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TAKING EFFECTIVE ACTION AGAINST OVERLOADED COMMERCIAL VEHICLES

The KiTraffic Digital Weigh In Motion (WIM) system is improving commercial vehicle overload inspections in Switzerland

The KiTraffic Digital Weigh In Motion (WIM) system: innovative Lineas sensors are installed directly in the road surface to allow accurate measurements at speeds from 10 to 130 km/h.

Swiss police in the canton of Thurgau are using the latest KiTraffic Digital Weigh In Motion (WIM) system from Kistler to boost the efficiency of their commercial vehicle overload inspections. This solution offers high accuracy combined with a comfortable user experience – making work easier for the officers at the Kefikon station as well as helping to improve road safety.

Switzerland's unique landscapes make it a magnet for tourists – but it is also an important industrial nation and transit country located in the very heart of Europe. The Blue Banana – a corridor of highly developed Western European agglomerations stretching from northern England to northern Italy – runs directly through Switzerland. The Swiss have built countless tunnels to cut down the time lost when traversing the Alps. Most notable among them is the 57-km Gotthard Base Tunnel, the world's longest railway tunnel. However, a large proportion of freight is transported by road, and the problems caused by this heavy commercial vehicle traffic are escalating. Truck numbers are rising year on year, and the vehicles are becoming heavier as time goes on. What's more, many of them are overloaded – so they not only increase the traffic risk but also cause excessive damage to the roads.

To combat these problems, the Swiss police regularly carry out commercial vehicle overload inspections on behalf of the Federal Roads Office (FEDRO). According to FEDRO statistics, a total of 124,783 trucks, articulated lorries, delivery vans and buses were inspected in 2023. These checks resulted in 24,240 complaints and in 4,775 cases, the vehicles were immobilized or prevented from continuing their journey.

The most accurate Weigh In Motion system on the market

What is the most effective way to support the police in their day-to-day work? And how can commercial vehicle overload inspections be made more efficient? In 2021, a Weigh In Motion (WIM) measuring point was set up near the Kefikon motorway rest area as part of a pilot project. This technology makes it possible to acquire sufficiently accurate measurements of the axle load and total weight of vehicles in traffic flowing at normal speeds (from 10 to 130 km/h). KiTraffic Digital, Kistler's latest WIM system, went into operation for the first time at Kefikon. Thanks to innovative sensor architecture and a fully digitalized measurement chain, KiTraffic Digital achieves class F5 accuracy as certified by OIML (the International Organization of Legal Metrology, which is the global institution for legally binding measurement technology standards). This means that vehicle weights and axle loads are recorded with a deviation of less than 2.5 percent – making KiTraffic Digital the most accurate Weigh In Motion System available on the market anywhere in the world.

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>
> **Ulrich Gloor, Head of Traffic and Lake Police in the canton of Thurgau**

High-precision acquisition of weight data plus efficient operation

Ulrich Gloor, Head of Traffic and Lake Police in the canton of Thurgau, reports: "Kistler approached us and presented an idea that appealed to us. Then Kistler planned and implemented everything precisely, and set up a solution for us that works." The Lineas Digital sensors are installed together with a numberplate camera (ANPR – Automatic

Ulrich Gloor, Head of Traffic and Lake police in the canton of Thurgau, is convinced by the KiTraffic Digital Weigh In Motion (WIM) system: he is delighted because efficiency is improved and officers' workloads are reduced.

Commercial vehicle overload inspections in free-flowing traffic: thanks to their 60 individual sensor elements, Kistler's Lineas Digital sensors capture vehicle weights and axle loads with utmost accuracy.

Number Plate Recognition) at a sufficient distance ahead of the rest area. They are used for preselection: suspect vehicles appear immediately on the officers' tablets, where the Kistler Checkpoint software clearly displays the vehicle image, numberplate and weight data.

At the rest area, the axle loads and total vehicle weights of suspicious trucks are checked again with static scales; at the same time, they are inspected for length and excess width. Andreas Keller, Head of Traffic Monitoring at the Traffic and Lake Police of the canton of Thurgau, emphasizes: "Commercial vehicle overload inspections are particularly important because they play a key part in road safety. Overweight vehicles have a longer braking distance and a longer stopping distance, so they put all other road users at risk."

Successful calibration and system expansion

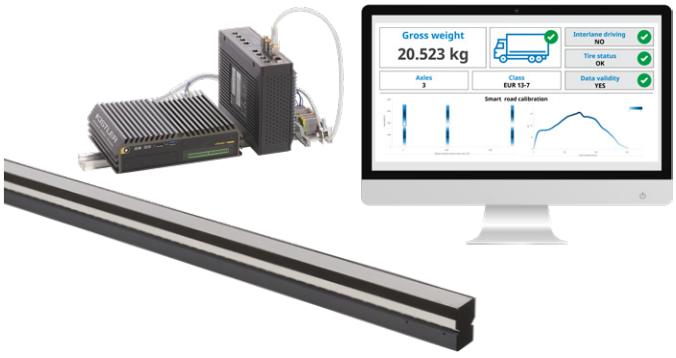
The Weigh In Motion System at Kefikon was initially set up on one lane in 2021 and following calibration, was certified by METAS, the Swiss Federal Institute of Metrology. "Many calibration runs were necessary for the certification so the system could be calibrated for all possible speeds, vehicle types and lane positions," says Ingrid Sagorz, Product Manager Traffic Solutions at Kistler. "We then ran an extensive test program together with METAS to determine and document the accuracy of the weight measurement." This is because Switzerland has a highly complex system of regulations for commercial vehicle overload inspections: depending on the vehicle category, structure and registration, different limits apply for total weight and axle loads. The local officers are ultimately responsible for deciding which vehicles to select and check again for possible fines.

Then in 2022, the next step was to install the KiTraffic Digital Weigh In Motion (WIM) system in the opposite direction. This was followed in May 2024 by the installation of Lineas Digital sensors in the second lane and on the hard shoulder, increasing the total number of sensors per direction of travel from 8 to 20. "The result is that we attain a very high level of accuracy for dynamic weight measurement – a level that has never been achieved anywhere else in the world," Sagorz points out.

All that is actually missing is the measurement between the lanes – for example, when drivers change lanes (interlane driving). Kistler is currently working on this new feature. This is another reason why a comprehensive re-certification of the system by the OIML is scheduled for 2025.

With the successful pilot project in Kefikon as the starting-point, the KiTraffic Digital Weigh In Motion (WIM) system has spread throughout the world in recent years. As of today, over 150 Lineas Digital sensors have already been installed – not only in Europe, but also in the USA and Brazil. With the appropriate local certification, direct enforcement of weight violations and other traffic violations such as tire pressure (where appropriate) is possible in addition to preselection.

Andreas Keller concludes with this summary of the benefits at the Kefikon site: "The hit rate for commercial vehicle overload inspections is higher thanks to the system, because we can perform explicit and more specific checks on moving vehicles that are too heavy." And Ulrich Gloor adds: "Technology will have to give us increasing support with our work and in this context, I can imagine that we'll be able to certify the system so we can automate law enforcement – especially in the low-threshold range – in a similar way to speed checks."



With OIML-certified accuracy of ≤2.5 percent of total vehicle weight, the KiTraffic Digital Weigh In Motion (WIM) system is the most accurate WIM solution available on the market.

Would you like to learn more about our applications? Explore now:

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