

RadionicsTM

**D2112/D2112E Control/Communicator
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.

If a discrepancy is found in this documentation, please mail a photocopy of the corrected material to:

Technical Communications
c/o Radionics, Inc.
1800 Abbott Street
P.O. Box 80012
Salinas, CA 93912-0012

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Revision Marking

In this version of the Installation Manual, we added information about the D2112E Control/Communicator. New information about the D2112E appears throughout the manual. We marked changes significant to the design and operation of the panel with a vertical line in the margin. An example of the line is shown in the margin to the left of this paragraph.

FCC Notices

Part 15

This equipment generates and uses radio frequency energy. If not installed and used in accordance with the manufacturer's instructions, it may cause interference to radio and television reception. It has been tested and found to comply with the specifications in 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 transformer 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 number 004-000-00450-7.

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).

Radionics registered the D2112 Control/Communicator for connection to the public telephone network using an RJ38X or RJ31X jack.

Use the ringer equivalence number (REN) to determine the number of devices you can connect to the telephone line. Excessive RENs on the telephone line may result in 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). Contact the telephone company to determine the maximum REN for the calling area.

If the D2112 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.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the D2112. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications to maintain uninterrupted service.

If you experience trouble with the D2112 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 D2112 from the network until the problem is resolved. User repairs must not be made. Doing so voids the user's warranty.

Do not install the D2112 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.). You must supply the local telephone company with the following information at their request.

- The line you are going to connect the panel to
- Make (Radionics), model (D2112), and serial number of the panel
- FCC registration number and ringer equivalence for the panel.

FCC Registration Number: AJ9USA-20644-AL-E

Ringer Equivalence: 0.2B

Service Center in USA: Radionics, Inc.
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Introduction

D2112/D2112E Control/Communicator

The Radionics D2112 and D2112E Control/Communicators are shipped pre-assembled from the factory. You should receive the following parts with your D2112 or D2112E panel.

Panel Assembly

- D2112 or D2112E Panel
- D2103 Enclosure
- D1625 Transformer
- **D2112 Only:** *Smoke Detectors Compatible with the D2112 Technogram (73-07115-000)*

Hardware Pack

- **D2112 only:** One 2.0k Ω end-of-line resistor for Point 1 (30-01098-102)
- Five 1k Ω end-of-line resistors for Points 2 to 6 (six with D2112E) (15-03130-008)
- Two #6 by 3/8" sheet metal screws to secure the D2103 Enclosure cover (60-03977-006)

Ordered Separately

Literature Pack

- *D2112/D2112E Installation Manual (74-07111-000)*
- *D2112/D2112E Program Entry Guide (74-07112-000)*
- *D2112/D2112E Program Record Sheet (74-07114-000)*

D202 Keypad

The D2112C package includes one D202 Keypad. Each D202 includes the following.

- *D202 Keypad*
- *Installation Sheet (74-07118-000)*
- *User's Cards (74-07090-000)*
- *Key Labels (74-07092-000)*
- *Security System User's Guide (74-07117-000)*
- * *Three-wire cable assembly (15-07032-000)*

Battery

Order a **D1240 Battery** (12 V 4.0Ah) to complete a basic D2112 or D2112E installation.

Order a **D126 Battery** (12 V 7.0Ah) for fire and combined fire/burglary systems.

Enclosure Options

The D2112 and D2112E are shipped in the D2103 enclosure. If you want to mount the D2112 or D2112E in one of the optional enclosures listed below, order the D2112M or D2112EM, and the enclosure of your choice.

- D8103 Universal Enclosure
- D8108A Attack Resistant Enclosure
- D8109 Fire Rated Enclosure

Listings and Approvals

Fire

Underwriters Laboratories lists the D2112 and D2112E Control/Communicators as Signal System Control Units for NFPA 72 Household Fire Warning.

The D2112 and D2112E have been submitted for evaluation to:

CSFM 7167-0801:143 (Residential)
UL 985 Household Fire Warning
ULC 540 Household Fire Warning and Burglar Alarm Control Units and Accessories

Burglary

UL 1023 Household Burglar Alarm
UL 365 Police Station Connect
UL 609 Local Burglar Alarm
UL 1076 Proprietary Burglary Alarm
UL 1610 Central Station
ULC 303 Burglar Alarm System Control Units, Local Type
ULC 304 Burglar Alarm System Control Units, Monitoring Station Type, Commercial Premises

Getting Started

Before You Begin

Radionics recommends you review this manual 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 the manual:

- *D2112/D2112E Program Record Sheet*
- *D2112/D2112E Program Entry Guide*
- *Security System User's Guide*

Mount the Enclosure

Lift the bottom of the enclosure cover and remove it from the base. See Figure 1.

Mount the base in the desired location. Leave a 2" clearance at the top of enclosure so that you can easily install the cover.

Run the Premises Wiring

Run the necessary wiring throughout the premises and pull the wires into the enclosure. Do not make any connections yet.

Wire Length

The length of the wire run for points is limited only by the resistance on the loop and potential EMI (Electro-Magnetic Interference) problems.

On the D2112, wire resistance on the Point 1 sensor loop must be less than 50Ω . Measure the wire resistance before installing smoke detectors. Short the end-of-line resistor before metering the wire.

Resistance on the sensor loops for Points 2 to 8 (1 to 6 on D2112E) must be less than 100Ω with the end of line resistor shorted and the detection devices connected.

Maximum wire length for the transformer is 50 feet (18 AWG, stranded).

Maximum wire length for all keypads combined is 500 feet (22 AWG).

EMI (Electro Magnetic Interference)

AC wiring can induce EMI (both noise and low level voltage) into adjacent wiring. Run phone and sensor loop wiring away from AC conductors, including the transformer wire. Run keypad wiring away from AC and phone wiring.

EMI may also occur if you install the panel or run system wires near the following:

- Computer network system
- Fluorescent fixtures
- Telephone cabling
- Ham radio transmitter site
- Heavy machinery and motors
- High voltage electrical equipment
- 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 3 on the panel to the end of the wire run.

If continuity is not maintained, the shielded cable may aggravate potential noise problems rather than eliminate them. If you cut the drain wire to install devices be certain to splice it together. Solder and tape all splices.

Connecting the drain wire to ground at other than terminal 3 may also produce problems.

