




weigh in motion solutions

WEIGH
IN MOTION

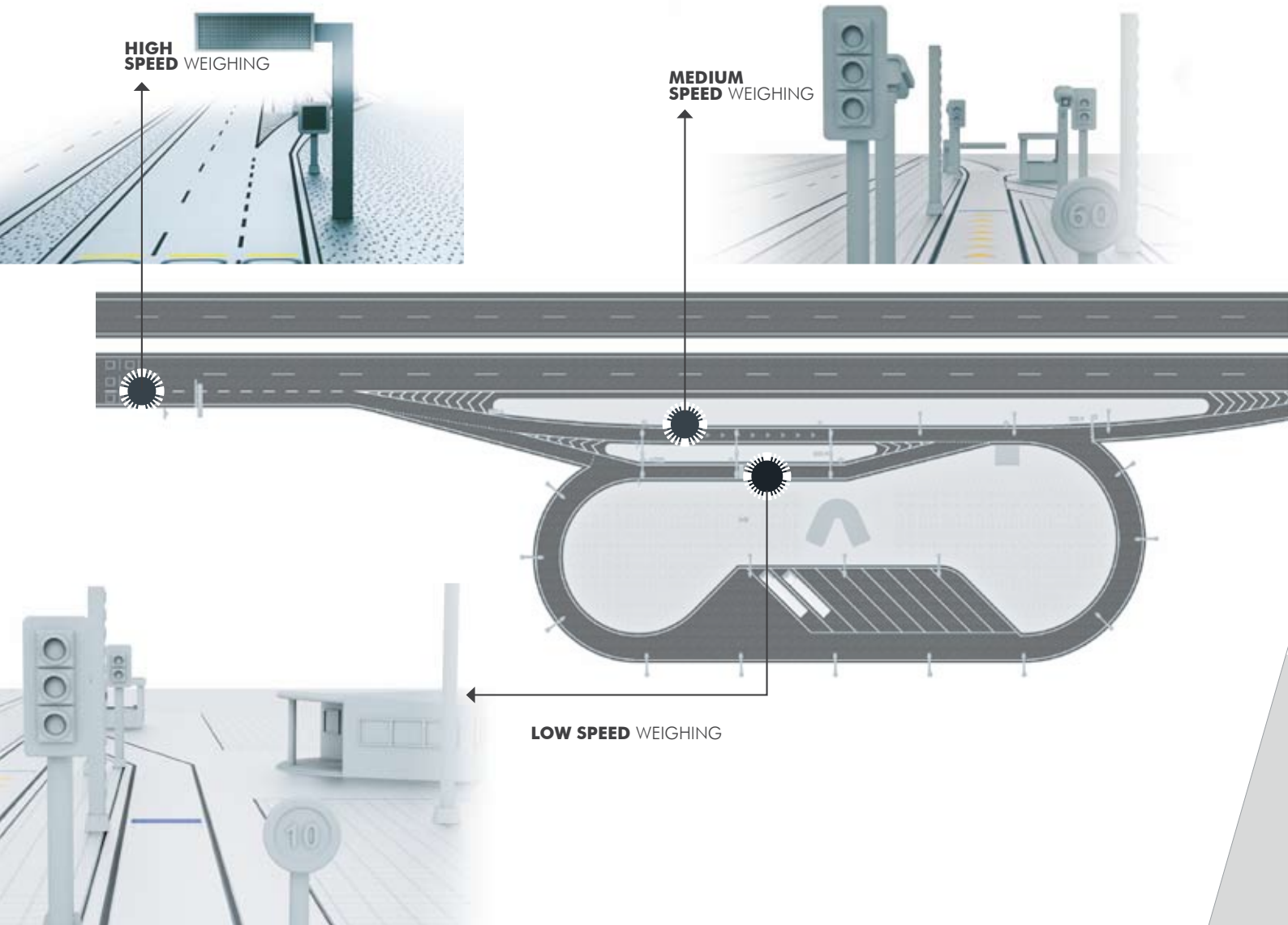
A photograph of a multi-lane highway at night, illuminated by streetlights. The image shows light trails from vehicles moving along the road, creating a sense of motion. The road has white dashed lane markings and a solid white edge line. The background shows a dark landscape with some structures and lights.

