



# PAVE-IR SOLUTIONS

**MOBA**<sup>®</sup>  
MOBILE AUTOMATION

Road construction experience of **more than 40 years** , together with the innovation power of a worldwide networked company makes **MOBA Mobile Automation** the forerunner of road construction of the future.



# INTELLIGENT PAVING - THERMAL REAL-TIME VISUALIZATION FOR ASPHALT PAVING OF THE FUTURE

## **PAVE-IR - THE INNOVATIVE SYSTEM FOR PROCESS OPTIMISATION AND DOCUMENTATION IN ROAD CONSTRUCTION**

The optimal temperature of the paving material is a decisive factor in road construction, with a significant influence on the quality of the road. A comprehensive thermal visualisation of the paving process offers important insights regarding the quality of the material and introduces completely new optimisation potentials.

PAVE-**IR** is the first system, which simply and clearly creates a thermal profile of the road – and that in real-time! The high-precision MTPS-100 temperature scanner creates a comprehensive thermal profile of the paved layer across a width of 13m, which optionally serves as proof of the laying and delivery temperatures. The fully automatic visualisation of the temperature thereby enables the quick detection of individual spots of thermal segregation and allows immediate action to be taken!

Up to four additional freely positionable high-performance sensors (IR SPOTS) additionally measure material temperatures at those points where the temperature is crucial, whether it is in the bucket, on the base or in the auger. This multiple measurement provides highly accurate, comprehensive values. Thereby it is possible to determine the temperature of the supplied material in real-time and to document this, if required. In this way, temperature differences of the paving material are visualised during the process, and immediate measures can be initiated, if required.

As an innovative tool and component of the 'Intelligent Paving' product range of MOBA Mobile Automation AG, PAVE-**IR** thereby is an important building block for a networked construction site of the future and significantly contributes towards a long service life of the road. The development thereof and its daily use on construction sites around the world is just further proof that digitalisation 4.0 has arrived in the daily construction routine.

# PAVE-IR - SYSTEM PROPERTIES AND ADVANTAGES

The unique technology of the scanner offers the distinct advantage of determining the temperature of the asphalt surface and the material very accurately. Capturing across a width of up to 13m is technically superior to camera-based solutions on the market. Based on its modular concept, PAVE-IR is compatible with every paver – completely independent of the manufacturer and the age of the machine.

Three functionalities comprise the core competence of the system: Highly accurate data capturing with the innovative cloud solution is linked to open interfaces for current asphalt logistics and processing systems, as well as a reporting system which can be scaled to detail. This combination is a unique feature on the market, as it covers the entire temperature visualisation process, from measurement to evaluation.

With its automatic temperature measurement, the intuitive operating panel and the self-explanatory temperature profiles, the PAVE-IR is an innovative tool, identifying optimisation potentials – and all of that without extra effort by the installation team! The decisive progress, besides the comprehensive visualisation and documentation of the measured temperature data, is the possibility of networking the paver – the cornerstone for the construction site of the future.



## IR-SCANNER TEMPERATURE VISUALISATION



# IR-TECHNOLOGY

NEW OPPORTUNITIES FOR THE CONSTRUCTION SITE OF THE FUTURE

## SYSTEM PROPERTIES

- » High-precision measurement of the material temperature for detecting thermal segregation
- » Modular structure with individually combinable and upgradeable components
- » Open interfaces for providers of logistics and optimisation solutions
- » Detailed thermal profile of the installed asphalt layer
- » Real-time capturing and analysis of temperature values
- » Cloud solution for easy data handling

