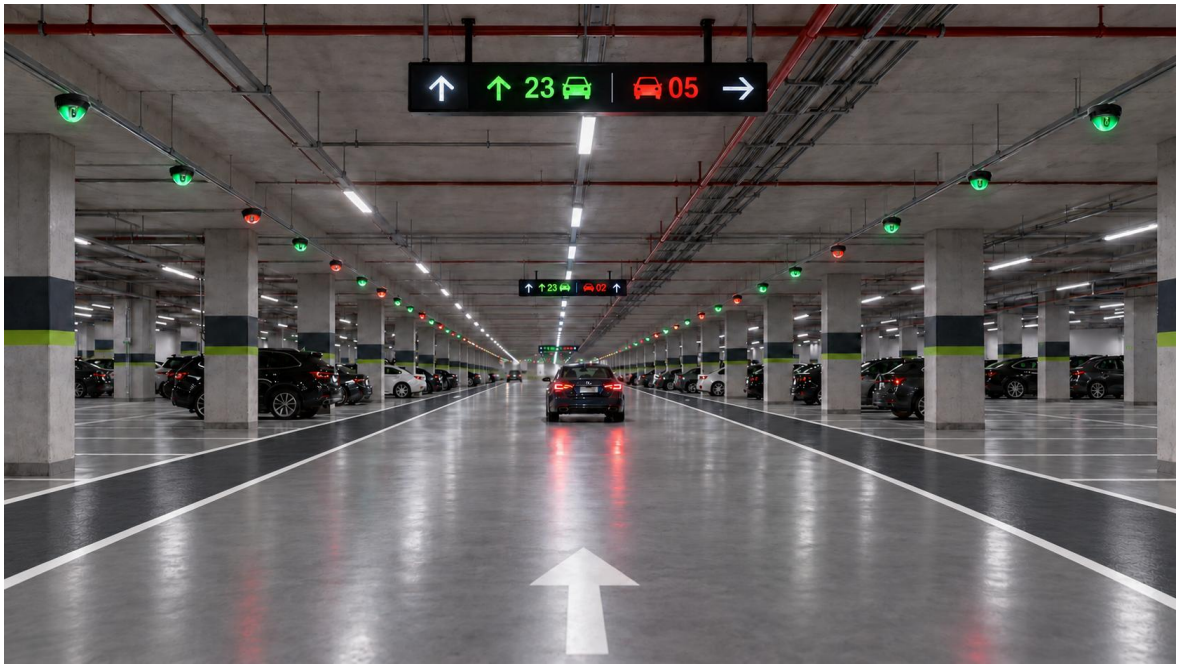
PRODUCT DATASHEET

Ultrasonic Parking Guidance System Solution

Front mounted detection and visual guidance for indoor parking facilities



Indoor parking guidance application illustration

Solution overview

The ultrasonic parking guidance system monitors individual parking spaces and directs drivers to available bays through integrated LED indicators, entrance displays and directional signs. A controller network collects occupancy data and provides operators with a live parking map and centralised management tools.

The system is designed for covered, fixed parking bays in shopping centres, office buildings, hospitals, hotels, residential developments and transport facilities. It supports both new installations and upgrades to existing car parks.

