

PHOENIX MB

Intelligent Rolling Stock Monitoring

Hot Box and Hot Wheel Detection
with Multi Beam Technology



Higher Safety and Cost Efficiency for Railway Systems

Higher speed of trains, larger loads per axle, the variety of wagon types for long-distance traffic as well as the integration of high-speed networks creates increased technical demands on systems used to monitor rolling stock.

voestalpine SIGNALING Siershahn engineers have set new standards in the development of **PHOENIX MB.**



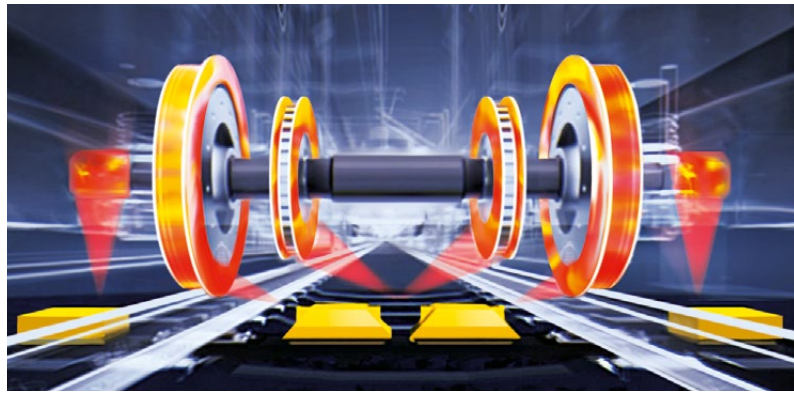
Axles Running Hot and Locked Brakes – Risk Factors for Operational Safety

Axles running hot and locked brakes are a major threat for any railway operation. A hot box can lead to fractures of axle journals which might cause a derailment. Considerable operational hazards are caused by locked brakes, e.g. due to overheated loosened wheel rims as well as broken wheel disks. Additionally, locked brakes can cause fire and are one of the main reasons for the formation of flat spots.

Intelligent Solutions for International Standards

The **PHOENIX MB** system is able to identify all types of axle boxes and braking systems, currently running on international rail systems and reliably detects dangerous temperature levels, up to a speed of 500 km/h. An infrared optic that repeatedly scans the undercarriage (MB = Multi Beam) with eight measuring points and a width of 120 mm is the heart of the system. The integrated signal processor is able to convert the results exactly and quickly. Besides an attractive purchase price the modular construction guarantees a quick and cost effective service of the system.

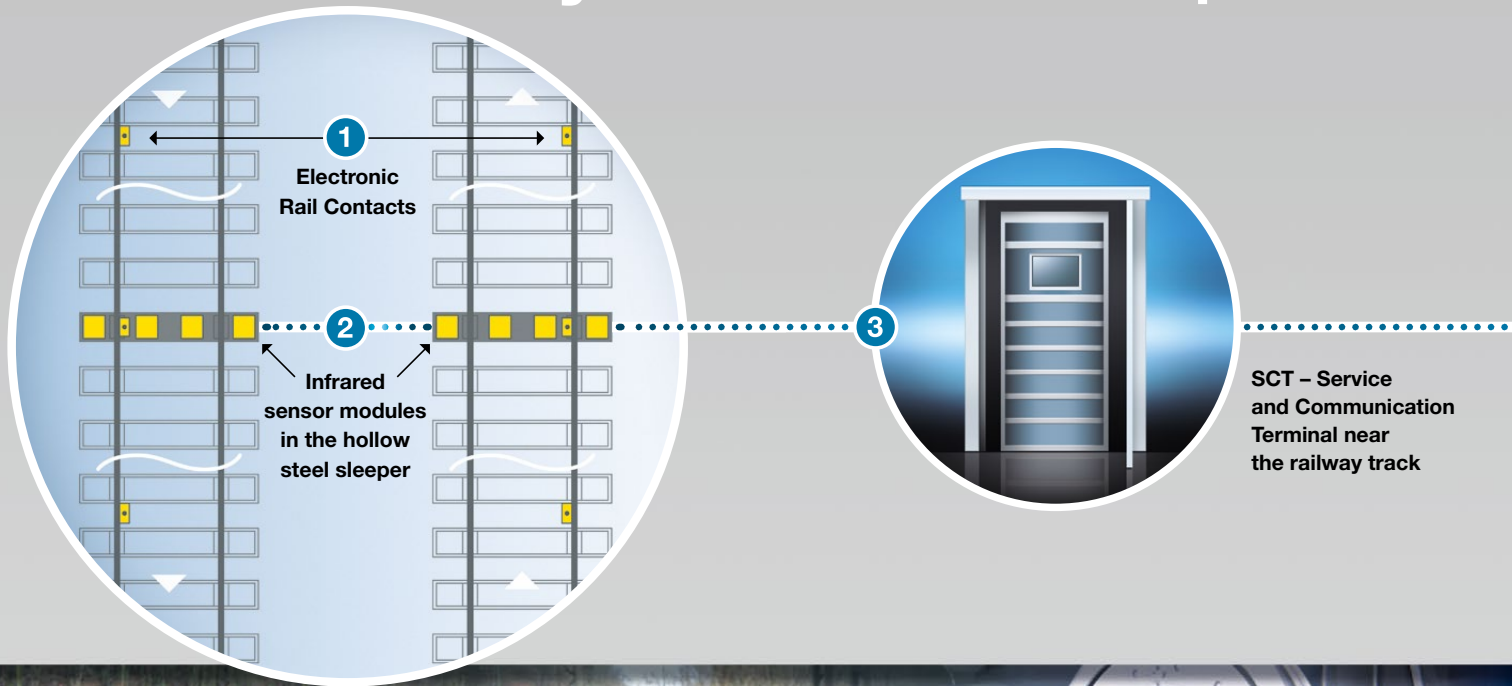
PHOENIX MB functions under all worldwide conditions – from intercity to long distance haulage, from the polar regions to the desert.



