PARKING, ELEVATED

Park Assist® introduces the new M4 - the most advanced camera-based guidance system in the parking industry. Elevate your parking experience by combining our exclusive sensor system with our sophisticated software suite!
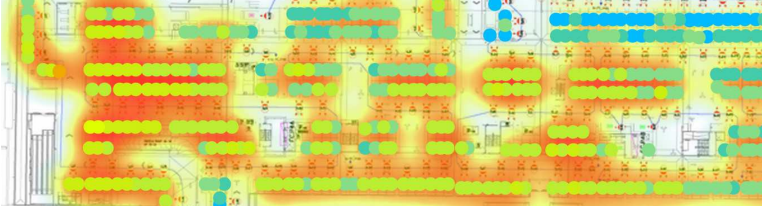
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M4 SYSTEM KEY FEATURES AND OPTIONS

GUIDANCE

First impressions start with parking. Guidance from Park Assist puts your best foot (and parking space) forward, while continuously optimizing parking utilization.

PASE WEB

Park Assist's PASE Web reporting system turns parking patterns into a data goldmine, all accessible and searchable in a web browser.

PASE DYNAMIC

The best seats at a concert carry premium prices – why shouldn't the best parking spaces? PASE Dynamic produces more revenue from premium parking locations.

PASE SURVEILLANCE

Covering every parking space, PASE Surveillance provides an unparalleled tool to visualize and deter incidents in parking structures.

PASE FINDER

44% of parking customers forget where they parked their car on a regular basis. With just a few taps, PASE Finder shows them exactly where to go.

PASE ALERTS

PASE Alerts applies parking policies and informs security teams of violations in real time. Manage staff parking, keep a lookout for threats, all automatically.

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M4 Smart-Sensor System

↑ PARKING →

PARKING SPACES AVAILABLE

↑ LEVEL 1	137	↑
↑ LEVEL 2	229	↑
↑ LEVEL 3	361	↑

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Our leading-edge M4 smart-sensor camera: Ahead of the curve and poised for the future.

Equipped with a formidable dual-core processor, the M4's bright LED light-ring indicator can be configured remotely to display thousands of colors to indicate occupancy status and parking space type (i.e. regular, premium, handicapped, etc.). Poised for future advances via firmware upgrades, its attractive housing has a seal rating of IP54, keeping detrimental dust and water away from the advanced electronics.

The most advanced
camera-based guidance system
in the parking industry.

Parking technology far beyond guidance: With core business intelligence.

With traditional ultrasonic parking systems, the sensor monitoring the space can only determine one thing: whether the space is occupied or not. So for years, parking systems were counted on to do only one thing: the tracking of empty spaces in order to provide parking guidance.

By contrast, a Park Assist camera based M4 smart-sensor system puts processing intelligence right at the parking-space level. Each individual sensor has the ability to stream surveillance video to a video management system, while also sending rich data for our integrated License Plate Recognition (LPR) and occupancy tracking.

We embedded a brain right in the sensor: Adding to the beauty of the system.
The streamlined layout of a Park Assist installation is as functional as it is aesthetically pleasing. M4 smart-sensors with dual cameras are installed above the driving lane to monitor a pair of spaces on each side. This unique vantage point provides the IP-based cameras with an unobstructed view of the parked vehicles – while providing parkers with clear sight lines for easy guidance and navigation.

Since each smart-sensor is equipped with a dual-core processor, the sleekly designed M4 delivers unprecedented performance with superior detection and surveillance. Due to the combined processing power of the multiple M4s, the core server doesn't have to carry the load for the whole system, creating scalable capacity for multi-functionality and future expansion.

99% accurate and continually verified.

With an ultrasonic system, the process for verifying system accuracy is both difficult and unfeasible. The only way is by assigning people to physically walk the garage, while manually recording the results. A process that is tough enough to execute, never mind to repeat frequently.

With Park Assist, the core system regularly gathers a smart-sensor image from every parking space across an entire site, at a specific point in time. Each image is reviewed by a third-party monitoring service, which uses live inspectors to manually verify whether that space is occupied or not. To ensure the accuracy of the inspectors themselves, test images are also inserted in the stream at random junctures.

Using the collected data from this doubly-verified process, Park Assist system analysts regularly provide the facility manager with a detailed report – proving the accuracy of the system in a tangible way.

Built-in fault tolerances to ensure system integrity and reliability.

The continual dialogue between the M4 smart-sensors and the core system ensures overall reliability as well.

The core server continually searches the daisy-chained installation for compromised smart-sensors – sending an immediate alert if a sensor needs to be replaced. Signals continue to pass downstream through a compromised M4's Ethernet switch until the sensor is replaced – a process that takes just a few minutes. Upon power-up, the system is restored to 100% functionality.

In addition, the smart-sensors are able to compensate for any momentary connection glitches. If the data connection is temporarily lost, the autonomous M4s continue to function – storing interim events in their flash memory until they can reconnect with the core server. They also synchronize regularly with public time servers, ensuring the accurate time-stamping that is crucial to the system and the data it generates.

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Why M4 Smart-Sensors over Ultrasonic:

There is really no comparison between a Park Assist camera based M4 Smart-Sensor System and one using outdated ultrasonic technology. Driven by core business intelligence, our customized guidance-and-beyond solutions heighten performance and profitability – while elevating the overall parker experience.

	Ultrasonic	M4 Smart-Sensor	Superior Product
LED Capabilities	2 colors per unit (red/green or blue/green)	RGB-based signaling lights can be remotely changed to virtually any color.	M4
Parker Experience	Basic guidance and wayfinding only.	Next-generation guidance includes our seamless wayfinding continuum – along with Park Assist's exclusive *Find Your Car*™ feature.	M4
System Control	System controls limited to basic guidance.	A wealth of features to increase revenues, streamline operations, enhance surveillance and more – accessed through the Park Assist Software Suite.	M4
Revenue Enhancement	Requires the installation of costly gate systems and the loss of valuable parking spaces.	The ability to institute premium and conditional parking rates through our *Park SelectRate* software extension, without the need for added equipment.	M4
Installation Ease	A complex installation that requires complete shutdown of the parking facility.	Installed quickly, section by section, with no disruption and minimal effect on daily operations.	M4
System Look-and-Feel	Cluttered two-conduit design impairs visibility. Requires substantially more conduit/wire for a comparable installation.	Modern streamlined single conduit design with superior sight lines. Installed with a minimized amount of conduit/wires.	M4
System Upgrades	Outmoded technology with no significant upgrades available.	Software-based system with steady stream of upgrades.	M4

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Our seamless wayfinding continuum: The ultimate in sitewide guidance.

The quality and customer-friendliness of a parking facility are often overlooked at many properties. However, the parking experience can be used to elevate the first impression for valued guests and visitors, to set their expectations for the remainder of the visit, and to enhance a property's overall brand-building strategy.

The Park Assist approach to guidance is to remove all stress and uncertainty from the process. The overarching goal is to provide a seamless and stress-free experience for each parker – from initial entry to an open space – while improving overall traffic flow throughout a facility or across an entire property.

Next-generation guidance at every key decision point.
Through the unique synergy of our camera based M4 smart-sensor system and customizable wayfinding signage, parkers are treated to a higher level of guidance and convenience from the moment they arrive – along with valuable followup guidance at every key decision point.

Parking search time reduced up to 44%. Reducing fuel usage and CO_2 emissions.*
Through the combination of our advanced wayfinding signage and the bright signaling LEDs on our smart-sensors, search time is reduced by as much as 44% – an average time savings of 76 seconds per parker – when a facility is over 75% occupied. For a 2,500-space garage, this can result in a yearly savings of up to 52,100 gallons of fuel and 459,000 kg of related CO_2 emissions.

