

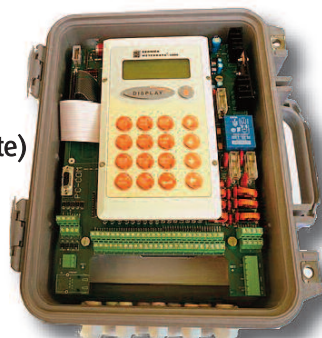
DATA CAR

ADVANCED MULTILANE TRAFFIC MONITORING SYSTEM

- ◆ Suitable both for permanent and temporary installations
- ◆ Non-Intrusive System
- ◆ Accurate detection, speed, counting and classifying traffic up to 8 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-3000C
Data Logger/Transmitter Unit
(GSM/GPRS/3G, Radio or Satellite)



GEO-MLR-3000 Multilane
Traffic Radar Sensor

GENERAL DESCRIPTION OF THE DATACAR SYSTEM

GEONICA S.A., established in 1974, has accumulated 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 be used 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 is composed by the following main elements:

- **MULTI-LANE TRAFFIC RADAR SENSOR**
- **Model 3000CP Data Recording and Transmission Unit**



Fig. 1: DATACAR System portable installation including Traffic Radar Sensor and 3000CP unit

DATACAR MAIN FEATURES

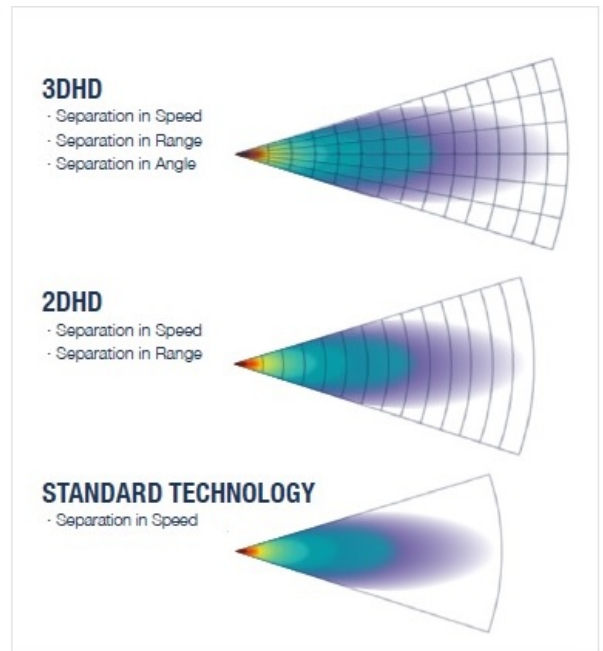
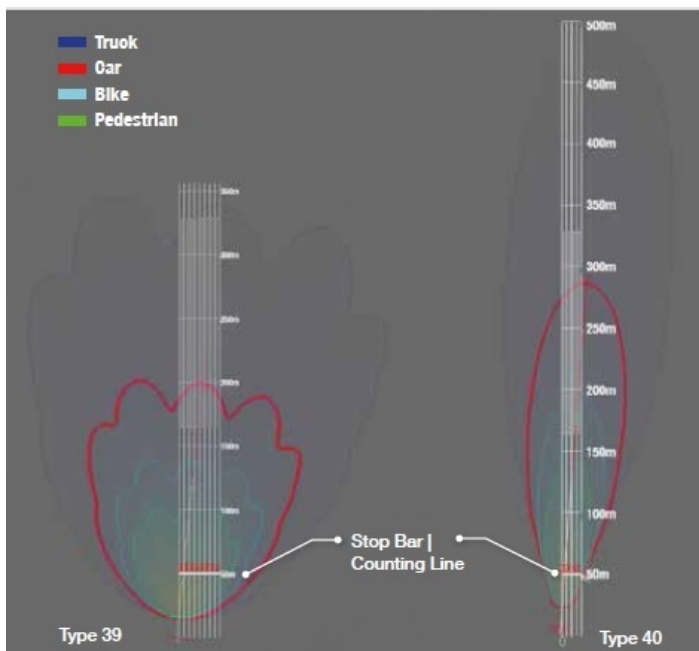
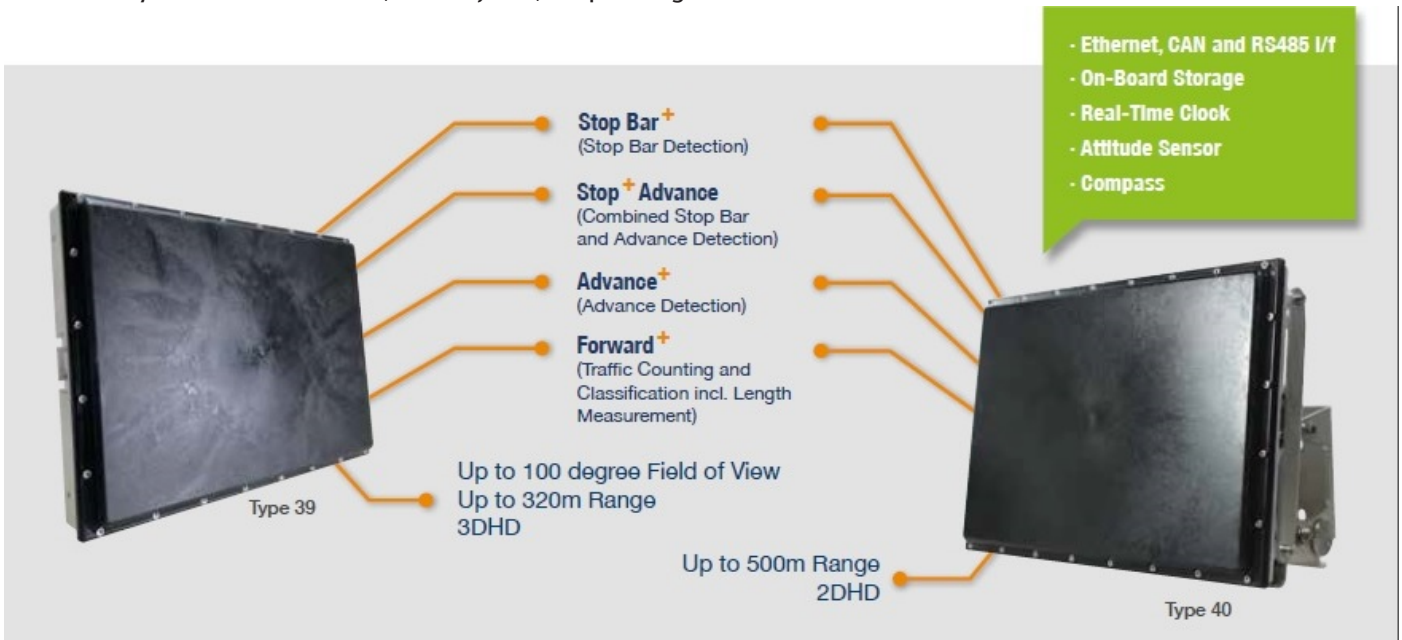
- Multi-Lane traffic detector
- Detects tracks and classifies all traffic up to eight (8) lanes.
- Tracks up to 256 objects simultaneously.
- Precisely measures the position and speed vector of all objects.
- Provides data for presence, count, speed, head way and gap times for common intersection detection applications.
- Self calibration and diagnostics on board (sabotage, self-alignment etc., self test).

