" POPIT condition has been resolved.

These reports may be followed by a `TROUBLE ZONE #` or `RESTORAL ZONE #` report, which indicates the master zone assignment of the missing POPIT.

Modem II Reporting

Only D8112G2 supports *expanded* POPIT reports (such as POPIT alarm reports) using Modem II format reporting.

Trouble Reports

When ZONEX is used on a 24 hour master zone or a controlled point in the disarmed state, and a missing condition occurs, the following report is printed out on the D6500 Receiver tape:

```
ACCT 1234 TROUBLE  ZN   D
ACCT 1234 TROUBLE* ZN 101
```

* Indicates that this point is "Missing"

Restoral Reports

When the point is restored from the missing condition, the following report will be printed out on the D6500 Receiver tape:

```
ACCT 1234 RESTORAL ZN   D
ACCT 1234 RESTORAL ZN 101
```

When multiple points on the same master zone go into any trouble condition, **all** of the points on the master zone must be returned to normal before individual restoral reports are sent to the D6500 receiver. A "`RESTORAL ZONE D`" will, however, be sent when the backbone itself has restored.

Missing Reports (Multiple)

If multiple points assigned to the same master zone go into a missing condition while in the disarmed state, the following reports are printed out on the D6500 Receiver tape:

```
ACCT 1234 TROUBLE* ZN   D
ACCT 1234 TROUBLE* ZN 103
ACCT 1234 TROUBLE* ZN 102
ACCT 1234 TROUBLE* ZN 101
```

* Indicates that this point is "Missing"

Armed Controlled Zone Points

If the D8112G2 is armed, a missing report would be printed out on the D6500 Receiver tape as follows:

```
ACCT 1234 TROUBLE  ZN   D
ACCT 1234 ALARM*   ZN 101
```

* Indicates that this point is "Missing"

When multiple points on the same master zone go into any alarm condition, **all** of the points on the master zone must be returned to normal before individual restoral reports are sent to the D6500 receiver. A "`RESTORAL ZONE D`" will, however, be sent when the expansion loop itself has restored.

A complete list of reports received by the D6500 Receiver can be found in the *D6500 Report Directory* (part#74-04651-001).

Local Status Test

Operation

While disarmed, the security system status can be checked by entering COMMAND 44 at the D1252A Command Center. This command also initiates a system walk test (described in the *D1252A Security System User's Guide*) as part of the status test. Each point of protection is polled as the D8112G interrogates its eight master zones. The D1252A Command Center displays two small "bird feet" that "hop" across the screen to indicate that a master zone is under interrogation.

If the D8112G contains an event (either a current event or an event in memory), the "bird feet" display is replaced by the event held in memory (see **POPIT Displays** in the **Installation** section). Events begin to accumulate each time the system is armed. System events can be cleared from the D8112G memory by arming the system and allowing the exit time to expire or disable/restart the D8112G.

If a programmed point of protection does not respond to the polling interrogation, a "missing" POPIT condition is displayed (see **POPIT Displays** in the **Installation** section). An "extra" POPIT display indicates that the ZONEX program does not recognize a POPIT Module transmission. Press any key on the D1252A Command Center to end the test.

Missing and Extra POPIT Modules

"Missing" and "extra" POPIT conditions are typically caused by installation or programming errors. In a properly functioning system, all POPIT Modules which are installed are assigned to the appropriate master zone in the ZONEX sub-handler program file. Figure 6 illustrates a system with six POPITs assigned to each of the first five master zones.

