100%

TRACK INSPECTION VEHICLES

MATISA

la passion du rail

TRACK INSPECTION VEHICLES

M 10
M 100
M 1200

The road to
100%
success

Optimisation of network management

MATISA track inspection vehicles are versatile and suitable to each customer requirements and and will fulfill your entire satisfaction. They can be equipped with one or more measuring systems to inspect your railway infrastructure parameters. Thanks to their construction which is similar to “passenger” type rail vehicles, The Top range of our vehicles covers the specific needs of heavy-traffic, high-speed networks. Their advanced auscultation system enable us to offer a high quality, safety and an optimum maintenance of your railway networks.

M10

Versatility in all simplicity

Whatever the track gauge, clearance gauge or climatic conditions, the M 10 measuring vehicles are prepared for an efficient and reliable inspection up to 80 km/h.

These vehicles on axles or bogies have a high robustness. With 2 cabins connected by a passage in protected engine compartment, this self-propelled vehicle allows the installation of a larger number of measurement systems.

80 km/h

M10E

Economical auscultation

This small self-propelled vehicle is designed for independent and cost-efficient inspections for a limited duration. The single driving post is raised and ensures good visibility as well as the operator’s comfort.
The cabin can accommodate up to 2 workstations.
This model meets the requirement of every budget, without compromising on the quality of the inspections. The very rigid frame acts as a reference for measuring track geometry.

M10
ON BOGIES

The partner of the metros

The M10 measuring vehicle is also available on bogies to meet the requirements of certain metro lines with small-radius curves, limited in the weight per axle and the need for a short wheel base.

The range of M 10 vehicles are very versatile and easily adaptable to particular aspects of networks. Aside from the measurement systems and technologies described hereafter, the M 10 vehicles can be equipped with the following options:

- Kit for different rail gauge
- Emergency drive system
- Lifting system for transport on road trailer
- Re-railing system
- Video surveillance of the tracks

M100 ON BOGIES

Reliability and flexibility

Whatever the gauge of the rails, the clearance gauge or the climatic conditions, the M 100 is designed for the reliable and flexible analysis at up to 100 km/h of the various parameters of the railway infrastructure or any large network.

The M 100 are robust vehicles on bogies, equipped with a very rigid frame that acts as a reference for measuring the track geometry.
The cabin can accommodate several workstations or cabin equipments such as toilets, kitchen, social compartment.

M 1200

Customized track inspection

The range of M 1200 measuring vehicle is designed for a multiple track inspection of many parameters up to 120 km/h of a railway infrastructure. Particularly well suited to the needs of large networks with heavy or high-speed traffic, their design is very similar to current railway vehicles of “passenger” type.

The M 1200 are self-propelled vehicles equipped with a drive of the hydrodynamic type and a DIESEL engine. The cabin can accommodate several work stations or cabin equipments such as toilets, kitchen, social campartment or berths. Depending on the requirements of each project, an M 1200 can be develop to a self-propelled train set composed of one or more track inspection cars.

INSPECTION TRAILERS

Make your choice

M 10 R

This measuring trailer is designed for the cost-efficient inspection of networks who have an alternative means of traction. The on-board measurement electronics enables automatic inspections with a user interface that can be remote on a portable PC to install in the adjacent vehicle.

M 100 R

This towable measuring wagon has a generator and is therefore autonomous as its power supply. The large cabin allows to put a number of internal facilities.

M 1200 R

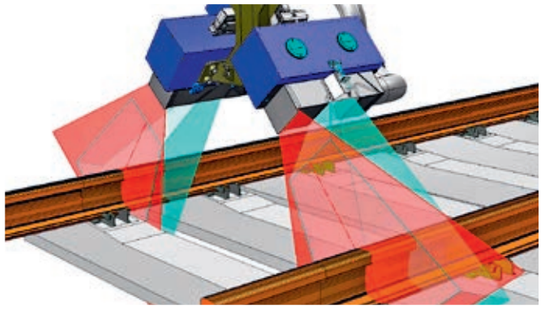
A little longer than the M 100 R, this vehicle has bogies with disk brakes enabling it to run up to 120 km/h.

COMPLETE EQUIPMENT FOR INSPECTION

Track geometry

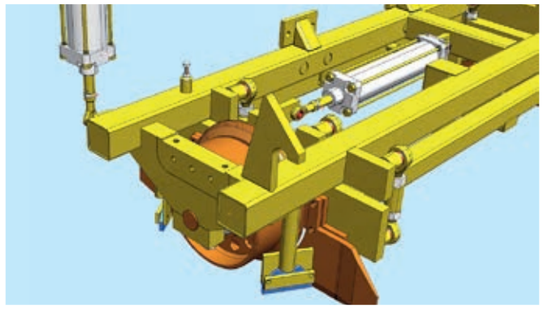
O - Optical sensor

The optical sensor technology is based on projecting LASER pulses onto the rail. The profile is obtained this way and, with the help of a camera, the useful data for calculating the parameters of the track geometry are determined by triangulation.



