







Smart Buildings. Future

Use Cases and Solution

Area Management Employee Services Digital Labeling Inventory Manageme Room Environment a Demand-Oriented Cl

Positioning Technologie

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The world of work is undergoing a fundamental trans-This white paper outlines technological solution approaformation. Hybrid work models, flexible space utilization ches that help optimize office buildings in the context of concepts, and a growing focus on employee well-being digital transformation. It focuses on integrated concepts are reshaping the demands placed on office spaces and for efficient space management, digital employee serwork environments. Companies are being challenged to vices, smart signage solutions, and the precise monitodesign their workplaces more efficiently, with a stronger ring and analysis of indoor climate and energy data. In focus on users and sustainability - while at the same time addition, demand-oriented cleaning is highlighted as a enhancing employee productivity and satisfaction. key element of modern facility management, data-driven, sustainable, and tailored to actual usage patterns.

Holistic, technology-driven solutions are becoming increasingly important. Office buildings are evolving into intelligent, connected environments that seamlessly integrate various digital applications. These systems enable transparent monitoring and analysis of resource usage, and support demand-driven management of space utilization, employee services, indoor climate, and energy consumption.

Through the integration of these technologies, futureready work environments emerge combining efficiency, user-centric design, and sustainability.

Smart Buildings. Future-Proof

Workspaces

The interplay of these components enables targeted, flexible, and resource-efficient workplace design laying the foundation for modern work environments aligned with the needs of both people and organizations. Use Cases and Solutions

The use of smart technologies in office environments optimizes the management of large office spaces and corporate campuses, increases operational efficiency, and enhances employee satisfaction and productivity. Real-time occupancy analysis and precise data collection allow organizations to monitor space utilization and streamline processes effectively.

Application scenarios range from space and resource utilization analysis to asset tracking, a workplace experience app, and digital room signage using E-Ink displays. In addition, businesses benefit from solutions that enable monitoring of indoor climate and energy consumption. These technologies support companies in designing office environments that are efficient, sustainable, and resource-conscious.

In addition to tailored, customer-specific solutions, infsoft also offers ready-to-use standard products equipped with powerful and innovative features. Our smart office solutions include tools for space utilization analytics, digital signage, asset management, and environmental monitoring - as well as our intelligent Workplace Experience App that connects users to their office environment in meaningful ways.

Area Management

Collecting occupancy information contributes to the efficient use and management of available office space.

For managers, the acquisition of space utilization data offers interesting insights and provides the basis for analyses and business decisions. Employees benefit from transparency regarding the occupancy of workstations and meeting rooms.

At a Glance

- Utilization analysis of workstations
- Real-time information on the occupancy of meeting rooms
- Optimization of area utilization

infsoft Occupancy

Extensive and user-friendly office space management can be realized with infsoft Occupancy. The application offers real-time insights into the use of workstations and meeting rooms and provides information on utilization over time. The customizable dashboard displays the data clearly in diagrams or heat maps. infsoft Occupancy also enables the generation of reports and management summaries on relevant key figures and evaluation focuses. The infsoft Analytics software tool also has detailed filter functions, for example, for geographies, time periods, cost centers, and room types.

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infsoft Analytics



Use Cases

The occupancy of workstations and rooms can be determined using different technologies. infsoft AI Occupancy Sensors offer comprehensive, data protection-compliant occupancy measurement based on an optical sensor in combination with a passive infrared (PIR) module. The captured image is analyzed by an AI model, and only information on the number of people and objects is stored. In addition to intelligent person and object recognition, passive occupancy indicators can also be recognized. These include, for example, changes in the arrangement of objects between images. The sensors are battery-powered (approximately 30,000 images per battery charge) and are installed on the ceiling.

Employees can use the Workplace Experience App to easily find and access available workstations in shared desk environments. The app provides real-time availability, making desk management more efficient and user-friendly.

Additionally, infsoft AI Occupancy Sensors enable precise monitoring of the number of people in meeting rooms. If no one is detected within 15 minutes of the scheduled start time, the room booking can be automatically cancelled and the space made available to others. This ensures optimal use of resources, reduces unused reservations, and supports flexible workplace strategies.

Deployed Hardware

infsoft AI Occupancy Sensors are installed on the ceiling using magnetic mounts. With an illumination area of approx. 50 square meters and a ceiling height of 2.40 m, it enables precise detection and counting of people and objects.