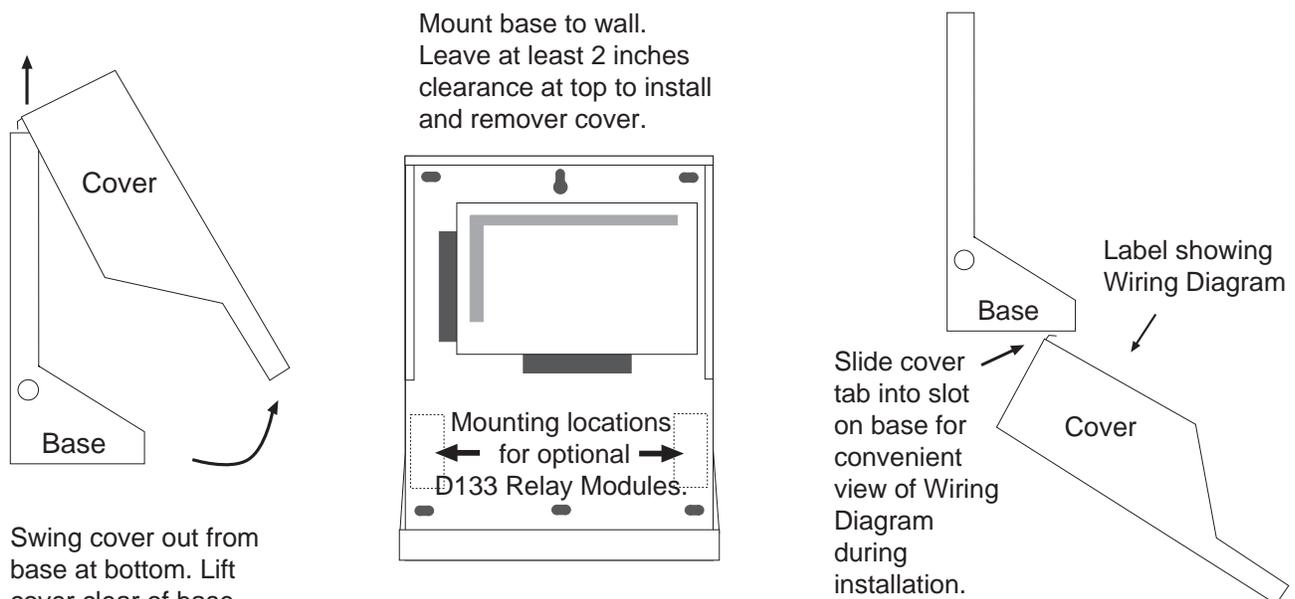


Figure 1: D2103 Enclosure

Connect Earth Ground Terminal 3

To help prevent damage from electrostatic charges or other transient electrical surges, connect the panel to earth ground at terminal 3 before making any other connections.

A grounding rod or cold water pipe are recommended earth ground references.

Radionics does not recommend a telephone or electrical ground for the earth ground connection. Use 18 AWG wire maximum under the terminal. Use a lug or splice for larger wire.

Do not connect any other panel terminals to earth ground. The panels common terminals and terminal 3, earth ground, are electrically isolated.

Charge the Battery as You Work

Lock the Standby Switch

Locking the pin in the standby position allows you to charge the battery as you install the detection devices and keypads. Lock the pin down now. See Figure 2.

With the Standby Switch locked down, the panel deactivates the external relay outputs, suppresses reports, and disables all arming functions.

Lock the Standby Switch down to program the panel locally, from the keypad or the D5200.

Releasing the Standby Switch from the closed position resets the panel. The panel resets all its timers and counters, and clears all buffers.

Transformer Terminals 1 and 2

Connect the transformer to terminals 1 and 2 on the panel before plugging it into the power source.

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

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

Battery Terminals 4 and 5

Place the battery upright in the base of the enclosure. First connect the bare end of the black battery lead to terminal 5 on the panel. Then plug the other end to the negative (-) side of the battery.

Next connect the bare end of the red battery lead to terminal 4 on the panel. Then plug the other end to the positive (+) side of the battery.

D126 Battery required for fire and combined fire/burglary systems: In order to meet standby battery requirements, use the Radionics D126, 12 V 7.0Ah battery for fire and combined fire/burglary systems.

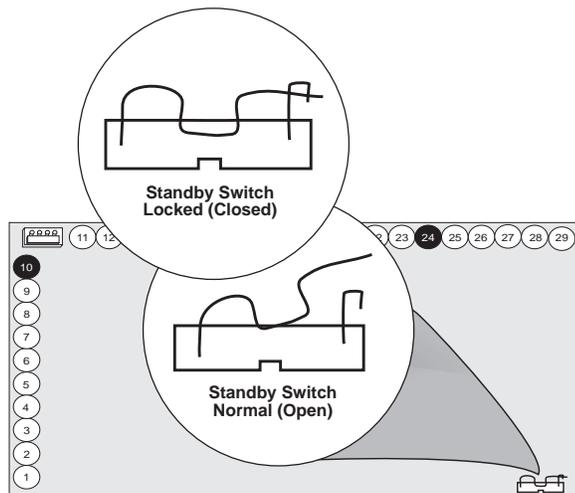


Figure 2: Standby Switch

Install Detection Devices, Keypads, and Bells

No Connections to the Panel Yet

Install and wire detection devices, keypads, and indicating devices (bells, sirens, or strobes for example) at their locations throughout the premises. DO NOT make the connections at the panel end of the wiring yet.

Number of Sensors

When using the D2112's Point 1 as a fire point, the number of devices you can connect to it's sensor loop is limited. See *Point 1 on the D2112 Only* on Page 10.

The number of sensors you can connect to the sensor loops for points 2 to 8 (1 to 6 on D2112E) is limited only by the resistance on the loop. Resistance must be less than 100Ω with the detection devices connected.

Continue Connections to the Panel

Power Down First

Unplug the transformer and disconnect the battery to make the remaining connections to the panel.

Alarm Output Terminals 6 and 7

Terminals 6 and 7 provide a 10.2 VDC to 13.9 VDC output when activated. **Terminal 6 provides a steady positive output.** Terminal 7 provides a pulsed or steady negative output as programmed.

There is always power at Terminal 6: The D2112 sends a trouble report if terminal 6 is shorted to ground. The D2112 sends a trouble report if terminal 6 is shorted to terminal 7 while the alarm output is activated.

Use this power for bells, siren drivers, piezo fire sounders, electronic horns, or other devices.

Available Power

The panel combines power produced by the power supply with power from the secondary power source (the battery) to produce a total of 1.5A of **alarm** power at terminals 6 and 7.

D126 Battery required for fire and combined fire/burglary systems: In order to meet standby battery requirements, use the Radionics D126, 12 V 7.0Ah battery for fire and combined fire/burglary systems.

Power restricted for fire and combined fire/burglary systems: Use the *Fire System Power Formula* below to calculate the alarm current available for fire and combined fire/burglary systems.

Fire System Power Formula

To calculate the current available at terminals 6 and 7 for fire and combined fire/burglary systems:

1. Add together the current draws for all devices connected to terminal 9. This total is current required for the **Normal Standby Condition (NSC)**. This total must be less than 140mA.
2. Subtract the NSC current required calculated in step 1 from the Primary Alarm Current, 860mA. The difference is the Alarm Current Available for terminals 6 and 7.

In formula format:

**Primary Alarm Current – NSC current required =
Alarm Current Available**

Keypads

Terminals 8, 9, and 10

You can connect up to four keypads to the panel.

The installation sheet packaged with each keypad contains mounting instructions. Wire keypads to the panel in parallel as shown in Figure 3.

You must use a minimum of five feet of wire (22 AWG) when connecting the keypad to the panel.

A short on terminal 9 within five feet of the panel prevents the panel from operating correctly.

Maximum wire length for all keypads combined is 500 feet (22 AWG).

Extra power needed for more keypads: The D202 Keypad draws 45mA (125mA Alarm). Review *Power Outputs* on page 14 to determine the total power output requirements for your system. Instructions for using stand alone power supplies are included.

Auxiliary Power

Terminal 9

The **continuous** current draw for powered devices connected to terminal 9, including keypads, must not exceed 350mA (140mA for fire and combined fire/burglary systems). Devices powered from this output must operate over a range of 10.2 VDC to 13.9 VDC.

You must use a minimum of five feet (22 AWG) of wire when connecting devices mounted outside the enclosure to terminal 9.

A short on terminal 9 within five feet of the panel prevents the panel from operating correctly.

Checking Continuous Current Draw

The panel allows you to check current draw using the keypad. For more information about this and other keypad diagnostic features, see the *D2112 Keypad Diagnostics* manual (74-07113-000).

