

D7212 Control/Communicator

Operation and Installation Manual

Notice

The material and instructions covered in this manual have been carefully checked for accuracy and are presumed to be reliable. However, Radionics, Inc. assumes no responsibility for inaccuracies and reserves the right to modify and revise this manual without notice.

It is our goal at Radionics to always supply accurate and reliable documentation. If a discrepancy is found in this documentation, please mail a photocopy of the corrected material to:

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P.O. Box 80012
Salinas, CA 93912-0012

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FCC Notices

Part 15

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Part 68

This equipment complies with Part 68 of FCC rules. A label contains, among other information, the FCC registration number and ringer equivalence number (REN). If requested, this information must be provided to the telephone company.

The Radionics D7212 Control/Communicator is registered for connection to the public telephone network using an RJ38X or RJ31X jack.

The ringer equivalence number (REN) is used to determine the number of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5). To be certain of the number of devices that may be connected to the line, as determined by the RENs, contact the telephone company to determine the maximum REN for the calling area.

If the D7212 Control/Communicator causes harm to the telephone network, the telephone company will notify you in advance. If advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

Part 68 (Continued)

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service.

If trouble is experienced with the D7212 Control/Communicator, please contact Radionics Customer Service for repair and/or warranty information. If the trouble is causing harm to the telephone network, the telephone company may request that you remove the equipment from the network until the problem is resolved. User repairs must not be made, and doing so will void the user's warranty.

This equipment cannot be used on public coin service provided by the telephone company. Connection to Party Line service is subject to state tariffs. (Contact your state public utilities commission for information.)

FCC Registration Number: AJ9USA-18808-AL-E

Ringer Equivalence: 0.1A 0.2B

Service Center in U.S.A.: Radionics, Inc.
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Introduction