PROGRAMMED	INSTALLED
2.5 Z1POINTS 6	*MASTER ZONE 1: 6*
2.6 Z2POINTS 6	*MASTER ZONE 2: 6*
2.7 Z3POINTS 6	*MASTER ZONE 3: 6*
2.8 Z4POINTS 6	*MASTER ZONE 4: 6*
2.9 Z5POINTS 6	*MASTER ZONE 5: 6*
2.10 Z6POINTS 00	
2.11 Z7POINTS 00	
2.12 Z8POINTS 00	

Figure 6: Operative ZONEX System

Figure 7 illustrates a system with six POPITs assigned in programming to each of five master zones in the ZONEX program file, and only *five* POPITs installed for master zone 5. A "missing" POPIT condition will be displayed when COMMAND 44 is entered in the D1252A. If the POPIT is assigned to a D8112G protective zone programmed for *controlled zone* response (burglary) and the D8112G is armed, the "missing" POPIT condition causes a system alarm. If the D8112G is disarmed, the system goes into a trouble condition. If the POPIT is assigned to a D8112G protective zone programmed for *24 hour* zone response (fire, panic, hold-up, etc.) the "missing" POPIT indicates a trouble condition.

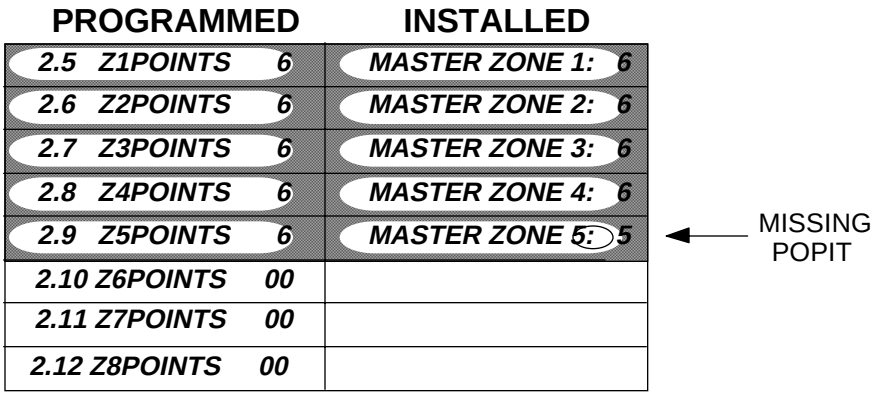


Figure 7: Missing POPIT

Figure 8 illustrates a system with six POPITs assigned in programming to each of five master zones, and *seven* POPITs installed for master zone 5. An "extra" POPIT condition will be displayed when COMMAND 44 is entered at the D1252A. The "extra" POPIT condition is annunciated only through the D1252A Command Center, and does not initiate a report to the central station.

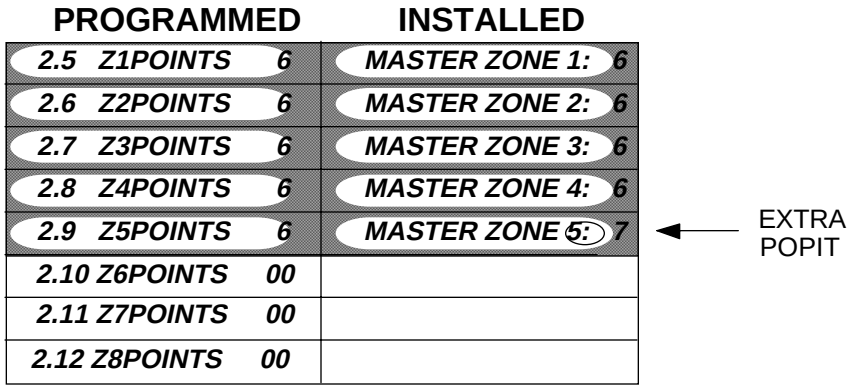


Figure 8: Extra POPIT

If six POPITs are assigned in programming to each of five master zones, and one POPIT has erroneous switch settings (Figure 9), master zone 5 appears to have only *five* POPITs installed, and master zone 7 (which has *no* POPITs assigned in programming) appears to have *one* POPIT installed. Both "missing" and "extra" POPIT conditions will be displayed on the D1252A.

