R A D I O N I C S

Omegalarm Zone Expansion

D8125 POPEX and D8126 POPIT
Operation and Installation Manual

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1. Introduction

The D8125 POPEX and D8126 POPIT Modules are hardware accessories for the Radionics Zone Expansion (ZONEX) concept. The D8125 POPEX Module is a Point Of Protection EXpander. One or two POPEX Modules can be used to interface zone expansion loops to the D8112G. Each POPEX Module can monitor up to 63 D8126 POPIT (Point Of Protection Input Transponder) 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 each *loop.*

POPEX/POPIT application programs are developed using 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. *The POPEX/POPIT Modules will not function with the D8112"E" Control/Communicator.* The D8112G contains the ZONEX firmware, and has expanded memory for custom ZONEX text displays on the Radionics Alpha Command Center. (Custom Alpha 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.

The POPEX and POPIT Modules are U.L. listed for Local or Police Connected Burglar Alarm, Central Station Burglar Alarm, Household Burglar Alarm, Central Station Fire (NFPA 71), Local Fire (NFPA 72A), Household Fire (NFPA 74), and Electrically Activated Transmitter applications. Several enclosures are available to house the Modules: the D8103, the D8108A, and the D8109. See "U.L. Applications" in the Specifications section of this manual to determine the appropriate enclosure for the application.

2. Operation

Each POPIT Module is assigned to report to a D8112G Control/Communicator "master zone". The POPIT can transmit several sensor loop conditions to the D8112G, such as: sensor loop alarm, sensor loop trouble, sensor loop open, sensor loop shorted, sensor loop normal, missing POPIT Module, and extra POPIT Module. The D8112G "master zone" code program (see 8112:MAIN Program Entry Guide) determines the system response to each of these sensor loop conditions. When an event occurs on a POPIT, the Alpha 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.

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

If *two* POPEX Modules are installed, all points of protection are available. The only difference between the modes is the location of the two *"NOT USED"* areas.

The I.D. codes which appear in Figures 1 and 2 indicate the master zone assignment and expansion point of each POPIT, and are used to cross-reference the POPIT Module to an event displayed on the Alpha Command Center. For example, in the I.D. code *ZN105,* "ZN1" indicates that the POPIT is assigned to master zone 1 of the D8112G Control/Communicator, and "05" indicates that the POPIT reports as expansion point #5.

ZN105
Master Zone ——⌐ ⌐—— Point of Protection (assigned to Master Zone)

Figures 1 and 2 display all POPIT assignments for both the horizontal and vertical modes. 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. Switches provided on each POPIT Module assign each point of protection to a master zone (see **POPIT Module Assignments** for switch settings).

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

- Up to 8 POPITs can be assigned to each D8112G master zone.
- All 8 zones of the D8112G can be used in the ZONEX system.
- Only 7 POPITs can be assigned to D8112G 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 each D8112G master zone.
- POPEX #1 assigns a maximum of 8 POPITs to a D8112G zone.
- POPEX #2 also assigns a maximum of 8 POPITs to a D8112G zone.
- Only 14 POPITs can be assigned to D8112G zone 8 (7 POPITs on POPEX #1 and 7 POPITs on POPEX #2).
- A maximum of 126 POPITs can be installed.

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

- Up to 16 POPITs can be assigned to each D8112G master zone.
- 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).
- 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 each D8112G master zone.
- 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.

