

# PEGASEM P300 Series

## Test Unit for Vehicle Brake and Acceleration Performance

### P340 / P330 / P320



The PEGASEM P300 Series has been developed for brake and acceleration performance tests of vehicles using a 5<sup>th</sup> Wheel or other sensors which create distance pulses. Besides its basic function as a control unit, the P300 System incorporates data acquisition capabilities, sensor preamplifiers and a sensor power supply.

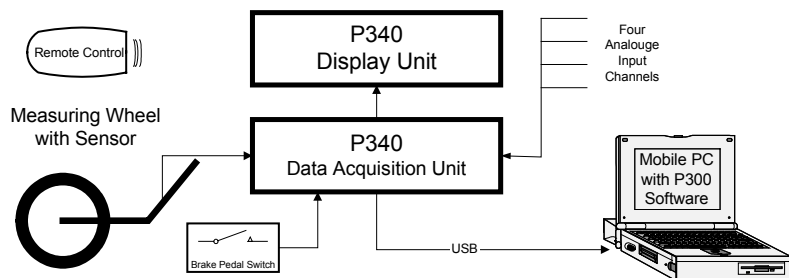


Data can be transferred and stored on a mobile PC via a USB interface. The MS–Windows<sup>®</sup> software calculates all necessary information to carry out brake tests according to various international regulations. Results are displayed in tabular and graphic format immediately after the vehicle stops. Data can be further examined using standard software packages (e.g. MS-Excel<sup>®</sup>). The PEGASEM P340 coupled with the PEGASEM 5<sup>th</sup> Wheel form a flexible and competitively priced system for approval and homologation tests e.g. per

- ECE-R13 Approval Of Vehicles With Regard To Braking
- ECE-R89 Speed Limiting Devices (SLD / ASLD)
- ECE-R90 Replacement Brake Lining Assemblies
- DIN70028 Measuring The Stopping Distance With ABS
- FMVSS121 Air Brake Systems
- FMVSS135 Light Vehicle Brake Systems

## Components of the P340 Brake Tester

- Data Acquisition Box
- Windows software for brake testing of vehicles
- Driver Display Unit
- Remote Control Unit
- Brake Pedal Switch



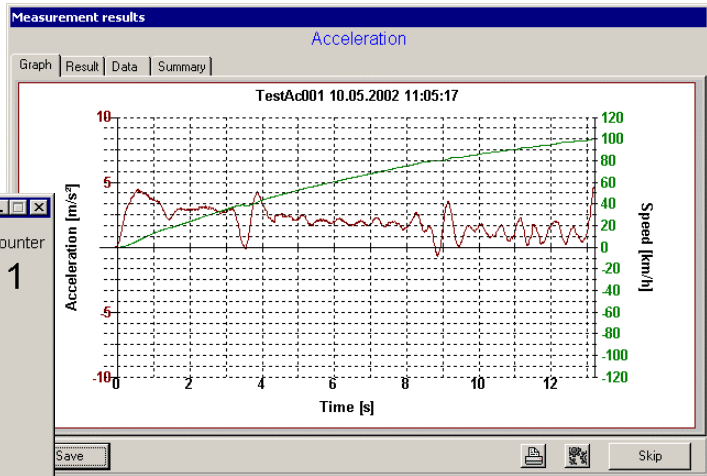
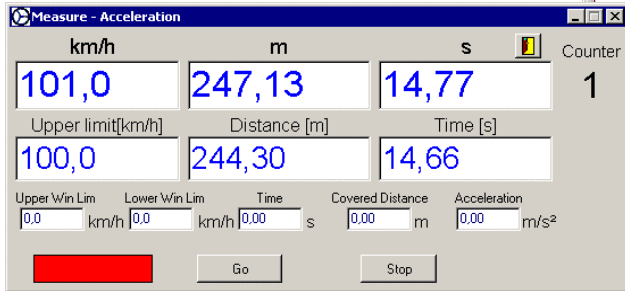
## Features

- Pulse-based Speed Input Channel for connection to any speed pulse transducer e.g. a 5<sup>th</sup> Wheel
- 4 Analogue Channels with differential inputs
- Full Scale Input Range from  $\pm 20V$  to  $\pm 20mV$
- Software controlled input amplifiers
- 5V and 12V Sensor supply
- Supported sensors include voltage output type sensors, current loop sensors, pressure sensors, force sensors, acceleration sensors and temperature sensors.
- Brake Measurement can be triggered by either:
  - o External brake pedal switch
  - o Vehicle stop lights
  - o PEGASEM brake pedal force transducer
  - o Software controlled trigger level on any of the 4 analogue input channels

