



HOME AUTOMATION, INC.

**Model 17A00
Expansion Enclosure**

Installation Manual

**Document Number 17100-1 Rev A
March, 2002**

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INTRODUCTION

This installation guide is intended as an aid to installing the Model 17A00 Expansion Enclosure.

The Model 17A00 Expansion Enclosure adds additional zone inputs and voltage outputs to an OmniPro or OmniPro II automation controller. The installer should thoroughly review and understand the Owner's Manual for the applicable system, which contains important information regarding proper configuration of the controller for use with the Model 17A00 Expansion Enclosure.

This manual assumes that the installer has a basic understanding of installing a security system.

In Underwriter's Laboratories (UL) Listed Installations, failure to install the control unit and accessories in accordance with UL Requirements, is a violation of the Listing Mark.

GENERAL

The Model 17A00 Expansion Enclosure is a self-contained unit that adds 16 zone inputs and 16 voltage outputs to the controller. It contains its own power supply and battery backup, and it may be located up to 1000 feet from the controller. It connects to the controller using a single two-conductor cable.

Each of the zone inputs may be used as a burglary zone, a fire zone, a temperature zone, or an auxiliary input. Each zone may also be used for connection of a Model 1101 Programmable Energy Saver Module (PESM).

The Expansion Enclosure provides 16 general-purpose voltage outputs. These voltage outputs can be used to operate 12VDC relays or other low-voltage switching applications.

The built-in supervised power supply provides power for the internal circuitry and for auxiliary devices connected to the Expansion Enclosure (Auxiliary 12VDC, Switched 12VDC, and Outputs 1-16).

INSTALLATION

The Expansion Enclosure should be located in an area that is protected from weather, temperature extremes, and burglars. It should be mounted securely using screws and wall anchors, as appropriate. An unswitched AC power outlet should be located nearby for the power transformer. The Expansion Enclosure may be mounted up to 1000 feet from the controller.

POWER SUPPLY CONFIGURATION

In the normal power supply configuration, a wall-mount 24VAC 40VA transformer and 12V 7Ah battery are used. This configuration provides both Auxiliary +12VDC and Switched +12VDC power that is backed-up by the batteries.

The transformer is connected to the 24VAC terminals. The battery is connected using the battery cable connected to the board. The EARTH GND terminal should be connected to a good earth ground, such as a grounding rod or cold water pipe, using 14 gauge wire.

24 HOUR BATTERY BACKUP OPTION

For extended battery backup time, a second 12V 7Ah battery can be installed - See Figure 5 - “24 Hour Standby Connections”. Maximum total current load is reduced to 0.4 amps.

ADDRESS SETTINGS

DIP switch "S1" is used to set the communications address for the Expansion Enclosure. Up to four Expansion Enclosures can be addressed and used with OmniPro and up to eight Expansion Enclosures can be addressed and used with OmniPro II.

Expansion Enclosures 1-4 are addressed by setting the corresponding switch to on and all others off. For example, to set the address for the first Expansion Enclosure, set switch S1-1 on and all others off; for the second, set switch S1-2 on and all others off. The third and fourth are addressed similarly, using S1-3 and S1-4, respectively.

Expansion Enclosures 5-8 are addressed by using the sum of all switches set to on. For example, to set the address for the fifth Expansion Enclosure, set switch S1-1 and S1-4 on and all others off. To address the sixth Expansion Enclosure, set S1-2 and S1-4 on and all others off. To address the seventh Expansion Enclosure, set S1-3 and S1-4 on and all others off. To address the eighth Expansion Enclosure, set S1-1, S1-3, and S1-4 on and all others off.

Multiple switch combinations are possible for certain addresses. For example, to set the address for the fifth Expansion Enclosure, you can set S1-1 and S1-4 on and all others off **or** you can set S1-2 and S1-3 and all others off.