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
POPEX 1 (D8112G TERMINAL 28)	654321 ZN 101	654-21 ZN 201	6543-1 ZN 301	654--1 ZN 401	65432- ZN 501	654-2- ZN 601	6543-- ZN 701	654--- ZN 801
	-54321 ZN 102	-54-21 ZN 202	-543-1 ZN 302	-54--1 ZN 402	-5432- ZN 502	-54-2- ZN 602	-543-- ZN 702	-54--- ZN 802
	6-4321 ZN 103	6-4-21 ZN 203	6-43-1 ZN 303	6-4--1 ZN 403	6-432- ZN 503	6-4-2- ZN 603	6-43-- ZN 703	6-4--- ZN 803
	--4321 ZN 104	--4-21 ZN 204	--43-1 ZN 304	--4--1 ZN 404	--432- ZN 504	--4-2- ZN 604	--43-- ZN 704	--4--- ZN 804
	65-321 ZN 105	65--21 ZN 205	65-3-1 ZN 305	65---1 ZN 405	65-32- ZN 505	65--2- ZN 605	65-3-- ZN 705	65---- ZN 805
	-5-321 ZN 106	-5--21 ZN 206	-5-3-1 ZN 306	-5---1 ZN 406	-5-32- ZN 506	-5--2- ZN 606	-5-3-- ZN 706	-5---- ZN 806
	6--321 ZN 107	6---21 ZN 207	6--3-1 ZN 307	6----1 ZN 407	6--32- ZN 507	6---2- ZN 607	6--3-- ZN 707	6---- ZN 807
	---321 ZN 108	----21 ZN 208	---3-1 ZN 308	-----1 ZN 408	---32- ZN 508	----2- ZN 608	---3-- ZN 708	NOT USED
POPEX 2 (D8112G TERMINAL 27)	654321 ZN 109	654-21 ZN 209	6543-1 ZN 309	654--1 ZN 409	65432- ZN 509	654-2- ZN 609	6543-- ZN 709	654--- ZN 809
	-54321 ZN 110	-54-21 ZN 210	-543-1 ZN 310	-54--1 ZN 410	-5432- ZN 510	-54-2- ZN 610	-543-- ZN 710	-54--- ZN 810
	6-4321 ZN 111	6-4-21 ZN 211	6-43-1 ZN 311	6-4--1 ZN 411	6-432- ZN 511	6-4-2- ZN 611	6-43-- ZN 711	6-4--- ZN 811
	--4321 ZN 112	--4-21 ZN 212	--43-1 ZN 312	--4--1 ZN 412	--432- ZN 512	--4-2- ZN 612	--43-- ZN 712	--4--- ZN 812
	65-321 ZN 113	65--21 ZN 213	65-3-1 ZN 313	65---1 ZN 413	65-32- ZN 513	65--2- ZN 613	65-3-- ZN 713	65---- ZN 813
	-5-321 ZN 114	-5--21 ZN 214	-5-3-1 ZN 314	-5---1 ZN 414	-5-32- ZN 514	-5--2- ZN 614	-5-3-- ZN 714	-5---- ZN 814
	6--321 ZN 115	6---21 ZN 215	6--3-1 ZN 315	6----1 ZN 415	6--32- ZN 515	6---2- ZN 615	6--3-- ZN 715	6----- ZN 815
	---321 ZN 116	----21 ZN 216	---3-1 ZN 316	-----1 ZN 416	---32- 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

