
NORSEMETER STUDIO

Pavement Surface Expert



Norsemeter
Friction

2003
Norway

Overview and features

The Norsemeter Studio, Pavement Surface Expert off-line data processing software utilise the field data from Roar measurement units to provide more comprehensive road surface characteristic data. . The reporting facilities of the software are designed very flexible to fulfil requirements from various users of road surface data, such as Pavement Management Services, Road authorities, Transportation Institutes, etc.. With this software and Roar measurement device you will get all necessary characteristic surface information such as friction, micro and macro texture, indication of braking action required for your road operations. Below there is a functional description of the software with it's optional modules.

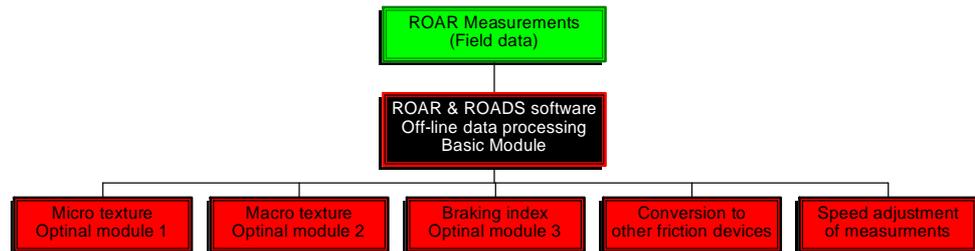


Figure 1 Norsemeter Studio, Pavement Surface Expert software overview

The Norsemeter Studio, Pavement Surface Expert software is based on a modular design to fit the exact needs of the user. The basic module includes all the basic functionality required such as filtering of field data, tagging of data, statistical analysis and reporting. There are several optional modules representing different kind of calculations and predictions based on the field data.

