

Friction meter TWO

MACHINE SPECIFICATION



Month/year: 09/2015
Part: TWO
Version: 4.0

Weight:

TWO measuring device	75 kg
Vehicle installation	20 kg
Axle load on reference wheel	120 kg
Axle load on measuring wheel	60 kg

Dimensions:

Total length	1089 mm
Total width	534 mm
Total height	565 mm
Ground clearance during transport	300 mm
Axle base	450 mm

Measurement principle:

Type:	Fixed-slip
Slip percentage	17.8%
Slip ratio can be changed if necessary.	

Description:

The Traction Watcher One is a **measuring device** used for continuous measurement of road surface friction. It has a simple and robust design and is affixed to the vehicle on a standard tow bar with four fixing points. The connection plate has two quick locks with safety device. There is also a safety hook.

Motion from the transport position (raised) to the measuring position (lowered) takes place by means of an actuator which is controlled from a PC or a switch on the front of the junction box on the friction meter itself. The connection plate holds two brackets which in turn hold shock absorbers and suspension. The strong support frame holds the chain box and the wheels.

Data box in vehicle:

This is a programmable "Data Acquisition System" installed in aluminium housing.

It provides the interface and connection for all the sensors and additional equipment designed for use with the TWO friction meter.

Power transmission:

The TWO uses a well-dimensioned chain for power

transmission. This is required to create a precise slip value from the forward reference wheel to the rear measuring wheel.

The chain is used to < 10% of nominal capacity.

Speeds:

Transport speed:	Speed of the vehicle
Measuring speed:	5 -110 km/h

Weight calibration:

The measuring instrument should be weight calibrated annually to ensure maximum accuracy of measured values.

Load cells:

The TWO uses two load cells. Both comply with the OIML and NTEP EN standards. Load cells can also be supplied in accordance with:

EEx ia IIC T6 level of European approval. The load cells are used to < 20% of nominal capacity.

Operating the TWO using the PC in the vehicle:

- Press the Start button. The measuring device lowers itself onto the road and applies itself at the set ground pressure.
- Press the same button " Stop" button. The measuring device stops measuring and raises itself to the transport position. A measurement file is stored in the report database.

Measuring modes:

1. Measurement – full ground pressure. Green background colour. (Only option on airport.)
2. Inspection – 30 kg ground pressure. Yellow background colour. Automatically switches between 30 and 60 kg ground pressure.
3. Spot measurement – set to an interval from 1 km up to 10 km. between each measurement (60-70 m.) site.
 - Speed is displayed in whole km/hour units.
 - Friction values are shown on a graph. A new value is plotted once every 10 m.
 - Average friction since start of measurement is shown



Please contact us for further information.

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Measurement accuracy:

Does the measuring device have control over the weight on the measuring wheel? Or is it assumed that there is the same weight on the measuring wheel when driving as when stationary?

Yes, we have control. Because the measuring device records both the weight on the wheel and the tension in the chain at the same time. The collection frequency is 100 Hz. The average of these 100 measurements per second, i.e. the friction value, is plotted on the friction graph once every 10 m.

Database storage of data: Why is this done? Would it be possible to perform searches on all data collected for a stretch of road over a day, week, month and season?

Yes, because it is then possible to carry out statistical searches.
Yes.

FTP logging:

Can data be transferred and made immediately available to several users at the same time?

Yes, Olsense Technology offers FTP storage of data. All data is thus made available to a number of users immediately after loading.

Other expenses:

Is the measuring device dependent for its function on receiving a speed signal from the measuring vehicle in order to function?

No, no expenses for this.
We have our own decoder/pulse counter integrated into the measuring device to record the speed.

Installation 1:

What sort of installation costs are we talking about to fit your friction meter to a measuring vehicle?

If an Olsense recommended workshop carries out installation on a vehicle, this will take 18-24 working hours. This depends on how much installation needs to be done, the vehicle model and how much has to be moved/changed before fitting can begin.

Installation 2:

Can you fit and install the friction meter to the vehicle yourself?

Yes, if you wish you can carry out the fitting yourself. You will find diagrams and information describing this in the instruction manual. Check / be aware of national authority requirements to vehicles.