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
654321 ZN101	6543-1 ZN 201	65432- ZN 301	6543-- ZN 401	654321 ZN 501	6543-1 ZN 601	65432- ZN 701	6543-- ZN 801
-54321 ZN102	-543-1 ZN 202	-5432- ZN 302	-543-- ZN 402	-54321 ZN 502	-543-1 ZN 602	-5432- ZN 702	-543-- ZN 802
6-4321 ZN 103	6-43-1 ZN 203	6-432- ZN 303	6-43-- ZN 403	6-4321 ZN 503	6-43-1 ZN 603	6-432- ZN 703	6-43-- ZN 803
--4321 ZN 104	--43-1 ZN 204	--432- ZN 304	--43-- ZN 404	--4321 ZN 504	--43-1 ZN 604	--432- ZN 704	--43-- ZN 804
65-321 ZN 105	65-3-1 ZN 205	65-32- ZN 305	65-3-- ZN 405	65-321 ZN 505	65-3-1 ZN 605	65-32- ZN 705	65-3-- ZN 805
-5-321 ZN 106	-5-3-1 ZN 206	-5-32- ZN 306	-5-3-- ZN 406	-5-321 ZN 506	-5-3-1 ZN 606	-5-32- ZN 706	-5-3-- ZN 806
6--321 ZN 107	6--3-1 ZN 207	6--32- ZN 307	6--3-- ZN 407	6--321 ZN 507	6--3-1 ZN 607	6--32- ZN 707	6--3-- ZN 807
---321 ZN 108	---3-1 ZN 208	---32- ZN 308	---3-- ZN 408	---321 ZN 508	---3-1 ZN 608	---32- ZN 708	---3-- ZN 808
654-21 ZN 109	654--1 ZN 209	654-2- ZN 309	654--- ZN 409	654-21 ZN 509	654--1 ZN 609	654-2- ZN 709	654--- ZN 809
-54-21 ZN 110	-54--1 ZN 210	-54-2- ZN 310	-54--- ZN 410	-54-21 ZN 510	-54--1 ZN 610	-54-2- ZN 710	-54--- ZN 810
6-4-21 ZN 111	6-4--1 ZN 211	6-4-2- ZN 311	6-4--- ZN 411	6-4-21 ZN 511	6-4--1 ZN 611	6-4-2- ZN 711	6-4--- ZN 811
--4-21 ZN 112	--4--1 ZN 212	--4-2- ZN 312	--4--- ZN 412	--4-21 ZN 512	--4--1 ZN 612	--4-2- ZN 712	--4--- ZN 812
65--21 ZN 113	65---1 ZN 213	65--2- ZN 313	65---- ZN 413	65--21 ZN 513	65---1 ZN 613	65 --2- ZN 713	65---- ZN 813
-5--21 ZN 114	-5---1 ZN 214	-5--2- ZN 314	-5---- ZN 414	-5--21 ZN 514	-5---1 ZN 614	-5---2- ZN 714	-5---- ZN 814
6---21 ZN 115	6----1 ZN 215	6---2- ZN 315	6----- ZN 415	6---21 ZN 515	6----1 ZN 615	6---2- ZN 715	6----- ZN 815
----21 ZN 116	-----1 ZN 216	----2- ZN 316	NOT USED	----21 ZN 516	-----1 ZN 616	----2- ZN 716	NOT USED

POPEX #1 (D8112 TERM 28)	16	16	16	15					63
POPEX #2 (D8112 TERM 27)					16	16	16	15	63

Figure 2: VERTICAL MODE - POPEX AND POPIT MODULES

3. Installation

Installing the POPEX Module
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, checking off each section as it is completed.

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) Disable the D8112G Control/Communicator by connecting terminals 29 and 32 with a wire.

√1[ ] 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) If installing only *one* POPEX Module in the system, connect D8112G terminal 28 to the POPEX "OUT" terminal; then go to step 8. If installing *two* POPEX Modules in the system, repeat steps 3 through 5 for POPEX #2; then go to step 7.
7) Connect D8112G terminal 27 to POPEX #2 "OUT" terminal. **NOTE:** Step 7 is for POPEX #2 only!!
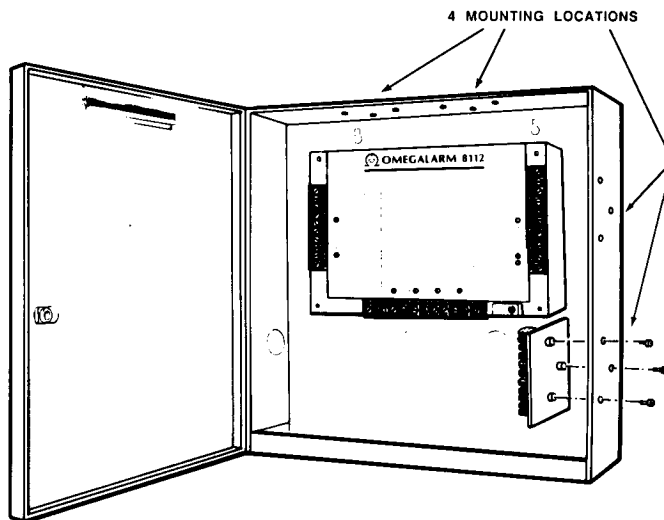8) Remove the wire between D8112G terminals 29 and 32.

