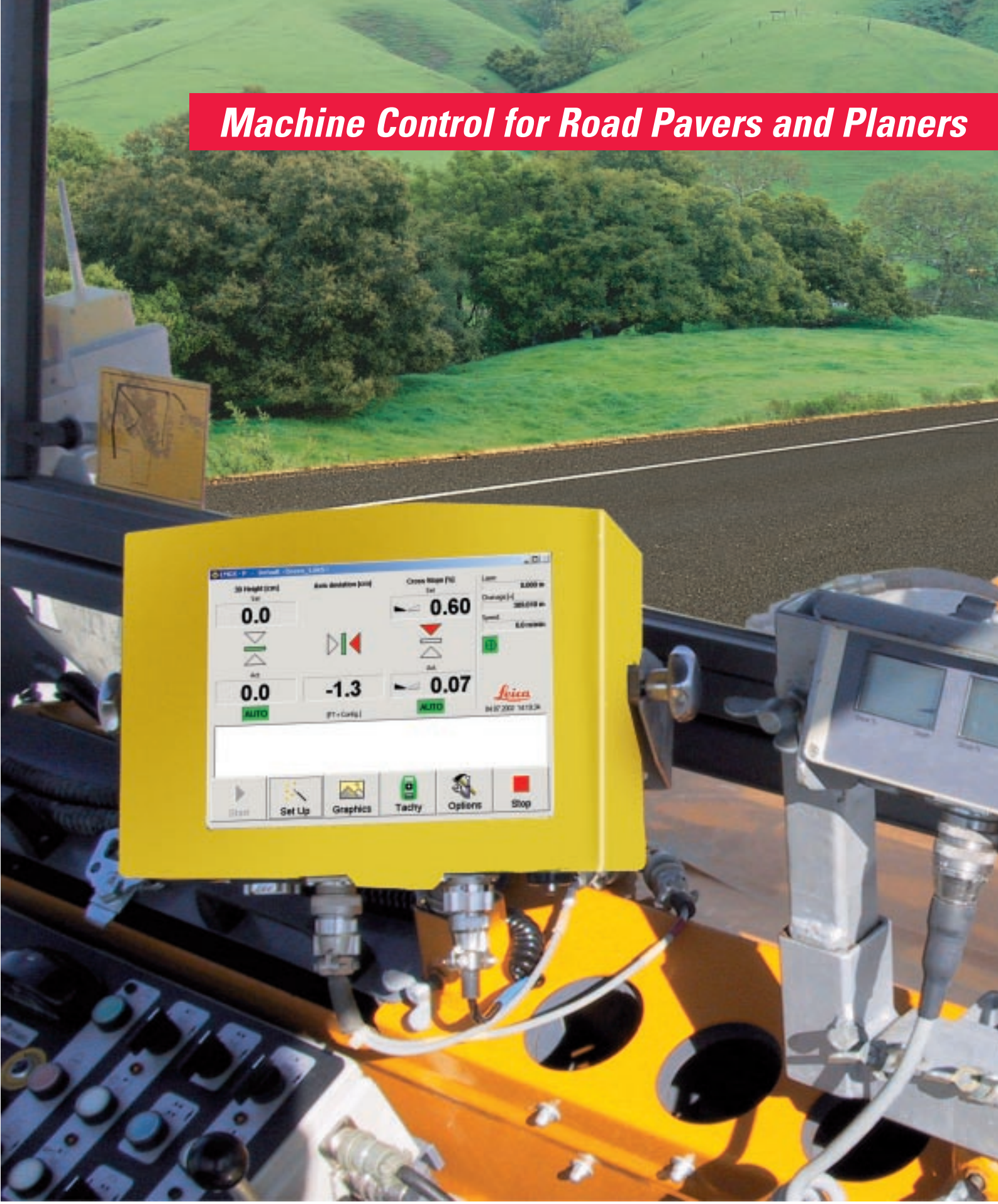
Machine Control for Road Pavers and Planers



