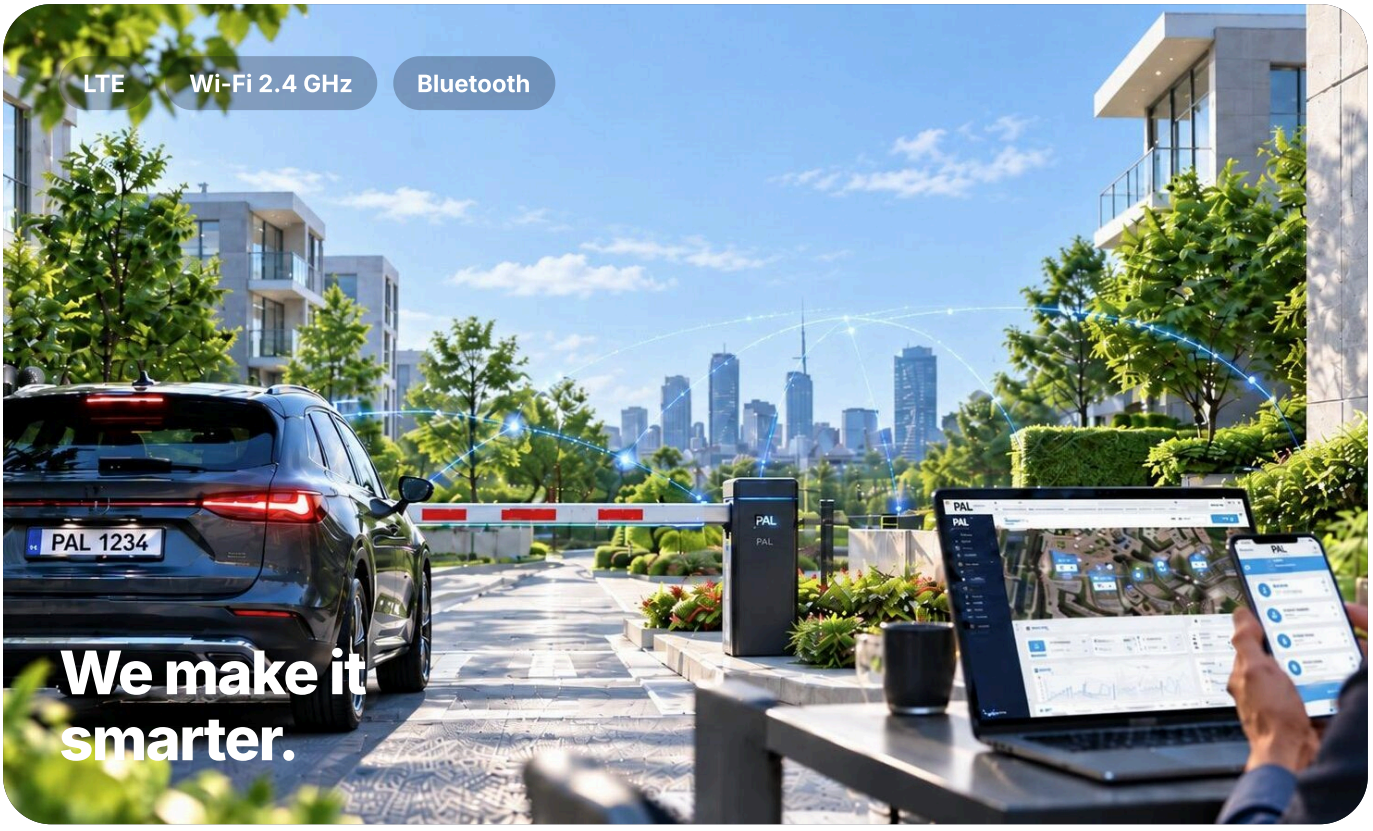
PAL ELECTRONIC SYSTEMS

VERSION 3

INSTALLATION & USER GUIDE

Spider

LTE, Wi-Fi and Bluetooth control units for gates, doors and lighting systems.



MODELS COVERED

- Spider-50
- Spider-i
- Spider-B
- Spider i-WRL
- Spider i-WR
- Spider B-WR
- Spider-Wiegand 26

INSIDE THIS GUIDE

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Safety information

Warning
Only an authorized installer may install, maintain or repair this unit.