Solution benefits

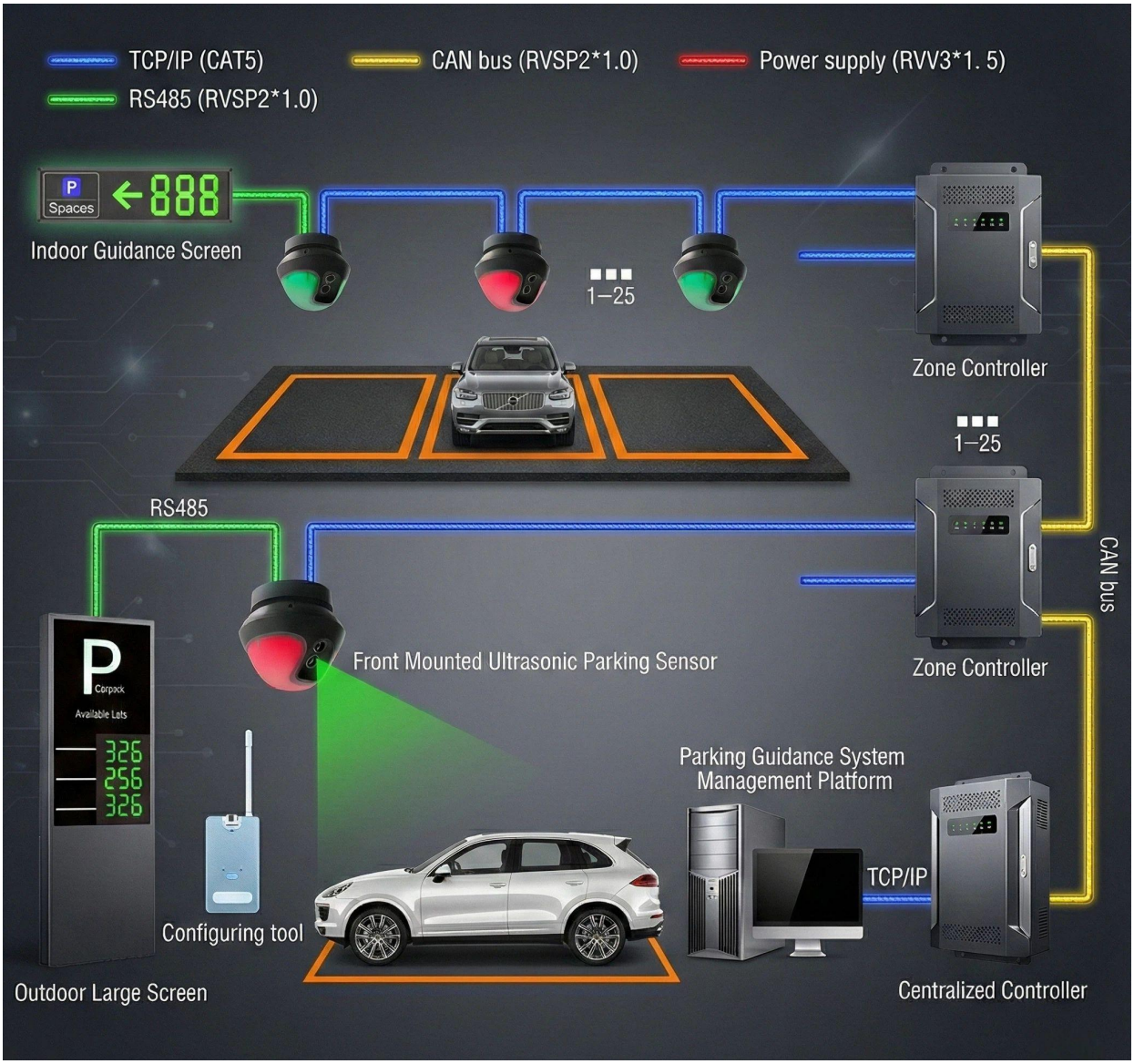
Visible guidance at every stage. Entrance counts, junction arrows and bay indicators help drivers navigate from the entrance to an available space.

