



NookBox

Smart Home Security

Nookbox Hybrid Installationsmanual

1.1 System Specifications

Functions	
Number of areas	8
Number of on-board wired zones	16 on-board zones, expandable to up to 64 ¹ zones in total
Number of total wired and wireless zones	80 per area, 640 in total
Number of wired keypads (KP-35-COMBO)	32 (via RS-485 connection)
Number of users	40 per area, 320 in total
Wired input	NO/NC Single end-of-line (SEOL) Double end-of-line (DEOL) EOL resistance configuration (in ohms): 1K, 2.2K, 3.74K, 4.7K, 5.6K, 6.8K, 8.2K, 10K (32 pieces of 5.6K resistors are included in shipment)
Ethernet interface	RJ-45 connection and Wi-Fi.
Electrical	
Power supply ²	(1) 16 ~ 18VAC, 40VA, 50/60Hz (2) 110 ~ 240VAC, 50/60Hz
Total current consumption of hardwired zones, auxiliary output, KP-35-COMBO	12V/400mA (max.)
PGM output ³	12V/400mA (max.)
Bell output	12V/400mA (max.)
Backup battery ⁴ options	(1) 12V/7A Sealed Lead Acid Battery (can be expanded up to 2 pieces) (2) 12V/4A Sealed Lead Acid Battery (can be expanded up to 2 pieces) (3) 7.2V 4500mAh NiMH rechargeable battery pack PTC resettable fuse (included) operation current: 5.5A

¹ Only one of these three options can be adopted at one time

² PGM output + Bell output = 400mA max

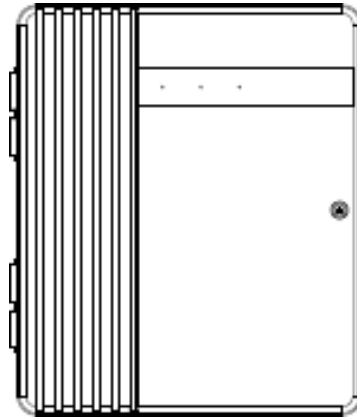
³ When purchasing the NiMH rechargeable battery pack from other supplier, only use the battery with corresponding 5.5A/2A PTC resettable fuse included for safety.

	(4) 7.2V 2300mAh NiMH rechargeable battery pack PTC resettable fuse (included) operation current: 2A
Battery duration	(1) 12V/7A SLA: 36 hours (2) 12V/4A SLA: 21 hours (3) 4500mAh NiMH: 33 hours (4) 2300mAh NiMH: 17 hours
Wireless	
LTE Frequency	EU: B1 (2100 MHz) / B3 (1800 MHz) / B5 (850 MHz) / B7 (2600 MHz) / B8 (900 MHz) / B20 (800 MHz)
3G Frequency	EU: B1 (2100 MHz) / B5 (850 MHz) / B8 (900 MHz)
RF Frequency	F1 868 MHz
RF encryption	Private Encryption Method
RF protocol	Nookbox
ZigBee protocol	ZigBee Pro HA 1.2, 2.4GHz
Z-Wave protocol	Z-Wave 500 series module 868.40 MHz (EU)
Wi-Fi	802.11 b/g/n, 2.4GHz
DECT Module	Reserved
Physical Properties	
Operating temperature	-10°C to 45°C (14°F to 113°F)
Operating humidity	85% relative humidity @23°C (non-condensing)
Dimensions	268 mm x 320 mm x 80 mm

1.2 What's in the Box

Your package includes the following items:

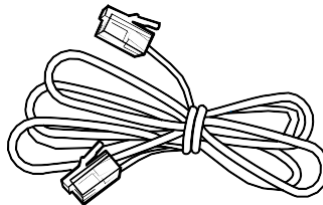
- Control Panel



- Open Frame Power Cord



- An Ethernet Cable



- Accessories:

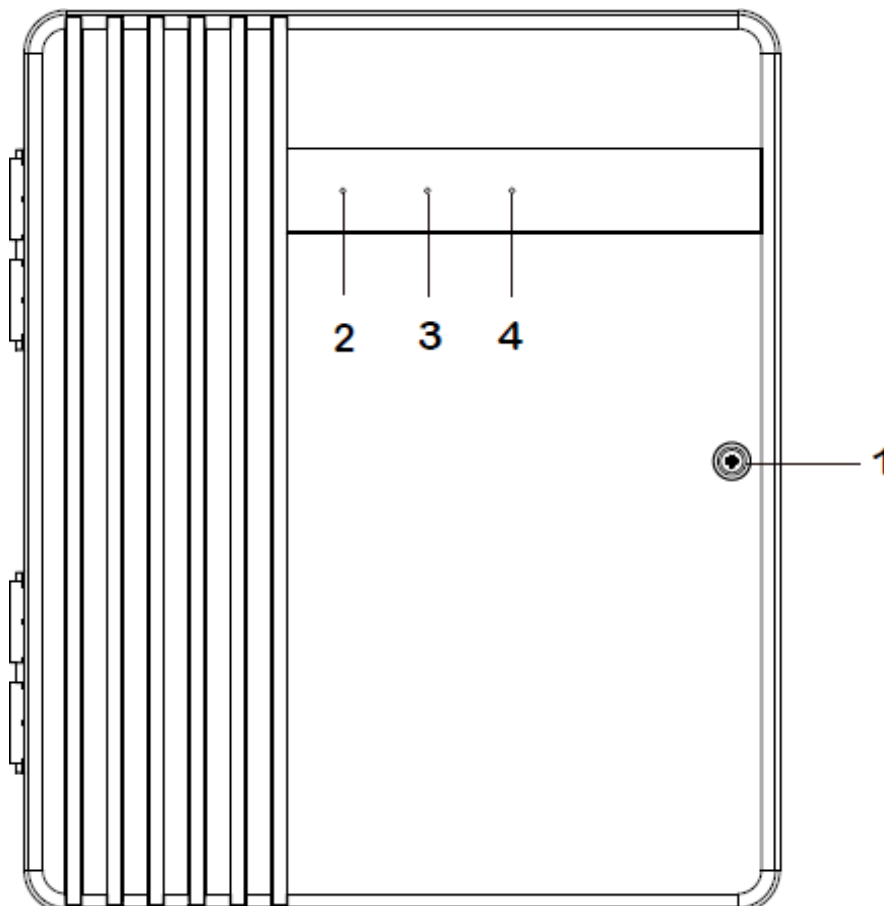
- ☞ Velcro tape x4
- ☞ Jumper Switch x2
- ☞ Removable Protective Cover x4
- ☞ U-shaped Grommet x4
- ☞ 5.6K Resistor (2 resistors for each zone, 32 resistors for 16 zones in total)
- ☞ Screw x4
- ☞ Wall Plug x4
- ☞ Tube Fuse x1 (for SLA Battery Panel Only)
- ☞ Power Cable x1 (for Hybrid-Panel-1-AC110/240V, Hybrid-Panel-3-23/45-AC110/240V Only)

2. Panel Information

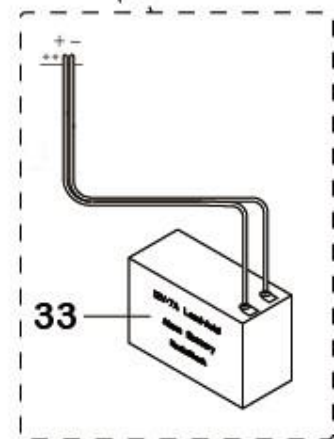
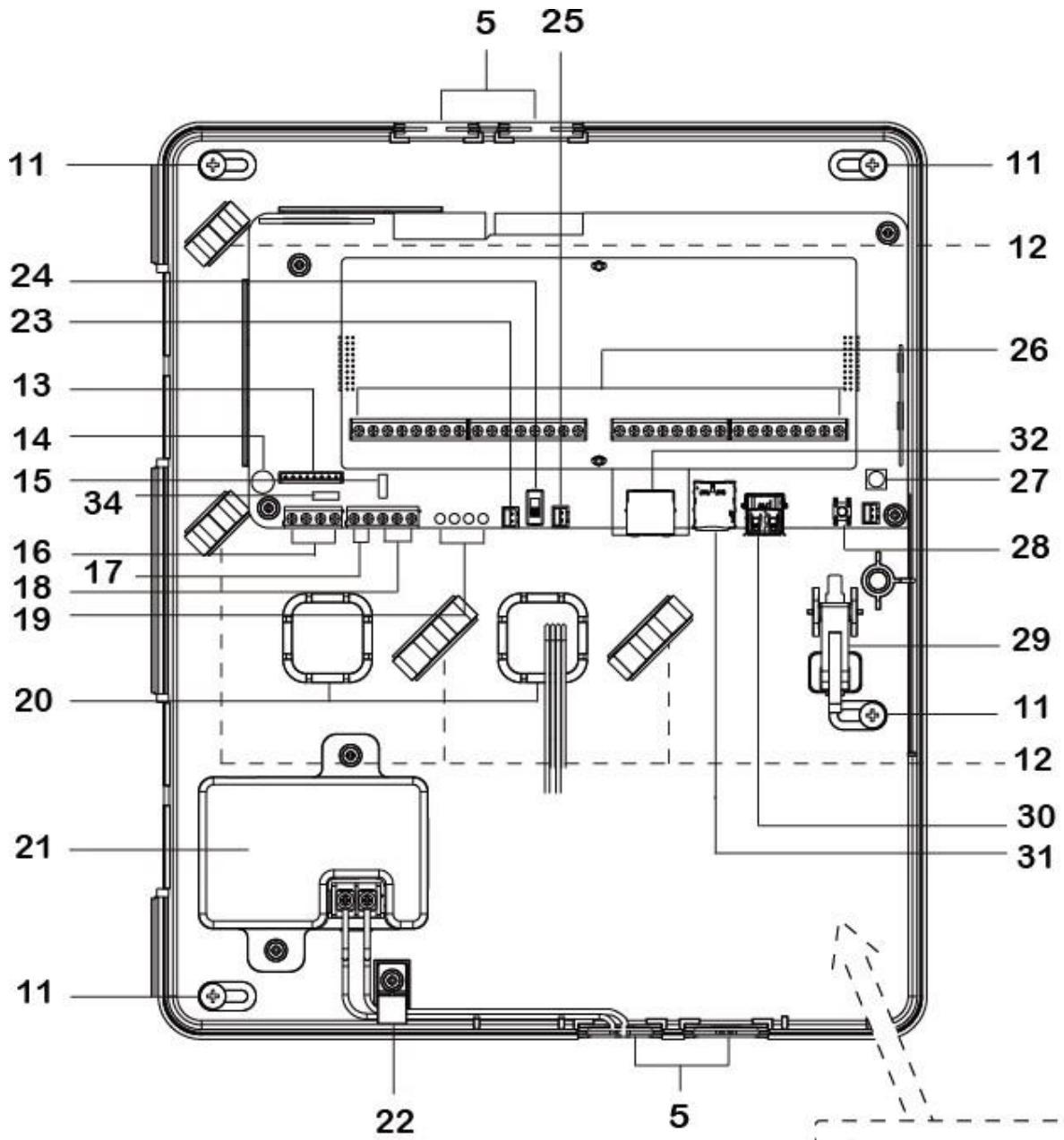
2.1. Identifying the parts