CONTROL
ANALYSIS
EFFECTIVENESS
PREVENTION
ACCURACY

One of the main aims of governments and authorities is TO ACHIEVE THE **BEST SAFETY** IN TRAFFIC AND PRESERVE INFRASTRUCTURES.

Overload is one of the biggest impacts on the pavements of the roads.

Girwir solutions provide various CONTROL and SANCTION systems.





REGISTER

GOAL

Register of the telemeter information of the current traffic.

ANALYSIS

GOAL

Accurate analysis of the information; it is for control and statistics.

MONITORING

GOAL

Overload detection to protect roads and bridges.

HIGH SPEED WEIGHING HSW

HSW system registers telemeter information of the vehicles which travel on rapid roads or high speed, up to 180 km/h.

The accuracy of the system is not affected by the type of tyre, the number of wheels or the pressure. The system measures a signal which is defined as a horizontal load.

PROCEDURE. The information of the raceway shaft is registered via quartz-glass sensors. Examples of the information obtained are: speed rate, weight, temperature, etc. The information is processed and analyzed by intelligent systems.

USE. The conservation and security of the rapid roads depends on a good use, the vehicles which travel with overload strain infrastructure to a bigger grade of erosion. For this reason, the control and detection of overloaded vehicles helps to guarantee the proper conservation of the roads and ensure the safety of their users.

MEDIUM SPEED WEIGHING MSW

MSW systems register the information of vehicles to up to 50 km/h. These vehicles are the ones shortlisted at the control site HSW to do a second pilot survey.

PROCEDURE The registered data of the vehicles is transmitted to the central of control for their analysis and to be contrasted with the information registered in the first control site.

The telemeter information of the vehicle is registered by the data logger GIRWIN DYNA B612.

GIRWIN DYNA B612 is an amplifier and signal analyzer manufactured by GIRWIN, which provides information of the weight per axle, total weight, speed, vehicle direction, distance between axles, etc.

The information given by GIRWIN DYNA B612 is registered together with the information of the auxiliary devices, such as cameras CCTV, cameras LPR, 3D scans, etc.

LOW SPEED WEIGHING LSW

The shortlisted vehicles in the earlier control sites are diverted to the third and last weighing station at Low Speed (LSW), up to 15 km/h or to a static weighing scale system, with the aim of doing an accuracy weighing.

The infringement process is only valid if this has been done with industrial weighing devices which hold the relevant metrological certification.

The devices of the units of measure of data acquisition are installed on the road surface in a position which complies with the specifications defined in the document COST 323 (COST 323, "Weigh-in-Motion of Road Vehicles, Final Report, Appendix 1, European WIM Specification Version 3.0, August 1999, pp. 149).

The compliance with the specification is one of the most important factors related with the accuracy and lifespan of the weighing systems.



WEIGH IN MOTION

HIGH SPEED SYSTEM

The high speed system HSWIM allows the registration of telemeter data of the vehicles which travel on the control site at a speed to up to 180 km/h.

girwim HSWIM system

Detection and short listing

Height sensors measure

Speed detection over the speed limit

Temperature sensors

Sensors for detection and placement on road

Weighing system: quartz sensor

License plate recognition (LPR System) and closed-circuit television (CCTV System)

Cabinet system with data logger to collect and process data and control room to supervise.

