



IRMA Matrix

Keep track of passenger counts with maximum accuracy.

Accurate ridership numbers are critical to delivering better service for today and tomorrow. Transit agencies need reliable passenger counting to evaluate demand, revenue, and post-COVID, to determine passenger loads for safe social distancing. To do all this, agencies need advanced, modern ways of counting their passengers up to the minute. IRIS Intelligent Sensing offers IRMA Matrix, a new system of Automatic Passenger Counting (APC).

With infrared and time-of-flight technology, IRMA Matrix sensors can provide APC data with 98% accuracy. Its sensors are independent from environmental influences and can differentiate between an object and a passenger in 3D. IRMA Matrix enables you to automatically count passengers and reliably establish the number of passenger-kilometers travelled.

Overview



Fail-Safe Communication

- Detects passengers with 500-pixel sensor matrix with 3D Time-of-Flight Technology (ToF); simultaneous detection of the direction of motion for boarding and alighting passengers (regardless of door height or crowds)
- Object Analyzer: Detects and evaluates passengers' statures; no door contact necessary - counting begins via telegram from the OBC (Occupancy-Based Control)
- Features High Dynamic Range (HDR) image processing and integrated Digital Signal Processor (DSP) for signal processing and counting
- Infrared light ensures accurate counting even in complete darkness; sensors are immune to temperature variations or humidity inside vehicles



Rear Panel View

- Uses only two (2) screws in vehicles to be installed, without any adjustment work
- Requires just one sensor per door (standard vehicle doors only)
- Installation requires no free blind range below the sensor
- Surface mount version for timesaving retrofitting available



Easy Installation and Maintenance

- Supports CAN and Ethernet interfaces, Power over Ethernet (PoE)
- System interface adapter available for IBIS, J1708 to be used in existing telematics systems
- Wi-Fi enabled (additional hardware required)

Agency Benefits

Accurate Ridership Count

Time-of-flight (ToF) sensors continually emit an invisible infrared light and measure the time it takes for an object to reflect light when it passes their field of vision. This yields real-time 3D images which can be counted reliably and automatically, clearly differentiating between an object and a passenger. Whether it's a teenager on their way to school, a mother carrying her toddler in a stroller, or a passenger in a wheelchair, there is no confusion. Unlike camera-based systems, ToF technology is also unaffected by external lighting conditions or environmental changes, ensuring maximum reliability and accuracy in automatic passenger counting.

Enhanced Strategic Planning

Accurate ridership numbers inform efficient route planning and enable agencies to adjust vehicle capacities to rider demand.

Real-time Occupancy Information

Real-time counts provide passenger load information which can be delivered downstream to passenger information systems. Vehicle occupancy information helps riders decide whether to board or wait for a less-crowded vehicle.

Low-Maintenance Hardware

IRMA Matrix works well in small, confined, and moving spaces. No additional adjustments/calibration after the sensors are installed and commissioned. Only regular cleaning is needed to remove dirt and debris. Option to install troubleshooting and audit tools.

Passenger Benefits

Increased Safety and Passenger Comfort

- Real-time occupancy counts help avoid overcrowding in vehicles
- Enables the implementation of health and safety protocols

Better Routes

- Easily aggregated passenger numbers assist planners and schedulers in evaluating rider demand and vehicle frequency

Improved Rider Experience

- Accurately keeping track of passenger demand helps agencies to react quickly and flexibly to changes, reducing friction for riders
- Distinguishes between baggage and transport-related objects such as wheelchairs, bicycles, and strollers, helping reliably allocate space in the vehicle for such, and the implementation of wheelchair access ramps as required

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TECHNICAL SPECS FOR

IRMA Matrix

DIMENSIONS (W X H X L)

- Sensor: 58 x 22 x 188 mm

HOUSING

- Aluminum pressure casting housing
- Optical openings made of synthetic materials (polycarbonate)

PROTECTION CLASS

- IP65 (IP67 on request)

INTERFACE

- Ethernet, 100 Mbit/s
- CAN, max. 125 kbit/s

CONNECTION

- Interface: iris-connector (sCON)

WIRING SYSTEM

- M12 connectors for Ethernet or CAN

- Cable according to EN45545-2 and EN50306

TYPE APPROVALS, STANDARDS

- EN50155, ECE, CE, EN50121-3-2, EN45545-2, EMV-06

VEHICLE INTEGRATION/SYSTEM ARCHITECTURE

- Ethernet via API, VDV301, direct UDP
- CAN via API
- Gateway to IBIS and J1708

POWER SUPPLY

- 24 VDV or 48 V PoE
- Power consumption: typically, 6 W; 8 W PoE

WEIGHT WITHOUT IRIS-CONNECTOR (sCON)

- Surface mount version: approx. 260 g

- Flush mount version: approx. 340 g

PIXEL

- 500

MTBF

- 1.2 million hours

REQUIRED EXTERNAL LIGHTING

- 0 LUX

MINIMUM INSTALLATION HEIGHT

- Allowing passengers to pass upright underneath the sensor, < 1.80 m



IRMA Matrix Hardware



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