Simulation of all possible groups of temperature monitoring: axle boxes, wheel rims and braking disks.



Modular System Concept



The System PHOENIX MB Consists of Six Functional Units

1 Electronic Rail Contacts

These contacts have been specially developed to control the measuring process at the moment the train passes. They activate the system, create a gate signal to evaluate the collected measurement data and then de-activate into standby mode.

2 Sensor Modules

The infrared sensors are integrated into the hollow steel sleeper as modular plug-in unit. They include the complete micro-electronics that are needed for calculating the measured data. The sensors are accurately positioned by pre-set module mounting and therefore, for the purpose of service, can be completely changed within a few minutes

without affecting the measurement geometry. No adjustment is necessary when serviced!

The measurement data is transferred to the Service and Communication Terminal (SCT) via high speed secure data transmission.

3 Service & Communication Terminal (SCT)

The main part is a powerful IPC that is able to cope with extreme environmental conditions. All service and test functions regarding the infrared sensors can be carried out using the IPC. The measurement data is automatically stored. Additionally, the SCT is the interface to next level network structure (e.g. IP) and can be integrated into different topologies.

5

RST – Remote Service Terminal

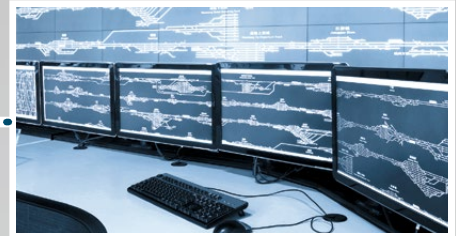
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Service Solutions

4



CMS^{AT} – Central Control and Processing Unit for the integration of several monitoring points of the railway system



Integration into the operational control system of railways is possible



4 Central Control and Processing Unit (CMS^{AT})

To integrate several monitoring points as well as other control systems a central control and processing unit is installed. Integration into different networking topologies resp. networking protocols is also possible. The system is capable of multi-processor operation and features a concept of redundancy and hot standby hardware components.

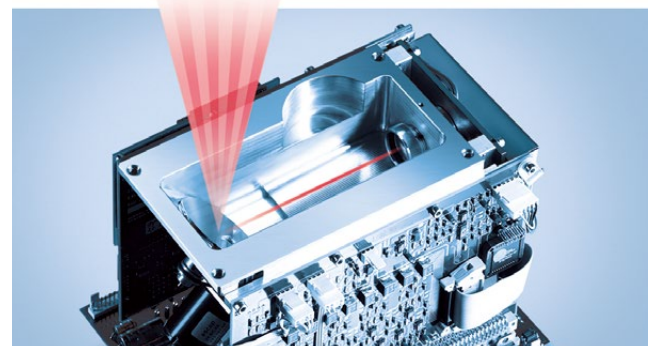
5 Remote Service Terminal (RST)

All service and test functions of the **PHOENIX MB** system can be executed worldwide by remote maintenance. This leads to significant savings of operating costs.