MODEL GEO-MLR-3000 MULTILANE HIGH PERFORMANCE TRAFFIC RADAR SENSOR

Model **GEO-MLR-3000** is state of the art true forward firing beam radar. It is designed to accurately detect lane, speed and class of individual vehicles and compute per lane volume, occupancy, gap, average speed, 85th percentile and headway parameters.

This multi-lane 3D object tracking sensor reliably detects and tracks up to 256 stopped and moving vehicles in up to eight lanes. At intersections, it is used for stop bar detection and advance detection. On highways and arterials, it is used for traffic counting and classification, object length measurement, precise speed measurement and wrong way detection.

GEO-MLR-3000 is the highest performance traffic radar available today, it provides a wide field of view of up to 100 degree and at the same time a range of up to 320m, or 500m (long range version). The 3DHD capability provides high resolution (good vehicle separation) capability in scenarios where many vehicles are closely spaced, i.e. in many lanes dense traffic, traffic jams, stop-and-go situations.



DATA RECORDING AND TRANSMISSION UNIT MODEL 3000CP

Data Recording and Transmission Unit **Model 3000-CP** 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 GSM, GPRS, PTSTN, etc.
- Com 5/6: Two additional optional ports

Storage memory:

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

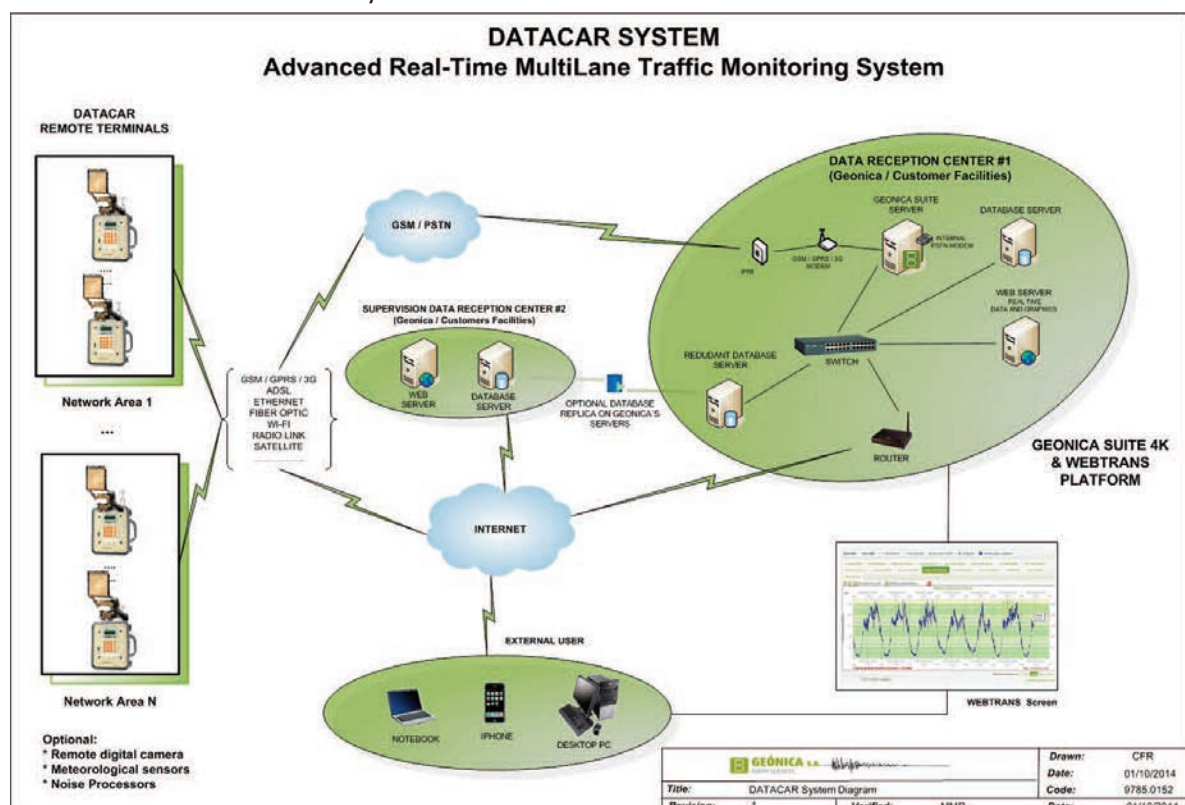
Data Transmission

Depending on the user requirements, Unit **3000CP** is capable of transmitting the data to the central facility in several ways:

- Serial port RS232/422/485
- Cellular Modem GPRS/3G
- Ethernet connection - Radio link
- Fiber optic
- Wi-Fi/Bluetooth
- Satellite (INMARSAT, 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-67 Polypropylene housing (dimensions 41x33x18cm). Batteries, charge regulator, communications modem, keyboard and visual display (optional) are all also enclosed into the same cabinet.



DATA RECEPTION CENTER

HARDWARE

In the Central Station a typical configuration includes the following elements:

- Communications Hardware for the reception of data transmitted by the Remote Stations (e.g. GPRS modems, 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 software 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 data

Maps and Information

- Display of station's status data on map
- Latest data on map
- Display of weather forecasts and camera/radar/satellite images

Monitoring

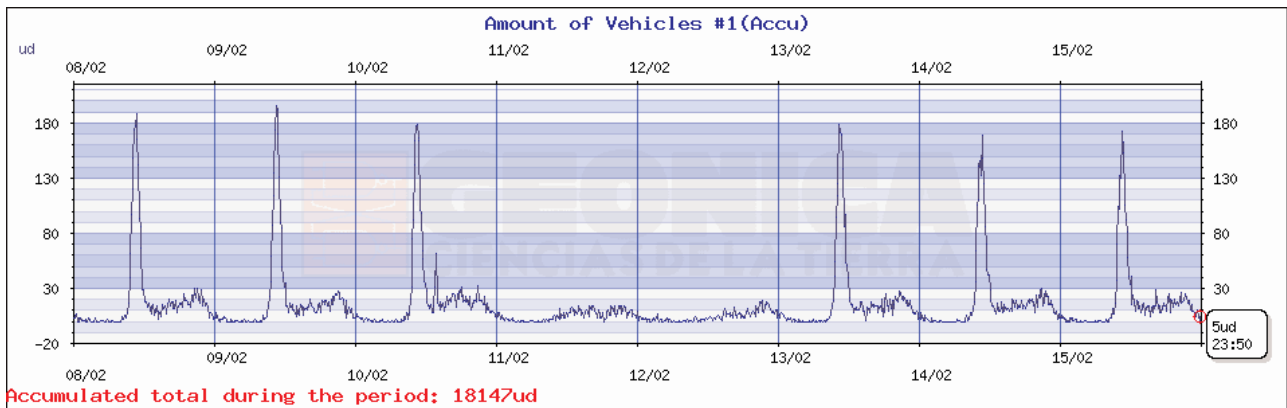
- Data in real time displayed by means of "gauges"
- Full customization of monitoring environment