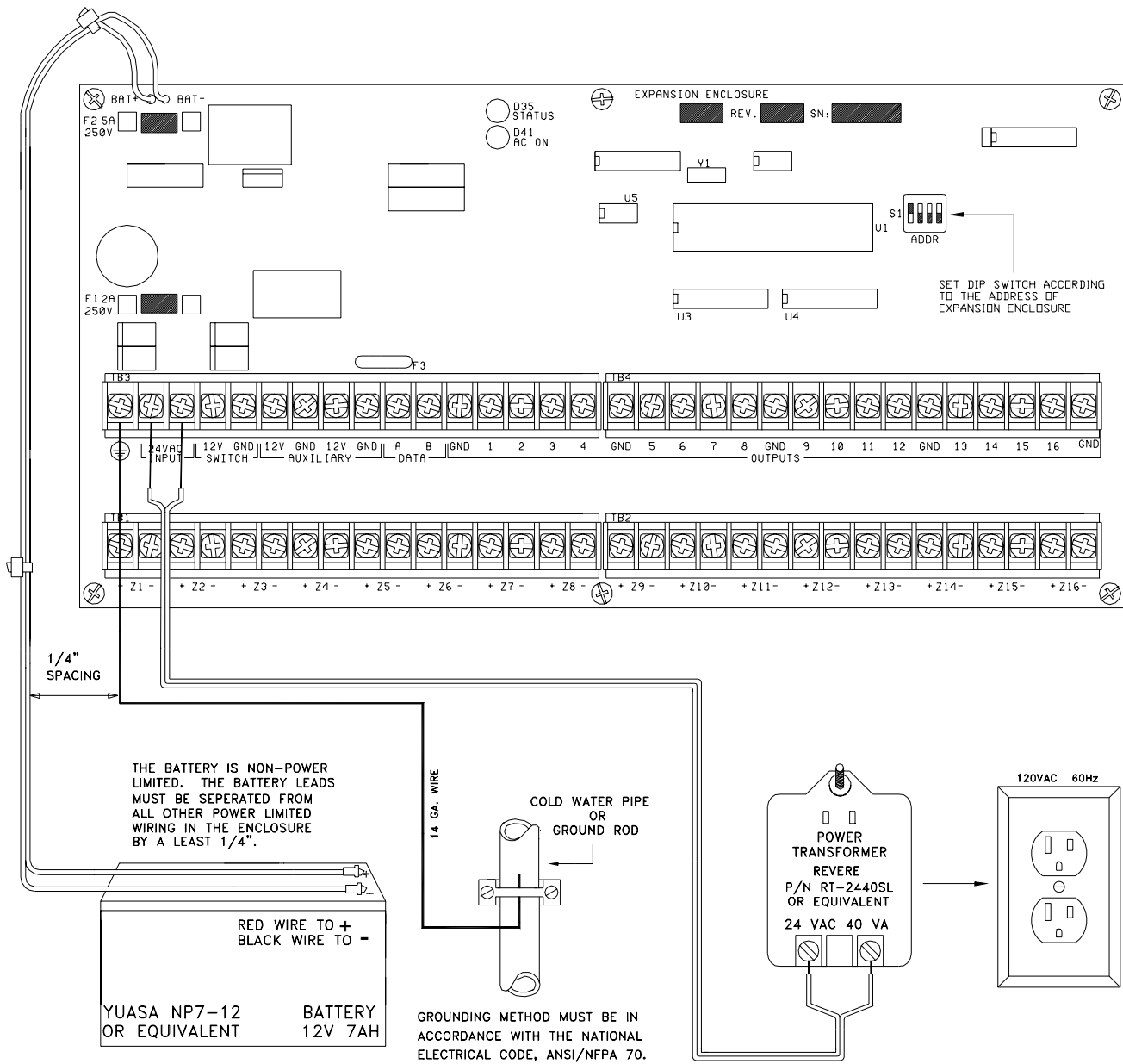


FIGURE 1
MODEL 17A00 HOOKUP

COMMUNICATIONS HOOKUP

The Expansion Enclosure communicates with the controller using the same wires that connect the consoles to the controller. The communications wires for the Expansion Enclosure and consoles may be homerun to the controller or daisy-chained to each other.

Connect the terminals marked "A" and "B" on the Expansion Enclosure to the corresponding terminals on the controller or console. The Expansion Enclosure may be located up to 1000 feet away from the controller.

SECURITY ZONE HOOKUPS

Each of the 16 security zone inputs may be used as a burglary zone, a fire zone, a temperature zone, an auxiliary input, or for connection of Model 1101 Programmable Energy Saver Modules.

The system supports a maximum loop resistance, excluding the end-of-line resistor, of 150 ohms.

The default settings for all zone inputs are configured as Auxiliary inputs.

