TECHNOLOGIES
PAVING INNOVATION

MatTracker™

User Manual

MatTracker™

User Manual

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PAVING INNOVATION

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About MatTracker™ User Manual

Content

This safety manual for MatTracker™ has been developed to the operator to provide the necessary safety information.

Safe use

Before MatTracker™ is operated, this **Safety Manual should be read thoroughly.**

To ensure safe use of the MatTracker™, the operator is advised to perform an individual risk assessment of the use of the system in combination the relevant asphalt paver.

All components in the MatTracker™ and all related products are CE-marked and comply with regulations for security and reliability.

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MatTracker™

The MatTracker™ and all related products contain a model number/name, serial number and part number, so that each unit is easily identified and traceable. The cables for MatTracker™ are also provided with part numbers. All relevant numbers should be stated, when contacting TF-Technologies regarding your product:

Example
Model number/name: MatTracker™
Serial number: TF-12345
Part number: S-55001

Contact information

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Safety manual information

Document name: MatTracker™ User Manual

Document number: G705104
Publication date: 11. May 2022

Symbol overview

This safety manual uses a range of symbols and warning notifications throughout the manual to make the operator aware of important safety measures or information regarding operation. The following symbols are used in this manual:

Warning!

Indicates important information the operator must be aware of to avoid dangerous situations that can result in death or serious personal injury

Caution!

Indicates important information the operator must be aware of to avoid dangerous situations that can result in material damages

Tip

Indicates information regarding efficient and failure-free operation of the MatTracker™

Step-by-step instructions

Indicates a step-by-step instruction, where a particular order of actions is required or recommended

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Appendix

Introduction

Introduction to MatTracker™

Track edges to ensure a high quality joint

The weakest part of an asphalt road is found in the longitudinal joint. On the edge of the mat it is difficult to get a high density.

The MatTracker™ follows the edge of an existing lane of paved asphalt and controls the side plate of the screed to secure a consistent and proper overlap. By automatically tracking the lane edge and controlling the side plate position, the MatTracker™ is able to deliver a higher precision in the width of the overlap for an improved density in the joint.

With a simple and intuitive interface the desired overlap can easily be adjusted, and the movement of the side plate can be monitored during operation via the integrated LED panel.

Each controller is designed to a different situation and machine for the optimal operation for the operator.

VERY IMPORTANT!

Make sure you read and understand The Important Safety Information before installing or operating the MatTracker™.

Make sure the Emergency STOP on the machine will also disconnect power to the MatTracker™

Configurations

System Configurations

The MatTracker™ System consists of three main components:

- MatTracker™ unit - sensor unit mounted on the side of the paver

Fig. 1 - MatTracker™

- MatTracker™ Handset - for controlling the MatTracker™, operation and settings, at a safe distance from the automated side plates.

Fig. 2 - MatTracker™ Handset

MatTracker™ Mounting, which ensures a correct and flexible mounting of MatTracker™ on the paving machine

Fig. 3 - MatTracker™ Mounting

System Overview

MatTracker™ is available in 2 kits configurations.

Every MatTracker™ can be used on either side of the paver.

S-55805 MatTracker™ Kit

System includes

Pcs.	Description
1	MatTracker™ unit
1	MatTracker™ Handset
1	Mounting Bracket for Handset
1	I-Cable for MatTracker™ to machine
1	I-Cable for Handset to machine
1	MatTracker™ Carry Case

S-55806 MatTracker™ Duo Kit

System includes

Pcs.	Description
2	MatTracker™ unit
2	MatTracker™ Handset
2	Mounting Bracket for Handset
2	I-Cable for MatTracker™ to machine
2	I-Cable for Handset to machine
1	MatTracker™ Duo Carry Case

Safety instruction

Important Safety Information

Crush Hazard! Keep a safe distance from the sideplate at all times!

Stand clear of the outside of the sideplate, when passing any potential larger objects such as curbs, parked cars, buildings, concrete blocks, road signs, bus stops etc. while the MatTracker™ System is connected, due to the increased crush hazard, when the MatTracker™ System regulates the sideplate outwards towards an unmovable object

Stand clear of the area between the sideplate and paving machine at all times, while the MatTracker™ System is connected, as this may result in serious bodily injury, when the MatTracker™ System regulates the sideplate inwards

Do not place any objects between the sideplate and paving machine for any amount of time, while the MatTracker™ System is connected, as this may result in serious bodily injury or material damages, when the MatTracker™ System regulates the sideplate inwards

Keep out of sight of the MatTracker™ detection area at all times!

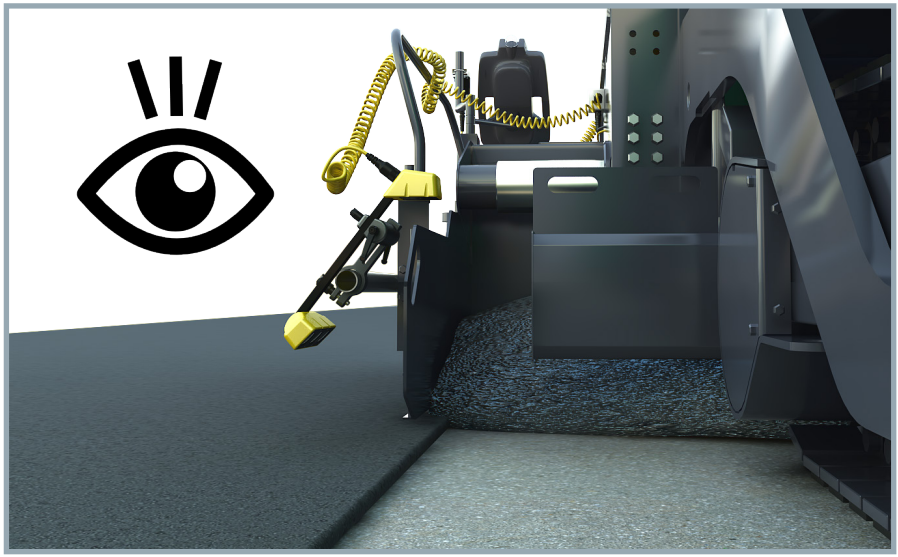
No objects must be placed in the field of vision of the MatTracker™, while the MatTracker™ is connected, as this may result in hazardous movements of the sideplate with increased crush hazard and risk of serious bodily injury.

Do not stare into the lamps of the MatTracker™, while the MatTracker™ is connected. The lamps emit invisible infrared light that may damage eyesight if pointed directly towards the eyes.

Use the MatTracker™ System vigilantly

The MatTracker™ System is not fully automatic. It is the responsibility of the operator to continuously monitor the operation of the MatTracker™ System to ensure full safety of all personnel and machinery during movement of the sideplate and ensure no one is in the danger zone of MatTracker™.

