

# GeoVizio-TR-S

## Track Measurement and Analysis

### Adding Value

An Innovative track geometry trolley that quantifies the condition of track and determines Track Quality Index (TQI) according to newest standards. Its software at the leading edge of technology allows the finest features for processing, analysing and reporting data.



Developed in partnership with Amberg Technologies, Pandrol's GeoVizio-TR-Smart is a new-generation smart geometry trolley for measuring the quality of all track parameters: gauge, cant, twist, longitudinal level and alignment.

Data is processed through the Inertial Measuring Unit which reconstitutes the trajectory of inspection in 3D. Parameters are then calculated according to customised specifications and displayed in real time on 9" tablet computer through GeoVizio Field Software during inspection, then analysed through powerful post processing on any workstation with GeoVizio Office Software.

The trolley is small and lightweight and can be dismantled quickly into two or three parts for easier transportation. Providing good inspection autonomy and suitable for all rail types and track gauges, it is a convenient and versatile option for quality track geometry control.

## → TECHNICAL FEATURES

### Inertial technology

The relative track position is determined using a high technology inertial measurement unit, which combines sensor data to ensure complete tracking with one instrument thus optimising equipment weight and space.

### Innovative calibration

Thanks to its latest inertial technology, on-track calibration can be performed in 2 minutes by leaving it stationary on track for 1 minute in both directions. Overall commissioning time including mounting, calibration and ready-to-use software is 5 minutes.

### Powerful calculation possibilities

Allows for three configurable bases for twist and gauge calculations at the same time, thereby increasing assessment possibilities. Top and horizontal alignments can be calculated using D1 and D2 wavebands, or with configurable versines.

### Comprehensive software features

GeoVizio-TR-S includes two independent softwares, Field and Office, each one designed to offer the best experience for both phases of the geometry assessment. GeoVizio Field connects to an onboard computer via Wi-Fi, saving data in its large storage capacity.

## → ADVANTAGES

- Designed to be reliable and robust, IP65 certified trolley is equipped with IP67 tablet computer anti-wear ceramic side guards.
- Weighing just 25 kg, the GeoVizio-TR-Smart is easy for a single operator to use and move on and off track. The trolley can be dismantled into three parts for ease of transportation.
- Supplied with two batteries for extended battery autonomy of up to 18 hours.
- Double data backup and high storage capacity ensure the safety of collected data.
- Advanced GNSS sensor provides accurate GNSS positioning of geometrical measurement, which can be exported in Google Maps or Earth for accurate visualisation of track defects.
- Adaptable to all gauges from 1000 mm to 1676 mm within 5 minutes thanks to removable gauge extensions. Suitable for both vignole and tram rails with specific wheels sets.



## → COMPONENTS

1. Gauge Extension
2. Onboard computer
3. Battery
4. Odometer + Gauge sensor
5. Cant sensor
6. GNSS
7. Brake
8. Tablet (fixed to the handlebar)

## → SPECIFICATIONS

Overview	
GeoVizio Trolley Smart	
Weight	25 kg
Operating temperature	-10 to 50° C
Gauge	1000 - 1676 mm
L x W x H	900 x 1710 x 300 mm (with folded bar)
Wheels	Vignole or Tram (standard Ø available)
Geometry Acquisition System & Sensors	
AMU 2010N	Inertial measuring unit
Precision cant sensor	Temperature compensated
GNSS sensor	+/- 1 m (Allocation of Trajectory, Irregularities & Events)
Measurement contact reference	Selectable : - 14 or -16 mm below Top of the rail (ToR)
TGU Gauge Measuring Unit	3 Contact Point Design / 1 Gauge Reference Ceramic gauge wheels