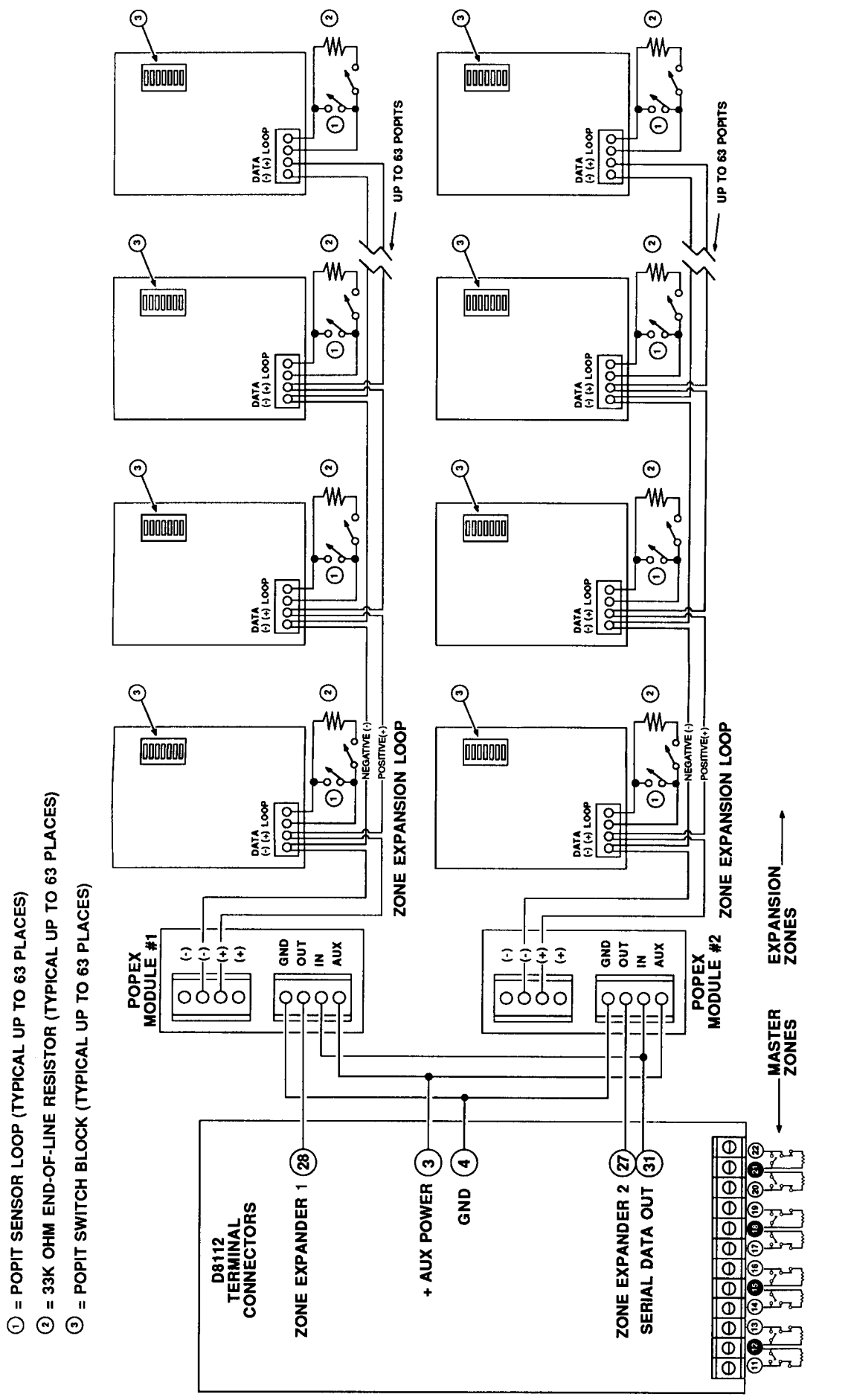**Figure 3: POPEX INSTALLATION**

Installing the POPIT Module
The *zone expansion loop* is a two-conductor wire connecting all POPIT Modules assigned to a single POPEX (see Figure 7). Two positive (+) and two negative (-) zone expansion loop terminals are provided on each POPEX Module for wiring convenience. When connecting the zone expansion loop to the POPEX Module, the positive

√2[ ] (+) wire from the zone expansion loop must be connected to the POPEX Module positive (+) loop input. The negative (-) wire from the zone expansion loop must be connected to the POPEX Module negative (-) loop input.

