

# 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		Cont. system accuracy	
Gauge (mm)	1000, 1067, 1435, 1520/24, 1600, 1668/76	Control point accuracy - relative to track axis - at a distance of 5 m	+/- 3 mm
Profiling unit	Amberg Profiler 120 FX	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.			
TGS FX		Positioning	
Gauge - for nominal gauges	-25 mm to +65 mm	Leica total stations - motorised, ATR - radio modem	TS15/16, TS30, TSS0/60, MS50/60
Superelevation (Cant) - at 1435 mm	+/- 260 mm (+/- 10°)	Leica GPS	GPS1200, GS10/14/15/16/18
Profiler 120 FX		Power supply	
Measuring range - on natural surfaces	0.3 – 30 m	TGS FX – sensors	GBS 1010, rechargeable > 8 h
Sensor performance		Battery life*)	> 4 h
Profile surveying (Lateral offset and height to track axis)		Panasonic control computer Battery life*)	> 4 h
Single point measurement - depending on object surface	1 s	*) Depending on conditions.	
Automatic profile measurement - depending on object surface	up to 60 points/min	Environmental specifications	
Track geometry measurement (Position, Gauge, Superelevation)		Working temperature range	-10° to +50° C
Measurement stop&go - duration	TPS: 5 s GPS: 1 s	Humidity - non-condensing	< 80 %
System accuracy		System weight	
Track coordinate*) - GRP with total station	+/- 1 mm	GRP 3000 - ready to measure - incl. battery and computer	30 kg
Superelevation	+/- 0.5 mm		
Gauge	+/- 0.3 mm		

## 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 - automatic 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 61326-1:2013 EN 61000-6-2:2005 EN 61000-6-4:2007/A1:2011 EN 60825-1:2014 EN 13977:2011 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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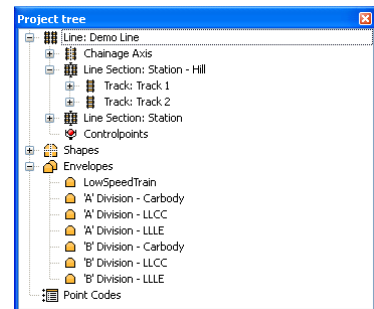
## System performance and technical data

### Amberg Clearance

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

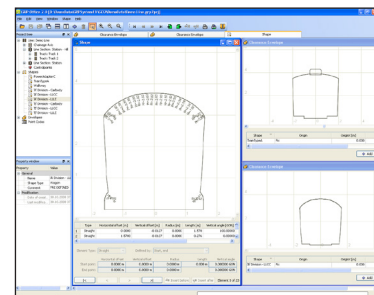
#### Project data management

- 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.



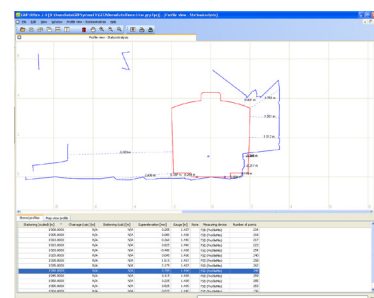
#### Surveying

- 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).



Amberg Technologies AG  
Trockenloostrasse 21  
CH-8105 Regensdorf  
Switzerland  
Phone +41 44 870 92 22  
info@amberg.ch  
www.ambergtechnologies.ch