PAVEPROF INERTIAL LASER PROFILOMETER

STANLAY™

The **PAVEProf Inertial Laser Surface Profilometer** is a a modular system for real time & continuous inspection and measurements of **highway& runway longitudinal** & **transverse surface profiling, surface roughness, texture and rutting at highways speeds to international standards**.

The system is capable of

- **Measuring International Roughness Index (IRI).**
- **Ride Number (RN).**
- **Transverse profile.**
- **Rut depth and macro texture.**
- **MPD & SMTD Texture.**

PaveProf Inertial Laser Profilometer is used **during the construction** phases to ensure standard quality levels are met and is also used to determine **maintenance levels for repair and remedial** action on existing roads. This results in significantly **improved highway conditions** and ultimately reducing accidents due to poor surface conditions.

Features :

- Full Speed Highway profiler, with simple installation.
- Portable, lightweight or Full Scale Profilometers available.
- True ASTM Class 1 profiling system at all collection speeds.
- Real time graphical display with instant RN, IRI, MPD, SMTD calculations.
- Multiple Laser supplier integration.
- Oblique sensors with 1000 mm measuring range for full transverse highway measuring.
- High precision and accuracy.
- Simple one touch operation.
- Testing speed range from 20 to 115 kmph.
- Optional GPS integration, with realtime display of position base format.

The overall system design is based on ASTM standards as below.
ASTM E-950 Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling.
ASTM E-1926 Computing International Roughness Index of Roads from Longitudinal Profile Measurements.
ASTM-1845 Calculating Pavement Macrotexture Mean Profile Depth.
ASTM-1489 Standard Practice for Computing Ride Number of Roads from Longitudinal Profile Measurements made by an Inertial Profile Measuring Device.
ASTM-1703 Measuring Rut-Depth of Pavement Surfaces Using a Straight Edge.

Why Laser Profilometer

- Laser Profilometers can be mounted on any vehicle of any type, irrespective of suspension type, mechanical condition, age of vehicle.
- Laser Profilometers are the standard to which other roughness measurement devices compare.
- Laser Profilometers can be used at any speed starting from 20kmph ideal for Indian traffic conditions (unlike other roughness devices which need to operate at upwards of 40kmph)
- Laser Profilometers are useful for inspection of any pavement type.
- Laser Profilometers provide real time IRI & / or texture results while in field. No processing of information required.

When **full highway testing** is required that will **not affect traffic flow**, the PaveProf range is your solution. Installed on to a highway vehicle and capable of measuring at speeds of up to 115kmph, the PaveRough lasers will measure longitudinal profile degradation and surface roughness used to calculate RN and IRI.

The system can be configured to measure surface texture and surface cracking for MPD and SMTD measurements. **If transverse highway data is required, more sensors can be added. The control system can interface with upto 40 lasers**. The lasers are designed for wheel path ruting measurement and using the extra long range of the oblique laser paveGeo sensors will measure transverse surface profile data up to 3.5 meters wide.

SYSTEM OPTION: LASER PROFILOMETERS

STANLAY™

I. PaveProf Single , Dual Wheel Path or 3 Point Laser (Left / Right / Centre) upgradeable to 7 lasers

Measure IRI. RN. Or Measure IRI/Texture

1 or 2 lasers upgradeable to 7 Lasers. Each system offered with front enclosure for fitment to vehicle. Built in accelerometer 1 for single laser system, 2 for 2 to 40 laser system. Encoder provided irrespective of system >= 16000 pulse per revolution output. Provided with CF53 Panasonic toughbook or similar for data collection. Allows camera systems to be added. System is modular to allow IRI or Texture or IRI + Texture Lasers. Provided as standard - Event Key Controller With predefined function keys to allow driver / operator START /STOP operation of profilometer and also feed events eliminating requirement for using computer repeatedly.

Choosing a System Option : Systems are modula

Single point for Roughness measurement : **Output : IRI+ RN**

1 or 2 point laser with accelerometer Left &/or right wheel path	Single control module	Will calculate IRI from single laser	laser @9.4kHz	One surface measurement every 25mm at 100km/h

Single, Dual Path or Three point laser for Roughness measurement : **Output : IRI+ RN**

1, 2 or 3 point laser with accelerometer Left/right/centre wheel path	Single control module	Will calculate IRI	laser @56kHz	

Single, Dual Path or Three point laser for Texture & Roughness measurement :

Output : IRI+RN+ MPD/SMTD

1 ,2 or 3 point laser with accelerometer Left/ right/centre wheel path	Single control module	Will calculate IRI	laser @110kHz Because high speed then texture can be measured	One surface measurement every 1mm at 100km/h

II. Laser Roughometer:

Entry Level Single laser system for IRI measurement
Economical Laser Profilometer Made in UK. Made for India.

Each Laser Roughometer System Contains :

- Single Laser system 9.4kHz Laser for IRI measurement.
- System module in casing. sealed to allow direct attachment to vehicle.
- Encoder for precise measurement
- Accelerometer, per system requirement.
- Paveprof data acquisition software for providing real time IRI Output.
- Toughbook laptop. CF53 or equivalent.

