

# Amberg Tamping VMS 3000

## The long-chord track survey system for demanding track works



### Innovation of a proven principle for track works

- Long chord method
- Combined survey of track and lateral distance offsets in one run
- Absolute accuracy 3 mm
- Greatest operational flexibility – thanks to twin-trolley mode and tripod mode option
- Integrated fixed-point measuring device
- Cost savings of 70% and more compared to manual / optical chord methods
- Safe digital data handling – from initial data input to final transfer of correction data
- Easy handling and flexible transportation

### High performance for long track sections – twin-trolley mode

- 1st Choice for measurements during track closures
- Measuring performance of up to 2300m/h
- Length of reference chord of up to 250m
- Measuring system GRP 3000 consisting of precision sensors for gauge, superelevation and distance, Profiler 110 with prism and ruggedized notebook
- Measuring system GRP TSC with automatic tripod for quick and easy self-levelling of tachymeter
- LED lightening bar assuring safe work during night
- User friendly handling specially designed for track workers



### Greatest flexibility under demanding project conditions – tripod mode

- Ideal for short track sections, e.g. turnouts, multi-track sections and projects with limited track access
- Length of reference chord of up to 400m
- Measuring system GRP 3000
- Tachymeter on tripod (with automatic self-levelling tribrach)
- Flexible measuring mode – as twin-trolley mode – complemented by Flex-Stop functionality
- Immediate measurement stop for rapid track clearance on demand – without impact on performance
- Modular system design allows upgrading at any time e.g. 2nd trolley and other survey applications

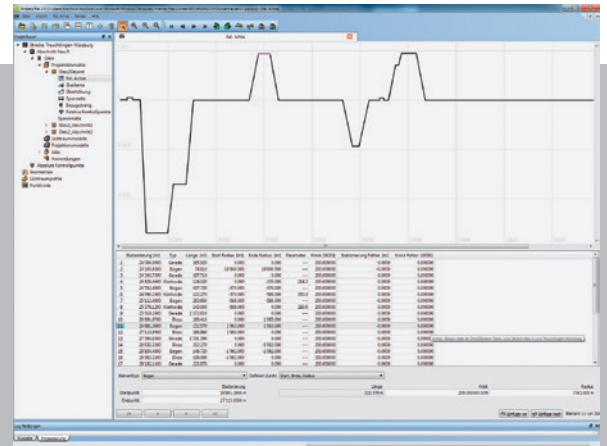


# Easy to use, fully controlled, highly efficient – From preparation through to evaluation

## Project data management

### Simple and quick project data management

- Project setup and track data definition in only a few steps
- Smart input of track data coming from track layout plan or other analogue document
- Direct import of digital alignment data
- Data base model assures immediate access to data input, management and reporting
- Various interfaces for design data transfer
- Integrated track point calculator

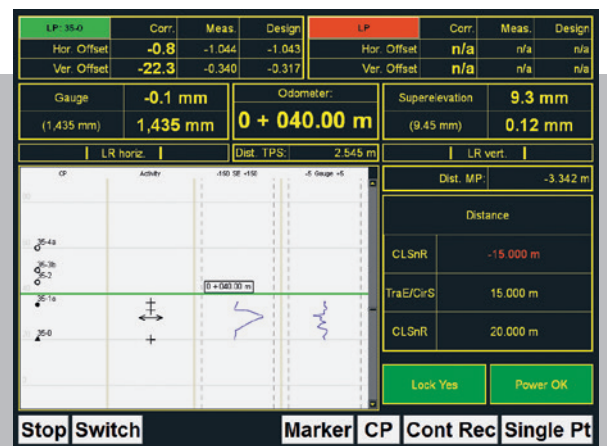


Project data input – intuitive, safe, efficient

## Measurement

### Tamping surveying with highest efficiency

- Easy measuring process – supported by big control screen for complete overview and control at any time
- Track and lateral distance offset survey in one run
- Real-time display of relevant track data
- Kinematic measuring mode
- Single point shots incl. code and note function for relevant track objects (e.g. synchro point, frog)
- Control point measurement including tie-distance control
- Different operation mode for optimal utilisation – during complete track possession or short access windows