Top Cover (front view)

- 1 Cover Fixing Screw**
- 2 LED 1 - Area 1 (Green/Red)**
 - ☞ Full Arm mode - Red lighting up
 - ☞ Home/1/2/3 mode - Red flashing
 - ☞ Learning mode - Green lighting up
 - ☞ Walk Test mode - Green flashing
- 3 LED 2 - Area 2 (Green/Red)**
 - ☞ Full Arm mode - Red lighting up
 - ☞ Home/1/2/3 mode - Red flashing
 - ☞ Learning mode - Green lighting up
 - ☞ Walk Test mode - Green flashing
- 4 LED 3 - Status (Orange/Red)**
 - ☞ System Fault - Orange lighting up
 - ☞ Alarm Trigger – Red flashing
 - ☞ Alarm in Memory – Red lighting up



Back Cover (internal view)



- 5 Removable Protective Cover x 4 (at top and bottom of the back cover)**
Removable cover to reveal or hide cable wiring hole.
- 6 Room for Backup Battery**
(For Hybrid-Panel-3-23/45 models): room for installing NiMH rechargeable battery pack.
(For Hybrid-Panel-3-23/45 models): with built-in 7.2V 2300mAh or 4500mAh NiMH rechargeable battery pack depending on capacity purchased.
- 7 U-shaped Grommet x 4**
To be used to replace the Removable Protective Cover to enhance wiring and cord management flexibility. Ensure to save the Protective Cover removed for future use.
- 8 Tube Fuse (included in shipment for Hybrid-Panel-1 models)**
250Vac 2A fuse for circuit protection.
- 9 Velcro Tape x 4 (loop side)**
To be applied on the battery pack for easy battery installation and connection.
- 10 In-line Tube Fuse Holder**
- 11 Mounting Holes x 4**
- 12 Wiring Clip x 4**
- 13 LED Board Connector**
- 14 EGND Terminal**
Please refer to **3.3 Hardware Installation** for detail.
- 15 J24 Jumper Switch**
Please refer to **3.3 Hardware Installation** for detail.
- 16 RS485 Terminal**
Connect to a hardwired keypad (KP-35-Combo). **Up to 4 hardwired KP-35-Combo** can be connected in parallel. Please refer to **3.3 Hardware Installation** for detail.
- 17 Bell Terminal**
Connect to a wired bell box. Please refer to **3.3 Hardware Installation** for detail.
- 18 PGM Port**
To be used as a voltage output port or a dry contact relay output depending on J24 jumper settings. Please refer to **3.3 Hardware Installation** for detail.
- 19 SLA Backup Connection Battery Terminal (not hot swappable)**
Connect to SLA battery pack, up to two battery packs can be connected.
- 20 Alternative Hole for Wiring Management x 2**
- 21 Built-in Power Unit (Input: 16 ~ 18VAC 40VA, Output: 12VDC/2A)**
Please refer to **3.3 Hardware Installation** for detail.
 - ☞ **Ensure to turn off all power supplies including Built-in Power Unit and SLA/NiMH Battery before connecting or removing cables or wires.**
 - ☞ **Don't connect the SLA Battery & NiMH Battery to the same Hybrid Panel board**

22 Wire Saddle

To be used for securing power cables.

