AMBERG TECHNOLOGIES

GRP 1000

The precise and robust track measuring system

The GRP 1000 is part of the successful GRP System FX product line from Amberg Technologies.

Precise and efficient track geometry recording – for a successful maintenance process.

The precise and robust track measuring system

Within the GRP System FX family, the GRP 1000 is the system configuration for track measurement and construction, meeting the exacting demands of high productivity and accuracy.

- Slab track construction
- Ballast track construction and maintenance
- Quality control of track geometry

Modular system configuration

The Amberg GRP 1000 system consists of the following:

- TGS FX track gauging trolley
- Prism column GBC100
- Software modules GRPwin «TRACK» and optional «TAMPING»
- Total station Leica TPS1100 / 1200 / 2000

The GRP 1000 can be easily upgraded using the profile measuring devices, Amberg Profiler 100 FX or Profiler 5002 for clearance surveys.

Measurement

The Amberg GRP 1000 together with the Leica TPS total stations delivers precise 3D track coordinates in real time. Automatic target tracking and permanent radio communication between the total station and GRP system enables a highly automated survey operation. The integrated precision sensors for gauge and superelevation provide the additional data required for a complete track geometry survey.

Typical GRP 1

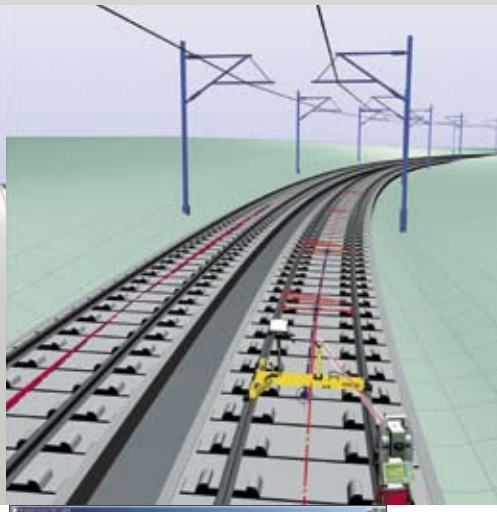
: TPS set up

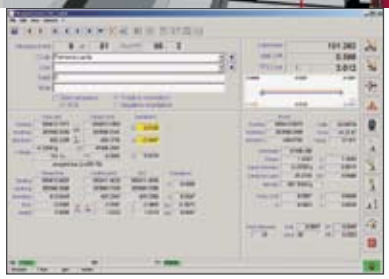
Typical track survey routine

1. Assemble GRP 1000
2. Position the total station
3. Target the total station on the prism of the GRP 1000
4. Start track surveying

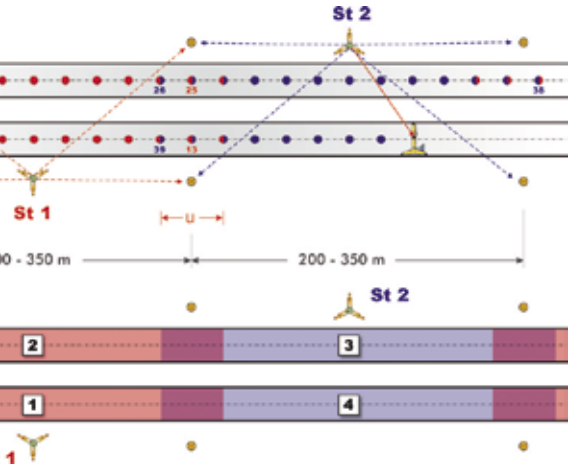
Deviations at a glance for rapid and precise track adjustment.

All together – reliable geometry data as base for good track quality.





000/3000 track survey layout.



: Control point : Survey point track axis u : Overlap

5. a. Survey a parallel track or
5. b. Move total station to the next set up point
! The use of 2 total stations makes it possible to increase production by up to 80%.

