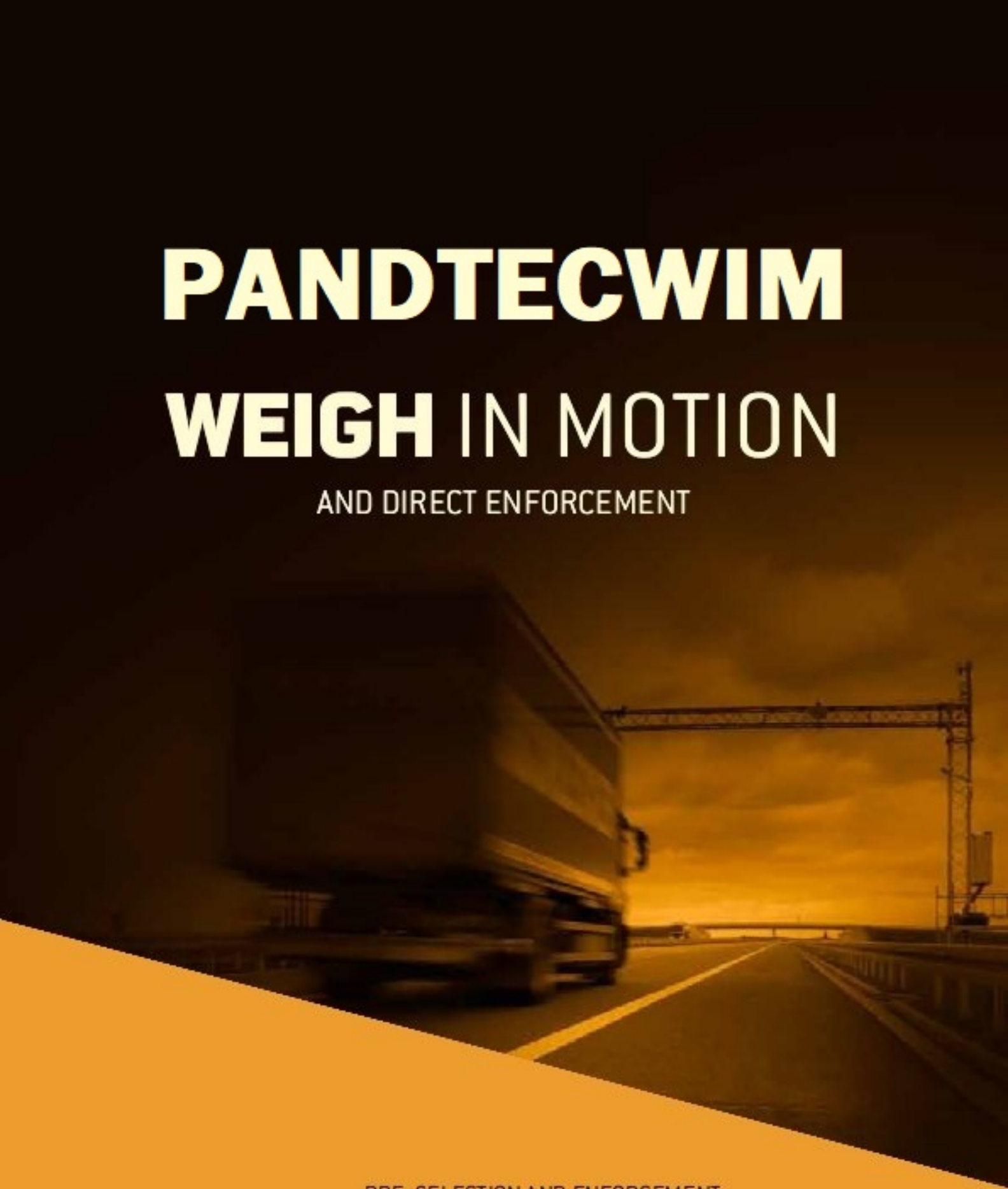
PANDTECWIM

WEIGH IN MOTION

AND DIRECT ENFORCEMENT



PRE-SELECTION AND ENFORCEMENT
WEIGH-IN-MOTION

CERTIFIED FOR DIRECT ENFORCEMENT

WEIGH-IN-MOTION AND DIRECT ENFORCEMENT

LPR SYSTEM

SIZE MEASUREMENT SENSOR

DIRECT ENFORCEMENT

PRE-SELECTION
FOR CONSEQUENTIAL OFFENSE SOLUTION ON THE SPOT

VMS

MOBILE CLIENT

PRESELECTION

CONTROL UNIT

DIRECT ENFORCEMENT

PandtecWIM is based on road sensors combined with inductive loop detection and other detection systems (LPR, size measurement). The embedded software solution of PandtecWIM enables on-line access to all system features and allows for direct enforcement.