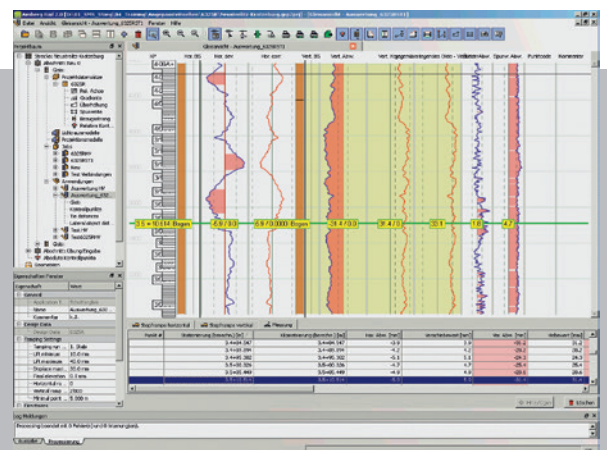


Screen display – clear, meaningful, ergonomic

## Evaluation

### Automatic evaluation and correction data calculation

- Automatic linking and analysis of measuring sequences
- Clear display of results of actual / nominal track comparison including tolerance levels, cross level, point and code info
- Comprehensive evaluation tool for determination of correction values, lift and slue (shift), including ramping, check of possible ramp slope, maximum lift and slue correction
- Actual / nominal fixed-point check
- Comprehensive documentation and export of results including tamping data files
- Lift & slue report for machine driver



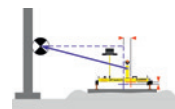
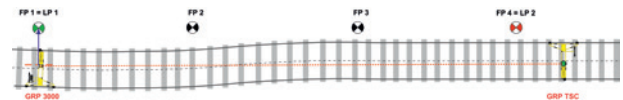
Graphical data analysis – all details at a glance

# Innovation of a proven principle for track works: The VMS long chord method

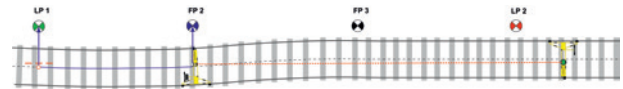
## Twin-Trolley Mode



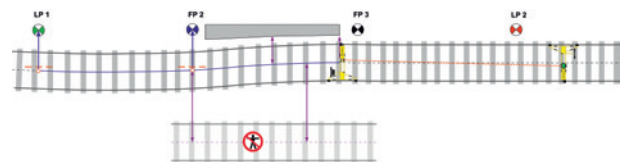
GRP TSC trolley moves to the end of the first section. Preparing the laser tachymeter within seconds by pushing one button.



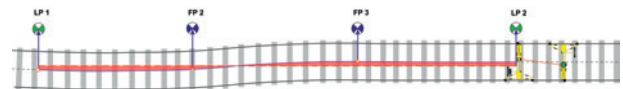
Start of chord measurement: Initial lift and slue calculation at fixed point LP 1 with GRP 3000



Kinematic track recording at walking speed. Survey of synchro points, other POI and additional fixed-point measurements possible at any time.

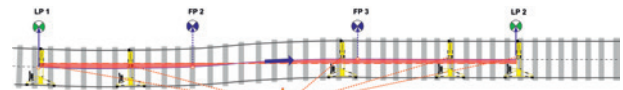


Optional: Non-contact measurement of parallel track distance, platform offset or position of contact wire.



Complete actual/nominal comparison at the end of the measuring section.

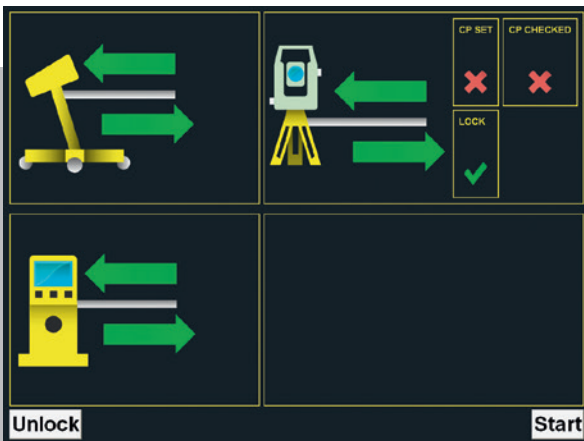
## Tripod Mode



Identical sequence of operation for tripod mode – combined with higher flexibility for track access and high productivity at turnouts and multi-track sections.