## SYSTEM ADVANTAGES

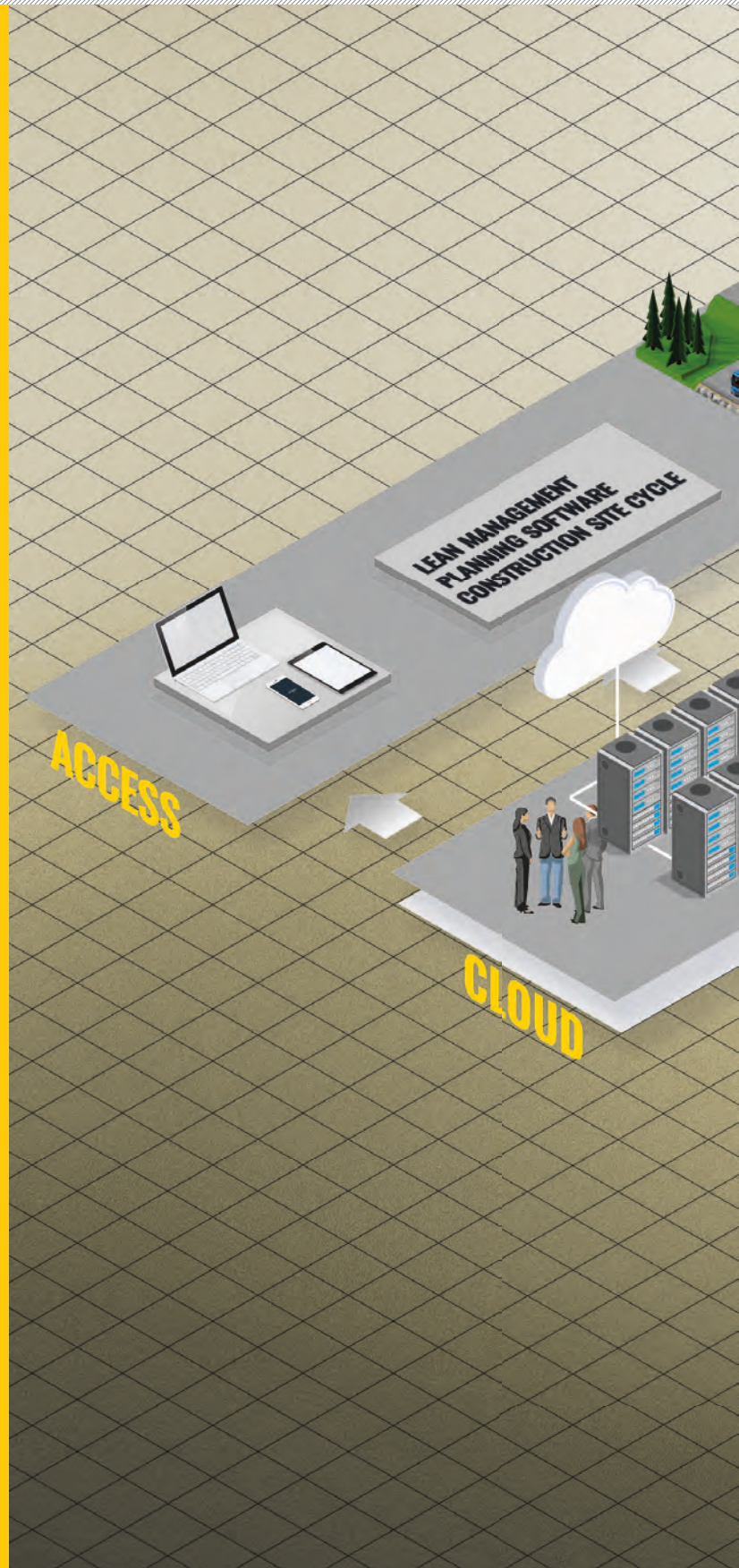
- » Optimisation of the installation process through monitoring of all relevant temperatures in real-time
- » Visualisation of thermal material properties (thermal segregation)
- » Perfect adaptability with equipment of all paver types and models
- » Highly flexible, future-proof system thanks to a modular concept
- » Extremely large installation widths can be captured – up to 13m

## MOBA CLOUD SOLUTION - DATA CAPTURE PAVE-IR

Data storage of the PAVE-IR and the subsequent analysis of the data can either be accomplished via the PaveProjectManager or via the MOBA Cloud solution. With the Cloud solution the PAVE-IR is seamlessly integrated into the MOBA paving product range and for the first time this allows real-time data exchange with other systems. Besides redundant data backup this opens up numerous further options for the user.

When automatic data transfer is activated, running projects can be retrieved and archived from the office – in real-time. Interfaces to third party solutions like logistics and planning tools increase added value and efficiency. This increased connectivity is an important step towards road construction of the future. A user control system allowing the distribution of user authorisations serves as an additional security measure and guarantees that only selected persons will have access to the data. This linking of data offers completely new insights, from which quality enhancing measures can be derived. This results in integrated systems emerging, which need not necessarily originate from the same manufacturer. In this way, the user benefits from a symbiosis, without becoming dependent himself.

