



TGMS

Track Geometry Measuring System

Track Geometry is the set of geometric characteristics of a railway that influence the safety, comfort and efficiency of rail transport. Monitoring and maintaining these parameters is essential to ensure smooth and safe operations.



The system evaluates **track geometry** under varying light and environmental conditions by integrating an **Inertial Measurement Unit (IMU)** with the **Rail Profile System**.

Employing a **contactless measurement principle**, the system avoids issues related to stiffness and mechanical constraints, enabling **flexible installation on a wide range of railway assets**, including bogies, carriages and road-rail vehicles.

Performances	
Max Sampling Frequency	Up to 350 fps
Sampling Step	250 mm
Operational Temperature	-25°C to + 50°C
Laser Class	3B, 450 nm

It measures the **track geometry key parameters over a very wide speed range**, including: **gauge, cross level, twist, longitudinal level and alignment**.

Thanks to their 350 fps acquisition rate, our laser triangulation devices can perform accurate measurements even on vehicles traveling at speeds of up to 300 km/h, while the specifically customized IMU maintains data reliability even down to the so-called “zero speed range”.

		Wave Length Band [M]	Unit	Range	Resolution	Accuracy
	GAUGE	$0 \div \infty$	mm	-20, +60	≤ 0.1	$\pm 0,2 \text{ mm}$
	CROSS LEVEL	$0 \div \infty$	mm	± 225	≤ 0.2	$\pm 2 \text{ mm}$
	TWIST	Short $0 \div \infty$ Long $0 \div \infty$	mm	± 15 ± 15	$\leq 0.1 \text{ [mm]}$ $\leq 0.1 \text{ [mm]}$	$\pm 1/L$ $\pm 2/L$
	ALIGNMENT	D1 $3 \div 25$ D2 $25 \div 70$	mm	± 50 ± 100	≤ 0.5 ≤ 0.5	$\pm 1 \text{ mm}$ $\pm 3 \text{ mm}$
	LONGITUDINAL LEVEL	D1 $3 \div 25$ D2 $25 \div 70$	mm	± 50 ± 100	≤ 0.5 ≤ 0.5	$\pm 1.5 \text{ mm}$ $\pm 4 \text{ mm}$

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