



The HeArt of traffic detection

COMARIO



US 6300

Detection

- ✓ Counting
- ✓ Height
- ✓ Gap
- ✓ Headway
- ✓ Static queue
- ~~✓ Speed~~
- ~~✓ Length~~
- ~~✓ Profile~~
- ~~✓ Direction~~
- ~~✓ Position~~

Installation

- ☐ Above the lane

Classification

Based on height

2 classes:

- ✓ Light vehicles
- ✓ Heavy vehicles

Output

- ☐ RS485 serial line

Traffic detector

Ultrasonic

Single technology

Entry level detector based on the ultrasonic technology. It is able to detect the presence and height of the vehicle.





MD 01

Detection

- ✓ Counting
- ✓ Speed (High accur.)
- ✓ Length
- ✓ Gap
- ✓ Headway
- ✓ Direction
- ~~✓ Height~~
- ~~✓ Profile~~
- ~~✓ Static queue~~
- ~~✓ Position~~

Installation

- ☐ Above the lane
- ☐ Side of the road

Classification

- Based on length
8 classes (typ.):
- ✓ 0 – 2,5 m.
 - ✓ 2,5 – 5 m.
 - ✓ 5 – 7,5 m.
 - ✓ 7,5 – 10 m.
 - ✓ 10 – 12,5 m.
 - ✓ 12,5 – 15 m.
 - ✓ 15 – 17,5 m.
 - ✓ > 17,5 m.

Output

- ☐ RS232 serial line
- ☐ RS485 serial line
- ☐ Digital output (trigger)

Traffic detector

Microwave Doppler Radar

Single technology

Microwave radar detector equipped with a patch antenna and a microprocessor for digital signal processing. Very accurate on speed measurement

Features

Frequency	24,15 Ghz
Antenna	12 x 25° or 6,5 x 7,5°
Dimensions	120 x 122 mm.





LSR 2001

Detection

- ✓ Counting
- ✓ Speed
- ✓ Length
- ✓ Height
- ✓ Profile (High accur.)
- ✓ Direction
- ✓ Position
- ✓ Static queue
- ✓ Gap
- ✓ Headway

Installation

- ☐ Above the lane
- ☐ Side of the road
 - ☐ Longitudinal
 - ☐ Transversal

Classification

Based on profile
TLS 8+1
ANAS 9
CUSTOMIZED 12

Output

- ☐ Ethernet RJ45
- ☐ RS485 serial line

Traffic detector

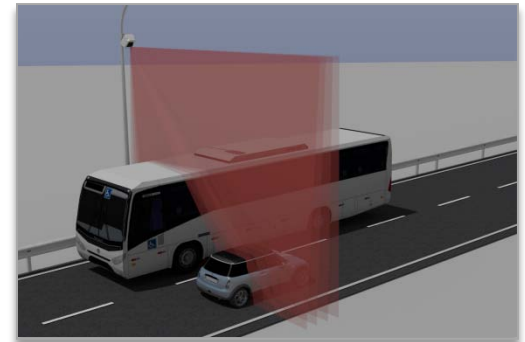
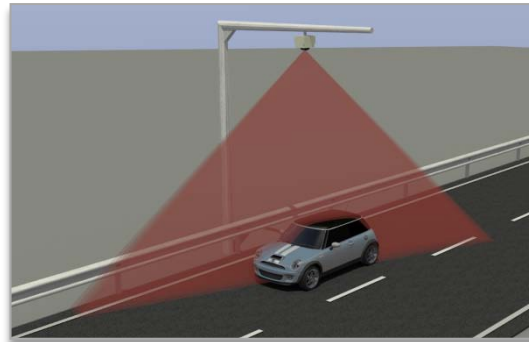
Laser scanner

Single technology

Detector equipped with a laser scanner and a CPU for data analysis and processing. The laser scanner makes 274 measurements on 4 planes with an opening angle of 96°.

Features

Emitted light	905 nm – not visible
Laser class	Class 1
Max range	20 m.