23 NiMH Battery Connector

Connect to 7.2V 4500mAh or 2300mAh NiMH rechargeable battery pack.

24 Battery Switch

Switch to “ON” for the battery to be charged when AC power is connected and serve as a backup power source when AC power is missing.

25 Built-in Power Unit Connector

26 Zone Terminal & 12V Auxiliary Voltage Output Terminal & GND Terminal

Zone 1-16 Hardwired Input Zones, supporting up to 400mA for all hardwired zones, auxiliary output, and KP-35-COMBO. Please refer to **3.3 Hardware Installation** for detail.

27 4G-LTE External Antenna Terminal

28 Learn Button

To be used for local learning or local reset.

29 Tamper Switch

To protect the Control Panel against disallowed case opening or removal.

30 USB Port (optional)

When connecting a USB dongle into the port, it is suggested to use a USB extension cable. There is no USB Port for the panel if it is built in 4G and Wi-Fi.

31 Micro-SIM Card Socket (not hot swappable)

32 Ethernet Port

33 Room for Backup Battery

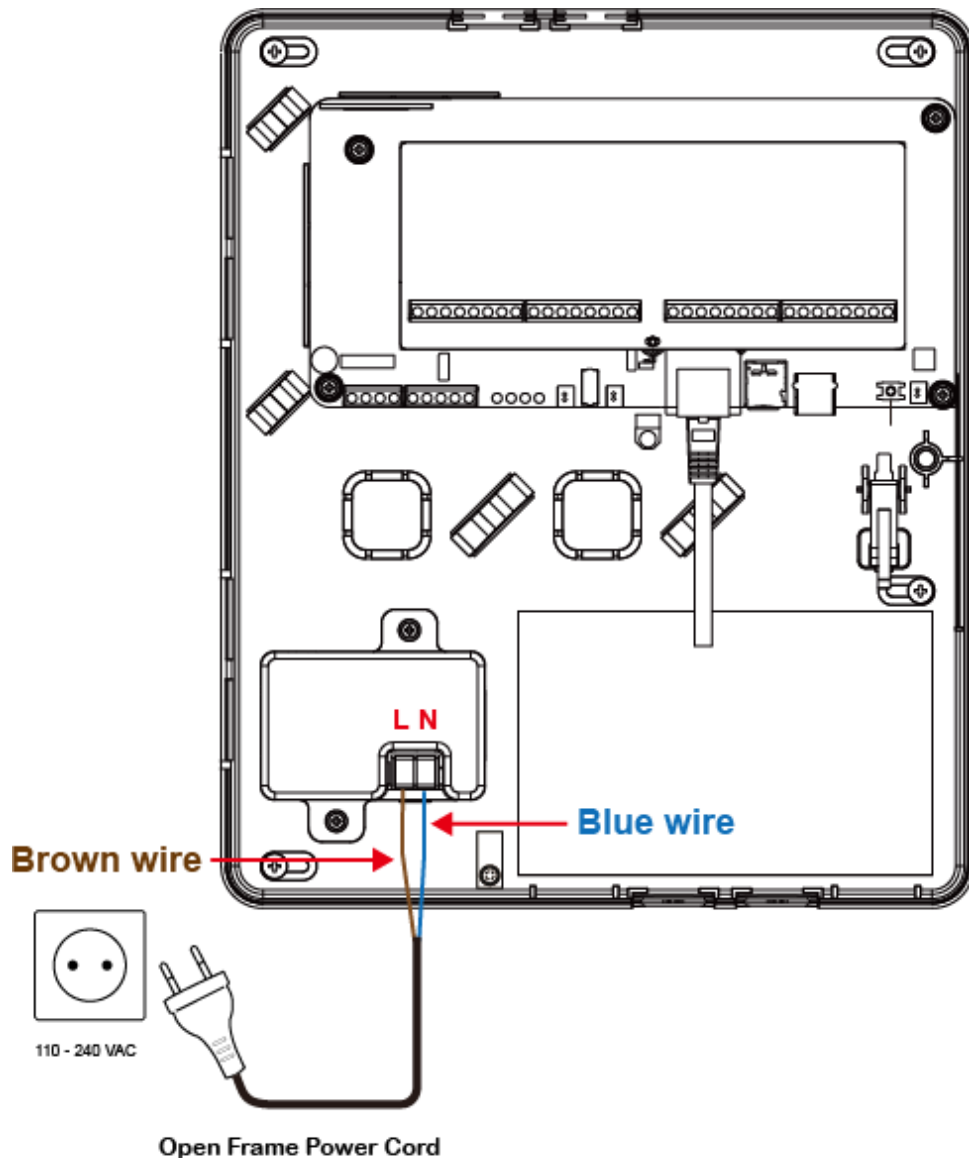
(For Hybrid-Panel-1 models): room for installing 12V 7A or 12V 4A SLA battery pack to serve as a backup power source. Note: ensure to replace the battery pack within 5 years from the date of manufacture, please refer to **NFPA-72, 2002 Edition** for detail.