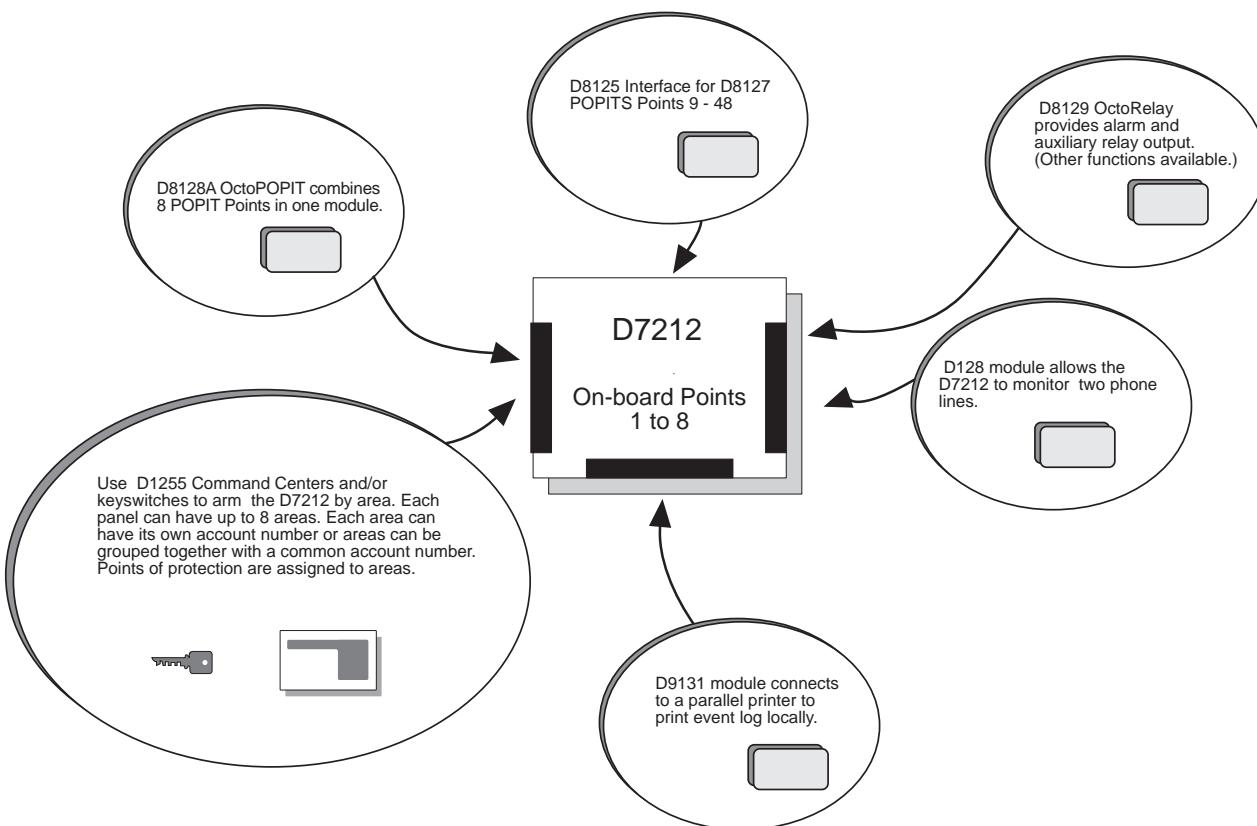


Figure 1: D7212 System Configuration

Points

The Radionics D7212 Control/Communicator panel provides up to 48 separate points of protection. Point programming parameters determine the panel's response to open and shorted conditions on the point's sensor loop. Points are programmed individually with several options to custom-fit the protection to your installation.

Points 1 to 8 are located on the D7212 circuit board (on-board points). They are standard sensor loops. The remaining 40 off-board points are POPIT (**P**oint **o**f **P**rotection **I**nput **T**ransponder) points. Each off-board point requires a POPIT module. D8127 POPIT modules require the D8125 POPEX module. The D8128A OctoPOPIT module combines eight POPITs in a single module and does not require the D8125 POPEX module.

Areas and Accounts

The D7212 supports up to eight separate areas. You can assign all points to a single area or spread them out over up to eight areas.

You arm and disarm the D7212 panel by area. You can arm and disarm several areas with one menu function. You can also assign a passcode and authority level that allows a user to arm an area from a remote command center in another area. Assigning each area its own account number creates eight separate accounts in one D7212 panel. Assigning the same account number to different areas, groups them together in a single account.

Area options include: exit tone and delay, separate fire and burglary outputs, and multiple opening and closing windows.

Communicator

The Radionics D7212 Control/Communicator panel uses a built-in digital communicator to send reports to the receiver. The panel transmits reports in either the Modem II or BFSK format. Your D6500 receiver's MPU and line cards must have software revision 6.00 (or greater) installed to accept Modem II reports from the D7212. Power your receiver down and up to print the software revision numbers.

The D7212 connects to an RJ31X jack for phone line seizure. Connection to the RJ31X complies with FCC regulations for using the public telephone network. You can program the panel to direct reports to four separate phone numbers. Adding the D128 Dual Phone Line Switcher module allows you to connect and supervise a second phone line.

D1255 Alpha III Command Center

The D1255 Alpha III Command Center offers complete system control and annunciation. The D1255 features an illuminated keypad, a 16-character English language display, and a built-in speaker that offers several distinct warning tones. Switches on the D1255 assign an address (1 to 8) to the command center. You assign addresses to areas in the Command Center Assignments section of the program.

You can connect a maximum of 32 command centers to the D7212. The available power, number of supervised command centers, and number of areas you intend to use, affect the total number of command centers you can connect to the D7212.

The D7212 can supervise up to 8 command centers. The panel transmits a serial device trouble report, `SDI FAILURE` in the Modem II format or `TROUBLE ZN D` in the BFSK format, if it loses communication with a supervised command center. You can add more command centers but only eight can be supervised. See *Command Center* in the *D7212 Program Entry Guide (74-06915-000)* for complete details on command center options.

Keyswitch

You can arm and disarm any of the eight available areas with maintained or momentary closure devices such as keyswitches. Keyswitches connect to points. Point programming determines which area a keyswitch controls. See *Options* in the *Point Index Parameters* module of the *D7212 Program Entry Guide (74-06915-000)*.

Event Memory

The D7212 uses event memory to store events for each area. You can view the events for an area at a D1255 Command Center assigned to the area. The D7212 panel clears the events for an area from event memory and starts storing new events when you master arm the area.

Event Log

The D7212 stores up to 500 events and event modifiers from all areas in its event log. Event modifiers add information about an event to the log. Some events are always followed by a modifier. For example, the D7212 adds at least two items to the log each time you arm or disarm an area, the open (or close) event and an event modifier showing the previous arming state.

All events and their modifiers are stored even if the D7212 does not send a report for them. You can view the log at a D1255 Command Center, print it locally using the D9131 Parallel Printer Interface and a parallel printer, or upload it to a D5300 Remote Account Manager II (RAM II).