Lage in Bezug auf die Gleise	Parti	Standard s. Abstand	Veränderung	Länge	Kriterium und	Grübnote	Mile	Mile	Stärke	Stärke	Stärke	Stärke
(siehe Tabelle)	Nr.	Bez.	Veränderung	5	4	3	2	1	10	9	8	7
0.1-28.4.7	018	AF	re 9.315	SAK			2215.99	221.485	94	73.1-44.52		
0.1-43.65	019	BW	re 9.524	SAK			2215.44	221.429	102	73.1-43.48		
0.1-44.99	020	BW	re 4.361	Kr			2215.91	221.382	164			
0.1-45.04	021	re 9.573	SAK				2215.91	221.413	118	73.1-40.43		
0.1-55.10	022	NW										
0.1-58.89	023	re 10.028	SAK				2214.26	221.355	171			
0.1-74.35	024	re 10.486	SAK				221.702	221.089	210			
0.1-87.63	025	re 10.839	SAK				221.096	220.951	245			
0.2-4.04	026	re 11.225	SAK				221.045	220.812	253	73.2-7.05		
0.2-24.13	027	re 11.675	SAK				220.905	220.721	284			
0.2-41.31	028	re 3.073	Ng				220.748	220.473	145			
0.2-51.36	029	re 1.598	Kr				220.489	221.021	332	73.2-62.47		
0.2-43.41	030	re 1.593	Kr				220.497	220.967	340			
0.2-76.39	031	re 1.601	Kr				220.571	220.903	332	73.2-73.70		
0.2-80.30	032	re 1.610	Kr				220.545	220.881	336			
0.2-91.62	033	re 1.617	Kr				220.502	220.845	343	73.2-89.59		
0.3-2.94	034	re 1.610	Kr				220.484	220.838	344			
0.3-18.84	035	re 1.634	Kr				220.475	220.811	346			
0.3-30.33	036	re 1.601	Kr				220.446	220.809	347	73.3-32.88		
0.3-32.78	037	re 1.597	Kr				220.457	220.798	341			
0.3-47.73	038	re 1.611	Kr				220.449	220.804	355			
0.3-46.33	039	re 1.600	Kr				220.439	220.798	359	73.3-82.84		
0.3-56.39	040	re 1.609	Kr				220.433	220.800	367	73.3-92.88		
0.4-23.22	041	re 1.621	Kr				220.433	220.794	367			

Doesn't mind whether it is analogue or digital project data



Clear structured survey process – the key for highest productivity


Nr.	Stationen	KP Nr.	Bezugspunkt	P	N	projektl. gemessen	Max. OS	Min. OS
1	EL 1 + 10.506	803	<	-3.742	-3.717	0	0	0
2	80.800		<	-3.754	-3.749	0	0	0
3			<	-3.737	-3.731	0	0	0
4			<	4.261	4.377	0	0	0
5			<	-3.754	-3.739	0	0	0
6			<	4.260	4.365	0	0	0
7			<	-3.739	-3.743	0	0	0
8			<	4.530	4.637	0	0	0
9			<	4.422	4.416	0	0	0
10			<	4.458	4.451	0	0	0

Numerous output options – from printout through to digital data

# Amberg Tamping VMS 3000

## System performance and technical data

Systemkonfiguration	
System configuration	1000, 1067, 1435, 1520/24, 1600, 1668/76
Amberg GRP 3000	
Gauge measuring range ▪ for nominal gauges	-25 to +65 mm
Cross level (cant) ▪ at 1435 mm	+/- 260 mm
Fixed-point measuring device Profiler 110 FX	
Fixed-point distance	< 20 m
Weight ▪ incl. computer, batteries	30 kg
Amberg GRP TSC	
Self-levelling tribrach ▪ time	< 5 s
Weight ▪ incl. total station, batteries	33 kg
Total station	
Leica total station ▪ motorized, ATR ▪ radio modem	MS50, TS50, TS30, TS15
System accuracy	
Survey of track position and height <sup>1)</sup>	
▪ Stop & Go mode	+/- 1 mm
▪ Kinematic mode	+/- 3 mm
Crosslevel	
▪ Stop & Go mode	+/- 0.5 mm
▪ Kinematic mode	+/- 1 mm
Fixed-point measurement ▪ relative to track axis ▪ at 5 m distance	+/- 3 mm
Measuring frequency	
Track geometry ▪ 3D track position, gauge, crosslevel	
▪ Stop & Go	< 5 s / measurement
▪ Kinematic	< 7 measurements / s

Environmental specifications	
Working temperatur range	- 10° to +50°
Humidity ▪ non-condensing	< 80 %-
Typical performance	
Twin-trolley mode	1000–2300 m/h
Tripod mode	700–1100 m/h
Tamping data (lift & slue)	
Tamping data preparation ▪ Correction data calculation incl. ramping	< 15 min/500 m
Tamping data formats	Plasser WinALC, ALC CGV5 Framafer BAO3 Matisa
System approvals	
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 Under- ground (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.	

<sup>1)</sup> Depending on e.g. chord length, atmospheric conditions, control point quality, positioning sensor and project conditions.