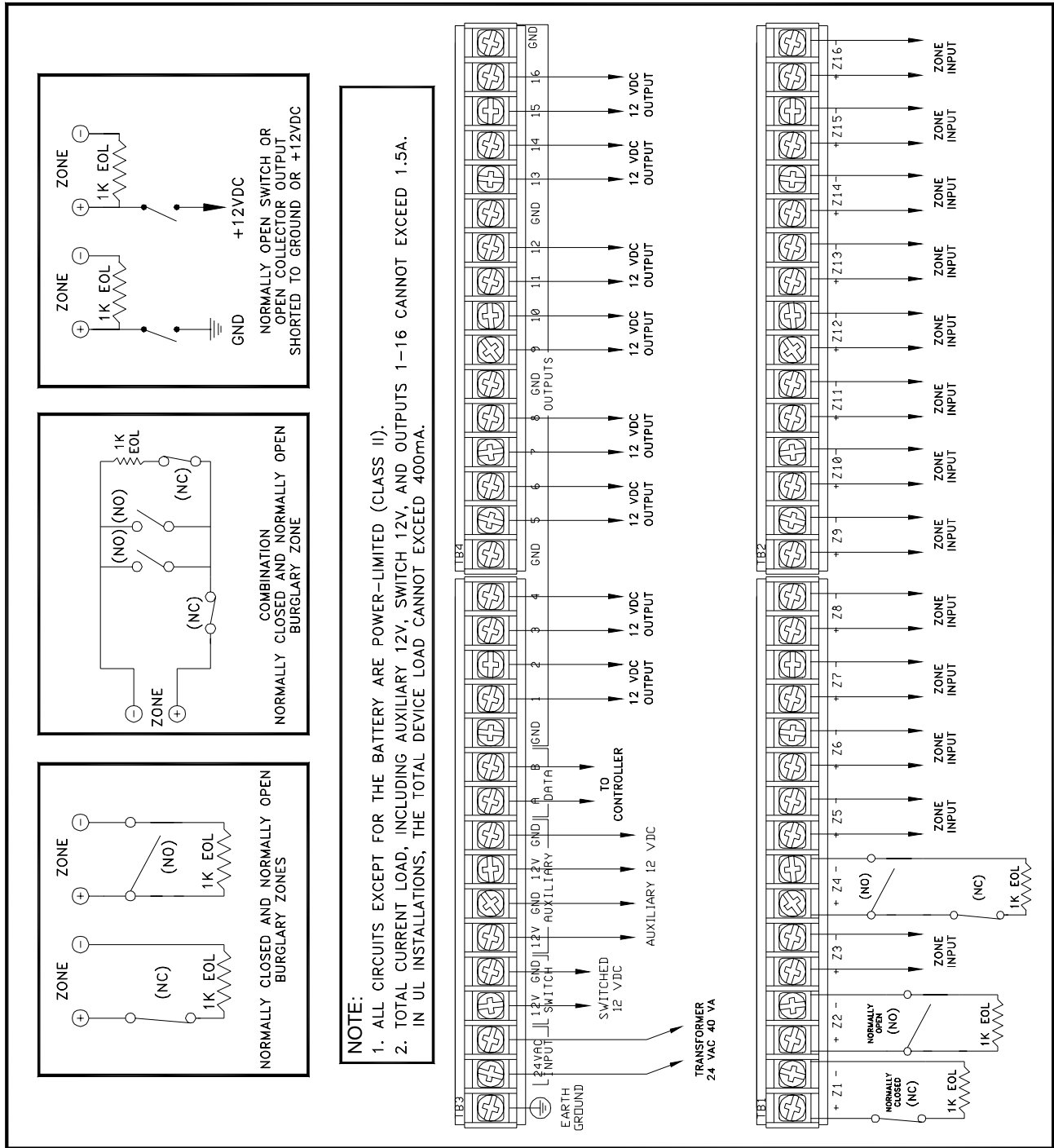
BURGLARY ZONE HOOKUP

The system supports both normally open and normally closed switches. Most contacts designed for doors, windows, motion detectors, glassbreak detectors and other security devices meet this requirement. An external 1000 ohm end-of-line resistor must be used for all burglary zones. Connect the loop to the "+" and "-" terminals for the desired zone.

1. When using a normally open switch, a 1000 ohm end-of-line resistor must be in parallel with the zone being used. Maximum loop resistance excluding end-of-line resistor should not exceed 150 ohms.
2. When using a normally closed switch, a 1000 ohm end-of-line resistor must be put in series with the zone being used. Maximum loop resistance excluding end-of-line resistor should not exceed 150 ohms.
3. Power motion detectors from AUXILIARY 12VDC.
4. Those sensors that latch alarms and can only be cleared by cycling power, such as some glassbreak detectors, should be powered from SWITCH 12VDC.
5. Unused zones may be left open, and should be left at the default setting of AUXILIARY zone types.
6. Use normally open or normally closed panic switches with a 1000 ohm end-of-line resistor.

It is also possible to use a switch or open collector output that shorts to ground or +12VDC. Connect the switch to the "+" terminal for the zone. Connect the external end-of-line resistor between the "+" and "-" terminals.

**FIGURE 2
OVERALL CONNECTIONS DIAGRAM**



FIRE ZONE HOOKUP

The system supports normally open (closed for alarm), four-wire smoke detectors. An external 1000 ohm end-of-line resistor must be used for all fire zones. Connect the loop to the "+" and "-" terminals for the desired zone.

1. Use normally open (closed for alarm) 4 wire "SYSTEM" type smoke detectors, ESL Model 445AT or equivalent, rated 8 - 14 VDC.
2. Power smoke detectors from SWITCH +12 VDC.
3. End of line resistor: 1000 ohms. The maximum loop resistance EXCLUDING the end of line resistor, is 150 ohms.
4. Use HAI Model 1503A0011 End Of Line Resistor Assembly in UL Listed Installations.
5. End of Line Relay Module (ESL Model 204B or equiv.) required for UL installations.