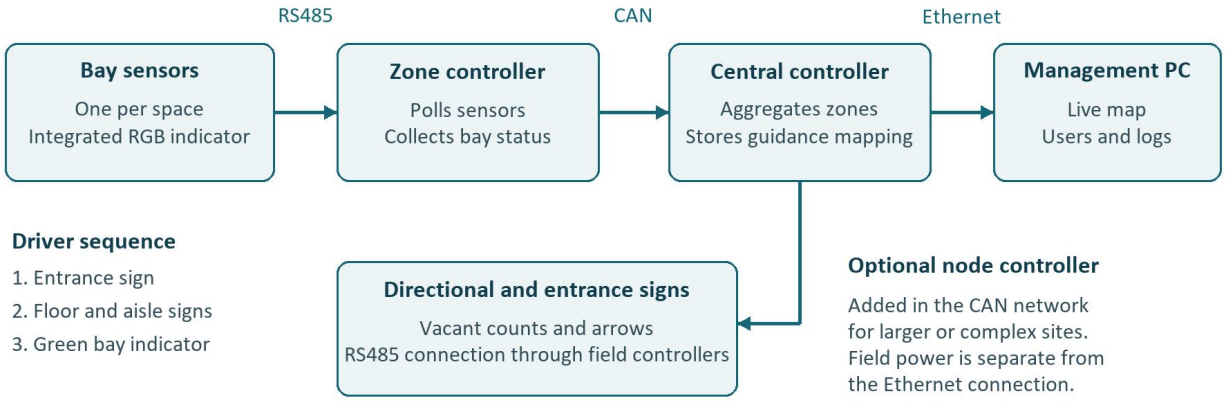
Integrated bay equipment. The sensor and status indicator share one housing, with front-mounted positioning for clear aisle visibility.

Centralised operation. Live occupancy, utilisation information, device management and user permissions support daily parking operations.

Modular installation. RS485 branches and a CAN controller network allow equipment to be arranged by floor, aisle and operational zone.

How the system works





System architecture with optional node controllers for expanded installations

1 Detect the parking bay. One ultrasonic sensor monitors each bay. Its acoustic distance measurement distinguishes an empty space from a parked vehicle within the calibrated detection area.

2 Display the bay status. The integrated indicator normally shows green for available and red for occupied. Additional colours can be assigned to the agreed parking categories.

3 Collect and process data. Zone controllers collect sensor status over RS485. The central controller aggregates the data through the CAN network, with an optional node controller layer for larger installations.

4 Update the guidance signs. The system sends available-space counts to entrance and indoor displays. Arrows direct drivers towards the associated floor or zone.

5 Monitor operations. The management platform displays individual bay status and utilisation information. The central controller retains downloaded guidance associations for operation independently of the management computer.

System components

System layer	Component
Bay detection	SXK-T02F integrated ultrasonic sensor
Sensor commissioning	SXK-T02-T configuration tool
Field control	SXK-K02Z zone controller
Network expansion	SXK-K02N node controller
Central control	SXK-K02M central controller
Indoor guidance	SXK-PGLED01 single-direction and SXK-PGLED03 three-direction displays
Entrance guidance	SXK-PGLED21 entrance display
Operations	Parking guidance management software

Integrated ultrasonic parking sensor

SXK-T02F



Installed above the front of each parking bay, the SXK-T02F combines ultrasonic occupancy detection with an integrated LED indicator. Each unit reports the status of one bay to the zone controller.

Key functions

Dual ultrasonic circuits. Two independent ultrasonic circuits support vehicle detection and operational reliability.

Interference filtering. Intelligent learning reduces interference from passing traffic and adjacent vehicles.

Visible status indication. Seven-colour LED hardware provides clear availability and configured category indication.

Remote management. Supports server-side upgrades and operator-controlled exclusion of selected bays from available-space counts.

Technical specifications

Parameter	Specification
Detection technology	Ultrasonic; one monitored bay per sensor
Supply voltage	DC 10-28 V; rated DC 24 V
Power consumption	<2 W
Detection accuracy	≥99% under suitable installation and calibration conditions
Response after parking	<2 s at the detector
Ranging error	2 cm
Indicator	Seven-colour high-brightness LED
Communication and connectors	RS485; 2 × RJ45
Communication distance	≤300 m using CAT5e
Power supply distance	≤150 m using CAT5e, subject to load and voltage-drop design
Installation height	2-3 m; recommended 2.5-2.8 m
Operating environment	-30 to +75 °C; 40-70% RH
Housing and dimensions	ABS engineering plastic; diameter 126 × 125 mm
Net weight	180 g

Use the approved mounting geometry and calibrate each bay. The RJ45 field connectors carry the specified sensor interface and must not be treated as Ethernet or standard PoE ports.

Parking guidance configuration tool

SXK-T110



The portable configuration tool links an Android handset to the ultrasonic sensor using Bluetooth and infrared communication. It supports on-site setup of sensor parameters during installation and maintenance.

