

# KISTLER

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## Effective charging solutions for overloaded vehicles

Turkey opts for weight enforcement with WIM technology from Kistler

Turkey's General Directorate of Highways of Turkey (KGM) recently decided to implement a weight enforcement system. During an initial testing phase, the WIM system from Kistler was installed at a trial site by the Mosaş Group, the system integrator. Backed by support from a team of Swiss specialists, Kistler's system delivers reliable measurement data.

#### The goal: increased road safety

Turkey's General Directorate of Highways (KGM) is keen to improve the condition of the country's roads. There were 7 300 fatalities on Turkish roads in 2016, according to the "Global status report on road safety 2018" by the World Health Organization (WHO). Although road deaths in Turkey have decreased steadily to 8.9 per 100 000 of the population in the last ten years, this figure is more than twice as high as in Central European countries. And in each year during the same period, KGM had to invest double the budgeted amount to maintain the nation's road network.

As well as controlling regular traffic, Turkey's local authorities are responsible for overseeing freight transport. They saw that a weight enforcement routine was necessary for two reasons: to reduce the accident rate, and to limit wear and tear on the infrastructure. To achieve these goals, about 100 weighing stations were installed all over the country. Every truck passing a station had to stop and wait until its weight was measured and approved.

There was no doubt that this process was necessary, but events soon made it clear that there was also potential for optimization. Traffic was slowed down dramatically because all trucks had to stop at the weighing stations. Long queues developed, causing even more potential hazards on the highways. And the weighing stations proved to have relatively short lifetimes due to the huge numbers of vehicles using them.

#### Preselection with WIM by Kistler

KGM now aims to improve this situation by implementing a preselection routine. It plans to install WIM sensors that measure the weight of vehicles as they drive over them, generating data for preselection: in future, trucks will only have to enter the weighing stations if they are above the weight limit. Fewer lorries will pass through the weighing stations, so traffic will flow more freely.

#### The Mosaş Group — an experienced partner

To prove the theory right, KGM invited various providers to take part in a test phase. Participants included the Mosaş Group, a Turkish company with over 100 employees and more than 20 years of experience and knowledge in the sector. The specialists at Mosaş provide highly reliable technology and engineering services with the focus on road and railway signaling systems, intelligent transportation systems, vehicle scales, weight measurement and size control systems, and the related software. Mosaş



High weighing accuracy (OIML R134-certified), single or dual tire detection and many more features: the WIM 5204A data logger.

set out in search of a reliable solution from an experienced partner — and they achieved both objectives when they found Kistler and its Weigh In Motion (WIM) system. The project initiated a fruitful exchange between the two companies that soon led to close cooperation.

#### Accurate weight measurements

To evaluate the participating providers, KGM set up several test sites near existing weighing stations. The location assigned to the Mosaş Group is about 1.5 km from the Akıncılar toll plaza on one of the main highways leading into Ankara, the Turkish capital. The complete WIM system includes Kistler Linesas 9195G quartz sensors and the WIM 5204A data logger. These rugged system components deliver high-precision measurements throughout long service lifetimes.

Installation of the Linesas WIM sensors in the road pavement is fast and easy. Two sensors were installed in a staggered layout on each of the two lanes. After several runs with a calibration truck, a maximum deviation of  $\pm 2.3\%$  was recorded — far below the required deviation of  $\pm 10\%$  stated in KGM's specifications. Further tests with different vehicle classes are now in progress.





Before the Kistler Linesas WIM sensor is installed, the slot has to be filled with a grouting compound. This is a 3-component epoxy resin composition, specially developed for this installation.



The grouting compound ensures a smooth road surface above the Kistler Linesas WIM sensors.

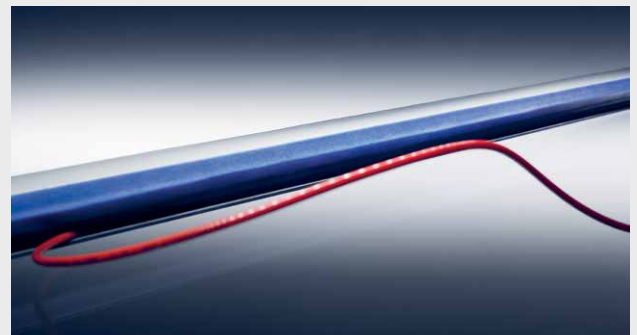
### Support from Kistler throughout the project

Kistler specialists were on site to train the integrator on the WIM system. "Kistler's support during the installation phase was ideal," in the words of Ahmet Enec, the Mosaş Group. "Field results from these products are good, and we are now going ahead to install the remaining sensors. At the same time, we are optimizing the system's performance."

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The local authorities will be visiting the site to check the system's performance in the coming weeks. If KGM accepts this pre-selection method, a business plan will be drawn up to increase the budget. And if all the requirements are met, the Ministry will decide to install WIM at all weighing stations — a step that will help to protect Turkey's highway infrastructure and improve safety on the nation's roads.



### Linesas quartz sensor for Weigh In Motion (WIM)

Linesas quartz sensors are used to measure wheel and axle loads and to determine gross vehicle weights while traffic is flowing. The sensor is installed in the road pavement and the measurement signals it provides are highly accurate.

- Quartz technology
- High measurement accuracy and long-term stability
- Compliant with OIML R134 (accuracy class D2)
- Rugged sensor design for long-term durability
- Wide measuring range
- Low- to high-speed weighing
- Insensitive to temperature fluctuations
- Installation in the road pavement is fast and easy

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