Summer measurement airport:

Includes a self wetting system that provides water in front of the measuring wheel, and provides a uniform depth of 1 mm in full width in front of the ASTM E 1551 measurement wheel.

Will the waterflow take care of different speeds?

The self wetting system provides sufficient and correct waterflow for all the required speeds.

For 40 mph, or 65 km/h. and

For 60 mph, or 96 km/ h. (Speed dependent supply.)

Additional equipment:

Can the following equipment be fitted to the measuring device?:

- Camera
- Ground temperature sensor
- Air temperature sensor
- Humidity sensor?

Yes, and in addition all data collected will be:
The images will be implemented in the log.
Ground temp: will be displayed in the report.
Air temperature: will be displayed in the report.
Dew point: will be displayed in the report.
Together with the friction curve or separately.

Training and Warranty:

Is training included? If so, how much?

On airports, the training material includes a separate chapter with focus on the FAA Advisory circular AC no: 150/ 5320 12C.

8 hours' delivery/training for operators and service personnel is included. 12 month warranty is included in our terms and conditions. If necessary we will offer and provide additional training for the operators.



airport



road



railway



TWO CFME technical build up:

The TWO is connected to car or trailer, mechanically with a quick connection QC system.

The QC system, provides an easy on and off installation. It enables operators to take off or put on the TWO measurement unit in 5 minutes.

The TWO QC geometry is the same whether you install on a car or on a trailer.

There is a Harting connector on a cable that connects the TWO measurement unit to the cars- or the trailers, cable connector.

The car or trailer connector, that meets cable from TWO unit, is to be preinstalled by authorized personell.

It is a part of the car / trailer installation, made prior to TWO CFME dealer's delivery to the end user.

The opposite ends of these cables are prepared with connectors, to fit to the DAS connection box.

The Data Aquisition System (DAS) connection box is collecting data from the friction sensors and all applicable extra equipment through the cables, and connectors described above.

The operation computer is connected to the DAS system with a single USB cable.

We learned over the years that when logging data at a 100Hz collection speed, that any other data communication will sooner or later, fail due to different reasons.

TWO CFME Computer operation.

The TWO operation and setup program is developed for Windows software. All previous versions of windows apply, except windows RT or windows mobile. (At this moment.)

The TWO CFME operator is monitoring and controlling activities, during friction measurement, with a single data collecting screen on the, touch screen computer. All push buttons, you should need to operate, are placed on the right side of the screen for easy access with your right thumb, while your hand is supported the edge of the computer screen frame.



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airport



road



railway



TWO CFME:

TWO CFME is approved by FAA for both maintenance and Operational purposes.

Maintenance friction measurement: Summer measurement.

Maintenance friction measurements are performed during summer season.

Measurement performed to establish whether:

- The runway friction is within applicable law and safety guidelines.
- Maintenance on runway is required, to meet requirements during wet surface conditions.

Main reason for poor surface friction, are the polishing of the surface caused by rubber build up from aircrafts landing on the runway, and surface painted areas.



Operational friction measurement: Winter measurements.

Operational friction measurements are performed during the winter season.

Why do we perform these measurements?

Basic questions would be: How good is the runway grip- right now?

After measurement and knowing this answer:

- You are able to decide perform correct spreading actions with deicing chemicals.
- Be able to keep your airport open for air traffic Because you can give:

- Adequate and reliable information to the ground control.

Remember to check friction after the remedying actions.



TWO Water system:

The optional water system is speed dependent selfwatering system.

We add sufficient water to simulate wet surface condition, it will apply an adequate water amount, to give similar properties that you would find, on the measurement surface during rainy weather.

The water measurements is a must, to obtain correct data, and be able to analyze maintenance status of the infrastructure surfaces.

With the data collected, with this attachment, you can compare your surfaces up against regulating protocols. The water system is an integrated part of the TWO CFME system.

The water container is either, carried onboard CFME vehicle or onboard TWO CFME Trailer.

TWO water system is a completely automated system. TWO water system, includes a separate water pump, and electrically operated and computer controlled water valve.

The TWO water flow is speed dependent, and is at all times within protocol specifications.

Before a measurement season (In TWO program, setup menu)

- Operator has to choose airport :) 1.00 mm height on water film*, and automated operation.



*For road measurement: 0,50mm height on water film will apply, to meet current Road authority requirements.