Key functions

Wireless handset connection. Bluetooth communication links the tool to the Android configuration application.

Local sensor configuration. The infrared link transfers configuration data to the target ultrasonic sensor.

Portable service access. The compact enclosure and detachable antenna support use across multiple parking bays.

Technical specifications

Parameter	Specification
Supply voltage	DC 5 V
Power consumption	<0.5 W
Communication	Bluetooth and infrared
Bluetooth version	V4.0
Bluetooth commissioning distance	Up to 2 m
Infrared distance	≤1.5 m
Supported handset	Android smartphone
Minimum operating system	Android 9.0
Operating temperature	-20 to +75 °C
Dimensions	74 × 24 × 15 mm
Weight	15 g

Commissioning use

Connect the tool to the compatible handset application, select the intended sensor, and position the infrared interface within its specified range. Apply the required configuration and verify the resulting bay indication and status in the management platform.

Indoor zone controller

SXK-K02Z



The zone controller links bay sensors and indoor guidance displays to the CAN control network. It polls connected field devices, collects parking status and forwards data to the central or node controller.

Key functions

Field data collection. Collects occupancy information through two independent RS485 channels.

CAN network communication. Provides data transfer between the field branches and the higher-level controller.

Diagnostics and service. Supports RS485 communication checks, device-status diagnosis and remote firmware updates.

Electrical protection. Incorporates short-circuit, overvoltage and overload protection.

Technical specifications

Parameter	Specification
Supply voltage	AC 110-240 V
Controller power consumption	≤2 W, excluding connected detector loads
Processor	32-bit ARM
CAN interface	1 channel
RS485 interface	2 independent channels
CAN communication distance	≤1,000 m
RS485 communication distance	≤300 m
Connected equipment	Ultrasonic sensors and compatible guidance display nodes
Operating temperature	-40 to +85 °C
Enclosure	Spray-coated galvanised steel sheet
Dimensions	320 × 260 × 90 mm
Net weight	3 kg

Installation and configuration

Locate the controller near its assigned sensor branches. Allocate devices, display nodes and supply loading in the approved project configuration, considering branch length and voltage drop. Device capacity and the field power budget must be confirmed for the selected controller configuration.

Indoor node controller

SXK-K02N

The node controller provides an optional aggregation layer within the CAN network. It collects information from downstream zone controllers, forwards it to the central controller and relays guidance data back to the field network.

Key functions

Network aggregation. Groups zone controllers for larger or more complex parking layouts.

Bidirectional data transfer. Uploads bay-status information and distributes central-controller commands and guidance data.

Industrial CAN communication. Supports communication over long cable routes within the specified network design.

Remote maintenance. Supports remote firmware upgrades and controller management.

Electrical protection. Includes short-circuit, overvoltage and overload protection.

Technical specifications

Parameter	Specification
Supply voltage	AC 110-240 V
Power consumption	≤2 W
Processor	32-bit ARM
Communication	2 CAN interfaces
CAN data rate	20 kbps
Communication distance	≤1,000 m
Downstream node capacity	Up to 25, subject to the approved network topology
Operating temperature	-30 to +75 °C
Operating humidity	≤90% RH, non-condensing
Enclosure	Spray-coated galvanised steel sheet
Dimensions	320 × 260 × 90 mm
Net weight	2.74 kg
Internal assembly	Power supply, control board, enclosure and circuit breaker

System placement

Install the node controller between the central controller and the assigned zone-controller groups. The required number is determined by the site layout, downstream controller quantities and approved CAN network structure. A node controller is not required for every installation.

Indoor central controller

SXK-K02M



The central controller is the collection and control centre of the parking guidance system. It processes bay-status information, maintains zone associations and coordinates the vacancy counts displayed throughout the facility.

Key functions

Central occupancy processing. Combines information from zone or node controllers and updates guidance data.

Flexible zone mapping. Associates sensors and displays with logical zones independently of their physical connection locations.

Local autonomous guidance. Stores downloaded associations and continues configured guidance independently of the computer.

Platform connectivity. Connects to the management platform over Ethernet and supports remote upgrades.