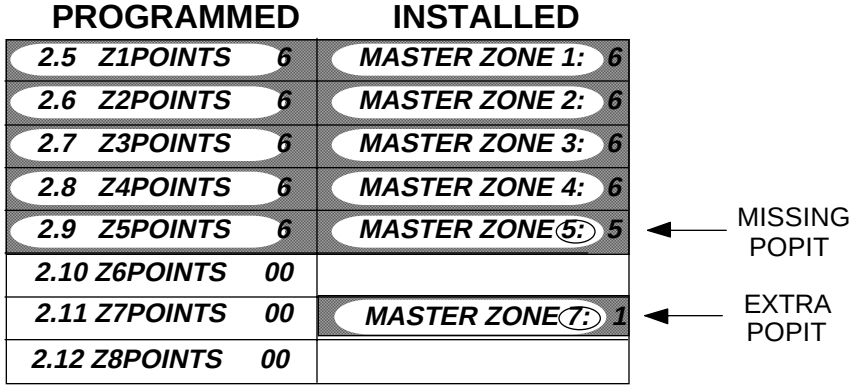


Figure 9: POPIT Switch Setting Error

Figure 10 also displays a system containing one POPIT with erroneous switch settings. Both "missing" and "extra" POPIT conditions will be displayed on the D1252A after entering a Command 44.

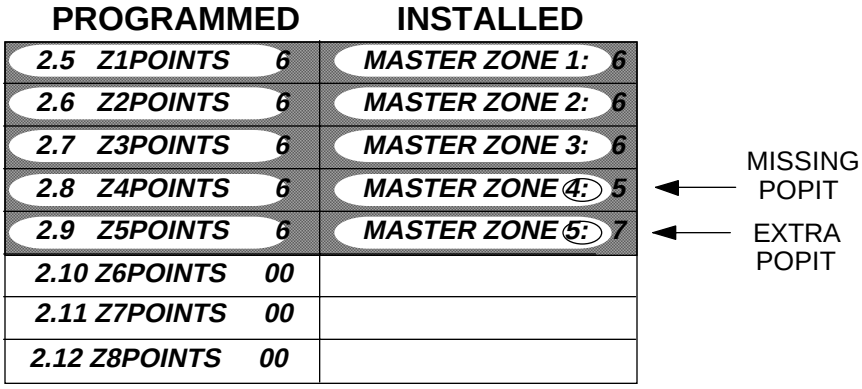


Figure 10: POPIT Switch Setting Error

If an extra POPIT is installed the system will indicate that it is *READY TO ARM*. The "extra" POPIT message will only be displayed when COMMAND 44 is entered at the D1252A (see Figure 11). Non-normal conditions in all POPITs assigned to the master zone with the extra POPIT may not be correctly reported as opens or shorts to the D8112G. If all POPITs assigned to this master are normal, however, a normal condition will be correctly reported.

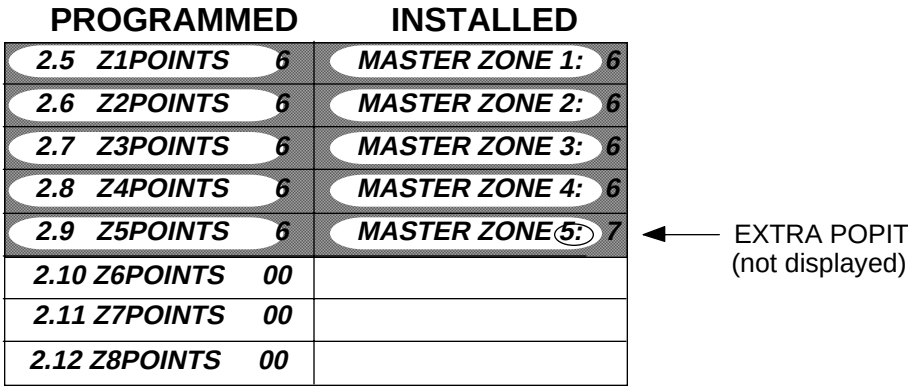


Figure 11: Extra POPIT Installed

If a POPIT is assigned to the wrong master zone, and it has the *same switch settings* as a POPIT in that master zone, the "missing" POPIT condition will be indicated but the "extra" POPIT will NOT be displayed (see Figure 12). Although the installations described in Figures 10 and 12 are similar, Figure 10 will display the "extra" POPIT condition because all POPIT switch settings assigned to master zone 5 are *unique*. In Figure 12, the "extra" POPIT condition is not displayed due to the *duplication* of switch settings.