The infsoft AI Occupancy Sensor captures an image, which is then sent to the infsoft LocAware platform[®] via an infsoft Locator Node Dongle. There, the image is analyzed and evaluated in compliance with data protection regulations with the help of artificial intelligence. The image is subsequently discarded and cannot be viewed at any time. Only the results of the evaluation (e.g., the number of people) are saved. The data obtained is made available to employees and other user groups in a target groupspecific manner.





infsoft Al Occupancy Sensor, infsoft Locator Node Dongle



More information about occupancy analytics

Employee Services

An app for employees increases employee satisfaction and productivity and supports efficient processes.

Various mobile services for employees can be bundled in such an app. Possible functions include indoor navigation, options for planning meetings and room booking, information on public transportation schedules and lunch menus, the ability to network with colleagues, and much more.

At a Glance

- Mobile app for employees
- Optimized collaborative working
- Digital building map and positioning

infsoft Workplace Experience

A Workplace Experience app has many features that increase employee satisfaction, make it easier to find one's way around a large corporate site, and improve processes at the workplace. In addition, the app can be easily linked to existing systems so that information can be exchanged seamlessly.

Wayfinding

Navigation on the company premises, across indoor and outdoor areas and all floors



infsoft Workplace Experience App

Meetings

Information on meeting room occupancy, reserve rooms, view current and planned availability or absence of colleagues.

Mobility

Travel and mobility information, e.g. public transportation and shuttle schedules, available parking, e-bike rental.

Dining

Locations and menus of canteens and cafeterias, including filter options and real-time information on occupancy.

Issue Reporting

Creation of tickets via ITSM software (e.g. ServiceNow), a geo-reference is established automatically or by scanning a QR code.

Social

Functions to promote internal communication and networking with colleagues (location sharing, skill finder, etc.).



infsoft Workplace Experience App



More information infsoft Workplace Experience

Use Cases

Especially for visitors coming to the site for the first time, an app can contribute to a more pleasant visit. For exam-On large company premises with several buildings, both ple, upon arrival, visitors can be assisted in finding a parvisitors and employees can quickly lose track of where king space and automatically receive a welcome message with relevant information about the upcoming meeting. they are and cannot find the fastest way to their destination straight away. Via a smartphone app, they can The content of such a message can include the exact access a digital map, select a destination (building, meelocation of the reception, contact persons and additioting room, office, cafeteria, restrooms and much more) nal useful information. Navigation across indoor and outand be guided there via turn-by-turn navigation. Navigadoor areas guarantees punctual arrival at the place of the tion works seamlessly across outdoor and indoor areas. meeting.

Besides the navigation solution, employees benefit from additional features within the app. These include the ability to schedule meetings with colleagues, book meeting rooms, a colleague finder function, current cafeteria menus, and much more.



Smart Working and Digital Services via the Workplace Experience App

Deployed Hardware

For positioning purposes, infsoft Locator Beacons are installed at regular intervals throughout the facility. These beacons provide the foundation for accurate indoor positioning and enable seamless operation of location-based services.

An added benefit: the existing infrastructure can easily be scaled or repurposed for future use cases. The Locator Beacons also support additional applications such as asset tracking, allowing for flexible expansion of the solution as needs evolve.



infsoft Locator Beacon

Digital Labeling

The use of E-Ink Display Beacons allows the digital labeling of meeting rooms and lockers.

The displays, which are installed outside meeting rooms, show the current occupancy and available time slots. By scanning a QR code on the display, a room can also be booked conveniently via smartphone. On lockers, in addition to the employee's name and department, other relevant information such as current presence status (on-site, working from home, on a business trip) can be displayed.

At a Glance

- Digital labeling of rooms, lockers and more
- Automatic updating of the displays

infsoft Room Signage

Systems for electronic room signage simplify workflows and create transparency, as employees can access realtime information on current and future meetings at any time. The result is a reduction in overall operating costs and the ability to automate processes. The system offered by infsoft is based on battery-powered infsoft E-Ink Display Beacons.

The infsoft E-Inks software tool enables the management of all installed displays. Here, additional information can be viewed and stored, the battery status can be checked, updates can be installed or the content of the display can be modified. infsoft Automation also offers the option of setting up triggers for automatic labeling of the E-Inks.



infsoft E-Ink Displays

More information
infsoft Room Signage

Use Cases

Dynamic workspaces require intelligent solutions that enhance transparency and productivity while reducing operational costs. One such solution is the digital signage of meeting rooms using energy-efficient E-Ink displays. These user-friendly displays automatically update based on calendar bookings or real-time room occupancy.

Data transmission is handled efficiently via Bluetooth Low Energy (BLE), enabling wireless, low-maintenance operation. Beyond meeting rooms, E-Ink displays can also be used for digital labeling of employee lockers.