The resulting reduction in a parking facility's carbon footprint is no small consideration. This focus on sustainability is something Park Assist continues to strengthen, through our active involvement in the Green Parking Council.

According to an Arup study commissioned by Park Assist for the 2,513-space parking facility at Westfield Century City Shopping Centre in Los Angeles. Comparative data was recorded one month before and one month after the installation of a Park Assist camera based smart-sensor system.

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Signs upon arrival: For properties with multiple parking areas, a multi-facility sign announces the number of available spaces at each garage or lot. This continually updated information enables parkers to decide on the best facility to park in at any given moment.

Secondary signage within a chosen garage: Once a parker has decided to park in a specific garage, a dedicated sign displays the number of available spaces on each level.

Directional interior in-aisle pointers: Once a parker has committed to searching for a space on a particular level, these signs enable a parker to make on-the-spot decisions (left, right or straight) based on the number of available spaces.

Signaling color-coded LEDs on the smart-sensors: This is where the M4s – which have been providing up-to-the-second occupancy data to the core system all along – really kick in to finish the wayfinding process. In addition to green (open) and red (occupied), these bright, clearly viewable LED indicators can be programmed to display thousands of colors to denote special-purpose spaces – i.e. blue for handicapped, purple for premium, and so forth.

Our optional *Park Finder* car location feature: Through our *Park Finder* software extension, we even offer an exclusive *Find Your Car*™ feature to complete the loop. This enables returning parkers to find the exact location of their vehicles upon exit by simply typing in the license plate number at a touchscreen kiosk or on a smartphone app – and/or when inserting their parking tickets at a pay station.

Facility beyond all expectations:
The multifaceted Park Assist advantage.

The M4 is a great example of how we continue to improve and expand the functionality of our smart-sensor driven technology. The actionable data gathered by our system-with-a-brain enables operators to maximize space utilization and ROI, increase revenue, streamline costs, enhance safety and security, and more.

Today, there are more reasons than ever for enterprises and organizations to leverage the core business intelligence of this revolutionary guidance-and-beyond technology. Key operational advantages, which span across the gamut of industries and genres, include:

Maximized usage through next-generation guidance. For new and existing facilities.
Without parking guidance technology, it's common for parking spaces to go unused during high-occupancy periods. Since parkers are quickly and efficiently led to open spaces throughout a facility, our next-generation Park Assist guidance system is crucial for obtaining maximum usage per square foot. This can save millions in construction costs for a new facility. It can also postpone or eliminate the need to expand or replace an existing facility.

Precise global monitoring across multiple facilities.
Our latest generation of smart-sensor cameras provide a 99% accuracy rate for occupancy monitoring. And while ultra-sonic sensors are limited to occupancy monitoring – with unverifiable results – our camera-based systems both see and sense what is truly going on. This is a key element in the ability of our system's core intelligence to provide precise cloud-empowered monitoring of multiple facilities.

Using sophisticated software algorithms, all Park Assist smart-sensors across the globe are regularly verified by a third-party monitoring service. This enables us to immediately discover sensor issues, often before the operator-in-charge does. And to provide Park Assist system owners with a real-time alert if even a single smart-sensor goes down – anywhere in the world.

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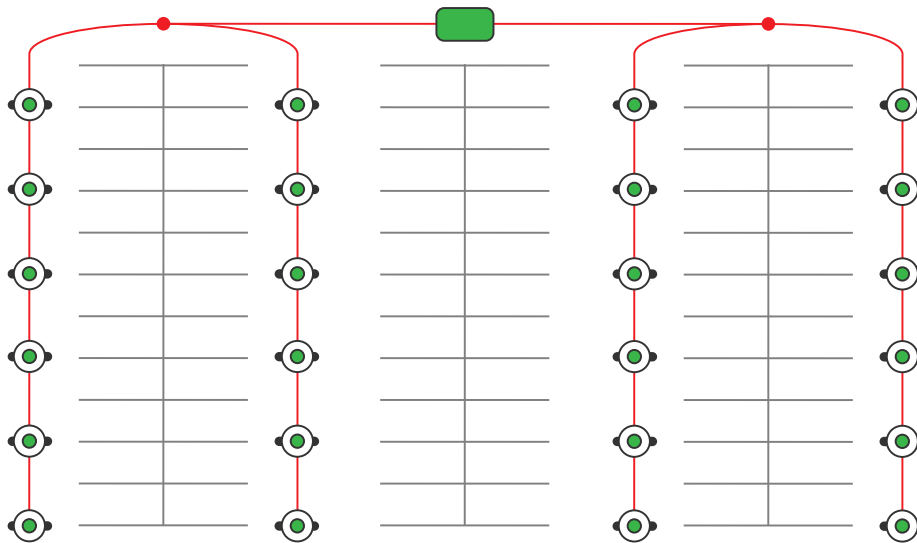
The M4 is installed above the middle of the driving lane with one unit monitoring up to 4 parking spaces.

One camera based smart-sensor can cover 4 bays.

⊙ Integrated camera sensor and indicator light ——— High Speed Ethernet ▮ Floor Cabinet

Expanded surveillance from a unique vantage point.

While our M4 smart-sensor cameras are already identifying vehicles and monitoring occupancy, our *Park Surveillance* software extension can also capture streaming surveillance video whenever motion is detected in or around a space. Or continuously, if desired. An expanded level of security and crime deterrence that would otherwise be cost-prohibitive.

Streamlined design-conscious installation. With no disruption to daily operations.

With the ultrasonic parking technology offered by our competitors, you need to shut down your facility for what is a complex installation. By contrast, a Park Assist M4 smart-sensor system is quickly installed, section by section, with no disruption and minimal effect on day-to-day operations.

A next-generation technology platform: Always ready for the next plateau.

At Park Assist, business intelligence is more than a concept. Parking technology is about far more than guidance. And we're always looking for new ways to extend the functionality of our ever-evolving suite of API-driven applications.

For more information about the M4 smart-sensor system detailed in this brochure, call Park Assist at +1 877 899 PARK (7275) or email us at info@parkassist.com.

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GREEN PARKING COUNCIL
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Park Assist is proud to be an active member of The Green Parking Council –
a national 501(c)(3) organization providing leadership and oversight for the green
conversion of parking facilities to sustainable, environmentally responsible assets.

M4 Smart-Sensor

The M4 camera based Smart-Sensor has the ability to sense, identify and count vehicles for individual parking spaces. Configured with one or two CMOS digital cameras, each smart-sensor can monitor up to four parking spaces simultaneously.

Camera images are continuously processed by the onboard computer to detect parking space occupancy changes using proprietary image processing software. For surveillance purposes, the output of the cameras can be streamed over the network. The M4's housing has a seal rating of IP54, preventing the ingress of water and dirt.

Built into the M4 Smart-Sensor is a Light Emitting Diode (LED) indicator, configurable to any of thousands of colors to indicate the status of the spaces it monitors. In a typical configuration, the indicator is green when at least one monitored space is unoccupied, and red when all monitored spaces are occupied. Status colors can be set remotely via software to meet local standards and/or address special needs.

Each M4 Smart-Sensor is autonomous, managing its own occupancy status and indicator color. Data and images flow from sensors to the core server for the system via standard TCP/IP Ethernet network. An internal Ethernet switch and power pass-throughs enable daisy-chain installation. The smart-sensors also feature network-accessible interfaces for remote configuration and maintenance.