# Operating Modes

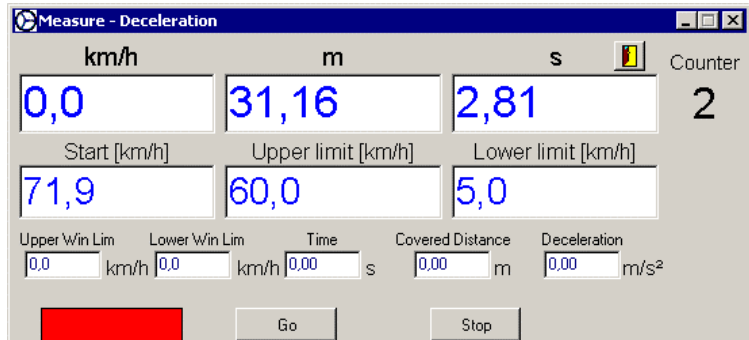
## Acceleration and Flexibility Test

Time, distance and average acceleration are measured from zero to a pre-selected speed. If the starting speed is selected as a non-zero value, a flexibility test can be performed.

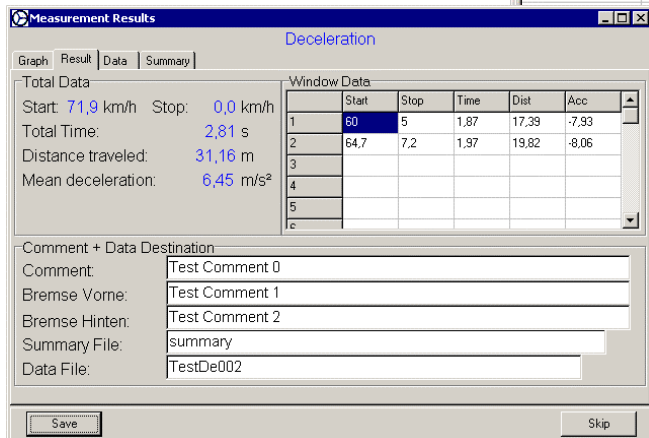


## Deceleration Test

This mode is suitable for brake, tyre, and coast down tests. Initial speed, stopping distance, stopping time and Mean Fully Developed Deceleration (MFDD) are recorded over the full braking cycle and simultaneously between two selectable speed windows. Measurement is triggered manually, by the stoplights, by reaching a trigger level on one of the analogue channels or by a brake pedal switch which is included with the system.