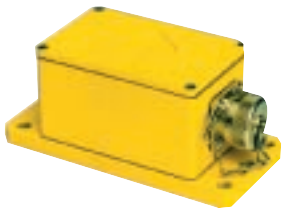
Leica Geosystems

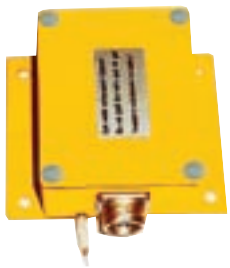
Leica Machine Control Systems for Pavers and Road Planers improve your efficiency

Leica's Machine Control System for Road Pavers
Pave stone, cement-bound material (CBM) or asphalt layers quickly, easily and accurately. Save material, time and costs by not having to rework your project.

Leica's Machine Control System for Road Planers
All the same benefits derived from the Machine Control System for Pavers – your machine's cutting depth can now be regulated more precisely, saving you time, money and rework.

Leica's Machine Control Systems for Pavers and Road Planers are competitively flexible, modular and upgradable. From the simple basic system, using height or slope sensors up to the high-precision 3D-Control System with Leica total stations. Whether you are working surfaces precisely measured with a laser and paving them using ultra sonic to scan the stakeout strings, controlling cutting depths with stringline or ground-following sensor, at Leica Geosystems you will find the appropriate sensor for each of these applications. From the ultra sonic, stringline sensor, slope sensor up to the laser receiver, the complete range of sensors can be combined to control your machine for any application. The latest CAN-bus technology makes it all very easy to handle. All sensors are microprocessor controlled and feed data into the digital controller via the CAN-network system.





Components of Leica's Basic Control System

Digital controller
– Industry-standard CAN-Bus technology
– Microprocessor-controlled
– Automatic sensor-type recognition
– Adaptable to virtually any machine's hydraulics (NPN/PNP, servo-valve, proportional)
– One controller and sensor per cylinder

Slope sensor
– Precise and robust
– 1mm/m accuracy
– Suitable for high-compaction paver screeds or planers

Stringline sensor
– Robust mechanical parts
– Measuring range: up to 50cm
– Suitable for road planers

Your advantages

Flexibility
- Whether you are using ultrasonic, slope, mechanical, stringline sensor or a laser receiver – for your every application, we have the appropriate sensor.
- Modular system design means you can mix-and-match single sensor or multiple sensors types, even with the 3D-system for joint-matching to existing surfaces!
- Versatile, can be adapted to control virtually any machine

High precision
- Simple, non-contact copying of reference heights with Sonic Ski
- Create surfaces with optimum smoothness easily with the BIG-Sonic Ski
- Pave exact heights and slopes for complex projects with the 3D-system

Save time
- Simple, quick system setup

Easy to operate
- Only four keys for and quick learning and total control
- Automatic «plug and play» sensor recognition
- Backlit display for complete status monitoring

Reliable
- Rugged system components
- CAN-Bus network for fast, error-free data transfer
- High-performance, robust machine computer

Cost savings for complex projects
- Tighter control over the amount of material required
- No more staking out for pins and stringline required when using the 3D-system
- Automatic slope adjustment direct from the digital design when using the 3D-system

LS-250 Laser receiver
– fully proportional laser receiver – works with virtually any laser beacon
– 25cm working window
– precise, linear scanning

Sonic-Ski Ultrasonic Sensor
– automatically temperature compensated
– wide scanning area
– 5 sensors provide precise scans over the entire width