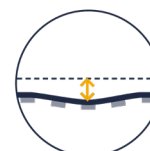
## → MEASUREMENT



Cant



Gauge



Vertical alignment



Alignment



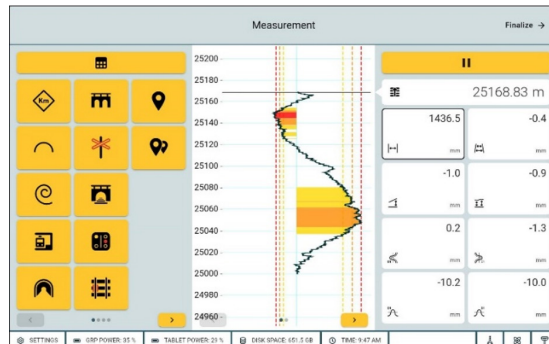
Twist

## → SOFTWARE

**Pandrol GeoVizio** uses leading-edge software with user-friendly interfaces for track geometry assessment, optimizing track measurement with real-time data visualization, customizable charts, and intuitive mapping visualisation for maintenance planing and safety improvement.

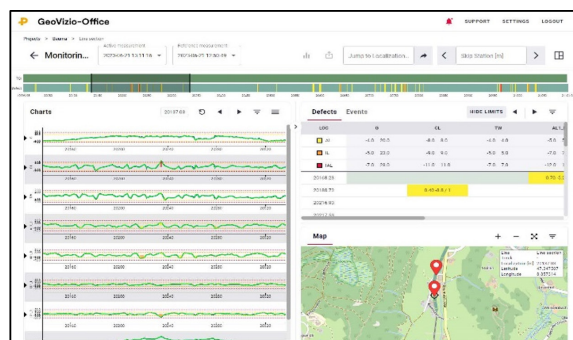
## → GEOVIZIO FIELD

- Features a wide range of geolocated predefined events to be added on track. Events can be personalised by the operator with additional information or manually created if not available as predefined event.
- Allows the operator to choose which measurement parameter to display any time to get a real-time overview of track condition during inspection.
- Sorts all inspection files into project trees : Project < Track < Measurement < Job. Projects can be exported to be analysed in GeoVizio Office.
- 4 configurable thresholds are available : Yellow, Orange, Red, Crimson (optional). Thresholds labels are also customizable.



## → GEOVIZIO OFFICE

- Displayed area can be selected within full inspection timeline, analysed range can be extended or reduced to zoom on a specific location for deeper analysis.
- Google Maps interface provides easy visualization of the targeted railway area.
- Interface is entirely customisable and charts can be filtered in order of showing relevant data to specific needs in all situations.
- Events and defects are listed in a table along with color code, length and value.



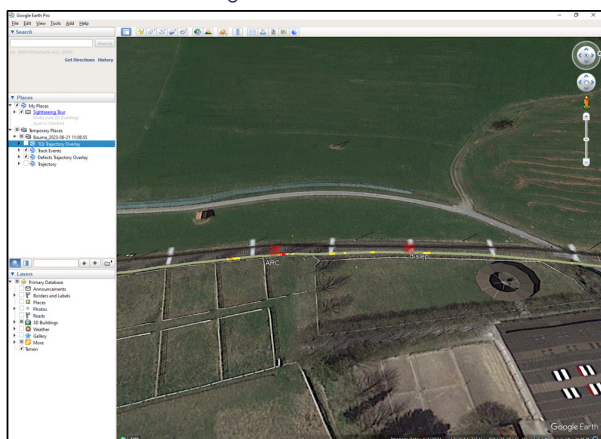
## → DATA EXPORTS

**Pandrol GeoVizio Office** offers countless possibilities for charts and data reporting.



Data can be exported in different formats : PDF, ASCII (CSV) and KML. ASCII (CSV). All defect and measurement charts can be plotted through configurable scales and spacing, parameters can be filtered or emphasized to closely illustrate on the focused phenomenon. Events and TQI can be exported separately as well in ASCII or PDF.

All measurements files can be merged toward providing geometry analysis of the entire track in a unique file into GeoVizio Office, thus enhancing reporting for your inspection project by exporting full track assessment in one PDF document.

