



**IRMA** – InfraRed Most Accurate

**iris** INFRARED  
INTELLIGENT  
SENSORS

# IRMA MATRIX

With IRMA Matrix the company iris presents a new and revolutionary solution for automatic passenger counting.

To develop the IRMA Matrix sensor the innovative detection principle of the IRMA 3D sensor has been enhanced. The measuring principle is based on a matrix of 500 pixels (sensor array) with which the sensor gauges the distance to the object and detects it three-dimensionally. This is made possible by the so-called time-of-flight (TOF) technique. This technique uses the phase difference between the transmitted and the decoded signals from the sensor; so the distance to the object is calculated from the run-time of the signal. In this way the presence and movement of persons within the visual field can be determined with very high accuracy.

Based on this principle a highly accurate passenger counting with a defined absolute accuracy is possible. The high stop accuracy of IRMA Matrix meets strictest standards for automatic passenger counting. This allows new applications in public transport, e. g. real-time capture of passenger load.

The installation costs are minimised thanks to the high integration of the sensor: IRMA Matrix is characterised by its direct connection to Ethernet or CAN with no further system component. In addition, you need only one IRMA Matrix sensor per standard door.

The 3DIS (3D Image Streaming) technology simplifies the control of the counting accuracy. The sensor images are transmitted in real time and thereby allow a subsequent evaluation without any personnel for manual counting or any other additional effort. The new iCon (iris connector) and a comfortable configuration complete the picture.

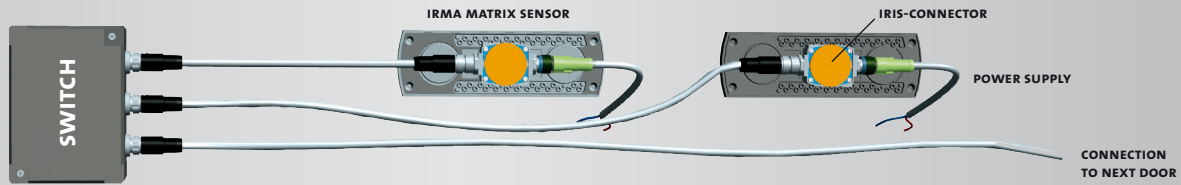
## FEATURES



- IRMA Matrix sensor with 500 pixel sensor matrix with time-of-flight (TOF) technology
- Integrated processor (DSP) for entire signal processing and counting
- Simultaneous detection of direction of motion for boarding and alighting passengers
- Support of system interfaces CAN and Ethernet
- IBIS, RS232, RS485 or J1708 available for connection to existing telematics systems such as AVL on-board

- computers, passenger information systems and ticketing systems
- Easy installation in vehicles without any adjustment work
- No door contact necessary, DPS supports Direct Power Supply from the vehicle's electrical system
- Only one sensor per door needed (in case of standard vehicle doors)

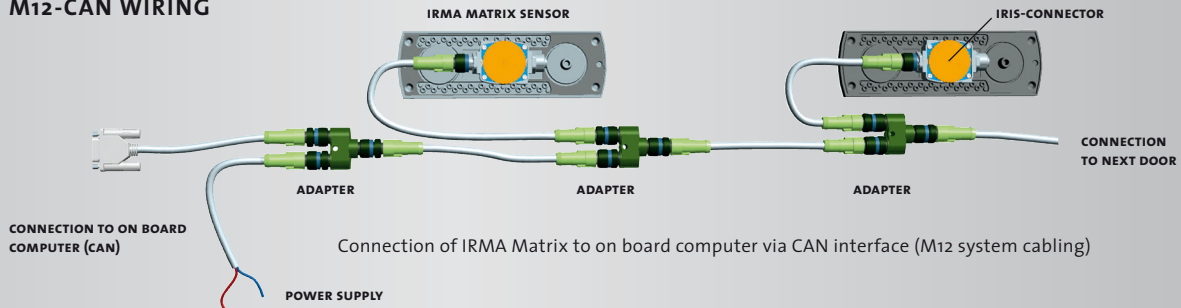
## M12-ETHERNET WIRING



CONNECTION TO ON BOARD SYSTEM

Connection of IRMA Matrix to on board system via the Ethernet interface (M12 system cabling).

## M12-CAN WIRING

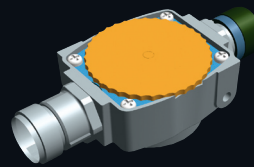


CONNECTION TO ON BOARD COMPUTER (CAN)

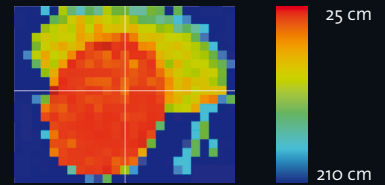
Connection of IRMA Matrix to on board computer via CAN interface (M12 system cabling)



IRMA Matrix on top version



iCon (iris connector)



Typical height profiles of a person (distance is coded in false color rendering)

## APPLICATIONS

- High passenger counting accuracy in vehicles (buses, trams, trolleybuses, trains) for ambitious demands on counting accuracy
- Real-time capture of passenger load
- High stop accuracy as basis for accurate monitoring of transport services (passenger-kilometers) and for precise revenue sharing
- Simple evaluation of counting accuracy (census comparison) through 3DIS technology (3D Image Streaming)

## TECHNICAL DATA

Specifications subject to change. Technically binding is the product data sheet.

### Dimensions

- installation version 188 mm x 58 mm (width x height)
- on top version 165 mm x 53 mm (width x height)

### Weight

- 250 g (without iris connector)

### Housing

- Aluminium housing
- Optical apertures are made of plastic (Makrolon)

### Cooling

- Passive cooling

### Protection class

- IP67 (with fitted iris connector)

### Interfaces

- Ethernet
- CAN

### Connection

- iCon (iris connector)

### Wiring System

- M12

### Vehicle Integration / System Architecture

- CAN / TCP / IP driver for standard operating systems
- Integration via API (Applications Programming Interface; for Windows, Linux and OSX platforms available)

### Power Supply

- From the electrical system of the vehicle

### Voltage

- Normal 24 VDC

### Power consumption

- 6W typical
- 9W maximum

### Installation

- 3 hole drilling template (standard)