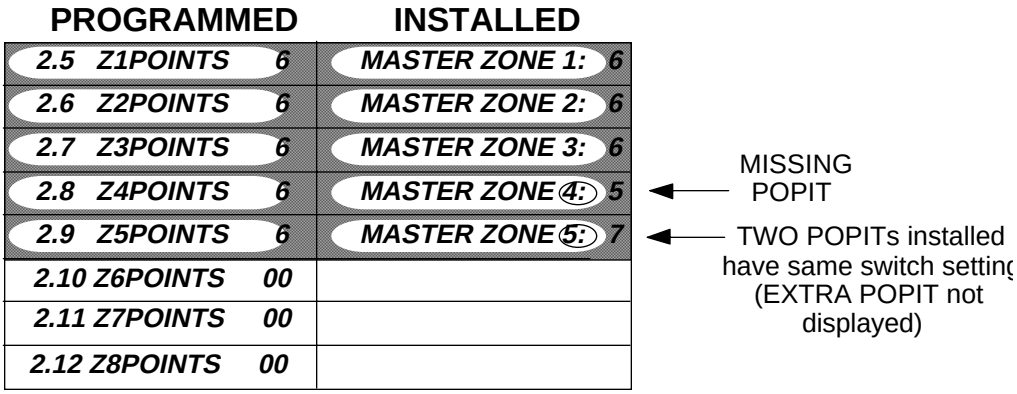


Figure 12: POPIT Switch Setting Error

Troubleshooting Guide

Introduction

This guide is provided to aid in correcting problems with installed POPEX and POPIT Modules. To prevent problems from occurring, read all of the pertinent documentation (*8112:MAIN* and *8112:AUX Program Entry Guides*, *8112:PTEXT Program Entry Guide* if an D1252A display is used, and the previous sections of this manual), and verify that the product handler programs are at the following revision levels (or higher): 8112:MAIN **A7**, 8112:AUX **B1**, 8112:PTEXT **A5**.

D1252A POPIT Activity

If the D1252A Command Center *does not* display POPIT activity:

1. Verify 8112:MAIN product handler program items *122 ExRAM* and *123 16ChDisp* are both programmed **Yes**.
2. Verify 8112:AUX product handler program item *2.1 ZONEX* is programmed **Yes**.
3. Verify that the revision level of the 8112:AUX product handler is **B1** or higher. If you are not sure what revision level of the 8112:AUX product handler was loaded into the panel:
   - Verify that you D5100 programmer contains the 8112:AUX.B1 or higher product handler.
   - Disconnect terminals 30 and 31 from the D8112.
   - Copy the 8112:AUX file out of the D8112.
   - Re-Load the same 8112:AUX file into the D8112.
   - Be sure to perform a disable/restart on the D8112 (momentarily connect terminal 32 to terminal 29) before or after programming or copying.
4. Verify the assignments of POPIT Modules to master zones in the 8112:AUX Product Handler program items *2.5 Z1Points* through *2.12 Z8Points*.
5. Verify that 8112:AUX Product Handler program item *6.1 MLogEN* is **Yes**.

Missing POPIT Modules

If the D1252A Command Center displays a “missing POPIT” status code (Example: ZN101**M**6):

1. Check the programming of horizontal or vertical mode *2.2 Hrzntl* (**Yes**/**No**) in the 8112:AUX product handler.
2. Verify that the appropriate vertical or horizontal switch setting chart was used (see Figures 1 and 2), and that the POPIT switch settings are correct (refer to **POPIT Module Installation**).
3. Verify the assignments of POPIT Modules to master zones in the 8112:AUX product handler program items *2.5 Z1Points* through *2.12 Z8Points*.

   NOTE: If all 126 points of protection are used in the horizontal mode, *2.12 Z8Points* must be programmed with a **15**.
4. Check the wiring of the POPEX Module to the D8112 Control/Communicator (refer to **POPEX Module Installation**, see Figure 5).
5. Meter the data terminals of each POPIT to verify correct polarity (refer to **POPIT Module Installation**), and a voltage of 9VDC to 13VDC.