The MOBA Cloud offers future-proofness and increases connectivity, if required. In the long term it paves the way for a uniform database, which contributes towards a better understanding and analysis of process data. The combination of data from different systems offers decisive added value. In this way, the linking of the MOBA paving products forms a basis for optimising measures and improves the quality of road construction in the long term.



### KEY FACTS:

- Real-time data transfer
- Interfaces to other systems
- Data analysis across systems
- Manufacturer-independent data exchange



# PAVE-IR SYSTEM - DETECT THERMAL SEGREGATION



ONBOARD COMPUTER  
THE “HEART” OF THE SYSTEM



# MODULAR SYSTEM - ROBUST HARDWARE FOR THE CONSTRUCTION SITE

## IR-TEMPERATURE SCANNER

- » Infra-red sensor for the measurement of the surface temperature
- » Automatic edge detection function
- » Large, variable installation width
- » Intelligent sensor, prepared for further options



01

## GNSS ANTENNA

- » Position data for geo-referencing
- » Provides coordinates and data for calculating the speed and travel distance of the machine
- » Robust and reliable



02

## WEATHER STATION

- » Assesses environmental conditions
- » Air temperature
- » Wind speed
- » Humidity



03

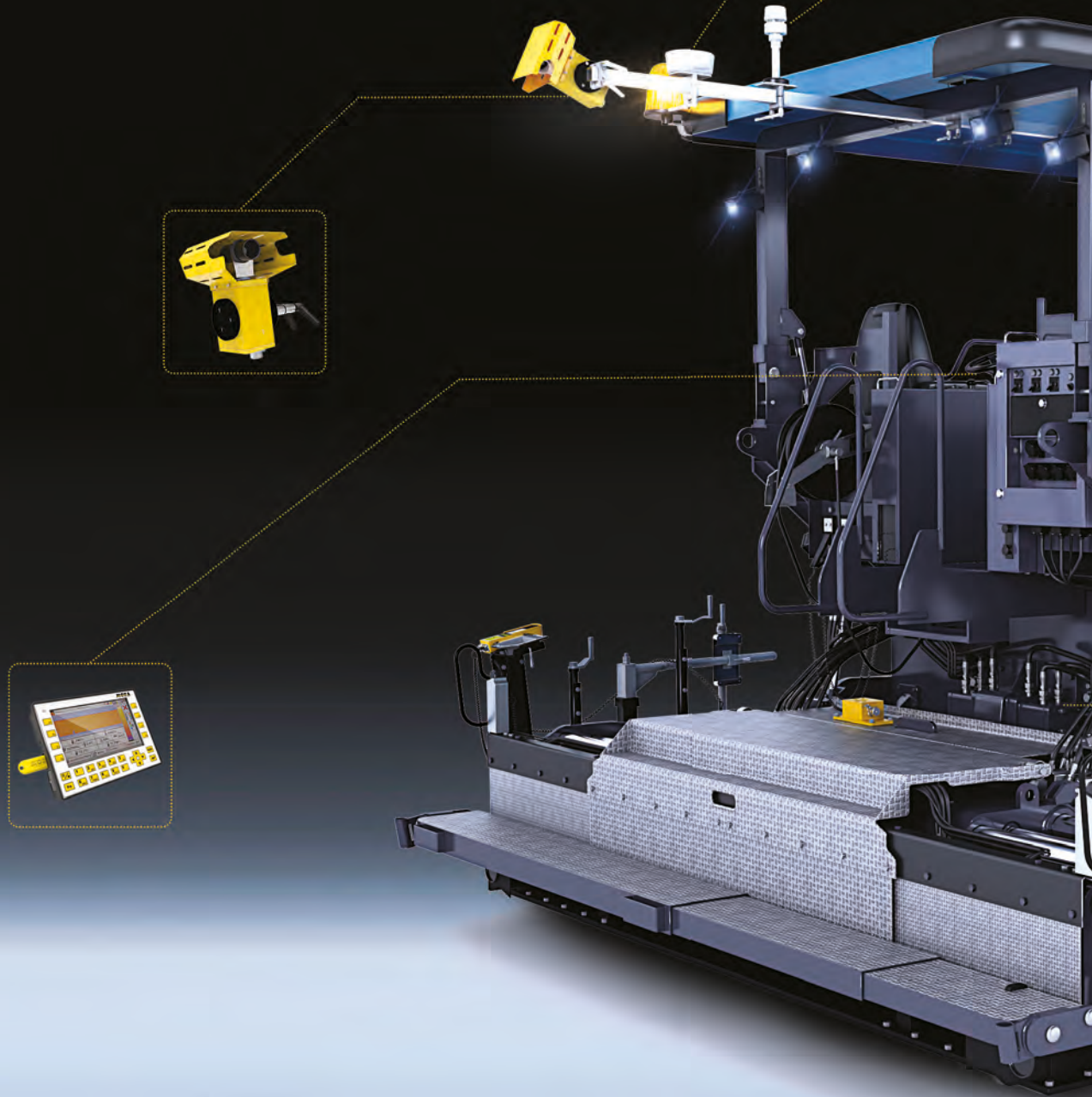
## IR-SPOT SENSOR

- » Additional material temperature measurement
- » Flexible installation
- » Temperature information in real-time
- » Up to four individual sensors can be used



04

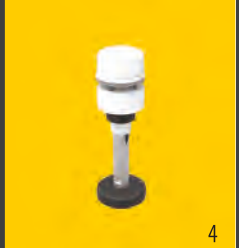
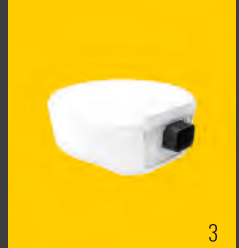
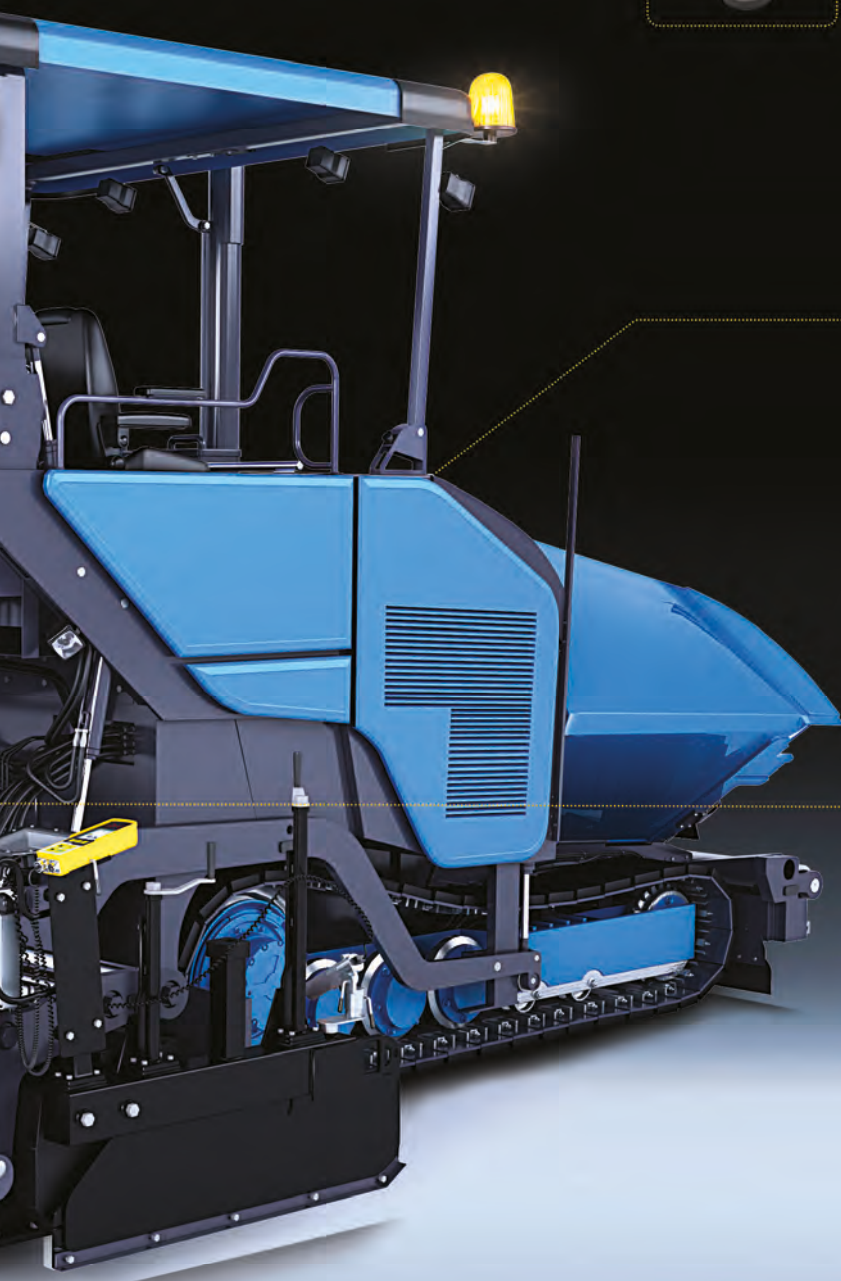
# MODULARITY FOR MORE FLEXIBILITY



