# Static/Dynamic Wheel Load Scale WL 104

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|---|---|
| **Application** | Weighing of wheel and axle loads of vehicles with pneumatic tyres in static mode or weighing in motion up to 20 km/h (LS-WIM). Two or more scales may be lined up to a seamless weighing strip. |
| **Operating modes** | static: 2 weight values per second. dynamic: After the wheel has passed the scale, its weight, velocity, foot print length and axle spacing are calculated and sent. |
| **Ranges** | 0...10t per scale |
| **Speed range** | 0...20 km/h |
| **Temperature range** | -20...+60°C |
| **Accuracy** | static: OIML No. 76 Class 4, dynamic ±0.5%. Optionally with HAENNI works test report or intended for official test. |
| **Errors due to external factors** | static: small external errors. dynamic: up to 10 km/h additional errors in the range of ±2 to ±5% may occur due to vehicle oscillations. Up to 20 km/h even ±10% are possible. |
| **Execution** | Aluminium alloys, water resistant IP 65 (IEC 144). |
| **Supply** | DC 12V |
| **Interface** | CANopen |
| **Electrical connection** | Plug |
| **Weight** | 20 kg |
| **Platform height** | 17 mm |



## Selection Chart

| Ordering example: | WL 104 / 4 1 1 . 1 1 1 | / 10Y | / . . . . |
|---|---|---|---|
| **Temperature range and standard** | - 20 . . . + 60°C<br>OIML No. 76 Cl.4 **4 1 1 . 1 1 1** | | |
| **Ranges** | 0 . . . 10t | **10Y** | |
| **For official test** | The ordering code is determined after the approval procedure | | |

## Operation

Because of its light weight, the wheel load scale WL 104 is easy to transport and can be used at any time without the need of ramps. Measurements are made on firm and level ground using levelling mats to ensure that all wheels of multiple axle systems are on the same level. As an alternative the scales may be placed into a recess in the pavement. The depth must be the same as the height of the scale to ensure that the platform surface is perfectly level with the pavement. Preferably the specially designed mounting frame is used.

In the normal case two scales are used, one for the left, the other for the right track of the vehicle. The platform size is large enough so that the driver encounters no problems to pass the scale within the active area. Another possibility is to line up three or more scales to a seamless weighing strip across the lane. This configuration enables to measure easily heavy haulage vehicles having different tracks compared to the pulling vehicle. In case that the scales are used for pre selection only, it is possible to work with one scale only measuring one side of the vehicle. The full weight is determined by doubling the results. Additional errors up to 5% may occur.

There is no display on the scale. The measured values are accessible via the interface. The further processing, visualisation and printout is performed by a connected personal computer with the processing software EC 200.

## Official Test

The wheel load scale WL 104 complies with all relevant standards for an official approval.

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## Dimensions
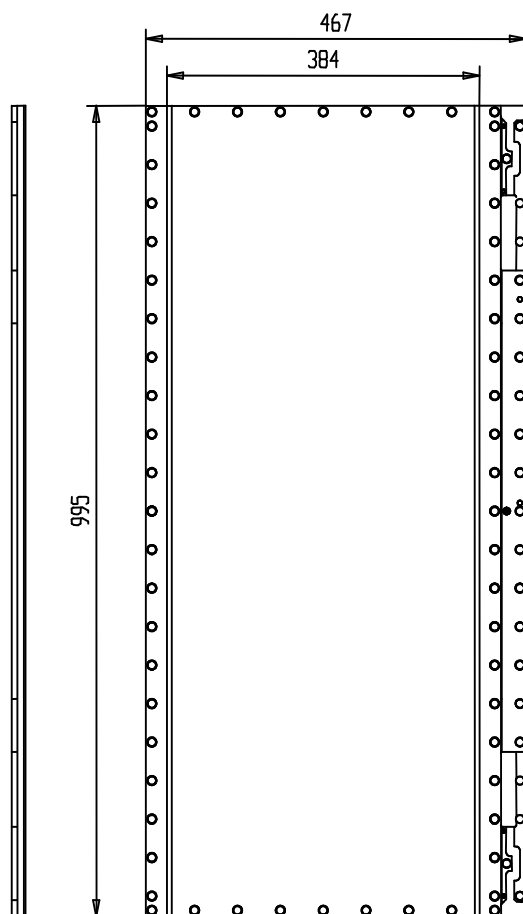


## Construction and Function

The wheel load scale WL 104 comprises of a flat weighing platform with integrated electronics sending the results onto the data bus.

The measuring system in the form of a grid of tubular sensing elements is mounted between the base and the cover plate of the weighing platform. Each element changes its resistance proportionally to the applied load. The resulting signal is amplified and converted to digital.

For compensation of all kind of temperature effects the platform is equipped with a temperature sensor.

The signals of the measuring system and of the temperature sensor are processed by the micro controller. It calculates the weight and, in the dynamic mode, also the speed, the foot print length and the distance to the preceding axle. These values are accessible via the data bus.

A self test routine is activated at switch on of the scale and the weight is set to zero. In service the weight is kept at zero automatically as long as the platform is not loaded, so there is no need for an external zero setting device.

The weighing mode (static or dynamic) is selected by configuring the firmware Accordingly. If the static mode is selected the actual weight is calculated twice per second and sent via the data bus. In the dynamic mode the weight and the speed are calculated and sent together with the foot print length, the axle spacing and the time of the measurement.

Depending on the type of the used processing unit different output is possible. In the minimum configuration only the weight is indicated on the display. A full evaluation comprises of automatic classification and weighing of the vehicle including the determination of additional values.

## Technical Data

| Range | | 0...10 t |
|---|---|---|
| Speed (dynamic weighing) | | 0...20 km/h |
| Division | | 50 kg |
| Accuracy static weight[2] | at first calibration | ±25 kg (up to 2,5 t) |
| | | ±50 kg (2,5 t...10 t) |
| | in operation | ±50 kg (up to 2,5 t) |
| | | ±100 kg (2,5 t...10 t) |
| Accuracy dyn. weight[3] | at first calibration | ± 0.5 % of the measured weight |
| | in operation | ± 1 % of the measured weight |
| | speed | ± 2 km/h |
| Loading limit | | 15 t |
| Permissible load per area | | 12 kg/cm2 |
| Loading limit per area | | 24 kg/cm2 |
| Operating temperature | | -20°C .... +60°C |
| Storage temperature | | -30°C .... +60°C |
| Electromagnetic susceptibility | | according OIML No. 76 1) |
| Zero tracking, test etc.. | | automatic according OIML No. 76 1) |
| Type of protection (IEC 144) | | IP 65 |
| Overrunable | | completely overrunable incl. cable |
| Operating site | | Firm and level ground, max. 10 mm bend through, max. 5% slope (≈3°) |
| Active surface | | 995 x 384 |
| Over all dimensions | | 995x467x17 |
| Power supply / consumption | | DC 11.5...16V / 1.5W @12V |
| Interface | | CANopen |

1) OIML is the abbreviation for Organisation Internationale de Métrologie Légale.
2) The given values are intrinsic errors (difference between the measured weight and the real applied load) Additional errors in the range of 1...3% may occur depending on various external factors: quality of the levelling, of the site and of the vehicle. Refer to paper P1196.
3) Same as 2), but 2 to 5% for speeds up to 10 km/h. at higher speeds up to 20 km/h even 10% are possible!