IMPORTANT: When using two POPEX Modules in the ZONEX system, two expansion loops must be used. POPIT Modules assigned to POPEX #1 cannot be placed on the POPEX #2 zone expansion loop.

POPIT Modules do not need to be wired in any particular order on the zone expansion loop. A switch setting on
√3[ ] each POPIT (see POPIT Module Assignments) identifies the point of protection, regardless of its physical location. The required wire gauge for the zone expansion loop can be determined using Figure 4. A method for calculating the minimum wire gauge required for specific applications is described in the technogram: *Calculating Zone Expansion Loop Wire Gauge.*

	Maximum Length of 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 WIRE SPECIFICATIONS

FIGURE 5: POPEX AND POPIT MODULE INSTALLATION

① = POPIT SENSOR LOOP (TYPICAL UP TO 63 PLACES)

② = 33K OHM END-OF-LINE RESISTOR (TYPICAL UP TO 63 PLACES)

③ = POPIT SWITCH BLOCK (TYPICAL UP TO 63 PLACES)

POPIT Sensor Loops

√4[ ] 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 normally armed 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# D106B, or #D106F (for fire installations).

IMPORTANT: The maximum length of 22AWG cable used for each sensor loop is determined by noise pick-up. Radionics recommends the use of twisted-pair wire in all POPEX-POPIT installations. When using long sensor loop wire runs, the cable must be shielded against AC induction. If a noisy or unstable environment is suspected, shielded cable is recomended.

POPIT Module Assignments

√5[ ] 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 which reports to the same master zone. 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. Each POPIT that reports to a particular POPEX must have a unique switch setting, and only switches numbered 1 through 6 should be used (switch 7 is not functional, and can be set in either position).

Programming Notes: If more than one POPIT is assigned to the same master zone, the points of protection must be assigned *sequentially*. Example: If 12 points of protection are assigned to master zone 4, the12 POPITs must have switch settings corresponding to I.D. codes 401 through 412. If all 126 points of protection are used in the horizontal mode, *2.12 Z8Points* in the ZONEX sub-handler program file should be programmed with a **15**, since the highest numbered point of protection is ZN815.

POPIT Labels

√6[ ] 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.

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.

4. POPIT Displays

The current status of each POPIT Module is transmitted to the D8112G1 Control/Communicator, and is recorded in memory for future reference. The Alpha Command Center displays both the current status and the event memory with a special code.

Here is an example of a POPIT display:

ZN101S2

Memory of Previous Events: The Alpha 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
S = Sensor loop electrically closed (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.

Master Zone Number: The D8112G1 master zone number assigned to the POPIT.

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 D8112G1 decodes the event signal, displays an event status code, and initiates the appropriate system response. The Alpha Command Center can be programmed to display two types of information: programmable and standard. Instructions for programming Alpha 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 Conditions

When an event occurs in the system (an open or shorted loop) that the D8112G1 interprets as an alarm, the system initiates an alarm response, and the Alpha sequences through the following displays:

ALARM WATERFLO

Programmed display (8112:MAIN).

Standard D8112G1 alarm display.

ZN102S1 RISER#2

Programmed display (8112:PTEXT).

Standard POPIT status code for POPIT #102.

Trouble and Fault Conditions

When a loop fault occurs, the following displays can appear on the Alpha (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.

ZN102O1 FRONT

                    Programmed display (8112:PTEXT).

                    Standard POPIT status code for POPIT #102.

*************   (Row of stars.)

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

SERVICE WINDOWS

                    Programmed display (8112:MAIN).

                    Standard display indicating a faulted zone.

ZN301S1 KITCHEN

                    Programmed display (8112:PTEXT).

                    Standard POPIT status code for POPIT #102.

