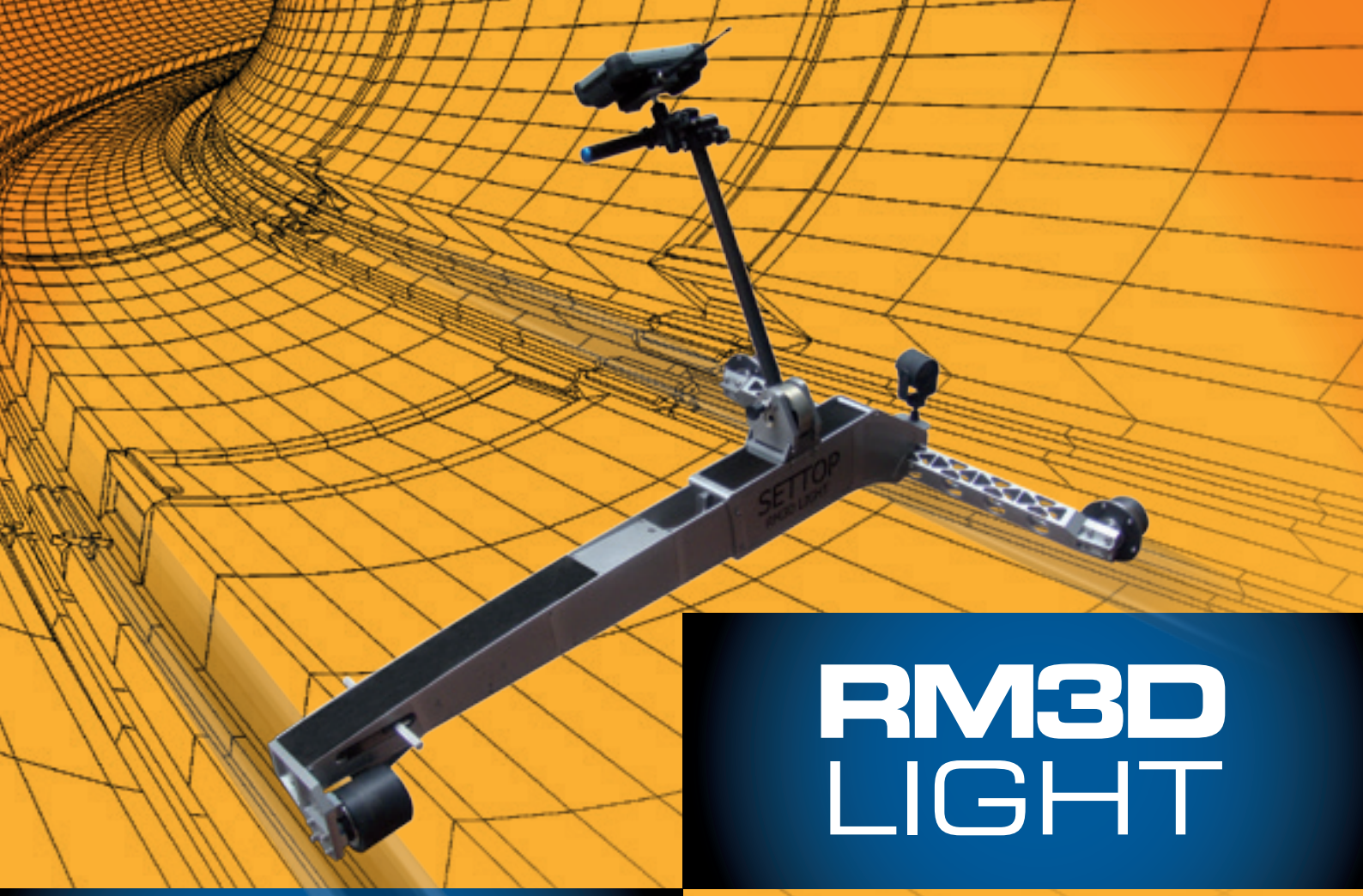


RM3D LIGHT

RM3D

ADVANCED 3D SYSTEM FOR MEASURING AND MONITORING RAILWAY TRACK

Nº A-94 CERTIFICATE FOR RM3D

adif
ADMINISTRADOR DE INFRAESTRUCTURAS FERROVIARIAS

SETTOP

Advanced 3D system for measuring and monitoring railway track

Method of working: ABSOLUTE
Use of high precision robotic stations

Method of working: RELATIVE
Use of system's sensors only

RM3D is an advanced system for control of design, monitoring, data collection and set out of rail track. It incorporates different methods of measurement:

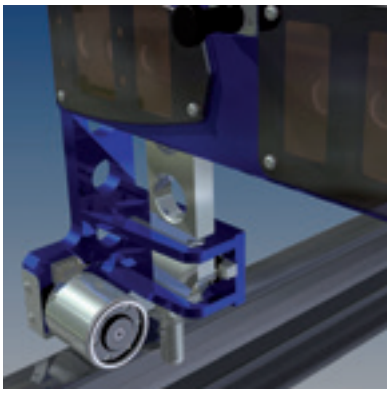
DATA COLLECTION: This is used to survey tracks to discover their actual current state. Data can be gathered in absolute mode (Total Station needed) or relative mode (RM3D device only)

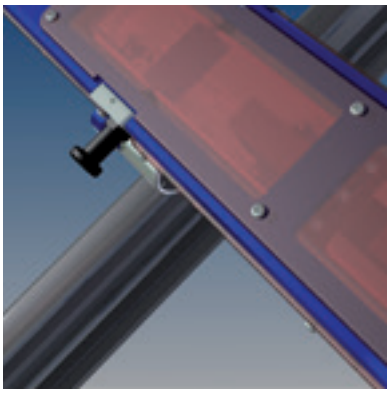
SET OUT: This is used for spatial positioning and assembly of the track. You need the axis file loaded, vertical alignment, super elevation and gauge.

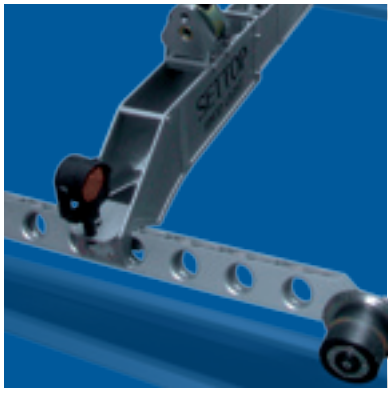
MONITORING: This is used to control the laying of the track. It compares the data collected on various consecutive days, taking 0 as an initial value.

VERIFICATION: This is used for controlling the assembly of the track and indicates any differences between the theoretical and the actual result.

In both cases there are numeric results, graphs and files which can be adapted to any format. For greater control, in absolute mode, you can use Trimble S6 latest model Total Stations.








Advanced 3D system for measuring and monitoring railway track

Trimble S8 1“robotic Total Station measurement without prism 120-150m.

With the Trimble S8 Total Station you can get an exceptional servoassisted and angular sensor performance. Designed with state-of-the-art servoassisted MagDrive technology and with modern communication protocols.

Control computer with touch screen

The system consists of the following:

RM3D surveying cart with high precision sensors and electronic control

Trimble Tablet field computer and Rm3 Software

Trimble S8 1" high precision robotic Total Station

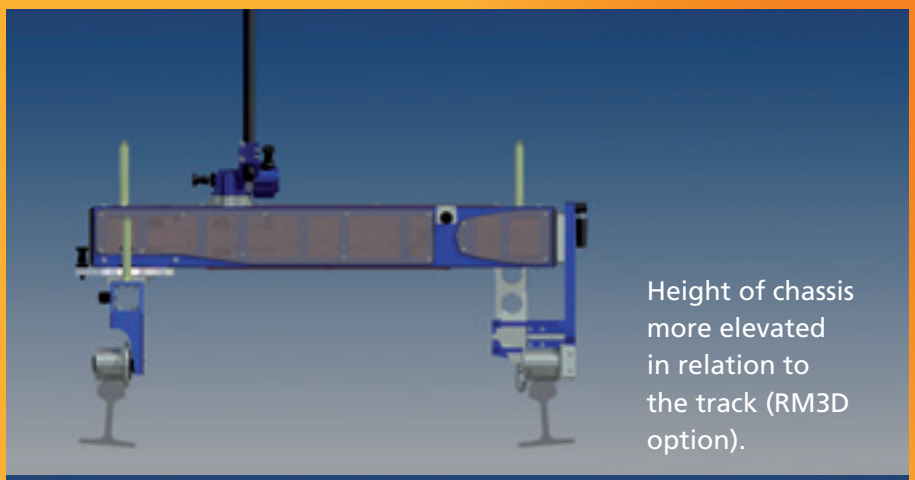
Parts of the measurement system:

- Electrical insulation between tracks
- Robotic Total Stations with recognition and automatic prism follow up (angular accuracy of 1" and of 1mm ± 1ppm in distance)
- Sensor to measure super elevation
- Gauge sensor
- Push bar
- Prism for measuring distances
- Odometer
- Lateral rollers
- Control computer with touch screen

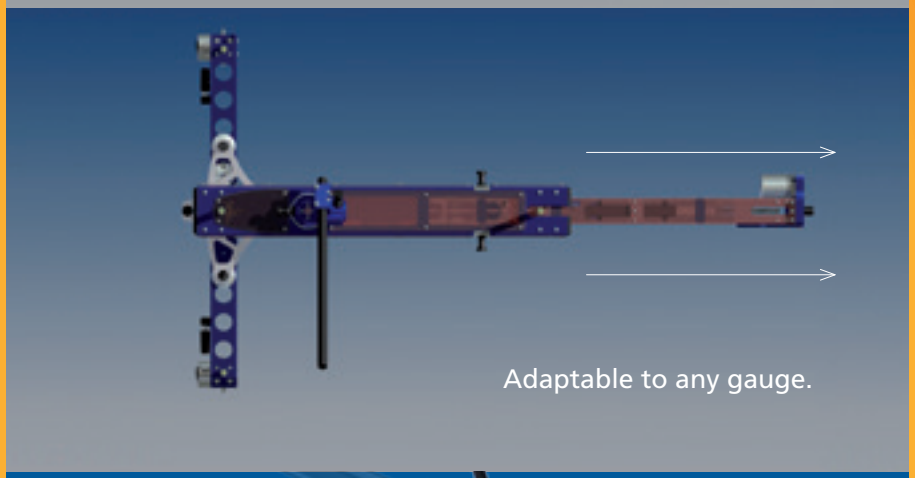
Advanced 3D system for measuring and monitoring railway track

Advantages

- Easy to handle
- Numeric and graphic analysis in real time of the current state of the track in order to establish accurately the action to be taken
- Integrated system
- Bluetooth wireless
- Automatic recording of data with 3D coordinates and sensors
- Fast and complete measurements
- High precision in determining the 3D coordinates of the tracks
- Collection of data direct for the tamper machine
- Possibility of working only with the sensors
- Documentation of railway lines
- Storage of all the information measured and the information derived from the measurements
- Possibility of personalisation and any developments needed for the job
- Possibility of measurement and integration of GPS (RM3D Light Advanced)



Height of chassis more elevated in relation to the track (RM3D option).



Adaptable to any gauge.

Easy to handle (RM3D Light option). Ergonomic and collapsible to any gauche.

