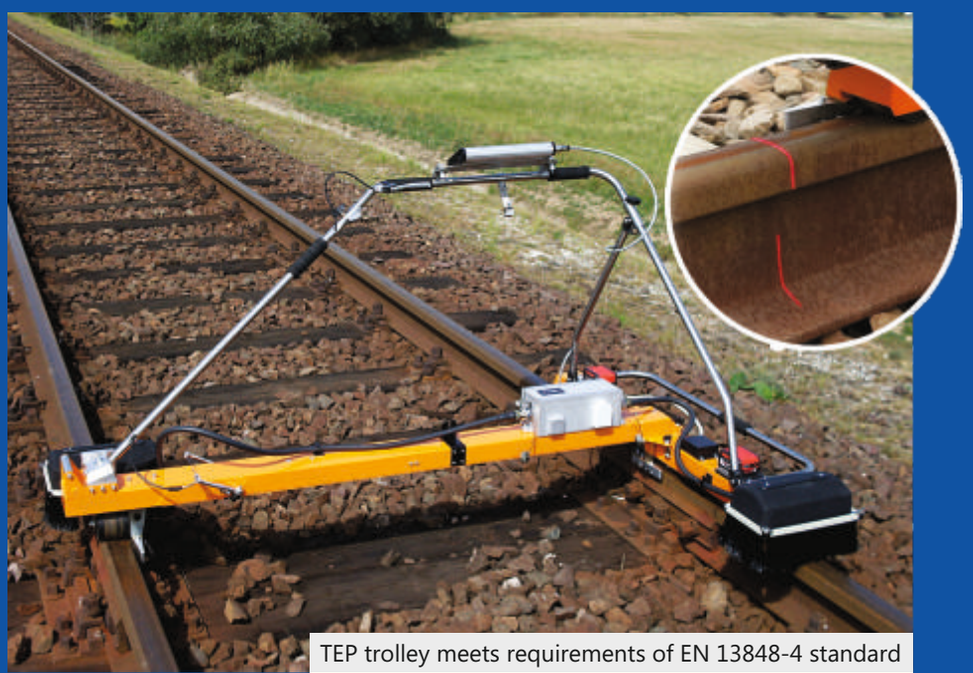
TEP DIGITAL TROLLEY

TEP trolley has al features of TEC/TET trolleys and, moreover it can be used to:

- measure and save transverse Vignoles (railway) and grooved rail profiles every 0.5 m.
- display rail profile during the measurement
- measure rail profile with accuracy of ±0.3mm
- determine rail wear parameters with accuracy of ±0.3mm
- make automatic assessment of rail profile in the track.



TEP trolley meets requirements of EN 13848-4 standard

The trolley is designed for measurements of track geometry. The gauge readings are recorded automatically in its electronic memory in real time as the trolley travels along the track. The operator can see measured values of the track gauge, cant, and the actual mileage on the display during measu-makes it possible to enter information on the track faults discovered and events noted. One can mark location, e.g., of the broken weld or rail, need to replace the sleeper or missing bolts.

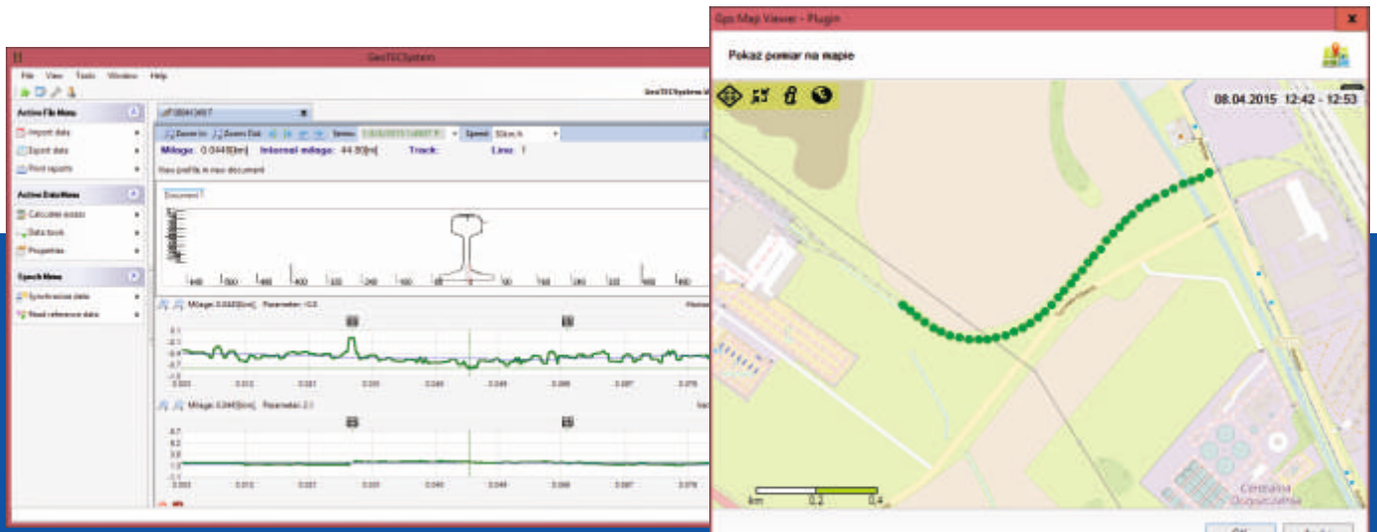
Specifications:

Mileage measurement increment: 0.5 m..	Operating temperature: -20°C ÷ +45°C
Gauge range: -15 to + 50 mm; accuracy: ±0.3 mm	Humidity: 15 to 85% (no condensation)
Cant range: ±200 mm; resolution: 0.1 mm	10 hours' non-stop operation with fully charged battery
Vertical irregularities - range: ±2 mm / 1 m; resolution 0,1 mm	Option - hot-swapping , providing unlimited service time
Horizontal irregularities - range: ±2 mm /1m; resolution 0,1 mm	Trolley available in versions for various track gauges, e.g., 914,1000,1067,1435,1520,1600,1668,1676 mm
Measurement of rail profile with 0.5 m increment	Trolley records the measured track section route using its built-in GPS receiver
Calculation of rail head profile vertical and horizontal wear; accuracy ±0,3 mm	Calculation of gradient and twist

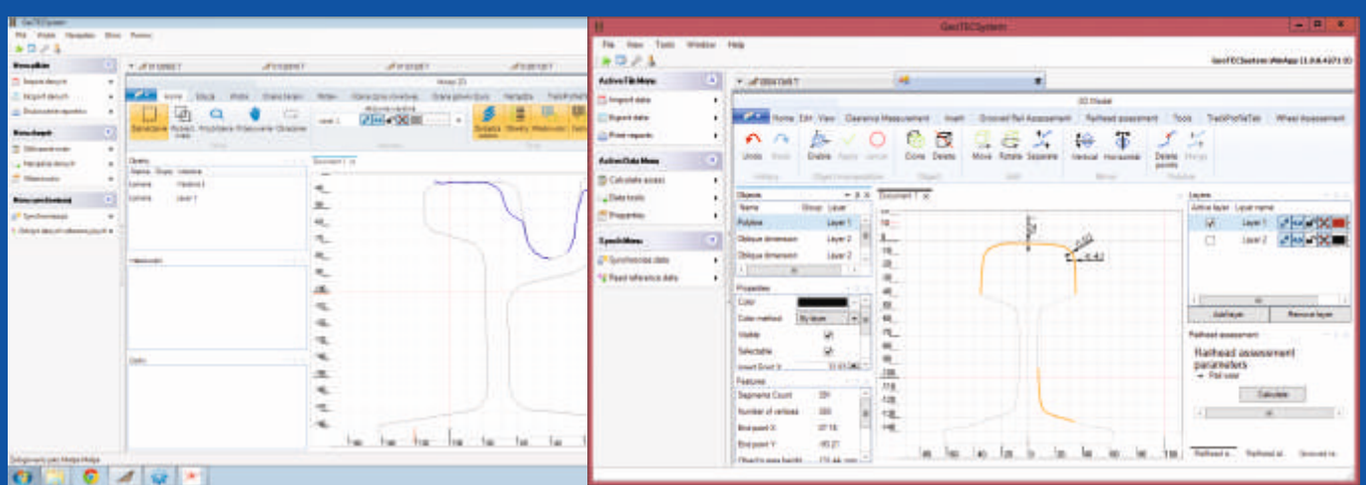
Trolley may be equipped with one rail profile measuring head (TEP2.1) or with two heads for the simultaneous measurement of both rails - leaft and rail (TEP2.2). GeoTECSystem software for the PC platform makes it possible calculation of the track gauge gradient, track twist, and recalculation of the measured vertical and horizontal irregularities measured on 1 m long base to 10 m long chords. Tabular printout of the measurement results is possible, with marking the mileage values where faults observed by the operator occurred, printout of the measurement results as plots, and also calculation of the synthetic indices W5 and J, employed -according the Polish State Railways.