Track survey

The GRP 1000 is ideal for routined ballast track maintenance as well as for short notice operations – especially for short sections. Designed with the user in mind surveying can start immediately after positioning the total station. The comparison of actual to design track axis is available in real time allowing an initial evaluation of track geometry. With the basic set up of 1 GRP 1000, 1 total station and a 2 men crew, it is possible to achieve 700 meters per hour of track measurement.

Correction data for track tamping

The required correction data for the tamping machine is calculated automatically from the track survey results. The data is interfaced in established formats to the guidance computers of Plasser & Theurer and Matisa tamping machines ensuring an optimum workflow.

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Slab track construction

The intuitive GRP 1000 system design combines tailor-made components with high precision measurement sensors. The high sensor up date rate and the practical software layout make the GRP 1000 as the ideal surveying tool for slab track construction. The colour-coded display of the actual deviation of the track axis to the design centre line in real time ensures precise track panel adjustment at highest performance rate.

Quality control

The GRP 1000 offers the comprehensive reporting system for track geometry assessments. The report interface is user definable and can output information such as conformity to design limits for track position, gauge, superelevation, horizontal and vertical curvature.

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Typical system performance for track geometry surveying

Assumptions	
GRP 1000 system set up	10 min
Set up total station	20 min
Target distance * total station – GRP	125 meter
Overlap of track axis survey	20 meter
Survey point track axis every	10 meter
Productivity with 1 total station	
Single track Performance per hour	450 meter
Double track Performance per hour	700 meter
Productivity with 2 total stations	
Single track Performance per hour	600 meter
Double track Performance per hour	1000 meter
Typical target distances for applications	
Typical target distance * at average atmospheric conditions are:	
Slab track adjustment	75 – 125 meter
Maintenance of ballast track	100 – 200 meter

* Distance between total station and GRP System depending on project specific accuracy demands and site conditions.

All listed performance figures are non-binding and may change according to project demands and environmental conditions.

Technical data GRP 1000

System configuration	
Available for nominal gauges (mm)	1000, 1067 1520/24, 1600, 1668/76
Speed of measurement	
Single measurement - coordinates, superelevation, gauge - depending on measuring mode and type of Leica TPS total station	3 – 8 sec
Tracking mode - data update frequency	3 Hz
Leica TPS1200 total station	3 Hz
TGS FX sensors	10 Hz
TGS FX measuring range	
Gauge - from nominal gauge	- 25 mm to + 65 mm
Superelevation (Cant) - at 1435 mm gauge	- 10° to + 10° +/- 225 mm
System accuracy	
Gauge - static	+/- 0.3 mm
Superelevation (Cant) - at 1435 mm gauge	+/- 0.5 mm
Internal GRP system accuracy	+/- 0.5 mm

Batteries	
Leica	GEB171, NiMH 12 V, 8 Ah
Battery live * approx.	8 hours
Panasonic	CF-VZSU3OU, Li-ion, 11.1 V, 6.6 Ah
Battery life * approx.	4.5 hours
Environmental specifications	
Working temperature range	-10° to + 50°
Humidity - non-condensing	80%
System weight	
GRP 1000 - ready to measure - at 1435 mm gauge	27.0 kg
Positioning	
Total stations Leica - ATR required	TPS1100 TPS1200 TPS2000

* Depending on conditions. Using new batteries, 1 GEB171 and 2 Panasonic CF-VZSU3OU batteries, will cover one typical GRP 1000 working day.

GRP System FX

The concept of the modular GRP System FX enables the GRP 1000 to be used as the basis for system expansions.

Upgrade options

Modular extensions upgrade the GRP 1000 to:

GRP 5000 –
The mobile scanner solution for infrastructure analyses

GRP 3000 –
The versatile system for railway surveying

Further information about the GRP System FX from Amberg Technologies are available from your local distributor or by e-mail: rail@amberg.ch

Efficiency due to modularity

The modular design of the GRP 1000 from Amberg Technologies enables the system to be easily transported direct to the work site. Speed of deployment and the flexible measuring technique enable measurements to be efficiently integrated into railway network operations. There is no requirement for costly support infrastructure.

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