

# People Counter

## PC M4.0



A high-accuracy people counting solution that:

- is based on 3D MLI Sensor™ technology
- runs on embedded software
- performs bi-directional counting
- offers an accuracy of > 99%
- has configurable data storage



**New generation**

## Enhanced Building Security and Improved Marketing Intelligence

Being able to accurately track and record the precise number of people present in building or moving through high-traffic areas at any given time is an invaluable asset. An exact count not only allows organizations to optimize their staffing and energy demands, it is also a key component in marketing intelligence gathering initiatives.

IEE's People Counter offers the following functions:

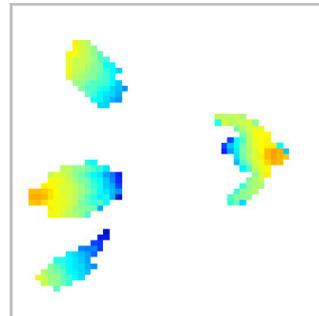
- Occupancy Monitoring in real time to:
  - control minimum and maximum occupancy
  - support evacuation measures
- Detection and analysis of pedestrian flows. With the web-based Occupancy Monitoring software, the count data that has been collected can be displayed in real time (live GUI). The software also has the capacity to provide historical data analysis, data aggregation and time plotting – allowing organizations to calculate such things as the maximum number of people, and the average time an individual spends in a particular area
- Optimization of a building's ventilation and energy efficiency
- Wrong way detection – detecting and counting people moving in the wrong direction



## How IEE's People Counter Works

### 3D MLI Sensor™ Technology

IEE has developed a 3D sensor that uses MLI (Modulated Light Intensity) technology. This technology is based on the optical time of flight (TOF) principle, where 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. 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 IEE's People Counter's sophisticated algorithms ensure reliable segmentation, tracking and counting of people.

With an accuracy of greater than 99% in the field, IEE's People Counter provides more reliable data than the passive infrared sensors, laser scanners or 2D video-based systems currently on the market.

# Advantages

## Easy Installation and Integration

IEE's People Counter's Design Housing provides easy and aesthetic integration into existing building architecture. The Design Housing can be integrated into dropped ceilings ("flush mount"), on the ceiling ("on-ceiling") or, by using an extension, below the ceiling ("under-ceiling") offering increased flexibility for all kinds of ceiling structures. After a basic configuration, such as detection area and mounting height, has been carried out, the sensor calibrates itself within a few seconds.



## 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

Due to its integrated people-counting firmware, the sensor does not require any additional computers or servers to process the data it captures. Its 'chip on board' function means that the sensor is capable of outputting count data or generating alarms.

## Self-Diagnostics

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

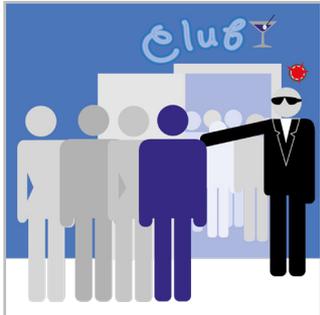
## Integrated Audible Alarm

An integrated alarm signal can provide an acoustic confirmation of a people count. 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.

## Doors and Staircases

Doors swinging through the detection area pose no problem for IEE's People Counter. The sensor also functions in stairwells.

# One Device, Multiple Applications



Maximum Occupancy Monitoring in night clubs

## Occupancy Monitoring

### Minimum and Maximum Occupancy Monitoring for Enhanced Building Safety

Safety-critical building complexes, high security areas or retail stores, where there is usually a high pedestrian volume, are often subject to maximum occupancy regulations. Installed above each access point, IEE's People Counter performs a bi-directional count of all people entering or exiting. By comparing all entries and exits in real time, the occupancy of a room, a particular floor or an entire building can be determined. In the event of a building evacuation, valuable information about the exact number of people in the building at that time can be made available to emergency services.



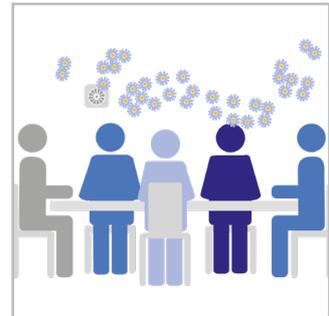
Minimum Occupancy Monitoring in laboratories

A separate Occupancy Monitoring software allows the data management of up to 30 groups of 30 sensors, both for real-time analysis and for statistical analysis.

Similarly, in areas that require a minimum occupancy, such as laboratories or surveillance and control rooms, IEE's People Counter monitors the occupancy level and issues an alert when the occupancy is too low.