USM 9001

Detection

- ✓ Counting
- ✓ Speed
- ✓ Length
- ✓ Height
- ✓ Profile
- ✓ Static queue
- ✓ Direction
- ✓ Gap
- ✓ Headway
- ✗ Position

Installation

- Above the lane

Classification

Based on profile
TLS 8+1
ANAS 9

Output

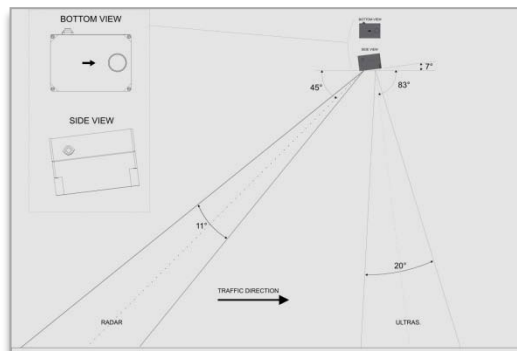
- RS485 serial line

Traffic detector

Microwave doppler radar + ultrasound

Double technology

Double technology detector equipped with a microwave doppler radar, an ultrasonic sensor and a microcontroller for signal processing.





USMI 9601

Detection

- ✓ Counting
- ✓ Speed
- ✓ Length
- ✓ Height
- ✓ Profile
- ✓ Static queue
- ✓ Direction
- ✓ Position
- ✓ Gap
- ✓ Headway

Installation

- Above the lane

Classification

Based on profile
TLS 8+1
ANAS 9

Output

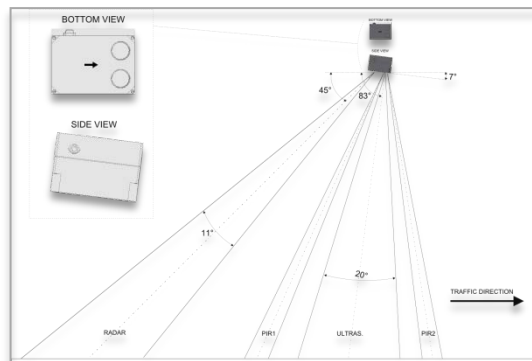
- RS485 serial line

Traffic detector

Microwave doppler radar + ultrasound + infrared

Triple technology

Triple technology detector equipped with a microwave doppler radar, an ultrasonic sensor, an infrared sensor and a microcontroller for signal processing. Standard detector for ITS projects in tunnels and roads.





RASER 4001

Detection

- ✓ Counting (High accur.)
- ✓ Speed (High accur.)
- ✓ Length
- ✓ Height
- ✓ Profile (High accur.)
- ✓ Static queue
- ✓ Direction
- ✓ Position
- ✓ Gap
- ✓ Headway

Installation

- ☐ Above the lane
- ☐ Side of the road
 - ☐ Longitudinal

Classification

Based on profile (High accur.)
TLS 8+1
ANAS 9
CUSTOMIZED 12

Output

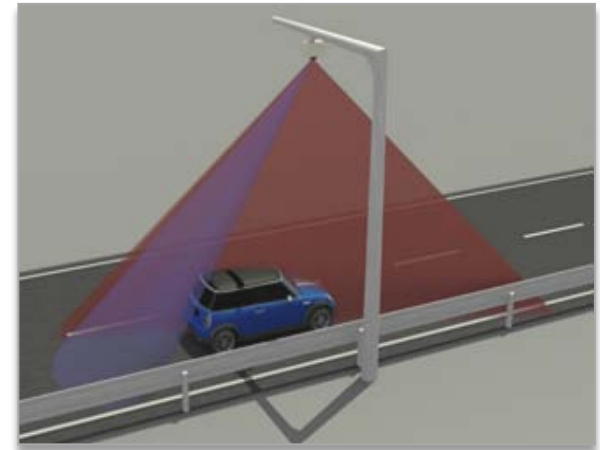
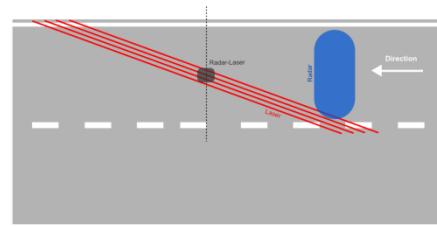
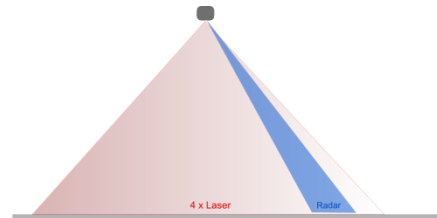
- ☐ Ethernet RJ45
- ☐ RS485 serial line

Traffic detector

Microwave doppler radar + laser scanner

Double technology – Top level

Double technology detector equipped with a microwave doppler radar, a laser scanner and a CPU for data processing. Top level detector with high accuracy in speed, counting and classification.