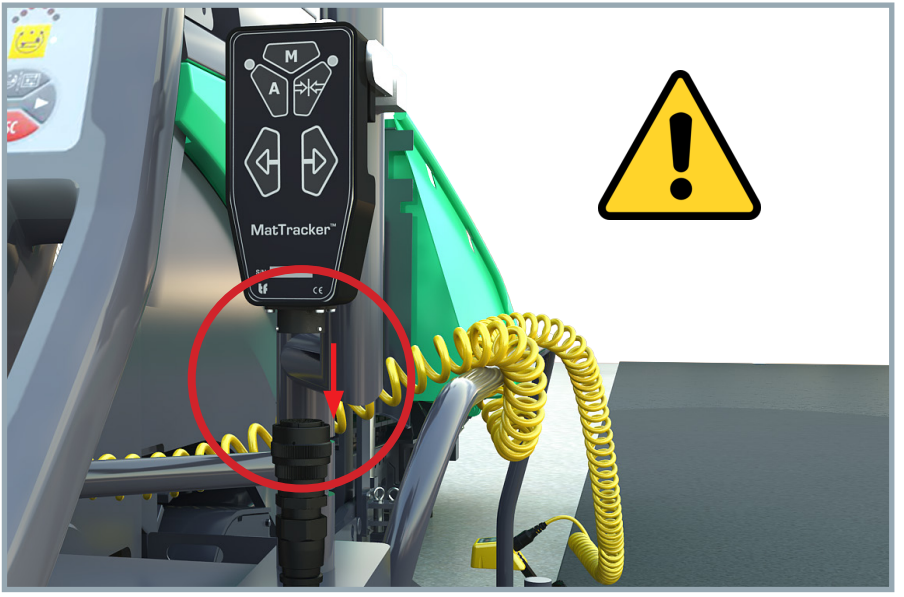
When tracking curbs or the sideplate is otherwise passing closely along any potential larger objects such as curbs, buildings, concrete blocks, road signs, bus stops etc. while the MatTracker™ is connected, the operator must remain particularly vigilant and constantly monitor the postition of the sideplate with his hand on the emergency stop, ready to immediately disengage the MatTracker™ if requiered.



Disengage and disconnect when not in use

Disengage the MatTracker™ Handset when it is not possible for the system to perform the regulation, e.g. when no edge is visible, when the screed is lifted, when passing larger objects such as drains and covers, as these objects can disturb the regulation and result in unintentional movement of the side plate that may result in serious personal injury or material damages.

Disconnect the MatTracker™ Handset immediately after use to avoid unintentional movement of the sideplate that may result in serious personal injury or material damages



Use the MatTracker™ System responsibly

Use the MatTracker™ System solely for what it is constructed to, within its specifications and as instructed in this user manual

Make sure all personnel working with and around the asphalt paver understands how the MatTracker™ System affects the asphalt paver

Do not use the MatTracker™ System unless you are a trained operator and have read and understood this user manual

Do not use the MatTracker™ System with unoriginal equipment, parts or cables, or if damaged, rebuilt or otherwise tampered with. This can ead to unpredictable control of the asphalt paver, which may result in serious personal injury or material damages

Follow standard safety practice for paving, including:

- Investigating local road construction work legislation and the use of protective equipment required for the paving job
- Performing a total risk assesment including an individual assessment of the MatTracker™ System in combination the relevant asphalt paver, and making sure everyone working with and around the asphalt paver knows how to avoid the described dangerous situations
- Investigating local health and safety regulation concerning the operation of heavy machinery, and incorporate any risks involved in the use of external controllers in the total risk assessment of the machine, e.g. placing operation stations outside dangerous areas

Comply with general safety requirements of asphalt pavers

Make sure the asphalt paver is equipped with an emergency stop that can stop all potentially dangerous parts of the machine, including switching off the power supply to the MatTracker™

Ensure the asphalt paver will stop all potentially dangerous parts of the machine in case of a malfunction in the power supply, including switching off the power supply to the MatTracker™

Make sure the asphalt paver is able to deliver a stable power supply as described in EN60204, for instance via the battery of the asphalt paver

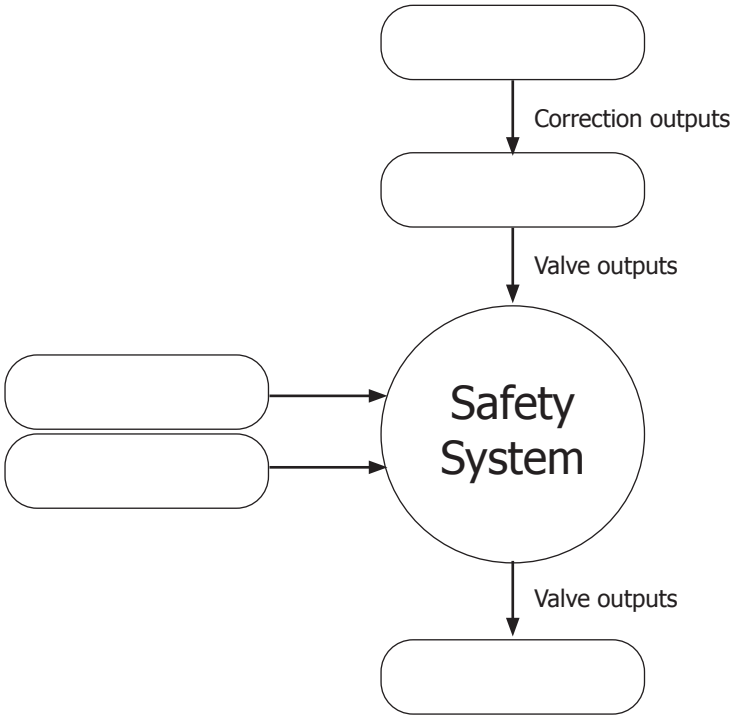
Ensure the asphalt paver complies with all requirements described in EN60204, Safety on Machinery - Electrical Equipment of Machines

Ensure that the asphalt paver has a 24V system and is designed for use with the outputtype of the MatTracker™ System

Ensure safe installation of the MatTracker™ System

Install, mount and connect the MatTracker™ System only as instructed in this user manual

Install and use a safety system that only allow use of the MatTracker™ correction outputs, when the paver is paving and prevent use of the MatTracker™ correction outputs when the paver is left active unmanned. The safety system must obey the SIL level 1 classification or the PL level C classification.



Connections of MatTracker™, Sensor/System, Safety System and Machine Controller

For installation with external controllers, ensure MatTracker™ initiated activations of the valve outputs cease, when communication between MatTracker™ and controller is lost

Ensure the emergency stop covers the MatTracker™ System, when installing the system on a new asphalt paver. Power supply to the MatTracker™ System must be switched off when the emergency stop is activated.

Make sure a form of overcurrent protection is installed between the asphalt paver power supply and the MatTracker™ System prior to connecting the MatTracker™ System. The overcurrent protection is usually built into the asphalt paver in the form of a fuse in a central fuse box.