Additionally, digital information screens and interactive floor plans can be installed on each floor, providing realtime insights such as the current occupancy status of offices and meeting rooms -offering greater orientation and efficiency in the workplace.

Deployed Hardware

E-Ink displays are available in a wide range of sizes- from compact 1.54 inches to larger 11.6 inch formats and support three-color rendering. An integrated LED indicator provides additional visual feedback. Thanks to electrophoretic technology, the displays offer wide viewing angles, ensuring excellent readability even from oblique perspectives. They are extremely energy-efficient, consuming power only when content is updated. The integrated Bluetooth Low Energy (BLE) technology allows for flexible, wireless data transmission. Mounting and housing options enable easy adaptation to individual project requirements. infsoft E-Ink Display Beacons are configured via the infsoft Locator Node Dongle.

Ideal for room signage, shelf labeling, and asset tracking,



Digital Labeling of Lockers

the devices can be remotely updated via the infsoft LocAware platform[®]. Their maintenance-free design and long battery life ensure reliable long-term use.



infsoft Locator Node Dongle, infsoft E-Ink Display Beacon

Inventory Management

The use of a tracking solution enables an automated, digital inventory of all assets and their effective management. In addition to information on the location and movement profile of the assets, other relevant information such as device number, acquisition date, purchase price and manufacturer can be displayed. It is also possible to set up automatic notifications.

Within the user interface, assets can be categorized, sorted and filtered to provide a better overview.

At a Glance

- Real-time localization
- Automatic inventory
- Booking/reservation of equipment

infsoft Inventory

infsoft Inventory and the software solution infsoft Assets enable efficient management of fixed and mobile assets with the option for real-time location tracking. Users can synchronize assets with third-party systems, add custom properties, and organize them into groups. Targeted notifications can be triggered for upcoming maintenance tasks or when assets enter or leave predefined zones allowing for quick responses and minimizing downtime. This application goes beyond traditional asset tracking by enabling proactive asset management. When combined with other infsoft tools such as the infsoft Automation Engine, automated workflows can be initiated seamlessly. The intuitive dashboard of infsoft Assets allows detailed monitoring of asset positions and movements over time. Supplementary information such as department,



acquisition date, or device status can be assigned to individual assets and accessed at any time. With search, sort, and filter functions, users maintain full control even over large asset inventories. This enables efficient management, rapid localization, and demand-driven utilization of company assets. Real-time notifications alert users to important changes or anomalies, enhancing operational transparency. Customizable reports provide valuable insights for strategic planning and resource optimization.







Inventory and Localization with Paper Tags

Use Cases

The application consists of several components. Real-time tracking creates an overview of the utilization of individual assets and enables an automatic inventory of all assets. Optionally, theft prevention or protection against loss by using geofencing can be set up. If the object leaves a predefined area, a notification can be sent automatically.

Deployed Hardware

infsoft Paper Tags transmit BLE signals at predefined intervals, for example once per day. These signals are received by infsoft Locator Node Dongles installed within the infrastructure such as plugged into access points and forwarded to the infsoft LocAware platform[®]. There, asset positioning and inventory management are carried out.

Unlike traditional inventories, infsoft Paper Tags enable continuous tracking and counting of assets. In addition to inventory management, the solution also supports automated notification triggers.



infsoft Locator Node Dongle, infsoft Paper Tag

Room & Energy Monitoring

Environmental sensors continuously capture data, such as room temperature, humidity, CO2 levels and brightness in the room. If one of the values deviates from the norm, a notification can be sent to the responsible personnel. Moreover, some parameters, such as the temperature, can also be controlled remotely via an app. Monitoring the room climate leads to optimal working conditions, protects the health of employees and also facilitates energy cost savings. Another solution that leads to energy savings is energy monitoring using smart Bluetooth Low Energy sockets.

At a Glance

- Monitoring of the room climate using sensors
- Recording of energy consumption
- Location-based room management

infsoft Room Environment

By monitoring the indoor climate and measuring relevant parameters (e.g. temperature, relative humidity, carbon dioxide levels, lighting intensity), it is possible to create an optimal working environment. This protects the health of employees and helps to improve productivity. If critical threshold values are exceeded or undershot, the responsible personnel can be informed and countermeasures initiated.

At the same time, the solution realizes effective energy management. By using an intelligent Bluetooth Low Energy socket, the power consumption of individual devices is reliably measured and wirelessly forwarded to the infsoft software tools. In infsoft Sensors, the energy usage data can be reviewed and energy-saving plans can be set up. By integrating infsoft Room Environment into a Workplace Experience app, information about environmental



infsoft Sensors

conditions can be viewed and optionally modified directly within the app.



