PRODUCT DATASHEET

SXK-PL30

Solar-Powered 4G Smart Parking Space Blocker

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Executive Summary

10 T	< 3 s	≈ 80 days	-20 to +85 °C
Impact load rating	Plate raise / lower	Autonomy per charge (9000 mAh)	Operating temperature

The PL30 is an off-grid, solar-powered parking space blocker that automates bay enforcement for roadside and surface parking. It combines a **10 T** impact-rated steel barrier, multi-modal vehicle detection and a QR-code payment interface in one flush-mounted chassis, converting any suitable bay into a self-reporting revenue asset without trenching, mains connection or attendant coverage.

This datasheet is written for procurement and specification. Every technical parameter, installation step, commissioning check and fault-handling procedure required to deploy and maintain the unit is included, and all values trace to the manufacturer's installation and specification document.

1. Product Overview

The PL30 is a flat-profile, solar-powered smart parking space blocker engineered for on-street and surface parking environments. Unlike conventional parking locks that rely on manual raising, the PL30 integrates an electromechanical locking plate, a multi-modal vehicle detection array, an embedded 4G LTE control unit and a QR-code payment interface into a single low-profile chassis that sits flush with the parking bay surface.

Enforcement is fully automated. When a vehicle enters an occupied bay, the plate raises automatically and holds the space. When the driver scans the QR code and completes payment — or when the vehicle departs — the plate lowers within **3 s**, returning the bay to service. The unit is powered by an integrated **9000 mAh** lead-acid battery with solar top-up, so no civil works, no trenching and no grid connection are required for typical deployments.

> **Positioning —** A retrofit-friendly, off-grid enforcement device that turns any suitable surface bay into a metered, self-reporting revenue asset — no trenching, no mains connection and no attendant coverage required.



Figure 1 — PL30 in the retracted (standby) state, locking plate flush with the chassis

1.1 Intended Audience

This datasheet is written for B2B specifiers and procurement decision-makers at:

- Parking operators and municipal parking authorities
- Property management companies and campus operators
- Parking system integrators and access-control engineering firms
- Smart-city and roadside infrastructure programmes

1.2 Scope of Datasheet

Sections 2 through 9 provide the complete data required for evaluation, specification, installation, commissioning and ongoing operation. No additional document is required to make a purchasing decision or to install and maintain the unit.

2. Key Features

Each feature below pairs the technical characteristic with the engineering or operational value it delivers, so that specifiers can justify each line item against an alternative solution.

Table 1 — Key Features

#	Feature	Technical Basis	Engineering / Operational Value
1	Flat-profile, low-rise chassis	1140 × 580 × 129.9 mm envelope; plate raises to 195 mm above ground at 70°	Fits standard bay dimensions without encroaching on the adjacent space or obstructing pedestrian routes
2	Fully automatic enforcement	Infrared, radar and geomagnetic detection combined with a DC brushed motor at 0.159 N·m	Space is locked the moment a vehicle enters — no attendant, no patrol rounds, no revenue leakage
3	Sub-3-second actuation	Plate raises in < 3 s; lowers in < 3 s	Payment validation is instantaneous for the driver; queue friction at the bay is eliminated
4	Off-grid solar power	9000 mAh lead-acid battery, ≈ 80 days of operation per full charge, 4 h recharge	No mains supply, no trenching and no electrical installation work — suitable for temporary and remote bays
5	10-tonne load rating	A3 steel plate assembly rated to 10 T impact	Withstands vehicle overrun and deliberate ram attempts; commercial-grade durability
6	Safety-first obstacle detection	Anti-pinch rebound: the plate reverses automatically when an obstacle is detected	Protects pedestrians, vehicle underbodies and the mechanism itself; avoids damage claims
7	Manual override	The plate can be physically raised and lowered by hand when the battery is depleted or a fault occurs	The bay is never permanently locked out; no tow truck, no key release, no service call-out
8	Multi-modal vehicle sensing	Infrared + radar + geomagnetic (5 mG resolution) + laser (0–2 m, 22 ms response)	Reliable occupancy detection across rain, shade, metal-surface interference and varying vehicle types

#	Feature	Technical Basis	Engineering / Operational Value
9	Integrated QR payment	110 × 110 mm QR code plate with voice confirmation	Self-reporting revenue collection with no cash handling at the kerb
10	Dual communication	4G LTE Cat.1 full-networking + Bluetooth BLE 4.0	Remote cloud management for fleet operators; on-site Bluetooth for commissioning and diagnostics
11	Active audible warning	Voice prompt on plate raise and lower; alarm tone on impact	Warns pedestrians of moving steel; audible alert on attempted forced entry
12	Built-in weather protection	Sealed electronics compartment with built-in waterproof protection; -20 °C to +85 °C operating range	Year-round outdoor operation in temperate and hot climates
13	Modular, serviceable construction	All steel components are baked-enamel finished; no unreachable cavities	Rust and corrosion resistance over a multi-year service life; field-replaceable modules

3. Technical Specifications

Values marked configurable are set through the operations backend at commissioning.