34 J53 Jumper Switch

Please refer to **3.3 Hardware Installation** for detail.

[Rechargeable Battery](#)

- A rechargeable battery can be installed inside the Control Panel to serve as a backup in case of a power failure.
- Battery options include 12V SLA battery pack or 7.2V NiMH battery pack.
- During normal operation, AC power is used to supply power to the Control Panel and at the same time recharge the battery.
- If the battery switch is set as **OFF**, the battery will not be charged when AC power is connected and nor will it serve as a backup power source when AC power is missing. You need to switch the battery to **ON** for it to be charged when AC power is connected and serve as a backup power source when AC power is missing.



Open Frame Built-in Power Unit:
 Connecting *BROWN* wire to Terminal *L*
 Connecting *BLUE* wire to Terminal *N*

2.2. Power Supply

Built-in Power Unit

- You can use the built-in power unit to connect to the mains power. AC module built-in power unit or Open Frame built-in power unit is installed. Please refer to ***Using the built-in Power Unit*** in **3.3 Hardware Installation** for more details.

Please note:

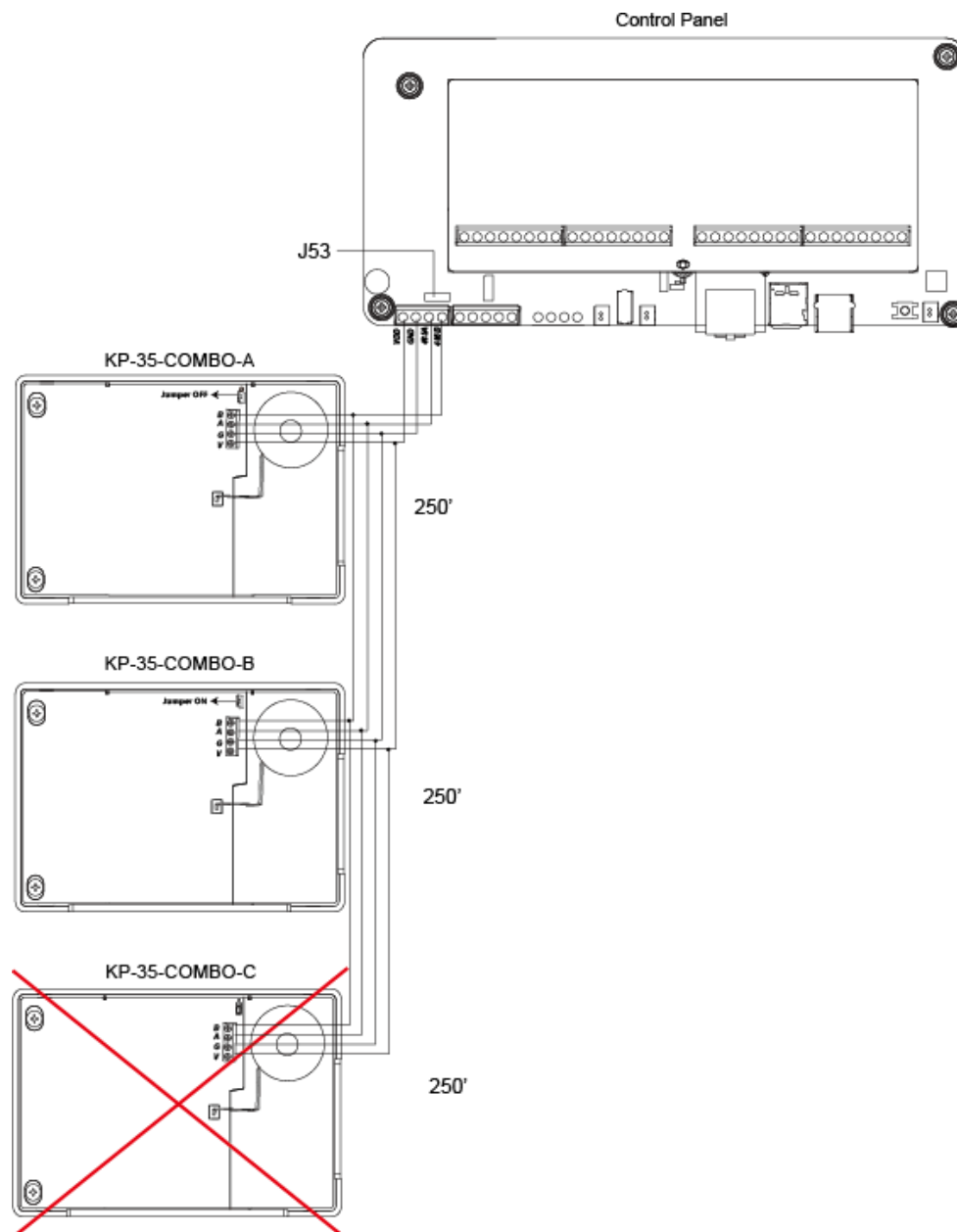
- ☞ **Don't use the adaptor and the Built-in Power Unit at the same time.**
- ☞ **Ensure to turn off all power supplies including Built-in Power Unit and SLA/NiMH Battery before connecting or removing cables or wires.**
- ☞ **Don't connect the SLA Battery & NiMH Battery to the same Hybrid Panel board**