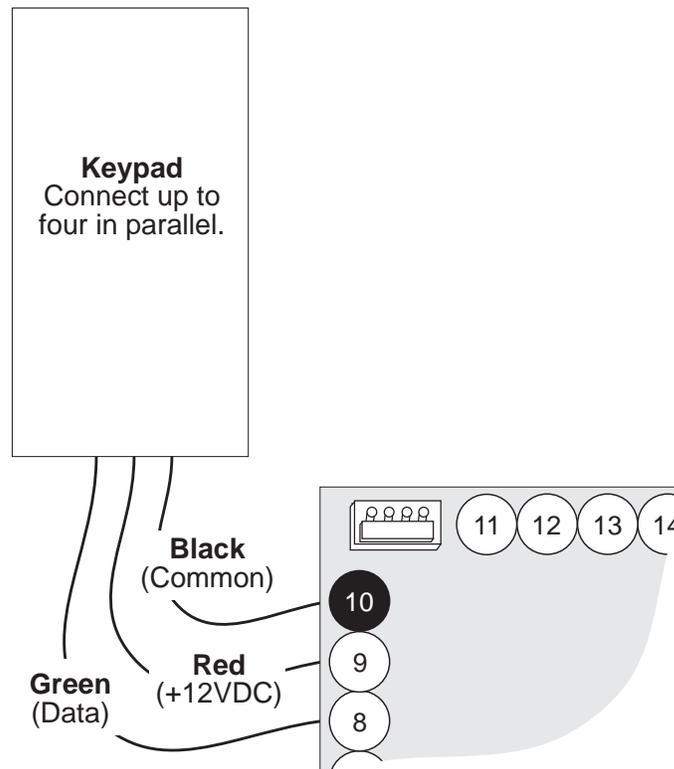


Figure 3: Keypad Wiring

Testing and Replacing D2112E Fuses

The D2112E's Aux Power and Bell outputs are protected by 2 Amp fast blow fuses. The fuses are 5 mm x 20 mm, 2 Amp Fast Blow (Radionics Part # 57-03570-008). To test the fuses, use a Volt/Ohm meter to follow these steps:

1. Remove the fuse from the socket.
2. Switch the meter to measure Ohms.
3. Attach the meter leads to each side of the fuse.
4. If the meter does not change when you connect the leads to the fuse, the fuse is open (blown). Replace the blown fuse with a 5 mm x 20 mm, 2 Amp Fast Blow fuse.
5. If the meter measures 0 Ohms, the fuse is closed (normal), and does not need to be replaced.

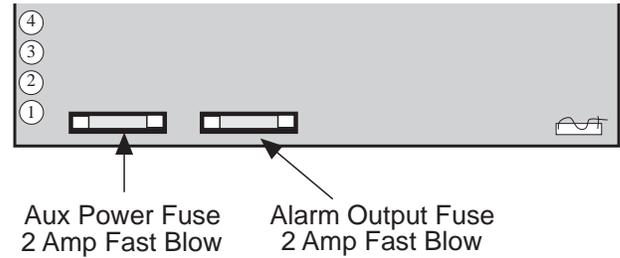


Figure 4: D2112E Fuse Locations

External Relays Terminals 11 and 12

You can program terminals 11 and 12 to provide outputs for two external relays. Review the *RELAYS Group in the D2112/D2112E Program Entry Guide* for a description of the relay functions available.

Connect a D133 Relay Module for each of the external relay outputs you intend to use. Figure 5 shows the connections.

Warning: Install D133 modules connected to terminals 11 and 12 in the enclosure with the panel as shown in Figure 1. Do not connect wiring for external devices directly to terminals 11 or 12.

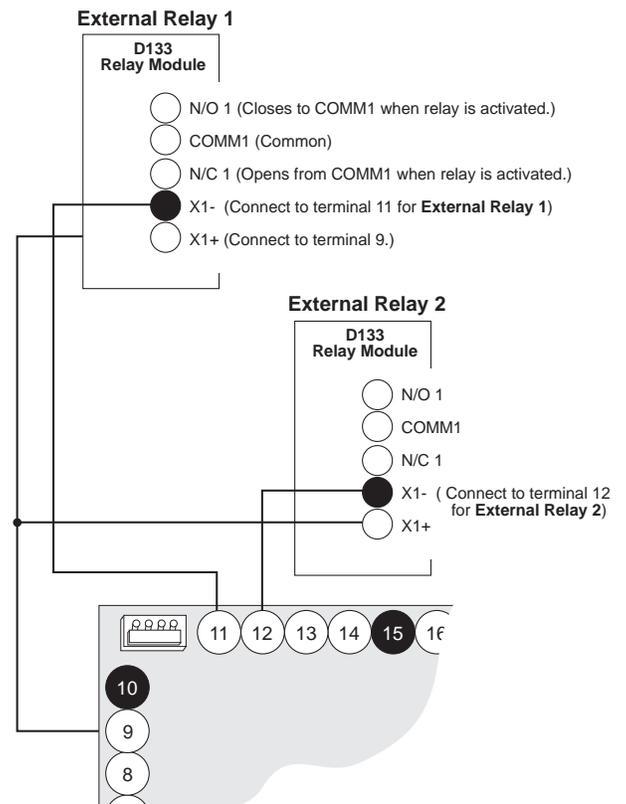


Figure 5: External Relay Wiring

Connect the Points

Point 1 on the D2112 Only Terminals 13 and 14

Point 1 on the D2112 is a powered, supervised point.

The panel monitors the Point 1 sensor loop for normal, shorted, or open conditions. Programming determines how the panel responds to those conditions. See the *D2112/D2112E Program Entry Guide*.

Terminal 13 provides positive (+) voltage to detection devices. Terminal 14, the loop return (-), is isolated from earth ground.

The keypad Reset function interrupts power to this sensor loop to reset smoke or glass break detectors.

Use a 2.0k Ω end of line resistor for point 1 on the D2112. Figure 6 shows point wiring.

Connecting Two-Wire Smoke Detectors to Point 1 on D2112 Only:

Connect up to five Radionics D262 two-wire smoke detectors to point 1 on the D2112. Refer to the *Technogram, Smoke Detectors Compatible with the D2112* (73-07115-000), for a complete list of detectors compatible with the D2112.

Four-Wire Smoke Detectors

Connect any number (limited by available power and the Authority Having Jurisdiction) of 12 VDC four-wire smoke detectors to any supervised point. Install a suitable power supervision device according to the manufacturer's instructions. Route the power for the detectors through a D133 Relay Module. The relay module must be connected to one of the panel's external relay outputs programmed for the reset function. See *RELAYS* in the *D2112/D2112E Program Entry Guide* for programming instructions.

Heat Detectors and Other Dry Contact Initiating Devices

Connect any number (limited by the Authority Having Jurisdiction).

Burglar Devices

Connect any number (limited by available power) of burglar devices to any point. Do not combine fire detection and burglar devices.

Points 2 to 6 (1 to 6 on D2112E) Terminals 15 to 22 (14 to 22 on D2112E)

Points 2 to 6 (1 to 6 on D2112E) are supervised, non-powered points.

The panel monitors sensor loops for normal, shorted, or open conditions. Programming for each point determines how the panel responds to those conditions. See the *D2112/D2112E Program Entry Guide*.

Terminate each sensor loop with a 1.0k Ω end of line resistor. Figure 6 shows point wiring.

Four-Wire Smoke Detectors

Connect any number (limited by available power and the Authority Having Jurisdiction) of 12 VDC four-wire smoke detectors to any supervised point. Install a suitable power supervision device according to the manufacturer's instructions. Route the power for the detectors through a D133 Relay Module. The relay module must be connected to one of the panel's external relay outputs programmed for the reset function. See *RELAYS* in the *D2112/D2112E Program Entry Guide* for programming instructions.

Heat Detectors and Other Dry Contact Initiating Devices

Connect any number (limited by the Authority Having Jurisdiction).