Closed solution. Not Upgradeable

SYSTEM OPTION: LASER PROFILOMETERS

III. PaveProf Multi Point Laser Inertial Profilometer: 3, 5 Or 7 Lasers

Measure IRI. RN. Texture. RUT

Modular Design based on Master – Slave. Each Bracket will be designed for attachment based on vehicle type. Configurable - Upgradeable to 40 lasers based on Short & Long range Lasers to allow configure system for covering full width of road lane, if required. Multi Point Laser system is modular to allow build system configuration per project requirement.

Three point laser for roughness & texture measurement : **Output**

Roughness IRI, MPD(Texture), SMTD

3 point laser with 2 accelerometer	Control module 1 encoder, 16000 pulses per rev	Will calculate IRI & Texture from three laser Left, Centre, Right	3 x High speed laser @110kHz, compliance with ASTM 950 for IRI & ASTM 1845 for Texture	One surface measurement every 1mm at 100km/h

Five point laser for roughness & texture measurement : **Output**

Roughness IRI, MPD(Texture), SMTD

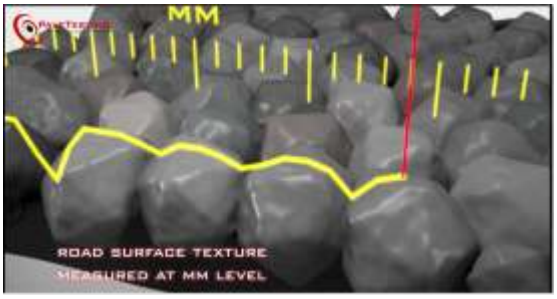
5 point laser with 2 accelerometer	Control module 1 encoder, 16000 pulses per rev	Will calculate IRI & Texture from three laser Left, Centre, Right	3 x laser @56kHz, compliance with ASTM 950 for IRI & 2 laser @ 110kHz in compliance 1845 for with ASTM Texture	One surface measurement every 1mm at 100km/h

Seven point laser for roughness & texture measurement : **Output**

Roughness IRI, MPD (Texture), SMTD + RUT

7 point laser with 2 accelerometers	Control module 1 encoder, 16000 pulses per rev	Will calculate IRI from 7 lasers , texture from 2 lasers & Transverse Rut	2 High speed laser @110kHz per ASTM 1845 for Texture (MPD) & 5 roughness lasers per ASTM 950 & 1703	One surface measurement every 1mm at 100km/h

Texture : Measured at mm level



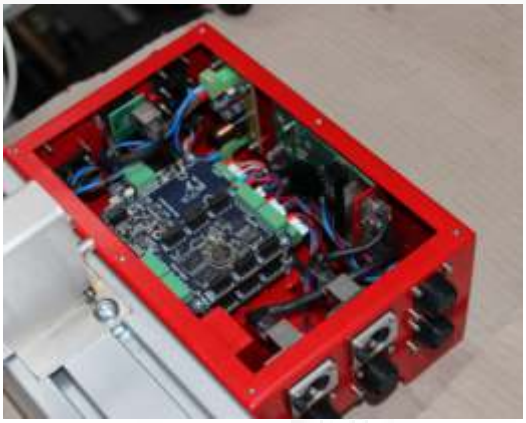
- **Minimum lasers required to calculate RUT is 5 lasers, recommended is 7.**
- **Each Laser also gives IRI and RN information as standard.**
- **Each texture laser will also give IRI and RN information as standard.**

Multi point Laser System is upgradeable apart from IRI, RUT and Texture Measurement to a complete LRMS system with DGPS , Camera systems for Road Measurement & Data acquisition system.

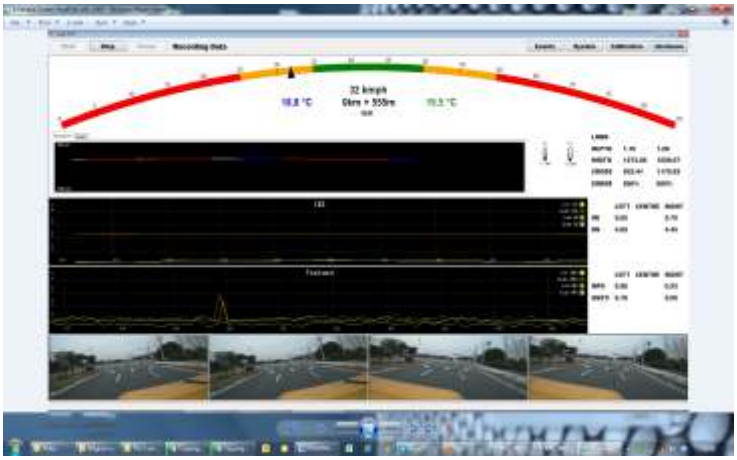
SYSTEM OPTION: LASER PROFILOMETERS

Each Multipoint System Contains :

- System module in casing.
- In case of multi laser system, One of the control modules is configured as Master, others as slave.
- Encoder for precise measurement
- Accelerometer, per system requirement.
- RS485 Communication between each control module box.
- Toughbook laptop.
- Bracket attachment to vehicle.



Pavetest Software used in highway setting :



Software allows real time display & Visualization of:

- Texture, Display and Values.
- Roughness, Display and Values.
- Rut – LRMS Display and values.
- In addition, camera view is selectable for 9 cameras (Cameras are optional).