



National Protective Systems Inc.

PAL2 User Manual



2026



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Introduction

PAL2 is a handheld 2.4 GHz panic button used with National Protective Systems' Campus Shield system. PAL2 is intended to be held in the user's hand during activation. When the user presses the activation button, PAL2 sends an emergency alert and forwards location and audio data from the scene to the Campus Shield system.

PAL2 is normally powered off to preserve battery life. The device only turns on when the user manually presses the activation button. PAL2 is not intended to operate continuously while worn on the body.

PAL2 is not a Wi-Fi client. It does not join, connect to, or use any Wi-Fi network. Instead, PAL2 uses a proprietary 2.4 GHz radio protocol to communicate with other Campus Shield devices. This allows the device to report alarms, send location data, and transmit voice data to the Campus Shield server.

Models included in this document	
PAL2	Personal Alarm Locator 2

Revision History

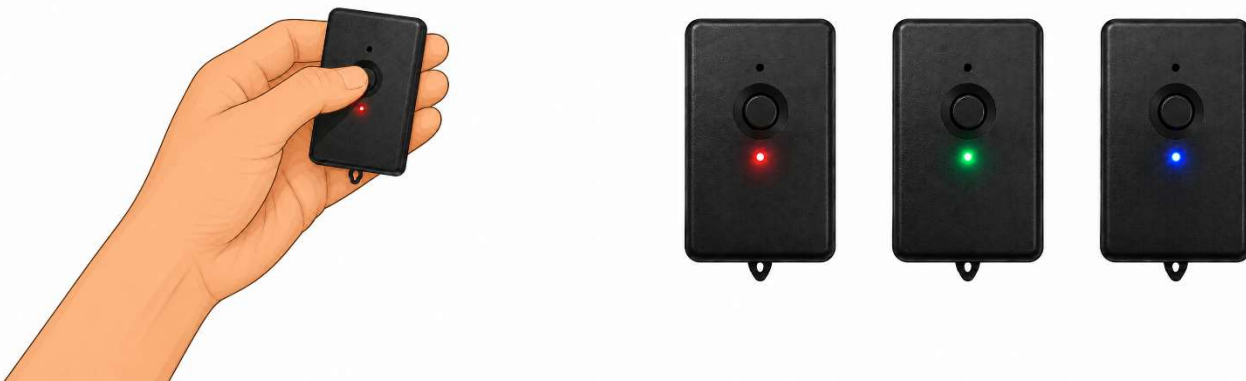
Version	Description	Date
V1.0	Initial Release	2026-05-28



1 Usage

1.1 Activation

PAL2 is designed to be held in the user's hand during activation. In an emergency, the user activates PAL2 by pressing the activation button. Once activated, PAL2 will vibrate and the status LED will turn red. The vibration and red LED indicate that PAL2 has powered on and the alarm has been activated from the user's device.



1.2 Connection

After activation, PAL2 will attempt to connect to the nearby Campus Shield system. Once the alarm has been successfully received by the system, the status LED will change from red to green. The green LED indicates that the alarm has been captured and that authorities have been alerted through the Campus Shield system. If PAL2 has a strong enough connection to support voice transmission, the status LED will change to blue. The blue LED indicates that the user may press the activation button again to send a voice message.

1.3 Alarm Cycle

A standard PAL2 activation starts a 90-second alarm cycle. During this alarm cycle, the Campus Shield system tracks the PAL2 device throughout the campus and continues reporting its location. When the status LED is blue, the user may press the activation button again to send a 10-second voice message. Additional voice messages may be sent during the alarm cycle by pressing the activation button again when voice transmission is available.