Keypad Wiring

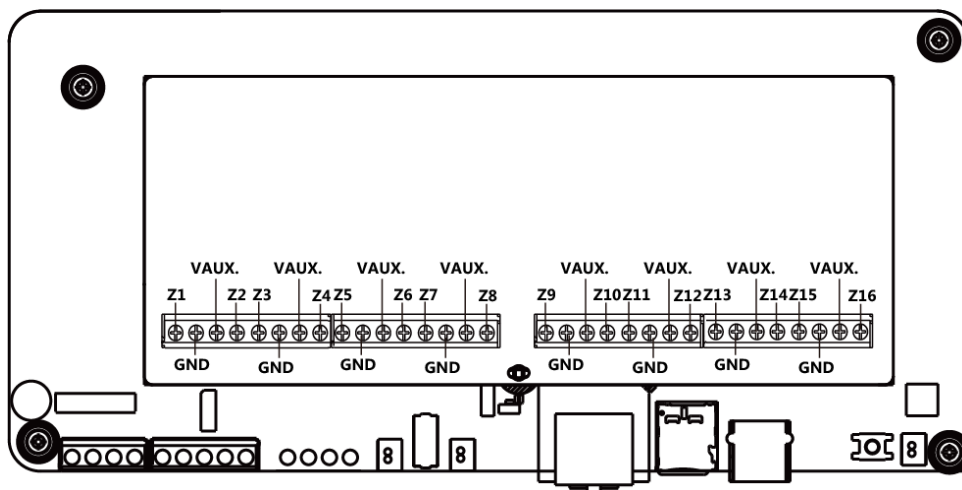
- The RS485 terminals can connect to a maximum of 32 wired keypads (KP-35-COMBO).
- Connect the Control Panel's "GND" to the "G" terminal on the KP-35-COMBO.
- Connect the Control Panel's "485A" to the "A" terminal on the KP-35-COMBO.
- Connect the Control Panel's "485B" to the "B" terminal on the KP-35-COMBO.
- Connect the Control Panel's "VDD" to the "V" terminal on the KP-35-COMBO.
- Ensure the furthest keypad's Jumper Switch and Control Panel's J53 Jumper Switch are set to ON to serve as a terminating resistor.

Example

- KP-35-COMBO-A is wired correctly as it is within 152m of the panel, in wire distance.
- KP-35-COMBO-B is wired correctly as it is within 152m of the panel, in wire distance. Since it has the furthest distance from the Control Panel, ensure its jumper switch is set to ON to serve as a terminating resistor before tightening the cover fixing screw.
- KP-35-COMBO-C is NOT wired correctly as it is farther than 152m from the panel.



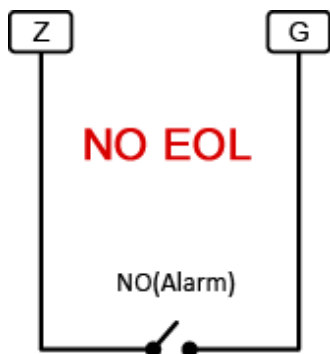
Zone Wiring (Zone 1 -16)



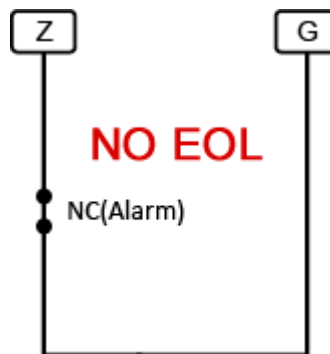
- The 16 zones can be wired to supervise NC (normally close) or NO (normally open) devices. Connect hardwired devices into any Zone terminal.
- Wire gauge: Minimum 20 AWG, maximum 18 AWG. Do not use shielded wire.
- The hardwired zones support Single-End-of-Line (SEOL) or Double-End-of-Line (DEOL) loop configuration, with a value from 1K, 2.2K, 3.74K, 4.7K, 5.6K, 6.8K, 8.2K, 10K ohms. Please install the resistor(s) at the end of each zone loop far away from the Control Panel. The Panel will detect if the circuit is secure, open, or short.
- For an NC loop, please have an EOL resistor in series with the loop.
- For an NO loop, please have an EOL resistor in parallel (across) the loop. Please refer to the following diagrams for wiring examples.
- There is no EOL resistor in loop 1 and loop 2.

NO/NC Wiring

1.