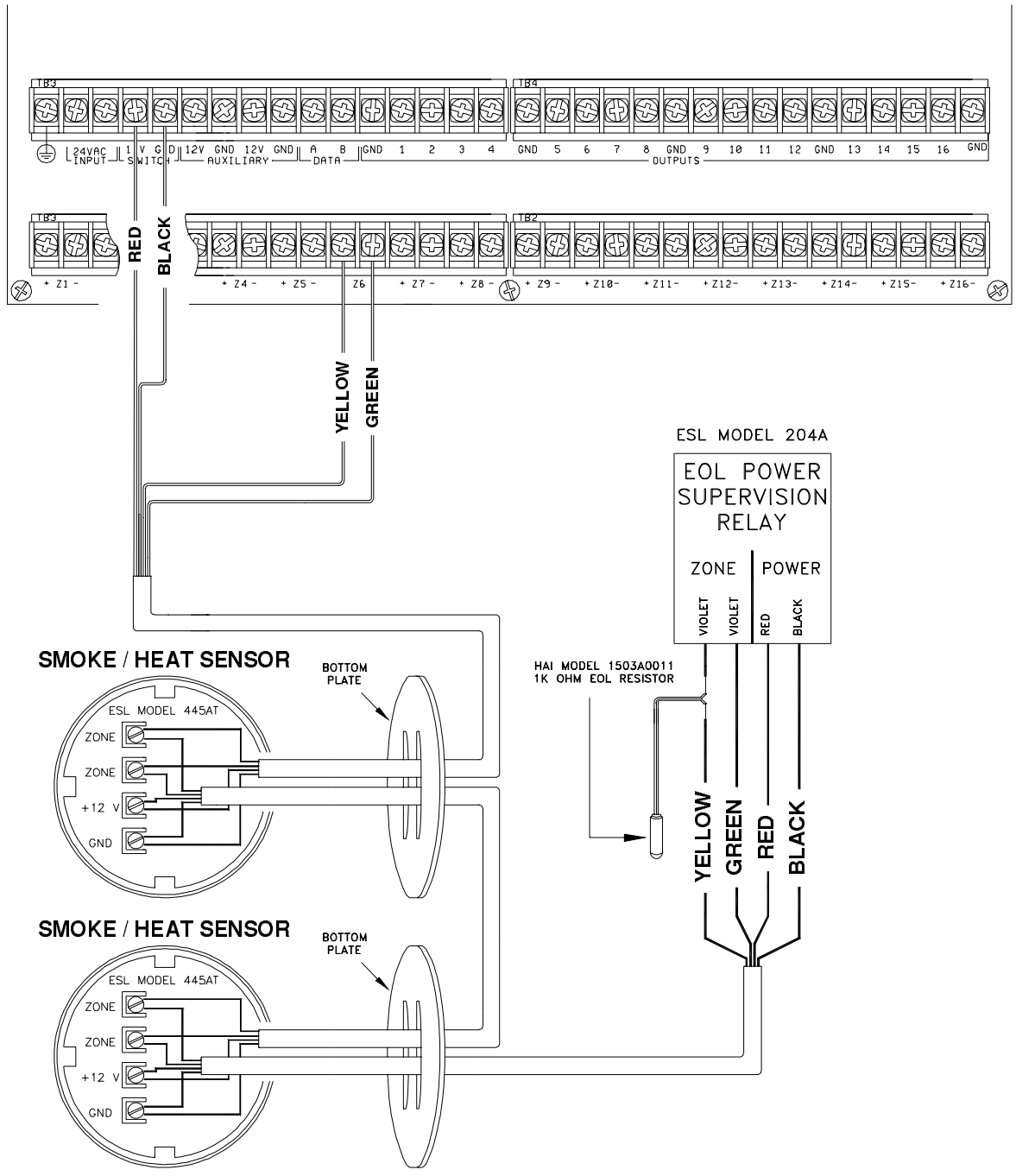


FIGURE 3
FIRE ZONE CONNECTIONS

OUTPUT HOOKUP

The Expansion Enclosure provides 16 general-purpose voltage outputs. These voltage outputs can be used to operate 12VDC relays or for other low-voltage switching applications. The voltage outputs can also be used to switch the relays in the Model 1101 Programmable Energy Saver Modules.

The outputs will maintain their state throughout power failures and will respond to commands during an AC power outage.

RELAY MODULES

The Model 10A07 4-Relay Module and Model 19A00 8-Relay Module converts voltage outputs from the Expansion Enclosure to general-purpose Form C relay outputs. The relay outputs can be used to operate remote controlled circuit breakers, silent relays (for high voltage/current applications), sprinkler valves, pool pump controls, and various other low-voltage switching applications.