3.1 Mechanical Specifications

Table 2 — Mechanical Specifications

Item	Specification	Unit	Remark
Model	SXK-PL30	—	—
Colour	Yellow chassis + grey plate	—	Customisable to customer requirement
Overall dimensions	1140 × 580 × 129.9	mm	L × W × H
Packing dimensions	1200 × 600 × 140	mm	—
Main body material	A3 steel	—	—
Maximum plate raise angle	70	°	—
Maximum height above ground when raised	195	mm	—
Plate raise time	< 3	s	—
Plate lower time	< 3	s	—
Unit weight	55	kg	—
Impact load rating	10	T	—
QR code plate size	110 × 110	mm	—
Mounting method and surface requirement	Expansion-bolt fixing; non-soft-base pavement required	—	See Section 6 for surface preparation
Packing list	Parking space blocker × 1; expansion bolts × 5; lead-acid battery × 1; QR code plate × 1	—	—

3.2 Electrical Specifications

Table 3 — Electrical Specifications

Item	Specification	Unit	Remark
Rated voltage	12	V	—

Item	Specification	Unit	Remark
Rated working current	1.4	A	—
Rated power	30	W	—
Standby current	< 1.5	mA	—
Low-voltage warning threshold	9–11	V	Configurable
Over-current protection threshold	2–6	A	Configurable
Power supply method	Lead-acid battery	—	Solar top-up supported
Battery capacity	9000	mAh	—
Normal operating time per full charge	≈ 80	days	—
Charging time	4	h	—
Charge cut-off voltage	12	V	—
Discharge cut-off voltage	9	V	—
Motor torque	0.159	N·m	—
Control method	DC brushed motor, PWM pulse-width-modulated soft start	—	—
Sensing methods	Infrared, radar, geomagnetic	—	Multi-modal detection array
Communication method	4G LTE Cat.1 full-networking + Bluetooth BLE 4.0	—	—

3.3 Sensor Specifications

Table 4 — Sensor Specifications

Item	Specification	Unit	Remark
Magnetic field range — full scale (FS) to fully applied field (typical)	-8 to +8	gauss (Gs)	—
Magnetic dynamic range	3-bit gain control	gauss (Gs)	—
Geomagnetic resolution	5	milligauss (mG)	VDD = 3.0 V, GN = 2
Hysteresis	±25	ppm	±2.0 gauss input range
Laser measurement range	0–2	m	—
Laser response frequency	22	ms	—
Laser sensor chip	VL53L0X	—	STMicroelectronics
Ultrasonic measurement range	1.2	m	—

3.4 Environmental Specifications

Table 5 — Environmental Specifications

Item	Specification	Unit	Remark
Operating temperature	-20 to +85	°C	—
Storage temperature	-40 to +125	°C	—
Operating humidity	5–95	%	—
Safety voltage	DC 12 V	—	No shock hazard to pedestrians

4. Product Architecture

The PL30 chassis comprises four functional groups that can be serviced independently. The system is monitored by an angle sensor that confirms true plate elevation, and by a probe that reports bay occupancy to the control electronics.

4.1 Component Breakdown

1. Drive-end housing (yellow, right-hand side in the front elevation) — houses the lead-acid battery bay, the control electronics enclosure, the Bluetooth and 4G antennas and the solar panel mounting face. The QR code plate is mounted on the outer face of this housing so that it faces the driver's side when the unit is installed.
2. Solar charging panel — mounted on the inclined outer face of the drive-end housing, angled to maximise insolation capture across the service life of the battery.
3. Locking plate assembly (grey, A3 steel with a raised tread pattern) — the flat barrier that rises to reserve the bay. The chequer-plate surface provides slip and tyre-contact grip in the raised position and resists deformation under vehicle overrun.
4. Hinge and transmission assembly — the pivot between the plate and the chassis, incorporating the DC motor, the 8 mm internal-hex wave-box transmission, the anti-pinch sensing linkage and the angle sensor that confirms the plate's true elevation.

The control panel on the opposite end cap carries the local key switch and status indicators for on-site diagnostics.