Caution
Use a stable 12 VDC, 1 A power supply. Install the unit in a waterproof, dustproof enclosure to protect it from humidity, rain and insects. Failure to do so may damage the unit.

Note
A metal cabinet blocks the cellular signal. If you install the unit in a metal cabinet, connect an external antenna and mount it outside the cabinet.

* Optional feature; additional charges may apply (for example, management via the PAL Web Portal).

CHAPTER 1

Product description

The Spider is an IoT control unit for gates, doors and lighting systems and any other equipment that benefits from remote control and management. It connects over a cellular network (4G LTE), 2.4 GHz Wi-Fi and Bluetooth, and controls the connected equipment through its onboard dry-contact relays. Management is through the PalGate App or through an easy-to-use PAL Web Portal.

> ⚠ **Important**
> An annual subscription is required to use this product.



One housing for all models

All Spider models use the same compact housing and installation method. They differ only in the number of relays and inputs, the number of app users, the 433 MHz receiver for remote controls (WR models) and the Wiegand input. Chapter 2 lists all models and their part numbers.

Figure 1 · Spider control unit (Spider B-WR shown)

1.1 Features

- Remote access and control from any location
- Backup operation during cellular network outages: Wi-Fi, or Bluetooth for nearby opening
- Automatic opening through the car's multimedia system (Apple CarPlay, Android Auto)
- Management through the PalGate App (iOS and Android) or the PAL Web Portal*
- Notifications: real-time email and push notifications
- Scheduling: timers, events, calendar, holidays and a programmable astronomical clock
- Programmable relay activation time (default: 2 seconds)
- 2.4 GHz Wi-Fi on all models
- "Nearby Only" feature: Allows you to restrict gate access to users who are within a configurable distance of the gate
- Compact size: 53 × 80 × 25 mm (2.09 × 3.15 × 0.98 in)
- LED indicators for unit status and signal strength
- Opening by the PalGate App, phone call, proximity, Siri, Google Assistant, smart watches (Apple and Google) or remote control (WR models)
- User import and export with Excel files

* Optional feature; additional charges may apply.

CHAPTER 2

Models & part numbers

2.1 Model comparison

MODEL	RELAY OUTPUT	INPUTS	APP USERS	433 MHZ REMOTES	WIEGAND 26
 **Spider-50** SP300 / SP100	1	1	50	—	—
 **Spider-i** SP301 / SP101	1	1	Unlimited	—	—
 **Spider-B** SP302 / SP102	2	2	Unlimited	—	—
 **Spider i-WRL** SP310 / SP110	1	1	3	4,000	—
 **Spider i-WR** SP311 / SP111	1	1	Unlimited	4,000	—
 **Spider B-WR** SP312 / SP112	2	2	Unlimited	4,000	—
 **Spider-Wiegand 26** SP313 / SP113	1	2	Unlimited	4,000	✓

All relays and inputs support N.O. and N.C. operation. All models are powered by 12 VDC.

2.2 Part numbers

MODEL	EUROPE	USA
Spider-50	SP300	SP100
Spider-i	SP301	SP101
Spider-B	SP302	SP102
Spider i-WRL	SP310	SP110
Spider i-WR	SP311	SP111
Spider B-WR	SP312	SP112
Spider-Wiegand 26	SP313	SP113

Package dimensions: 53 × 80 × 25 mm (2.09 × 3.15 × 0.98 in). Each model is available in regional versions for different cellular frequency bands: SP3XX for Europe and SP1XX for the USA. Make sure that you order the correct part number for the installation region.

CHAPTER 3

Technical specifications

12 VDC
Supply, 1 A

~70 mA
Standby current

53 × 80 × 25
2.09 × 3.15 × 0.98 in
Dimensions

CE FC
Certification

PARAMETER	VALUE
Supply voltage	**12 VDC, 1 A**
Average standby current	**~70 mA**
Relay contact rating (resistive)	**1 A at 30 VDC; 0.5 A at 125 VAC**
Antenna	**SMA, 50 Ω**
Operating temperature	**−20 °C ... +70 °C (−4 °F ... +158 °F)**
Dimensions	**53 × 80 × 25 mm (2.09 × 3.15 × 0.98 in)**
Net weight	**83 g / 2.93 oz (Spider-50, Spider-i, Spider-B); 87 g / 3.07 oz (other models)**
Wi-Fi	**2.4 GHz**
Voice	**VoLTE**
Certification	CE FC **FCC ID: 2AUD3-SPIDER**