MAG 01

Detection

- ✓ Counting
- ✓ Static queue
- ✓ Gap
- ✓ Headway
- ✓ Profile
- ✓ Speed (2 detect.)
- ✓ Length (2 detect.)
- ✓ Direction (2 detect.)
- ✗ ~~Height~~
- ✗ ~~Position~~

Installation

- ☐ Under the lane
 - ☐ Up to 25 cm. below

Classification

Based on length (only with 2 detectors)

Output

- ☐ Digital Output
- ☐ RS485 serial line

Traffic detector

Magnetic

Single technology

Earth magnetic field detector to be installed underground. Same performance of inductive loops but with less maintenance. By using 2 sensors in the lane it is possible to detect speed, length and direction of transit.

Features

Sensitivity	4 levels
Range	up to 150 cm.
Protection	IP69





WMAG 01

Detection

- ✓ Counting
- ✓ Static queue
- ✓ Gap
- ✓ Headway
- ✓ Profile
- ✓ Speed
- ✓ Length
- ✓ Direction
- ✓ Height
- ✓ Position

Installation

- ☐ Under the lane
 - ☐ Up to 25 cm. below

Classification

No classification

Output

- ☐ Digital Output
- ☐ RS485 serial line

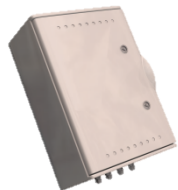
Traffic detector

Wireless Magnetic

Single technology - Wireless

Wireless earth magnetic field detector to be installed underground. It doesn't need the cut on ground for the cable. Powered by lithium batteries. Data is trasfered to a wireless gateway (one gateway can handle 48 detectors).





MOB LINK

Detection

- ✓ Counting
- ✓ Speed (High accur.)
- ✓ Length
- ✓ Gap
- ✓ Headway
- ✓ Direction
- ✓ ~~Height~~
- ✓ ~~Profile~~
- ✓ ~~Static queue~~
- ✓ ~~Position~~

Installation

- ☐ Side of road

Classification

- Based on length
8 classes (typ.):
- ✓ 0 – 2,5 m.
 - ✓ 2,5 – 5 m.
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 - ✓ > 17,5 m.

Data

- ☐ Local storage
- ☐ Transmission to control center
 - ☐ Ethernet
 - ☐ 2G/3G modem

Mobile traffic system



Mobile doppler radar + control unit

Single technology – Temporary detections

Integrated radar and control unit for temporary detections. Can be easily moved from one position to another. Battery power supply with up to 2 weeks of autonomy.





RAM 20

Detection

- ✓ Over height
- ✓ Lane
- ✓ Traffic counting (only vertical)
- ✓ Direction (only horizontal)

Classification

With vertical scanning installation it can give 4 classes:

- ✓ Motorcycles
- ✓ Cars
- ✓ Vans
- ✓ Trucks

Installation

- ☐ Side of road
 - ☐ Vertical scanning
 - ☐ Horizontal scanning

Output

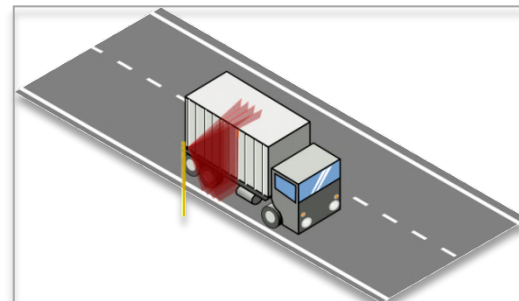
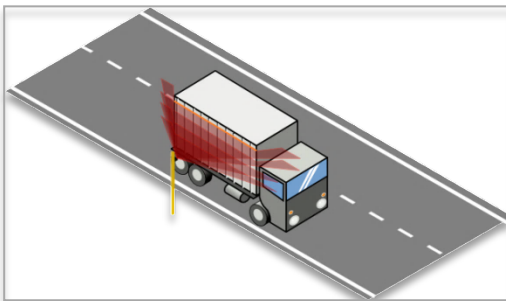
- ☐ 4 relays
- ☐ Ethernet

Over height detector

Single laser scanner

Single technology

Laser scanner over height detection system. Composed by a laser scanner detector and a control unit with a CPU and output (relays) board. Doesn't need installation of devices on both sides of the road.