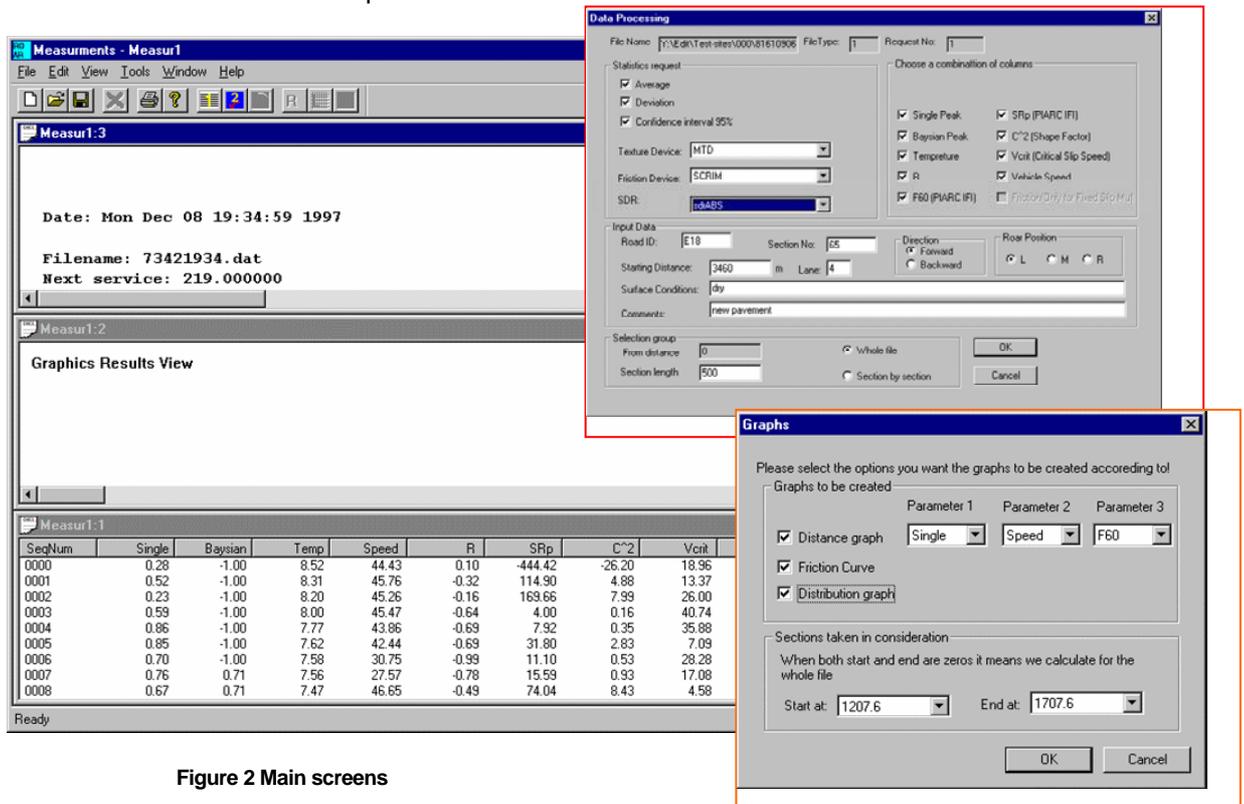


Figure 2 Main screens

The main purpose of this software is to help to integrate ROAR's parameters into any existing pavement or road database of Road authorities or Pavement Management Systems. The other purpose is to analyse pavement conditions by using the ROAR's data. Therefore, the basic module has two modules. One is road tagging and statistical module and the other is the graphical presentation module. (see Figure 2 Main screen)

The road tagging module will refer the measurements to a road reference system using the following input parameters: road number, section number, lane number, section length, starting distance, forward/backward direction, ROAR's position (L/M/R).

Based on this parameters the program will refer the ROAR's measurements to a road section and which will be tagged with the following information:

- RoadID.Section#.Lane#.ROAR's_Position

Average for each section

Standard deviation for each section

95% confidence interval for each section

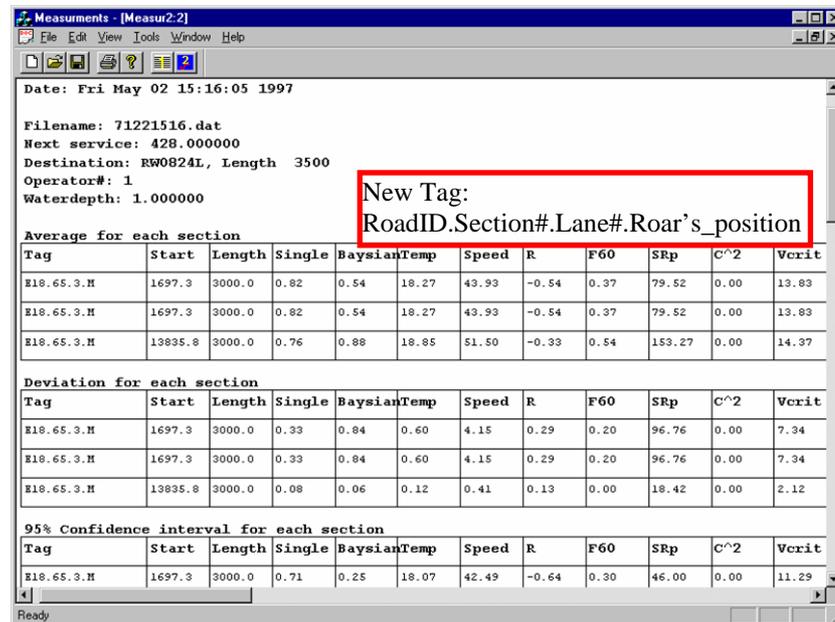


Figure 3 Result screen

The program also calculates the average, standard deviation and 95 % confidence interval of every parameter of ROAR for each section and will be reported in the above format.

The help to analyse the ROAR's data and the pavement conditions the software presents the following options to visualise graphically the measured data for any section selected by the user (multiple section selection is also available)

- distance graph, where any three of the ROAR's parameter can be plot into one graph versus distance.
- Distribution of the Mup value

