

AccMARK 1.0 Light

User manual

Introduction

Congratulations to your choice of performance meter. AccMARK is a versatile and flexible solution for most needs in accelerometer based performance measurements. The basic operation of AccMARK is given in this manual.

Performance of a vehicle is often measured by taking the time it takes to accelerate between two speeds or the time it takes to run a distance. AccMARK performs this measurement by measuring time and the acceleration of the vehicle. To do this it uses a solid state accelerometer, GeeSENS, and a computer where the speed of the vehicle is calculated from the acceleration data.

AccMARK can measure the time between any interval within 0-300 km/h and any distance up to 1000m.

Disclaimer

This product shall not be used on public roads. Operation of the product shall not be done by the person driving the vehicle measured. Sinit will not be held responsible for any accident or malfunction of the product or computer it is run on howsoever caused when using this product.

Installation instructions

This section describes how to install AccMARK on your PC, mounting instructions for the accelerometer module GeeSENS, and how to connect GeeSENS to your PC by the serial interface.

Before performing performance measurements, the AccMARK software and appropriate GeeSENS accelerometer module have to be properly installed and mounted. Step-by-step installation instructions are given below. The requirements on the PC are listed in the technical specifications at the end of this instruction.

1 Installing AccMARK on your PC

AccMARK software is distributed as a self-installing file. Run it and follow the prompts to allow it to install itself. Note that you must install AccMARK on your PC's hard disk; it will not run properly if you try running it from a CD or floppy disc. After a successful installation AccMARK is launched by double-clicking the AccMARK icon on the desktop. For your convenience you may install AccMARK Light on multiple PCs.



2 Installing GeeSENS in your vehicle

AccMARK is always used in combination with a proper choice of accelerometer module. The GeeSENS accelerometer must be placed firmly attached to a horizontal surface in the vehicle and it must be facing in the proper direction with the arrow on the top of the case pointing in the direction the vehicle will move. If the GeeSENS is not placed correctly all measurements will be showing incorrect values.



3 Connecting GeeSENS to the PC

GeeSENS is connected to the PC by the RS232 serial interface.

Verifying your installation

Once the three steps above have been performed, AccMARK is ready for performance measurements. For your convenience AccMARK allows communication with GeeSENS using any of the COM-ports, as well as running in a "no-GeeSENS" mode; See the instructions for the AccMARK settings window how to configure the COM-port.



Program overview

MAIN WINDOW

SAVED RUNS

AccMARK Light 1.0

Stored runs

040917 Fri 12:17	k9
040917 Fri 12:14	
040915 Wed 19:57	
040915 Wed 20:01	
040915 Wed 20:16	
040915 Wed 20:23	
040915 Wed 20:31	
040915 Wed 20:41	
040915 Wed 20:47	
040915 Wed 20:52	
040915 Wed 21:01	
040915 Wed 21:10	
040915 Wed 21:15	

New run

0-100 km/h

201 m

492 m

1000 m

Other interval

Settings...

About...

Quit

Start (km/h) 0.00

End (km/h) 131.13

Dist (m) 201.0

Time (s) 9.38

Max acc (g) 1.23

Tilt (° @ g) 2.8 @ 1.0

View graph

PRESET INTERVALS

Enter interval

A Distance (1-1000 m) 0

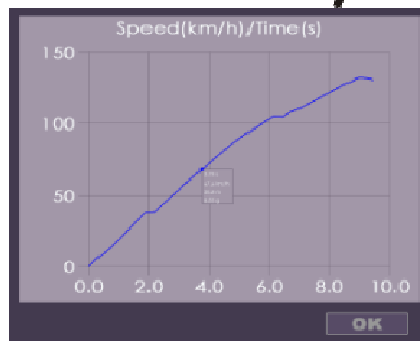
C Speed interval (0-300 km/h)

From 0

To 0

Cancel OK

GRAPH WINDOW



Enter settings

Local g-force 9.84

Trigger g-force 0.20

Suspension tilt angle 2.8 at 0.7 g

Reset

GeoSENS port

- COM1
- COM2
- COM3
- COM4
- No GeoSENS

Calibrate GeoSENS

OK

RUN WINDOW

Distance (m)

12.0

Time (s)

2.32

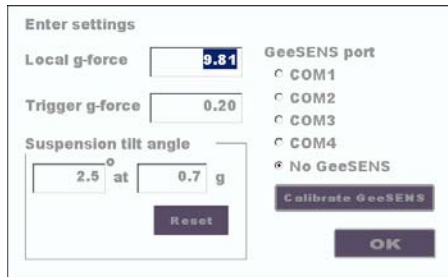
0 km/h 100 km/h

Restart Cancel

Main window



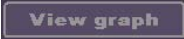
- Settings – the settings dialog appears



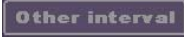
-
- Local g-force – Earth gravitation constant. Default value 9.81.
- Trigger g-force – A minimum acceleration is needed in order to trig the AccMARK. Default value is 0.20g.
- GeeSENS port – Select the proper COM-port for your computer, or run it in a “no-GeeSENS”-mode. In the “no-GeeSENS”-mode a constant acceleration of 0.5g is used (for validation of your software installation).
- Calibrate GeeSENS – Used to calibrate your GeeSENS to the AccMARK software. Do this on installation of software updates or changing hardware, and at the beginning of the racing season.
- OK – To confirm your settings.
- Suspension tilt angle – This is a critical parameter for accurate performance measurements. The default value corresponds to a typical street car.
- About... – Gives information about software version and GeeSENS serial number.