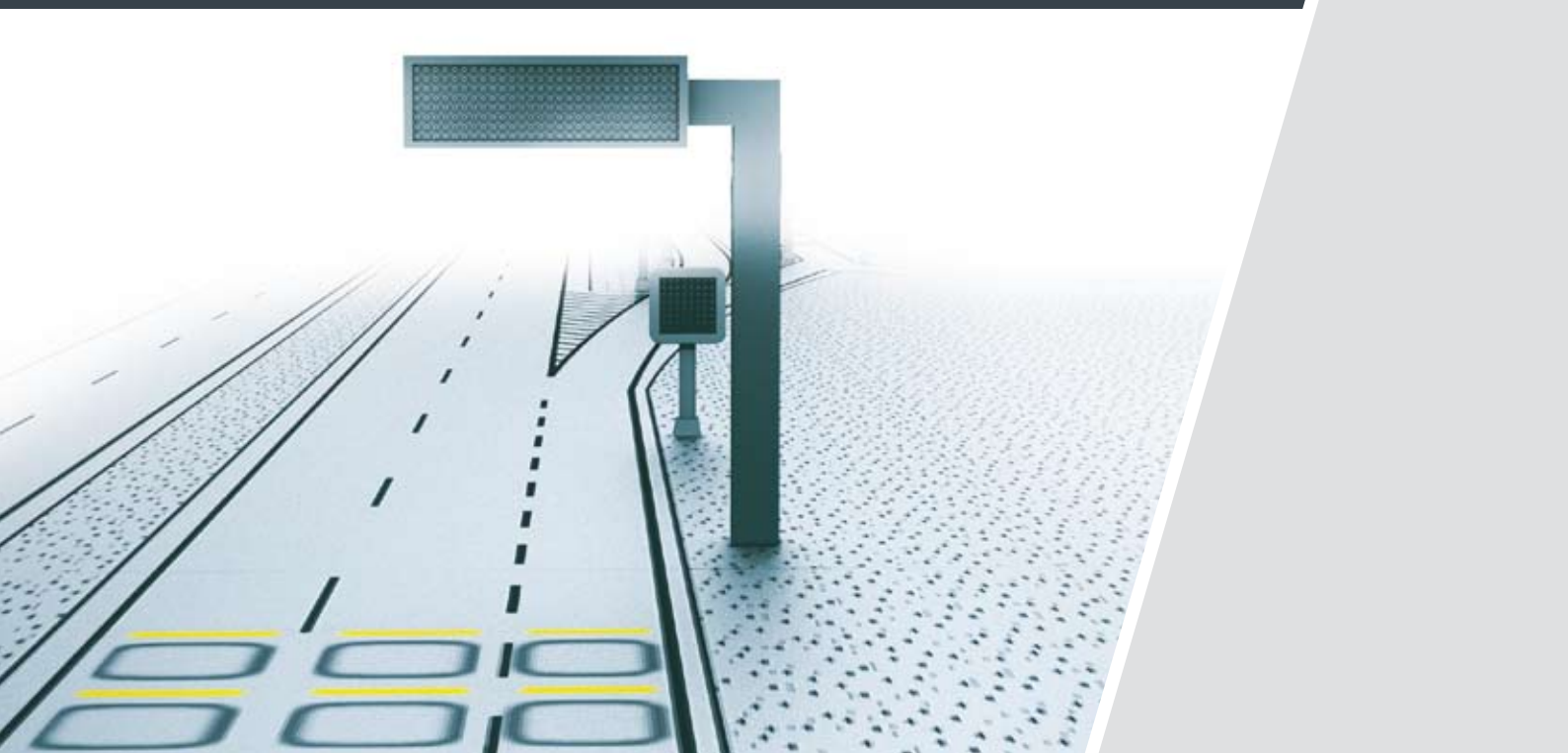
Warning system of evasion of control.

The system is appropriate for speeds to up to 180 km/h.

The systems HSWIM are commonly used to detect vehicles on rapid roads, such as motorways and dual carriageways, with overload. The weight sensors, integrated in the pavement, register telemeter data of the vehicles for purposes of classification and/or short listing.

The data registered by the system when the vehicle is travelling on the HSWIM zone includes: number of axles, loads per axle and total weight, speed, distance between the axles, direction, etc.

HSWIM is equipped with WIM-DIS (video) system of digital images, which allow the reproduction of images of vehicles in real time associated with the data of the vehicle.



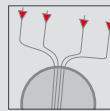
ELEMENTS of the overall system

(per lane and depending on the degree of precision required)

- Between two and four sensors of quartz Linesas (Kistler)
- Two inductive loops
- A camera of automatic number plate recognition (LPR)
- A camera of general overview (VMS)
- 3D volumetric scan (optional)
- For the set of the road it is also necessary to assemble a gate or support depending on the place.
- Central cabinet, where the data logger and all the electronics is assembled.



INDUCTIVE LOOPS



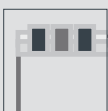
THE SENSORS OF QUARTZ LINESAS (KISTLER)

A wheel rolling on the sensors Linesas applies the vertical forces to the quartz glasses practically without any type of distortion. The quartz discs piezoelectric produce an electronic change proportional to the applied forces. The piezoelectric sensibility is practically independent of the temperature, the time and the speed. The signals of electric load are converted by an amplifier of load in voltages, exactly proportionate. Additionally, they can be processed as it is needed.