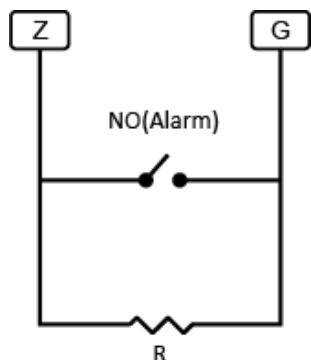


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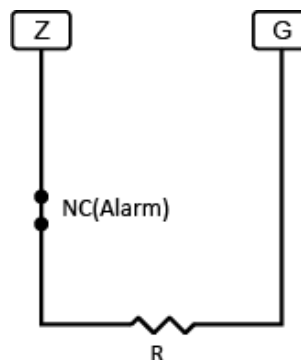


Single-End-of-Line Resistor Wiring

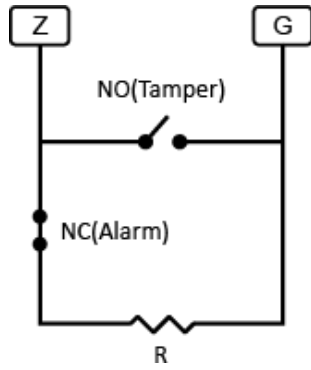
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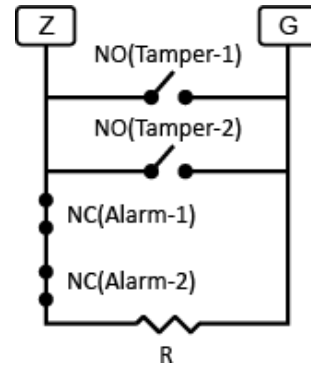
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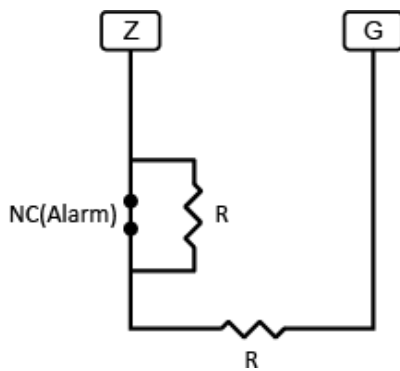


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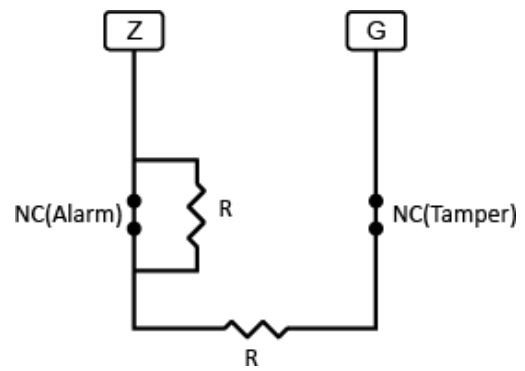


Double-End-of-Line Resistor Wiring

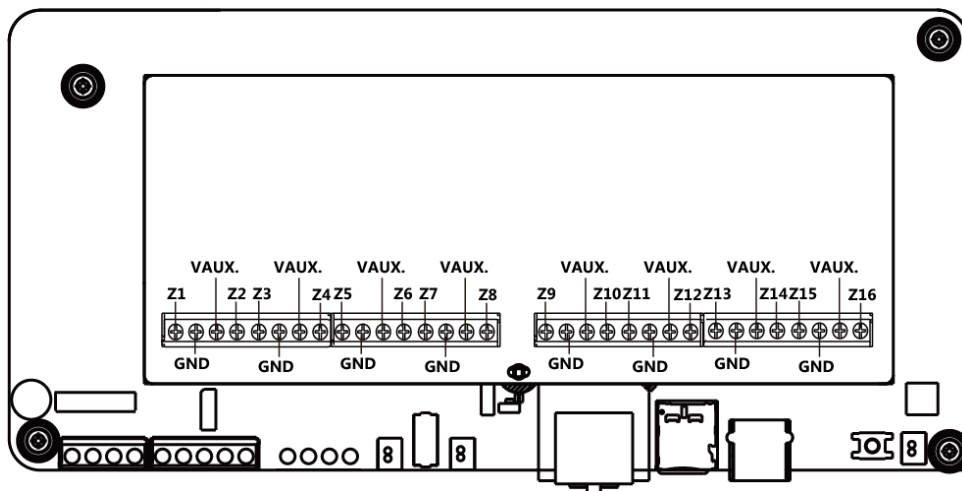
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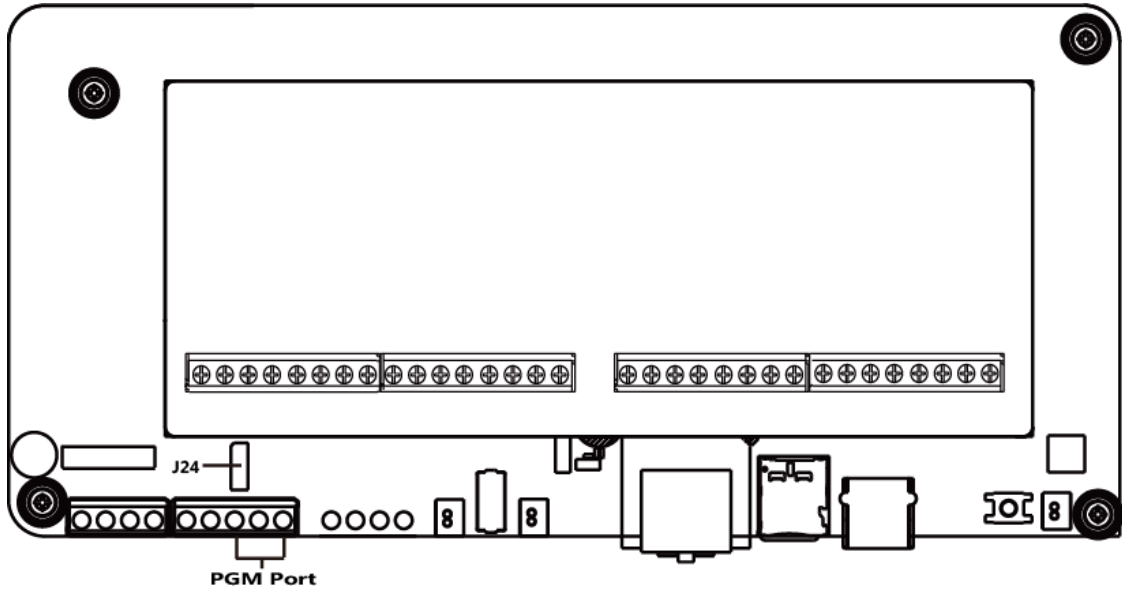