PART NUMBER	DESCRIPTION
M4-100	Camera Sensor, 4G, single camera
M4-200	Camera Sensor, 4G, dual camera

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M4 Smart-Sensor Specifications

ARCHITECTURE:

- Processor   800 MHz Cortex A9 dual-core processor
- Imaging   One or two 5.0 megapixel CMOS cameras
- Network   RJ45 Ethernet connection designed for daisy chained installation

INDICATOR:

- Technology   16 RGB LEDs; color mixing for thousands of possible colors

INTERFACES:

- Network   TCP/IP
- Video   Streaming H.264 via RTSP

ENVIRONMENT:

- Operating Temperature   -30° to 50°C (-22° to 122°F)
- Environmental sealing   IP54

MECHANICAL:

- Mounting   Spring-loaded mounting clip
- Material   ABS and polycarbonate plastic

ELECTRICAL:

- Voltage   7-30V DC
- Power Draw   6W typical
- Product Safety   ETL listed

DIMENSIONS:

- Height   142 mm (5.6")
- Width   228 mm (9.0")
- Depth   228 mm (9.0")
- Weight   1.0 kg (2.2 lbs)

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L4 Smart-Sensor

The L4 camera-based Smart-Sensor has the ability to sense, identify and count vehicles for individual parking spaces. Configured with one or two CMOS digital cameras, each smart-sensor can monitor up to four parking spaces simultaneously.

PART NUMBER	DESCRIPTION
L4-100	Camera Sensor, 4G, single camera, lightpipe mount
L4-200	Camera Sensor, 4G, dual camera, lightpipe mount
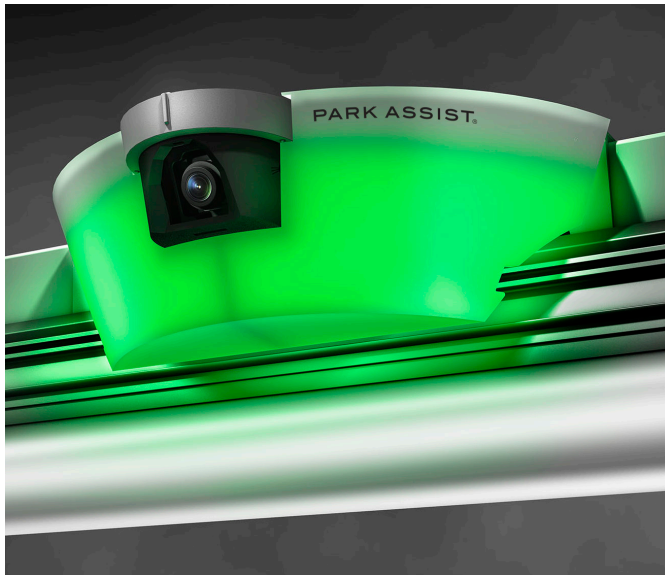
Camera images are continuously processed by the onboard computer to detect parking space occupancy changes using proprietary image processing software. For surveillance purposes, the output of the L4 smart-sensor camera can be streamed over the network. The L4's housing is sealed to prevent ingress of water and dirt, and is designed specifically to mount on the Lightpipe LED lighting system.

Built into the L4 Smart-Sensor is a Light Emitting Diode (LED) indicator, configurable to any of thousands of colors to indicate the status of the spaces it monitors. In a typical configuration, the indicator is green when at least one monitored space is unoccupied, and red when all monitored spaces are occupied. Status colors can be set remotely via software to match local standards and/or address special needs.

Each L4 Smart-Sensor is autonomous, managing its own occupancy status and indicator color. Data and images flow from the sensors to the core server via a standard TCP/IP Ethernet network. An internal Ethernet switch and power passthroughs permit daisy-chain installation. The smart-sensors also feature network-accessible interfaces for remote configuration and maintenance.

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L4 Smart-Sensor Specifications

ARCHITECTURE:

- Processor	800 MHz Cortex A9 dual-core processor
- Imaging	One or two 5.0 megapixel CMOS cameras
- Network	RJ45 Ethernet connection designed for daisy chained installation

INDICATOR:

- Technology	4 RGB Power LEDs; color mixing for thousands of possible colors

INTERFACES:

- Network	TCP/IP
- Video	Streaming H.264 via RTSP

ENVIRONMENT:

- Operating Temperature	-30° to 50°C (-22° to 122°F)
- Environmental sealing	IP54

MECHANICAL:

- Mounting	Self-clamp to lightpipe only
- Material	ABS, polycarbonate plastic, and steel

ELECTRICAL:

- Voltage	7-30V DC
- Power Draw	10W typical

DIMENSIONS:

- Height	74 mm (2.9")
- Width	267 mm (10.5")
- Depth	241 mm (9.5")
- Weight	1.0 kg (2.2 lbs)

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Cabling

Park Assist cables for power and data create connections between smart-sensor units. Ends are pre-terminated with proper connectors to speed installation. Each cable is roughly 8 m (26') in length, designed for typical sensor spacing in most facilitiess.

PART NUMBER	DESCRIPTION
CBL-P00-8	Cable, power, 12 AWG, 8 m / 26' length
CBL-D00-8	Cable, data, Cat5e, 8 m / 26' length

Specifications

POWER CABLE:

- Length	7.9 m +/-0.1 m (26' +/- 4")
- Connector type	TE Connectivity 796640-2
- Wire gauge	12 AWG (3.3 mm^2)
- Wire type	Stranded
- Number of conductors	2
- Insulation material	Polyvinyl Chloride (PVC)
- Cable rating	NEC type CL3R, FPLR
- Flame Test	UL 1666

DATA CABLE:

|	
- Length	7.9 m +/-0.1 m (26' +/- 4")
- Connector type	RJ45
- Wire type	Category 5e
- Wire sequence	EIA/TIA-568B
- Insulation material	Polyvinyl Chloride (PVC)

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Channel System

Specially-designed aluminum mounting channel simplifies the installation of the Park Assist smart-sensor system. From initial hanging to mounting smart-sensors, the channel reduces the time to get a system up and running.

Channel hanger clips easily and securely attach channel to threaded rods.

Park Assist smart-sensors attach to the channel without tools. The open channel holds the wiring that connects each unit to the high-speed network. Channel can be assembled into long straight runs, or junction pieces can be used to alter the channel's path in height and direction. The channel hangs from the ceiling using standard anchors, threaded rods, and nuts attached to Park Assist hanger clips that fit inside the channel.

PART NUMBER	DESCRIPTION
CS-CHNL-3	Channel system, channel, standard aluminum, 10' / 3.05 m
CS-HANGER-0	Channel system, hanger clip, short profile
CS-JS	Channel system, Straight duct junction
CS-JH90	Channel system, 90 degree connector (*not pictured*)
CS-JH45	Channel system, 45 degree junction
CS-JT	Channel system, T Junction
CS-JX	Channel system, X Junction
CS-JV45U	Channel system, 45 degree up junction
CS-JV45D	Channel system, 45 degree down junction (*not pictured*)
CS-CAP	Channel system, Conduit end-caps (*not pictured*)

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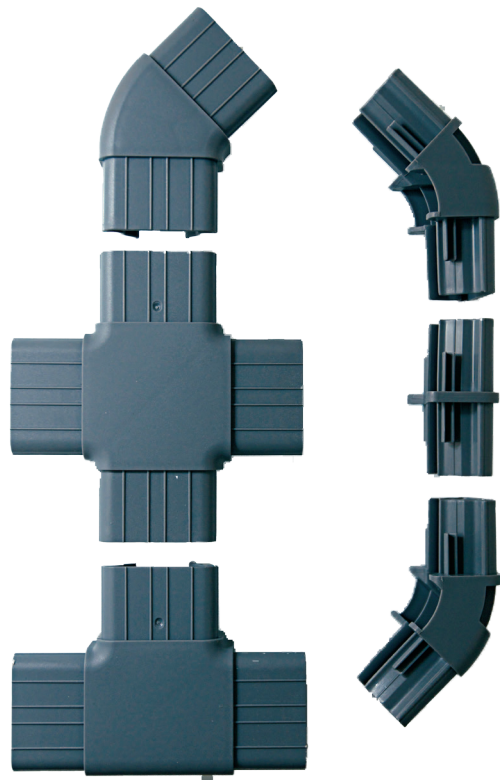
Channel System Specifications