RAM 200

Detection

- ✓ Over height
- ✓ Lane
- ✓ Traffic counting
- ✓ Direction

Classification

4 classes based on profile:

- ✓ Motorcycles
- ✓ Cars
- ✓ Vans
- ✓ Trucks

Installation

- ☐ Side of road

Output

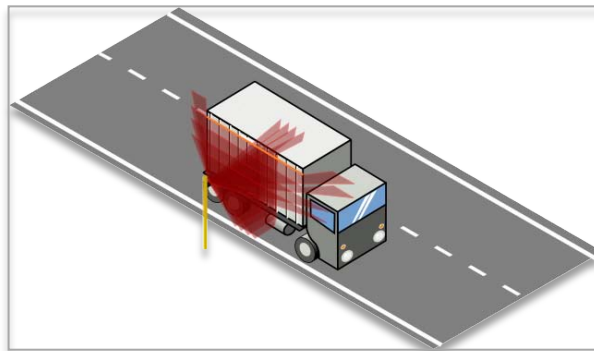
- ☐ 8 relays
- ☐ Ethernet

Over height detector

Double laser scanner

Double technology

Double laser scanner over height detection system. Composed by 2 laser scanner detectors (one vertical and one horizontal) and a control unit with a CPU and output (relays) board. Doesn't need installation of devices on both sides of the road.





BT 100

Bluetooth detector



Bluetooth

Single technology

Detection

- ✓ Active bluetooths on cars
 - ✓ phones,
 - ✓ PDAs
 - ✓ Speakerphones
 - ✓ PCs

Applications

- ✓ Travel time
- ✓ Average speed
- ✓ Origin destination matrix
- ✓ Percentage of left or rights turns

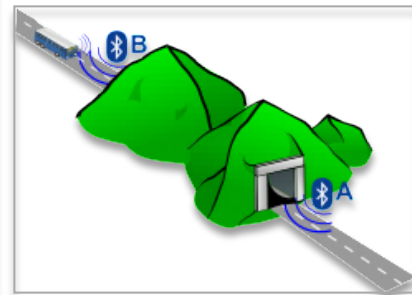
The systems detects the bluetooth codes of active devices inside the cars. When the system detects the same code on two positions it computes the travel time, average speed or origin destination matrix.

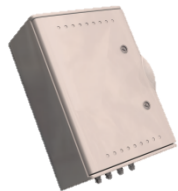
Installation

- ☐ Side of road
- ☐ Above the road

Software

- ☐ Web based
- ☐ Reports
- ☐ Diagnostics
- ☐ Maps
- ☐ Settings





TRAFFIC LINK

System

- ✓ ARM 9 CPU
- ✓ Linux embedded OS
- ✓ Web pages for configuration
- ✓ Software Carcounter for communication with detectors and control center
- ✓ Ethernet, Serial and USB ports

Features

- ✓ Detectors data collecting
- ✓ Communication with control center
- ✓ Data aggregation
- ✓ Traffic alarms
- ✓ Data check
- ✓ Diagnostics

Installation

- ☐ On pole
- ☐ On gantry

Communication

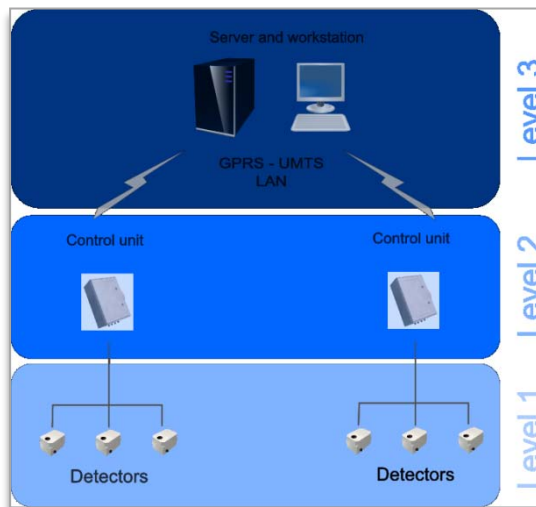
- ☐ Ethernet
- ☐ 2G/3G modem
- ☐ Local storage
- ☐ USB

Detectors control unit

Local control unit

Level 2 of the system architecture

The control unit collects traffic data from the detectors, checks the data, makes all the computations (aggregations, generation of alarms, etc.) and sends the data to the control center.