AUX Power Wiring

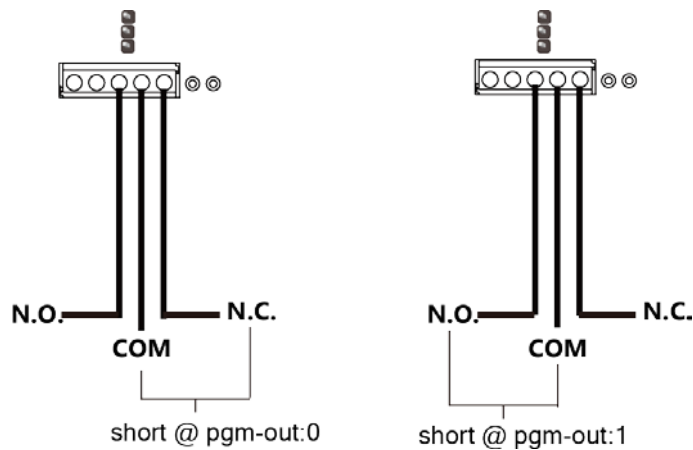


- **The Control Panel can provide a maximum of 12V 400mA current for hardwired zones, auxiliary output and KP-35-COMBO.**
- Min/Max operating voltages for devices/detectors is 11.4VDC -13VDC.
- Please note that the total current should **not exceed 400mA**, otherwise, an additional power supply is required.

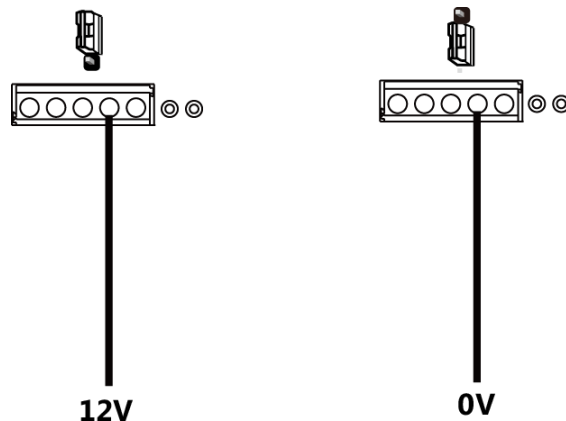
PGM Wiring



- The PGM port can be a voltage output port or a dry contact relay output depending on J24 jumper settings.
- When J24 Jumper Switch is disconnected, PGM port will operate as a dry contact relay output.



- When the J24 jumper link is inserted connecting the 1st and 2nd pins, the PGM port will provide 12V output.
- When the J24 jumper link is inserted connecting the 2nd and 3rd pins, the PGM port will provide 0V output.
- The total current drawn from the PGM-output and Bell port must **not exceed 400mA**. Min/Max operating voltages for devices / detectors is 11.4VDC -13VDC.



Bell Wiring

- The total current drawn from the PGM-output and Bell port must **not exceed 400mA**.
Min/Max operating voltages for devices / detectors is 11.4VDC -13VDC.
- Be sure to observe polarity when connecting polarized sirens or bells.