2 PAL2 Hardware

2.1 Specifications

2.4 GHz Radio (802.11 b/g/n/ax)		
Frequency	2412–2462 MHz, US channels 1–11	
Modulations	DSSS, CCK, OFDM	
Transmit Power	Up to -20.5dB	
Signal Strength	Approx. -30dBm to -90dBm	
Antenna	Integrated PCB trace antenna, max gain 3.96 dBi	
Peripherals		
LED	Multi-color LED used for user feedback during activation, charging, etc.	
Vibration Motor	15,000 RPM vibrator used for user feedback during activation.	
USB-C Connector	5 VDC Nominal Input, used for charging and factory processing.	
IMU	Used to read user’s speed, steps, and orientation during activation.	
Battery	Li-Coin 4.0V Nominal	
Dimensions		
PAL2	Length	50 mm
	Width	35 mm
	Height	20 mm
Weight		
PAL2	Unit	Approx 50g
	Packaging	TBD
	Mounting Kit	TBD



2.2 Electrical Specifications

2.2.1 Operating Conditions

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{usb}	Operating supply voltage at USB-C Connector	4.5	5	5.5	V
T_A	Operating ambient temperature	0	25	60	°C
T_{A-EXT}	Extended operating temperature	-20	25	70	°C

2.2.2 Power Consumption

Symbol	Parameter	Min.	Typ.	Max.	Unit
P_{usb}	Power consumption referenced at USB input	0.5	1	3	W

2.2.3 Operating Conditions

Symbol	Parameter	Min.	Max.	Unit
V_{usb}	Operating supply voltage at Ethernet Connector (PoE)	4	5.5	V
T_s	Storage temperature	-20	70	°C

2.3 Certifications

Certifications
FCC Part 15 B
SAR Testing Exposure limits with 5mm



2.3 Interfaces

PAL2 has four main interface features: the Status LED, Activation Button, Microphone Sound Hole, and USB-C.

PAL2 Diagram



Specifications

	USB-C 5V-0.2A		Dimensions 50 x 35 x 20 mm		Weight Approx 50 g
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2.3.1 Status LED

PAL2 is equipped with a multi-color status LED used to indicate device status to the user. During activation, the status LED uses red to indicate that PAL2 has powered on, green to indicate that the alarm has been received by the Campus Shield system, and blue to indicate that voice transmission is available. During charging, the status LED uses red, yellow, and green to indicate battery or charging status.

2.3.2 Activation Button

PAL2 is equipped with a tactile activation button designed for easy, discreet, and deliberate use. The button is slightly recessed to help prevent accidental activation. Pressing the activation button powers on PAL2 and starts the alarm cycle. The activation button may also be pressed while the device is charging.

2.3.3 Microphone Sound Hole

PAL2 is equipped with a small internal microphone used to capture audio from the incident and forward it to the Campus Shield system. This allows dispatchers and first responders to receive additional information from the scene before arrival. When voice transmission is available, the user may speak toward the microphone sound hole to provide additional details about the incident.

2.3.4 USB-C Port

PAL2 is equipped with a USB-C port for charging, battery testing, and device health checks. A standard USB-C charging cable and compatible USB power source may be used to charge the device. The status LED indicates the battery state during charging: Red: Low battery, Yellow: Charging, Green: Charged / Good battery status