Ensure that the short circuit breaking capacity is adapted to the total maximum power consumption of the MatTracker™ System installed or equal the prospective fault current in case of short-circuiting. The maximum power consumption of all the parts in the MatTracker™ System can be found under Technical Specifications (data sheet) p. 55

Mount the MatTracker™ System, so that the operator has access to the emergency stop while operating the MatTracker™ System, and is able to ensure that no one is located in dangerous areas that can be affected by the operation of the MatTracker™ System

Mount the MatTracker™ System, so that the operator

- is secured from exposure to ejection of objects from the machine, machine emissions, moving parts of the asphalt paver and passing traffic/machinery while paving
- has easy access to operating the MatTracker™ System without any obstacles the operator can stumble upon or get his clothes caught in and with sufficient room for the operator to move all parts of his body, use appropriate safety equipment and does not require him to bend or stretch unnecessarily

Make sure that the measuring areas of the MatTracker™ camera is free from dirt or obstacles that will lead to faulty reactions of the system

Mount the MatTracker™ System so that the probability of material damages is minimized, e.g. where it is unexposed to the moving parts of the asphalt paver, excessive radiant heat, as well as potential shocks or pulls from the cables

Do not mount or re-adjust the MatTracker™ System on an asphalt paver on the move or in operation. It can remove focus from the surrounding traffic or moving parts of the machine, which may result in serious personal injuries or material damage

Inform TF-Technologies or your local representative immediately, if the MatTracker™ System for any reason is not safe to use

Emergency Procedure

In case of accidents, break-downs or otherwise dangerous situations, use the following procedure:

1.
2.
3.

1 Press emergency stop

2 Turn off the asphalt paver and remove the key

3 Disconnect the cable between the MatTracker™ and the asphalt paver & between the MatTracker™ Handset and the asphalt paver

Mounting and Connecting MatTracker™

Mounting MatTracker™

MatTracker™ is mounted with the MatTracker™ Mounting System. The mounting system is easy to install on the paver, and enables very easy mounting and adjusting of the MatTracker™ to ensure perfect conditions for MatTracker™.

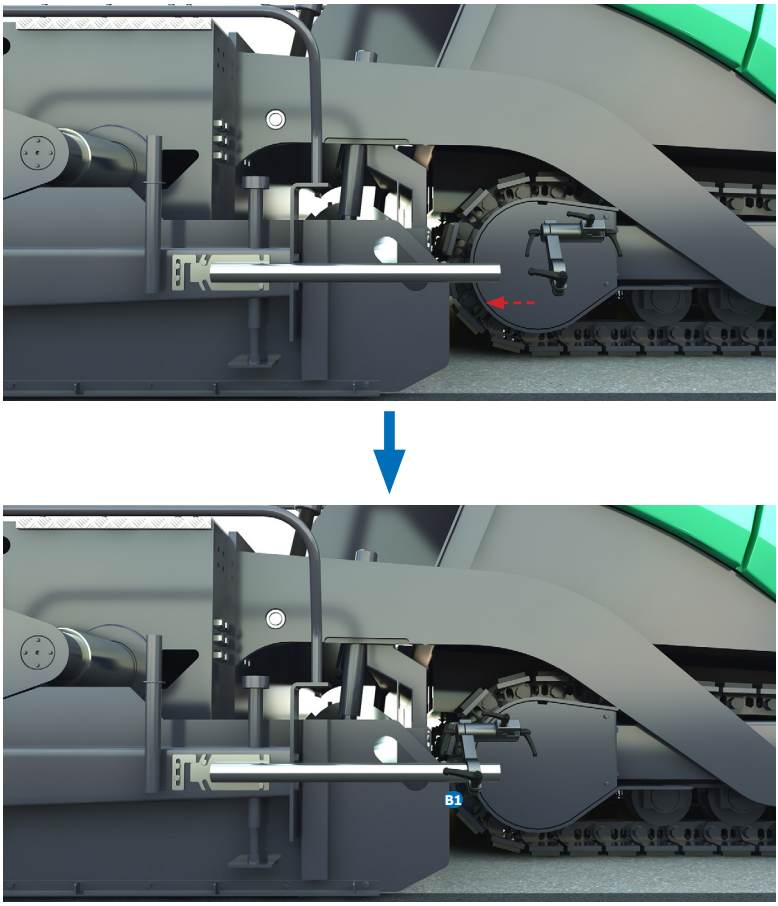
MatTracker™ Mounting System consists of 2 main parts.

MatTracker™ Mounting System

Ref.	p/n	Description
A	S-55701	MatTracker™ Machine Mount: Rod (A1), Stop Plate (A2), M10/12 Fitted Bolts + M12 shim (A3) and M12 Bolts + M10 shims (A4)
B	S-55702	MatTracker™ Sensor Mount Incl. 4 handles for adjusting

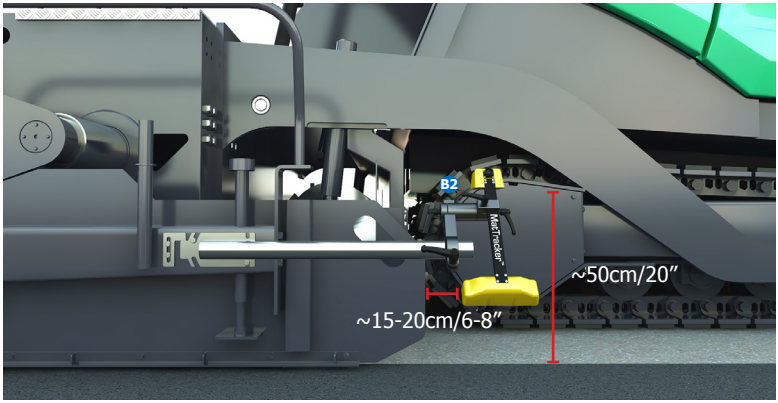
The Sensor Mount is easily installed on to the Machine Mount (should already be installed on machine. If not, please refer to the installation guide for MatTracker™ Mounting System).

Release the handle "B1" and slide the Sensor Mount on to the tube. Fasten the handle to secure the Sensor Mount.



The tube on the Machine Mount, can be cut if it's too long. It should not be unnecessarily long as it can get in the way of adjusting the position of the MatTracker™

Mount the MatTracker™ unit in the Sensor Mount by loosening the handle "B2" and mount the MatTracker™. Securely tighten the handle again to secure the MatTracker™.



MatTracker™ should be set approximately 15-20 cm/6-8" in front of the side plate and 50 cm/20" (+/- 2 cm/ 1") from the ground.

The Sensor Mount can be adjusted in all directions by loosening the handles to adjust the position. Tighten the handles again when the desired position is attained.

The exact adjustment of the postion is set when MatTracker™ is connected to the machine to ensure the MatTracker™ is reading the edge of the mat correctly.

Please go to "Daily Operation" for further information about the exact setting of MatTracker™ before operation.

When the MatTracker™ is not in use the Mounting System can be left on the machine or the Sensor Mount and Machine Mount can be removed. Simply loosen the two fitted bolts to remove the Machine Mount. Then tighten the bolt again and leave on the machine together with the Stop Plate for easy installation at a later time.