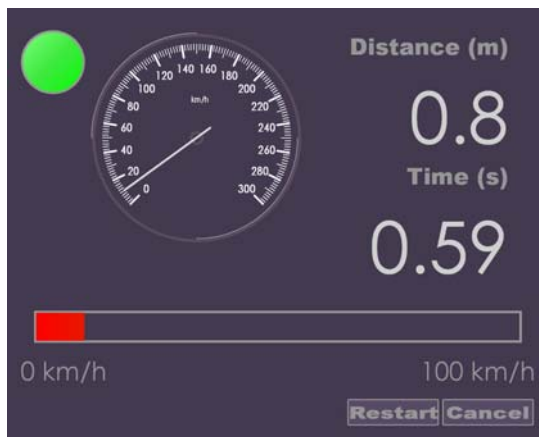


- In the above figure: AccMARK Light 1.0 is installed on the GeeSENS serial number is 65535

- Quit – Saves data and exit AccMARK.
- Stored runs – data base with stored runs
 - Information about the highlighted run is shown in display
 - To delete a saved run: highlight it and press <Delete>
 - To plot a saved run: highlight it and press 
- New run – configuration of new run and to start a new run

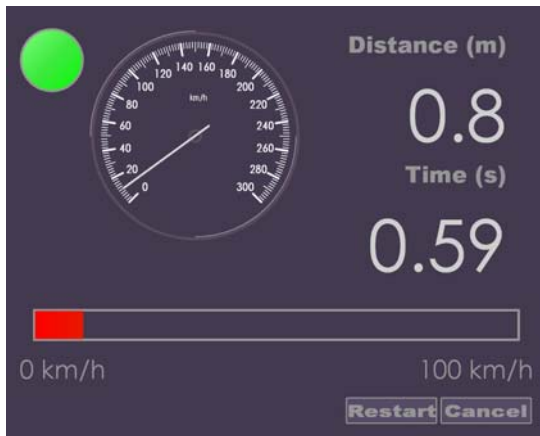


- Use the preset runs or the  to select the proper interval.
- The run window appears – See next section



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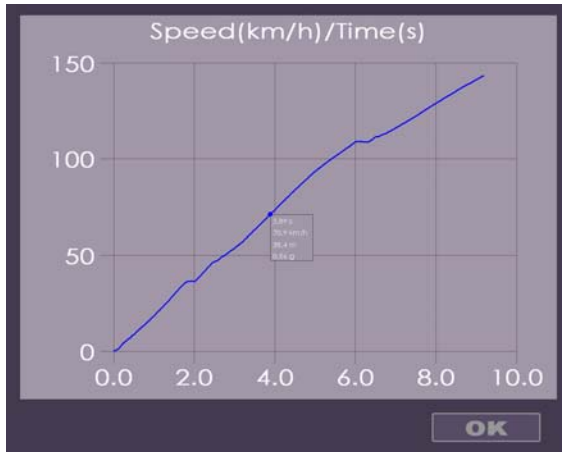
Run window




The run window is the window that is used during a performance run.

- Displayed information
 - Red or green light
 - Red light: - An auto calibration is performed during red light. **Thus, it is important that the vehicle stands still and is in a horizontal position during red light.** After the auto calibration the light switches to green.
 - Green light – The system is ready to perform a run. Start when ever you like. An acceleration above the trigger level (see Settings) will trig the system to start. Once the task is finished the lamp switches to red light again.
 - Speedometer – Displays the actual speed of the vehicle.
 - Distance – Displays the elapsed distance in meter.
 - Time – Displays the elapsed time since start.
 - The bar – Displays the relative fulfillment of the performance task.
- Inputs
 - **Restart** or <Enter> restarts the run
 - Prestage – a prestage of the car also make a reset
 - **Cancel** or <Space bar> cancels the run (Note that the run may be started by pressing <Space bar> a second time)

Graph window



The graph window is used in order to analyze different runs. , <Enter> or <Space bar> closes the window.

Tips and hints for proper usage of AccMARK

Tilt angle

All vehicles with suspension will tilt under heavy acceleration. This means that the accelerometer will pick up some of the earth gravity when tilted and display higher acceleration than the actual. AccMARK provides a function to correct this error by compensating if the tilt angle at near maximum acceleration is known. In the settings dialog the tilt angle at a known acceleration may be entered. The angle may be measured on a photograph of the car taken close after starting with full acceleration. The Maximum G-force measured during this run using AccMARK and the angle measured in degrees should be used.

Acceleration measurement

All performance measurements must be started when the vehicle is at a stand still. The road section used must be level horizontally without any turns or bumps. When a measurement is selected the Run window with the speedometer, clock and odometer is shown. During the first second the position of the GeeSENS is measured so that any minor misplacement can be corrected for. The start light at the upper left corner signals with a green colour when the run can be started.

Perform acceleration through the gears until the end of the selected interval or distance is reached. The start light will turn red when the end is reached.

If AccMARK starts the measurement before the vehicle is started the trigger value may be set too low, press Restart in the Run window to try a new start.

You can always press Cancel to return to the main Window to change settings or measurement interval.

When a run has been completed it can be stored by pressing Save. Enter a descriptive comment about the run in the Enter description dialog and press OK.

After saving AccMARK is ready to measure the same interval again, to return to the main windows press Cancel.