CHANNEL

- Material Aluminum	6063-0
- Finish	Iridite per MIL-C-5541E, Class 3
- Wall Thickness	1.3 mm (0.05") +/-10%
- Length	3.05 m (10 ft)
- Weight	1.7 kg (3.7 lbs) per piece
- Packaging	Bundle of 16
- Shipping Weight	26.7 kg (58.9 lbs) per bundle
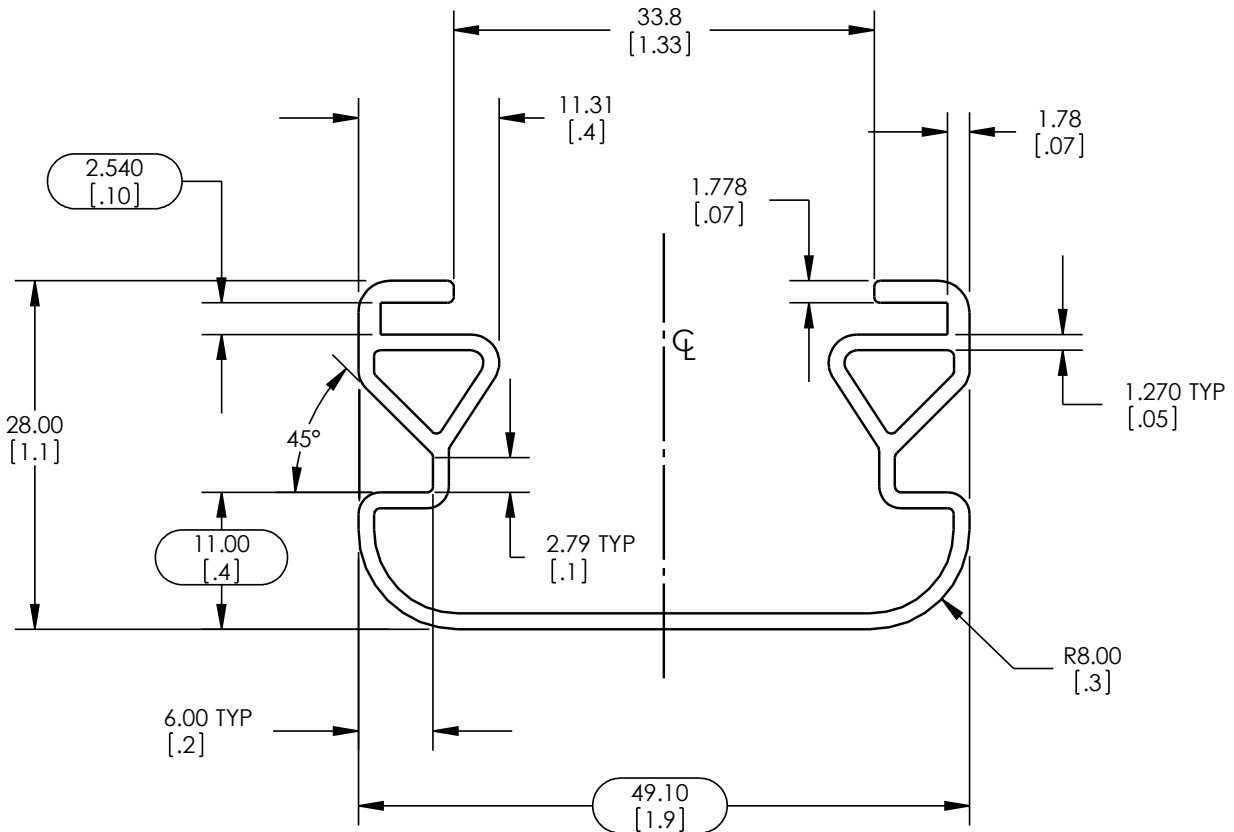
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Floor Cabinet

Each floor or region of a Park Assist installation includes at least one Floor Cabinet. The equipment housed in the cabinet includes a network switch for the camera based smart-sensor network, along with supplies used to distribute power to the smart-sensor units. Power and data for the digital wayfinding signage on each floor are also routed through the Floor Cabinet.
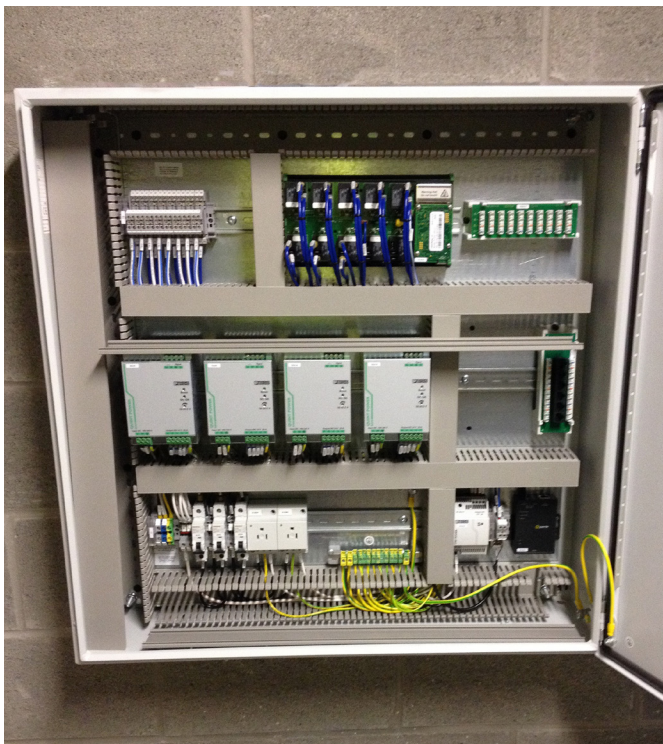
Floor Cabinets are linked via copper twisted-pair or fiber optic cable to the core switch, which manages the entire network.

The managed Ethernet switch can control up to 300 smart-sensors. The terminal block can accommodate up to 31 interior digital signs.

PART NUMBER	DESCRIPTION
CAB-C300-110	Cabinet, Camera system, standard, 110V AC
CAB-C300-230	Cabinet, Camera system, standard, 230V AC

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Floor Cabinet Specifications

COMMUNICATIONS:

- Ethernet	Contains managed Ethernet switch and ethernet punchdown block
- RS485	Contains ethernet-to-serial bridge with internal connection to managed switch, and serial punchdown block

ENVIRONMENT:

- Operating temperature	-25° to 50°C (-13° to 122°F)
- Sealing	IP66 / NEMA 4

ELECTRICAL:

- Power Input	110V AC 60 Hz or 230V AC 50 Hz
- Power Output	Four 24V DC supplies 480W output capacity each
- Product Safety	UL 508A

CONSTRUCTION:

- Body	Powder-coated steel
- Door	Powder-coated steel with PU seal
- Color	Light gray

DIMENSIONS:

- Height	760 mm (29.9")
- Width	760 mm (29.9")
- Depth	210 mm (8.3")

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Loop Controller

Each entry or exit point of a Park Assist Loop System installation includes at least one Loop Controller. The Loop Controller houses up to six loop detectors, each monitoring one lane of traffic. Data for the nearby signs is routed through the Loop Controller, which also supplies power for these signs.