TRAFFIC BOOK

Software

- ✓ Web based
- ✓ Postgres database
- ✓ Linux Debian operating system

Features

- ✓ Communication with control units
- ✓ Reports with charts and tables
- ✓ Analysis for traffic engineering
- ✓ Maps
- ✓ Diagnostics

Installation

- ☐ On control center server
- ☐ Suitable for installation on virtual server

Communication

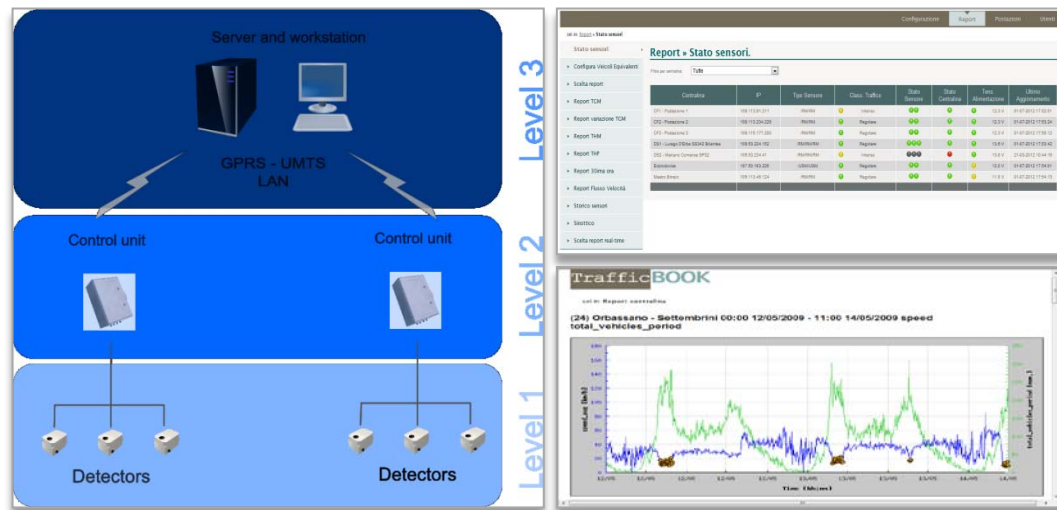
- ☐ Ethernet
- ☐ 2G/3G modem

Control center

Control center software

Level 3 of the system architecture

The control center software receives the data from all the control units and stores them on the database. The software also provides web pages to create reports, show maps and diagnostics.



SOUTH AMERICA, ARABIC COUNTRIES AND OTHER

Brazil

IMIGRANTES MOTORWAY – Traffic detection system with triple technology detectors. Travel time and O/D matrix with bluetooth detectors

CET SAO PAULO - Magnetic field detectors for vehicle detection on traffic lights. Travel time and o/d matrix with bluetooth detectors

SPEED ENFORCEMENT – Radar doppler and double tech radar+laser scanners detectors for speed enforcement

Emirates

ABU DHABI– Triple technology detectors for Yas Island tunnel

Saudi Arabia

JEDDAH– Travel time and O/D matrix with bluetooth detectors

Iraq

KURDISTAN– Height detection system on tunnels entrances

EUROPE

Italy

TORINO CITY – Ultrasound traffic detectors installed on gantries. Wireless magnetic field detectors. Doppler radars detectors

AUTOSTRADA PER L'ITALIA – Triple tech detectors on tunnels. Laser scanner for bus detection on Florence entrance. Radar + laser scanners detectors on Bologna motorway. Ultrasonic detectors for queue detection

ANAS – Triple technology detectors for tunnels on roads and motorways (Salerno-Reggio Calabria)

ROME – Complete traffic detection system with double technology detectors

MARGHERA HARBOUR – Ultrasnpic detectors for counting and queue detetcion. Wireless magnetic field detectors for counting and queue detection. Laser scanner for traffic light

FRIULI VENEZIA GIULIA REGION – Complete traffic detection system with triple tech detectors

PORDENONE, COMO, FIORANO, PAVIA, UDINE AND OTHER MUNICIPALITIES – Traffic detection systems with fixed or mobile radar detection stations

GALLIPOLI AREA – Complete traffic detection system with doppler radar detectors

MESTRE CITY RING – Complete traffic detection system in the area of Martellago

LOMBARDIA REGION – Detection on tunnels in the Como and Malpensa area

VICENZA, DESENZANO AND MONZA MUNICIPALITY – Parking system with magnetic field detectors

MANY OTHERS...

Spain

TRAFFIC DETECTION ON MOTORWAY – Triple tech detectors on gantries for traffic detection

TRAIN SPEED DETECTION – Mobile unit for detection of speed of trains in critical positions

Slovenia

WRONG WAY DETECTION ON MOTORWAY – Triple technology detectors for the generation of alarms in case of drivers entering in wrong way in the motorway

The HeArt of detection systems



Thank you!

