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ROMDAS
Manufactured by
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providers of innovative technology for measuring and managing roads

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There are several unique features to this system which significantly enhance the data reliability and accuracy over other traditional multi-laser profilometers. These include:

- **Scanning Laser**: accurately measures the transverse profile across the full lane width.
- **Macrotexture Measurement**: can be measured over whole pavement.
- **Lane tracking**: eliminates data variability and inaccuracies due to vehicle wander ‘year-on-year’.
- **Roof Mounted Equipment**: mounted 2.2 m above pavement surface, at rear of vehicle.
- **Roughness Inertial Measuring Unit (IMU)**: instead of traditional accelerometers.
- **Validation tool**: unique tool which quickly calibrates the equipment on a weekly basis.
- **Laser based pavement imaging**: automated defect detection, lane markings, high quality pavement images (with optional defect overlay).

**Scanning Laser**

The LCMS accurately measures the transverse profile across the full lane width up to 4m with the equivalent of 4096 points transversely which are used to calculate rut depth and shoving. The traditional multipoint lasers measure data points at discrete locations and therefore tend to miss high and low points, therefore predominantly under reporting the true rut depth. They also suffer from the effects of less than full lane scan width and interference of features such as kerbs and verges.

**Macrotexture Measurement**

The LCMS is unique in that with the very high transversal scan rate of the laser the Macro texture can be calculated for all parts of the complete pavement area. The LCMS reports the Mean Profile depth (MPD) macro texture and / or Road Porosity Index (RPI) in 5 adjustable width longitudinal bands across the whole lane width (the 5 AASHTO bands are: central band, two wheel path bands, and two outside bands).

To replicate the longitudinal profiles of historical data we can adjust the bands down to a width of several mm to give the same result as a single point Laser profiler. The Lane Tracking will automatically track this to the same wheelpaths as longitudinal roughness.

**Lane Tracking**

A key advantage to using the LCMS system is the ability for data sets to be referenced to the lane markings and kerb positions instead of the vehicle transverse position travelled which will vary from year to year.

Lane tracking will therefore eliminate this well-recognised variable that would be practically impossible to mitigate otherwise, and ensure the difference in the year to year survey data are only to do with the changes in pavement surface and not the track taken by the vehicle.

This unique feature can be used when calculating the wheelpath and lane roughness, Macrotexture Measurement, rutting scan width.
Roof Mounted Equipment

Because the equipment is mounted 2.2m above the ground and only extends marginally beyond the edge of the vehicle, it is much less vulnerable to accident and damage. Traditional multipoint Laser rut bars which are usually mounted around 300mm high and extend out to 2.5 m, are much more exposed to potential damage from other traffic and obstacles. Our mounting system has side deflection beams to provide extra protection that would not be possible to implement on a front mounted system.

Roughness Inertial Measuring Unit (IMU)

The effects on the profile accuracy due to the Profiler accelerometers off axis accelerations from vehicle tilt and roll and cornering are well recognized. The specifications call for a bi-axial accelerometer for this reason, however the LCMS roughness system goes much further and uses a full 6 degrees of freedom IMU with 3 axis accelerometers and 3 axis gyroscopes to completely negate any possible effects of these non-vertical accelerations.

Validation Tool

The LCMS Validation Tool uses a calibrated pyramidal object and test software to validate the calibration of the Sensors. The validation includes:

- Range Validation; verifies the sensor alignment in order to make sure that calibration tables (.ltx and .ltz files) are still valid.
- Focus Validation; assesses the sensors optical quality.

These tests will be carried out on a regular basis and will alert the operator to any anomalies well before they start to affect the accuracy of the data. This ability to verify the system calibration to such accuracy in the field is a huge step forward in terms of ensuring the quality of the data.

Laser Based Pavement Imaging

The systems software is capable of fully automated defect detection of cracks and potholes, as well as providing high quality jpeg images of the pavement surface.

Because these images are laser image-based they are completely unaffected by ambient light conditions (which are very problematic in traditional Video-based pavement imaging systems) and in fact can be collected day or night. These extra data sets are all extracted from the raw data. The laser based imagery software can also automatically detect lane marking etc.