3.1 Frequency bands

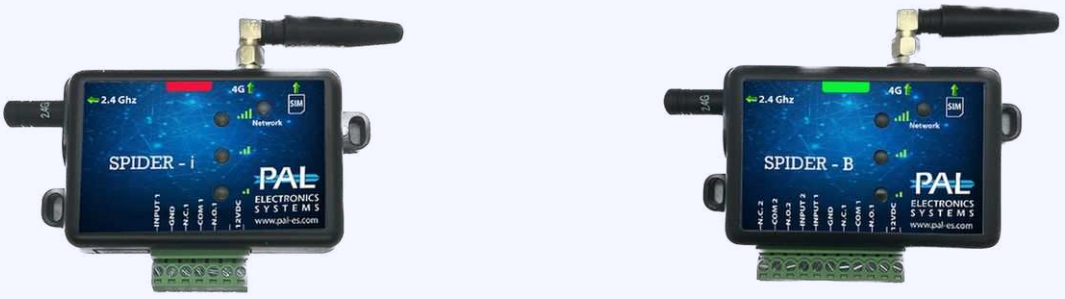
REGION (PART NUMBERS)	NETWORK	BANDS
Europe (SP3XX)	**4G**	B1, B3, B7, B8, B20, B28
	2G	B3, B8
USA (SP1XX)	**4G**	B2, B4, B12, B66

Cellular coverage
For each model, there are different versions for different regions of the world, each with its own frequency bands. Make sure that the part number is correct for the installation region. Before installation, make sure that the 4G signal at the site is sufficient. The installer or user is responsible for 4G reception at the site. PAL Electronic Systems Ltd. is not responsible for the quality of cellular network coverage.

CHAPTER 4

Terminals

All models include a **± 12 VDC** power input, a 4G antenna connector and a 2.4 GHz antenna (Wi-Fi and Bluetooth).



One relay — Two relays

Figure 2 · Terminal layout (Spider-i, Spider-B)

MODEL	RELAY OUTPUT	INPUTS	OTHER
Spider-50 SP300 / SP100 **Spider-i** SP301 / SP101	N.O.1 · COM 1 · N.C.1	INPUT 1 · GND	± 12 VDC
Spider i-WRL SP310 / SP110 **Spider i-WR** SP311 / SP111	N.O.1 · COM 1 · N.C.1	INPUT 1 · GND	± 12 VDC 433 MHz receiver
Spider-B SP302 / SP102	N.O.1 · COM 1 · N.C.1 N.O.2 · COM 2 · N.C.2	INPUT 1 · GND INPUT 2 · GND	± 12 VDC
Spider B-WR SP312 / SP112	N.O.1 · COM 1 · N.C.1 N.O.2 · COM 2 · N.C.2	INPUT 1 · GND INPUT 2 · GND	± 12 VDC 433 MHz receiver
Spider-Wiegand 26 SP313 / SP113	N.O.1 · COM 1 · N.C.1	INPUT 1 · GND INPUT 2 · GND	± 12 VDC D0 · D1 · GND – Wiegand 433 MHz receiver

CHAPTER 5

Wiring

Warning
Disconnect all power before you start wiring. Do not exceed the maximum relay load: 1 A at 30 VDC; 0.5 A at 125 VAC.

5.1 Connecting an electric lock

1. **Connect power to the unit**
   Connect a `12 VDC/1 A` power supply to the **+** and **–** terminals. Polarity does not matter.

2. **Connect the lock to a separate power supply**
   Connect the (+) terminal of the lock power supply directly to the lock.

3. **Connect the (–) wire through the relay**
   Connect the (–) terminal of the lock power supply to `N.O.1`. Connect `COM 1` to the other lock wire.

4. **Connect a magnetic sensor** (optional)
   Connect the sensor to `INPUT 1` and `GND`. The unit then sends door status notifications.