Use Cases

By installing condition-sensing sensors in office spaces, the climate and lighting can be optimized. Light sensors, for example, detect when it is too bright in the room and the blinds can be lowered automatically. Heating and air conditioning can also be controlled automatically with the help of temperature sensors. Infrared and presence sensors detect when the office is empty. In this case, the



Energy Monitoring and Control via BLE Socket

lights can be switched off and the heating turned down. In addition to optimal working conditions for employees, energy and associated cost savings can be realized.

Another possible application scenario of condition monitoring is the control of temperature and humidity in archive rooms. The purpose is to ensure that important documents are not damaged, for example by excessive humidity. As soon as a value exceeds a critical limit, a warning can be sent automatically to the person responsible. Smart plugs record power consumption and transmit the data wirelessly to infsoft software tools. This enables users to monitor energy usage and disconnect devices from the power supply at defined times helping to reduce energy consumption and costs.

Deployed Hardware

Sensor Beacons continuously measure environmental conditions. infsoft Locator Beacons Smart Plug collect data on power consumption. The information is then sent to an infsoft Locator Node Dongle and transmitted to the backend.



Locator Node Dongle, Smart Plug, Temperature/Humidity

Demand-Oriented Cleaning

Utilization analysis using modern sensor systems enables demand-driven cleaning of workstations and meeting rooms. Sensors detect in real time whether individual desks or rooms are currently occupied or have been used since the last cleaning. Based on this data, cleaning staff receive precise instructions via a mobile device indicating which areas need to be cleaned and disinfected. This allows cleaning processes to be carried out more efficiently, resources to be used more effectively, and hygiene standards to be reliably maintained.

At a Glance

- Evaluation of the actual area utilization
- Utilization-based planning of cleaning

infsoft Occupancy

Occupancy analysis in office buildings provides the basis for efficient, demand-oriented cleaning and enables optimized resource utilization. With infsoft Occupancy, users gain real-time, detailed insights into actual space usage. This allows cleaning processes to be precisely aligned with real demand, resulting in sustainable reductions in operating costs.



More informationinfsoft Occupancy





Use Cases

Demand-driven cleaning of workstations and meeting rooms can be efficiently implemented using the infsoft Al Occupancy Sensor. This sensor leverages artificial intelligence to detect and accurately analyze workspace and room occupancy in real time. Based on a detailed, occupancy-based usage overview that indicates exactly which desks and rooms were used and when, cleaning staff can precisely identify which areas require cleaning or disinfection. This enables optimized planning of cleaning routes, saves time and resources, and contributes to higher hygiene standards and improved operational efficiency within the office building. The solution is particularly valuable in dynamic work environments with shared desks and flexible room usage.

By avoiding unnecessary cleaning of unused spaces, operational costs are significantly reduced. Data privacy is fully ensured, as the AI evaluates occupancy patterns without recording personal information. Integration with existing facility management systems allows for automated workflows and simplified coordination.

Deployed Hardware

The infsoft Al Occupancy Sensor is capable of performing precise occupancy detection both actively and passively. It uses artificial intelligence to not only capture the real-time occupancy of workstations or meeting rooms but also detect changes in the arrangement of objects. By recognizing passive occupancy indicators such as laptops, keyboards, or coffee cups, workspace and room resources can be marked as occupied even when no individuals are physically present. The captured data is transmitted to infsoft software tools via an interface, where it is processed intelligently.

This provides a more accurate and realistic representation of actual space utilization. The sensor contributes to improved space management by identifying underused



Demand-Oriented Cleaning of Workspaces

areas and usage patterns. It enables data-driven decisions for optimizing workplace layouts and occupancy policies.



Locator Node Dongle, Al Occupancy Sensor



Basics

is needed for additional information exchange. Indoor navigation is typically implemented using Bluetooth Low Indoor positioning systems (IPS) enable the localization of Energy (BLE) Beacons. Beacons are placed at regular interpeople and objects within buildings. GPS is not available vals throughout the building, and position determination indoors due to the lack of line-of-sight contact with GPS takes place on a device (e.g., smartphone), requiring an satellites. Additionally, GPS cannot determine the floor on app. Optionally, the position can also be continuously which a device is located. For this reason, alternative locatransmitted to a backend to make the data available for lization methods are used indoors. Indoor positioning is communication and analysis purposes. based on a sender-receiver model, providing two met-Server-Based Approach hods for determining the current position of a person or object. These methods typically rely on technologies such as Wi-Fi, Bluetooth Low Energy (BLE), Ultra-Wideband A server-side procedure is used for the localization of (UWB), or geomagnetic field mapping. The choice of techassets and people. Transmitters are attached to assets or nology depends on factors like accuracy requirements, carried by individuals, and receiver hardware is distribuinfrastructure availability, and cost. ted across the site to capture the signals from the trans-

Client-Based Approach

A client-side procedure is used for navigation purposes and for the localization of people, where a return channel



Client-based and Server-based Indoor Positioning

mitters and transmit the data to the backend. In office environments, common applications include the localization of tools and personnel. To meet customer requirements for the requested accuracy, several positioning technologies are available for server-side localization.



