AMBERG TECHNOLOGIES

EN 13848-4 CONFORMITY

Amberg Clearance GRP 3000

The configuration consists of

- Premium hardware GRP 3000
- Application specific software Clearance Basic
- Robust and guaranteed precision thanks to GRP Fidelity
- First-class application support

Technical data GRP 3000

System configuration	
Gauge (mm)	1000, 1067, 1435,1520/24, 1600, 1668/76
Profiling unit	Amberg Profiler 110 FX
TGS FX	
Gauge - for nominal gauges	-25 mm to +65 mm
Superelevation (Cant) - at 1435 mm	+/- 260 mm (+/- 10°)
Profiler 110 FX	
Measuring range - on natural surfaces	0.3 – 30 m
Sensor performance	
Profile surveying (Lateral offset and height to track axis)	
Single point measurement - depending on object surface	1 s
Automatic profile measurement - depending on object surface	up to 60 points/min
Track geometry measurement (Position, Gauge, Superelevation)	
Measurement stop&go - duration	TPS: 5 s GPS: 1 s
System accuracy	
Track coordinate*) - GRP with total station	+/- 1 mm
Superelevation	+/- 0.5 mm
Gauge	+/- 0.3 mm

Cont. system accuracy	
Control point accuracy - relative to track axis - at a distance of 5 m	+/- 3 mm
Object point accuracy*) - GRP with total station	+/- 1.5 cm

*)Typical project accuracy. Depending on e.g. atmospheric conditions, control point quality, positioning sensor and project conditions.

Positioning	
Leica total stations - motorised, ATR - radio modem	TS15, TS30, TS50, MS50
Leica GPS	GPS1200, GS10/14/15
Power supply	
TGS FX – sensors Battery life*)	Leica GEB171, rechargeable > 8 h
Panasonic control computer Battery life*)	Li-Ion battery, rechargeable > 4 h

*) Depending on conditions.

Environmental specifications	
Working temperature range	-10° to +50° C
Humidity - non-condensing	< 80 %
System weight	
GRP 3000 - ready to measure - incl. battery and computer	30 kg

System use and typical system performance

Clearance applications	
Typical project applications	- Clearance surveying - Clearance gauging - Structure gauging - Compliance checks of lineside installations
Typical project performance	
Clearance gauging – Single profile measurement relative to track axis	
Measuring duration of single object (e.g. signal, bridge, platform) - 10 measuring points - manual targeting	60 s
Measuring duration of cross section (e.g. tunnel) - 50 measuring points - automatc measuring	60 s
Clearance surveying – cross-section profile measurement with absolute 3D object coordinates	
Cross-section interval	10 m
Measuring points per profile	30
3D track axis, every - GRP with total station	10 m
Resulting performance	350 m/h
System approval	
CE Conformity	EN 61326-1:2005 EN 61000-6-2:2005 EN 61000-6-4:2006 EN 13848-4 Directive 2004/108/EC Directive 2002/95/EC
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)

DB RiL 833.0050 Type approval as railway surveying device by DB AG. DB RiL 824.0050 Measurement and detection of long-wave track irregularities.

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.

Amberg Clearance GRP 3000

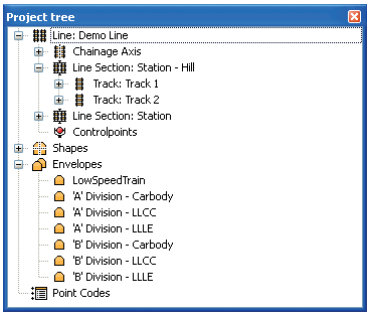
System performance and technical data

Amberg Clearance

Modular system solution for automatic clearance surveying completed by typical railway analyses and documentation.

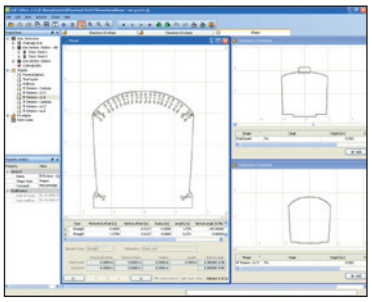
Project data management

- 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.



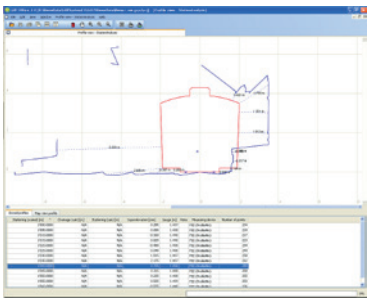
Surveying

- Profile measurements in 2D clearance mode or 3D coordinate mode with combined capturing of all relevant track geometry data (stationing, gauge, superelevation, 3D track coordinates (with TPS, GPS only)).
- Profile data collection:
  - Either with manual object point targeting.
  - Or automatic profile measurement with definable point density on the object surface.
- Display of profile distances between measured object and selected theoretical clearance envelope in real-time directly on site.



Evaluation

- Complete surveyed data management including automatic incorporation of subsequent re-measurements.
- 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.
  - Profile plot including clearance distances.
  - Coordinate list with additional gauging information.
- Established interfaces to third party clearance and design applications like DXF, ASCII, SC0 (ClearRoute), LUE (Lira).



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