Loop Controllers are linked via RS485 to a Serial Device Server, which can be located within a Garage Controller or directly at the head. Loop Controllers may also daisy-chain to other Loop Controllers via RS485.

PART NUMBER	DESCRIPTION
CAB-L100-1L	Cabinet, Loop system, 1 lane
CAB-L100-2L	Cabinet, Loop system, 2 lanes
CAB-L100-3L	Cabinet, Loop system, 3 lanes
CAB-L100-4L	Cabinet, Loop system, 4 lanes
CAB-L100-5L	Cabinet, Loop system, 5 lanes
CAB-L100-6L	Cabinet, Loop system, 6 lanes

Loop Controller Specifications

CAPABILITIES:

- Support Capabilities (max per cabinet)	Up to 6 Loop Detectors / Up to 10 Digital Signs
- Communications	RS485 serial, half-duplex (2-wire), daisy-chaining

LOOP CHARACTERISTICS:

- Loop Dimensions	1 m x 2 m (3' x 6') – typical 1 m x 3 m (3'x 10') – wide
- Loop Depth	2 cm – 4.5 cm (3/4" – 1 3/4")
- Loop Turns	4 wire turns
- # of Loops	2 loops per lane
- Loop Wire	18 AWG, XLPE jacket
- Loop Lead-In	Twisting 20 twists/m (6 twists/ft) minimum

ENVIRONMENT:

- Operating Temperature	-30° to 70°C (-22° to 158°F)
- Sealing	IP66 / NEMA 4

ELECTRICAL:

- Power Input	110V AC 60 Hz / 2 A (max) or 230V AC 50 Hz / 1.5 A (max)
- Power Output	24V DC 100 W (max)
- Battery Specs	24V DC, 1.3 Ah, Sealed Lead Acid

CONSTRUCTION:

- Body Powder Coated	16 ga powder-coated steel
- Door Powder Coated 1	16 ga powder-coated steel with PU seal
- Color	Light gray (RAL 7035)

DIMENSIONS:

- Height	502 mm (19 3/4")
- Width	502 mm (19 3/4")
- Depth	210 mm (8 1/4")
- Weight	50 kg (110 lb)

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Garage Controller

The Garage Controller serves as a remote head-end for the serial communications required for a Park Assist Level Counting System. It provides a minimum of four separate RS485 serial channels and can communicate with the central Park Assist control platform over fiber, Ethernet, VDSL or 4G LTE infrastructure.

The Garage Controller can provide 4, 8 or 12 channels of RS485 serial communication to handle parking facilities of almost any size. Each RS485 serial channel supports up to 32 daisy-chained devices at a distance up to 1,200 m (4,000') of wire.

PART NUMBER	DESCRIPTION
CAB-GC100	Cabinet, Garage controller

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Garage Controller Specifications

CAPABILITIES:

- Support Capabilities (max per cabinet)	Up to 384 Loop Detectors, Level Count Cameras or Digital Signs

COMMUNICATIONS:

- Local	RS485 serial, half-duplex (2-wire), daisy-chaining – 1,200m (4,000') max
- Ethernet Uplink (default)	10/100BASET Ethernet over Cat 6 – 100m/328'
- Fiber Uplink	100BASE-FX 1300 nm multimode (ST) – 2 km (1.2 mi) – default
	100BASE-FX 1300 nm multimode (SC) – 2 km (1.2 mi)
	100BASE-FX 1310 nm single mode (SC) – 20 km (12.4 mi)
	VDSL Uplink 1 Mbps over 24 AWG wire – 1.9km (1.18mi) up to 50 Mbps over 24 AWG wire – 300m (984')
- 4G LTE Uplink	Transfer Rate (max): 50 Mbps Up, 100 Mbps Down Support for most global markets

ELECTRICAL:

- Power Input	110V AC 60 Hz or 230V AC 50 Hz
- Power Output	24V DC 100 W (max)
- Battery	24V DC, 1.3 Ah, Sealed Lead Acid
- Battery Life	30 minutes at full load
- Product Safety	UL 508A (pending)

CONSTRUCTION:

- Body	Powder-coated 16 ga steel
- Door	Powder-coated 16 ga steel with PU seal
- Color	Light gray (RAL 7035)

DIMENSIONS:

- Height	502 mm (19 3/4")
- Width	502 mm (19 3/4")
- Depth	210 mm (8 1/4")
- Weight	50 kg (110 lbs)

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Uninterruptible Power Supply

The Uninterruptible Power Supply protects the Park Assist Core Server from electric power fluctuations, including surges, spikes, lightning, and other disturbances. If power is interrupted the UPS supplies power to the Core Server from its internal battery, providing the server time to shut down gracefully. Internal systems manage the battery, maximizing battery life by regulating recharging operations.

Specifications

ELECTRICAL:

- Nominal input voltage	120V AC (-110) 240V AC (-230)
- Input frequency range	57-63 Hz (-110) 47-53 Hz (-230)
- Input voltage range	84 - 144V (-110) 160-286V (-230)
- Output type	Sine wave
- Output capacity	640W / 1000VA
- Output connections	4x NEMA 5-15R (-110) 4x IEC 320 C13 (-230)
- Filtering	Full-time multi-pole 0.3% IEEE surge let-though zero clamping response time Meets UL 1449

REGULATORY

- Approvals (-110)	UL 1778, FCC Part 15 Class A
- Approvals (-230)	CE, C-tick, EN 50091-1, EN 50091-2

PHYSICAL:

- Mounting	1U height rack mount

PART NUMBER	DESCRIPTION
IT-UPS-1000-110	IT head end, UPS, 1000VA, 1RU, 110V AC
IT-UPS-1000-230	IT head end, UPS, 1000VA, 1RU, 230V AC

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Core Server

The Park Assist Core Server is the central manager of the entire camera based smart-sensor system. It consists of an industry-standard rackmount server running multiple virtual machines, each tasked with a different aspect of system operation. At the heart of the Core Server is our Park Server software, occupying one of the virual machines. In total, the responsibilities of the Core Server include:

PART NUMBER	DESCRIPTION
IT-CSERV-300	IT head end, Core server, standard, 1RU

· Receiving and processing transactional data from smart-sensors

· Updating information displayed on signage: interior and exterior

· Processing images from smart-sensors with License Plate Recognition (LPR) software

· Network management (e.g. IP addressing, time synchronization)

· Supporting advanced optional software features

Specifications

· Communication with other onsite systems being used (e.g. kiosks for *Park Finder*, PARCS or other systems)

HARDWARE:

· Time-limited local storage of all data

- CPU	Quad-core processor
- DRAM	32 GB
- Storage	1 TB or greater; sized to fit installation
- Network	Gigabit Ethernet
- Mounting	1U height rack mount

· Transmitting data (excluding images) to *Park Insights*: a cloud-hosted portal to access the parking data gathered by the system

SOFTWARE:

· Presenting a web-accessible interface for commissioning, configuration and ongoing administration of the camera based smart-sensors

- Operating Systems	Windows Server 2008 Ubuntu Linux
- Database	SQL Server Express
- Virtualization	VMware®

Core Switch

Specifications

NETWORK

Switch type	Managed layer 3
Switching fabric	160 Gbps
Ports	24x 10/100/1000
Standards	IEEE 802.1s, w, x, x-Rev
	IEEE 802.3ad, ae, af, at
	IEEE 802.3x full duplex
	IEEE 802.1D Spanning Tree
	IEEE 802.1p CoS Prioritization
	IEEE 802.1Q VLAN
	IEEE 802.3 10BASE-T
	IEEE 802.3u 100BASE-TX
	IEEE 802.3ab 1000BASE-T
	IEEE 802.3z 1000BASE-X

ELECTRICAL

- Input Voltage	100-240V AC, 50-60 Hz

REGULATORY

Product Safety	UL 60950-1, CAN/CSA-C22.2 No. 60950-1, EN 60950-1, IEC 60950-1
EMI	FCC Part 15 Class A, EN 55022 Class A, CISPR 22 Class A

DIMENSIONS:

- Mounting	1U height rack mount

At the center of the Park Assist network is the Core Switch. Data from all types of sensors is concentrated at the Core Switch, which features ample ports and room for expansion via modules. Energy use is minimized by applying reduced power modes to ports not in use. All switch configuration is controlled by Park Assist to manage traffic, ports, and security protocols.