Bluetooth Low Energy (BLE)

Beacons are small wireless radio transmitters that use Bluetooth Low Energy (BLE) to send signals within a range of up to 70 meters. In a server-side approach, these signals are received by infsoft Locator Nodes, which then transmit the data to a central system for processing. This enables precise real-time localization of beacons in indoor environments such as office buildings, making a variety of tracking and monitoring applications possible - from asset tracking and employee location to usagebased space management.

One of the key advantages of BLE beacons is their costefficiency and long battery life. Thanks to their low energy consumption, many models can operate for up to five years or more on a single coin cell battery. Beacons are available from numerous manufacturers and come in a wide range of form factors to suit different use cases: small BLE tags can be attached to assets or tools, while ISO cards and wristbands are ideal for personnel tracking. For more advanced applications, beacons with E-Ink displays allow for dynamic digital labeling for instance, of meeting rooms, lockers, or shared desks.

Moreover, many beacons support the integration of various environmental sensors. These can collect data such as movement (via accelerometers or tilt sensors), temperature, humidity, CO2 levels, and ambient light. This sensor data enables intelligent building applications like automated climate control, air quality monitoring, or the detection of occupancy patterns to optimize workspace utilization. infsoft's system architecture supports beacons from all manufacturers, offering maximum flexibility. In addition, BLE beacons operate on frequencies that typically do not interfere with other wireless networks, ensuring reliable and interference-free communication.

BLE at a Glance

Pro:

- Cost-effective, unobtrusive hardware
- Low energy consumption
- High accuracy compared to Wi-Fi
- In some cases, the customer's existing infrastructure can be utilized (e.g., Cisco DNA Spaces)

Cons:

 Attachment to mobile office assets can be challenging

Wi-Fi

Wi-Fi-based positioning relies on the fingerprinting method, analyzing Wi-Fi signal characteristics at various locations. Two key parameters are used: the Received Signal Strength Indication (RSSI), measuring signal power, and the MAC address, uniquely identifying each device. In a server-based setup, all Wi-Fi-enabled devices whether smartphones, laptops, or Wi-Fi tags are detected by infsoft Locator Nodes. These nodes continuously scan for signals and transmit the data to a central server for localization and analysis.

This method enables indoor applications such as foot traffic measurement, visitor flow analysis, and asset tracking. By detecting the presence and movement of devices, valuable insights into space utilization can be gained, especially in offices, retail environments and event venues. The accuracy, typically between 5 and 15 meters, depends on environmental factors like signal reflections and obstacles such as walls or people. Though less precise than some alternatives, Wi-Fi positioning remains cost-effective, scalable, and well-suited for zone-based tracking using existing infrastructure.

Wi-Fi at a Glance

Pro:

- · Devices only need to have Wi-Fi enabled
- In some cases, the customer's existing infrastructure can be utilized (e.g., Cisco DNA Spaces)

Cons:

- Relatively inaccurate (5-15 meters)
- No consistent latency with mobile devices
- Use of randomized MAC address when a smartphone is not connected to the Wi-Fi network
- High energy consumption with Wi-Fi tags



Client-based Positioning with infsoft Locator Beacons

UWB

Ultra-Wideband (UWB) is a short-range radio technology that is particularly well-suited for industrial environments where high-precision localization is essential. With an accuracy of less than 30 centimeters, UWB significantly outperforms other technologies such as Bluetooth Low Energy (BLE) or Wi-Fi. It also enables precise detection of vertical positioning (height differences), making it ideal for multi-level environments like warehouses or production facilities. Another key advantage is its low latency, UWB systems can deliver up to 100 position updates per second, enabling smooth real-time tracking of fastmoving assets.

Unlike BLE and Wi-Fi, which rely on signal strength (RSSI), UWB uses the time-of-flight (ToF) method. This technique calculates the time it takes for a signal to travel between a UWB tag and multiple receivers, infsoft Locator Nodes, mounted in the environment. The tracked object is equipped with a small UWB tag, which can either be battery-powered or draw power from connected equipment such as forklifts or AGVs. The tag transmits data including its unique ID, time-of-flight, and timestamp to the Locator Node Dongle, which determines the asset's precise position.