*************   (Row of stars.)

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

5. Central Station Reports

The POPEX and POPIT Modules do not affect D8112G1 Control/Communicator standard central station reports. When a POPIT initiates an alarm or trouble report, the D8112G1 transmits the message indicating the D8112 master zone tripped (if programmed for expanded reporting). Two POPIT reports to the central station (in addition to alarm, trouble, and restoral 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 are followed by a "TROUBLE ZONE #" or "RESTORAL ZONE #" report, which indicates the master zone assignment of the missing POPIT. The D8112G1 presently does not support *expanded* POPIT reports (such as POPIT alarm messages).

6. Local Status Test

While disarmed, the security system status can be checked by entering "COMMAND 4 4" at the Alpha Command Center. This command also initiates a system walk test (described in the Alpha Command Center User's Guide) as part of the status test. Each point of protection is polled as the D8112G1 interrogates its eight master zones. The Alpha Command Center displays two small "bird feet" that "hop" across the screen to indicate that a master zone is under interrogation.

If the D8112G1 contains an event (either a current event or an event in memory), the "bird feet" display is cancelled, and the Alpha display shows the event held in memory (see the POPIT Displays section). Events begin to accumulate each time the system is armed. System events can be cleared from the D8112G1 memory by master arming and then disarming the system.

If a programmed point of protection does not respond to the polling interrogation, a "missing" POPIT condition is displayed (as shown in the POPIT Displays section). An "extra" POPIT display indicates that the ZONEX program does not recognize a POPIT Module transmission. Press any key on the Alpha 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.

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 4 4 is entered in the Alpha. If the POPIT is assigned to a D8112G1 protective zone programmed for *controlled zone* response (burglary) and the D8112G1 is armed, the "missing" POPIT condition causes a system alarm. If the D8112G1 is disarmed, the system goes into a trouble condition. If the POPIT is assigned to a D8112G1 protective zone programmed for *24 hour* zone response (fire, panic, hold-up, etc.) the "missing" POPIT indicates a trouble condition.

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

Figure 6: OPERATIVE ZONEX SYSTEM   **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 4 4 is entered at the Alpha. The "extra" POPIT condition is annunciated only through the Alpha Command Center, and does not initiate a report to the central station.

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: (7)	← EXTRA POPIT
2.10 Z6POINTS	00		
2.11 Z7POINTS	00		
2.12 Z8POINTS	00		

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 Alpha.

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

PROGRAMMED		INSTALLED		PROGRAMMED		INSTALLED	
2.5 Z1POINTS	6	MASTER ZONE 1: 6		2.5 Z1POINTS	6	MASTER ZONE 1: 6	
2.6 Z2POINTS	6	MASTER ZONE 2: 6		2.6 Z2POINTS	6	MASTER ZONE 2: 6	
2.7 Z3POINTS	6	MASTER ZONE 3: 6		2.7 Z3POINTS	6	MASTER ZONE 3: 6	
2.8 Z4POINTS	6	MASTER ZONE 4: 6		2.8 Z4POINTS	6	MASTER ZONE 4: (5)	← MISSING POPIT
2.9 Z5POINTS	6	MASTER ZONE 5: (5)	← MISSING POPIT	2.9 Z5POINTS	6	MASTER ZONE 5: (7)	← EXTRA POPIT
2.10 Z6POINTS	00			2.10 Z6POINTS	00		
2.11 Z7POINTS	00	MASTER ZONE 7: (1)	← EXTRA POPIT	2.11 Z7POINTS	00		
2.12 Z8POINTS	00			2.12 Z8POINTS	00		

Figure 9: POPIT SWITCH SETTING ERROR   **Figure 10: POPIT SWITCH SETTING ERROR**

If an extra POPIT is installed and there are no "missing" POPITs (see Figure 11), the "extra" POPIT message will *not* be displayed when COMMAND 4 4 is entered, and the system will indicate that it is "ready to arm". 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 D8112G1. If all POPITs assigned to this master are normal, however, a normal condition will be correctly reported.

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: (7)	← EXTRA POPIT (not displayed)
2.10 Z6POINTS	00		
2.11 Z7POINTS	00		
2.12 Z8POINTS	00		

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.