PART NUMBER	DESCRIPTION
IT-CSWITCH-300	IT head end, Core Switch, 24 port

Surveillance Server

Surveillance Servers from Park Assist store and analyze video streamed from camera based smart-sensors, while also presenting a client interface for control and search. They are the primary hardware component of the *Park Surveillance* software extension. Provided in partnership with TKH Security, a global leader in surveillance technology, Surveillance Servers run the VDG Sense video management system software. Sense provides the following functionality:

· Capture and store video from smart-sensors

· Process video for motion and other events

· Serve video to Sense client software for display, search, analysis and other functions

· Centralized security and user management

When selecting the *Park Surveillance* extension, Surveillance Servers are automatically included in the system.

PART NUMBER	DESCRIPTION
IT-SSERV-1U	IT head end, Surveillance server, 1RU, 2xNIC, 4bay

Specifications

HARDWARE:

- CPU	Quad-core processor
- DRAM	4 GB
- Storage	1x SSD Up to 4x HDD, configured to suit project needs
- Network	Dual Gigabit Ethernet
- Mounting	1U height rack mount

SOFTWARE:

- Operating System	Windows 7
- Server Software	VDG Sense

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Indoor Kiosk

Park Assist Indoor Kiosks present a touchscreen interface for the *Park Finder* software extension, enabling parking visitors to locate their vehicle. Each unit is self-contained, featuring a client PC and a large display with touchscreen for easy public access.

Kiosk housing is made of powder-coated steel, and designed for mounting to the floor. Indoor units are intended for installation in conditioned environments such as mall corridors, lobbies, and airport terminals. Custom paint and decoration options are available to suit specific branding needs for individual clients.

Park Assist's core server software drives the search interface on the kiosk display. Visitors are invited to enter their license plate number, select their car from the search results, and view a map of the garage showing their vehicle's location.

PART NUMBER	DESCRIPTION
KS-N200-110	Kiosk, indoor, 110V AC
KS-N200-230	Kiosk, indoor, 230V AC

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Indoor Kiosk Specifications

- Client PC	Integrated
- Display	27" diagonal portrait orientation
- Touch Screen	Multi-touch
- Operating System	Windows 7
- Network	Wired Ethernet and 802.11 WiFi
- Power	110V AC 60 Hz (-110)
	230V AC 50 Hz (-230)

|	
- Height	1699 mm (66.9")
- Width (housing)	485 mm (19.1")
- Width (base plate)	533 mm (21.0")
- Depth (housing)	147 mm (5.8")
- Depth (base plate)	500 mm (19.7")
- Weight	95.3 kg (210 lbs)

- Operating Temperature	0° to 40°C (32° to 104°F)
- Housing	Powder-coated steel
- Mounting	Attached to floor
- Product Safety	UL Listed

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Outdoor Kiosk

Park Assist Outdoor Kiosks present a touchscreen interface for the *Park Finder* software extension, enabling parking visitors to locate their vehicle. Each unit is self-contained, featuring a client PC and a large display with touchscreen for easy public access.
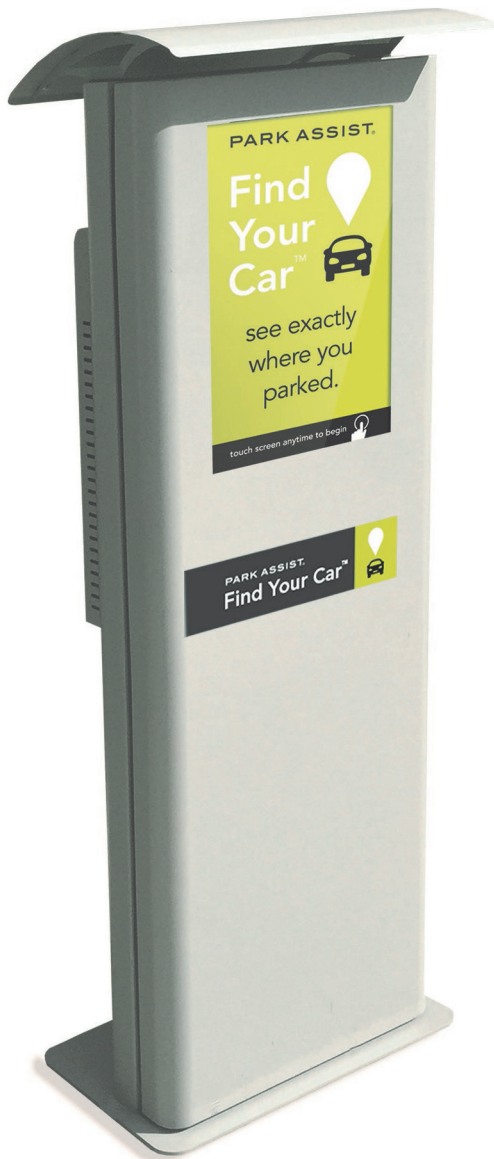
Kiosk housing is made of powder-coated steel, and designed for mounting to the floor. Outdoor units are intended for installation in sheltered locations exposed to the ambient environment. For the most extreme environments, optional internal heating or cooling can be added. Custom paint and decoration options are available to suit clients' branding needs.

Park Assist's core server software drives the search interface on the kiosk display. Visitors are invited to enter their license plate number, select their car from the search results, and view a map of the garage showing their vehicle's location.

PART NUMBER	DESCRIPTION
KS-T200-110	Kiosk, outdoor, 110V AC
KS-T200-230	Kiosk, outdoor, 110V AC

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Outdoor Kiosk Specifications

- Client PC	Integrated
- Display	27" diagonal portrait orientation
- Touch Screen	Multi-touch
- Operating System	Windows 7
- Network	Wired Ethernet and 802.11 WiFi
- Power	110 V AC 60 Hz (-110)
	230 V AC 50 Hz (-230)

- Height	1628 mm (64.1")
- Width	592 mm (23.3")
- Depth	267 mm (10.5")
- Weight	106.6 kg (235 lbs)

- Operating Temperature	0° to 40°C (32° to 104°F)
	Expandable with optional heating or cooling
- Housing	Powder-coated steel
- Mounting	Attached to floor
- Product Safety	UL Listed

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License Plate Recognition (LPR) Camera

For areas where mounting overhead camera-based smart-sensors is not feasible, a Park Assist installation employs standalone License Plate Recognition (LPR) Cameras. These cameras capture license plate images for vehicles entering and leaving parking areas such as rooftops and surface lots. With this information, LPR-related functions of the Park Assist smart-sensor system can be extended to otherwise uncovered areas.

Each LPR camera includes infrared illumination for operation in poor lighting. Because they are often mounted outdoors, camera housings are sealed against dirt and moisture ingress. Multiple mounting options are available.