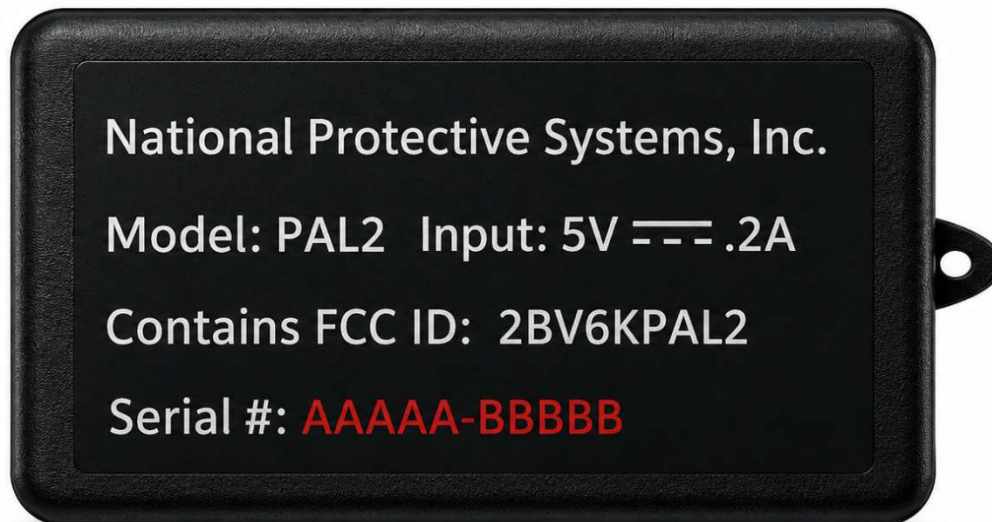




4 PAL2 Setup

4.1 PAL2 Setup

1. Remove PAL2 from the packaging and responsibly discard all packaging materials.
2. Visit <https://natpro.systems/mypal> to setup your device
 - a. Alternatively, contact your local Campus Shield Administrator for assistance.
3. Complete the setup form using the PAL2 serial number and your personal information.
4. After setup is complete, you should receive a confirmation text and/or email indicating that your device has been activated and is ready for use on campus.
5. Charge your PAL2 every few months to help maintain proper battery life and ensure the device is ready for use.





5 Regulatory Information

5.1 FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Consult the dealer or an experienced radio/TV technician for help

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The following information is provided in compliance with FCC regulations:

Model numbers: PAL2

Responsible Person: National Protective Systems, Inc.

Responsible Person Address:

6 Blackburn Center

Gloucester, MA 01930

Company Contact: support@nat-pro.com

5.1 RF Exposure Statement

This equipment complies with the radiation exposure limits set forth for an uncontrolled environment. This equipment should be used and operated at a minimum distance of 5mm between the radiator and any part of the human body.

5.2 Open Source

Open-Source License attributions are available at: <https://natpro.systems/legal>



Q&A

1. Is PAL2 always on and tracking me?
No. PAL2 is designed with user safety and privacy in mind. PAL2 is normally powered off and does not continuously track the user. The device turns on when activated by the user. While on campus, PAL2 may also wake periodically to perform a battery or device health check-in.
2. Can PAL2 be used at home?
The PAL2 is designed for use within approved Campus Shield coverage areas. The device will not operate as an alarm device at home unless approved Campus Shield receiving equipment has been installed and configured for that location.
3. Does PAL2 have an IP rating?
No. PAL2 does not have an IP rating. The device should be kept dry and should not be submerged or exposed to heavy water, rain, or harsh environments.
4. Is there a visual indicator to show that PAL2 is receiving power or is on?
Yes. PAL2 has a multi-color status LED. During activation, red indicates that the device has powered on and the alarm has been activated from the user's device.
5. Is there a visual indicator to show that PAL2 is connected to the system?
Yes. The status LED will change to green when the alarm has been received by the Campus Shield system and the system has been alerted.
6. Is there a visual indicator to show that PAL2 can capture audio?
Yes. The status LED will change to blue when voice transmission is available. When the LED is blue, the user may press the activation button again to send a voice message.
7. What coverage area can PAL2 support?
PAL2 communicates with nearby Campus Shield receiving devices, such as DAD2 units. Coverage depends on the building layout, construction materials, device placement, and installed system design. Typical coverage may range from approximately 25 to 1,800 square feet per receiving area, depending on site conditions.
8. What wireless communication protocol does PAL2 use?
PAL2 uses a proprietary 2.4 GHz radio protocol developed for the Campus Shield system. The communication is based on 802.11 MAC frames with custom NPS logic. PAL2 is not a Wi-Fi client, does not join Wi-Fi networks, and does not use Bluetooth Low Energy.
9. Trouble shooting steps?
We will create a troubleshooting guide soon.