6 Service Solutions

If the customer requests, the systems can be controlled, configured and serviced by voestalpine SIGNALING Siershahn.

Measuring and Test Engineering by voestalpine SIGNALING Siershahn – Safe, Reliable and Flexible

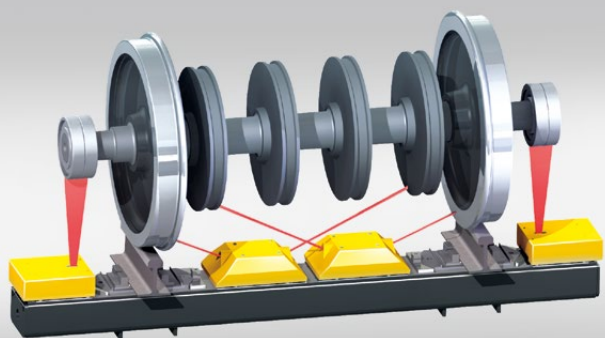


Every sensor module carries eight infrared detection elements for the secure monitoring of all type of vehicles. Electronic and sensor technology work reliably and accurately under all environmental conditions.

PHOENIX MB

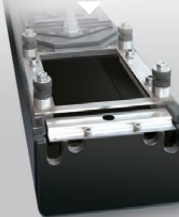
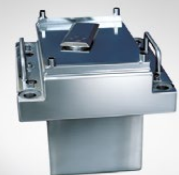
The Advantages of the System at a Glance

- Inspection of all types of axle boxes used worldwide and high flexibility for future construction types
- Continuing measurement of the complete axle box
- Higher safety with multiple scanning (Multi Beam) with eight independent detection elements
- Fast sensor electronic: 3D thermographic image with 450 measuring points at a speed of 500 km/h (1,125 at 200 km/h)
- Range of thermal imaging of the axle boxes
 - Speed of train up to 500 km/h
 - Range of temperature: 0 °C up to 150 °C
 - Temperature resolution: ± 1 K
 - Repetition accuracy: ± 1 K
 - Scanning width: 50 up to 120 mm
 - Autocalibration
- Range of thermal imaging of the brakes
 - Speed of train up to 500 km/h
 - Range of temperature: 80 °C up to 650 °C
 - Temperature resolution: ± 1 K
 - Repetition accuracy: ± 3 K
 - Scanning width on brake and wheel disk: 50 up to 120 mm
 - Autocalibration
- Software for a complete identification of vehicles (Automatic Equipment Identification)
- Software to avoid false alarms
- Flexible integration into existing networks
- Secured data transmission
- Remote maintenance concept
- Modular setup of sensor modules: exchanged within a few minutes, without re-adjustment
- Tamping of the ballast without disassembly of the bearer
- Mechanical components and sensor housing made of heavy-duty stainless steel
- Environmental conditions for the sensor module
 - Working range: -30 °C up to +70 °C (extended temperature range on request)
- Fulfillment of EMC standard EN 50 121-4
- Heating of sensor modules for winter condition
- Option: Equipment suitable for installation in desert or arctic environment



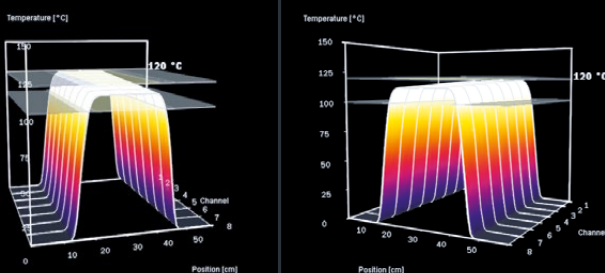
Important Flexibility in Type and Complexity

Depending on the requirements, different varieties of bogie monitoring system are employed. From simple monitoring of axle boxes up to the complete diagnosis of axle boxes, wheel rims and brake disk, as shown above with four sensor modules inside the corresponding hollow steel sleeper.



Easy Service Mode

Due to the modular structure the different sensor modules can be replaced within a very short time. No adjustment of the scanner is necessary. The picture from top to bottom: top cover, sensor module in stainless steel casing and hollow steel sleeper outside.



