AMBERG CLEARANCE GRP 3000

REAL-TIME CLEARANCE MEASUREMENT

Modular System Solution for Automated Measurement, Analysis, 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 or 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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SYSTEM PERFORMANCE AND TECHNICAL DATA

System [1] [2]	
	GRP 3000
Gauge [mm]	1000, 1067, 1220, 1372, 1435, 1495, 1520/1524, 1600, 1668/1676
Profiling unit	Amberg Profiler 120 FX
Weight [kg] (re 1435 mm gauge)	31.6
Gauge measurement	
Range [mm] (re nominal gauges)	-20 to +55
Accuracy [mm]	±0.3
Cant measurement	
Range [mm] (re 1435 mm gauge, range ±10°)	±260
Accuracy [mm]	Stop & Go: ±0.5 Kinematic: ±1.0
Track position measurement	
Track position accuracy [mm] (remote total station + prism on trolley)	Stop-&-Go: ±1 Kinematic: ±3
Track position accuracy [mm] (GNSS receiver)	Hz. position: ±20 Height: ±40
Trolley battery	
Type	Amberg GBS 3100 Li-Ion, rechargeable
Operating time [h]	>8
Field computer battery	
Type	Panasonic FZ-G2 compatible
Operating time [h]	>8 if connected to GBS 3100
Environmental specifications	
Working temperature range [°C]	-10 to +50
Humidity [%] (non-condensing)	<80

Amberg Profiler 120 FX [2]	
Measuring range [m]	<30
Distance measuring accuracy @ 5 m [mm]	1

Positioning sensors & accessories			
	Leica	**Topcon**	**Sokkia**
Total station (≤1")	TS15/16, TS20, TS30, TS50/60, MS50/60	GT-1500/1200, MS AXII	iX-1500/1200, NET AXII
Prism	Round, Mini, 360, 360 Mini, Mini Zero	Prism-2, ATP1	AP01, ATP1
GNSS receiver	GPS1200, GS10/14/15/16/18	HiPer VR, XR	GRX3, GRX5

Clearance applications	
Typical project applications	- Clearance surveying - Clearance gauging - Structure gauging - Compliance checks of lineside installations

Sensor performance [1]	
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

Typical project performance [1]	
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 approvals
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, 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)

1) Typical performance may vary depending on project conditions.
2) Results depend on factors such as control point density, control point quality, and overall project conditions

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