People Counter
PC

A high-accuracy people counting solution that:
- Performs a bi-directional count at each entrance and exit
- Offers >99% accuracy
- Runs on embedded software
- Is based on 3D MLI Sensor™ technology
- Has the capacity to log count information

Enhanced Safety, Security and Building Automation, and Improved Marketing Intelligence

Being able to accurately track and record the precise number of people present in a building or moving through high-traffic areas at any given time is an invaluable asset, not only for safety and security professionals, but also for marketing intelligence gathering initiatives, building automation and to allow organizations to optimize their staffing and energy levels.

Delivering real-time data, the People Counter offers:
- Occupancy monitoring to:
  - control maximum or minimum occupancy
  - support evacuation measures
  - trigger demand-controlled ventilation (DCV)
- Wrong-way detection and bi-directional counting
- Wait time determination and queue management
- Flow monitoring

Optional computer software has the capacity to provide historical data analysis, data aggregation and time plotting – allowing organizations to perform precise calculations, such as the average time an individual spends inside a particular zone.

How the People Counter Works

3D MLI Sensor™ Technology

IEE has developed a 3D sensor using MLI (Modulated Light Intensity) technology. MLI technology is based on the optical time of flight (TOF) principle, whereby an active, non-scanning light source emits modulated near-infrared light. The phase shift between the light emitted by the source and the light reflected by the people and objects in the field of view is measured to create a real-time topographic image of the monitored area. Through sophisticated embedded algorithms, the overhead-located 3D MLI Sensor™ processes 3D data in order to detect and count the number of people in a specific area and track the direction of their movements.
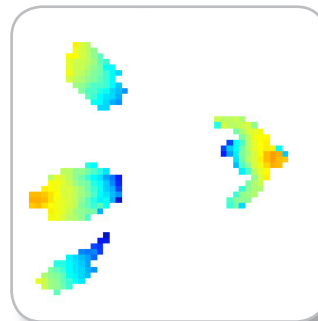
Topographic image

Unparalleled Accuracy >99%

Extensive test scenarios have demonstrated that the People Counter's sophisticated algorithms ensure reliable segmentation, tracking and counting of people. At the same time, they minimize the counting errors that commonly occur with most other people counting systems on the market, and which result in unreliable data.
With an accuracy level of greater than 99%, the People Counter provides more reliable data than the passive infrared imagers, scanners or video-based 2D systems currently on the market.

Easy Installation and Integration

Typically installed above entrance doors or turnstiles, the People Counter's optimized Design Housing allows easy and aesthetic integration into existing architecture. The Design Housing is available for in-, on- and under-ceiling mounting, providing flexibility for all kinds of ceiling structures.

After the installer has configured basic settings, such as detection area and mounting height, the sensor calibrates itself within a few seconds. During this calibration, the sensor surveys the detection area and captures the presence of any fixed objects (for example furniture) and walls.

Reliability in Changing Light Conditions

Since the sensor emits its own illumination, the performance is not influenced by artificial light and the sensor also works in the dark.

Embedded Software

For most of its applications the sensor does not require any additional controllers to process the data it captures. For single-door occupancy monitoring applications, the People Counter can automatically trigger occupancy alarms that may also be used for energy saving or climate control measures. Similarly, for wrong-way detection, the sensor can directly generate an alarm via its integrated buzzer, the data port and/or the web interface.

Self-Diagnostics

A self-diagnostic routine runs at start-up and is regularly repeated to detect any sensor malfunction.

Integrated Audible Alarm

An integrated alarm signal can provide an acoustic confirmation of a people count, and this in both directions. The integrated alarm can also sound when an occupancy threshold for single door areas has been met or if a sensor malfunction has been detected.

Double Doors and Staircases

Double doors, or doors swinging through its field of view, pose no problem for the People Counter. The sensor also functions in staircases.

One Device, Multiple Applications
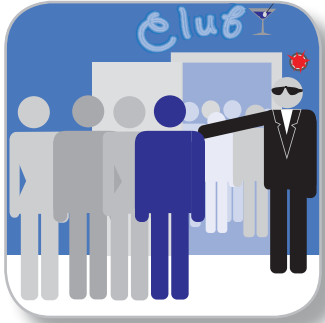
Maximum occupancy monitoring in night clubs

Minimum occupancy monitoring in laboratories

Occupancy Monitoring

Minimum and Maximum Occupancy Monitoring for Enhanced Safety

Night clubs, museums, entertainment venues and other places where people gather are often subject to maximum occupancy regulations. Suspended above each entrance and exit, the People Counter performs a bi-directional count of each person entering and exiting a single room, a particular floor or an entire building, and triggers a warning signal when a pre-defined threshold has been reached or exceeded. An optional occupancy monitoring software allows the data management of up to 30 groups of 30 sensors, for both real-time and post-count analysis.