For scenarios requiring real-time display of location data on mobile devices, the infsoft UWB tags can transmit positioning information directly via Bluetooth or a USB interface. This enables seamless integration into mobile apps, for example, for tracking tools or personnel on-site. Thanks to the wide frequency spectrum used by UWB (minimum bandwidth of 500 MHz), signal interference is minimal, ensuring stable and reliable localization even in complex environments with high device density or challenging structural conditions.

However, compared to Bluetooth Low Energy, UWB tags are considerably more expensive and have a shorter battery life, which can impact overall deployment costs and maintenance efforts.

UWB at a Glance

Pro:

- High accuracy
- Accurate measurement of height differences
- Low latency
- Nearly interference-free with constant line-of-sight

Cons:

- Cost-intensive
- Shorter battery life compared to BLE Beacons

RFID

RFID stands for "Radio-Frequency Identification" and refers to systems that use radio waves to identify objects or people. In a passive RFID system, a transponder (RFID tag) contains a microchip that stores data typically a serial number which can be transmitted wirelessly to a reader. The reading unit such as an infsoft Locator Node generates an energy field that activates the RFID tag. For data exchange to occur, the distance between the Locator Node and the transponder must not exceed one meter (remote coupling). RFID tags do not require a direct line of sight to the reader and are highly resistant to external influences and virtually maintenance-free.

Common RFID applications in office environments include access control, time tracking, and inventory management of supplies and equipment through spot-based localization. RFID also supports document tracking, booking of shared resources like meeting rooms, and monitoring the availability of office assets such as laptops or monitors.

RFID at a Glance

Pro:

- Low cost per asset
- No battery required

Cons:

- Short range (< 1 m)
- Reader only reports "seen" / "not seen"
- Installation requires extensive planning
- Infrastructure can be cost-intensive

Summary

Client-Based Positioning

Client-Based positioning is typically used for indoor navigation. In most cases, such a solution is implemented using Bluetooth Beacons. One of the main advantages of this technology is the ease of installation, long battery life, and low maintenance requirements for the beacons, which are installed at regular intervals throughout the building. for example, to optimize processes or ensure safety. Depending on the specific use case and accuracy requirements, different positioning technologies can be applied. Bluetooth tags are particularly well-suited due to their long battery life and minimal maintenance needs, provi-

which are installed at regular intervals throughout the building.
Additionally, Bluetooth enables client-side positioning on both Android and iOS devices, offering a significant advantage over Wi-Fi-based approaches.
Bluetooth tags are particularly well-suited due to their long battery life and minimal maintenance needs, providing reliable area- or room-level accuracy which is typically sufficient for office settings. Bluetooth is therefore often the preferred technology. If equipped with the appropriate sensors, the beacons can also monitor environmental conditions such as temperature and humidity.

To use indoor navigation, a smartphone app and enabled Bluetooth are required. Employees and visitors can easily navigate to relevant destinations and view their current position on a digital map. The use of sensor fusion, leveraging the smartphone's built-in sensors, can further enhance positioning accuracy.



Server-Based Positioning

In office environments, server-based positioning is primarily used to track assets such as office chairs, laptops, or monitors. It can also be employed to locate personnel, for example, to optimize processes or ensure safety.



In order to meet our customers' requirements for reliable positioning, we rely on our own hardware. This enables a precise, stable and application-specific positioning solution. This enables us to guarantee quality and optimum system integration. Depending on the application and the requirements on site, two different infsoft Locator Nodes are available that can be used in a tracking project. The infsoft Locator Node Dongle enables the localization

integration.The infsoft Locator Node Dongle enables the localization
of people and assets using BLE. It also acts as a gateway
for infrastructure components such as infsoft Locator
Beacons and infsoft E-Ink display hardware. The connec-
tion to the network is made via Wi-Fi. The infsoft Locator
Node Dongle can be operated with any USB power sup-
ply, for example via access points or monitors. This ensu-
res simple and uncomplicated installation and expansion/
upgrading as required.

The infsoft receiver hardware for office applications includes both the infsoft Locator Nodes and the infsoft Locator Beacons. Both hardware components are optimally designed for use in modern office and work environments and contribute significantly to efficient and accurate positioning.

infsoft Locator Nodes

infsoft Locator Nodes are hardware components that can receive Wi-Fi and Bluetooth Low Energy (BLE) signals from mobile transmitters. This enables the location of Wi-Fi tags and beacons that are attached to objects or carried by people, as well as the positioning of Bluetooth- or Wi-Fi-capable mobile devices. The gateway function allows communication between different device types and the cloud and enables, among other things, a bidirectional exchange of information between infsoft Locator Nodes and Bluetooth transmitters such as the infsoft E-Ink Display Beacons.