The average Friction vs. Slip Speed Curve of any section

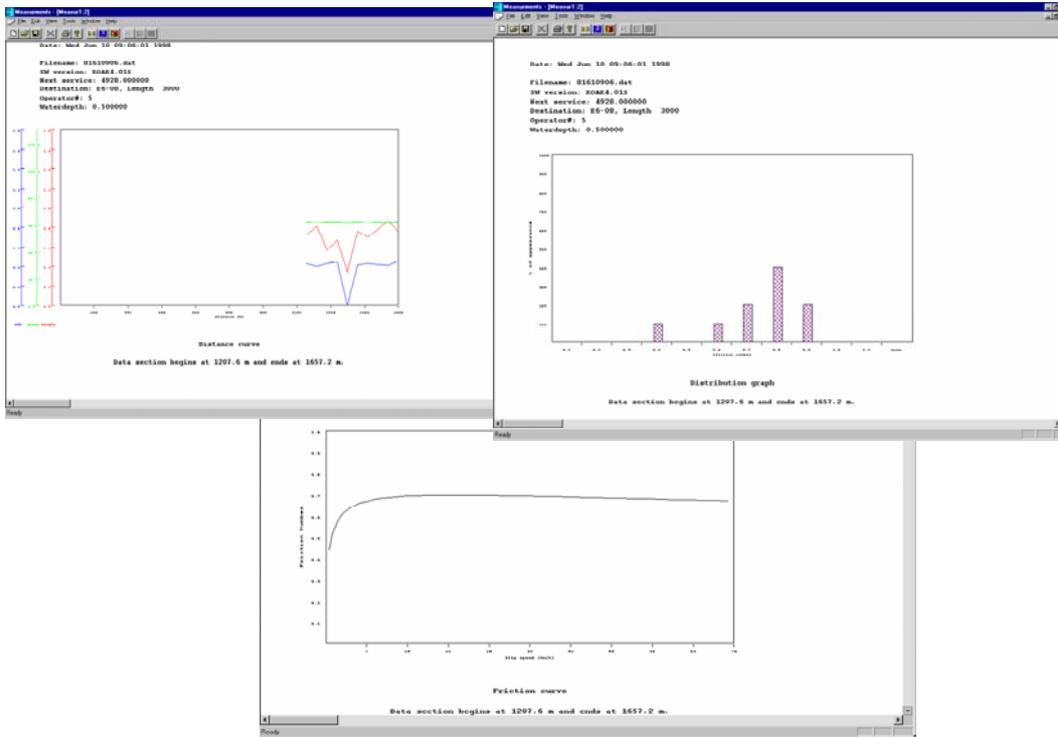


Figure 4 Friction Curve graph

The software generates basic reports with information from the process made, the data file and the input(s) from the user. The reports can be saved onto a file for archiving and subsequent printing purposes and can be imported into any software.

1	Tag	Single	Baysian	Temp	Speed	R	F60	SRp	C*2	Vcrit	Distance	Comments
2	E18.67.3.M	0.02	-1	17.36	32.49	0	0	0	0	-1.11	197.3	new pavement,dry, clean
3	E18.67.3.M	0.01	-1	17.5	44.33	0	0	0	0	-1.44	366.4	new pavement,dry, clean
4	E18.67.3.M	0.01	-1	17.43	48.05	0.09	1	-0.24	0	0.16	598.5	new pavement,dry, clean
5	E18.67.3.M	0.59	-1	17.43	47.28	-0.06	0.51	443.04	0	11.89	717.5	new pavement,dry, clean
6	E18.67.3.M	0.79	-1	17.37	46.57	-0.79	0.32	49.25	0	14.25	739.7	new pavement,dry, clean
7	E18.67.3.M	0.82	-1	17.37	46.82	-0.79	0.36	52.99	0	14.95	770.2	new pavement,dry, clean
8	E18.67.3.M	0.73	-1	17.4	47.01	-0.82	0.37					
9	E18.67.3.M	0.79	0.78	17.42	47.01	-0.71	0.41					
10	E18.67.3.M	0.88	0.78	17.4	45.2	-0.56	0.35					
11	E18.67.3.M	1.5	1.47	17.89	43.3	-0.53	0					
12	E18.67.3.M	1.38	1.47	18.09	49.71	-0.59	0.02					
13	E18.67.3.M	1.19	1.18	18.07	44.49	-0.29	0.25					
14	E18.67.3.M	1.17	1.18	18.41	38.56	-0.8	0.35					
15	E18.67.3.M	0.99	0.98	18.46	39.47	-0.79	0.34					
16	E18.67.3.M	0.84	0.98	18.47	41.07	-0.65	0.42					
17	E18.67.3.M	0.82	0.54	18.27	43.93	-0.54	0.37	79.52	0	13.83		new pavement,dry, clean
18	E18.67.3.M	0.82	0.54	18.27	43.93	-0.54	0.37	79.52	0	13.83		new pavement,dry, clean
19	E18.67.3.M	0.76	0.88	18.85	51.5	-0.33	0.54	153.27	0	14.37		new pavement,dry, clean

Optional modules

Optional modules to the ROAR Data Processing Software can be acquired with the software as a package or added at a later stage as an upgrade. The optional modules will add functionality to the software and will produce additional information which can be used in all the statistical calculations and visualisations described above.

All the Optional Modules require variable slip measurements.