Similarly, for areas requiring a minimum occupancy, such as laboratories or surveillance and control rooms, the People Counter monitors the occupancy level and issues an alert when needed.

Occupancy monitoring with the People Counter accurately calculates the number of people present in a room, floor or building at any given time. It also provides useful information to safety staff in case of an emergency evacuation.

Demand Controlled Ventilation (DCV)

DCV is a ventilation control strategy that provides the right amount of fresh air needed by the occupants in a specified area, such as seminar rooms, offices and museums. After calculating the number of occupants, the People Counter provides this information to the DCV unit, allowing the ventilation to be instantly adapted based on the fluctuating demand. This helps to optimize the indoor air quality and save energy.
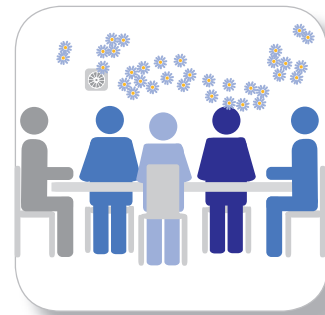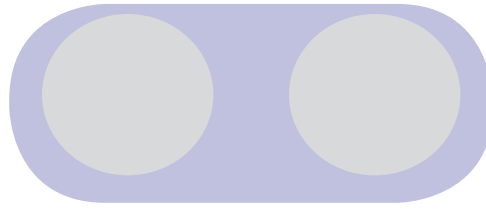

Occupancy monitoring for DCV

Marketing Intelligence Gathering for Retail Environments

A key indicator of a store's performance is its conversion rate or the percentage of visitors that actually make a purchase. Marketing metrics such as CPM (cost per thousand) and SSF (shoppers per square foot) can only be generated if accurate statistics on visitor numbers are available. By tracking visitor traffic and density, the People Counter helps store managers analyze sales data to better plan staffing levels.

Retail occupancy monitoring

Web-based Occupancy Tool

With its embedded software, the People Counter's sensor is particularly suited for occupancy monitoring in a single zone where entry is via one single access point. In these situations, an alarm can be generated based on a set minimum or maximum occupancy value.

For multiple zones or zones with multiple access points and, consequently, multiple sensors, an Occupancy Tool is available. This offers real-time monitoring, extended data analysis, and recording and reporting functionalities, such as:

- Real-time monitoring of multiple zones and/or multiple doors
- The option to set thresholds in each occupancy zone to trigger an alarm, send e-mails and SMSes or switch relays
- Data logging, plus an export function
- Statistics such as average stay, average occupancy, percentage compared with other zones or sensors, and total entries and exits
- Data plotting, including occupancy and entrances or exits, on user-definable graphs
- The ability to define report templates to streamline future analysis or to generate periodic customizable PDF reports sent automatically by e-mail
- Visualization of sensors and zones via counters placed on importable building plans
- A web-based interface and a MySql database

Wrong-Way Detection

The People Counter detects people moving against the flow of traffic in the pre-defined wrong direction and triggers an alert to indicate a possible security risk. This kind of monitoring typically takes place at arrival gates in airports or at turnstiles in subways or train stations.
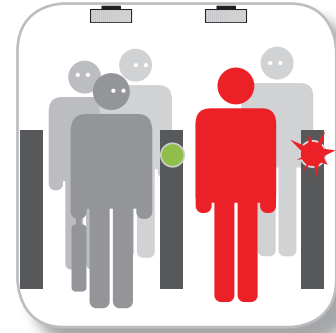
Wrong-way detection

Wait Time Determination and Queue Management

If installed at multiple locations overlooking queues at airport check-ins or security lanes, the People Counter can be used to accurately monitor the length and duration of a queue, thereby providing valuable input for operational staff to manage service levels. Ultimately, it can lead to a reduction in wait time, ensures overall better service to passengers, and prevents handling agents from having to pay quality infringement fees to the airlines.

Queue management

Dwell Measurement and Loitering Detection

The People Counter not only accurately recognizes people standing close together within the detection area as individuals; it can also track them – even if they are standing still. The sensor counts each person and provides a histogram of dwell times, providing crucial statistical information for retailers. This type of application is typically used to measure how much time customers spend in front of sales displays in supermarkets.