Detailed Illustration of Results

The temperature data of every axle box can be shown in 2D or 3D graphics. Additionally, the 3D graphic can be swivelled in any direction. Every measuring segment is shown precisely and clearly. Its position on the axle box can easily be identified.



Headquarters of voestalpine SIGNALING Siershahn, Germany.

Central Network

CMS^{AT}

Central, modular IT solution to control and monitor different diagnostic systems as well as flexibly integrate railway specific networking components.

Diagnostic Systems

PHOENIX MB

Hot Box and Hot Wheel Detection Unit with Multi Beam Technology

ATLAS FO

Precise Diagnosis of Wheel Defects and Vehicle Weights

MISTRAL

Precise Wind and Airflow Measurement

DED^{AT}

Efficient Detection of Dragging Equipment

Service Solutions

Maintenance and Repair Services

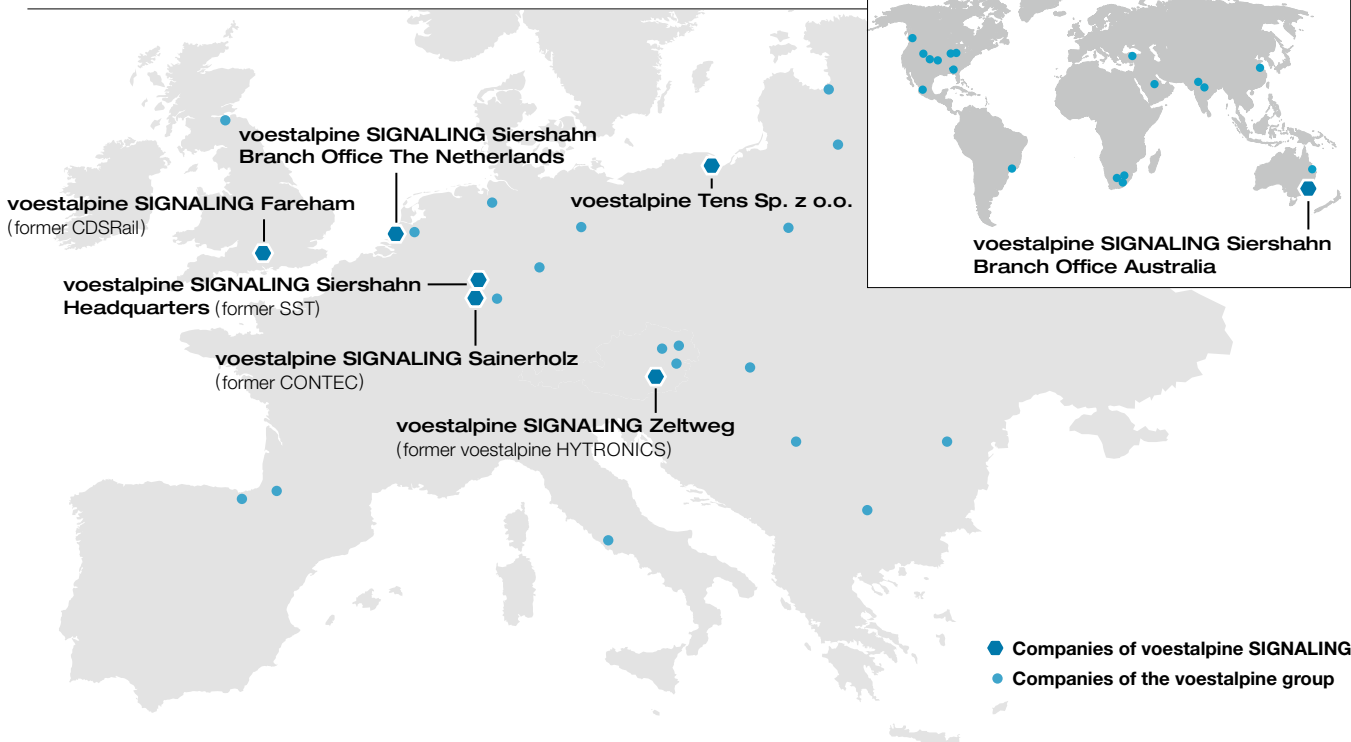
Extensive services and equipment to overhaul the diagnostic systems enable safe operation and guarantee low maintenance costs.

Training Courses

Comprehensive offers for initial and continuing training enable an independent and competent handling of the systems. Preventive maintenance and service done by own employees enhance availability and reduce costs.

European Locations

Locations Worldwide



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