Modular Machine Control Systems

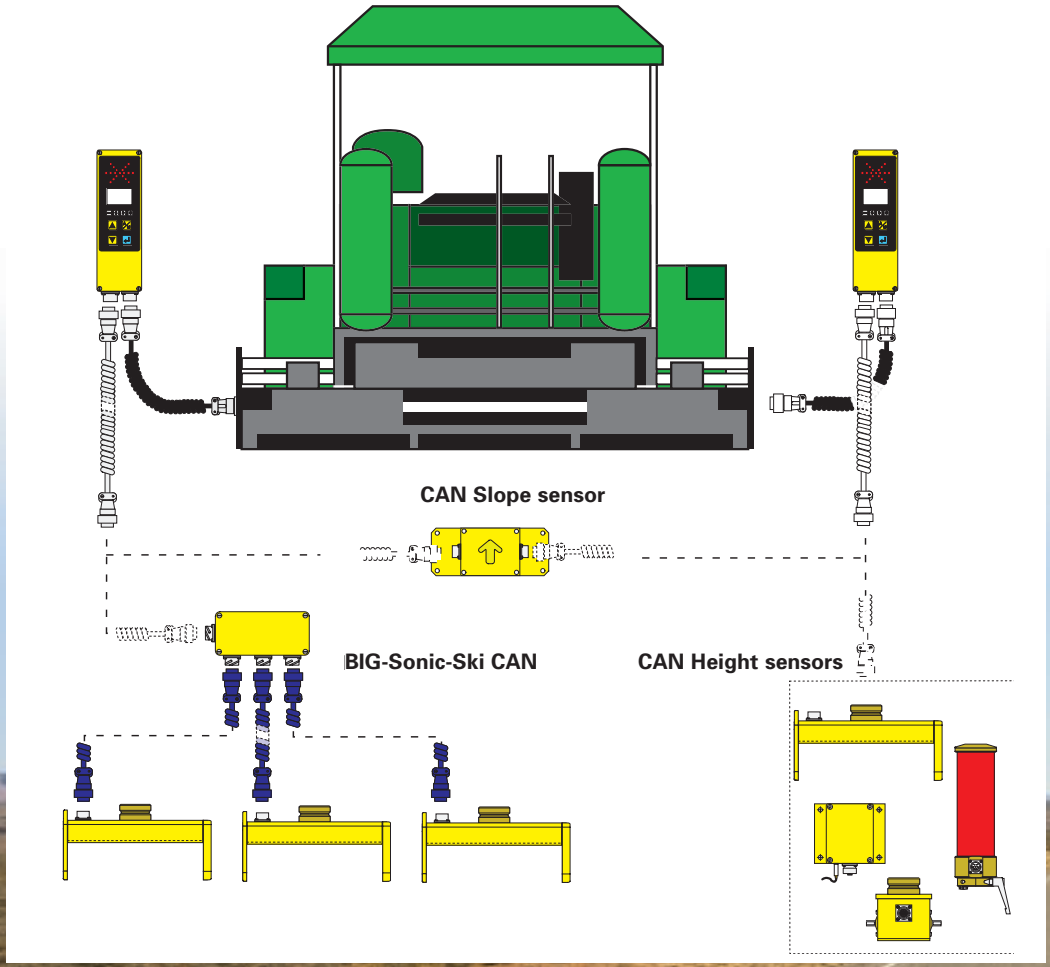
Laser control with the LS-250 proportional laser receiver

A great team! Laser control with laser beacon made by Leica Geosystems!

The Javelin dual axis slope laser with +/- 20° or +/- 50° options for slope adjustment and 1200 RPM, along with the Rugby laser, are instruments the construction industry can rely on!

Be even more efficient with the LS-250 proportional receiver. The paving/planing setpoint can be established instantly, and unlike our competitors, anywhere within the sensor's receiver window – so setup time is minimal!

Examples of modular control systems



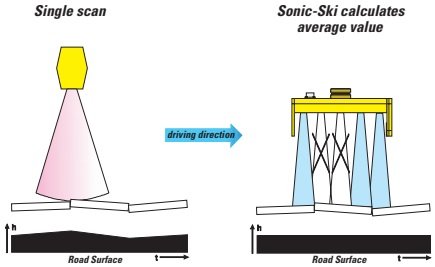
BIG-Sonic-Ski for Pavers

Calculate averages – over short or long stretches.