Installed above the entrance of a secured area, the People Counter can detect people loitering outside entrances and can trigger a warning signal to security staff in case of suspicious behavior, i.e. when a predetermined loitering time is exceeded.


Loitering detection

Technical Data

Device Properties	PC9696M2	PC6464M2
Mounting height	2.5 to 3 m	3.0 to 5.0 m
Detection area	1.5 m x 0.9 m to 2.5 m x 1.5 m	1.5 m x 0.8 m to 3.2 m x 1.6 m
Field of view/illumination	90° x 60°	60° x 40°
Type of illumination	Modulated near infrared light (NIR)	
Weight	1.3 kg (Core Housing) + 1.6 kg (Design Housing)	
Dimensions of the Core Housing	W 167 mm x H 133 mm x D 94 mm	
Dimensions of the Design Housing	206 mm (integration cutout diameter), 247 mm (outside rim diameter), 115 mm (height)	
Operational temperature range	–20°C to +50°C	
Core housing ingress protection	IP 40	
Supply voltage	24 V DC ± 15%	
Power consumption	max. 2.7 A at 24 V DC	
Housing material	Powder coated aluminum	
Technology	3D MLI Sensor™	
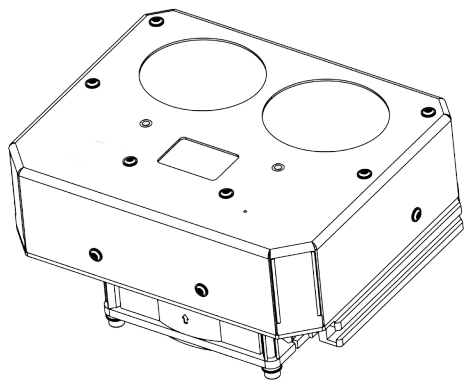
Core Housing
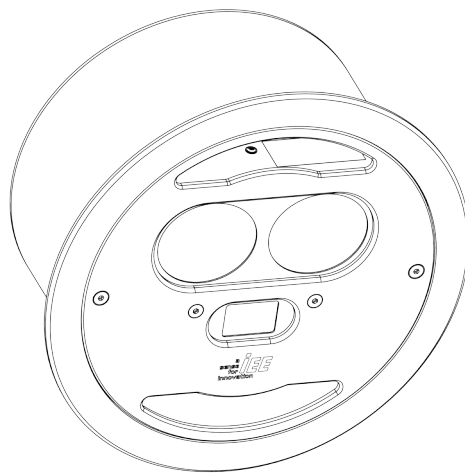
Design Housing

Network Protocols

- IP address fixed or DHCP
- Configuration/application output: web interface HTTP or XML-RPC (optional)
- Time synchronization via SNTP
- Firmware updates via Ethernet

Logging

- Access to current status and counting history
- Configurable counting logging interval, e.g. 10 s -> minimum log history 2 days 9 hrs

Application Outputs

The following application outputs are available via the web interface:
- total forward and backward
- occupancy (number of people in a zone)
- occupancy low/high alarm (when configurable threshold is met)
- current in (number of people present in the detection zone at any given time)
- current in low/high alarm (if configurable threshold is met)
- wrong direction detection

Optional Relay Modules

The People Counter offers two types of relay or interface modules that:
- connect directly to the sensors via the data cable and switch if the following events take place: occupancy thresholds, wrong direction, forward or backward count, "current in" thresholds (people in sensor's field of view)
- connect to the computer running the Occupancy Tool via USB and switch when occupancy thresholds are met

Sensor Management Tool

The computer-based multi-language sensor management tool enables the management of several sensors and offers the following features:
- Fast software updates over the Ethernet network
- Sensor configuration and backup
- Copy a given configuration onto multiple sensors

Languages

Language packs can be uploaded into the sensors, and can be altered at any time in the Sensor Management Tool.

For a detailed overview on accessories such as design housing, ceiling brackets, power supplies and cables, please ask a sales representative for a price list.

Application Areas

- Airports
- Banks
- Entertainment venues
- Laboratories
- Military and police infrastructure

- Movie theaters
- Museums
- Night clubs
- Offices
- Public transportation facilities

- Retail environments, malls and shops
- Seminar rooms
- University campuses

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Contact

Interested in learning more about our people counting and occupancy monitoring solutions?

- Contact your local dealer
- Send an e-mail to infrastructure@iee.lu
- Surf to www.iee.lu/markets:public