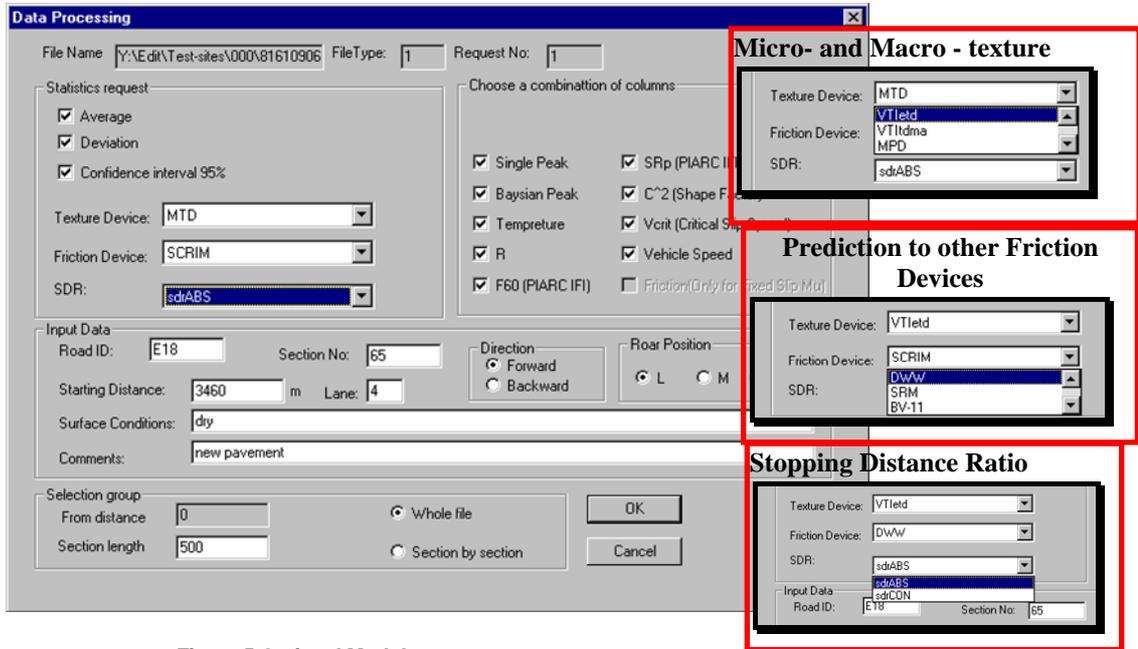


Figure 5 Optional Modules

Stopping Distance ratio

This option calculates, from the ROAR's variable slip measurements, a stopping distance ratio for vehicles equipped with conventional and ABS brake systems. This index gives a quantitative and qualitative description of the braking performance of the vehicles on the particular section analysed. This number shows the ratio between the ideal braking performance ($SDR = 1$) and the actual braking performance on the measured section. If $SDR = 2$, that means it takes two times longer distance to stop the vehicle on that surface.

Micro texture

This module provides the additional capabilities to calculate from ROAR's variable slip measurements the microtexture of road surfaces and reports it in BPN numbers.

Macro texture

The macro texture calculation module gives the user the option to select from a wide range of laser, volumetric or outflow texture measuring devices, and it will calculate from the ROAR variable slip measurements the macrotexture of the road surface and report it in the chosen scale.

Prediction of other measuring devices

This option allows the user to predict the friction values that would be obtained if measuring with other devices, and it is only available for variable slip data files. The software lets the user choose from the following list of friction measuring devices:

- SCRIM
- Griptester
- SRM (Stuttgarter Reibungsmesser)
- MuMeter
- Skiddometer
- BV-11and BV-14
- British Pendulum Number
- Dynamic Friction Tester
- K J Law Friction Tester - 100% fix slip
- K J Law Friction Tester Peak Friction

Speed adjustment of measurement

The speed correction feature of the software package provides functionality for the user to adjust friction values measured at any speed to correspond to friction values measured at a pre-determined specific speed. This optional software module, thus, enables the user to conduct the friction measurement survey at any speed or variable speed — following the traffic — and still report friction and use friction values in analyses as if they were measured at a standard constant speed.

For further information call or write to:



Visitaddr: Oscarsgt 27, 0352 Oslo
Postaddr: P.O.Box 7159 Majorstuen, 0307 Oslo
Norway

Phone: +47 23 20 12 70, Fax: +47 23 20 12 71

Email: info@norsemeter.no

Internet: [http:// www.norsemeter.no](http://www.norsemeter.no)