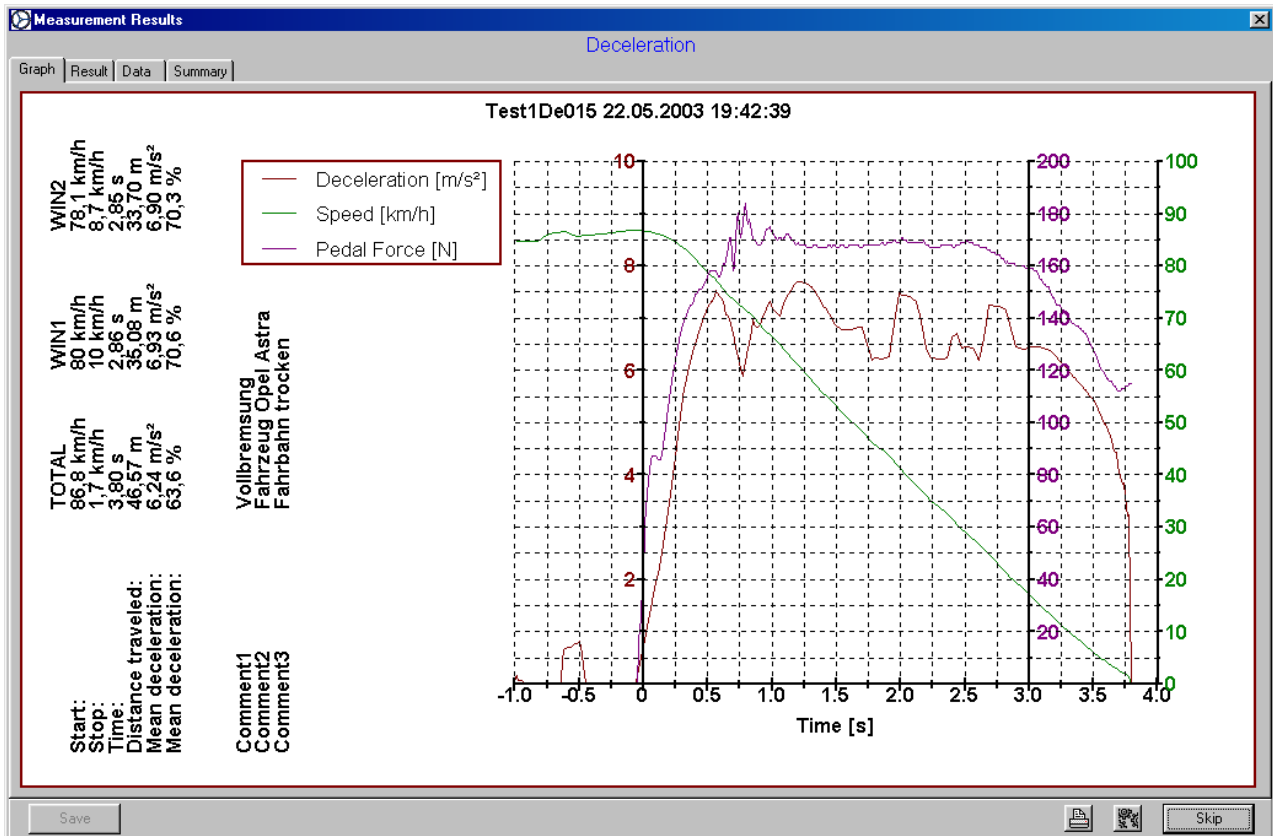


t	v	v_sm	a	a_sm	s
2,37	12,73	12,63	9,22	8,79	30,474
2,38	12,07	12,29	9,60	9,01	30,507
2,39	11,82	11,94	9,46	9,01	30,540
2,40	11,63	11,62	9,13	9,04	30,572
2,41	11,15	11,30	8,74	9,08	30,603
2,42	11,06	10,97	9,10	9,08	30,646
2,43	10,55	10,61	10,01	9,11	30,675
2,44	10,42	10,28	9,13	8,88	30,703
2,46	10,00	9,94	4,76	8,86	30,759
	65	9,57	10,22	8,86	30,772
	24	9,16	11,38	9,06	30,798
	84	8,83	9,25	9,02	30,822
	65	8,47	9,93	9,06	30,845
	35	8,11	10,17	9,15	30,868



The MFDD is calculated in accordance to procedure ECE-R13 and ECE-R90 using the following formula:

$$d_m = \frac{v_b^2 - v_e^2}{25.92 \cdot (s - s_e)}$$



Printout of a Brake Test on a Passenger Car

## Combined Acceleration and Deceleration Test

After performing an acceleration test from zero and reaching a predefined speed, a brake test will be executed immediately during the same test run.

## Fade Test (Hot Brake Test)

In this mode, before the final deceleration test is carried out, several repetitive brake cycles have to be performed within a given time frame to warm up the brake system. The P300 System automatically records every cycle as described in the section: *Deceleration Test*, and guides the user through the sequence by visible and audible signals. The selectable test schedule, the automatic speed trigger and the audible feedback allow the driver to concentrate on the road, performing the runs without help from a second person.

**Measure - Fading**

km/h      m      s

0,0      24,60      2,46

Start [km/h]      Upper limit [km/h]      Lower limit [km/h]      Cycle

69,9      56,0      7,0      4

Upper Win Lim      Lower Win Lim      Time      Covered Distance      Deceleration      Max. Cyc.

56,0 km/h      7,0 km/h      1,58 s      13,67 m      8,66 m/s<sup>2</sup>      4

Go      Stop

**Fading Setup**

**Fading Parameters**

Fixed       Variable

Upper limit: 60\_ km/h      90\_ %

Lower limit: 30\_ km/h      10\_ %

Trigger: 65\_ km/h

Number of Brake Cycles: 20

Additional final measurement

Final Measurement Parameters

Fixed       Variable

Upper limit: 60\_ km/h      80\_ %

Lower limit: 30\_ km/h      10\_ %

Trigger: 65\_ km/h

OK      Cancel

## Wheel Size Calibration

The wheel size is calculated automatically by driving along a test track with a known length. This data is stored for future measurements.

An optionally available light barrier, with two stationary reflectors at the roadside, will conveniently recalibrate the wheel when the vehicle passes the reflectors.

## Exporting Data to MS-Excel®

All data is sampled 100 times per second and recorded by the P300 software in tabular format. Spreadsheet programs such as MS Excel® and other data analysing software can import this data. This gives the user access to all test details and calculated test results for further processing according to their specific requirements. Examples for post processing include statistical comparisons of test runs, and data links to customised documentation forms.

## Special Versions

### P330

Offers all functions as described above but without Analogue Inputs. The P330 is designed for measuring distance, speed, deceleration, acceleration and derived values.

### P320

Same as P330 but excludes the Driver Display and Remote Control Unit. The laptop screen is used for displaying all information.

## Accessories

### Measuring Wheels

- 5<sup>th</sup> Wheel Standard 20"
- 5<sup>th</sup> Wheel Eco 20"
- 5<sup>th</sup> Wheel 12"
- 5<sup>th</sup> Wheel Mini 6"

### FMS Universal 5<sup>th</sup> Wheel Mounting System

- Mounting Set for towing lugs used on passenger vehicles
- Clamp for the ball shaped trailer hitch
- Flange adapter for trucks
- Rod and tube adapter
- Clamping Adapter for the 2" receiver on US vehicles
- H-Adapter with suction cups
- H-Adapter with magnets

### Miscellaneous

- Interface cable (5m, 10m or 20m) to connect 5<sup>th</sup> Wheel Sensor to P3xx
- Pedal Force Sensor PFS1000
- Reflective Light Barrier