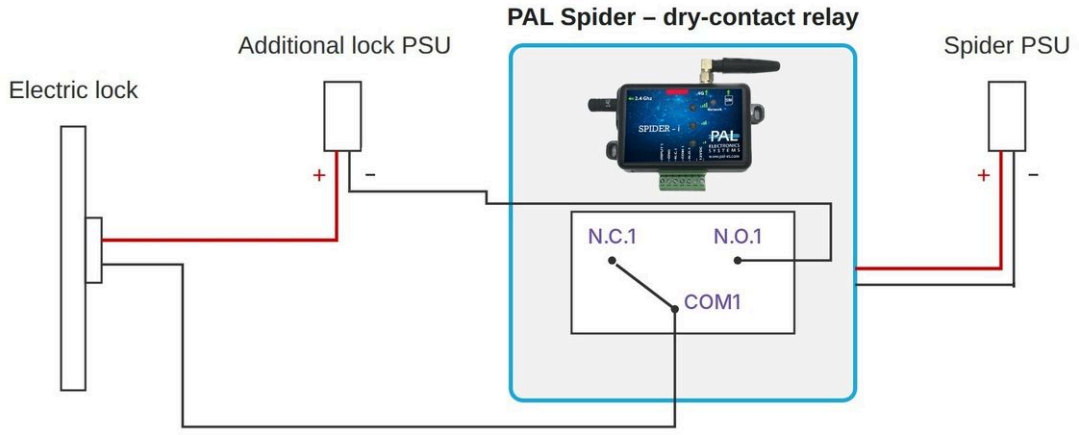


Figure 3 · Electric lock wiring: separate lock power supply, with the (–) switched through the relay N.O. contact

Note
For electromagnetic locks, or other devices that open when power is removed, use `N.C.1` and `COM 1`.

5.2 Connecting a gate operator

1. **Connect power to the unit**
   Connect a `12 VDC` power supply to the **+** and **–** terminals. Polarity does not matter.

2. **Connect the unit to the gate control board**
   Connect from Spider `COM 1` to `COM` on the gate control board. Connect from Spider `N.O.1` to `OPEN` on the gate control board.

3. **Connect a magnetic sensor** (optional)
   Connect the sensor to `INPUT 1` and `GND`. The unit then sends gate status notifications.

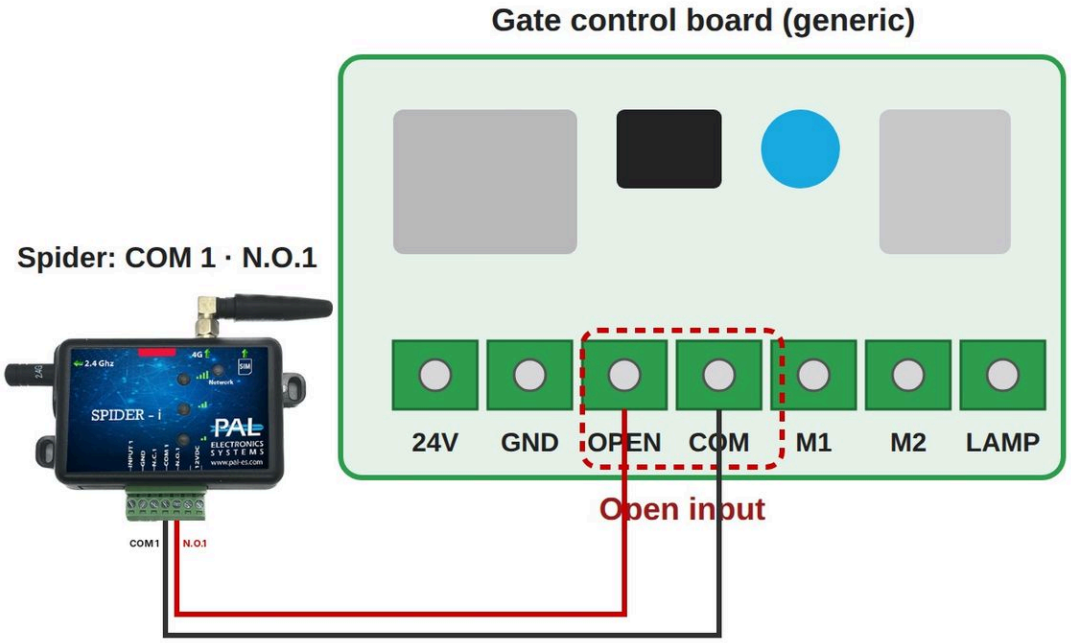


Figure 4 · Connecting the Spider to the open input of a gate control board (generic drawing)

> ⚠ **Caution**
> Terminal names differ between manufacturers. To identify the open input, refer to the control board manufacturer's instructions.