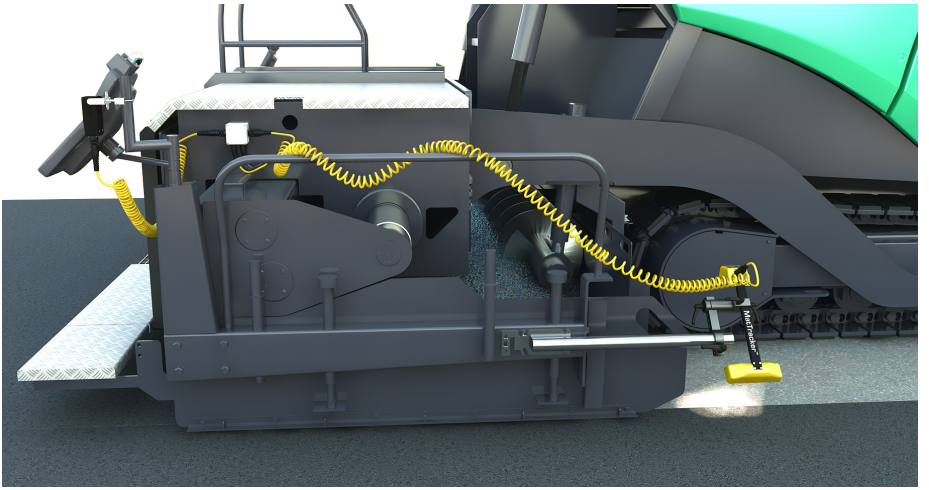
Ensure that MatTracker™ is not to close to any moving parts on the paver which will affect the operation of the machine or cause MatTracker™ to be crushed or damaged

Connecting MatTracker™

Once MatTracker™ has been mounted correctly, it can be connected to the machine.

Simply connect the I-cable with the 6-pin plug to the MatTracker™ in one end and the MatTracker™ connectorbox in the other end.
Connect the I-cable with the 12-pin plug to MatTracker™ Handset in one end and the MatTracker™ connectorbox in the other end.

Once the cable is plugged in and the machine is on, so is MatTracker™.



Operation

Operating MatTracker™

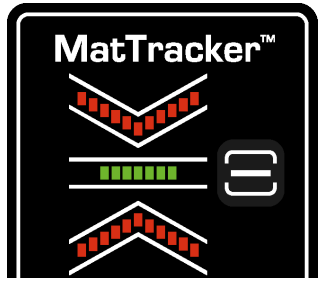
Safe use

Before MatTracker™ is used it is important that the operator has read and understood the section Safety Instruction, p. 13 and onwards, describing the responsibility of the operator and some of the situations that should be avoided while paving with MatTracker™.

Operation

MatTracker™ is operated using the Handset. The first time the MatTracker™ is used on a particular asphalt paver, it is important to set the correct valve/machine type and adjust the minimum pulse, cf. Settings p. 40, before startup.

MatTracker™ Handset



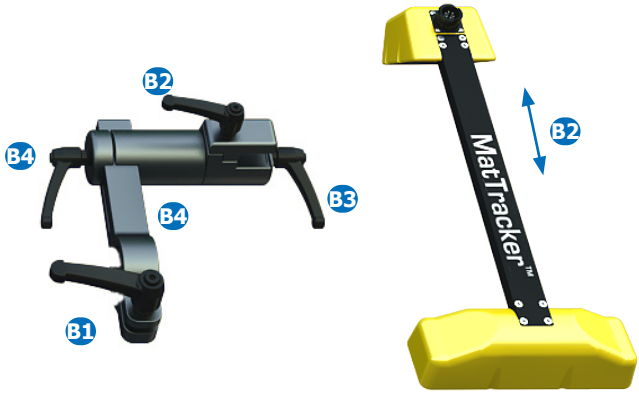
MatTracker™ unit

Daily Operation

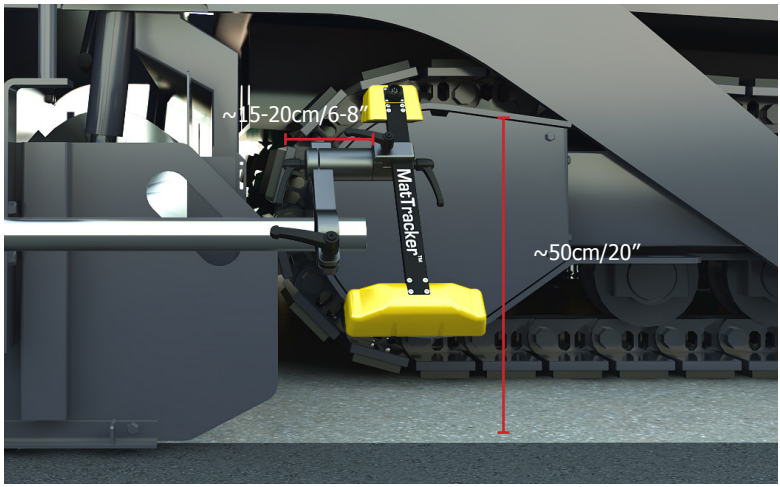
Correct position of the MatTracker™

Once MatTracker™ is connected and activated, it has to be adjusted to the correct position before operation is commenced.

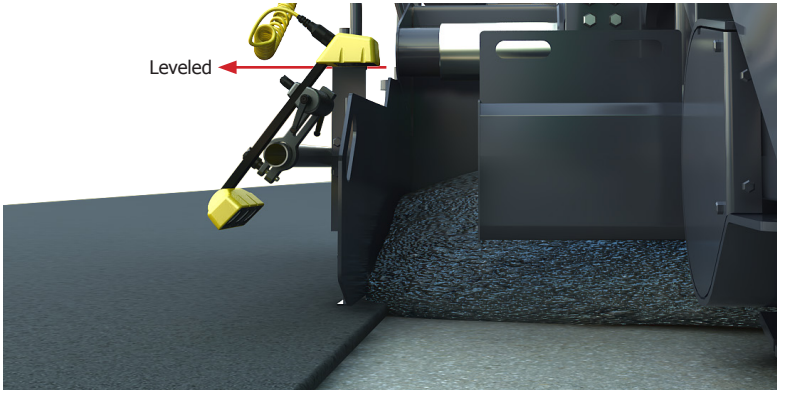
With the MatTracker™ Sensor Mount it is easy to ensure the exact and correct position of the sensor. Adjust the position of the sensor by releasing the handles, adjusting the sensor to correct position, and securing the handles again.



It is imparative that MatTracker™ is positioned correctly before operation.
The distance from the side plate to the MatTracker™ should be 15-20cm/6-8”.
The distance from the sensor camera to the ground should be 50cm/20” (+/- 2 cm/ 1“).



The camera must be approximately leveled and placed exacly over the edge of the road. The edge of the road should be approximately in the middle of the camera field of view. Use the two guide lines on the side of the sensor to ensure correct position.



Step-by-Step Operation of the MatTracker™

1.
2.
3.