## PROCESS DOCUMENTATION IN ROAD CONSTRUCTION 2.0

Thanks to the modular structure, the system is compatible with every paver type and can therefore be installed flexibly in every machine. The configuration levels can be flexibly adapted to the construction site. In this way, additional functions can easily be added with additional **IR SPOTS** or a weather station.

1. **ONBOARD COMPUTER OPERAND** displays the comprehensive thermal profile
2. **IR-TEMPERATUR SCANNER** technology for the measurement of the surface temperature
3. **GNSS ANTENNA** Position data for geo-referencing
4. **WEATHER STATION** measures air temperature, wind speed and humidity
5. **IR-SPOT** temperature sensor additionally measures the temperature of the material





“

„Tools like the PAVE-IR produce high quality, long service life road surfaces, for the advantage of the entire road traffic, and thereby for all who participate“

[Stephen Sebesta, Texas Transportation Institute]

“

“Before we had tools like the PAVE-IR, we knew very little about material temperature during installation. These aspects become obvious since we can visualise them.”

[Swedish construction manager]

“

“The system is accepted very well by our employees. They can immediately see what is in the feed and in the discharge. These are areas which previously were not visible.”

[Bernhard Stolz, Technical Manager Gebr. Stolz]

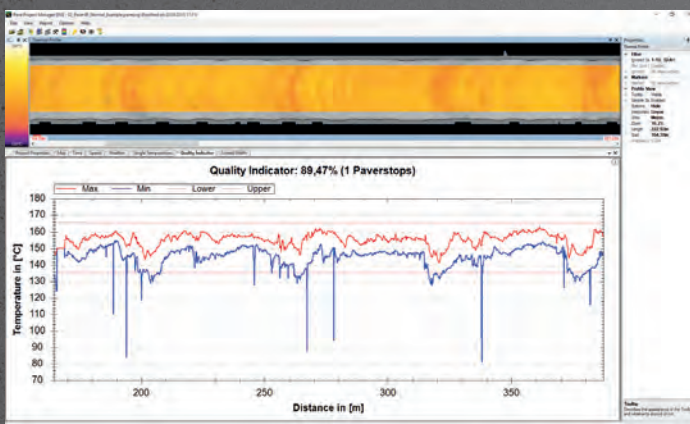
# IR-SCANNER

## DETECT THERMAL SEGREGATION

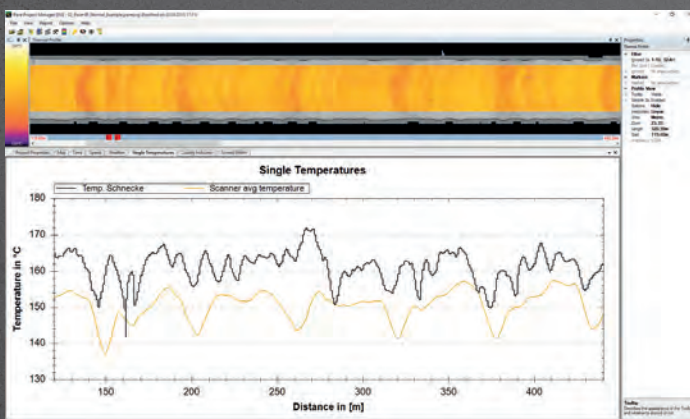
# PAVE PROJECT MANAGER - THE SOLUTION TO DETECT THERMAL SEGREGATION

## OVERVIEW OF THE MODULES

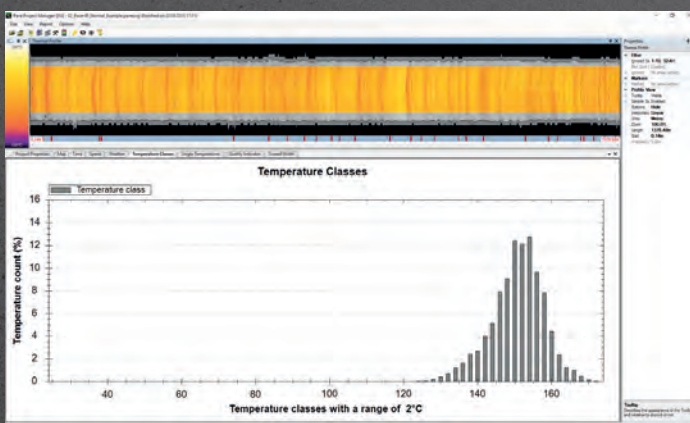
- » Individual temperatures
- » Time diagram, e.g. for paver stops
- » Quality factor diagram
- » Speed diagram
- » Weather diagram
- » Map view
- » Report generation
- » Export functionality
- » Future functions can be added