The gauge has many operational advantages, like low weight (about 30 kg) which makes fast removal from the track possible to let the train pass, next, immediate continuation of the measurements is possible without any calibration. The track gauge may be folded easily and transported even in a small car. The gauge electronic memory can store up to 56 000 km of track geometry measurement results and rail profiles from 260 km of track.

Dedicated software is delivered with the trolley making it possible to save the measured profiles in DXF format, to compare the measured profiles with the reference profiles, as wel as automatic dimensioning of the measured profiles, edition of profiles and printing of reports.



Screenshot of PC software for analysis and presentation of measurement results acquired by the trolley



Examples of measurement results of rail profile and their correspondence with a reference profile

Numeric data report

Measurement date: 01.06.2016 07:00:45
Line: 1 (Murawa - Wilcza)
Track: T1
Analysis speed: 80 km/h

Parameters tolerances:
-8 < Gauge < 10
-20 < Cant < 20
-18 < Vertical irregularity < 18
-17 < Horizontal irregularity < 17
-16 < Track twist < 16
-2 < Track gradient < 2
-100 < Events < 100
; - Broken weld = - Joint H - Hectometer mark) - Rails flat
/ - Skewed sleepers R - Turnout E - Platform D - Crossing

Mileage [km]	Gauge [mm]	Cant [mm]	Vert. irr. [mm]	Hor. irr. [mm]	Twist [mm]	Grad. [mm]	Events
-0.0100	3.0	-1.2	—	—	—	-0.3	
-0.0095	2.9	-1.2	—	—	—	-0.3	
-0.0090	2.7	-1.1	—	—	—	0.0	
-0.0085	2.8	-1.0	—	—	—	0.2	
-0.0080	2.7	-0.9	—	—	—	0.3	
-0.0075	2.8	-0.7	—	—	0.4	0.5	
-0.0070	3.0	-0.6	—	—	0.5	0.4	
-0.0065	3.3	-0.5	—	—	0.4	0.0	
-0.0060	3.4	-0.6	—	—	0.3	-0.3	
-0.0055	3.3	-0.7	-3.2	20.9	0.1	-0.2	
-0.0050	3.1	-0.8	-4.3	21.5	-0.3	-0.1	
-0.0045	3.1	-0.7	-5.6	22.3	-0.5	-0.3	
-0.0040	3.0	-0.7	-6.6	22.9	-0.9	-0.3	
-0.0035	2.8	-0.7	-7.1	24.9	-0.9	-0.1	
-0.0030	2.7	-0.8	-7.5	27.0	-0.8	0.2	
-0.0025	2.7	-1.0	-7.8	28.0	-0.5	0.4	

-7.7	29.4	-0.2	0.4	
-7.6	30.1	0.2	-0.2	
-6.9	30.0 #	0.1	-0.7	R
-5.3	29.5 #	-0.1	-0.3	R
-3.8	28.3 #	-0.1	1.1	R
-1.5	27.3 #	-0.4	5.4 #	H R
0.0	27.0 #	-0.4	1.9	R
1.0	24.1 #	-0.6	-3.6 #	R
2.1	20.9 #	-0.5	-0.7	R
	20.7 #	-0.8	-0.8	R
	18.7 #	-1.2	-1.6	R
	17.6 #	-1.9	-4.6 #	R
	17.8 #	-1.8	-2.3 #	R
	17.9 #	-0.9	1.5	R
	18.8 #	0.3	1.3	R
	19.8 #	1.0	1.2	R
	20.6 #	0.9	0.0	R
	22.1 #	0.4	-0.9	R
	23.5 #	-0.3	-0.1	
	22.3 #	-0.6	0.5	
	23.4 #	-0.5	0.2	
	23.8 #	0.3	0.1	
	23.6 #	0.9	0.6	
	23.1 #	0.9	-0.1	
	21.9 #	0.1	-0.3	
	26.1	0.6	-0.4	
	36.2	1.0	-0.9	
	49.1	1.4	-1.2	
	61.4 #	0.3	-0.9	
	73.8 #	-0.2	0.1	
	86.1 #	0.6	0.2	
	99.1 #	2.3	0.7	
	112.2 #	2.7	6.8 #	

Graw 1/2

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