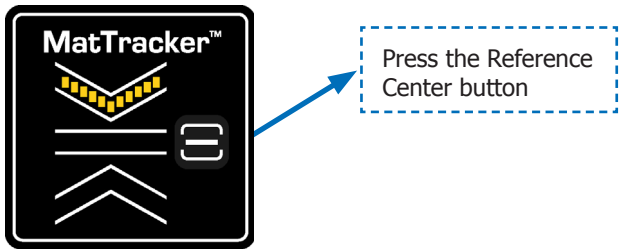
1 **Overlap**

Position the paver and adjust the side plate at the correct overlap relative to the edge to be matched. The adjustment can be done by using the arrow buttons on the MatTracker™ Handset. Overlap has to be set according to local requirements and type of job.

1.
2.
3.

2 Reference center

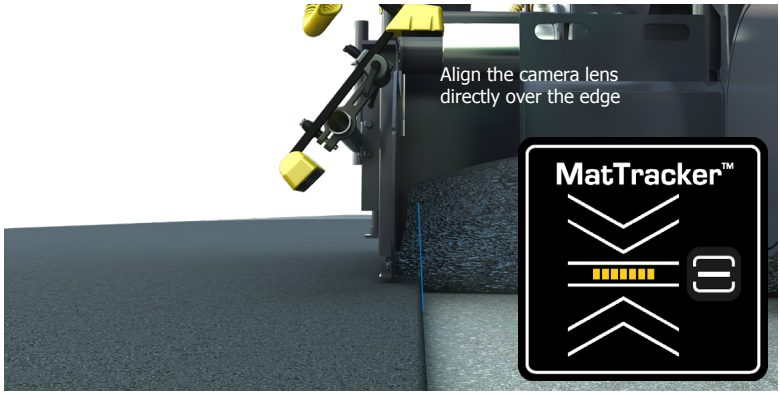
Press the Reference Center button on the MatTracker™ LED panel.
Pressing the button will reset the control set-point to the middle of the MatTracker's field of view. This allows the operator the widest margin to do set-point adjustment on the fly while paving.



1.
2.
3.

3 Sensor adjustment

Adjust the sensors position in such a way that the camera lens is exactly on top of the edge to be followed. Use the LED arrows as indicators of direction. When the MatTracker™ is in the right position only the yellow center bar will be lit. This mechanical adjustment is done using the handles of the MatTracker™ Sensor Mount.
Make sure to keep the recommended height (50cm/20") and level of the camera house.

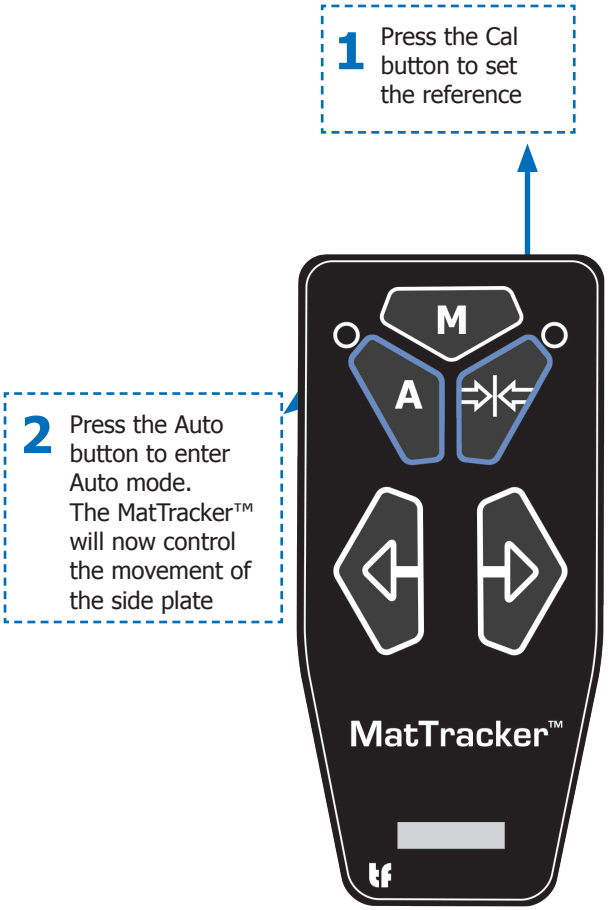


1.
2.
3.

4 Auto mode

Press the "Cal" button on the MatTracker™ Handset for the MatTracker™ to identify the edge as a reference. Then press the Auto button for the MatTracker™ to go into Auto mode. Now the MatTracker™ will automatically control the movement of the side plate using the edge as reference.

When in Auto mode the LED next to the auto button will be lit and the LED arrows/bar on the MatTracker™ Sensor Unit will change from yellow into red/green indication.



1.
2.
3.

5 Adjusting set-point on the fly

Minor adjustments of the joint overlap, while paving with the MatTracker™ in Auto mode, are done using the arrow buttons of the MatTracker™ Handset.

Pressing and holding the "A" and Arrow button (either in or out) will change and set the setpoint accordingly. For each time the arrow button is pressed, the setpoint is adjusted a few mm in the direction of the arrow beeing pressed (in or out).

The LED in upper right corner will blink once. Press the arrows on the handset to increase or decrease the overlap to the correct position.

When in Auto mode the LED next to the auto button will be lit and the LED arrows/bar on the MatTracker™ are red/green.

1.
2.
3.

6 End of use

To temporarily disengage the MatTracker's control of the side plate press the Man button of the MatTracker™ Handset to enter manual mode. From manual mode you can manually control the side plate by using the arrow buttons of the Handset.

To permanently disengage the MatTracker's control of the side plate exit to manual mode pressing the Man button and then disconnect the cable from the MatTracker™ Handset.

When in Man mode the LED next to the auto button will be lit and the LED arrows/bar on the MatTracker™ will turn off and then change from red/green into yellow.

!

In case of emergency disengage the MatTracker™ by using the paver's emergency button

Limitations in operation

The MatTracker™ is not able to detect all type of edges under any given conditions. Hence the MatTracker™ should be regarded as an operator assistant and not a fully autonomous system. So the operator must do a continuous visual evaluation of the edge to validate if manual intervention is required.
Some of the known limitations of the MatTracker™ are listed in the following.

Interupted edges

In order to function properly the MatTracker™ needs a well-defined and uninterrupted edge.
The operator must therefore look out for structures interrupting the edge such as maintenance covers or edges that has been deformed by trucks backing up to the paver or intersecting traffic crossing the edge. If interrupted or deformed edges are detected the side plate must be manually controlled until the edge is regular again.

Narrow curves

Aligning a straight edge against an arch will always be a matter of compromise. This is also true when aligning a paver's side plate up against a lane with a narrow curve. To prevent gaps, poorly compacted areas and excess overlap special attention should be given to evaluate if a curve is too narrow for the MatTracker™ to be operated in.

Minimum edge height

In order for the MatTracker™ to effectively identify the edge the height of the edge should not be less than 20 mm. The exact figure of this limitation is dependent of the type of material used and how the edge is formed by the screed/roller.