Burglar Devices

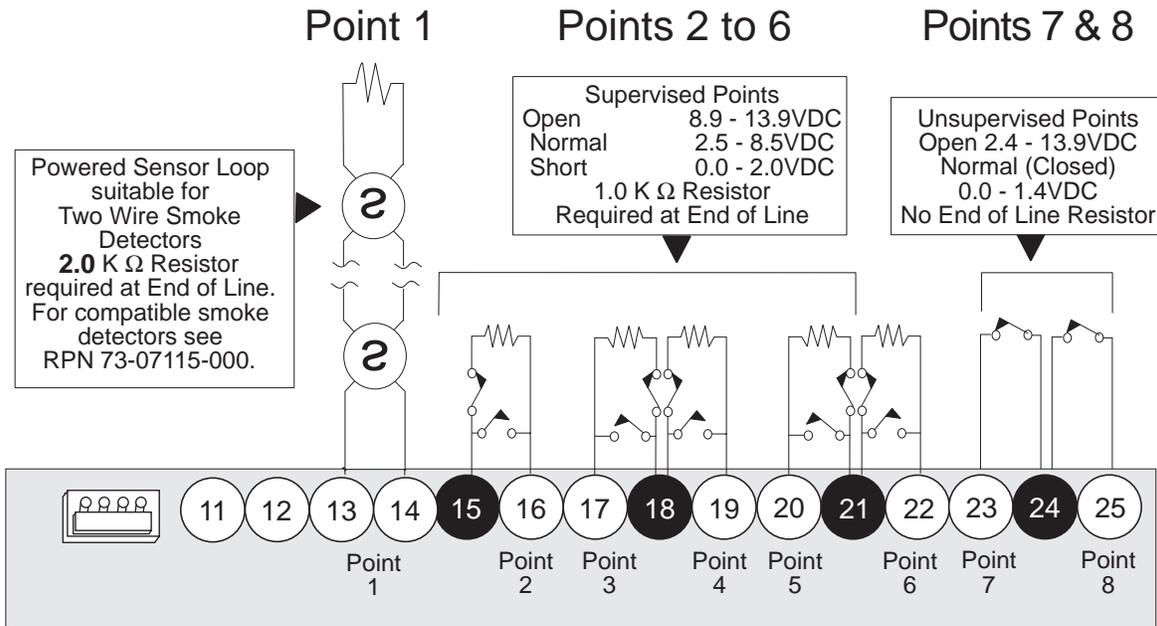
Connect any number (limited by available power) of burglar devices to any point. Do not combine fire detection and burglar devices.

Points 7 and 8 on the D2112 Only Terminals 23 to 25

Points 7 and 8 are non-powered points that are not supervised with an end of line resistor.

The D2112 monitors the sensor loops for Points 7 and 8 for normal (closed) and open conditions. Programming determines how the panel responds to those conditions. See the *D2112/D2112E Program Entry Guide*. Figure 6 shows point wiring.

D2112



D2112E

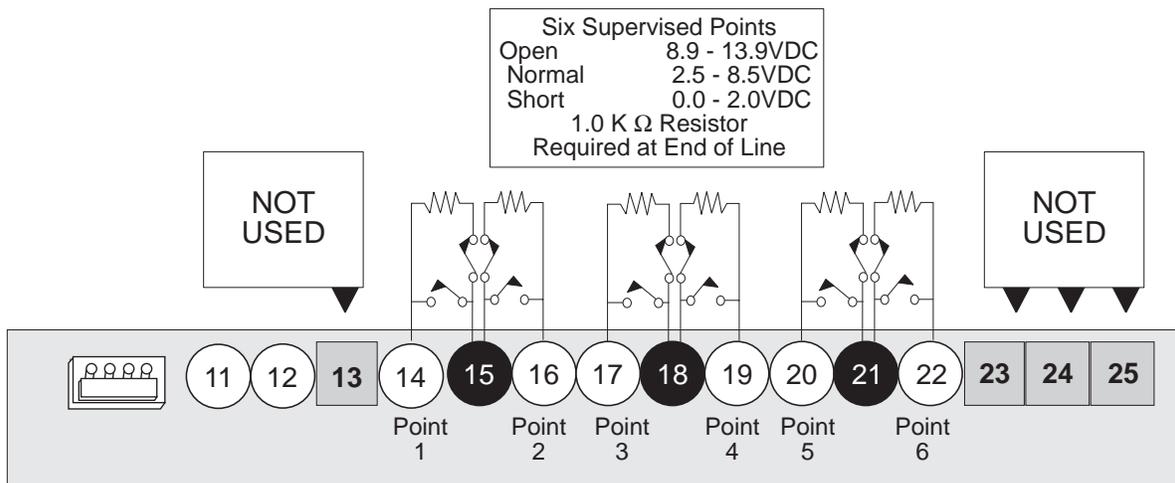


Figure 6: Points

Make the Telephone Connections

Phone Jack

To prevent jamming of reports, wire the RJ31X jack before the in-house phone system to support line seizure. See Figure 7. Line seizure provides for a temporary interruption of normal phone usage while the communicator transmits data.

After installation, confirm that the panel seizes the line, acquires dial tone, reports correctly to the receiver, and releases the phone line to the in-house phone system.

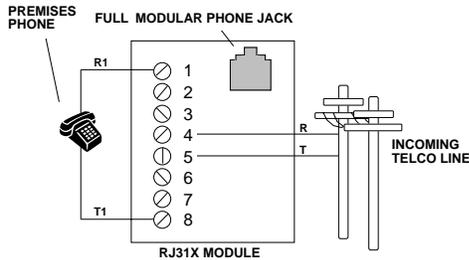


Figure 7: RJ31X Phone Jack

Phone Cord

Connect the flying leads of the D164 Phone Cord to the panel as shown in Figure 8. Connect the modular end to the RJ31X jack.

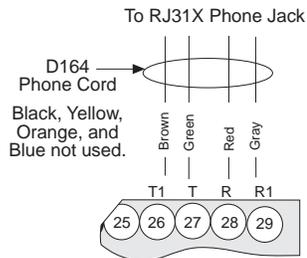


Figure 8: Phone Cord

Power Up

Connect the battery and then plug in the transformer.

Leave the Standby Switch locked down for now.

Program the Panel

Use the D202 Keypad, the Radionics D5200 Programmer, or a remote programmer to program the panel. See the *D2112/D2112E Program Entry Guide* for programming options and keypad programming instructions.

If you're programming from the keypad or using the D5200, make sure the Standby Switch is locked down. See Figure 9.

If you're using the D5200, Figure 10 shows the location of the programming jack. See the *D5200 Programmer Operation Manual* for instructions on using the programmer.

Unlock the Standby Switch

When you're finished programming move the Standby Switch to the normal position. See Figure 9. The panel sends a RE-BOOT report to the receiver and the panel returns to the disarmed state. If you programmed for test reports and left the hours and minutes to next report prompts at 0 (zero), the panel sends a test report with the RE-BOOT report.

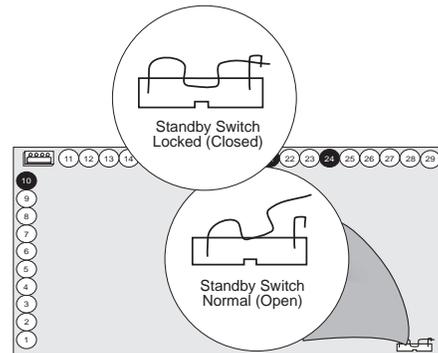


Figure 9: Standby Switch

All Non-Fire "Points to Watch" become selected:

After the Standby Switch is unlocked, all non-fire points on the system become selected "Points to Watch." See the *Watch-Test User's Card* on the D202 Keypad for more information.

RAM II ResetBye does not disarm the panel: After you unlock the standby switch, the panel returns to a disarmed state. Using RAM II **ResetBye**, however, does not affect the armed state of the panel.

Fill out the Point Chart

Radionics recommends you fill out the *Point Chart* on the Installation Label located inside the D2103 enclosure cover.

You must fill out the point chart if you programmed Point 1 for Fire with Verification (Digit 1 = 2). See *POINT CODES* in the *D2112/D2112E Program Entry Guide* for more information.

Use the program record sheet to gather the information you need to fill out the point chart.