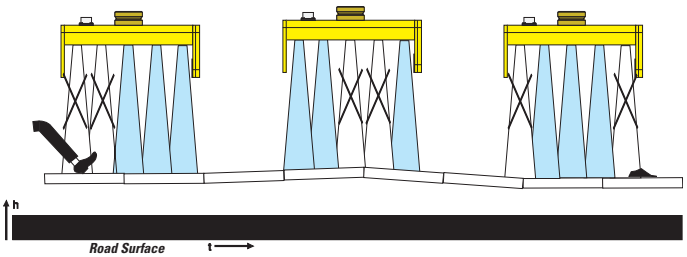
- **Non contact sensing**
- **Simple to learn and operate**
- **Create smooth even layers**
- **Higher flexibility even under adverse conditions**
- **Automatically temperature-compensated**
- **Fast setup means maximum productivity**

The BIG-Sonic-Ski incorporates all the proven advantages of the Sonic-Ski – and then stretches them to new limits. Undulations stretched out over long distances such as over highways, runways, temporary construction ramps are smoothed. It all works flawlessly.
There is no need to clean the mechanical ski afterwards. Each individual ski calculates an average value within its own range, taking obstacles into consideration. The average value is combined with the other average values gathered by other Sonic-Skis or stringline sensors to calculate an optimal paving height value which is used to regulate the screed.

1. Calculating the average with a single Sonic-Ski
From five simultaneous ultra sonic measurements, the three furthest from the reference point are used for the calculation. Obstacles are excluded from the calculation of the average.



2. Calculating the average with several Sonic-Skis or Stringline sensors
Using several Sonic-Skis to calculate average values even over large undulating surfaces. Excessively large deviations are simply filtered out of the calculation of the average value.



3D System Upgrade for Pavers …

Leica's 3D Machine Control System paves asphalt quicker, easier and more precisely. The system provides for direct paving height control within the defined project area without stakeout strings or copying setting-out mistakes by controlling the height and slope of the screed. A Leica TPS1100 Series total station measures the exact 3D position of a prism mounted on the machine and transfers the position by radio modem to the machine computer six times every second! Combined with the data from the slope sensors on the machine, the position and orientation of the Paver is continuously updated. The project's CAD-based design data is then used to continuously compare the actual position with the Design-position and to adjust the screed in height and slope accordingly to deliver the most accurate paving results!

Applications for 3D-controls

- Pavements requiring very high level accuracy or with a prescribed «minimum-thickness» design criteria.
- Large paving projects with frequently changing slopes.
- Projects with complex designs such as undulating land scapes, banks, curves and superelevations …

Advantages of the Leica 3D System

- Automatic height and slope control.
- More precise geometry control of slope changes.
- More flexible logistics on site without stringlines.
- Automatic logging of paving production.
- Modular system, upgrade from MOBA-matic to 3D.
- Robotic total station can be used for any surveying tasks.
- Integrated as-built control measurement functions for pavement level checking.
- Continuous paving if 2 total stations are used.