See *S- View Log* in the *Security System User's Guide* (71-06141-000) for a complete listing of log events and event modifiers.

EMI/Lightning Transient Protection

The D7212 maintains the Radionics high level of quality and field dependability. Its design significantly reduces electromagnetic interference and malfunction generally caused by lightning.

Programming

Use either the Radionics D5200 Programmer, or the D5300 Remote Account Manager II (RAM II) to program the D7212. Refer to the *D7212 Program Entry Guide* (74-06915-000) for programming options.

Other Features

The D7212 has many programmable features. A short list of some of the features follows. Complete details on all the D7212's features can be found in the *D7212 Program Entry Guide* (74-06915-000).

- Supervision of AC (primary power), battery (secondary power), ZONEX and SDI buses, CPU (Central Processing Unit), 1 printer, and telephone lines
- Automatic system test reports
- Remote access for programming, diagnostics, and log uploads using the Radionics D5300 Remote Account Manager II (RAM II)
- RAM Line Monitor answering machine work-around
- Fire Alarm Verification
- Programmable Alarm Output
- Programmable Relay Output using the D8129 OctoRelay Module
- Opening and Closing Windows
- Skeds (scheduled events)

D7212 Control/Communicator Assembly

The Radionics D7212 Control/Communicator is shipped pre-assembled from the factory. You should receive the following parts with your D7212 panel.

Literature Pack

- *D7212 Installation Reference Guide*(74-06913-000)
- *D7212 Program Record Sheet*(74-06894-000)
- *UL Smoke Detector Compatibility Technogram* (73-06143-000)
- *UL 1023 Household Burglary Technogram*(73-06806-000)
- *Point Chart Label*(79-06916-000)
- Eight 1k Ω end-of-line resistors
- Two 14", 18 AWG, color-coded battery leads
- *Security System Owner's Manual* (71-06633-000)

D7212 Assembly:

- D7212 PC board
- Faceplate shield
- Mounting Skirt
- One #6x1/4" screw

Ordered Separately

Order the following to complete a basic 8 point D7212 installation.

- D1255 or D720 Command Center (or keyswitch)
- D1640 Transformer
- D126 Battery
- D161 or D162 Phone Cord
(order two cords if you are using the D128 Dual Phone Switcher)
- D8103, D8109, or D8108A Enclosure

Listings and Approvals

Fire

UL

Underwriters Laboratories lists the D7212 Control/Communicator as a Signal System Control Unit for:

Central Station, Local, Auxiliary, Remote Station, and Household Fire Warning.

CSFM

Approved by the California State Fire Marshal.

NYC-MEA

Approved by New York City's Materials and Equipment Acceptance System.

Factory Mutual (FM)

Submitted for evaluation by Factory Mutual.

Burglary

UL

Underwriters Laboratories lists the D7212 Control/Communicator for:

Central Station, Local, Police Connect, Mercantile Safe and Vault, and Grade A Household systems.

Department of Defense (DOD)

The D7212 has been granted approval for Department of Defense (DOD) installations in Sensitive Compartmented Information Facilities (SCIF).

Installation

Before You Begin

This *Installation* section contains a general installation procedure. It refers you to other sections of the manual for detailed instructions.

Radionics recommends you review this manual and the *D7212 Program Entry Guide* (74-06915-000) before you begin the installation to determine the hardware and wiring requirements for the features you want to use.

Have the following additional documents handy as you read through this manual:

- *D7212 Program Record Training Sheet*(74-06895-000)
- *Security System Owner's Manual*(71-06633-000)
- *D7212 Operation and Installation Manual*(74-06144-000)

Before you begin the installation of the D7212 you should be familiar with the operation of the D5200 programmer or the RAM II remote programmer.

Enclosure Options

Mount the D7212 Control/Communicator assembly in any of the Radionics enclosures listed below. Refer to the *Installation Guide for UL and Fire Applications* in this manual to determine if your application requires a specific enclosure.

- D8103 Universal Enclosure (gray)
- D8109 Fire Enclosure (red)
- D8108A Attack Resistant Enclosure (gray)

Beginning the Installation

Mounting the Enclosure

Mount the enclosure in the desired location. Be certain to use all five mounting holes. See Figure 2.