Inspection files can be reprocessed according to different specifications or parameters regardless of specifications used during measurements recording.



KML file imported into Google Earth

Defects Report										
<b>Comments:</b> SBB Dig. Renovation Zurich Bahnhofstrasse 1 Switzerland-8001 +41224507099						<b>Line Name:</b> Birmenstorf <b>Line Comment:</b> <b>Track Name:</b> Track 1 <b>Track Comment:</b>		<b>Operator:</b> Antonio <b>Meas. System:</b> DMS1000 <b>Meas. Date/Time:</b> 2022.07.06 13:02:40 <b>Measuring Range:</b> 2300.00 - 3300.00 <b>Validation Date:</b>		<b>Address:</b> 20231000
<b>Service Provider:</b> Amberg Technologies AG Trockenstrasse 21 Switzerland-8105 +41448700120						<b>Design Name:</b> Design 120 track <b>IDN:</b> 11041		<b>Configuration Name:</b>		
Localization [m]	Speed [km/h]	G [mm]	CL [mm]	TW [mm]	AL_L [mm]	AL_R [mm]	LL_L [mm]	LL_R [mm]	Event	Comment
2306.71				0.50-4.71						
2352.71									RAJ	
2376.71									BS 10 m	
2392.21									D-RASH	
2424.71							0.40-12.51			
2437.21							1.30-15.02			
2455.41			0.00-12.72							
2458.41							0.40-12.61			
2463.41						1.70-10.61				
2518.81						0.70-8.61				
2519.81	80-120			0.00-4.11						
2520.21					0.00-4.11					
2517.71						0.00-4.11				
2517.31						0.00-4.01				
2519.11						0.00-4.11				
2571.21							3.00-9.61			
2571.41							2.10-9.61			
2568.11						0.00-4.11				
2564.71							0.20-4.01			
2565.21							0.00-4.01			
2567.01						0.00-11.01				

Defects Report on Office version

## → SPECIFICATIONS

Measurement	
Parameter	Repeatability (95%) [mm]
Gauge	± 0,2
Cant	± 0,5
Twist	± 0,2
Longitudinal level – Top (D1 wave band 3÷23 m)	± 0,5
Horizontal Alignment (D1 waveband 3÷23 m)	± 0,5
Longitudinal level – Top (D2 waveband 25-70m)	± 1,0
Horizontal Alignment (D2 waveband 25÷70 m)	± 1,0
Longitudinal level – Top Chords 40m (configurable)	± Depending on chord lenght, typical ± 1 mm
Horizontal Alignment Chords ≤ 40m (configurable)	± Depending on chord lenght, typical ± 1 mm
Track distance	2 ‰

Tablet & Software	
Tablet	9 inches (40,6 cm), 16:9 (horizontal), 1920 x 1080 p Autonomy : 7 hours Ram : 4 GB Texture solidity : Rigid rubber frame
GeoVizio Field	Version 1.5 / Supplied with manual in 6 languages
GeoVizio Office	Version 1.5 / Supplied with manual in 6 languages

### Measurement application fields

GeoVizio-TR-S is suitable for all types of track and rails, regardless of the track conditions (wear, vegetation, surface quality).



Inertial Measuring Unit 2010

## → ADDITIONAL INFORMATION

Options	
Gauge	All gauges sizes available
Wheels	Tram or Vignole
Reference from ToR	-14 mm or -16 mm
Charger plug type	Depending on country

Accessories	
Ruggedised transport flight case	PGEOP373
Transport bag set	PGEOP374
Extra gauge extension and configuration	PGEOP137
Extra licence dongle or softkey	GTLIB001

### Standard compliance

- EN 13848-1: Characterization of track geometry
- EN 13848-4: Measuring systems – manual and lightweight devices
- EN 13848-5: Geometric quality levels – plain line, switches and crossings
- EN 13848-6: Characterisation of track geometry quality
- EN 13977 : Safety requirements for portable machines and trolleys for construction and maintenance.

In partnership with



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