> ⓘ **Note**
> The Spider relay output is a dry contact. It operates in the same way as the open push-button and does not supply power to the control board.

CHAPTER 6

LED indications

6.1 SIM / network LED

LED STATE	MEANING
Fast flashing	System is starting up
Slow flashing	Searching for a cellular network
All LEDs flashing	SIM card not recognized

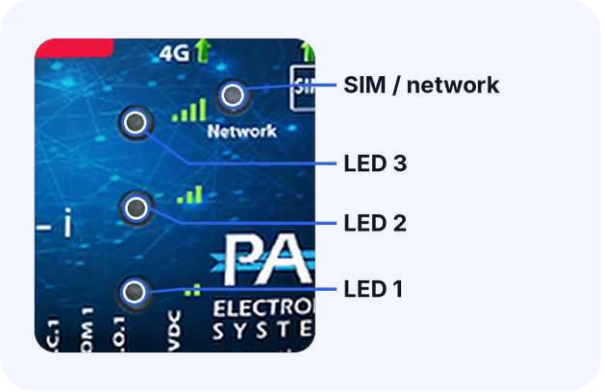


Figure 5 · LED positions

6.2 LED 1 – connection status

LED STATE	MEANING
Flashes twice	Connecting to the internet
Flashes four times	Connecting to the server

6.3 Signal strength

● ○ ○
Low signal
LED 1 on

● ● ○
Good signal
LEDs 1–2 on

● ● ●
Very good signal
LEDs 1–3 on

⚠ **Caution**
A low signal (LED 1 only) can cause unreliable operation. Move the unit to a different location or install an external antenna.

CHAPTER 7

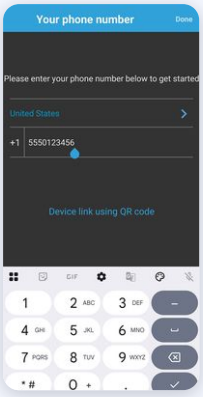
PalGate App

You set up the Spider and manage its users in the PalGate App. Download the PalGate App from the App Store or Google Play (search for “PalGate”), or scan the QR code.

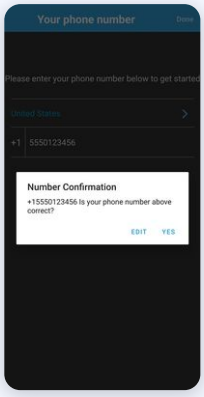
Download on the App Store

ANDROID APP ON Google play

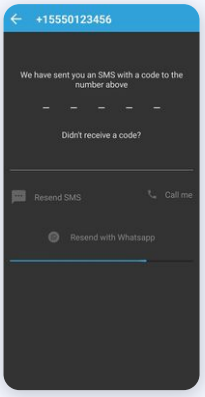
7.1 Installing the PalGate App



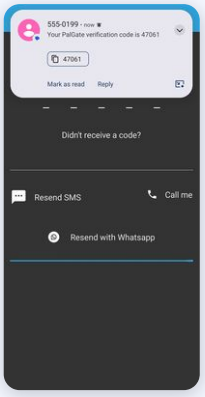
1 Enter your phone number
Enter your mobile phone number.



2 Confirm the number
Tap “Yes” to confirm.



3 Wait for the code
A verification code is sent to you by SMS.



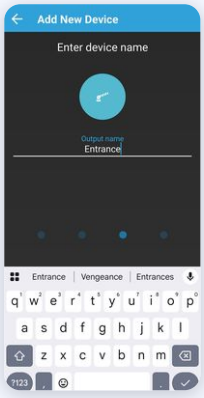
4 Enter the code
Enter the verification code to complete the setup.

7.2 Adding a new device

You add the Spider in the PalGate App. You need the serial number and code printed on the unit label.



1 Scan the QR code
Scan the QR code on the unit, or tap “Manual” to type the details.



2 Name the gate
Enter a name for the gate and add a photo (optional).



3 Enter the details
Type the serial number and code exactly as printed on the unit. Tap “Next”.



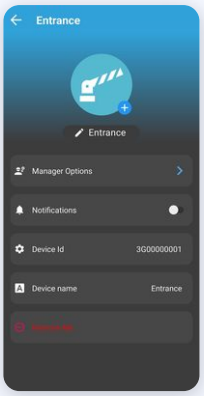
4 Done
The gate appears on the “My Gates” screen.