Technical specifications

Parameter	Specification
Supply voltage	AC 110-240 V
Power consumption	≤2 W
Processor	32-bit ARM
Communication	Ethernet and CAN
Ethernet connector	RJ45
CAN-connected equipment	Indoor zone controllers or node controllers
Direct controller capacity	Up to 25 zone controllers or node controllers
Logical zone capacity	Up to 256 zones
CAN communication distance	≤1,000 m
Operating environment	-30 to +75 °C; ≤90% RH, non-condensing
Enclosure	Spray-coated galvanised steel sheet
Dimensions	320 × 260 × 90 mm
Net weight	2.84 kg

Computer-independent guidance requires powered, communicating field equipment. Logical zones are configurable parking groups and are separate from the physical controller connection limit.

Indoor LED guidance displays

SXK-PGLED01 and SXK-PGLED03





Indoor guidance displays show available-space counts and directional arrows at aisle entrances, junctions and floor transitions. SXK-PGLED01 provides single-direction guidance; SXK-PGLED03 provides three-direction guidance.

Key functions

Live directional guidance. Displays the remaining spaces in each associated zone together with the selected arrow direction.

Configurable count thresholds. Red and green indication responds to the configured vacancy warning threshold.

Mobile commissioning. Bluetooth setup supports display addressing and arrow configuration.

Technical specifications

Parameter	Specification
Supply voltage	AC 220 V ±10%
Communication	RS485; Bluetooth for commissioning
Communication distance	RS485 ≤300 m; Bluetooth ≤8 m
Light source	High-brightness red and green LEDs
Display content	Available-space count and selectable directional arrows
Pixel pitch	4.75 mm
Reference display resolution	80 × 32 pixels per specified display module
LED drive	Constant current
SXK-PGLED01 dimensions	650 × 183 × 56 mm
SXK-PGLED01 power	≤20 W maximum
SXK-PGLED03 dimensions	1,410 × 183 × 56 mm
Operating environment	-30 to +75 °C; 5-95% RH
Housing	Black aluminium frame with acrylic panel

Select the display arrangement for the junction layout. Electrical loading for the three-direction assembly is specified with the selected configuration; the single-direction power value does not apply to the complete three-direction sign.

Entrance LED guidance display

SXK-PGLED21



The entrance guidance display presents parking availability before a driver enters the facility. Its reference three-layer configuration can display counts for separate levels or zones.

Key functions

Entrance availability information. Shows the remaining parking spaces for the assigned facility, floors or zones.
Clear day and night indication. High-brightness red and green LEDs provide count visibility, with illuminated sign text.
Configurable warning threshold. Changes the count indication between green and red according to the configured availability threshold.
Protected construction. Uses a coated steel enclosure, weather-resistant finish and electrical protection against short circuits, overvoltage, overcurrent and overload.

Technical specifications

Parameter	Specification
Supply voltage	AC 110-240 V
LED module voltage	DC 5 V
Reference configuration	Three display layers
Numeric display	3 or 4 digits, according to configuration
Light source	High-brightness red and green LEDs
Communication	RS485
Communication distance	≤300 m
Power consumption	≤30 W per display layer
Operating temperature	-30 to +75 °C
Operating humidity	≤90% RH, non-condensing
Enclosure materials	Spray-coated galvanised steel, white polycarbonate and acrylic panel
Reference dimensions	2,000 × 750 × 140 mm

The image illustrates the entrance-display product style. Final face layout, mounting and environmental suitability follow the selected project configuration.

Parking guidance management software

The management software gives operators a live view of parking occupancy and the equipment network. It connects to the central controller through Ethernet and supports daily operation, configuration and maintenance.

Key functions

Electronic parking map. Shows the distribution of parking bays and their live status, with occupied spaces in red and available spaces in green.

Utilisation monitoring. Displays parking utilisation as a curve over a 24-hour period.

Bay event visibility. Displays the floor, time and bay number when a vehicle occupies a monitored space.

Device and user management. Provides online device search, tabular import, map management and configurable account permissions.