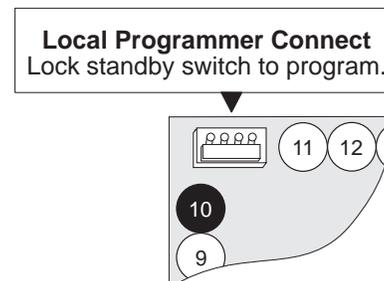


Figure 10: Programmer Jack

Test the System

After finishing installation and programming, make a complete functional test of the system. Test the panel and all devices for proper operation. Test after you first program the panel and after any subsequent programming session.

Clear after test: To clear the alarm memory and report buffer, close the Standby Switch for two seconds and then release it. The panel returns to service in the disarmed state.

Detailed Panel Description

Primary (AC) Power Circuit

A 16.5 VAC, 25VA transformer (Radionics model D1625) is the primary power source for the panel.

The AC power circuit provides 1.0 Amps of rectified DC power. The panel reserves 140mA of this power for internal operations and 350mA for continuously powered devices. Under alarm conditions 860mA of power is available for continuously powered and alarm indicating devices combined.

Transient suppressors and spark gaps protect the circuit from power surges. This protection relies on the ground connection at terminal 3. Make sure you connect terminal 3 to a proper ground.

AC Power Failure

The panel indicates an AC power failure when power at terminals 1 and 2 is missing for 60 seconds. The *AC Fail Buzz/Rpt* program item sets the panels response to detected AC failure. The panel indicates an AC power restoral 60 seconds after power restores to terminals 1 and 2.

Secondary (DC) Power

A 12V, 4.0 Ah sealed lead-acid rechargeable battery (Radionics D1240) supplies secondary power for auxiliary and alarm outputs. The battery also powers the system during interruptions in primary (AC) power.

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

Larger Battery Increases Backup Time: To increase battery backup time, connect a larger capacity battery, up to 7 Ah (Radionics D126).

Battery Replacement

Radionics recommends battery replacement every three to five 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.

D135A Prevents Deep Discharge: The D135A Low Battery Cutoff Module protects the battery from deep discharge during extended power outages. Deep discharge can cause permanent battery damage.

Battery Supervision

When the battery drops to 12.1 VDC the OK light on the keypad winks, indicating a trouble condition. The panel transmits a BATTERY LOW report.

When battery voltage returns to 13.0 VDC and there is AC power at terminals 1 and 2, the OK LIGHT at the keypad stays on steady. The panel transmits a BATTERY RESTORAL report.

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. Deduct any continuous load for devices connected to the panel from 860mA to find the maximum current available for charging. At 13.9 VDC the battery is fully charged and is maintained with a trickle charge of approximately 5mA.

Battery Discharge/Recharge Schedule (No AC Power)

Discharge Cycle

AC OFF	OK light on keypad begins winking AC Fail reports if programmed
13.9 VDC	Charging float level
12.1 VDC	Low Battery reports if programmed
10.2 VDC	Panel shuts down below 10.2 VDC

Recharge Cycle

AC ON	Panel restarts, battery charging begins, AC restoral report sent
13.0 VDC	Battery restoral reports sent, OK light on steady
13.9 VDC	Battery float charged

Power Outputs

D2112 Circuit Protection

Two self-resetting protection devices protect the panel from short circuits on both the auxiliary and alarm power outputs.

D2112E Circuit Protection

Two fuses protect the panel from short circuits on both the auxiliary and alarm power outputs.

D2112 bell circuit protection: A short on alarm power output while the bell is ringing disables the alarm power output until the output times out or you perform a panel reset.

Reports

The panel transmits a trouble Point 99 report when there is a short on the alarm output, terminals 6 and 7, or when the fuse is open. The panel transmits a trouble Point 98 report when Auxiliary Power, terminal 9, is shorted, or when the fuse is open.

Extra Power for Keypad or Other Powered Devices

The D202 Keypad draws 45mA (125mA in alarm).

You may need to add one or more D8132 Battery Charger/Power Supply Modules for the number of keypads you want to use. Figure 11 shows the D8132 powering keypads in a stand-alone configuration.

For UL certificated accounts use a UL listed power supply. The D8132 is not UL listed as a stand-alone power supply.

D2112 and D8132 (or other power supply) must share COMMON: Note that Figure 11 shows the common from the D8132 module connected to both the keypads' common and the terminal 10 on the panel.

A stand-alone power supply powering any device connected to the panel must also be connected to terminal 10 on the panel. Do not connect the stand-alone power supply to earth ground.

Telephone

Dialing Format

You can program the panel to use DTMF or pulse dialing. See *Phone Parameters* in the *D2112/D2112E Program Entry Guide*.

Communication Failure

After 5 attempts to reach the receiver (10 attempts if two phone number are programmed) the panel goes into communication failure. The panel clears any reports in its phone buffer. The panel sounds a tone at the keypad and winks the OK light.

Pressing the Clear key silences the tone. When communication restores (a report is acknowledged by the receiver), the OK light restores.

Ground Start

Some telephone systems require a momentary ground input to initiate dial tone. To interface with a ground start system, connect a D133 relay as shown in Figure 12.

See *RELAYS Group* in the *D2112/D2112E Program Entry Guide* for instructions on programming the external relay output for Ground Start.

Terminal 3 on the panel must be connected to an earth ground reference.

Warning: You cannot use ground start phone systems for fire or combined fire burglary systems.