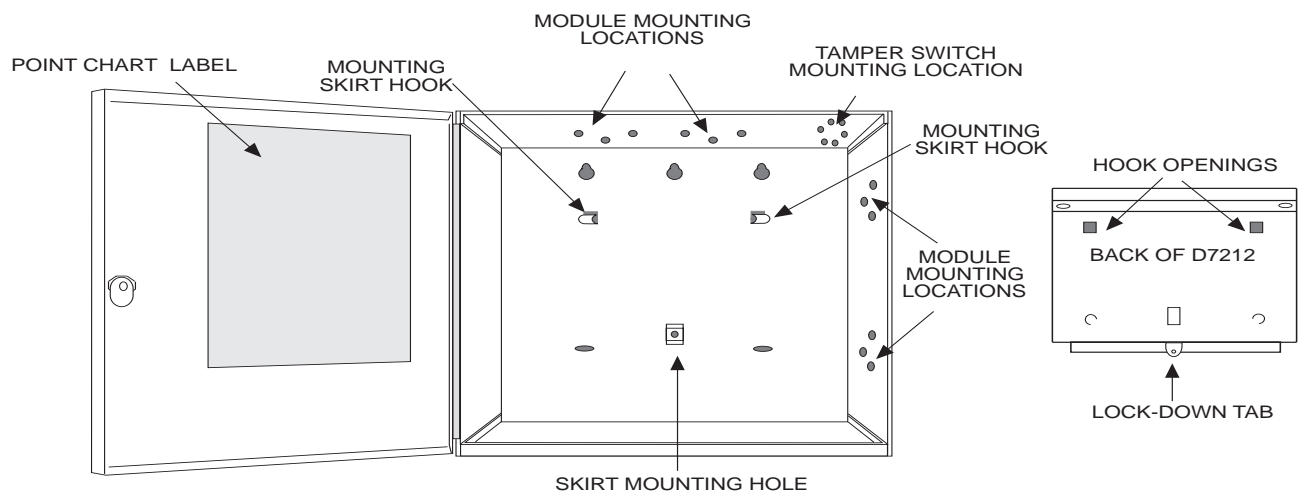


Figure 2: Mounting Enclosure

Premises Wiring

Run the necessary wiring throughout the premises and pull the wires into the enclosure.

EMI (Electro Magnetic Interference) may cause problems: EMI may occur if you install the D7212 system or run system wires near the following:

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

If you think that EMI may be a problem, use shielded cable. The drain wire for the shielded cable must have continuity from terminal 10 on the D7212 to the end of the wire run. If continuity is not maintained, the shielded cable may aggravate potential noise problems rather than eliminate them.

Connecting the drain wire to ground at other than terminal 10 may also produce problems. If you cut the drain wire to install devices be certain to splice it together. Solder and tape all splices.

Installing the D7212 Assembly

1. Place the D7212 assembly over the inside back of the enclosure, aligning the large rectangular openings of the mounting skirt with the mounting hooks of the enclosure. Slide the D7212 down so it hangs on the hooks. See Figure 2.
2. Remove the tape from the #6x1/4" screw in the mounting tab on the D7212 assembly. The screw passes through the mounting tab and into the skirt mounting hole in the enclosure. Tighten the screw to secure the D7212 assembly in the enclosure.
3. Connect earth ground to the panel before making any other connections. See *Connecting Earth Ground* below.

Connecting Earth Ground

Terminal 10

To help prevent damage from electrostatic charges or other transient electrical surges, connect the D7212 to earth ground at terminal 10 before making any other connections. A grounding rod or cold water pipe are recommended earth ground references.

Do not use telephone or electrical ground for the earth ground connection. Use 16 AWG wire when making the connection. Do not connect any other panel terminals to earth ground.

Locking the Reset Pin

Locking the Reset Pin disables the panel. See Figure 3. The D7212 ignores the command centers and points while disabled. CALL FOR SERVICE appears in command center displays while the pin is locked down.

Existing reports transmitted with Reset Pin locked down: Any reports that are in the panel's report buffer when you lock down the Reset Pin, will be transmitted. However, no new reports can be created with the pin locked down.

To prevent buffered reports from being transmitted, momentarily close the Reset Pin, wait for the buzzer to stop sounding, and then lock the pin down to prevent new reports from being generated.

Locking Reset Speeds Programming: If you have supervised command centers or other supervised devices connected to the Data Bus (terminals 30 and 31), locking the Reset Pin will speed communication between the panel and the D5200.