Main Characteristics

	RM3D LIGHT	RM3D
WEIGTH	~ 25 KG	~ 60 KG
VEHICLE TRANSPORT	TOURISM / COMMERCIAL	TOURISM / COMMERCIAL
MEMORY CAPACITY	INDEFINITE. COMPUTER MEMORY	INDEFINITE. COMPUTER MEMORY
INCREASED MEASUREMENT	USER DEFINED	USER DEFINED
ADAPTABLE TO ANY GAUGE	YES	YES
GAUGES	1000 – 1435MM 1668 MM (OPTION)	1000 – 1435 – 1668 MM
EXTENSIBLE BY GUIDES	NO	YES
ELEVATED IN RELATION TO THE TRACK	NO	YES
BANK	14,5º (±350 MM)	14,5º (±350 MM)
TOTAL STATION	TRIMBLE S SERIES ROBOTIC	TRIMBLE S SERIES ROBOTIC
GPS	YES	YES
BLUETOOTH	YES	YES
MEASURING GAUGE	STOP&GO / CONTINUE	STOP&GO / CONTINUE
TRACK ASSEMBLY	REAL TIME	REAL TIME
EXPORT	DXF, KML, ASCII	DXF, KML, ASCII
PERSONALIZATION	YES	YES

RM3D an be adapted to any type of gauge (1000-1435-1668mm).

Height of chassis more elevated relative to the track (option RM3D) with the aim of enabling it to pass when there is an accumulation of material in the centre of the railway lines (for example, when there is an accumulation of ties or tools for assembling tracks).

Possibility of working in two different ways (absolute and relative). You will either be able to work with high precision robotic stations, (via which you will be able to determine the coordinates and the geometry of the railway line in **ABSOLUTE** mode) or without them in order to evaluate the **RELATIVE** state of the railway lines (gauges, super elevations, twists, etc.).

All the data obtained, independently of the system used for data collection, can be used to carry out monitoring of the railway line in such a way that we can obtain both graphically and numerically any measurement differences between the phases X and 0 of the measurement from data obtained in absolute or relative mode.

Special design that avoids indication of the occupation of the track.

RM3D RM3D LIGHT ADVANCED

RM3D is a system for monitoring, setting out and checking of railway track. This extendible system can be used for monitoring, setting out and analysing the geometry of railway tracks.

Measured parameters	Resolution	Precision	Mesasured range		Units
Track gauge	0.1	±0.2	-50	+150	Mm
camber	0.1	±0.1	±350 (on track 1435 mm)		Mm
Odometer	3	±2.5	±999.999 m		

RM3D

	Weigth	Size (Width / Length / Height)	Size (Width / Length / Height)
	~60 Kg	1700 x 1000 x 1200	1300 x 500 x 800

RM3D LIGHT

	Weigth	Size (Width / Length / Height)	Size (Width / Length / Height)
	~25Kg	1500 x 1000 x 1200	Removable

COMPUTER

	Weigth	Size (Width / Length / Height)	Memory	Battery duration
	1.4 Kg	140 x 229 x 50	1 GB RAM	8 h

Operational time of system with all batteries fully charged (total station + computer + sensors): 8 hours

Operational conditions: between -5 and +45ºC; Humidity from 15 to 85%- no condensation and system is able to function in rainy weather

Control unit with anti-splashing protection (IP-55): Is able to work in adverse weather conditions and has an LCD graphic panel which shows the measurements taken and stored in real time as well as at specific points on the track during the measuring process.

The software has, among others, the following characteristics:

- Transmission of the measurements taken via USB or serial RS-232 to the portable computer
- Graphic and numeric display of measurement reports
- Display and evaluation of the results of measurements taken in real time
- Evaluation of the state of the track in real time in accordance with assembly tolerance
- Storing of measurements carried out
- Measurement with GPS or Total Station
- File layout in XML, LandXML, MDT, Inroads, Clip, Ispol and Trimble Road (RXL)
- Data export in ASCII defined by user
- Graphic export to DXF and KML

All track measurements can be stored in a database

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