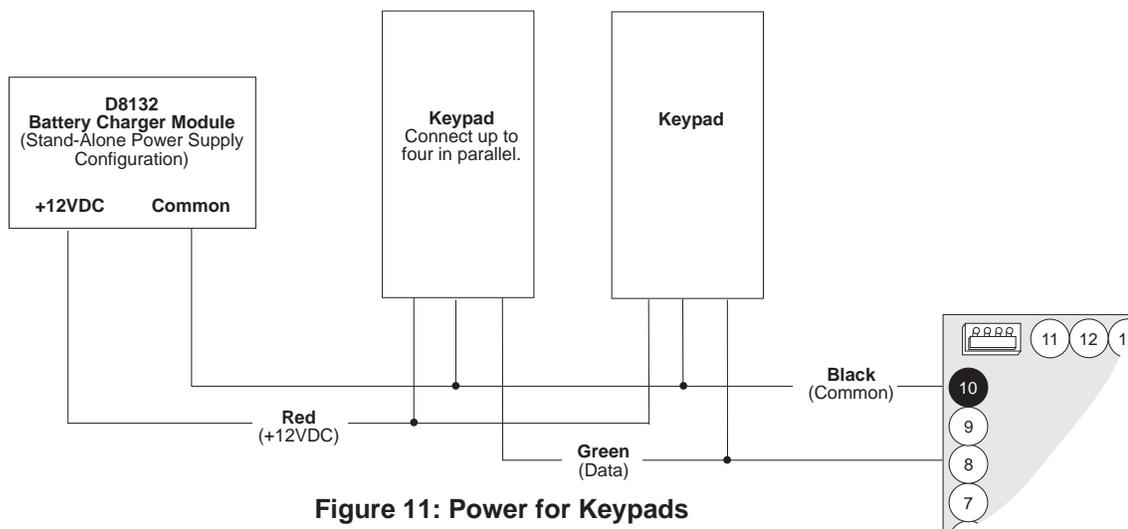


Figure 11: Power for Keypads

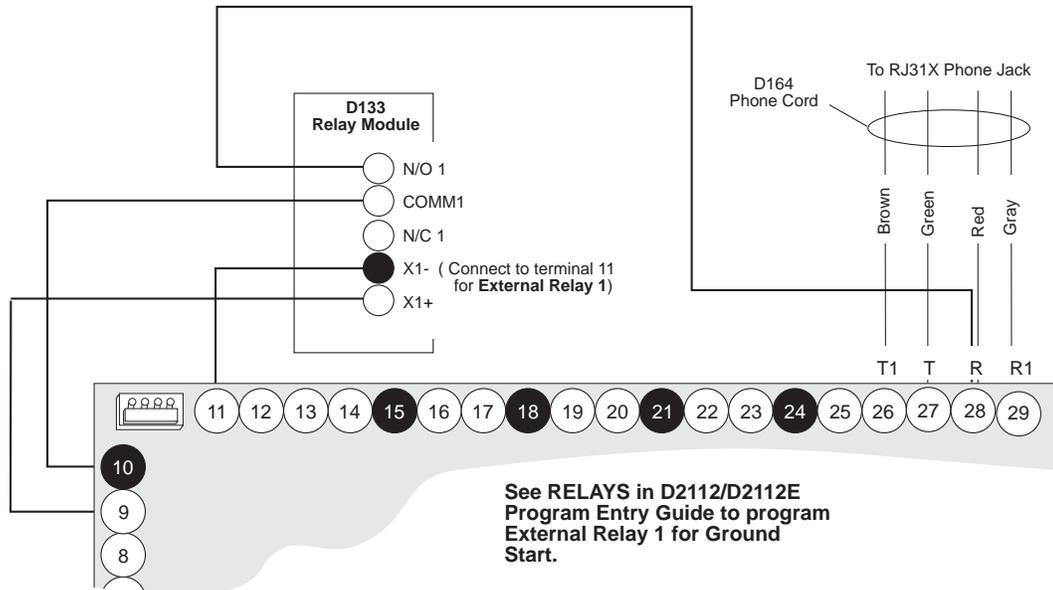


Figure 12: D133 for Ground Start

Points

Point Parameters

D2112 Point 1

Point 1 is a powered sensor loop. Review the Radionics Technogram: *Smoke Detectors Compatible with the D2112 (73-07115-000)* for a list of compatible detectors.

Point 1 is supervised with a 2.0K EOL resistor.

Points 2 to 6 (1 to 6 on D2112E)

Points 2 to 6 are supervised with a 1.0K EOL resistors

Open Loop = Greater than 8.9 VDC, but less than 13.9 VDC.

Normal Loop = Greater than 2.5 VDC, but less than 8.5 VDC.

Shorted Loop = Greater than 0.0 VDC, but less than 2.0 VDC.

(D2112 Only) Points 7 and 8

Points 7 and 8 are not supervised with EOL resistors.

Open Loop = Greater than 2.4 VDC, but less than 13.9 VDC.

Normal (Closed) Loop = Greater than 0.0 VDC, but less than 1.4 VDC.

Point Response Time

The panel scans point sensor loops every 500 milliseconds. A point must be faulted for 2 scans before the panel initiates an alarm.

Keyswitch

Description

You can connect a momentary contact arming station (keyswitch) to turn the D2112 on and off. The keyswitch is connected to a point sensor loop (points 2 to 6 only, do not use points 7 and 8).

You can use the external relay outputs and D133 Relay Modules to activate arming status lights for keyswitch arming stations. See the *Relays* section *D2112/D2112E Program Entry Guide*.

Programming

See the *POINT CODES Group* in the *D2112/D2112E Program Entry Guide* for the correct programming for points used for keyswitches.

Installation

Connect the end-of-line resistor for the point at the keyswitch so that the switch shorts the resistor when it operates. An open on the circuit produces an alarm if the area is armed and a trouble if it is disarmed. See Figure 13.

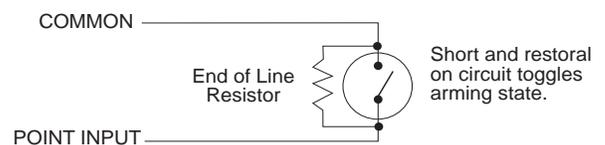


Figure 13: Keyswitch

Keyswitch Operation

Shorting and restoring the point sensor loop toggles the system On and Off. All faulted points are bypassed. See *POINT CODES Group* in the *D2112/D2112E Program Entry Guide*.

Silencing the Bell

To silence the bell (stop Alarm output) if the system is On (or Part On), operate the keyswitch to turn the system Off. If the area is Off, operating the keyswitch only silences the bell. It does not turn the system On.

Easikey

You can use a Radionics Easikey access system to turn the system Off. Program the *Keyswitch* prompt to Easikey. See the *D2112/D2112E Program Entry Guide* for instructions. You must use a 12VDC option for the Easikey installation. See the *Easikey Installation and Operation Instructions*.

Connect the Easikey door controller to the panel using a D133 Relay Module as shown in Figure 14. Make certain to connect the common for the Easikey's 12VDC power supply to terminal 10 on the panel.

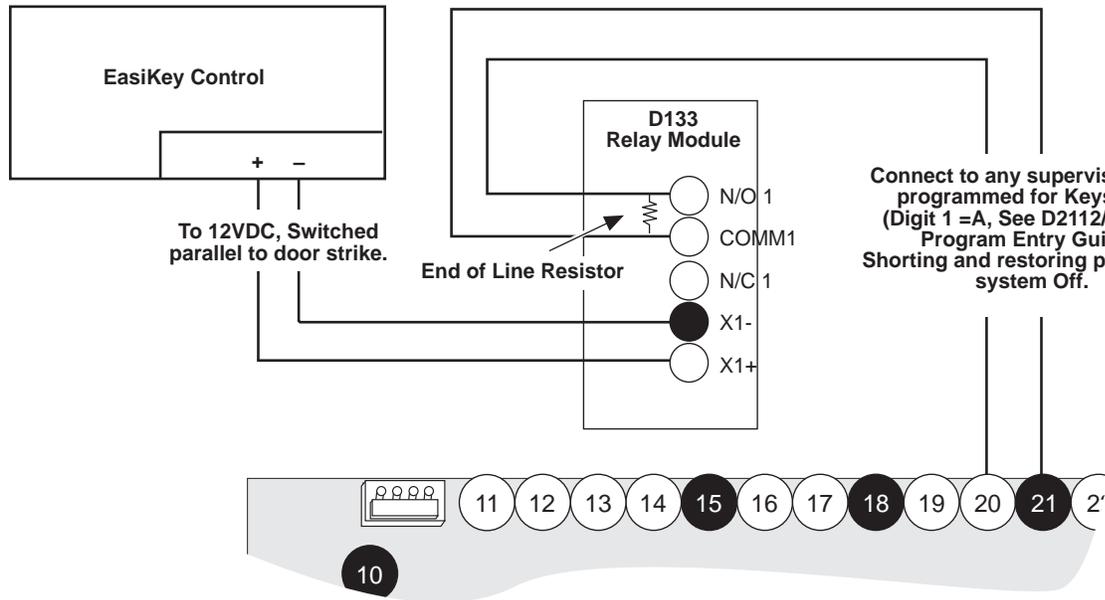


Figure 14: Easikey

Installation Guide for UL Applications

Introduction

The *System Chart* references components evaluated and listed by Underwriters' Laboratories for compatibility with the panel. These components meet the basic system requirements for the applicable standard.

The *System Wiring Diagram, Issue A* shows the relationship between the panel and the accessory components referred to in the *System Chart*. See the installation and operation instructions for each component for detailed instructions.

Optional Compatible Equipment

You can use UL listed components that do not require evaluation for electrical compatibility in many applications when installed according to the manufacturer's instructions.

Burglary Applications

You can use UL listed burglary alarm sensors that do not require evaluation for electrical compatibility in burglary applications. In some cases you must use a UL listed Radionics interface module in conjunction with the sensors. Consult the individual component specification and installation documents to determine suitability.

In burglary applications with one 7.0Ah, 12 VDC battery the panel supports an auxiliary output of 350mA and an alarm (bell) output of 1.5A configured as necessary. For additional loadings refer to the *Current Rating Chart for Standby Battery Calculations*.

