

PEGASUS – Technical characteristics

Hot axle box detector:

Thermal imaging of axle bearings

- Max. train speed: 500 km/h
- Thermal imaging at temperature range: 0°C - 180°C
- Temperature resolution: ± 1 K
- Accuracy (repeated measurements): ± 1 K
- Scanning width:
 - 60 - 140 mm 10 beams
 - 50 - 120 mm 8 beams
 - 25 - 60 mm 4 beams
- RAC Auto-calibration
- Ambient temperature: -40°C to +70°C and RH 100%
- Scanner measurement response time <2ms
- IP66 Level of Protection

Hot wheel detector:

Thermal imaging of brakes

- Max. train speed: 500 km/h
- Thermal imaging at temperature range: 20°C - 650°C
- Temperature resolution: ± 1 K
- Accuracy (repeated measurements): ± 10 K
- Scanning width for brakes and wheel discs: 50 - 140 mm
- RAC Autocalibration
- Ambient temperature range: -40°C to +70°C and RH 100%
- Scanner measurement response time <2ms
- IP66 Level of Protection

General technical data:

- Linux OS
- IVM vibration protection and threshold monitoring (Patent EP 1772342)
- Measuring of all axle bearing types
- Entire bearing surface is continuously measured
- Higher safety due to redundant sensing, using up to 10 independent elements
- 3D thermal image recorded with ca. 7200 scanned points at 500 km/h
- Standard compliant:
 - Interoperability according to the trans-European high speed rail system directive 2006/860/EC
 - EN 55011:98 + A 1:99 + A2:02, Class B (emissions test)
 - EN 50121-4:00 (immunity test)
 - EN 15437-1:2009
- Modular system design:
 - Scanner modules can be replaced in a few minutes
 - no adjusting needed after replacing
- Track can be tamped without deinstalling the assembly
- Scanner link speed: 100 Mb/s
- Scanner variants: 4/8/10 beams
- Max no. of axles: 4000
- IR Sensing Range 3-5 microns
- Alarm evaluation for a 50-axle train: 14 sec
- Signal evaluation HBD/HWD 10us
- Auto open/close shutters and internal vibrating mirror
- Ensure working in dusty environment



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Pegasus – Hot axle box detector



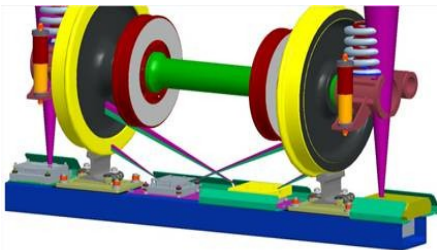
State-of-the-art railway coach monitoring:
innovative and safe



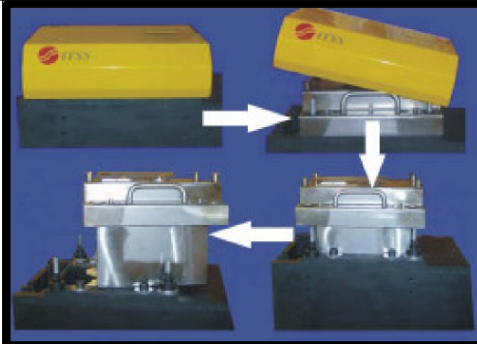


Higher train speeds, higher axle loads as well as the use of different coach types demand innovative systems. ITSS has developed Pegasus, a system which meets the highest safety standards and at the same time, is attractively priced with a view to address the high cost pressure under which railway operators must operate.

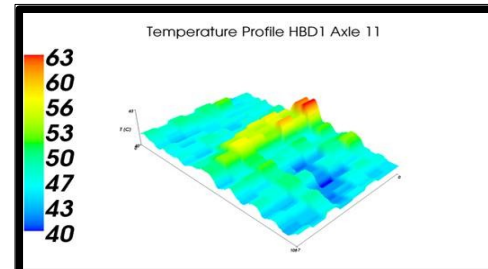
Pegasus identifies and records all standard axle types and braking systems. Hot bearing boxes and defective brakes are reliably detected. Modular design is the key to the impressive price-performance ratio of the Pegasus system. 10-beam scanners are used to scan all standard axle-bearing types over a maximum width of 140mm to reliably detect hazard conditions.



State-of-the-art infrared and digital technology is used to ensure rapid and precise processing of measured values.



All sensor modules of the system are integrated into a sleeper. They are precisely positioned with the help of pre-adjusted guides in the sleeper and can be replaced in only a few minutes without changing the alignment geometry.



Above: 3D thermal imaging using 8 channels at 300 km/h. Even at a speed of 500km/h the temperature profile can be recorded reliably at 7200 pixels over 100cm length and 12cm axle bearing width.

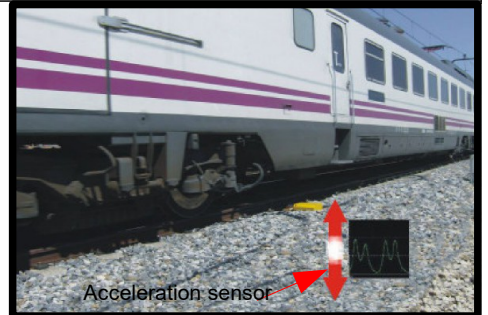
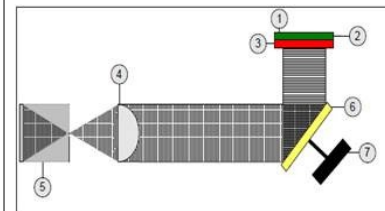
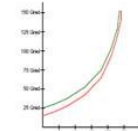
The system scans the axle box across a total width of 140mm using a 10-channel scanner (or 120mm using a 8-channel scanner) in order to reliably identify all hazard conditions in all standard axle box types. Using 10 independent channels ensures a very high degree of redundancy.



Redundant auto calibration (RAC)

Temperature sensor monitoring in the reference element is designed as a fail-safe system (two redundant temperature sensors in the reference system monitor each other). As a result, false alarms due to faults in the reference elements are avoided.

1. Temperature sensor 1 (green)
2. Reference element
3. Temperature sensor 2 (red)
4. IR optical element
5. IR Detector
6. Deflection mirror
7. Motor for deflection mirror



Intelligent Vibration Monitoring (IVM)

Scanner vibration is monitored by special acceleration sensors, thanks to which premature ageing of sensors can be almost eliminated, which in turn results in significant reduction of maintenance overheads. This approach eliminates "incremental aging" of scanners, which has been the cause of frequent sporadic faults leading to high service costs and premature end-of-life of older equipment. Vibration monitoring ensures that corrective measures can be undertaken in time and avoid high operating costs. This unique function is protected by a European patent (EP 1772342).