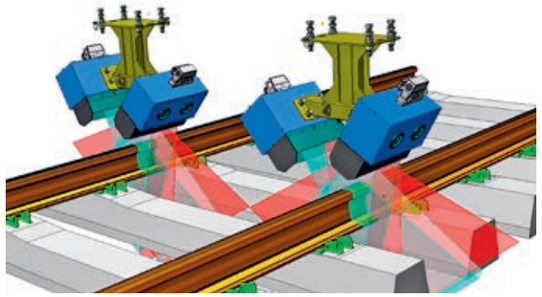
S - Mechanical sensors

The MATISA mechanical sensors are composed of rollers which simulate the passage of railway wheels and are sensed pneumatically against the rails. The counter-rollers ensure a smooth run over any type of turnout.



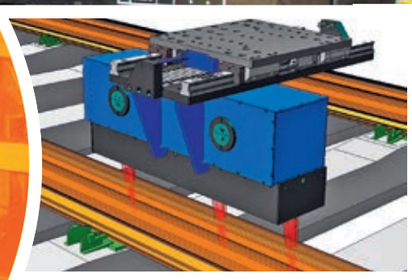
Rail profilometry

Two MATISA optical sensors determine the transverse profile of the rail, each measuring one side of the profile of the same rail.
The complete rail profile is obtained by superposing the two measured profiles.



Corrugation measures

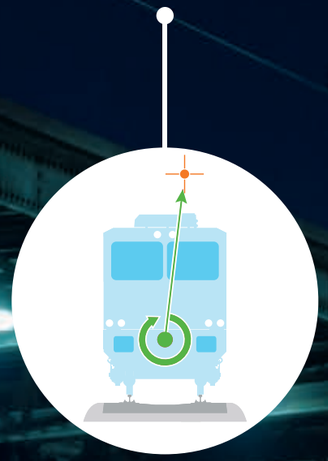
Based on a set of punctual LASER sensors, the longitudinal profile of the track is determined using the 3-point measurement principle. A control system guided with the help of a pair LASER-CAMERA keeps the punctual lasers at the rail top.

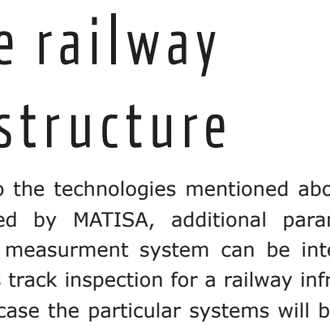


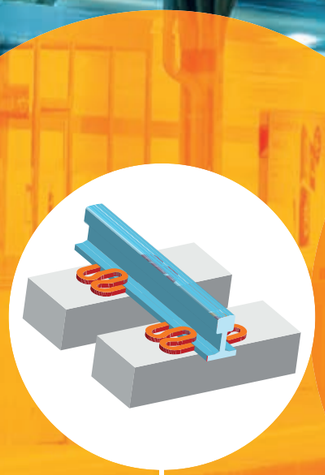
Other parameters of the railway infrastructure

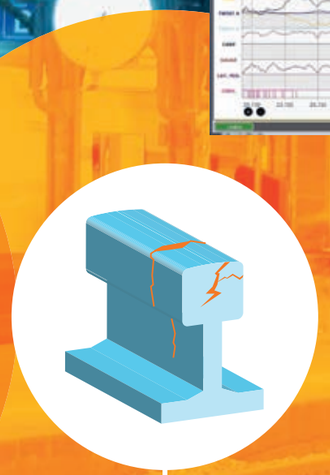
In addition to the technologies mentioned above and fully mastered by MATISA, additional parameters, analysis and measurment system can be integrated into MATISA's track inspection for a railway infrastructure. In this case the particular systems will be focus on the following aspects:

- Clearance gauge inspection by LASER scanner
  - Inspection of clearance gauge
  - Position of the adjacent track
  - Ballast profilometry
  - Platform inspection
- Inspection of axle box accelerations
- Inspection of a third rail
- Etc.









Data analysis

The MASER-ANA track geometry analyser enables a real-time assessment, on board, the quality of the railway infrastructure.