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: (5)	← MISSING POPIT
2.9 Z5POINTS	6	MASTER ZONE 5: (7)	← Two POPITS installed have same switch setting (EXTRA POPIT not displayed)
2.10 Z6POINTS	00		
2.11 Z7POINTS	00		
2.12 Z8POINTS	00		

Figure 12: POPIT SWITCH SETTING ERROR

7. Troubleshooting Guide

This guide is provided to aid in correcting problems with installed POPEX and POPIT Modules. To prevent problems from occuring, read all of the pertinent documentation (8112:MAIN and 8112:AUX Program Entry Guides, 8112:PTEXT Program Entry Guide if an Alpha display is used, and the previous sections of this manual), and verify that the product handlers are at the following revision levels (or higher): 8112:MAIN **A7**, 8112:AUX **A8**, 8112:PTEXT **A5**.

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

1) Verify 8112:MAIN product handler program item   *122 ExRAM* **YES**

2) Verify 8112:AUX product handler program item *2.1 ZONEX* **YES**

3) Verify that the revision level of the 8112:AUX product handler is **A8** or higher. If you are not sure what revision level of the 8112:AUX product handler was loaded into the panel:
   • Verify that your D5100 Programmer contains the 8112:AUX.A8 or higher product handler.
   • 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).
   Firmware revision 17.07 of the D8112G Control/Communicator does not detect loop faults when programmed with 8112:AUX.A6. To determine the system firmware revision level, enter COMMAND 5 9 at the Alpha Command Center.

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.*

Missing POPIT Modules
If the Alpha Command Center displays a "missing POPIT" status code (Example: ZN101M6):

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 (√5).

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 (√1, see Figure 5).

5) Meter the data loop terminals of each POPIT to verify correct polarity (√2), and a voltage of 10 to 13 VDC.

6) Meter the data loop (disconnected from the POPEX) to verify that it is not shorted together or to ground.

7) Check the wire gauge (√3). Proper wire gauge is determined by the length of the wire run. Compare the system wiring runs to the recommended wiring chart in Figure 4. The maximum resistance between each POPIT and its corresponding POPEX is 100 ohms.

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.

Extra POPIT Modules
If the Alpha Command Center displays an "extra POPIT" status code (Example: ZN101X6):

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 (√5).

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, the ZONEX system may be encountering one of the circumstances listed below:

1) 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 RF induced noise.

2) 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 data loops 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 R.F. source located nearby.

3) If problems are encountered while loading a file into the Control/Communicator, disconnect the wiring from D8112G Serial Data In and Serial Data Out terminals (30 and 31), and reload the file.

4) If the Alpha 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 data 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 Alpha Command Centere will display the faulted condition and the system will respond to the POPITs.

8. Specifications

POPEX Operating Voltage:
10.5 to 14 VDC supplied by the
D8112G Control/Communicator

POPEX Current: 50 mA per POPEX Module
+ POPIT current

POPIT Operating Voltage:
7 to 15 volts supplied by the POPEX Module

POPIT Current: 2.5 mA per POPIT Module

Sensor Loop Response Time:
Approximately 1 second

POPIT sensor loops are supervised with a 33K Ω end-of-line resistor: Radionics model# D106B or #D106F (fire applications).

Maximum increase of resistance on the POPIT Loop is 1000 ohms.
Maximum resistance between the POPEX Module and any POPIT is 100 ohms.

UL APPLICATIONS

The enclosures and POPIT models 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 POPIT Module. Refer to U.L. 681 "Installation and Classification of Mercantile and Bank Burglar Alarm Systems" for further details on installation requirements.

Application	Enclosure	POPIT Model
UL Household Fire/NFPA 74	D8103	D8126U or T
UL Household Burglar	D8103	D8126U or T
UL Local Burglar/Police Connected Burglar	D8108A	D8126T*
UL Central Station Burglar Grade C	D8103	D8126T*
UL Central Station Burglar Grades B & A	D8108A	D8126T*
UL Local Fire/NFPA 72A	D8109	D8126U or T
UL Central Station Fire/NFPA 71	D8109	D8126U or T
UL Electrically Activated Transmitter	D8109	D8126U or T

*A D8126U mounted within a tampered enclosure can be used in place of a D8126T.

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