THE INDUCTIVE LOOPS

They are the sensors in charge to detect the vehicles. They allow different combinations depending on the necessities.



GANTRIES

Steel structures which are used to sustain the posters of vertical signage on the roads, in such case they are structure with 2 holders.



VARIABLE MESSAGE SIGNS (VMS)

They are used on variable message panels of high quality and their purpose is to act as traffic guidance and give information. They allow managing traffic with individualized indications.



CAMERAS OF GENERAL OVERVIEW (CCTV)

Video surveillance cameras allow a general vision of the weighing area of high speed.



DATALOGGER DYNA B612



CAMERAS OF AUTOMATIC NUMBER PLATE RECOGNITION (LPR)

High precision cameras for number plate recognition on rapid roads, with specific applications for the traffic agents and controls of access. The installation of the cameras with a powerful engine of recognition of characters allows an optimal tracking of the vehicle applying the necessary individualized indications if overload is detected.



CONTROL ROOM

It allows the control of multiple signals in real time coming from road sensors, GPS systems and other intelligent systems of transport, allowing a quick answer in case of emergency; divert transit traffic or fine vehicles with a better efficiency.



CABINET

The cabinet is placed on the side of the road on the weighing area, with a structure of metal cabinet. It includes a power source with circuit breakers and all the requisite electronics for the manoeuvring of the various elements.



WEIGH IN MOTION

MEDIUM SPEED SYSTEM

MSWIM allows the short listing of vehicles which have been selected in the highway or Main Street and have joined the access line where the vehicles are weighing with a classifying bending plate.

girwim MSWIM system

Detection and preselecting

Height sensors measure

Speed detection over the speed limit

Sensors for detection and placement on road

Weighing system: Bending late, axle weighing device

License plate recognition (LPR System) and closed-circuit television (CCTV System)

Cabinet system with data logger to collect and process data and control room to supervise.

Variable message area (entrance signage or continuation of the movement of the vehicle)

Warning system of evasion of control

The system is appropriate for speeds to up to 50 km/h.

MSWIM classifies and selects the lorries which arrive, on the basis of a weighing threshold fixed by the personnel of the weighing station.

The system can give the following information:

- Number of axles
- Loads per axle and total weigh
- Distance between the axles (optional)
- Height of the vehicle (optional)
- Type of vehicle

The vehicles which do not exceed the threshold are immediately told to follow the lane, through a sign of variable messages, to return to the main road. The rest of the vehicles are directed, with the variable messages signs, to the derivation lane to be weighed on the scale of low speed (LSW) or the static scale.

MSWIM is equipped with license plate recognition cameras (LPR) and systems of digital images, which allow the application of the management of images in real time associated with the data of the vehicle.



ELEMENTS of the overall system

(per lane)

- Bending Plate GIRWIM
- Inductive loops
- License plate recognition cameras (LPR)
- Variable Message Signs (VMS)
- Central cabinet, which includes data logger and the electronics needed to manage the system.
- Height sensor measure (optional)
- Camera of general vision (CCTV) (optional) (3)