Third-party systems such as Cisco (CMX, DNA Spaces, MSE, Meraki), HP Aruba or Xirrus can be easily connected.

The resulting low installation and maintenance costs when using the infsoft Locator Node Dongle result in significant reductions in overall costs compared to alternative solutions.

The infsoft Locator Node PoE differs from the infsoft Locator Node Dongle only in the type of data communication. While the infsoft Locator Node Dongle is limited to network connection via Wi-Fi, the infsoft Locator Node PoE can be connected via both Wi-Fi and Ethernet (PoE).



infsoft Locator Nodes

Like the Locator Node Dongle, this wired gateway hardware enables the location of Bluetooth Low Energy (BLE) tags for assets and people. Smart devices with activated Bluetooth can also be detected.

infsoft Locator Beacons

infsoft Locator Beacons are permanently installed, battery-powered hardware components that record the signals from mobile beacons used to track objects at regular intervals and send them to the nearest infsoft Locator Node. This technology is particularly suitable for applications in which an area-accurate, slightly time-delayed position determination is sufficient.

A major advantage is that the number of locator nodes required can be reduced, which significantly reduces installation effort and costs. In addition, the maintenance requirements for infsoft Locator Beacons are very low, as the battery life is up to ten years, depending on the scanning interval.

Locator Beacons can also emit signals that are received by smartphones, for example, and are therefore also suitable for applications such as indoor navigation and location-based services.

BLE Tags

Bluetooth Low Energy Tags, also known as BLE Beacons, are compact, battery-powered radio transmitters that emit signals at regular intervals. These beacons come in various sizes and form factors, making them suitable for a broad range of use cases from indoor navigation and asset tracking to presence detection and access management. Their versatility allows them to be attached to equipment, integrated into ID cards, or worn as wristbands.

The underlying technology is constantly evolving, with beacons available in different versions. Bluetooth 5.0 offers greater range and signal stability, making it suitable for precise indoor positioning in environments like offices or hospitals. Bluetooth 5.1 adds Angle of Arrival (AoA) for even higher accuracy with line of sight, ideal for open areas such as warehouses where real-time, centimeter-level tracking is needed.

infsoft E-Ink Display Beacons

infsoft E-Ink Display Beacons convey the look and feel of Existing real-time locating systems (RTLS) can be signifipaper and impress with their excellent readability, wide cantly enhanced through the integration of sensor data, viewing angles, design flexibility, robustness, and long enabling a more comprehensive and intelligent indoor battery life. These beacons combine E-Ink (electronic ink) monitoring solution. By transmitting and recording envitechnology with Bluetooth Low Energy (BLE), enabling not ronmental and motion-related parameters such as CO2 only location tracking but also dynamic content display. levels, temperature, humidity, light intensity, air pres-This makes them ideal for environments where informasure, or acceleration, organizations can achieve a holistic tion needs to be updated frequently and flexibly. sensor data fusion that provides valuable insights beyond simple location tracking.

Content updates can be done quickly and wirelessly, either manually via mobile devices or automatically through geo-based triggers or schedules. This eliminates paper labels, saving time and resources. E-Ink displays remain visible without power and only use energy when content changes, ensuring long battery life.

Beacons with E-Ink displays are ideal for digital labeling of meeting rooms, lockers, shelves, and workstations. They support flexible office concepts by showing booking status or user names and can be integrated into warehouse logistics for clear, real-time information at the point of use.



infsoft Locator Beacons





infsoft E-Ink Display Beacons

Condition Monitoring Systems

Motion sensors integrated into beacons can be used to detect movement and orientation changes, making it possible to analyze workspace utilization in real time. This supports the implementation of flexible workplace concepts, enables dynamic desk booking systems, and helps facility managers make informed decisions about space planning and energy management. By combining localization and sensor data, a new level of operational efficiency and user comfort can be achieved.







infsoft offers customized, comprehensive solutions and
powerful software tools for the successful implementation
of a real-time locating system.The Live Scripting Engine can filter information or visu-
alize data connections in real time and in retrospect. The
tool also displays heat maps and traces routes.

As a central data hub, the LocAware platform[®] is the core of the infsoft software tools. Here, all tools for setup and data management are bundled, linked and accessible with a single login (single sign-on). The platform is available as a cloud solution.

The web-based tools enable the management of a location on all floor levels, the analysis of movement data, the management of hardware such as beacons and locator nodes as well as the definition of geo-based triggers.