Leica 3D system components

System Software

MOBA DLS-III
Digital controller

GRZ 121 Pro Prism

… and Planers

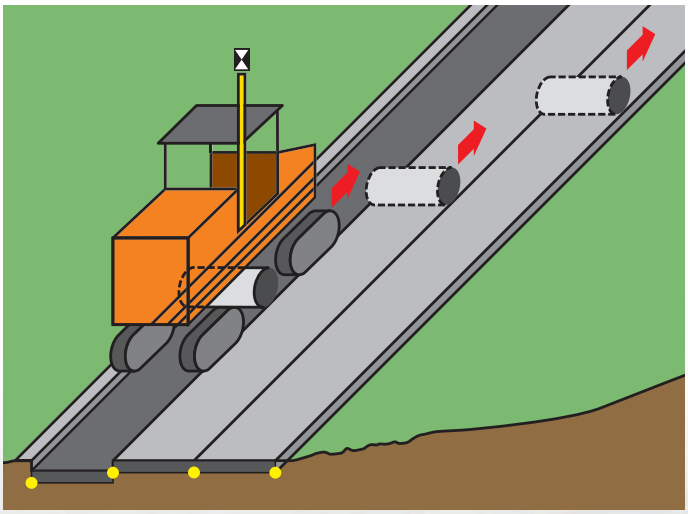
Planers (often referred to as Road Mills) are used for road maintenance. They plane (grind) the surface of old or damaged pavement to a depth of up to 35 cm depending on the repair works required. Planers typically have a narrow drum width requiring surfaces to be planed in strips. This can introduce and propagate errors. With the Leica 3D system, the absolute position of the machine is calculated and adjustments for design height and cross slope are automatically made. In this way, maximum accuracy is maintained across the entire project. The MOBA-matic or WIRTGEN controller are the core control system. They independently control the left and right side of the machine, in accordance with the sensors used, with or without cross-coupling. Cross-coupling means evenly applying and regulating both control circuits for height and slope.

Your advantages

- Using absolute positioning as reference, eliminates error propagation from strip to strip.
- Slope adjustment is done automatically.
- All work can be documented digitally on the Machine PC.
- Wires and pins are no longer required, improving site logistics.
- 3D applicable to any stringline projects.

Sample project:

1. Left control side: Slope (3D)
   Right control side: 3D height
2. Left control side: Stringline of 1st track
   Right control side: 3D height
3. Left control side: Stringline of 2nd track
   Right control side: 3D height



We are always at your service

- We offer support with project planning and system installation.
- We offer a complete range of system solutions.
- We offer customised solutions to your specifications.
- We provide worldwide service.

In addition to Machine Control Systems for Road Pavers and Planers, Leica Geosystems offers solutions for other automatic construction machines such as Graders, Slip-form Pavers, Trimmers and Bulldozers.

TQM
ISO 9001 / ISO 14001

Total Quality Management – Our commitment to total customer satisfaction
Ask your local Leica Geosystems agent for more information about our TQM program.

MOBA Controls

The machine control system for Road Pavers and Planers was developed with the assistance of MOBA Mobilautomation GmbH.

CAUTION
LASER RADIATION – DO NOT STARE INTO BEAM
620-690nm/0.95mW max.
CLASS II LASER PRODUCT

Distancer (infrared) and ATR:
Laser class 1 in accordance with IEC 60825-1 and EN 60825-1
Laser class I in accordance with FDA 21 CFR Ch. I § 1040

Distancer (visible laser beam) and Laser plummet:
Laser class 2 in accordance with IEC 60825-1 and EN 60825-1
Laser class II in accordance with FDA 21 CFR Ch. I § 1040

Electronic guide light:
Laser class 1 in accordance with IEC 60825-1 and EN 60825-1

Construction laser – our lasers are always built to meet the demands of construction sites, no matter what they are used for: the construction of high-rise buildings, for digging trenches, for machine guidance or interior construction.

Automatic levels – professional optical levels are built for the construction site. They are quickly set-up, very precise and top every comparison of price to performance ratios.

Leading in GPS and TPS technology – used worldwide in projects that demand the highest standards, designed for various applications and to be easy-to-use. We developed the first reflectorless total stations in 1998 and our experience with GPS dates back to 1967. We hold several patents and were first at introducing many new technologies to the industry.

Software and accessories – integrated software solutions and a complete series of tripods, staffs, our patented 360° prisms, batteries, chargers, everything you need to extract the best performance from your instrument.

Hand-held Laser Distance Meter – Simple and handy tool to determine distances, areas and volumes quickly and accurately, indoors and outdoors.

DIGI System – The location system provides a fast and safe solution for tracing buried utility services.

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