For commercial burglary installations use a maximum of 45 seconds of entry delay and a maximum of 60 seconds of exit delay.

Test weekly: UL Standard 1023 requires a weekly test. Configure the User System Test to test the battery. See *User Configuration* in the *D2112/D2112E Program Entry Guide* for instructions.

Fire Applications

You can use UL listed fire initiating devices not requiring electrical compatibility evaluation in any application. For example: four-wire smoke detectors, heat detectors, waterflow switches, and manual pull stations are suitable fire initiating devices. Consult the individual component specification and installation documents to determine suitability.

When using four-wire smoke detectors, install a suitable power supervision unit according to the manufacturer's instructions. Use the D133 Relay Module to provide reset capability.

In fire applications with one 7.0Ah, 12 VDC battery the panel supports an auxiliary output of 140mA and a bell output of 720mA configured as necessary. For additional loadings refer to the *Current Rating Chart for Standby Battery Calculations*.

D2112 only: Two-wire detectors must be electrically compatible, and must be UL listed for use with the D2112. See the Radionics Technogram *Smoke Detectors Compatible with the D2112* (73-07115-000), or you may contact the detector manufacturer.

Test weekly: Radionics recommends testing fire and combined fire/burglary systems weekly. Configure the User System Test to test the battery. See *User Configuration* in the *D2112/D2112E Program Entry Guide* for instructions.

For all Burglary applications the panel must be programmed to send a supervisory signal to the central station a minimum of once every 24 hours.

Do not set or program an automatic telephone dialer or similar device to place a call to a police station number that is not specifically assigned by that station for such service.

Sounding Device

The sounding device shall operate for at least four minutes before an automatic cutoff for Household Burglary applications and at least 15 minutes for Commercial Burglary applications.

For all Commercial Burglary applications the system must be programmed to sound the audible device every time the system is armed.

Enclosures

The **D2103** enclosure is suitable for Household Fire and Burglary applications only.

Enclosure tamper protection causing an immediate alarm signal is required for all burglary applications.

Radionics offers three optional enclosures.

The **D8103** enclosure is suitable for residential fire and/or burglary installations and commercial applications that do not require attack resistance or approval by Factory Mutual. (See the *System Chart* for acceptable applications.)

System Chart

	Household Burglary (Grade A)	Household Fire	Household Fire / Burglary Combined	Central Station Burglary (Grade C)	Police Connected Burglary	Local Burglary	Proprietary Burglary	Local Fire / Burglary Combined	Local Fire	Local and Central Station Fire Combined	Local and Central Station Fire / Burglary (Grade C)	Central Station Fire / Burglary (Grade C)	Central Station Fire	Electrically Actuated Transmitter						
NFPA Standard		72	72					D2112 and D2112E not listed for these applications												
Minimum Hours of Standby Battery	4	24 + 4 mins alarm	24 + 4 mins alarm	4	4	4	4	<p style="text-align: center;">Key</p> <p>No = Not acceptable for this application</p> <p>Req. = Required for this application</p> <p>Opt. = Optional for this application</p> <p>1+ = One or more required for this application. Consult the appropriate standard.</p> <p>2+ = Two or more required for this application. Consult the appropriate standard.</p> <p>1• = D2112 Only: At least one detector required. You can substitute other 2-wire detectors listed for use with the D2112. You could use the D262 with the D270 four-wire base or other manufacturers' four wire detectors. You must use a listed power supervision relay with four wire detectors.</p> <p>◆ = Listed bell (siren) housing required for burglary alarm bell or siren.</p> <p><input type="checkbox"/> = (Empty Box) Not used for this application.</p>												
D2103 Enclosure	Included with panel.				No	No	No													
D8103 Enclosure	Optional, order D2112M (panel on D2102 mounting skirt) and D1625 transformer. Order D101 lock for D8103.				No	No	No													
D8108A Enclosure					Req.	Req.	Req.													
D8109 Enclosure					No	No	No													
D126 Battery	Opt.	1	1	Opt.	Opt.	Opt.	Opt.													
D127 Reversing Relay	Opt.	No	Opt.	Opt.	Opt.	Opt.	Opt.													
D164 Telephone Cord	Required to connect panel to RJ31X TelCo Block.																			
D202 Command Center	1+	1+	1+	1+	1+	1+	1+													
D262 Smoke Detector Head D261A Base		1•	1•																	
D431, D435, D438, D440, D442, D448, Indicating Device	1+	1+	1+	Opt.	◆	◆	◆													
D1240 Battery	1	No	No	1	1	1	1													
D1625 Transformer	Required for all applications.																			
D8004 Transformer Enclosure	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.														
D8122 Derived Channel S.T.U.	Optional, contact TelCo for availability of derived channel service.																			
D8130 Release Module	Optional																			

The D2112 and D2112E control panels are suitable for Grade A Local Mercantile Premises Alarm systems and Grade A Mercantile Safe and Vault Alarm systems. For all local applications and Grades, the model D8108A Attack Resistant Enclosure and a UL listed sounding device are required.

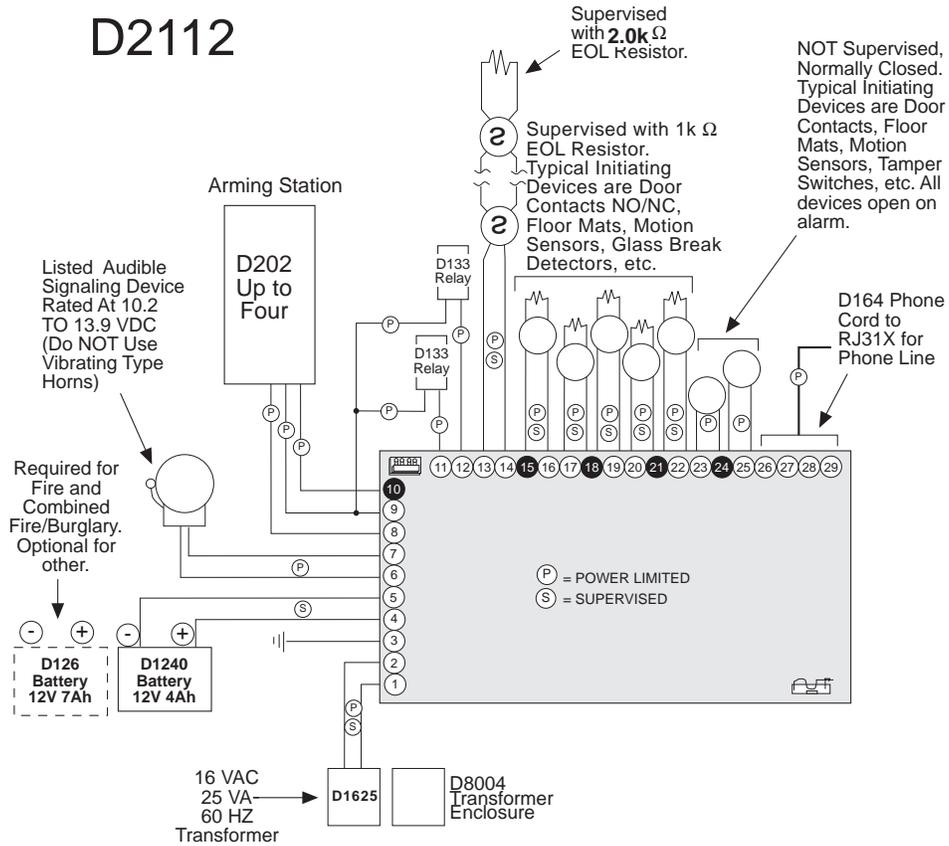
The D2112 and D2112E control panels are suitable for Grade B when used with a UL listed local sounding device. Suitable for Grade AA Central Station Mercantile when used with model D8122 derived channel subscriber terminal unit.