4.2 Operational Principle

Table 6 — Operational Principle

Condition	Unit Behaviour
Bay empty	Plate remains lowered (flush with ground); system in standby
Vehicle detected entering the bay	Plate raises to 70°, locking the space; voice warning sounds
Driver scans the QR code and pays	Plate lowers within 3 s; voice confirmation sounds
Free parking time exceeded	Plate raises automatically and the billing timer starts
Vehicle departs (paid or within free time)	Plate lowers, returning the bay to service
Obstacle detected during travel	Plate reverses immediately to protect the obstacle and the mechanism
Low battery or system fault	Plate can be raised and lowered manually so the vehicle is never trapped
Forced impact on the raised plate	Alarm tone sounds and an escape-fee warning is reported to the backend

4.3 Product Views



Figure 2 — PL30 perspective view showing the drive-end housing, solar panel and locking plate assembly



Figure 3 — PL30 plan view: chequer-plate barrier, end-cap control panel and solar panel

5. Applications

The PL30 is suited to any paved parking scenario in which a bay must be individually enforced, reserved or metered. The flat chassis keeps the unit compatible with kerbside access, loading zones and street-cleaning operations.

5.1 Roadside and Curbside Paid Parking

The primary deployment. The unit converts an unmarked kerbside bay into an individually enforced, revenue-generating space that can be paid for by QR code without an attendant. The flat chassis introduces no vertical element that obstructs kerbside access, loading zones or street-cleaning operations.

5.2 Open-Air Surface Car Parks

Retail, office, hospital and campus car parks where per-space pricing, reservation and overstay enforcement are required. Because each bay is individually instrumented, occupancy analytics are available per space rather than per zone.

5.3 Shared and Reserved Space Management

Supports scheduled reservation workflows for EV charging bays, staff-only bays and accessible parking bays, where the space must be released automatically at a defined time or on vehicle departure.

5.4 Private and Closed-Property Lots

Apartment compounds, factory campuses and logistics yards where contractor vehicles and visitor vehicles compete for the same limited allocation.

5.5 Temporary and Event Parking

Deployment on temporary hardstanding for events, construction sites or market days, where mains power is unavailable but revenue control is still required.

5.6 Field Installation Reference



Figure 4 — PL30 deployed in a kerbside bay with QR payment signage

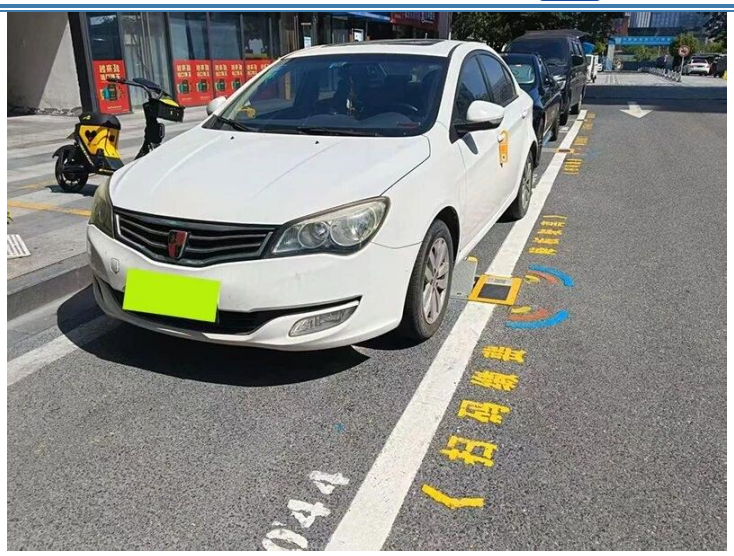


Figure 5 — PL30 enforcing a numbered urban bay



Figure 6 — PL30 installed along a tree-lined roadside bay



Figure 7 — Multiple PL30 units on a brick-paved surface parking area

6. Installation Requirements

Installation is a mechanical task only: the unit is fixed with expansion bolts to a prepared non-soft-base surface, and no electrical wiring is required on site. Read the site-selection and calibration notes before starting.

6.1 Site Selection

Table 7 — Site Selection

Requirement	Specification
Recommended position	Left-hand mid-portion of the parking bay
Unit orientation	Solar panel and QR code plate face the driver's side
Surface	Non-soft-base pavement (asphalt or concrete); soft-base surfaces must be replaced with a non-soft-base layer first
Level	The surface must be level; non-horizontal ground requires levelling before installation
Preparation	The mounting area must be clean and free of surface debris
Anchor holes	2 holes, ϕ12 mm, approximately 100 mm deep, drilled at the marked positions
Cable routing	Surface channelling for the cable run determined on site

6.2 Critical Installation Note — Angle Sensor Calibration

> **Caution —** If the mounting surface is sloped, adjust the angle sensor so that it sits level, parallel to the horizontal plane. A mis-set angle sensor prevents the plate from lowering fully to the ground and generates a persistent “plate did not lower” fault.