BENDING PLATE











BENDING PLATE

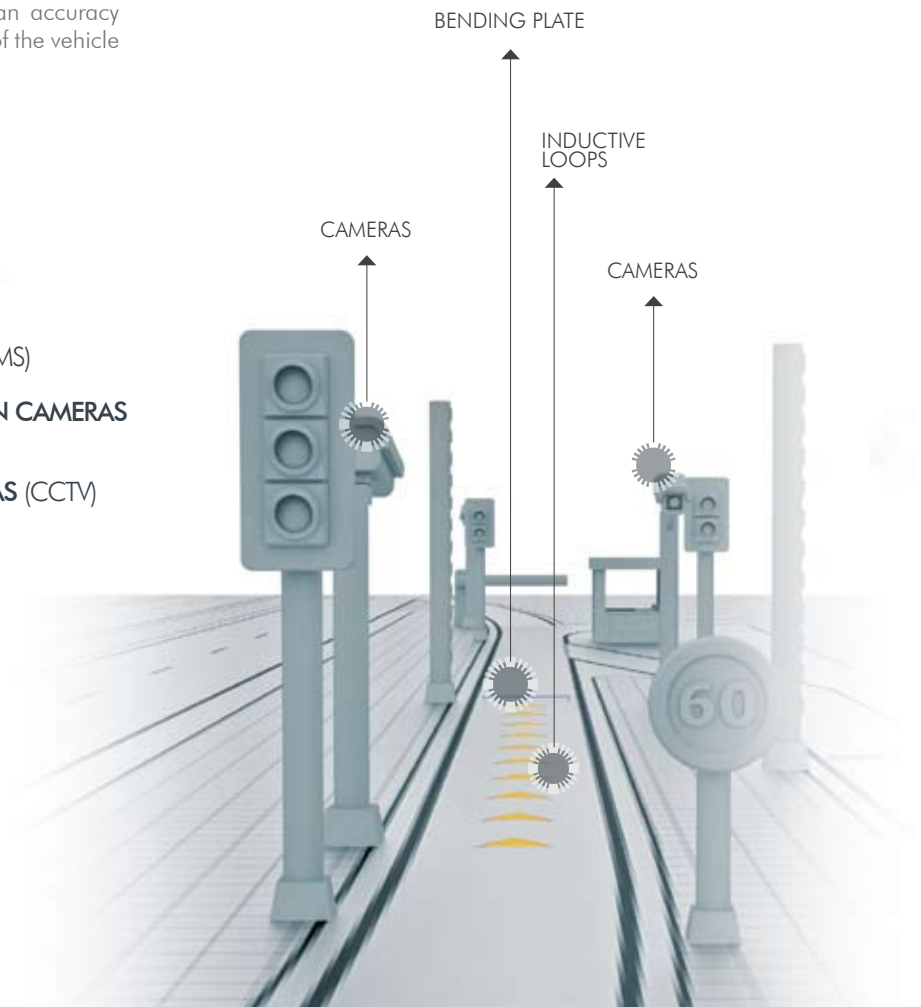


BENDING PLATE

The bending plate consists of two steel platforms of 1.75 m, placed one at the side of the other to cover about 3.5 m of width of the lane. The plates are equipped with strain gages and strain gauges. When the wheels of the vehicles go through the effective areas of the Bending plate, these ones release an electrical signal. The measured deformations are analyzed to determine the load of the wheels.

If the Bending Plate is correctly installed and gauged, it can provide the gross weight within an accuracy rate between 5%-10% of the real weight of the vehicle for the 95% of the measured vehicles.

-  **INDUCTIVE LOOPS**
-  **GANTRIES**
-  **VARIABLE MESSAGE SIGNS (VMS)**
-  **LICENSE PLATE RECOGNITION CAMERAS (LPR)**
-  **GENERAL OVERVIEW CAMERAS (CCTV)**
-  **CONTROL ROOM**
-  **CABINET**
-  **DATALOGGER DYNA B612**



LOW SPEED SYSTEM

El LSWIM is autonomous equipment operated by the scale BPPEM with a data logger associated in the application area