Each LPR Camera connects to the Park Assist network using standard Ethernet cabling. Software for image processing is included with each camera, and runs on embedded processing units.

PART NUMBER	DESCRIPTION
LC-300	LPR camera, single lane width, includes mounting hardware

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LPR Camera Specifications

OPTICAL:

- Lens Type	5.2 – 58.8 mm
- Iris	Automatic motorized, programmable
- Focus	Automatic motorized, programmable
- Zoom	Automatic motorized, programmable
- Operating Distance	3 – 20 m (9.8 – 66')

ILLUMINATION:

- Type	High power IR LED
- IR Wavelength	850 nm
- Intensity	Adjustable

ENVIRONMENT:

- Operating Temperature	-35° to 55°C (-31° to 131°F)
- Humidity	0% to 100% condensing
- Sealing	IP67

ELECTRICAL:

- Voltage	24-28V AC
- Power Draw	14 W typical
- Data Interface	RJ45 Ethernet
- Processing platform	Integrated
- Product Safety	CE Mark

DIMENSIONS:

- Height	270 mm (10.6")
- Width	188 mm (7.4")
- Depth	440 mm (17.3")
- Weight	5 kg (11 lbs)

CE

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Wireless Sensor Network

Wireless sensors complement Park Assist guidance systems by extending space-level vehicle detection to uncovered areas such as roof areas and surface lots. Sensors transmit parking space status wirelessly through relay nodes to central data collector points, utilizing a self-repairing mesh radio network. All data flows into the central Park Assist core server for seamless management of the entire site.

A combination of magnetic and infrared technologies are used to detect vehicles, ensuring reliable sensing in a wide variety of situations. Sensors feature IP67 sealing to survive harsh environmental conditions. Multiple sensor models allow the system to adapt to a variety of requirements, including flush mount and surface mount sensors.

Standard sensor

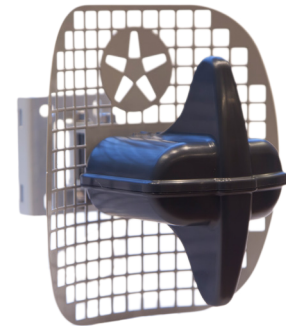Surface mount sensor

Flush mount sensor

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Wireless Sensor Network

Ethernet data collector

WAN data collector

Relay node

PART NUMBER	DESCRIPTION	PART NUMBER	DESCRIPTION
WS-S100-ST-US-BLK	Wireless sensor system, standard sensor, US, black, per space complete	WS-S100-SM-EU-BLK	Wireless sensor system, surface mount sensor, EU, black, per space complete
WS-S100-ST-US-YEL	Wireless sensor system, standard sensor, US, yellow, per space complete	WS-S100-SM-EU-YEL	Wireless sensor system, surface mount sensor, EU, yellow, per space complete
WS-S100-FM-US	Wireless sensor system, flush mount, US, per space complete	WS-S100-ST-AU-BLK	Wireless sensor system, standard sensor, AU, black, per space complete
WS-S100-SM-US-BLK	Wireless sensor system, surface mount sensor, US, black, per space complete	WS-S100-ST-AU-YEL	Wireless sensor system, standard sensor, AU, yellow, per space complete
WS-S100-SM-US-YEL	Wireless sensor system, surface mount sensor, US, yellow, per space complete	WS-S100-FM-AU	Wireless sensor system, flush mount, EU, per space complete
WS-S100-ST-EU-BLK	Wireless sensor system, standard sensor, EU, black, per space complete	WS-S100-SM-AU-BLK	Wireless sensor system, surface mount sensor, EU, black, per space complete
WS-S100-ST-EU-YEL	Wireless sensor system, standard sensor, EU, yellow, per space complete	WS-S100-SM-AU-YEL	Wireless sensor system, surface mount sensor, EU, yellow, per space complete
WS-S100-FM-EU	Wireless sensor system, flush mount, EU, per space complete		

Wireless Sensor Network Specifications

FUNCTIONALITY:

- Air interface	Proprietary mesh network
- Frequency band	868 MHz (Europe) 902 - 928 MHz (United States) 915 - 928 MHz (Australia)
- Detection Method	IR and Magnetic (Standard and Surface Mount); Magnetic (Flush Mount)
- Detection Height	0 to 900 mm (0" to 35.4")

ENVIRONMENTAL:

- Operating Temperature	Sensors and Relay Node: -40° to 85°C (-40° to 185°F) WAN Data Collector: -30° to 65°C (-22° to 149°F) Ethernet Data Collector: 0° to 55°C (32° to 131°F)
- Sealing	Sensors: IP67 Relay Node and WAN Data Collector: IP65 Ethernet Data Collector: IP44

MECHANICAL:

- Sensor Installation Method	Into pavement or attached to pavement surface

ELECTRICAL:

- Power source, Sensors and Relay Node	Integrated long-life lithium battery
- Battery Life	5 to 9 years typical
- Power source, data collector	100-240V AC, 50-60 Hz; or 15 V AC
- Product Safety	CE Mark

DIMENSIONS (SENSORS):

- Standard Sensor	78 mm (3.1") diameter, 53 mm (2.1") into pavement
- Flush Mount Sensor	78 mm (3.1") diameter, 72 mm (2.8") into pavement
- Surface Mount Sensor	240 mm (9.5") diameter, 35 mm (1.38") above pavement

CE

Interior Disabled Sign Insert

Interior symbol sign inserts provide an extra layer of guidance to drivers for special parking areas. Visually similar to interior digit sign inserts, symbol inserts use LEDs to create illuminated symbols, arrows, and digits. Symbol inserts may be employed standalone, or ganged with digit inserts within a larger sign enclosure. Power and network connectivity are provided by Park Assist Floor Cabinets.

PART NUMBER	DESCRIPTION
SN-I2A-SS-DS-BL-210	Sign insert, 7 segment, 2 digit with disabled wheelchair symbol, interior, blue, 130 mm char height

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Interior Disabled Sign Insert Specifications

CONTENT DISPLAY:

- Capabilities	Two blue characters, right-justified, leading zero suppression
	Blue arrow and red cross, 8 selectable directions
	Capable of displaying 0-99
	Active area: 130 mm x 435 mm (5.1" x 17.1")
- Brightness	Continuously adjustable via software
- Orientation	Normal or inverted, with software compensation

ENVIRONMENT:

- Operating Temperature	-30° to 50°C (-22° to 122°F)
- Environmental Sealing	IP54

MECHANICAL:

- Mounting Options	2x M8 threaded inserts on top and bottom
	2x L-brackets bolted to back housing (adjustable location)
- Case	Black powder-coated aluminum

ELECTRICAL:

- Voltage	24V DC nominal
- Power Draw	23W maximum
- Communication	RS485 via sealed RJ45 port

DIMENSIONS:

Height	200 mm (7.9")
Width	510 mm (20.0")
Depth	86 mm (3.4")
Weight	3 kg (6.6 lbs)

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Interior 3-Digit Sign Insert

With a Park Assist smart-sensors system, interior digit sign inserts are placed at key driver wayfinding decision points within parking structures. Each insert displays the currently available number of spaces for its indicated area, enabling visitors to quickly make decisions about where to park. Multiple inserts may be grouped into a single enclosure.

Light emitting diodes (LEDs) are the key optical element, forming the basis for all illuminated characters and symbols. Character display color is selectable to meet client preferences. Power and network access are provided by Park Assist Floor Cabinets, which make wayfinding signage an extension of the smart-sensor network.