The D2112 and D2112E control panels are suitable for Grade A Mercantile Premises and Mercantile Safe and Vault alarm systems. Suitable for Grade AA Police Station Mercantile Premises and Mercantile Safe and Vault systems when model D8122 derived channel subscriber terminal unit is used. For all Police Station Connect applications the model D8108A Attack Resistant Enclosure and a UL listed sounding device are required.

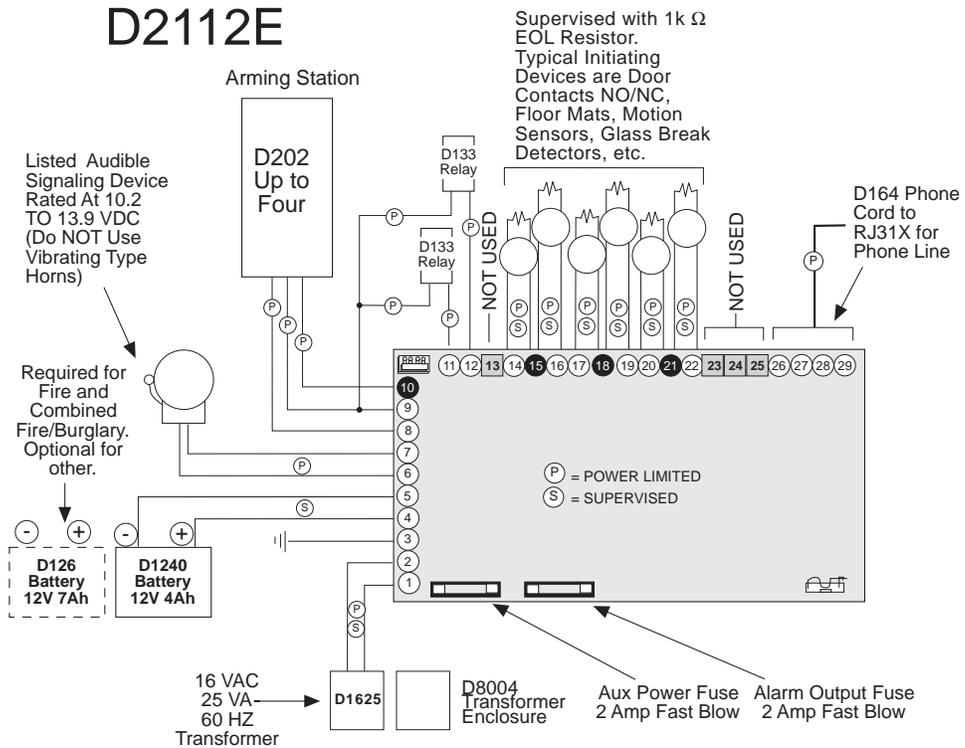
The D2112 and D2112E control panels are suitable for Grade B Proprietary Burglary applications when used with a UL listed local sounding device and Grade BB proprietary Burglar applications when installed with a model D8122 derived channel subscriber terminal unit.

System Wiring Diagram, Issue A

D2112



D2112E



Specifications

Primary Power Supply

- 16.5 VAC 25 VA class 2 plug-in transformer (D1625)

Secondary Power Supply

- 12 VDC 4.0 Ah sealed lead acid rechargeable battery. 7.0 Ah battery required for Fire and combined Fire/Burglary systems.

Auxiliary Power Output

- 350mA maximum at 10.2 VDC to 13.9 VDC for devices powered at terminal 9 (140mA for Fire and combined Fire/Burglary systems) .

Alarm Power Output

- 1.5 A maximum at 10.2 VDC to 13.9 VDC output. Output may be steady or pulsed depending on programming.
- **Fire and Fire/Burglary Systems**
To comply with UL 985 listing standards for household fire alarm systems (effective March 1, 1989), the total combined continuous and alarm current draw for the system **during alarm conditions** must be limited to 860 mA provided by the primary power supply (rectified AC).

Minimum Operating Voltage

- 10.2 VDC

Telephone Connection

- RJ31X or RJ38X jack interfaced with D164 phone cord.

Environmental

- Temperature: 32°-122°F (0°-50°C)
- Relative Humidity: 5-85% at 86°F (30°C) non-condensing

D2103 Enclosure Dimensions

Height: 10.75 inches

Width: 9.18 inches

Depth: 3.5 inches

D2112E Auxiliary Power and Bell Output

Fuse Specifications

2 Amp Fast Blow (5 mm x 20 mm)

Radionics Part # 57-03570-008

Arming Stations

- D202 Keypad
- Keyswitch
- Easikey

Compatible Enclosures

- D2103 Standard Enclosure
- D8103 Universal Enclosure
- D8109 Fire Enclosure
- D8108A Attack Resistant Enclosure

Compatible Accessories (D2112 and D2112E)

See the Radionics Product Catalog for complete list.

- D126 12V, 7 Ah Rechargeable Battery
- D127 Reversing Relay
- D133 Relay Module
- D135A Low Battery Cutoff Module
- D164 Phone Cord
- D202 Keypad
- D250 Heat Detector Base
- D254 135° Fixed Point Thermostat
- D255 190° Fixed Point Thermostat
- D440 (6"), D442 (10") Bells
- D448 12 VDC Horn
- D1240 12V, 4 Ah Rechargeable Battery
- D1625 16.5 VAC 25 VA Transformer
- D5200 Programmer
- D5300 Remote Account Manager II
- D8004 Transformer Enclosure
- D8121A/
D8122 Derived Channel S.T.U.
- Easikey

D2112 Point 1 Only

- D261A Smoke Detector Base
- D262 Smoke Detector Head

D2112/D2112E Terminal Quick Reference

Terminal	Description
1,2	AC Input Connect 16.5 VAC, 25 VA transformer for primary power source.
3	Earth Ground Connect to earth ground. A cold water pipe or grounding rod is preferred. Do not connect to telephone or electrical ground.
4	Battery Positive Connect Positive terminal of 4.0 to 7.0 Ah battery to this terminal.
5	Battery Negative Connect Negative terminal of 4.0 to 7.0 Ah battery to this terminal.
6	Alarm Output Positive Supplies 1.5 Amps at 10.2 to 13.9 VDC for alarm output. This terminal provides a constant output. Negative is switched.
7	Alarm Output Negative Negative terminal for alarm output. This terminal switches for pulsed or steady alarm output.
8	Keypad Data Data for Keypads
9	Auxiliary Power Positive Supplies 350mA at 10.2 to 13.9 VDC for auxiliary power, keypads, and relay outputs .
10	Common Common for Auxiliary Power and Relay Drivers
11	External Relay 1 Connect D133 Relay for Form C Dry Contact
12	External Relay 2 Connect D133 Relay for Form C Dry Contact
13	D2112 Positive Point 1 Not used on D2112E D2112: Positive power for Point 1. Switched for sensor reset. Use for approved two wire smoke or glass break detectors.
14	D2112: Negative Point 1 D2112E: Input Point 1 D2112: Negative power for Point 1 D2112E: Input for Point 1
15	Common Common for Points 1 and 2
16	Input Point 2 Input for Point 2
17	Input Point 3 Input for Point 3
18	Common Common for Points 3 and 4
19	Input Point 4 Input for Point 4
20	Input Point 5 Positive for Point 5
21	Common Common for Points 5 and 6
22	Input Point 6 Input for Point 6
23	D2112: Point 7 D2112E: Not Used D2112: Input for Point 7. No EOL Resistor D2112E: Not Used
24	Common Common for Points 7 and 8
25	D2112: Point 8 D2112E: Not Used D2112: Input for Point 8. No EOL Resistor D2112E: Not Used
26	T1 Tip of phone line to premises phone
27	T Tip of incoming phone line
28	R Ring of incoming phone line
29	R1 Ring of phone line to premises phone

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