6.3 Installation Sequence

1. Select the mounting position, preferring the left-hand mid-bay location.
2. Position the unit so the solar panel and QR code end face the driver's side; mark the anchor positions and the cable-routing groove on the ground.
3. Drill the anchor holes with a ϕ12 mm hammer-drill bit to approximately 100 mm depth; cut the cable channel as determined on site.
4. Clean the mounting surface, insert the expansion bolts, set the unit into position and tighten the bolts.

6.4 Required Installation Equipment

Table 8 — Required Installation Equipment

Item	Specification	Qty
Hammer drill	Drill bits 12 × 30 mm and 6 × 15 mm	1
Generator	—	1
Cordless drill	16 mm socket	1
Safety warning tape	—	2 rolls
Rivet gun	—	1
Hammer	—	1–2
Rivets	—	Several
Waste bin	—	1
Rubber traffic cones	—	8–10
Reflective vests	—	6
Vehicle mover	—	4

7. Commissioning and Operation

Commissioning is performed with the operations mini-programme and the Bluetooth tool. All acceptance criteria below are observable in the backend or at the unit.

7.1 Commissioning Checklist

Table 9 — Commissioning Checklist

#	Step	Acceptance Criterion
1	Issue a raise command from the operations mini-programme	Plate raises normally; in the empty bay it lowers automatically after the configured interval and seats fully down
2	Bind the device ID in the operations mini-programme	The backend matches the device automatically and displays the berth as online
3	Issue a raise/lower command and inspect the data upload log	Data upload log is normal; press Reset and allow the radar to complete environmental self-learning
4	Drive a vehicle into the bay	The backend reports occupancy; if not detected, inspect the probe wiring for correct and secure connection
5	Shake the raised plate firmly	The escape-fee warning fires and is received by the backend
6	Scan the QR code and complete payment	The plate lowers and a lowering confirmation is broadcast

7.2 Operating Workflows

Temporary parking — the vehicle parks and the free-time period begins. The plate raises automatically once the free period expires and the billing timer starts; the driver scans the QR code, pays, and the plate lowers so the vehicle can leave.

Reserved / shared parking — the backend grants or denies access per bay according to the reservation record; the plate position follows the authorised state automatically.

7.3 Bluetooth Command Reference

These commands are used for on-site commissioning and for the maintenance procedures in Section 8.

Table 10 — Bluetooth Command Reference

Function	Command
Reset	`12345678EB90FFFFFFFF0233`
Raise plate	`12345678EB90FFFFFFFF0234`
Lower plate	`12345678EB90FFFFFFFF0235`
Modify heartbeat interval	`12345678EB90FFFFFFFF50C (0C = interval value)`
Modify lock name	`12345678EB90FFFFFFFF1DLK13CE01## (13CE01 = name)`
Modify IP address and port	`12345678EB90FFFFFFFF1DIP“60.12.194.4”,65084 ## (60.12.194.4 = IP address, 65084 = port)`

8. Fault Codes and Troubleshooting

The table below maps each alarm condition to its likely cause and the corrective action. Codes are raised by the control electronics and reported to the operations backend.

Table 11 — Fault Codes and Troubleshooting

Fault	Code	Symptom	Cause	Corrective Action
Plate jammed	80	Plate cannot raise or lower	Foreign object obstructing the plate; deformed transmission; faulty control box	Observe the lock state on site and clear any obstruction — applies to foot pressure, brick weight, tyre pressure and truck underbody cases. If the transmission is deformed, open the mechanical housing and turn the wave box with an 8 mm internal hex key: heavy resistance indicates a mechanically seized wave box — contact the manufacturer for replacement; free rotation rules out mechanical seizure and physical raise/lower can proceed. If the control box is suspected faulty, swap in a control box from a working unit; remove the SIM card from the faulty control box before replacement