On-board relays (terminals 6, 7, and 8) and off-board relays, deactivate when the panel is reset. There is power at terminal 8 when the relay is deactivated. Activation interrupts power at that terminal. The relays remain deactivated while the Reset Pin is locked in the disable position.

You can program the panel while it is locked in the disable position with either the D5200 or D5300 (RAM II) programmers. If you place the reset pin in the disable position with one or more areas disarmed, there must be an entry in the *Answer Disarmed* program item to use RAM II.

If you place the reset pin in the disable position when all areas are armed, there must be an entry in the *Answer Armed* program item. See *RAM Parameters* in the *D7212 Program Entry Guide* (74-06915-000).

Releasing the reset pin from the closed position resets the panel. The panel resets all its timers, counters, indexes, and buffers.

Changes to some program parameters require a reset before they become effective: Radionics recommends that you reset the panel after changing program parameters with the D5200 programmer. The D5300 (RAM II) programmer prompts you for a "RESET BYE" when a program change requires that the panel be reset.

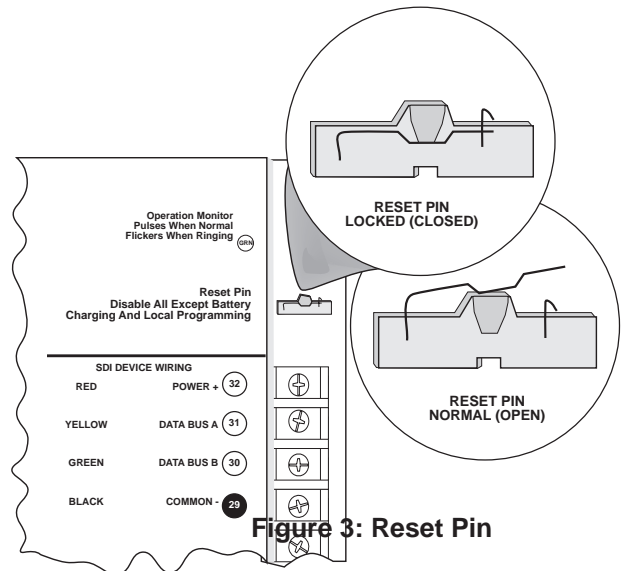


Figure 3: Reset Pin

Lock the Reset Pin Now

Locking the pin in the disable position allows you to power up the panel and charge the battery as you install the detection devices and command centers. Lock the pin down now.

Finishing the Installation

Earth ground and reset pin first: Make the earth ground connection to terminal 10 and lock the reset pin in the closed position if you haven't already done so.

Charge the Battery as You Finish

Connect the battery and then the transformer so that the panel can charge the battery as you finish the installation. See the *Power Supply* section for instructions.

On-board Buzzer Sounds at Power Up and Reset: The D7212 performs a series of self diagnostic tests of its hardware, software, and program at power up and at reset. The buzzer on the D7212 sounds during the tests. They take about 10 seconds to complete.

If the panel fails any of the tests, the buzzer continues sounding and a system trouble message appears at the command centers. See *Self Diagnostics* in the *Trouble Shooting* section for a description of each system trouble message.

Touch Terminal 10 first: If the on-board buzzer sounds briefly when you touch the panel, you're discharging any static charge you may be carrying to the panel. The panel may generate WATCHDOG RESET and/or PARAM FAIL events. See the *Trouble Shooting* section for a description of these events. Always touch terminal 10, the panel's earth ground connection, before beginning work on the panel.

Install and Wire Detection Devices

Install and wire detection devices and command centers at their locations throughout the premises. DO NOT make the connections at the panel end of the wiring yet.

The *On-Board Points* section of this manual contains instructions for wiring the on-board points to detection devices. The *Arming Devices* section contains instructions for wiring the command centers.

Instructions for wiring the off-board point POPIT sensor loops are found in the instructions packaged with the POPIT modules.

Install Modules and Relays

1. **Power Down First:** Power down the D7212 by unplugging the transformer and disconnecting the battery. Radionics recommends that you power down the D7212 when installing modules or relays, or when making wiring connections to the panel.
2. Install and wire any modules required for your installation as described in the module's installation instructions.

Instructions for the D8125 POPEX Module, the D8128A OctoPOPIT Module, the D8129 OctoRelay Module, the D811 Arm Status Relay Module, and the D128 Dual Phone Line Switcher appear in this manual.