Missing POPIT Modules (cont.)

6. Meter the positive (+) and negative (-) data terminal wires (disconnected from the POPEX) to verify that they are not shorted or grounded.
7. Check the wire gauge (refer to **POPIT Module Installation**). Proper wire gauge is determined by the length of the wire run and the number of POPITS installed on the POPEX. Compare the system wiring runs to the recommended wiring chart in Figure 4. To determine the maximum resistance between each POPIT and its corresponding POPEX:
   1). Disconnect the Zone Expansion Loop from the POPEX.
   2). Prior to installing the POPITs, twist the two Zone Expansion Loops together and measure the resistance with a volt-ohm meter. Maximum resistance should not be greater than 90ý.
   3). After installing the POPITs, meter the backbone wires. The resistance on the backbone should be equal to 920Ký divided by the number of POPITs on the wire (±20%). Each POPIT = 920Ký resistance (±20%).
8. If *all* points in the ZONEX system are missing, verify that the points of protection labeled *DO NOT ENABLE* in Figures 1 and 2 are *not* assigned to a POPIT.
9. If further difficulties are encountered, replace the appropriate POPEX or POPIT Module.
10. Check the tamper switch on the D8126T/D8127T to make sure it is operating properly. D8126T/D8127T POPIT modules should be installed at least three inches away from each other. This prevents the magnets from interfering with each other.
11. If shielded cable was installed, check that there is not more than one ground on the shield. Shielded cable should be grounded **only** to terminal 4 at the D8112. Verify by removing the drain wire from terminal 4 and metering between terminal 4 and the drain wire. If continuity is found, search for the foreign ground on the drain wire.

Extra POPIT Modules

If the D1252A Command Center displays an “extra POPIT” status code (e.g., ZN101**X**6) during a Command 44:

1. Check the programming of horizontal or vertical mode in the 8112:AUX product handler program item *2.2 Hrzntl* (**Yes**/**No**)
2. Verify that the appropriate vertical or horizontal switch setting chart was used (see Figures 1 and 2), and that the POPIT switch settings are correct.
3. Verify that each POPIT connected to the same POPEX Module has a *unique* switch setting (refer to **POPIT Module Installation**).
4. Verify the assignments of POPIT Modules to master zones in the 8112:AUX product handler program items *2.5 Z1Points* through *2.12 Z8Points.*

Additional Troubleshooting Tips

If you have determined that there are no missing or extra POPIT Modules and the problem has still not been solved,one of the following troubleshooting tips may provide you with additional help.

1. Before loading or copying a file into the Control/Communicator, always disconnect the wiring from D8112G **Serial Data In** and **Serial Data Out** terminals (**30** and **31**).

Additional Troubleshooting Tips (cont.)

2. ZONEX systems can be influenced by very strong R.F. sources, such as radio stations and HAM radio operations with transmitting antennas located within one mile of the system. Use shielded twisted pair wire for best protection against R.F. induced noise.
3. If the system intermittently displays a trouble condition, and transmits Trouble Zone D and Restoral Zone D reports with master zone number to the central station, meter the Zone Expansion Loop wired to the POPITs for high level AC inductance or spikes. Inspect the wiring for intermittent grounds and shorts, and determine if there is a strong AC source located nearby. AC induction on the data line must be less than 0.1VAC.
4. If the D1252A displays non-programmed information when a master zone is faulted, copy the 8112:PTEXT file for the non-expanded zone displaying the information, delete the information, and reload the file.
5. If some POPITs are missing and some POPITs are present on the same Zone Expansion Loop, check the polarity of the data loop connecting the “missing” POPITs. POPITs with reversed polarity cannot be polled by the D8112G.
6. Certain revision 17.07 D8112G Control Communicators may not detect POPIT faults even when all programming and wiring has been properly completed. Radionics has developed two solutions to this problem:
   1). Restore all POPITs to a normal condition (close all doors and windows), and then disable and restart the system.
   2). Fault a POPIT into a trouble condition (as determined by the master zone code). The D1252A Command Center displays the faulted condition and the system responds to the POPITs.
   3). If unable to resolve the problem, contact Radionics’ Technical Support.
7. Keep all Zone Expansion Loops away from all AC current sources (fluorescent lights, high-voltage transformers, motors, etc.) or sources of RF interference. AC induction or RF interference may occur when a ZONEX system is installed in or near the following:
   - Radio station transmitter site or other broadcast station.
   - Ham radio transmitter site.
   - Computer network system.
   - Heavy machinery and motors.
   - PBX telephone sytem.
   - Welding shop
   - High voltage electrical equipment or transformers.
   - Public service (police, fire department, etc.) using radio communications.
   - When wires must be run close to electrical lines, fluorescent fixtures or telephone cabling.
8. If shielded cable is used, verify that the drainwire is connected only to terminal 4 on the D8112. Verify that each splice on the shielded backbone has the drainwires soldered together and isolated from ground.

