# DATACAR

## ADVANCED MULTILANE TRAFFIC MONITORING SYSTEM

- Suitable both for permanent and temporary installations
- Non-Intrusive System
- Accurate detection, speed, counting and classifying traffic up to 4 lanes simultaneously
- Mounted at a certain angle to the road
- Quick and simple Installation and alignment
- Virtually Maintenance Free
- Real-time transmission of traffic data and images
- Optional Internet accessibility (Web Posting)
- Remote Alarms transmission via e.g. SMS/email

**METEODATA**
**Datalogger/Transmitter Unit**
**3G / GPRS, Line, Radio or Satellite**

**GEO-MLR4000**
**Multilane Traffic Radar Sensor**



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## GENERAL DESCRIPTION OF DATACAR SYSTEM

**GEONICA** established in 1974, has a large experience in the design of data acquisition and transmission remote terminals for the monitoring of environmental, meteorological and traffic parameters. This fact has allowed developing an advanced Traffic Counting, Speed and Classifying System with real-time data transmission, generating a very powerful Performance Monitoring of the collected information.

**DATACAR** System has been designed to detect, track and classify all traffic (multi-lane traffic detector). The system implements the newest RADAR technology and it can beused for permanent or temporary installations.

**DATACAR** System may include other sensors and detectors for complementing the traffic information such as:

- Meteorological Sensors (e.g. Wind Speed and Direction, Air Temperature and Relative Humidity, Precipitation)
- Noise detectors: for real time environmental noise monitoring, establishing the correlation between traffic and noise.
- Still image cameras: for real time site visualization of traffic status.

The System acquires, stores and transmits the traffic and other parameters of each location to a Central Station where the data is received, processed and displayed.

### DATACAR SYSTEM CONFIGURATION

**DATACAR consists of three main elements:**

- **MULTI-LANE TRAFFIC RADAR SENSOR**
- **METEODATA DATALOGGER & TRANSMISSION UNIT**
- **GEONICA SUITE AND WEBTRANS INTERNET PLATFORM SOFTWARE PACKAGES**

Fig. 1: DATACAR System portable installation including Traffic Radar Sensor and **METEODATA** unit

## DATACAR MAIN FEATURES

- Multi-Lane traffic detector
- Detects tracks and classifies all traffic up to 4 zones lanes.
- Reliable all-weather performance.
- Precisely measures the position and speed vector of all objects.
- Provides data for presence, count, speed, head way and gap times for common intersection detection applications.
- Self calibration and diagnostics on board (sabotage, self-alignment etc., self test).



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## MODEL GEO-MLR4000 MULTILANE TRAFFIC RADAR SENSOR

The non-intrusive, radar-based **GEO-MLR4000** is an advanced sensor for the detection and measurement of traffic on roadways. It is allweather accurate and virtually maintenance free. Best of all, **GEO-MLR4000** is renowned for longterm worry-free reliability.

The **GEO-MLR4000** is a small roadside pole mounted radar, operating in the microwave band. Simultaneously, the sensor provides per lane presence as well as volume, occupancy, speed and classification information in up to 4 user-defined detection zones.

The **GEO-MLR4000** all-in-one concept combines a high resolution radar and a variety of communications options all in a single enclosure. This sleek cabinet free detection station is simple to integrate into any system whether urban signal control or highway traffic management.

## BENEFITS

- Fast, safe installation, on existing road-side poles, with no traffic disruptions
- Compatible with all **GEONICA** integrated solutions including detection station, counting, urban traffic control, event reporting, data collection with **METEODATA**
- Highly flexible: suitable for any road and pole type, with various built-in communication options.
- Zero Setback feature means any pole is suitable
- Low power requirement allows low cost solar power operation

## APPLICATIONS

- Mid-block detection for intersections (advance detection)
- Freeway traffic management and incident detection
- Traveler information and journey time prediction
- Ramp metering
- Queue detection
- Work zone safety systems
- Permanent and mobile traffic counting stations
- Loop replacement (single or dual loop emulation)

## FEATURES

- Provides presence indication and accurate measurements of volume, occupancy, speed and classification in up to 4 separate zones (lanes) up to 76 meters away
- Fully programmable to support multiple applications using simple intuitive software on a Notebook PC
- True-presence: detects stationary and fast moving vehicles; single or dual loop emulation
- Reliable all-weather performance
- Low life-cycle cost with no routine maintenance procedures and high reliability. Typical MTBF : 10 years or 90,000 hours
- Easy to calibrate by fast, automatic set-up wizard

| Expected GEO-MLR4000 Accuracy | Free flow traffic (normal traffic) | Higher density non typical traffic |
|---|---|---|
| Per Lane Volume | 95% | 80% |
| Per Lane Occupancy (Side Fired) | 95% | 80% |
| Per Lane Classification By Length | 90% | 60 - 80% |
| Class Length Limits & Resolution | 25.5m, 0.1m | 25.5m, 0.1m |
| Average Vehicle Speed (Side Fired) | 90% | 60 - 80% |