The system is appropriate for speeds to up to 15 km/h

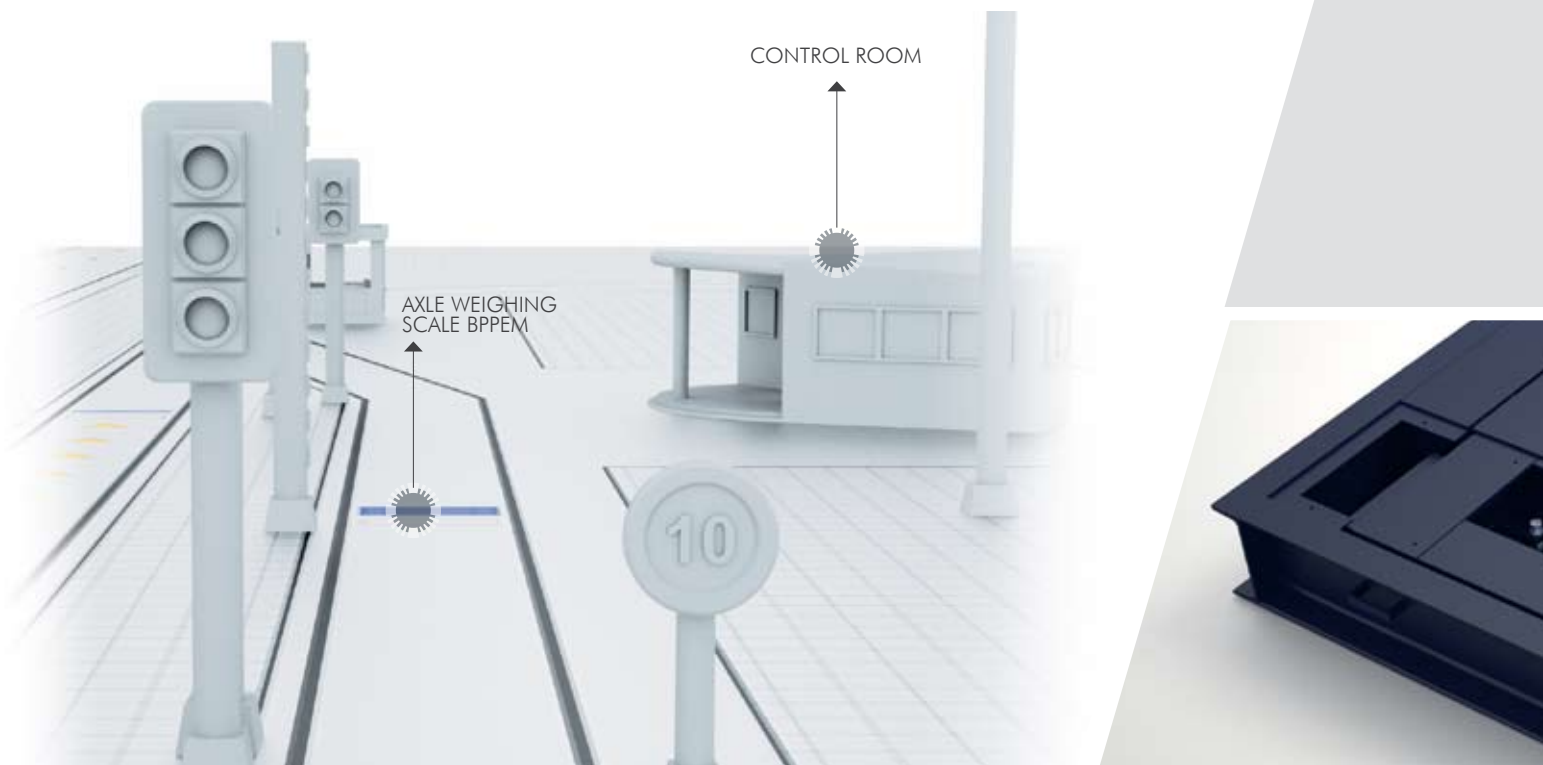
girwim LSWIM system

Detection and preselecting
Height sensors measure
Speed detection over the speed limit
Sensors for detection and placement on road
Weighing system: Bending late, axle weighing device
License plate recognition (LPR System) and closed-circuit television (CCTV System)
Cabinet system with data logger to collect and process data and control room to supervise.
Variable message area (entrance signage or continuation of the movement of the vehicle)
Warning system of evasion of control.

This scale is usually placed after the MSWIM system. The system selects the vehicles with overload. A traffic light or a variable messages sign, placed after the scale automatically advises the offenders to deviate or to go to the place where they are going to receive their fine or the traffic agent is going to make a further revision. On the other hand, the vehicles which are travelling without overload and which do not have done any type of infringement are immediately directed to the exit.

If a vehicle does not follow the indications of the signal and does not deviate, the camera placed on the exit lane is going to take a picture of the vehicle and an alarm sign is going to appear in the software of the traffic agent as an escape infringement.

The scale of the system is installed near the control room.



ELEMENTS of the overwall system

- Axle weighing scale BPPEM type
- Inductive loops
- Infrared curtain, to separate vehicles
- License plate recognition camera (LPR)
- License Plate Recognition
- Traffic light with green, red or deviation.
- Central room where all the elements are coordinated.

OPTIONAL

- Barrier to stop the vehicle and address it to the waiting zone.
- Camera to take pictures in case of escape infringement.