WEBPOSTING SOFTWARE

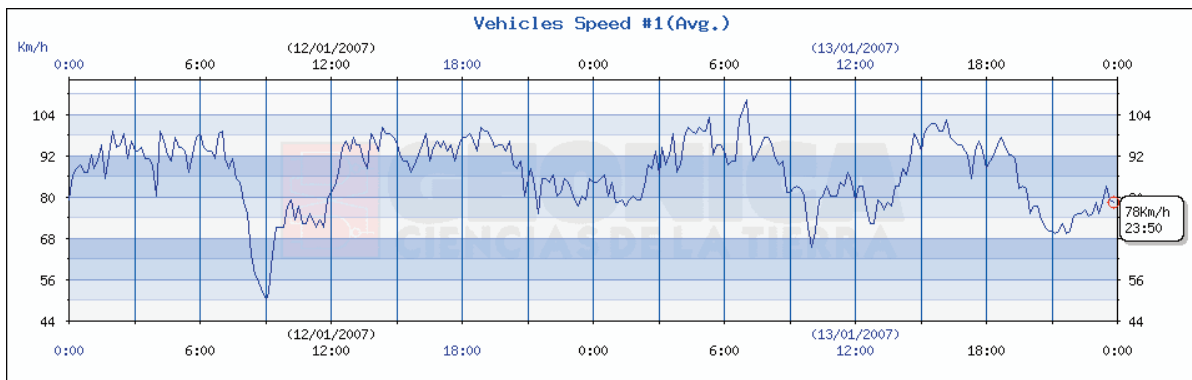
A very valuable option offered by **GEONICA** with the **DATACAR**, is the possibility of WEB Posting, in such a way to provide worldwide access via INTERNET to the historical and instant values of all the parameters measured at the remote station.

Data visualization in Internet is possible thanks to **WEB-TRANS 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).

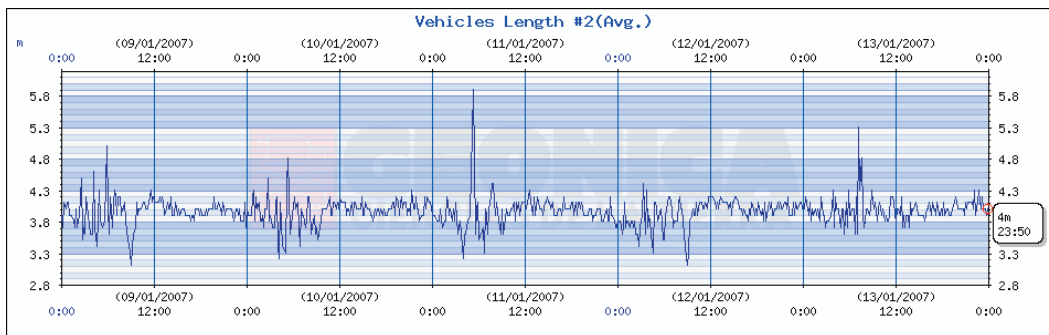
Some examples of Performance Monitoring graphics are shown at the next page:



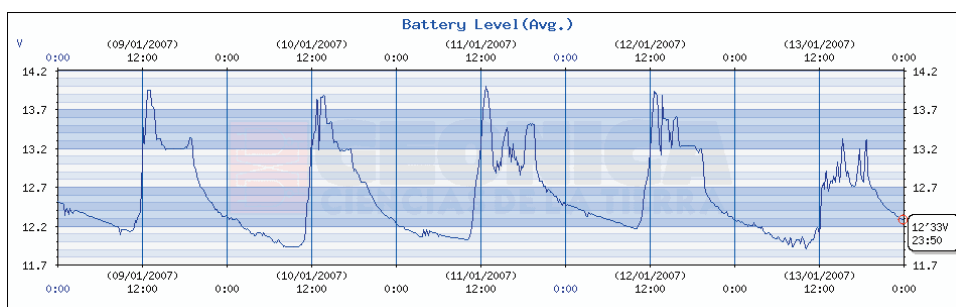
Number of vehicles for a period of 8 days



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