Setup & Administration

The Setup Tools contain all the functions required to set up an indoor positioning system - mapping, calibration, data management and path definition. The Administration Tools from infsoft offer useful functions for managing the indoor localization system used (e.g. registration and management of beacons and infsoft Locator Nodes).

Processing & Output

The processing and output tools from infsoft enable the intelligent use and evaluation of the data obtained and support companies in optimizing processes and making better decisions.

infsoft Analytics

The infsoft Analytics tool enables real-time monitoring of movement patterns. It is possible to measure the frequency in certain areas, perform location and time-based analyses and combine the system with infsoft Automation to enrich the data.



infsoft Analytics

infsoft Assets

The position of an asset is visualized in real time with infsoft Assets. It is possible to assign properties to devices (e.g. e-mail address, name, etc.), combine devices into groups and send push messages to selected users. The tool can also be used for asset tracking and linked to other tools, such as infsoft Automation.



infsoft Assets

infsoft Sensors

infsoft Sensors visualizes condition-sensing devices on a digital map, providing real-time monitoring of environmental factors like temperature, humidity, air pressure, CO2 levels, light intensity, and presence detection. Facility managers can quickly identify irregularities and take action, such as adjusting ventilation or lighting. Automated alerts can be set based on sensor thresholds. The platform supports various use cases, including air quality management and storage monitoring, while historical data enables trend analysis and long-term optimization.



infsoft Sensors

infsoft Automation

infsoft Automation enables the definition of various triggers with and without location reference along the process chain in real time. The automated actions to be triggered can include, for example, warnings, notifications (push, e-mail, etc.), and door locking or unlocking. Triggers can be based on location data, sensor values, or specific time events, allowing for flexible and rule-based process control. This enables seamless automation of workflows for example, activating ventilation when CO₂ levels are high or sending alerts when unauthorized access is detected.

	AUTOMATION SETUP	Inform Technicians					×		
	1 Trigger: Run Automatier	by change of element or	/ and by time interv	al .			LAST TIME	count	
	BULIDINS,API > Section > Data	Not available	0						
							LAST TIME	COUNT	
	If any v of the f	ollowing conditions a	are satisfied				Net available		
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infsoft Automation

infsoft Workflow

The infsoft Workflow Tool enables the active planning, control and logging of work-sharing processes within RTLS projects. The tool can be used to record and structure all tasks that need to be performed during the execution of organizational processes. Geoinformation can also be stored at any time.

infsoft Machine Learning

This is a visual tool with which user-defined machine learning models can be created, trained in the shortest possible time and used in a wide variety of applications. The powerful environment processes position and/or sensor data and uses self-optimizing algorithms that are able to learn from experience. By recognizing patterns and regularities in existing data sets, values and results can be predicted.

SDKs, Web Services & Developer

infsoft's technology is also available as a plugin for integration into third-party apps. The plugins include indoor interface. positioning, indoor navigation, 2D/3D building plans and infsoft Developer Hub GEOItems. The determined position is output as virtual GPS coordinates and can be used as such in the app for The infsoft Developer Hub gives developers access to your own purposes. The SDK (Software Development Kit) the full functionality of the infsoft LocAware platform[®]. is currently available for the Android and iOS mobile operating systems and as an HTML5 plugin. In addition to The portal offers API explorer functions, code examples and extensive instructions and documentation to make native implementation, it is also possible to use frameworks such as PhoneGap or Xamarin. it easier for developers to get started with the platform.



infsoft LocAware platform[®]

infsoft's products can also be easily adapted to different system environments. The infsoft Web Services enable fast and efficient data integration via REST/SOAP



About infsoft

infsoft GmbH, based in Großmehring near Ingolstadt, has been offering comprehensive platform solutions for large companies since 2005. The focus is on the location of people and assets, utilization analyses of space and equipment, room sensor evaluations and the provision of workplace experience systems. E-labeling components for mobile assets and situational room labeling complete the portfolio.

smart connected locations: The infsoft LocAware platform[®] forms the basis of the full-service offering as a central cloud IoT hub. Extensive web applications for data management and visualization are available within the platform. infsoft LocAware offers a bi-directional connection to third-party systems via numerous interfaces in order to bundle internal and external data streams.

Long-standing customers include F. Hoffmann-La Roche, Roche Diagnostics, Audi, Frankfurt Airport and the Swiss Federal Railways (SBB). infsoft's quality management is certified according to DIN EN ISO 9001, and our information security management is certified according to ISO/IEC 2700. Our quality management encompasses all measures to improve processes, services and products in order to consistently meet customer and regulatory requirements.

Imprint

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