See *Off-board Points* for D8125 and D8128A instructions. See *Relays* for D8129 and D811 instructions. See *Dual Line Transmitting* in the *Telephone Connections* section for instructions for the D128.

3. If you are using the power outputs at terminals 7 or 8, install a D136 relay in the appropriate sockets. See *Programmable Power Outputs* in the *Power Outputs* section for instructions.
4. If you are using a ground start phone system, insert a D136 relay in socket K6/J5 and set the ground start pin in the ground start position. See *Ground Start* in the *Telephone Connections* section.

Make the Telephone Connections

See *Telephone Connections*. If you are connecting the D7212 to a ground start phone system, you need to install D136 relay, see *Install Modules and Relays* on the previous page.

Connect the On-Board Points and Command Centers

Connect the on-board point and command center wiring to the D7212. See the *On-Board Points* and *Arming Devices* sections for instructions.

Power Up

Reconnect the battery and then plug in the transformer. Remember the buzzer sounds for 10 seconds when you first power up the panel.

Leave the reset pin locked down for now.

Yellow Charging Status LED doesn't go out: If the yellow charging status LED doesn't go out within 5 minutes of powering up the panel, the battery may be deeply discharged, or you may have connected too many powered devices to the panel. Combined continuous current draw for terminals 3, 8, and 32, and the Accessory Connector (J2) cannot exceed 1.4A. See the *Power Outputs* section for help.

Programming the Panel

If you haven't created a program for the panel, review the *D7212 Program Entry Guide* (74-06915-000). Check to be certain you have all the required accessory modules installed for the features you want to use.

Use the D5200 Programmer or the RAM II remote programmer to load your custom program into the panel.

Move the reset pin to the normal position. See Figure 3. The panel transmits reboot and battery reports to the receiver.

Install the Point Chart Label

Point chart label required for fire systems with verification points: You must install the point chart label for fire or combined fire/burglary systems using verification points.

Use the program record sheet to gather the information you need to fill out the point chart. Install the label on the enclosure door as shown in figure 2. To avoid smearing your entries on the chart, use the label's peel off backing to press the label in place.

Power Supply

Primary Power

Terminals

1

2

Primary (AC) Power Circuit

A 16.5 VAC, 40 VA internally fused transformer (Radionics model D1640) is the primary power source for the D7212. The AC power circuit provides 1.9 Amps of rectified AC power. The panel reserves 500 mA of this power for internal operations leaving 1.4 Amps for powered devices.

Transient suppressors and spark gaps protect the circuit from power surges. This protection relies on the ground connection at terminal 10. Make sure you connect terminal 10 to a proper ground. See *Connecting Earth Ground* in the *Installation* section.

AC Power Failure

The D7212 indicates an AC power failure when the power at terminals 1 and 2 is missing. The *AC Fail Time* program item sets the number of seconds that AC must be missing before the panel acknowledges the failure and the number of seconds after the power returns before the panel acknowledges the restoration of power.

You can program *AC Fail Time* from 1 to 90 seconds. The Radionics default sets *AC Fail Time* at 10 seconds.

Installing the Transformer

Do not short the terminals of the transformer: Shorting the terminals opens the internal fuse causing permanent failure. Connect the transformer to terminals 1 and 2 of the panel before plugging it into the power source.

Use 18 AWG (minimum) wire to connect the transformer to the panel. Wire length should be kept as short as possible. Maximum length is 50 feet.

Connect the battery and then plug in the transformer: Radionics recommends that you always connect the battery first and then plug in the transformer. Instructions for *Installing the Battery* appear on the next page.

Only plug the transformer into an unswitched, 120 VAC, 60 Hz power outlet. Secure the transformer to the outlet with the screw provided.

Never share the transformer with other equipment: Foreign grounds on the AC input damage the D7212 power circuit.

AC wiring can induce both noise and low level voltage into adjacent wiring. Route phone and sensor loop wiring away from any AC conductors, including the transformer wire. Route data wiring away from AC and phone wiring.

D8004 Transformer Enclosure required for fire systems: Use the D8004 Transformer Enclosure for the D1640 transformer in fire and combined fire/burglary applications.

Secondary (DC) Power

A 12V, 7 Ah sealed lead-acid rechargeable battery (Radionics D126) supplies secondary power for auxiliary and alarm outputs, and powers the system during interruptions in primary (AC) power.

Lead Acid Batteries ONLY: The D7212 charging circuit is only calibrated for lead-acid batteries. Do not use gel-cell or nicad batteries.