WIM is a cutting edge high-speed weigh-in-motion system. It meets the most demanding criteria for traffic detection and dynamic weighing. WIM is used for traffic statistics, pre-selection, and direct enforcement.

The system was developed with an emphasis on accuracy, reliability, and simplicity. It is suitable for basic single lane installations as well as for complex multi-lane free-flow environments with heavy traffic.

Protects against road damage by overloaded vehicles

Helps to significantly extend the lifetime of roads and to cut repair costs

WIM is open to third party SW and HW components. It is customizable for specific applications and local conditions.

- Vehicle data (gross vehicle weight, axle load, wheel load, type/class of vehicle, vehicle speed, gap, vehicle dimensions)
- High accuracy for slow & high speeds
- Overloaded vehicle detection
- Pre-selection and direct enforcement
- Twin-tyre detection
- Monitoring of free-flow traffic on multi-lane roads
- High accuracy of vehicle classification
- User-configurable weight limits according to local legislation
- Watchdog system monitoring
- Web API for third party data integration
- SQL database

CLASSIFICATION

Standard EN 8+1

EUR 13 and COST 323

Full adaptation to specific national standards possible

Custom categories reflecting specific customer / end user needs and requirements

CONTROL UNIT

- Speed measurement range 5–250 kph
- Weight resolution of 10 kg
- Traffic intensity accuracy 98% +
- Classification accuracy 95% + (on average, depends on vehicle category)
- Ethernet interface
- Communication options GSM/GPRS, TCP/IP, Wi-Fi
- 120 GB SSD for data storage (higher capacity is an option)
- Max. cable length for loop: 300 m / WIM sensor: 100 m
- Operating temperatures
  - 0 to +30 °C (CrossWIM OEM)
  - -20 to +35 °C (cabinet STANDARD)
  - -40 to +30 °C (cabinet ARCTIC)
  - -5 to +40 °C (cabinet TROPIC)
  - -5 to +52 °C (cabinet DESERT)
- One 3U rack up to 6 lanes, 6U racks up to 12 lanes

TYPICAL **ACCESSORIES**

1

License Plate Recognition (LPR)

WIM can be equipped with a customized license plate recognition system. Measured data is made available in real time and can be used for vehicle pre-selection or direct enforcement.

2

Overview cameras

Overview cameras capture color photos or live-stream video and have night vision capability.

3

Vehicle size measurement sensor

3D vehicle size measurement sensor is a further option. The sensor is most often used for height measurement, but can also be used for a more precise speed measurement or a more accurate vehicle classification.

4

Variable Message Signs (VMS)

Variable Message Signs are mostly used in the pre-selection mode. They can display license plates, measured weight and can divert overloaded vehicles from the road.

THE MODULAR SYSTEM

WIM is designed as a modular system. According to the required precision, a corresponding layout and configuration can be selected.

STANDARD WIM SYSTEM

- 2 inductive loops per lane
- 4 **QUARTZ** sensors per lane

Double detection (weighing) of each wheel. Allows for a high precision measurement – **certified.**

- Gross weight certified accuracy **± 5%** (AVG real accuracy ± 3%)
- Speed accuracy ± 1%
- Axle base accuracy ± 2,5 cm
- Vehicle length accuracy ± 0,3 m
- Basic vehicle classification

FULL-FEATURED WIM SYSTEM

- 2 inductive loops per lane
- 4 **QUARTZ** sensors per lane
- 2 **PIEZO** sensors per lane

Double detection (weighing) using a **combination of sensors** for a high precision measurement. Also allows for speed measurement and accurate classification.