Connect the green pigtail wire (J1) to ground (GND) on the Expansion Enclosure.

Each relay on the Relay Module will use one voltage outputs on the Expansion Enclosure. Each output is connected to one of the trigger inputs (T1 – T8).

When an output (unit) is activated (turned on) the relay is energized and a connection is made between the NO and C terminals of the corresponding relay. The red LED above the relay will light whenever the relay is energized.

When the output (unit) is deactivated (turned off) the relay is no longer energized and a connection is made between the NC and C terminals of the corresponding relay. The red LED above the relay will not be lit.

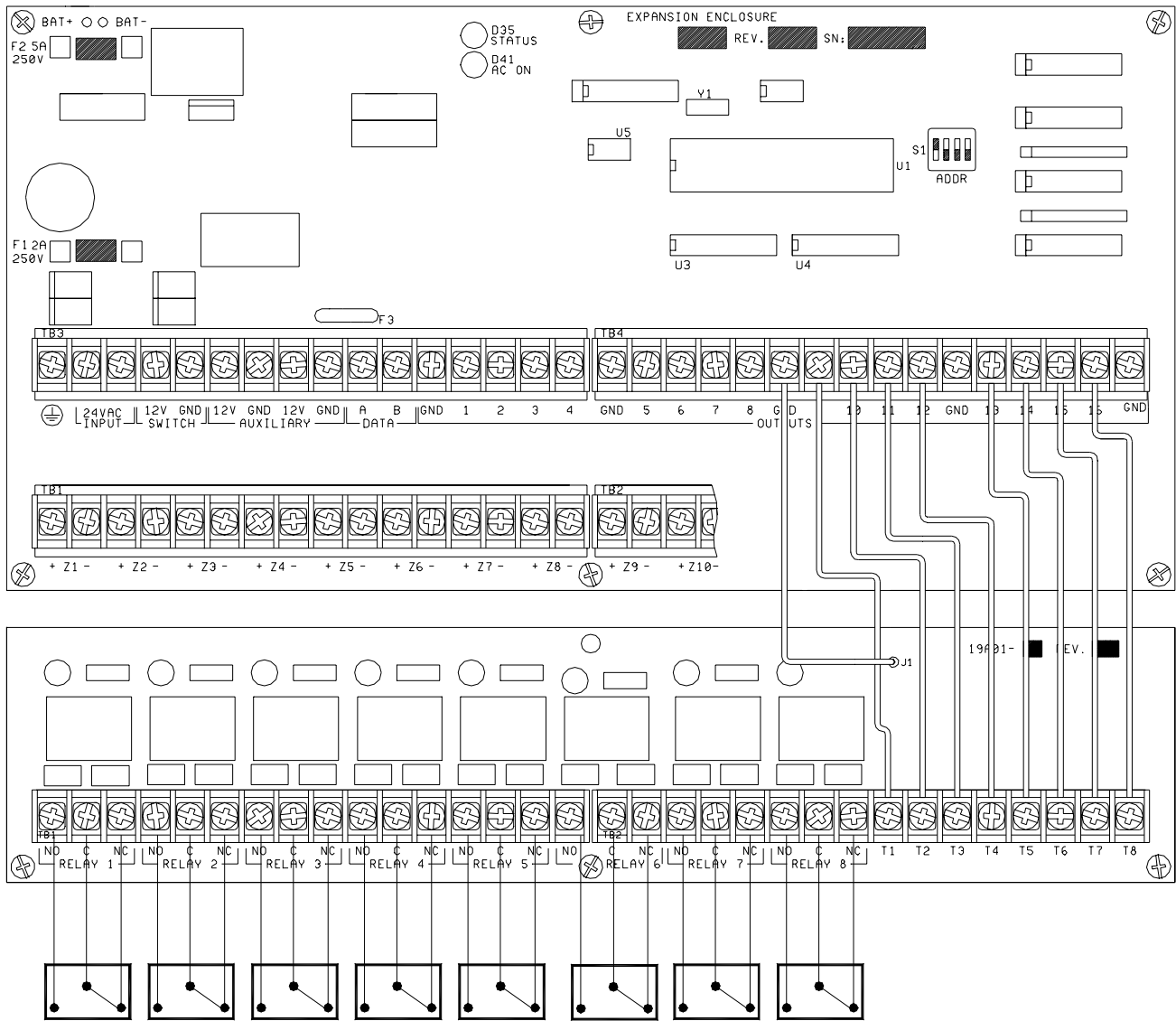


FIGURE 4
RELAY MODULE CONNECTIONS

OUTDOOR TEMPERATURE, TEMPERATURE SENSORS

The Expansion Enclosure may be used to connect up to 16 Temperature Sensors. Each requires one security zone.