PART NUMBER	DESCRIPTION
SN-I3-SS-MC-210	Sign insert, 7 segment, 3 digit, multi-color, interior, 130 mm char height

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CONTENT DISPLAY:

- Capabilities	Three characters, right-justified, leading zero suppression
	Capable of displaying 0-999 and 'Full'
	Active area: 130 mm x 313 mm (5.1" x 12.3")
- Digit Color	Green, amber, or red
- Brightness	Continuously adjustable via software
- Orientation	Normal or inverted, with software compensation

ENVIRONMENT:

- Operating Temperature	-30° to 50°C (-22° to 122°F)
- Environmental Sealing	IP54

MECHANICAL:

- Mounting Options	2x M8 threaded inserts on top and bottom
	2x L-brackets bolted to back housing (adjustable location)
- Case	Black powder-coated aluminum

ELECTRICAL:

- Voltage	24V DC nominal
- Power Draw	30W maximum
- Communication	RS485 via sealed RJ45 port

DIMENSIONS:

Height	200 mm (7.9")
Width	410 mm (16.1")
Depth	86 mm (3.4")
Weight	2.4 kg (5.2 lbs)

Interior 3-Digit/Arrow Sign Insert

With a Park Assist smart-sensors system, interior digit sign inserts are placed at key driver wayfinding decision points within parking structures. Each insert displays the currently available number of spaces for its indicated area, enabling visitors to quickly make decisions about where to park. Multiple inserts may be grouped into a single enclosure.

Light emitting diodes (LEDs) are the key optical element, forming the basis for all illuminated characters and symbols. Character display color is selectable to meet client preferences. Power and network access are provided by Park Assist Floor Cabinets, which make wayfinding signage an extension of the smart-sensor network.

PART NUMBER	DESCRIPTION
SN-I3A-SS-MC-210	Sign insert, 7 segment, 3 digit w/ arrow, multicolor, interior, 130 mm char height

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CONTENT DISPLAY:

- Capabilities	Three characters, right-justified, leading zero suppression Green arrow and red cross, 8 selectable directions Capable of displaying 0-999 and 'Full' Active area: 130 mm x 435 mm (5.1" x 17.1")
- Digit Color	Green, amber, or red
- Brightness	Continuously adjustable via software
- Orientation	Normal or inverted, with software compensation

ENVIRONMENT:

- Operating Temperature	-30° to 50°C (-22° to 122°F)
- Environmental Sealing	IP54

MECHANICAL:

- Mounting Options	2x M8 threaded inserts on top and bottom 2x L-brackets bolted to back housing (adjustable location)
- Case	Black powder-coated aluminum

ELECTRICAL:

- Voltage	24V DC nominal
- Power Draw	36W maximum
- Communication	RS485 via sealed RJ45 port

DIMENSIONS:

Height	200 mm (7.9")
Width	510 mm (20.0")
Depth	86 mm (3.4")
Weight	3 kg (6.6 lbs)

Interior 4 Digit Sign Insert

With a Park Assist smart-sensors system, interior digit sign inserts are placed at key driver wayfinding decision points within parking structures. Each insert displays the currently available number of spaces for its indicated area, enabling visitors to quickly make decisions about where to park. Multiple inserts may be grouped into a single enclosure.

Light emitting diodes (LEDs) are the key optical element, forming the basis for all illuminated characters and symbols. Character display color is selectable to meet client preferences. Power and network access are provided by Park Assist Floor Cabinets, which make wayfinding signage an extension of the smart-sensor network.

PART NUMBER	DESCRIPTION
SN-I4-SS-MC-210	Sign insert, 7 segment, 4 digit, multi-color, interior, 130 mm char height

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Interior 4 Digit Sign Insert Specifications

CONTENT DISPLAY:

- Capabilities

Four characters, right-justified, leading zero suppression
Capable of displaying 0-9999, 'FULL', 'OPEn', and 'CLSd'
Active area: 130 mm x 400 mm (5.1" x 15.7")

- Digit Color

Green, amber, or red

- Brightness

Continuously adjustable via software

- Orientation

Normal or inverted, with software compensation

ENVIRONMENT:

- Operating Temperature

-30° to 50°C (-22° to 122°F)

- Environmental Sealing

IP54

MECHANICAL:

- Mounting Options

2x M8 threaded inserts on top and bottom
2x L-brackets bolted to back housing (adjustable location)

- Case

Black powder-coated aluminum

ELECTRICAL:

- Voltage

24V DC nominal

- Power Draw

36W maximum

- Communication

RS485 via sealed RJ45 port

DIMENSIONS:

Height	200 mm (7.9")
Width	510 mm (20.0")
Depth	86 mm (3.4")
Weight	3 kg (6.6 lbs)

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Interior Symbol Sign Inserts

Interior symbol sign inserts provide an extra layer of guidance to drivers for special parking areas. Visually similar to interior digit sign inserts, symbol inserts use LEDs to create illuminated symbols, arrows, and digits. Symbol inserts may be employed standalone, or ganged with digit inserts within a larger sign enclosure. Power and network connectivity are provided by Park Assist Floor Cabinets.

PART NUMBER	DESCRIPTION
SN-IA-DS-MC-210	Sign insert, Disabled wheelchair symbol, interior, blue, 130 mm char height

Interior Disabled Sign Insert Specifications

CONTENT DISPLAY:

- Capabilities	Blue disabled wheelchair symbol
	Blue arrow and red cross, 8 selectable directions
	Active area: 130 x 313 mm (5.1" x 12.3")
- Brightness	Continuously adjustable via software
- Orientation	Normal or inverted, with software compensation

ENVIRONMENT:

- Operating Temperature	-30° to 50°C (-22° to 122°F)
- Environmental Sealing	IP54

MECHANICAL:

- Mounting Options	2x M8 threaded inserts on top and bottom
	2x L-brackets bolted to back housing (adjustable location)
- Case	Black powder-coated aluminum

ELECTRICAL:

- Voltage	24V DC nominal
- Power Draw	15W maximum
- Communication	RS485 via sealed RJ45 port

DIMENSIONS:

Height	200 mm (7.9")
Width	410 mm (16.1")
Depth	86 mm (3.4")
Weight	2.4 kg (5.2 lbs)

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Interior Pram/Stroller Sign Insert

Interior symbol sign inserts provide an extra layer of guidance to drivers for special parking areas. Visually similar to interior digit sign inserts, symbol inserts use LEDs to create illuminated symbols, arrows, and digits. Symbol inserts may be employed standalone, or ganged with digit inserts within a larger sign enclosure. Power and network connectivity are provided by Park Assist Floor Cabinets.

PART NUMBER	DESCRIPTION
SN-IA-PR-WH-210	Sign insert, Pram/Stroller symbol, interior, white, 130 mm char height

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Interior Pram/Stroller Sign Insert Specifications

CONTENT DISPLAY:

- Capabilities   White pram/stroller symbol
White arrow and red cross, 8 selectable directions
Active area: 130 mm x 313 mm (5.1" x 12.3")

- Brightness   Continuously adjustable via software

- Orientation   Normal or inverted, with software compensation

ENVIRONMENT:

- Operating Temperature -30° to 50°C (-22° to 122°F)

- Environmental Sealing IP54

MECHANICAL:

- Mounting Options 2x M8 threaded inserts on top and bottom
2x L-brackets bolted to back housing (adjustable location)

- Case   Black powder-coated aluminum

ELECTRICAL:

- Voltage   24V DC nominal

- Power Draw   16W maximum

- Communication RS485 via sealed RJ45 port

DIMENSIONS:

Height	200 mm (7.9")
Width	410 mm (16.1")
Depth	86 mm (3.4")
Weight	2.4 kg (5.2 lbs)

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