

# Amberg Clearance GRP 5000 Profiler 6012



## The configuration consists of

- Premium hardware GRP 5000
- Application specific software Clearance Plus
- Robust and guaranteed precision thanks to GRP Fidelity
- First-class application support

## Technical data GRP 5000

System configuration	
Gauge (mm)	1000, 1067, 1435, 1520/24, 1600, 1668/76
Profiling unit	Amberg Profiler 6012
Compatible	Z+F Profiler 9012
Profiler 6012	
Scanner type	Infrared phase shift
Range (Ambiguity interval)	119 m
Sensor performance	
Profile surveying (Lateral offset and height to track axis)	
Max. data acquisition rate - Pixels/sec	1'000'000
Amberg Profiler Max. scan speed - Rotations/sec	200
Track geometry measurement (Position, Gauge, Superelevation)	
Kinematic measurement - data frequency	TPS: 7 Hz GPS: 10 Hz
System accuracy	
Track coordinate*) - GRP with total station	+/- 5 mm
Superelevation	+/- 1.0 mm
Gauge	+/- 0.3 mm

Cont. system accuracy	
Profile accuracy - relative to track axis - at a distance of 5 m	+/- 5 mm
Object point accuracy*) - GRP with total station	+/- 2 - 4 cm
*) For more details, see „GRP 5000 - System specification and typical accuracies for system application“.	
Positioning	
Leica total stations - motorised, ATR - radio modem	TS15/16, TS30, TS50/60, MS50/60
Leica GPS	GPS1200, GS10/14/15/16/18
Power supply	
GRP system	GBC 5000 battery, rechargeable > 5 h
Battery life*)	> 5 h
Panasonic control computer	Li-Ion battery, rechargeable > 4 h
Battery life*)	> 4 h
*) Depending on conditions.	
Environmental specifications	
Lighting conditions	Darkness to daylight
Working temperature range	-10° to +45° C
Humidity	Non-condensing
System weight	
GRP 5000 - ready to measure - incl. battery and computer	56 kg

## System use and typical system performance

Clearance Plus applications		
Typical project applications	<ul style="list-style-type: none"> <li>- Clearance surveying</li> <li>- Clearance gauging</li> <li>- Structure gauging</li> <li>- Compliance checks of lineside installations</li> <li>- Structure condition assessment</li> </ul>	
Typical project performance		
Application	Clearance surveying	Variant studies
Project section, lengths	1'000 m	1'000 m
Required point density	10 x 10 mm	20 x 20 mm
Surveying		
Typical measuring speed *) GRP with total station / **) GRP with GPS	3.6 km/h	1.0 km/h*) / 3.6 km/h**)
Track occupation	17 min	60 min *) / 17 min**)
Track geometry data	Stationing, Gauge, Superelevation	Stationing, Gauge, Superelevation, 3D track position
Analysis		
Working time interactive (operator) / automatic (PC)	1.5 h / 6 h	1.5 h / 6 h
Results		
	2D clearance map, cross-sections	3D point cloud 3D track axis cross-sections
System approval		
CE Conformity	EN 61326-1:2013 EN 61000-6-2:2005 EN 61000-6-4:2007/A1:2011 EN 60825-1:2014 EN 13848-4 Directives 2014/30/EU Directives 2014/35/EU 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)	
Extract of references		
Amberg's railway surveying solutions have proven their high performance all over the world. Demanding projects have been successfully realised in e.g. Germany, Austria, Belgium, the Netherlands, Denmark, France, Italy, Spain, Greece, Turkey, Australia, United Kingdom, Saudi Arabia, UAE, Korea, USA, PR China.		

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## System performance and technical data

### Amberg Clearance

Speedy and definite clearance assessments with real-time results. Modular system solution for automatic clearance surveying completed by typical railway analyses and documentation.

#### Project data management

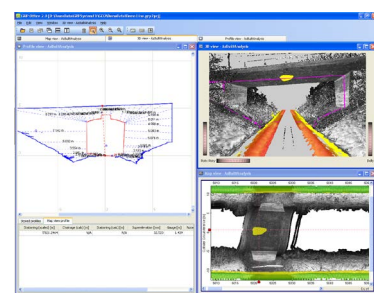
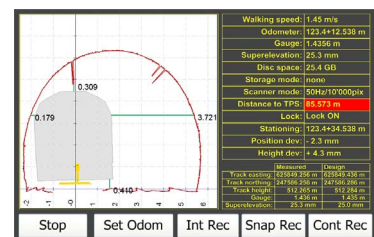
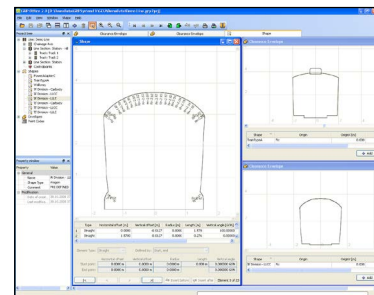
- Central database for input, visualisation and management of clearance envelopes, clearance models, track project data including route data chronology, control points and measuring epochs.
- Flexible and user-friendly clearance envelope editor.
- Provision of all clearance specifications for subsequent surveying tasks and evaluations.

#### Surveying

- Profile measurements in 2D clearance mode or 3D coordinate mode with combined collection of all relevant track geometry data (stationing, gauge, superelevation, 3D track coordinates (with TPS, GPS only)).
- User-definable data registration mode depending on project requirements:
  - Continuous point cloud registration
  - Definable interval profile recording
  - Targeted individual profile surveying
- Comparison and display of profile distances between measured object and selected theoretical clearance envelope in real-time directly on site – including alarm function for clearance envelope violation.

#### Evaluation

- Fully automatic evaluation by comparing clearance surveys with a predefined clearance model for given section – either relative to the current track position or (for 3D data) in terms of a predefined, theoretical track position.
- Comprehensive, automatic reporting:
  - Traditional profile plot including clearance distances.
  - Extensive clearance mapping – stored with scaled image documentation for clear identification of potential encroachments.
  - 3D visualisation including colouring of all critical clearance objects and including an option for creating videos of the surveyed section.
- Established interfaces for third party clearance and design applications including 3D point cloud export for post-processing in common planning software tools (e.g. Cloudworx).



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