



## COMPLETE RAILWAY INFRASTRUCTURE DATA IN NO TIME

Fast and precise – high performance made simple

The **Amberg Clearance IMS 5000** is a state-of-the-art, modular railway surveying system that excels in real-time data acquisition and dynamic clearance analysis. It precisely measures both relative and absolute track geometry, generating accurate 3D point clouds for comprehensive infrastructure assessments, ensuring unmatched performance.

### Advanced Railway Scanning

- **Modular Design with IMU:** Combines reliable GRP 5000 with advanced IMU technology for flexible configurations.
- **Comprehensive Surveys:** Captures both relative and absolute track geometry.
- **High-Resolution Data:** Produces detailed 3D point clouds for clearance analysis and BIM workflows.
- **Efficient Operation:** Captures track geometry and point cloud data at walking pace, scanning up to 5000 m/h with real-time data display, reducing costs and personnel needs.

### Modular System Design

- **Precision Trolley:** Equipped with sensors for gauge, cant, and distance, adaptable to specific needs.
- **High-Resolution Scanning:** Amberg Profiler 6020 captures complete infrastructure data with exceptional accuracy.
- **Kinematic Precision:** AMU 1030P/2030/2010 ensures precise measurements.
- **Scalable System:** Allows for easy upgrades and customization.

### Absolute Track Survey

- **Maximum Productivity:** Capture in absolute mode at up to 4000 m/h.
- **Accurate 3D Control Points:** Utilizes absolute points for precise data referencing.
- **Versatile Operation:** Reliable day and night without requiring line-of-sight.

### Relative Track Survey

- **Focused Measurement:** Captures relative track geometry and surrounding objects.
- **Comprehensive Calculation:** Measures key track parameters for dynamic clearance analysis.



## SYSTEM PERFORMANCE AND TECHNICAL DATA

| System configuration                                                  |                                                                |
|-----------------------------------------------------------------------|----------------------------------------------------------------|
| Gauge [mm]                                                            | 1000, 1067, 1220, 1372, 1435, 1495, 1520/1524, 1600, 1668/1676 |
| Gauge measuring range [mm] (re nominal gauges)                        | -20 to +55                                                     |
| Cant [mm] (re 1435 mm gauge)                                          | ± 260                                                          |
| Profiling unit                                                        | Amberg Profiler 6020/C/M                                       |
| Track alignment measurement                                           | AMU 1030P/2030/2010                                            |
| System weight [kg] (re 1435 mm gauge, AMU 2030, no stabilization kit) | 52                                                             |

| Sensor performance <sup>(1)</sup> |                                 |
|-----------------------------------|---------------------------------|
|                                   | <b>Amberg Profiler 6020/C/M</b> |
| Profiles / second                 | up to 267                       |
| Million scan points / second      | up to 2.188                     |
| Range [m]                         | 0.3 to 182                      |

| System performance <sup>(1)</sup> |          |          |
|-----------------------------------|----------|----------|
|                                   | Relative | Absolute |
| Typical measuring speed [m/h]     | 3500     | 2500     |
| Max. measuring speed [m/h]        | 5000     | 4000     |

| System accuracy <sup>(2)</sup>                       |          |          |
|------------------------------------------------------|----------|----------|
|                                                      | Relative | Absolute |
| Track position and height [mm]                       | NA       | ± 3      |
| Gauge [mm]                                           | ± 0.3    | ± 0.3    |
| Cant [mm]                                            | ± 0.5    | ± 0.5    |
| Profile accuracy @ 5 m distance [mm] (re track axis) | ± 3      | ± 3      |
| Object point accuracy @ 5 m distance [mm]            | ± 3      | ± 5      |

| Environmental specifications |                      |
|------------------------------|----------------------|
| Lighting conditions          | Darkness to daylight |
| Working temperature range    | -10 to +45 [°C]      |
| Humidity (non-condensing)    | < 80 [%]             |

| Data export options       |                                                                              |
|---------------------------|------------------------------------------------------------------------------|
| Track data                | ASCII, DXF, LandXML, Further formats on request                              |
| Profiles (cross-sections) | ASCII<br>DXF<br>ClearRoute<br>TopoRail<br>Lira<br>Further formats on request |
| Point cloud               | ASCII<br>PTS<br>LAS/LAZ<br>Further formats on request                        |

| System approvals             |                                                                                                                                                                                                |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CE Conformity                | EN 61326-1:2013<br>EN 61000-6-2:2005<br>EN 61000-6-4:2007/A1:2011<br>EN 60825-1:2014<br>EN 13848-4<br>EN 13977:2011<br>Directives 2014/30/EU<br>Directives 2014/35/EU<br>Directives 2011/65/EU |
| GRP System FX approvals from | Network Rail / London Underground (UK), Deutsche Bahn (DE), SBB (CH), SNCF (FR), ÖBB (AT), RFI (IT), Adif (ES), ProRail (NL), Infrabel (BE)                                                    |

| References                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Amberg's railway surveying solutions have demonstrated high performance globally. They have been successfully implemented in demanding projects across Germany, Austria, Belgium, the Netherlands, Denmark, France, Italy, Spain, Greece, Turkey, Australia, the United Kingdom, Saudi Arabia, the UAE, South Korea, the USA, and China. |

<sup>(1)</sup> Typical performance may vary depending on project conditions.

<sup>(2)</sup> Results depend on factors such as control point density, control point quality, and overall project conditions.