### 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. It ensures that areas such as seminar rooms, offices and museums are ventilated in an optimal and energy-efficient manner. After calculating the number of occupants, IEE's 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 for Retail Environments

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



Retail Occupancy Monitoring

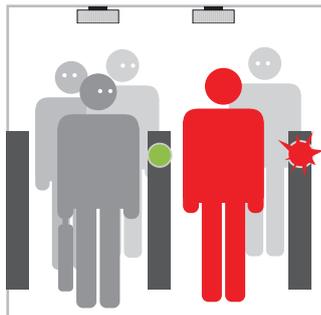
## Web-based Occupancy Monitoring Tool

IEE's People Counter's Occupancy Monitoring Tool 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 or SMSes, or switch relays
- Statistics such as average length of stay, average occupancy and total entries and exits
- Data plotting, including occupancy, entrances and exits, on user-definable graphs
- The ability to define report templates to streamline future analysis or to generate periodic customizable PDF reports that can be sent automatically by e-mail
- A web-based interface and a MySQL database

## Wrong Way Detection

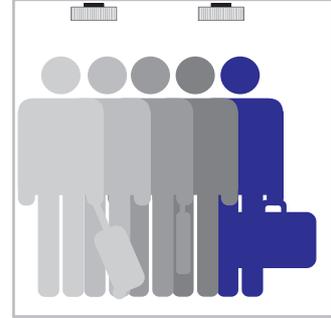
IEE's People Counter detects people moving against the flow of traffic in the pre-defined wrong way and triggers an alarm to indicate a potential security risk. This type of monitoring typically takes place at arrival gates in airport, or at turnstiles in subways or train stations.



*Wrong way detection*

## Wait Time Determination and Queue Management

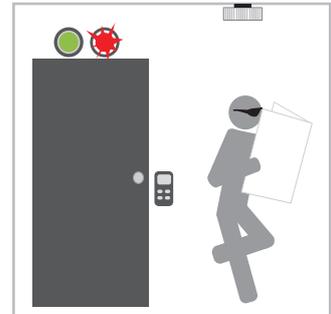
If installed at multiple locations overlooking queues at airport check-in desks or security lanes, IEE's People Counter can be used to accurately monitor the number of people in a queue, as well as the length of time they are required to wait, providing valuable input for operational staff to manage 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

IEE's People Counter not only accurately recognizes people standing close to each other in the detection area as individuals; it can also track them – even if they are barely moving or 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 determine how much time customers spend in front of sales displays in supermarkets.



*Loitering detection*

If installed above the entrance to a secured area, IEE's People Counter can detect people loitering outside entrances and can trigger a warning signal to security staff in the event of suspicious behavior i.e. when a pre-determined loitering time is exceeded.

## Technical Data

Device Properties	PC96M4.0	PC64M4.0
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	0.8 kg (Core Housing) + 0.16 kg (Design Housing)	
Dimensions of the Core Housing	Ø 138 mm x H 60 mm	
Dimensions of the Design Housing	Ø 147 mm (integration cutout diameter), Ø 181 mm (outside rim diameter), 70 mm (height)	
Operational temperature range	-20°C to +50°C	
Core housing ingress protection	IP 30	
Supply voltage	24 V DC ± 15%	
Power consumption	max. 1.0 A at 24 V DC	
Housing material	Polymer	
Technology	3D MLI Sensor™	



## Network Protocols

- IP address, fixed or DHCP
- 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 hours

## Application Outputs

The following data is available via the web interface:

- total forward and backward count
- occupancy (number of people in a zone)
- occupancy low/high alarm (when the configurable threshold is met)
- current in (number of people present in the detection zone at any time)
- current in low/high alarm (if the configurable threshold is met)
- wrong way detection

## Optional Relay Modules

IEE's 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: the occupancy threshold is exceeded, detection of movement in the wrong direction, the threshold is exceeded in either the forward or reverse direction, the current in (number of people currently in the field of view) threshold is exceeded
- connect to the computer running the Occupancy Monitoring Tool via USB and switch when the occupancy thresholds are met

## Sensor Management Tool

The computer-based, multi-lingual sensor management tool enables the management of multiple sensors and offers the following features:

- Sensor configuration and backup
- Fast software updates via the Ethernet network
- Copy a given configuration to multiple sensors

## Languages

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

For a detailed overview of the accessories such as design housing, ceiling brackets, power supplies and cables, please ask an authorized dealer for a price list.

## Potential Application Areas

- Airports
- Banks
- Entertainment venues
- Laboratories
- Military and police infrastructure
- Movie theatres
- Museums
- Night clubs
- Offices
- Public transportation facilities
- Retail environments, malls and shops
- Seminar rooms
- University campuses

# People Counter

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### About us

IEE develops and manufactures cutting-edge sensing systems for building security and management. The innovation driven company is specialized in design and manufacture of people counter, unauthorized access control and volumetric object surveillor devices. IEE's TDflex™, unique, multiple award-winning tailgate detector, provides an additional security layer in modern access control systems in buildings and thus prevents unauthorized access to highly secured areas.

As a worldwide pioneer in passenger presence detection, IEE is one of the leading suppliers of advanced automotive interior sensing solutions. Founded in 1989 and headquartered in Luxembourg, it has operations in Europe, America and Asia. IEE employs 4,100 people worldwide and more than 10% of the company's workforce is engaged in Research & Development.

### Contact

**Want to learn more about our access control solutions?**

- Contact your local dealer
- For purchase information, please email us at [infrastructure@iee.lu](mailto:infrastructure@iee.lu)
- Visit our website [www.iee.lu](http://www.iee.lu)