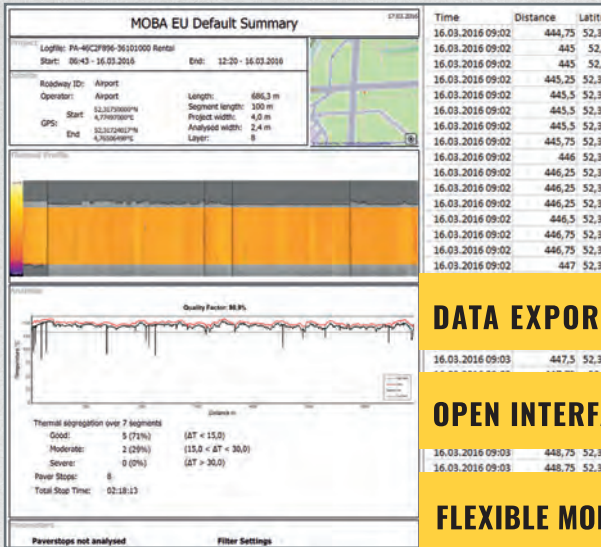
QUALITY INDICATOR DIAGRAM



ADDITIONAL INDIVIDUAL TEMPERATURES



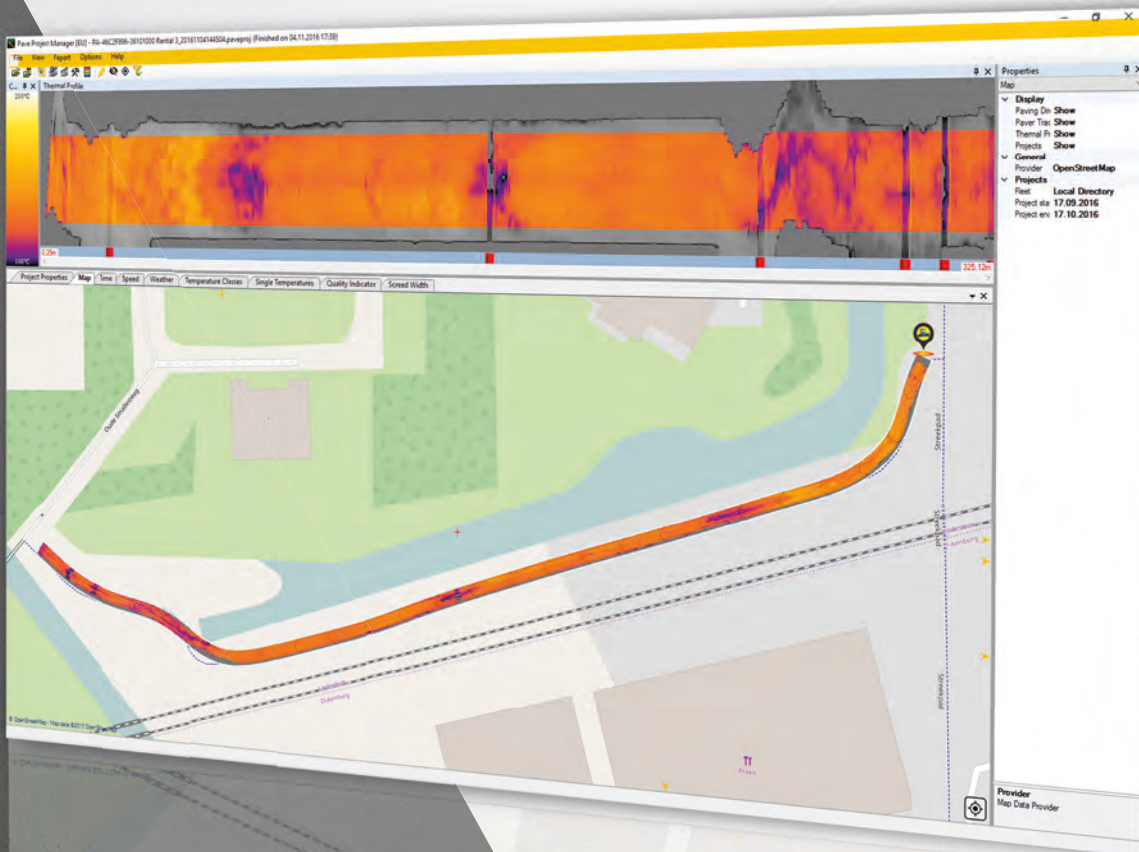
TEMPERATURE CLASSES



**DATA EXPORT TO OTHER APPLICATIONS**

**OPEN INTERFACES FOR THIRD-PARTY PROVIDE**

**FLEXIBLE MODULES FOR ANY TASK**



# ONE GROUP - ONE RESPONSIBILITY



## MOBA GROUP

The **MOBA GROUP** is a leading global player in the world of mobile automation. Close collaborations between the headquarter in Limburg an der Lahn and subsidiaries all over Europe, Asia, North and South America create new perspectives for recent and future developments..

Superior technical know-how and more than 40 years of experience combined with an international dealer network guarantee a premium support – **worldwide. INSPIRING MOBILE AUTOMATION** - this is what the **MOBA GROUP** stands for since more than **40 years**.

### **MOBA GERMANY**

65555 Limburg / Germany  
Phone: +49 6431 9577-0  
E-mail: sales@moba.de

### **MOBA ITALY**

37069 Villafranca die Verona / Italy  
Phone: +39 045 630-0761  
E-mail: salesitaly@moba.de

### **MOBA FRANCE**

77164 Ferrières en Brie / France  