7.3 Adding users

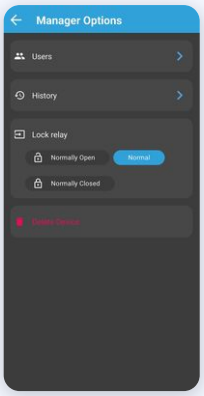
Only users defined as managers can add users. Every new user receives a notification and can open the gate from the PalGate App.



1 Open the gate settings
On the “My Gates” screen, tap the gear icon next to the gate.



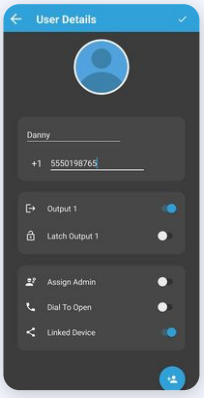
2 Tap “Manager Options”



3 Tap “Users”



4 Tap “+”
Tap “+” in the top-right corner to add a user.



5 Enter the user details
Enter the name and phone number, or select a contact from your phone. Tap “Save”.



6 Done
The user receives a notification and appears in the user list.

> **Note**
> You can allow each user to open from any distance or only when nearby (“Nearby only”), and assign an access schedule. You can also import and export users as Excel files, and manage users in the PAL Web Portal.

7.4 Opening methods

- PalGate App
- Phone call
- Proximity & automatic
- Siri
- Google Assistant
- Smart watches (Apple and Google)
- Apple CarPlay
- Android Auto

> **Caution**
> Before you install the system, make sure that the gate or door has working safety and protection devices.

Installation checklist

- [ ] A stable 12 VDC, 1 A power supply is connected
- [ ] The unit is installed in a waterproof, dustproof enclosure
- [ ] An external antenna is fitted if the unit is in a metal cabinet
- [ ] The signal LEDs show good or very good reception (2–3 LEDs on)
- [ ] The device is added in the PalGate App and a test opening was successful

SERIAL NUMBER	INSTALLATION DATE
SITE	INSTALLER

CHAPTER 8

Professional Installation Notice

1. Mandatory Professional Installation Notice

IMPORTANT: This device must be professionally installed. This product is not intended for sale to the general public and must be distributed exclusively through authorized dealers, value-added resellers (VARs), or certified system integrators. No end-user self-installation is permitted under FCC regulations.

2. Installer Qualification Requirements

Only personnel who have completed PAL Electronic Systems product-specific installation training are authorized to install this device. This training, provided through PAL Electronic Systems technical support team, covers commercial wiring, overs RF system integration, antenna installation and positioning, relay and power supply integration, gate/door automation systems, and the device's configuration software. Personnel who have not completed this training are not authorized installers. Ordinary consumers do not have the necessary skills or professional tools to ensure the device is installed in full compliance with FCC regulatory requirements.

3. Authorized Antenna & RF Accessory List

Only the following pre-approved antennas and RF accessories are permitted for use with this device. Unauthorized modifications or use of unlisted components will void the user's operational authorization:

Antenna Manufacturer	Antenna Type	Operating Band	Maximum Antenna Gain
SXN	MONOPOLE	2412~2462MHz	3dB

All RF cables and adapters used must maintain a total system insertion loss equal to or higher than the value documented in the FCC certification filing. Installers are responsible for verifying that the final antenna gain does not exceed the maximum approved value.

4. RF Radiation Exposure Compliance

This equipment must be installed with a minimum separation distance of 25cm between the radiating antenna and all nearby people. The antenna must not be co-located or operated in conjunction with any other transmitting antenna, to fully comply with FCC RF exposure limits for an uncontrolled environment.

5. Installation Compliance Restrictions

Follow the complete step-by-step installation procedure provided in this manual to ensure the final deployed configuration matches the exact test state documented in the FCC certification. This device is restricted to commercial/industrial/professional deployment scenarios only, and must not be made available for general consumer use. Any changes or modifications not expressly approved by the compliance responsible party will revoke the user's FCC authorization to operate this equipment.

PALGATE APP

Open your world.

Manage and open all your gates and doors from a single app. Download the PalGate App from the App Store or Google Play.

PAL ELECTRONIC SYSTEMS

We make it smarter.

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