Controlled bay exclusion. Allows authorised personnel to mark selected bays as occupied so that they are excluded from advertised availability.

External data exchange. Supports data push to third-party platforms and log export for operational review.

Functional and interface specifications

Parameter	Specification
Controller connection	Ethernet connection to the central controller
Parking representation	Site map with individual bay status
Standard occupancy states	Available and occupied
Utilisation view	24-hour utilisation curve
Event information	Floor, event time and bay identifier
Management modules	Devices, operations, maps and users
Device onboarding	Online discovery and tabular device import
Access control	Configurable account permissions
Maintenance	Server-side equipment upgrade functions
External output	Third-party data push and log export

Deployment and integration

Software licensing, workstation requirements, supported operating system, storage and backup arrangements are defined in the selected software package. Third-party integration requires an agreed data interface and implementation scope. Plate recognition, payment, charger status and vehicle-finding functions require their own devices and software integration.

Product configuration and installation

Equipment selection

Component	Selection basis
SXK-T02F sensor	One installed sensor for each monitored bay
SXK-T02-T configuration tool	Shared commissioning and maintenance tool
SXK-K02Z zone controller	Quantity based on assigned field devices, cable routes and power loading
SXK-K02N node controller	Optional network aggregation for the approved controller topology
SXK-K02M central controller	Quantity based on controller groups and network architecture
SXK-PGLED01 / SXK-PGLED03	Selected for the number and direction of routes at each junction
SXK-PGLED21 entrance display	Selected by entrance count and required floor or zone information
Management software	Configured for site maps, equipment, users and agreed integrations
Installation accessories	Mounting supports, field cabling, power distribution, cabinets and network equipment

Installation requirements

Sensor positioning. Maintain the specified mounting height and a clear detection area. Check columns, pipework, beams and adjacent vehicle positions before fixing the sensor.

Power and communications. Use the approved wiring diagram, pin assignments and polarity. Size supplies and conductors for connected loads and voltage drop. Observe the specified communication and power-distance limits.

Driver visibility. Install signs before route decision points and keep bay indicators visible from the aisle. Coordinate supports with vehicle clearances and building services.

Commissioning. Assign unique addresses, map sensors to bay identifiers, set display zones and arrows, and verify vacancy counts using occupied and vacant test conditions.

Handover. Provide the final equipment schedule, wiring drawings, configuration backup and operator instructions. Verify software permissions, device communication and recovery after interruption.

Specification scope

All dimensions are in millimetres unless otherwise stated. Communication distances depend on compliant cabling and the approved network design. Detector response time is separate from the complete system update time. Product appearance and configured display layouts may vary by order.

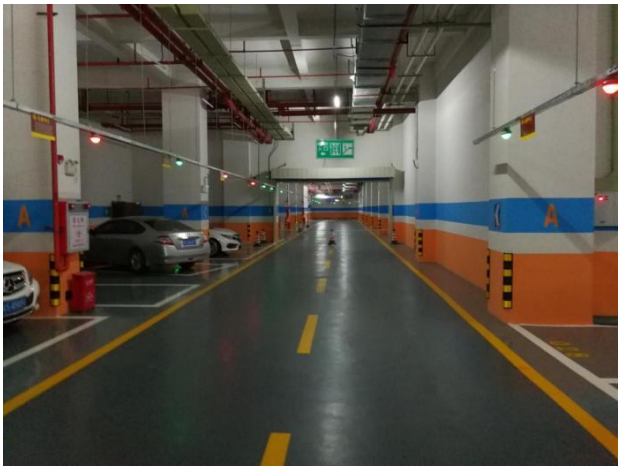
Installation examples



Junction guidance display and overhead bay indicators in a covered car park

Guidance through the parking facility

Entrance displays provide availability information before entry. Indoor signs guide drivers through floor transitions and aisle junctions, while the integrated bay indicators identify individual available spaces.



Overhead detector installation and directional guidance along a parking aisle

Installation layouts are adapted to the parking geometry, ceiling services, traffic direction and operational zoning. The photographs illustrate field installation arrangements; the final equipment layout follows the approved project design.