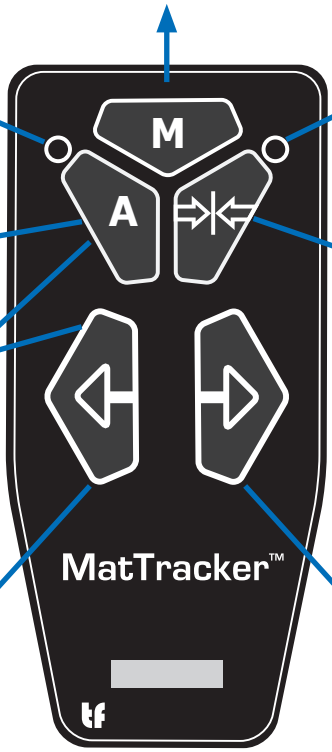
Compression roller with 45 degree angle

The principle of operation of the MatTracker™ relies on the formation of a shadow behind the edge formed by a light source emitted from a 45 degree angle relative to the vertical edge.
Some rollers are equipped with axillary compression rollers that compress the edge to form a 45 degree angle. These edges will not be identified by the MatTracker™ as the angle of the light and the edge are parallel and no shadow can be formed.

Buttons and Symbols on MatTracker™ Handset

Buttons

The MatTracker™ Handset has five buttons used for operating the MatTracker™. Settings Menu is activated using the Handset, cf. Settings p. 38.



Press the M button to switch MatTracker™ into manual mode. Sideplate can now be controlled with the arrows in and out.

When setpoint is adjusted, this LED will indicate:
Green blink [1 sec]: setpoint is ok
Red blink [1 sec]: setpoint will be out of area. (Setpoint is set as far out as possible)

When in AUTO mode, this LED will be on.

Pressing the A button will switch MatTracker™ into Auto mode. Now MatTracker™ is controlling the sideplate.

Pressing the CAL button will set the reference to the current position

Pressing and holding the A + Arrow button (either side) will change and set the setpoint. The LED in upper right corner will blink once.

Left ARROW will regulate the sideplate to the left.
If in Auto mode, pressing the ARROW will set MatTracker™ into MANUAL mode.

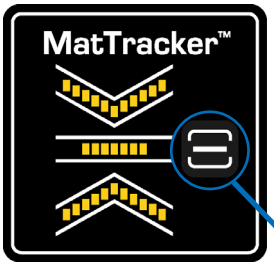
Right ARROW will regulate the sideplate to the right.
If in Auto mode, pressing the ARROW wil set MatTracker™ into MANUAL mode.

Buttons and Display on MatTracker™

Buttons

The MatTracker™ unit, has a display with a number of LEDs and one button.

MANUAL mode



MANUAL mode: MatTracker™ is de-activated and LED display shows how MatTracker™ *would* adjust if activated, but *no* adjustments are made. All LEDs are YELLOW when in Manual mode.

Pressing the button will reset the setpoint. This means focusing the edge to the middle of the camera eye, ensuring MatTracker™ can adjust evenly to the the left and right. This function is also active when MatTracker™ is in Manual mode

AUTO mode

AUTO mode: MatTracker™ is Activated and LED display is used to indicate how MatTracker™ is adjusting the sideplate by flashing red arrows in the direction of the movement made, or green line when it is on point.

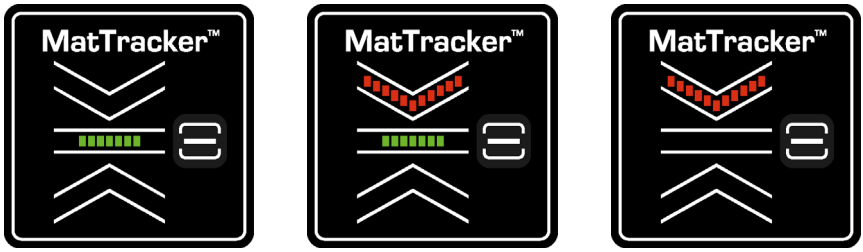
Before paving is commenced, it is recommended to check whether the control parameters, cf. Settings p. 38, are adjusted correctly. Normally, only the setpoint will need adjustment while paving.

Display/LED indicators - Auto Mode

Light indicators on MatTracker™

The MatTracker™ uses light indicators to indicate the movement of the sideplate.

On/off:		
Green bar is on	*Green bar on and red arrow flashes*	*Red arrow flashes*
Proportional:		
Green bar is on	*Green bar on and red arrow increase in intensity*	*Red arrow increase in intensity*



Following edge on point (Area A)	*Small adjustment of sideplate, following the edge*	*Bigger adjustment of sideplate, following the edge*

On point	*Correcting in direction of the arrow*

Error indications

Both red arrows in the MatTracker™ display will flash in case the edge has been out of sight for more than 3 seconds. In this case, it is necessary to adjust the sideplate back to the edge.

All LEDs OFF	*Red arrows flash simultaneously*	*All LEDs flash simultaneously*

Lost sight of edge, or there is currently no edge to follow	*Out of range. Adjust manually back to the edge*	*Cannot set/change setpoint*

Display/LED indicators - Manual Mode

Light indicators on MatTracker™

The MatTracker™ uses light indicators to indicate the movement of the sideplate.

On/off:		
Yellow bar is on	*Yellow bar and arrow flashes*	*Yellow arrow flashes*
Proportional:		
Yellow bar is on	*Yellow bar on and yellow arrow increases in intensity*	*Yellow arrow increases in intensity*

Following edge on point (Area A)	*Small adjustment of sideplate required to follow the edge*	*Bigger adjustment of sideplate required to follow the edge*
On point	*Correcting in direction of the arrow*	

Error indications

Both arrows in the MatTracker™ display will flash yellow in case the edge has been out of sight for more than 3 seconds. In this case, it is necessary to adjust the sideplate back to the edge.

All LEDs OFF	*Red arrows flash simultaneously*	*All LEDs flash simultaneously*

Lost sight of edge, or there is currently no edge to follow	*Out of range. Adjust manually back to the edge*	*Cannot set/change setpoint*

Settings

Control Parameters

Before using the MatTracker™ it is important to be aware of 3 control parameters that are vital for the way the MatTracker™ performs: Setting the correct valve/machine type, minimum pulse and sensitivity.
All settings menus are accessed by connecting power to the handset while holding down a specific button.

While in the Settings mode, the MatTracker™ is in idle mode. To indicate this, the LEDs on the MatTracker™ will flash yellow alternately.

Arrows flash alternately while Handset is in Settings Mode.

After saving the changes, disconnect power from the Handset to return to operational mode. Only one parameter can be changed at a time.
After disconnecting power, the Handset and MatTracker™ will reboot in manual mode for safe operation.

Valve/machine type

Make sure MatTracker™ is corresponding to the valves of the machine by making the correct setting. MatTracker™ can be set to Proportional or on/off and PNP or NPN.