Extra Batteries Increase Back-up Time: To increase battery back-up time, connect a second 12V, 7 Ah battery in parallel to the first battery to form a 12V, 14 Ah battery. Use a D122 Dual Battery Harness to ensure proper and safe connection. You can use the D8132 Battery Charger Module to connect two additional batteries for a total of four. See the *D7212 Standby Battery and Current Rating Chart* in this manual for battery standby time calculations.

Installing the Battery

Place the battery upright in the base of the enclosure. Locate the red and black leads supplied in the literature pack. Connect the black battery lead to terminal 4, and then to the negative (-) side of the battery. Connect the red battery lead to terminal 5, and then to the positive (+) side of the battery.

Warning, High Current Arcs Possible: The positive (red) battery lead and Terminal 5 can create high current arcs if shorted to other terminals or the enclosure. Use caution when working with the positive lead and terminal 5. Always disconnect the positive (red) lead from the battery before removing it from terminal 5.

Replacement

Radionics recommends battery replacement every 3 to 5 years under normal use. Exceeding the maximum output ratings, or installing the transformer in an outlet that is routinely switched off, causes heavy discharges. Routine heavy discharges can lead to premature battery failure.

D8132 boosts battery backup: Adding a D8132 Battery Charger Module supports additional batteries of up to 36 Ah capacity if required.

Warning: The transformers for the D7212 and any D8132 modules connected to it must be powered from the same 120 VAC circuit. The D7212 supervises AC power by monitoring the power from the transformer connected to terminals 1 and 2. It cannot supervise the AC power for D8132 modules if their transformers are not plugged into the same AC circuit as the transformer for the panel.

Battery Supervision

When the battery voltage drops to 13.8 VDC, the yellow Charging Status LED lights. When the battery drops to 12.1 VDC the red Low Battery LED lights and the panel, if programmed for power supervision, transmits a BATTERY LOW report in the Modem II transmission format. It transmits a TROUBLE ZN 9 report in the BFSK format.

If the battery is missing or shorted, the red Low Battery LED flashes at the same rate as the green Operation Monitor LED. If the panel is programmed for power supervision, it transmits a BATTERY MISSING report in the Modem II transmission format, or TROUBLE ZN 9 report in the BFSK format.

Battery Supervision (Continued)

When battery voltage returns to 13.7 VDC the Low Battery LED goes out. If the panel is programmed for power supervision, it transmits a BATTERY RESTORAL report in the Modem II transmission format or RESTORAL ZN 9 report in the BFSK format. At 13.9 VDC the Charging Status LED goes out.

Investigate low battery reports right away: If primary (AC) power is off and the discharge continues, the panel becomes inoperative when the battery voltage drops below 10.2 VDC.

Battery Charging Circuit

Float Charge

The float voltage for the battery charging circuit is 13.9 VDC at a maximum current of 1.4 Amps. Deduct any continuous load for devices connected to the panel from 1.4 Amps to find the actual current available for charging.

Load Shed Relay protects battery: During an AC power loss the battery supplies all power to the security system. If the battery voltage falls below 10.2 volts during an AC power loss, a "load shed" relay isolates the battery from the panel and disables the panel. Load shed protects the battery from being damaged by deep discharge. When AC power restores, the load shed relay resets and battery voltage is again available.

Reset or power down required for shorted battery: If the D7212 determines the battery is shorted, it uses the load shed relay to disconnect the battery. You must reset or power down the panel after correcting the problem to reset the load shed relay and reconnect the battery.

Reset the panel by momentarily placing the reset pin in the disable position. See Figure 3. The red Low Battery LED continues to flash until you reset the panel.

A shorted battery condition is created either by a shorted cell inside the battery or by a short on terminals 4 and 5. A shorted battery may generate WATCHDOG RESET reports.

Battery Discharge/Recharge Schedule (No AC Power)

Discharge Cycle

AC OFF AC fail report when AC fails if panel is programmed to report AC failure at occurrence.

13.9 VDC Charging float level

13.8 VDC Charging Status LED on

12.1 VDC Low Battery & AC fail reports if programmed; Low Battery LED on

10.2 VDC Battery load shed (processing functions continue if AC is present)

Recharge Cycle

AC ON Load shed relay resets, battery charging begins, battery trouble and AC restoral reports sent.

13.7 VDC Battery restoral reports sent, Low Battery LED off

13.9 VDC Charging Status LED off, battery float charged