- Gross weight certified accuracy **± 5%** (AVG real accuracy ± 3%)
- Multi-tyre detection
- Axle (vehicle) width accuracy ± 10 cm
- Axle base accuracy ± 2,5 cm
- Speed accuracy ± 1%
- Vehicle length accuracy ± 0,3 m
- Advanced vehicle classification

TYPICAL LAYOUTS

ENTRY WIM SYSTEM

- 2 inductive loops per lane
- 2 **PIEZO** sensors per lane

Entry level lite version

- Gross weight accuracy **± 20%** (AVG real accuracy ± 15%)
- Indicative speed measurement, number of axles and wheelbase, vehicle length, weight per axle
- Vehicle classification

STAGGERED WIM SYSTEM

- 2 inductive loops per lane
- 2 **QUARTZ** sensors per lane

Economical layout using QUARTZ sensors
Single detection (weighing) of each wheel.

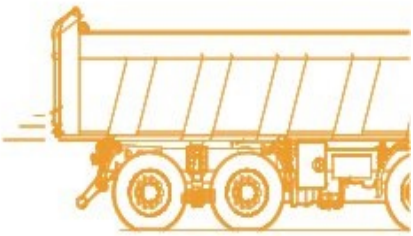
- Gross weight accuracy **± 7,5%** (AVG real accuracy ± 5%)
- Speed measurement, number of axles and wheelbase, vehicle length, weight per axle
- Vehicle classification

EXTRA WIM SYSTEM

- 2 inductive loops per lane
- 6 **QUARTZ** sensors per lane
- 2 **PIEZO** sensors per lane

Example of the **highest level** with **triple** weighing (detection) of each wheel and a combination of sensors for high precision measurement of speed, vehicle size and advanced vehicle classification.

VARIABLE LAYOUTS



SOFTWARE SOLUTION

An integral part of the system is a SW solution based on Microsoft Windows Server, MS SQL database, and a web interface that offers all key functions for system monitoring, control, and setup.

System information, real-time measured data, and also statistics are evaluated on-line and readily accessible through any internet-enabled (mobile) device.

Control Panel

- Real-time visualization of passing vehicles including LPR and overview camera snapshots
- Vehicle database access including search and filtering functions
- Detailed information of every recorded vehicle (e.g. total vehicle weight and even wheel and axle weight, overloaded indication, speed, validity of measurement)
- Traffic statistics (e.g. overloaded vehicles, classification, country of origin)
- Display of measurement protocol in case of an offence
- Data export to Microsoft Excel and PDF
- Device calibration and configuration of operational parameters
- User accounts management, database management and regional settings
- Web API for data integration
- Calibration and maintenance tools

Watchdesk

WEB INTERFACE

The main module of the web application is the so called Watchdesk. This is a console, where weighed (measured) vehicles are displayed in real-time, including an indication of their traffic offence. After that, it is possible to display all detailed information such as the number of axles, axle weight, wheel weight, wheel speed (to see if there was any turning or breaking) and a calculated measurement validity.

Violations

Vehicle browser

The web interface is designed for operation by end users (typically road administration), for system administrators or enforcement staff (e.g. police).

STATISTICS

Vehicle categories

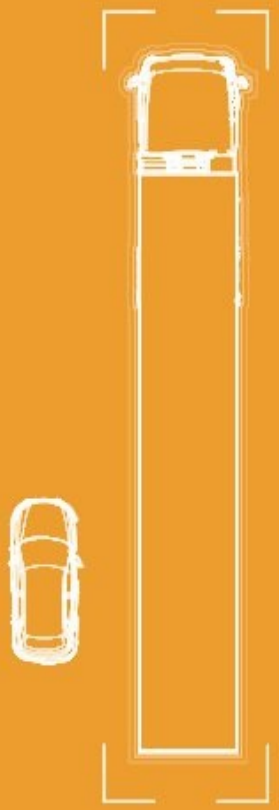
Overloaded vehicles

Weight statistics

CASE STUDY

DIRECT ENFORCEMENT

Thanks to automatic ticketing there was a substantial improvement in enforcement and prosecution of offenders. Furthermore, protection of roads from overloaded vehicle damage was achieved. This dramatically increases the lifespan of roads and leads to significant savings on repairs.



REFERENCES

Japan, Osaka
WIM on a bridge

Saudi Arabia, motorways
WIM with VMS

Korea, motorways
WIM Extra

Iran, motorways
WIM for pre-selection

Poland, motorways
WIM and vehicle size (height) measurement

Czech Republic
WIM for direct enforcement in cities of Kolín, Velké Meziříčí and Zlín

Vietnam, motorways
WIM for a tolling system

Pandtec

Road Traffic Technology