1 Connect power to the Handset, while pressing the button "M" to acces the setting menu

4 Press M to save the settings. All diodes will turn off, to indicate you have exited the menu

2
Left diode will indicate which setting MatTracker™ has.

- Diode ON: Proportional
- Diode OFF: on/off

Use the left arrow to switch between On/Off and Proportional

3
Right diode will indicate which setting MatTracker™ has:

- Green: NPN
- Red: PNP

Use the right arrow to switch between NPN and PNP

Minimum Pulse

First time MatTracker™ is used on an asphalt paver, the Minimum Pulse must be adjusted, so that the MatTracker™ is matched to the hydraulics of the asphalt paver. Minimum Pulse must be set for movement of the sideplate in outwards and inwards direction, separately, on both sides of the screed. The handset will identify whether you are setting the minimum pulse in the inwards or outwards direction.

1 To access the Minimum Pulse Menu, connect power to the Handset, while pressing the button "A" + the arrow left or right. Direction of arrow, indicating the direction of the movement of the side plate to be calibrated.

2 **Right** diode lights up red: Indicates Minimum Pulse setting **IN** is activated.

Left diode lights red: Indcates Minimum Pulse setting **OUT** is activated.

This will always be the case no matter if you are in the left or right side.

4 Press A to save the settings. Diode will turn off, to indicate you have exited the menu

3 Use the right and left arrow keys to adjust either up (->) or down (<-) until you are just able to feel the movement of the sideplate. The Minimum Pulse must not be set lower than this value.

Use the left arrow to Adjust pulse **DOWN**

Use the right arrow to Adjust pulse **UP**

On machines with proportional valves, minimum pulse must be finetuned while paving on first time use

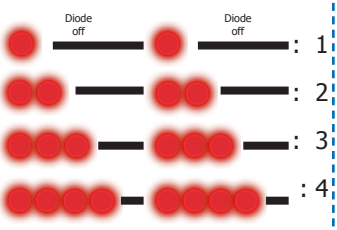
Sensitivity

Sensitivity is the parameter that determines how fast the MatTracker™ will react to a change in the edge. An increase in sensitivity entails a faster reaction, while a decrease in sensitivity means a slower reaction. It can be necessary to adjust sensitivity while paving, it simply must be changed till the regulation of MatTracker™ is satisfactory.

1 Connect power to the Handset, while pressing the button "CAL" to acces the Sensitivity setting menu.

2 Right diode will turn on orange light to indicate you are in sensitivity setting mode

3 Left diode indicates the current value of Sensitivity by flashing red.



The sensitivity scale goes from 1-8.

4 Press "CAL" to save the settings. All diodes will turn off, to indicate you have exited the menu.

Use the left arrow to DECREASE value for sensitivity

Use the right arrow to INCREASE value for sensitivity

Maintenace

Maintenance

The most important part of the maintenance of the MatTracker™ is to keep all parts clean, dry and dirt free. Remember to follow the cleaning instructions, as incorrect cleaning agents or too large forces can damage the equipment and cause degrading functionality.

It is recommended to inspect all parts after use:

	Mechanical damage	After use	Replace cable
	Wet connectors	After use	Wipe off with dry cloth
	Dirty	After use	Clean with water or benzine
	Mechanical damage	After use	Replace cable/ Replace connector on Mat-Tracker™ Handset and/or cables
	Dirty	After use	Clean with water or benzine
	Mechanical damage	After use	Replace MatTracker™ Handset and/or cables
	Wet before storing	After use	Wipe off with dry cloth
	Insignificant mechanical damage	After use	Continue use
	Significant mechanical damage	After use	Damaged parts should be repaired or replaced
	Dirty	After use	Clean with water or benzine
	Dirty	After use	Clean with water or benzine
	Mechanical damage	After use	Replace unit
	Functionality testing	Once a year	Thoroughly inspect the system / Send equipment to service

If you need parts/spareparts, please contact TF-Technologies or your local MatTracker™ dealer. (www.tf-technologies.com for dealers and contact info)

Service and Repair

In case of problems with the MatTracker™, please see Troubleshooting, p. 48, providing answers to the most common problems. If problems persist, contact TF-Technologies or your local representative for assistance.

Do not attempt to repair the equipment yourself. Replacement of connectors, or any other parts must be undertaken by TF-Technologies or an appointed service representative of TF-Technologies. Contact your local representative for further information

Service and repair of the MatTracker™, Handset, cables or other parts of the System undertaken by anyone else than TF-Technologies or an appointed service representative of TF-Technologies can result in damaged equipment

Transport

Advice on transport of the MatTracker™ system:

The MatTracker™ system should be transported in a suitable carry case, where all parts rest firmly without being able to clash against each other. The use of MatTracker™ Carry Cases with custom-cut foam is recommended

The transport case must protect the equipment from shock and pressure, as the MatTracker™ system is often transported together with heavy equipment for the paving job

If the MatTracker™ system is packed up wet, the Carry Case should not be completely closed. Both Carry Case and content should be wiped dry before the Carry Case is completely closed and put in storage

When receiving the MatTracker™, the following should be inspected:

If, against all expectations, there are any damaged parts, please contact your re-seller as soon as possible.

In the unlikely event parts of the MatTracker™ has been damaged at reception, the following is recommended:

- Inform seller right away
- Document any potential damage in the form of text and pictures
- Do not use damaged products

Storage

Advice on storage of the MatTracker™ system:

For long-term storage, the MatTracker™ system should be kept dry and out of direct sunlight

Notice that high temperatures can be obtained by storing the MatTracker™ in a non-ventilated car in the summer

If the MatTracker™ system is packed up wet, the Carry Case should not be completely closed. Both Carry Case and content should be dry before the Carry Case is completely closed and put in storage

Cleaning

It is important that the MatTracker™ is maintained and cleaned often, so that it does not lose functionality. Especially the camera glass and lamp glass. However, inappropriate cleaning agents or an incorrect cleaning method can damage the equipment and cause degrading functionality.

It is generally recommended to use a dry cloth with a little water or benzine, as the equipment is secured against water, and because benzine evaporates quickly. A quick evaporation ensures that the benzine does not collect in nooks and crannies and has long-term dissolving effects, as can be the case with other cleaning agents.

Please note that benzine is an organic dissolvent, which is flammable and harmful to health and environment. It must therefore be used responsibly and with respect for its harmful effects. The operator should follow these instructions before use:

- Follow the instructions on the bottle of benzine
- Always use as little as possible
- Avoid breathing vapors and direct contact with the skin

When cleaning with fluids, only small amounts should be dapped on the areas to be cleaned, and these areas should be wiped with a dry cloth afterwards. The equipment must never be submerged in chemical liquids or exposed to cleaning agents in larger quantities, as the fluids can gather in nooks and crannies and have long-term dissolving effects.

Be particularly aware of:

No parts of the MatTracker™ system should be submerged in fluids as it may gather in nooks and crannies

Never use cellulose thinner or acetone, as these dissolve paint and plastic respectively, which will degrade the functionality of the equipment. Other cleaning agents can also be harmful, but experience shows that these two in particular should be avoided

Never use a high-pressure cleaner to remove dirt, as it will expose the equipment to too large forces

When mechanically rinsing the equipment, no scraping must be undertaken on the display or connectors as these parts are particularly sensitive

Use of benzine to clean cables can make the writing on the cables disappear, but the cables will not be damaged

Disposal

When disposing the MatTracker™ system the equipment must be treated as electronic waste in compliance with the local regulations of the country in which the equipment is disposed.