Fault	Code	Symptom	Cause	Corrective Action
Plate raise/lower timeout	40	Plate travel exceeds the timeout	Motor wiring loose; motor failed; motor idling; plate hinge damaged	Check that the motor wiring is connected per the diagram and fully tightened. With wiring confirmed intact, lower the plate fully with an internal hex key, then connect the battery directly to the motor: if the plate rises the motor is sound, if not the motor has failed — contact the manufacturer. Motor idling and a plate hinge damaged by vehicle impact also require manufacturer repair
Plate oscillation alarm	20	Plate detected moving under load	Suspected attempt to force the plate; genuine obstruction	Enforce the escape-fee policy; a staff member verifies the condition on site
Plate obstructed during travel	10	Plate stops mid-travel	Foreign object under the plate; rusted hinge; vehicle underbody too low	Clear any foreign object. Inspect the hinge for rust — clean it, apply paint and lubricate. For low-clearance vehicles the unit lowers automatically to protect both vehicle and lock; if manual override is required, issue a raise command from the backend
Probe communication fault	08	Probe not reporting	Probe wiring disconnected or mis-wired	The probe lead is long; check three places: (1) the connector at the probe housing, (2) the connector at the control unit where the cable enters the conduit — check for crushing, and (3) the plug between the wire and the circuit board inside the control unit for looseness
Angle sensor fault	04	Angle sensor not reporting correctly	Sensor mis-mounted; wiring loose	Verify the sensor is mounted with the notch facing up, backed against the plate and aligned parallel to the horizontal plane. Then check the wiring for correct and secure connection, including the plug between the wire and the circuit board inside the control unit
Radar fault	02	Radar not reporting	Radar module failure	Replace through the manufacturer under warranty

Fault	Code	Symptom	Cause	Corrective Action
Geomagnetic sensor fault	01	Geomagnetic sensor not reporting	Sensor module failure	Replace through the manufacturer under warranty
Device offline	—	Unit unreachable on the network	Battery depleted; SIM not seated; antenna damaged; network fault	Confirm in the backend whether the battery is depleted. If not, power-cycle the unit by disconnecting the battery for 10 seconds and reconnecting, then listen for the voice prompt. No voice prompt indicates a power fault — contact the manufacturer. If the prompt sounds but the network is down, check that the SIM is seated (re-seat it if necessary), inspect the antenna for damage and the antenna-to-board connector inside the control unit for looseness, and query the carrier to confirm the SIM is not locked or expired. Moving an IoT SIM to a different device triggers a carrier lock
Low battery	—	Unit reports insufficient charge	Battery depleted	The battery must be replaced. Solar recharge is slow; once the voltage drops the unit cannot operate on solar alone. The battery supports external charging
Vehicle present but plate does not raise	—	No occupancy data reported	Sensor or reporting fault	Contact the manufacturer and provide the data packet uploaded by the affected unit
No vehicle but occupancy shown	—	False occupancy report	Environmental interference	Issue a reset command from the Bluetooth tool or the backend
Plate does not lower fully	—	Plate stops above the ground	Foreign object under the plate; angle sensor mis-set	First issue a reset command from the Bluetooth tool or the backend; if the plate still does not seat, raise it and check for an obstruction beneath. Then lower the plate fully with an internal hex key and observe whether the angle sensor is level — if tilted, adjust it to level

9. Ordering Information

Confirm the model designation and configuration below at the time of order. Commercial terms not listed are confirmed by the manufacturer on request.

9.1 Standard Configuration

Table 12 — Standard Configuration

Item	Description	Qty
PL30 parking space blocker	Model SXK-PL30, including control electronics, motor, sensor array, solar panel and QR code plate	1
Expansion bolts	Supplied with the unit	5
Lead-acid battery	12 V, 9000 mAh	1
QR code payment plate	110 × 110 mm, customisable artwork	1
Operations mini-programme access	Backend account and device-binding entitlement	1

9.2 Ordering Details

Table 13 — Ordering Details

Field	Detail
Model designation	SXK-PL30
Product code	PL30
Minimum order quantity	To be confirmed — contact Thinkpark
Lead time	To be confirmed — contact Thinkpark
Colour customisation	Chassis colour available on request; QR code plate artwork is customisable
Mounting	Expansion-bolt fixing; non-soft-base pavement required
Packaging	1320 × 600 × 17 0 mm; unit weight 55 kg

9.3 Product Support

Table 14 — Product Support

Item	Detail
Technical support	tom@autobarriergate.com
Website	www.autobarriergate.com
Manufacturer	THINKPARK TECHNOLOGY CO., LTD

10. Declaration

Photographs, charts and illustrations in this datasheet are provided for explanation and reference only and may differ from the specific product supplied. The product is supplied subject to the final technical specification confirmed at the time of order. The manufacturer reserves the right to change the information contained in this document without notice.

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