INDUCTIVE LOOPS



LICENSE PLATE RECOGNITION CAMERAS (LPR)



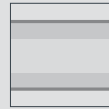
CONTROL ROOM



CABINET



DATA LOGGER DYNA B612



AXLE-WEIGHING SCALE BPPEM

Scale designed for the static and dynamic weigh, axle to axle of vehicles. It is thought for a quick and easy installation in the civil works as the scale includes a complete set, that is completely assembled and with a frame in the entire perimeter. It also includes cells, internal cabling, motion limiting and transport. Its assembly is always in-built.

The bridge is built with HEB-220 mm, and the perimetrical frame in UPN 300 mm. It has the load points outside the support area of the axle of the vehicle, to give greater stability.

The stoppers of movement are voltage barriers longitudinally or transversally shaped.



BARRIERS TO CONTROL ACCESS

The automatic, fast barriers are an ideal solution for the selection and traffic control of entrances and exits to streets; car parks etc, both for residential and industrial areas. They allow the management of quick access in public car parks, hospitals, motorways.

They are made with a reinforced steel structure with anti-rust treatment and lacquered with electrostatic dust, which offers a last duration and guarantee aesthetic characteristics.



INFRARED CURTAIN

SORTER / DIVIDER

This curtain is immune to sun. It has a height of approximately 1900mm and 3 separated areas. The nearest to the ground has a resolution of 10 mm to detect the presence of the lifted axles.

The second area has a resolution of 30 mm to detect the attachment or spear. The rest of the curtain has a resolution of 50 mm for classification.





DATALOGGER

DYNA B612



It allows the control of the traffic in real time and collects the key data of the vehicle, such as the weight of the vehicle, loads per axle and with optional mode, the distances, the speed of the vehicle and much more.

GIRWIM DYNA B612 Data Logger is a unit of processing of data specifically designed to interact with GIRWIM systems. It allows the control of the traffic in real time and collects the key data of the vehicle such as the weight of the vehicle, loads per axle and with optional mode, the distances, the speed of the vehicle and much more.

The key is to improve the processing of data and prepare the signals of the BPPEM platform to achieve a better

accuracy and weighing in low speed with the maximum reliability.

The data logger GIRWIM DYNA B612 can be easily integrated by the system integrator in its global system for an customized solution, according to the necessities of the user.

GIRWIM DYNA B612 Data Logger is suitable to be used in applications such as traffic data collection and toll collection depending on the weight.

DATALOGGER

GENERAL DATA FOR DATALOGGER

Accuracy	Static weight Low speed	% %	0.5 2
Accuracy in weight measurement	level of reliability	%	95
Measuring range (per axle)		Tons	0 ... 30
Speed range		km/h	1 ... 15
Operating temperature range		°C	-20 ... 65
Dimensions	WxHxD	mm	213x77x136
Weight (4 channels)		kg	1.5

DATALOGGER

Power		VDC	10 ...30
Consumption	24V	mA	150

OTHER INTERFACES

Communication Ethernet ports (TCP/IP)			1
Digital input channels			4
Digital output channels			4
Interface RS485			1



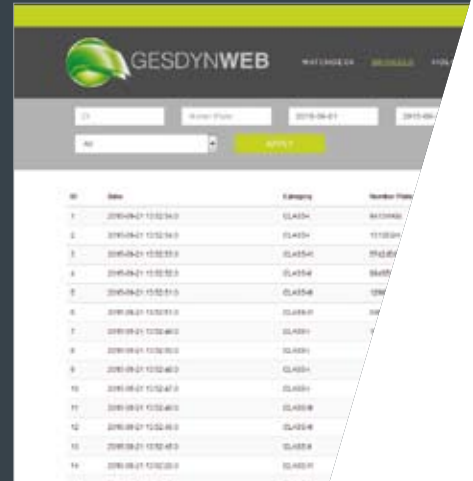
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GESDYNWEB

GESDYN WEB presents an easy and intuitive interface which concentrates all the information generated by the different systems and GIRWIM devices.



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The information is assessed on-line and immediately viewed through devices with internet access (such as mobiles, tablets, etc...).

The Web environment is consultant-oriented, traffic managers or police force.