Connect the terminals on the Temperature Sensor to the Expansion Enclosure as follows:

Terminal 1 (Black Wire) to AUXILIARY 12VDC GND

Terminal 2 (Red Wire) to AUXILIARY 12VDC (+) terminal

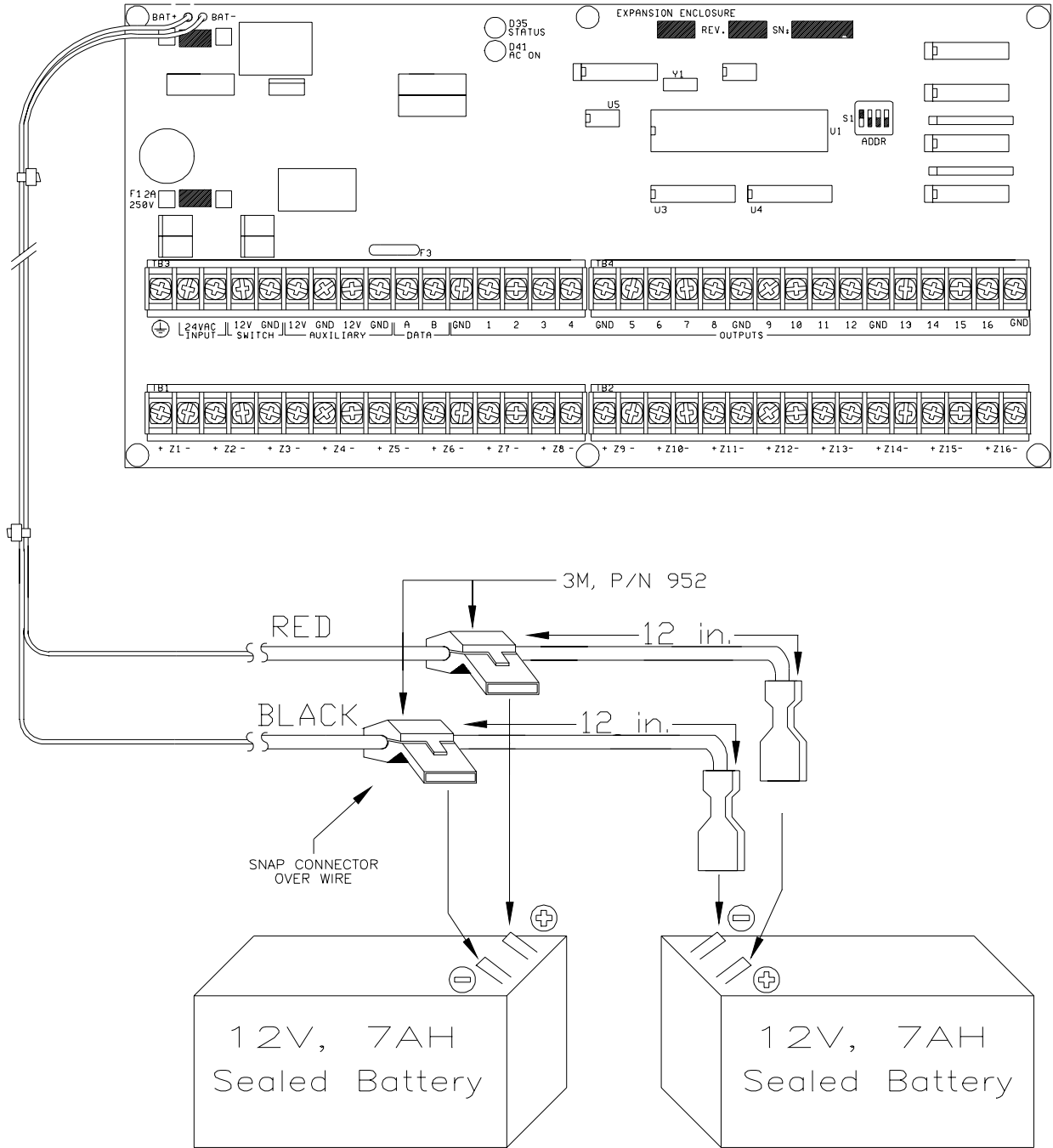
Terminal 3 (Yellow Wire) to the ZONE (+) terminal

An outdoor temperature sensor mounts in an outdoor location, usually under an overhang, and sends the outdoor temperature the Expansion Enclosure. It is coated with a sealant to withstand outdoor moisture. The outdoor temperature can be displayed on the console, spoken over the telephone, or displayed on a communicating thermostat.

24 HOUR STANDBY

Maximum current ratings for 24 hours:

Auxiliary 12V, Switch 12 V, and Outputs 1-16: 400 Ma



SYSTEM CHECKOUT

The following procedure should be followed to verify the correct installation and operation of the Expansion Enclosure.