Phone: +33 (0) 1 64 26 61 90  
E-mail: infos@mobafrance.com

### **MOBA UK**

HP178LJ Haddanham / UK  
Phone: +44 184 429 3220  
E-mail: ilewis@moba.de

### **MOBA SPAIN**

08211 Barcelona / Spain  
Phone: +34 93 715 87 93  
E-mail: moba-ise@moba.de

### **MOBA USA**

Fayetteville GA 30214 / USA  
Phone: +1 678 8179646  
E-mail: mobacorp@moba.de

### **MOBA BRASIL**

Belo Horizonte - MG / Brasil  
Phone: +55 31 7513-4959  
E-mail: mobadobrasil@moba.de

### **NOVATRON FINLAND**

33960 Pirkkala / Finland  
Phone: +358 (0) 3 357 26 00  
E-mail: sales@novatron.fi

### **MOBA SWEDEN**

861 36 Timrå / Sweden  
Phone: +46 (0) 73-3750097  
E-mail: pwallgren@moba.de

### **MOBA TECMASERM**

08700 Barcelona / Spain  
Phone: +34 93 804 24 85  
E-mail: moba-tecmaserm@moba.de

### **MOBA CHINA**

116600 Dalian / China  
Phone: +86 411 39269311  
E-mail: ysun@moba.de

### **MOBA Chile**

Avda. Providencia 1476  
Phone: +56 (9) 61678464  
E-mail: mijmarco@moba.de

### **MOBA INDIA**

Gujarat - 382044 / India  
Phone: +91 989 855 6608  
E-mail: sdesai@moba.de

### **MOBA DENMARK**

5250 Odense / Denmark  
Phone: +45 70 26 96 91  
E-mail: jlindskov@moba.de