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## METEODATA DATA RECORDING AND TRANSMISSION UNIT

**METEODATA** Data Recording and Transmission Unit will receive all the incoming information from the **TRAFFIC RADAR SENSOR** storing all data in its internal memory of 64 MB.
The most relevant features of the Data Logger are described below:

**Inputs/Outputs (total 16 or 24, plus 4/6 serial ports):**

- 8 or 16 Analog Input channels (fully differential)
- 2 Digital Inputs; 4000 V galvanic insulation
- 2 Digital Outputs; 4000 V galvanic insulation
- 4 Pulse channels (16 bits) for weather sensors with impulse output.

**Communication Ports (4 standard; 6 optional):**

- Com 1: General purpose RS232 serial port
- Com 2: development (Dedicated)
- Com 3: General purpose, programmable, RS232/422/485 serial port
- Com 4: Serial port for connection to modems 3G, GPRS, PTSN, etc.
- Com 5/6: Two additional optional ports

**Storage memory:**

- 64 MB internal memory.
- Optional 2GB removable SD memory card.

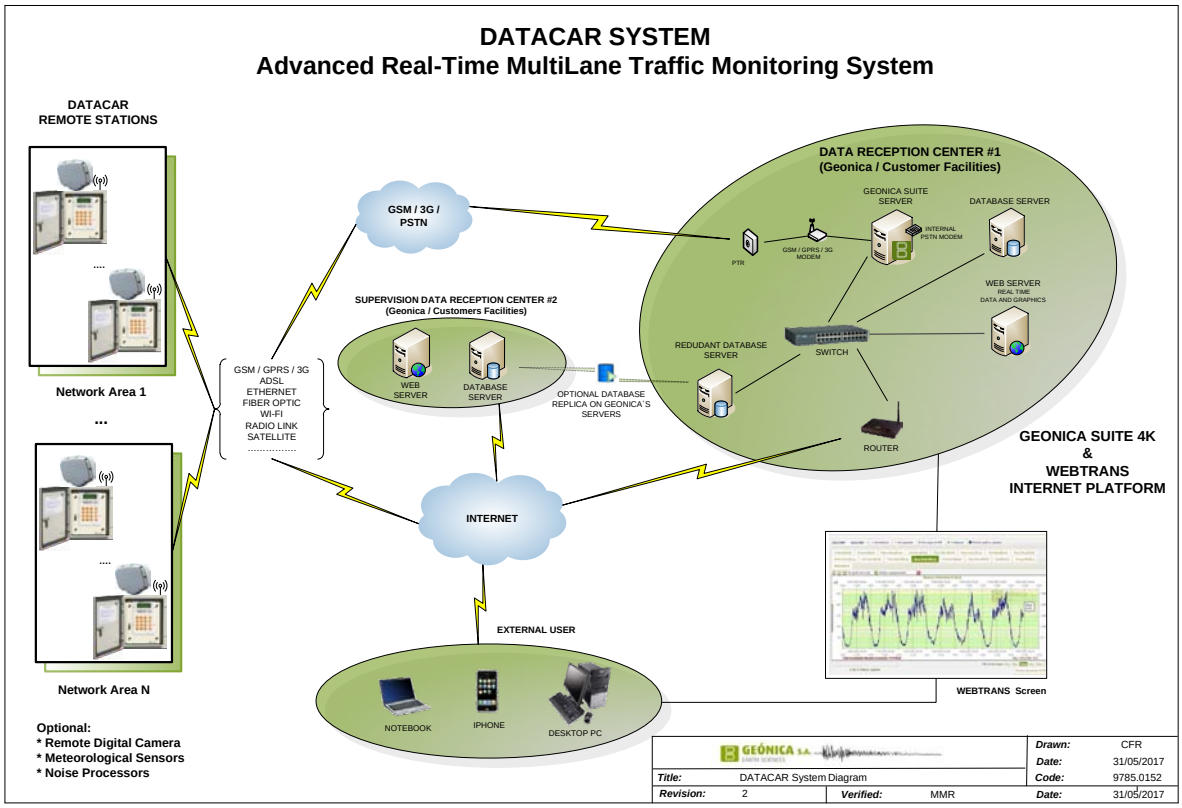
**Data Transmission**

Depending on the user requirements, **METEODATA** is capable of transmitting the data to the central facility in several ways:

- Serial port RS232/422/485
- Cellular Modem GSM/GPRS/3G
- Ethernet connection
- Radio link
- Fiber optic
- Wi-Fi/Bluetooth
- Satellite (INMARSAT, VSAT, etc)
- Internet

Such flexibility on the communication ports, inputs and outputs and memory capacity, allows the system to be connected to a large number of different sensors like anemometers, visibilimeters, rain gauges, etc., and also noise processors or digital cameras for image acquisition and transmission.

The Data Recording and Transmission Unit is mounted on a IP-66 housing. Batteries, charge regulator, communications modem, keyboard and display are all also enclosed into the same cabinet.



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## GEO-DRC DATA RECEIVING CENTER

In the GEO-DRC Data Receiving Center a typical configuration includes the following elements:

- Communications Hardware for the reception of data transmitted by the Remote Stations (e.g. 3G/GPRS, switching devices, Satellite Receivers, etc.)
- Communications (**TELETRANS)** Server: for querying data from the Remote Stations
- Database Server, including SQL Database
- Web Server: That hosts the Web Hosting Service (**WEBTRANS**)
- Optional workstations: For one / several users stations management as Client mode

For a small size layout Communications SW and Database may be settle in the same Server. The Central station admits both for servers and Communication Hardware fully redundant giving the System maximum robustness.

## MANAGEMENT SOFTWARE

**GEONICA SUITE 4K** is a set of software programs for Remote Stations configuration and Data Management. The soft-ware package runs under Windows operating system. The software components are described below:

### TELETRANS-W4K

- Remote communication with stations
- Wide variety of communication systems supported: GSM, GPRS, 3G UMTS/WCDMA, Wi-Fi, WiMAX, Fiber Optic, Ethernet,ISM Radio, RS232, RS485, USB, Satellite (INMARSAT, Thuraya, Insat, Meteosat, GOES, etc), etc.
- Data storage remote request• Instantaneous data display on tables /charts
- Request of images captured by the stations
- Station settings: time, channels, etc.
- Basic and advanced test of station features
- Calibration of stations and sensors
- Automatic execution of tasks
- Station firmware / configuration update
- Compatible with high availability cluster• "Keep Alive" function included
- Fully automated and unattended operation

### DATAGRAPH-W4K

- Query
- View real time data, statistical and historical charts and graphs
- Reporting
- New virtual parameters from existing ones
- Alarms display
- Easy display of parameters with bit-coded dataMaps and Information
- Display of station's status data on map• Latest data on map
- Display of weather forecasts and camera/radar/ satellite images Monitoring
- Data in real time displayed by means of "gauges"
- Full customization of monitoring environment

## WEBPOSTING SOFTWARE

A very valuable option offered by **GEONICA** with the **DATACAR**, is the possibility of WEB Posting, in such a way to provide worldwide access via INTERNET to the historical and instant values of all the parameters measured at the remote station. Data visualization in Internet is possible thanks to **WEBTRANS** ***Ubiquitas*** Application. User is granted to access of his account and look at the traffic parameters any number of remote terminals (number of stations depends on the server configuration). Some examples of Performance Monitoring graphics are shown in the next page:



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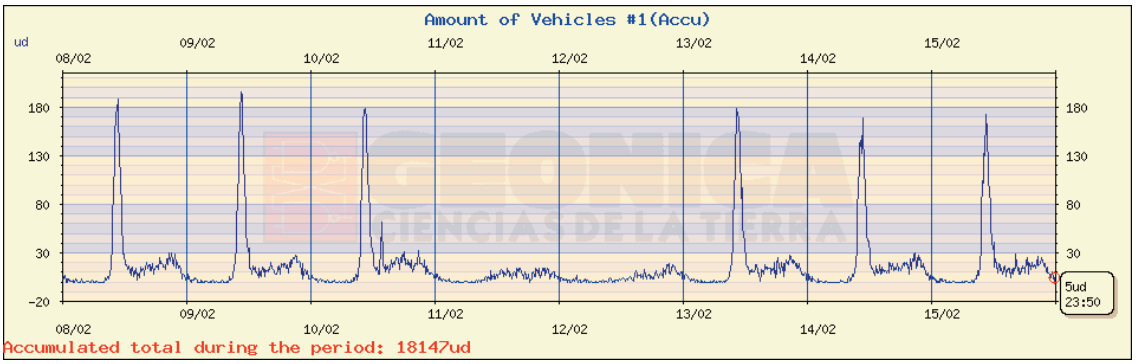
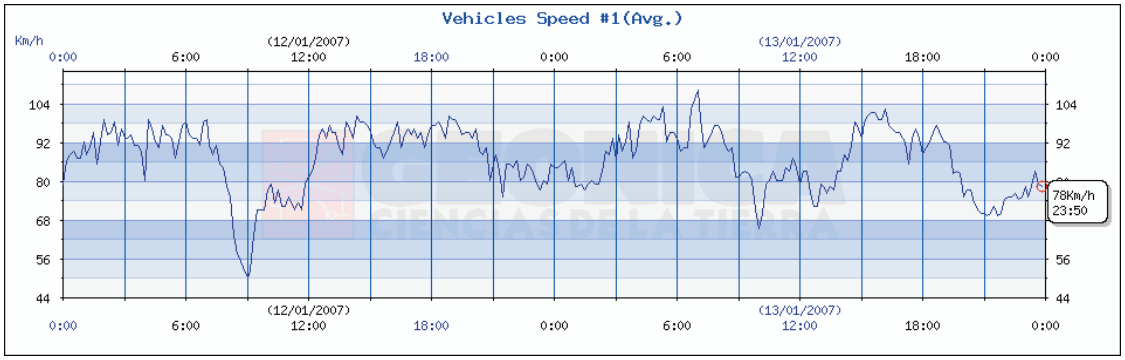
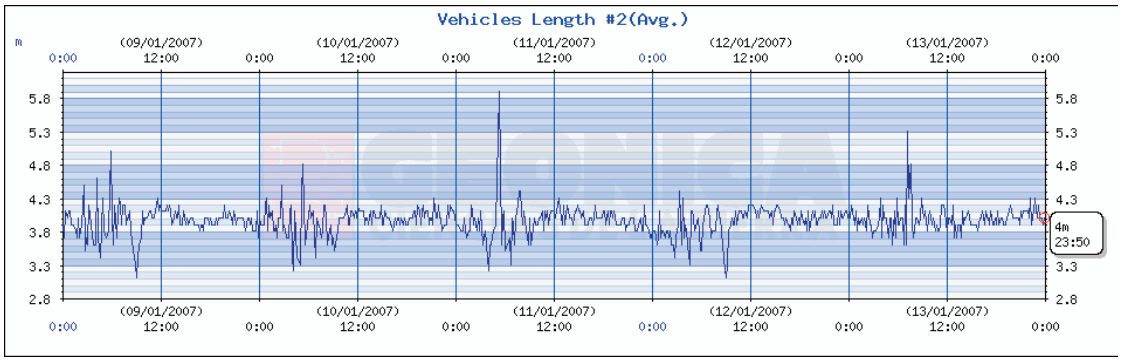


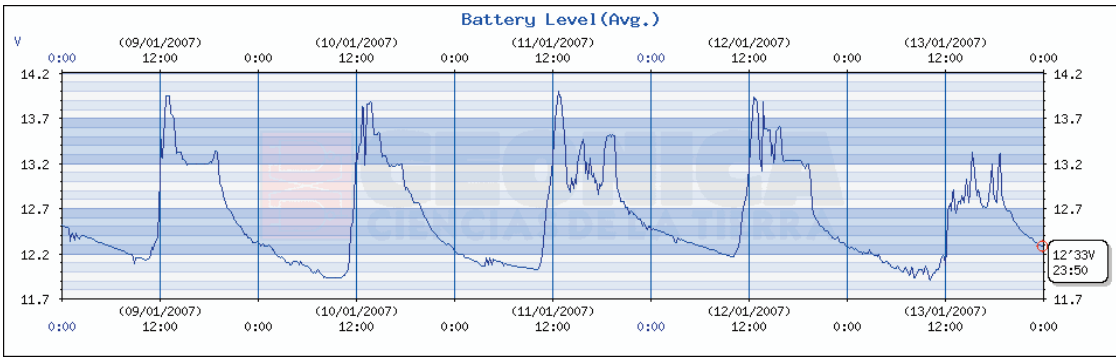

Number of vehicles for a period of 8 days




Average vehicles velocity during a period of 2 days




Vehicles length average with a resolution of 10 minutes, during a period of 5 days




Battery voltage of a remote DataCar Station power feed by solar panels, in a 5 days period sample



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