PRELIMINARY CHECKS

1. Carefully review the hookups to the power supply, zone inputs, and outputs. Make sure that all wires are fully inserted into the terminal strips and that all screws on the terminal strips are securely tightened.
2. Make sure that no one is standing by a siren or sounder that may activate unexpectedly.
3. Configure the controller for operation with the Expansion Enclosure. Set the zone types for each of the Expansion Enclosure zone inputs. Bypass all panic, tamper, and fire zones.

POWER SUPPLY CHECKOUT

1. Disconnect the positive (red) wire to the battery. Make sure that it is not touching anything.
2. Plug in the power transformer. The AC ON LED should illuminate. The STATUS LED should begin blinking, which indicates that the processor and software are working properly.
3. Unplug the power transformer to turn off the system. Connect the red battery wire to the positive terminal on the battery. The system should not start.
4. Plug in the power transformer. The system should start.
5. Unplug the power transformer. The system should continue to run on the battery, as evidenced by the flashing STATUS LED. The AC ON LED should be off. Plug the transformer back in and secure it to the outlet.

COMMUNICATIONS CHECKOUT

The STATUS LED blinks at a rate of one blink per second if the Expansion Enclosure is communicating properly with the controller. If the STATUS LED blinks at a rate of four blinks per second, it indicates that the Expansion Enclosure is not communicating properly. In this case, check the following:

1. Verify that the "A" and "B" terminals on the Expansion Enclosure are connected to the corresponding "A" and "B" terminals on the controller. If the wiring for the Expansion Enclosure is daisy-chained to a console, verify that the entire chain is connected properly.
2. Verify that DIP switch S1 on the Expansion Enclosure is set properly.
3. Verify that the number of Expansion Enclosures has been properly set-up at the controller.
4. Verify that the controller is operating properly.

BURGLARY ZONE CHECKOUT

Check that all doors and windows are closed, all motion detectors and security devices are normal, and all fire sensors are reset.

1. Restore all security zones. Verify that the console reads "SYSTEM OK".
2. Check the wiring for any zones that are in alarm or in trouble.
3. Have a partner go around the house and trip each sensor one at a time. The display should indicate the correct zone when the zone is tripped, then return to "SYSTEM OK" when the zone is secured. Be sure that the zone type indicated is correct for the zone being tested.
4. For sensors that latch alarms that can only be cleared by cycling the power to the sensor, it is necessary to arm then disarm the system to clear the alarm condition.
5. If the zone being checked is armed (i.e. panic and tamper zones, which are always armed) the alarm will be activated. Disarm the system following the alarm activation.
6. For a complete list of zone types and descriptions, refer to the controller Installation Manual that was supplied with the system.

FIRE ZONE CHECKOUT

1. Verify that the console displays "SYSTEM OK". Check the fire zone per the sensor manufacturer's instructions. The fire alarm should be activated.

Note: The Controller's Fire Alarm Verification feature, if used, will require two consecutive activations of the sensor.

2. Cancel the alarm at the console to silence the alarm. The display should indicate that the zone is still in alarm.
3. Arm the security system then disarm it. This arm/disarm cycle will reset the smoke detector. If the cause for the alarm (i.e. smoke) has cleared, the display will return to "SYSTEM OK".

OUTPUT CHECKOUT

Command each voltage output individually. Verify that the correct device is activated. Verify that the device is turned on when an ON command is issued and turned off when an OFF command is issued.

For a complete list of output unit numbers, refer to the controller Owner's Manual that was supplied with the system.

TROUBLE CONDITIONS

The Expansion Enclosure reports the following trouble conditions to the controller: security zone wiring problems, AC power off, and low battery.

Excessive resistance or ground faults in the loop wiring are reported as zone trouble conditions.

AC power off is reported if the AC power has failed for more than three minutes.

The battery is checked under load periodically as requested by the controller.

UNDERWRITER'S LABORATORIES (UL) REQUIREMENTS

When used with the applicable controller, the Model 17A00 Expansion Enclosure meets UL requirements for these applications:

UL 985 Household Fire Warning System Units
UL 1023 Household Burglar Warning System Units

When used in a UL Listed Installation, the following items apply:

1. IN UL Listed Installations, the transformer shall be the Revere P/N RT-2440SL and 2 12 V, 7 amp-hour batteries.
2. If used in UL applications, the Model 17A00 and the controller shall be configured for 24 hour Standby Time as shown under 24 HOUR STANDBY CONNECTIONS diagram in this manual. Maximum current ratings for 24 hours must be observed.
3. Burglary Zone Hookup - using HAI P/N 393-1K, 1000 ohm EOL resistor.
4. Fire Zone Hookup - using HAI P/N 1503A001, 1K End Of Line Resistor Assembly.
5. Operation of the PESM Programmable Energy Saver Module was not investigated by UL.