Various algorithms analysis helps and support the decision:

- Checking the running safety and passenger comfort
- Planning, monitoring and acceptance of maintenance work
- Optimizing the resources for the maintenance of a network

MASER-ANA calculates in particular a quality rating for each track section and identifies isolated defects by comparing data outside the tolerance limits set by the operator.

Technical data

Equipment	M 10 E/O/S/US	M 100 O/S/US	M 1200
Running gears	●=2 axles x=2 MATISA bogies	2 bogies MATISA M100S=3 MATISA bogies	2 "passenger" bogies
Number of driven axles [1]	●=1 x=2/3	●=2 x=3/4	●=2 x=3/4
Drive type [1]	Hydrostatic	Hydrostatic	Hydrodynamic
Engine type [1]	Caterpillar	Caterpillar	Voith (MAN)
Generator	●	●	●
UIC continuous and automatic brake [1]	●	●	●
Parking brake	●	●	●
Pneumatic and direct braking circuits	●	●	●
24 V DC electric circuits [2]	●	●	●
Air-conditioned driving and measuring cabins [2][3]	●	●	●
Driving lights	•	●	●
Device for detecting fire on the motor unit [2]	●	●	●
UIC couplings	●	●	●
Couplings central or network-specific	x	x	–
Predisposition and adapter kit for dual gauge	x	x	–
Loading system on trailer	x	–	–
Device for derailing and re-railing	x	–	–
Auxiliary power unit	x	x	–
Safety system linked to the driving	x	x	x
WC-shower	–	x	x
Social compartment	–	x	x
Berths	–	x	x
Workshop compartment	–	–	x

Technical data	M 10 E/O/S/US	M 100 O/S/US	M 1200
	W6A – UIC 505-1	W6A – UIC 505-1	UIC 505-1
Track gauge [mm]	914-1,668	1000-1,668	1,435
Minimum curve radius in driving mode [m]	●=80 x=60	80-90	80-150
Max. speed [km/h]	80	100	120
Speed in train convoy [km/h]	80	100	120
Length [mm]	~12,000	16,000-19,500	≥16,000
Width [mm]	2,711	3,000	Variable
Height [mm]	3,725	4,160	Variable
Weight [t]	●~28 / x~40	~60	≥65
Wheel base [m]	●=6,55 x= 5,95	10-12	10-20
Wheel base (bogie) [m]	●=N/A x=1.6	1.8	≥1.8
Wheel diameter [mm]	840	920	920
Buffer strength [kN]	1,200	1,200	1,200

Basic technology	Max. speed [km/h]	No sampling [mm]	Curve radius [m]	Typical accuracy 1 σ	Fitted in vehicle
Optical geometry	120	250	60	<1 mm	O
Cant with inertial platform	120	250	N/A	<5 mm	O/S
Geometry mechanical sensors	3 trolleys=60 3 bogies=100	250	80	<1 mm	M 10 S M 100 S
Cant with pendulum	40	250	N/A	<5 mm	R/E
Ultrasound	80	≤5	150	–	US
KP localisation with distance encoder	80	250	N/A	≤1‰	R/E/O/S
Synchronisation software, real-time signal processing	120	–	N/A	–	R/E/O/S
Ultrasonic acquisition software	80	≤5	N/A	–	US

Additional technology	Max. speed [km/h]	No sampling [mm]	Curve radius [m]	Typical accuracy 1 σ	Fitted in vehicle
System for inspecting rail profiles	120	1000 mm	60	0.1	O/S
System for inspecting undulatory wear with positioning	120	Variable	60	Variable	O
Position of a 3rd rail	120	250 mm	60	<1	O/S
Axle box acceleration	120	Variable	N/A	–	R/O/S
Rail temperature	120	250 mm		–	
Gauge measurement	120	200 Hz	N/A	≤2	O/S
Calculate ramps and curves, inertial platform	120	–	N/A	–	O/S
Localisation using beacons	120	–	N/A	–	O/S/US
GPS localisation (indicative)	120	–	N/A	–	O/S
Analyser and reporting	120	–	N/A	–	R/E/O/S
Software for reconstruction of signals of track geometry	120	–	N/A	–	R/E/O/S

[1] Only applicable for self-propelled vehicles
[2] Not available on M 10 R
[3] The M 10 R has no cabin and the M 1200 R has a large cabin without the driving parts

E	Economical
O	Optical
S	Standard
US	Ultrasound
R	Trailer

Legend: ● Basic equipment | **x** Optional | **–** Not available

These tables are indicative. The technical data with technical details for the machine and their options are valid.

The road to 100% success

Subsidiaries and a network of agents

100%

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