Specifications

Operating Voltage

D8125: 10.5-14VDC supplied by the D8112G Control/ Communicator.

D8126/D8127: 7-15VDC supplied by the POPEX Module.

Current

D8125: 50mA per POPEX Module + POPIT current.

D8126/D8127: 2.5mA per POPIT Module

Operating Temperature Range

32°F - 122°F (0°C - 50°C), 86% Relative Humidity.

Resistance

Maximum increase of resistance on the POPIT Loop is 1000ý. Maximum resistance between the POPEX Module and any POPIT is 90ý.

Sensor Loop Response Time

Approximately 1 second

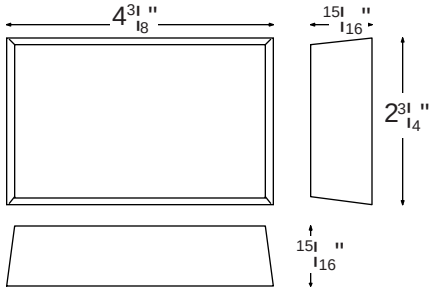
POPIT sensor loops are supervised with a 33Ký end-of-line resistor: Radionics model# D106F.

Loop Condition Voltages

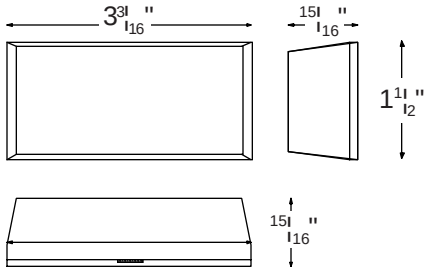
Open: 12VDC
Normal: 6VDC
Shorted: 0VDC
Panel responds to a grounded loop as an open condition.

Dimensions

D8125 module: 5"L x 2 7/8"W x 3/4"H
D8126 enclosure:



D8127 enclosure:



U.L. Applications

The control panel enclosure and POPIT modules required for specific UL or NFPA ZONEX system applications are listed below. The D8108A Attack-Resistant Enclosure meets or surpasses the requirements for all of these applications. Any mercantile combination fire and burglar system must use the model D8126T/D8127T POPIT Module. Refer to UL 681 "Installation and Classification of Mercantile and Bank Burglar Alarm Systems" for further details on installation requirements.

Application	Control Enclosure	D8126/D8127 Model
Residential		
UL Household Fire/NFPA74	D8103	U or T
UL Household Burglar	D8103	U or T
Commercial		
UL Local Burglar/Police Connected Burglar	D8108A	T*
UL Central Station Burglar Grade C	D8103	T*
UL Central Station Burglar Grades B & A	D8108A	T*
UL Local Fire/NFPA 72 (chap. 6)	D8109	U or T
UL Central Station Fire/NFPA 71	D8109	U or T
UL Remote Station Fire/NFPA 72 (chap. 8)	D8109	U or T
UL Electrically Activated Transmitter	D8109	U or T

* A model "U" POPIT mounted within a tampered enclosure can be used in place of a model "T" POPIT.

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