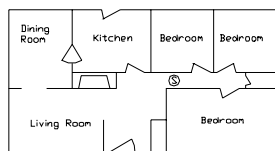
FEDERAL COMMUNICATIONS COMMISSION (FCC) NOTICE:

The Model 17A00 Expansion Enclosure been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

This product generates and can radiate radio frequency energy. Due to its low power design, it is unlikely to interfere with radio and TV communications. If it is suspected of doing so, the user is encouraged to try to correct the problem by reorienting the receiver's antenna, moving the receiver away from the product, or consulting an experienced radio/TV technician for help.

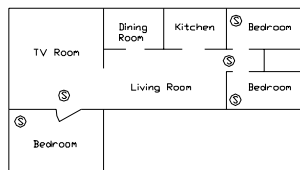
SMOKE DETECTOR INSTALLATION GUIDELINES

1. Ceiling mounted smoke detectors should be located in the center of the room or hall, or not less than 4 inches from any wall. When the detector is mounted on a wall, the top of the detector should be 4 to 12 inches from the ceiling.
2. Do not install smoke detectors where normal ambient temperatures are above 100° F (37.8 ° C) or below 40 ° F (4 ° C). Also, do not locate the detector in front of air conditioners, heating registers, or other locations where normal air circulation will keep smoke from entering the detector.
3. Additional information on Household Fire Warning is available at nominal cost from: The National Fire Protection Association, Battery March Park, Quincy, MA. 02269. Request Standard No. NFPA 72. Contact your home Insurance Company for a possible reduction of your insurance premium.
4. A smoke detector should be located between the sleeping area and the rest of the family living unit.
5. In family living units with more than one sleeping area, a smoke detector should be provided to protect each sleeping area.
6. A smoke detector should be located on each story (Refer to the diagrams below).
7. For complete details on proper location and installation of smoke detectors, refer to the instructions supplied with the smoke detector.

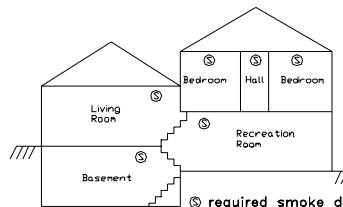


(a) A smoke detector should be located between the sleeping area and the rest of the family living unit.

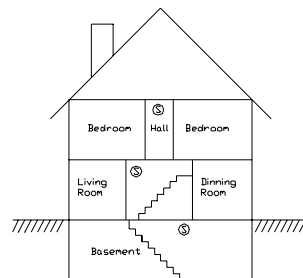
(b) Where to Locate the Required Smoke Detectors in New Construction. All of the smoke detectors specified in (a) for existing construction are required, and, in addition, a smoke detector is required in each bedroom.



(b) In family living units with more than one sleeping area, a smoke detector should be provided to protect each sleeping area in addition to detectors required in bedrooms.



Split level arrangement. Smoke detectors are required where shown. Smoke detectors are optional if door is not provided between living and recreation rooms.



A smoke detector should be located on each story.

TABLE 1 - MODEL 17A00 EXPANSION ENCLOSURE SPECIFICATIONS

Size: 13 W x 13 H x 4.5 D

Weight: approx. 10 lb. (w/o battery)

Operating Ranges: 32 - 120 degrees F (0 - 49 degrees C)
10 - 85 % relative humidity, non-condensing

Transformer: Output 24VAC, 1.67 amps, 40VA; Input 120VAC, 0.41 amps, 60Hz

Battery: Rechargeable lead-acid, 12 volts, 7 amp-hour

Main Fuse: 2A fast blow

Battery Fuse: 5A fast blow

AUX 12VDC Fuse: Polyfuse: 2.5A

Polyfuses are permanent fuses that do not need replacement.

Nominal Voltage: AUX 12VDC: 10 - 13.7VDC; SWITCH 12VDC: 11.5-12.5; OUTPUTS 1-16: 9.6-12VDC

Low Voltage Cut Out: approx. 9VDC

Typical Current Consumption at Nominal Voltage: 80 mA at 13.7VDC

| OUTPUTS | UL RATINGS | MAXIMUM |
|---|--|----------------|
| Total Combined Current Device Load: AUX 12 VDC, SWITCH 12VDC, and OUTPUTS 1-16: | 400mA | 1.5A* |
| Backup: Required battery backup hours: | two 7Ah | |
| Maximum Individual Current Loads: (Total must not exceed Total Combined Current Device Load) | | |
| AUX 12VDC: | 400mA | 1.5A* |
| SWITCH 12VDC: | 400mA | 1.0A* |
| OUTPUTS 1-16: | 100mA each | 100mA each |
| Zone Inputs: | 16 end-of-line supervised inputs, multi-purpose for burglary, fire, temperature, and auxiliary inputs. | |

* Not verified by UL