The responsibility for safe and appropriate disposal is transferred to the buyer in the sale of the MatTracker™ system.

Appendix

Troubleshooting

Connection of MatTracker™

Symptom	Probable Cause	Appropriate Action
No display	*No power to MatTracker™*	• *Verify paver power supply* • *Verify cable connections* • *Inspect cables for damages*

Erroneous Behaviour

Symptom	Probable Cause	Appropriate Action
MatTracker™ indicates "Cannot set/ change setpoint"	*MatTracker™ mechanical setpoint is off*	*Adjust mechanical setpoint by ensuring MatTracker™ is located directly over the edge. Then click the setpoint button, see page 36*
MatTracker™ is not reacting, but movements are indicated with red lights in the MatTracker™ display	*System is not connected correctly* *or*	• *Inspect cables* • *Check connections* • *Check wiring in MatTracker™ connector box*
	MatTracker™ is set to incorrect valve type	• *Check that control parameters for valve type, matches the valves on the machine*
MatTracker™ is reacting too fast or too slow	Incorrect pulse value	• *Check and set the minimum pulse value, see page 40.*
MatTracker™ movements are too big or too small	*Incorrect sensitivity value*	• *Check and set sensitivity value, see page 41. If movements are too big decrease sensitivity, if movements are too smal, increase sensitivity*
Correction indicator on the MatTracker™ does not correspond to the actual edge	*Camera or lamp glass is dirty* *or*	• *Clean camera and lamp glass. Make sure all dirt is removed.* • *Use appropriate cloth and be careful that removal does not cause scratches in the glass, see page 45.*
	Camera or lamp glass is damaged by cracks or scratches *or*	• *Return MatTracker™ for replacement of damaged parts*
	MatTracker™ is mounted at incorrect hight	• *Re-arrange the MatTracker™. It should be mounted 50cm/20" from the ground*
MatTracker™ indicates "Edge not found" (see page 36)	*MatTracker™ is mounted at incorrect hight* *or*	• *Re-arrange the MatTracker™. It should be mounted 50cm/20" from the ground see page 22 - Mounting MatTracker™*

Symptom	Probable Cause	Appropriate Action
MatTracker™ indicates "Edge not found"	*Camera or lamp glass is dirty* *or*	• *Clean camera and lamp glass. Make sure all dirt is removed.* • *Use appropriate cloth and be careful that removal does not cause scratches in the glass, see page 45*
	Edge type not compatible with MatTracker™	• *Use Manual mode on MatTracker™ Handset or ashpalt paver controller*
MatTracker™ does not change from Manual mode to Auto mode when pressing the mode button on the Handset	*System not connected correctly*	• *Inspect cables* • *Check connections* • *Check wiring in MatTracker™ connector box*

List of parts in the MatTracker™ System

The MatTracker™ for use on asphalt pavers.

The main parts in the system are

- MatTracker™ Sensor Unit
- MatTracker™ Handset

S-55001 MatTracker™ Sensor Unit

S-55201 MatTracker™ Handset

Spareparts and accessories for MatTracker™

Part no	Product	
S-55001		MatTracker™ Sensor unit
S-55201		MatTracker™ Handset
S-55701		MatTracker™ Machine Mount
S-55702		MatTracker™ Sensor Mount
S-50280		I-Cable, MatTracker™ to machine
S-55301/4.0		I-Cable, Handset to machine
S-50576		Handset Mounting Bracket
S-55401		MatTracker™ Carry Case - 1 System
S-55402		MatTracker™ Carry Case - 2 System

MatTracker™ connections

MatTracker™ connections table

Connector	Socket Type		Function	Pin no.	Connection
MatTracker™	Bayonet, male 6-pin		Vbat	A	
			Gnd	B	
			Input_side	C	
			N.A.	D	
			CAN_Hi	E	
			CAN_Lo	F	
MatTracker™ Handset	Bayonet, male 6-pin		CAN_Lo	A	
			Input_side	B	
			Vbat	C	
			Output Out Dir	D	
			N.A.	E	
			Output In Dir	F	
			Gnd	G	
			Output Main Valve	H	
			CAN_Hi	J	
			N.A.	K	
			N.A.	L	
			N.A.	M	
MatTracker™ Chassis connector, machine	Bayonet, male 6-pin		Vbat	A	Red
			Gnd	B	Black
			Input_side	C	Green
			N.A.	D	
			CAN_Hi	E	Purple
			CAN_Lo	F	Yellow
MatTracker™ Handset Chassis connector, machine	Bayonet, male 12-pin		CAN_Lo	A	Yellow
			Input_side	B	Orange
			Vbat	C	Red
			Output Out	D	White
			N.A.	E	N.A.
			Output In	F	Green
			Gnd	G	Black
			Output Main Valve	H	Blue
			CAN_Hi	J	Purple
			N.A.	K	N.A.
			N.A.	L	N.A.
			N.A.	M	N.A.

Technical Specification (data sheets)

TECHNOLOGIES
PAVING INNOVATION

MatTracker™
Tracks lane edges for a perfect lane overlap

MatTracker™ is a sensor for use on asphalt pavers to improve the quality of longitudinal joints between two adjacent lanes.

The weakest part of an asphalt road is found in the longitudinal joint. On the edge of the mat it is difficult to get a high density. A key parameter to achieve a high density is to secure a consistent and proper overlap.

MatTracker™ follows the edge of an existing lane of paved asphalt and controls the side plate of the screed to maintain a specific overlap. By automatically tracking the lane edge and controlling the side plate position, MatTracker™ is able to deliver a higher precision in the width of the overlap for an improved density in the joint.

At the same time, automating the control of the side plate frees up a screed operator to focus on other quality enhancing activities.

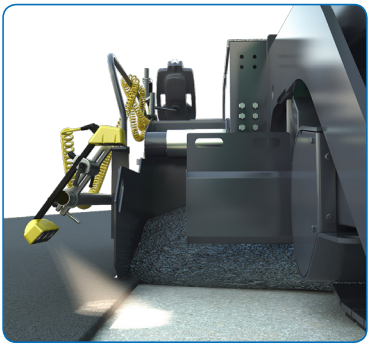
The MatTracker™ uses a NIR-camera, a NIR-light source and advanced image processing algorithms to identify the edge of an existing paved lane.

With a simple and intuitive interface the movement of the side plate can be monitored during operation via the integrated LED panel.

MatTracker™ can be used on either side of the paver.

MatTracker™

MatTracker™ Specifications	
Part Number	S-55001
Application	Adjusts position of side plate to ensure a certain overlap, when paving multiple lanes
Power Supply	12/24 Volt System (10-30 VDC)
Power Consumption	Typical 250 mA at 24 VDC
Dimensions (LxWxH)	200x200x400mm/7.9x7.9x15.7 inches
Weight	1.6Kg / 3.6lbs
House	Aluminium
Storage Temperature	-30°C to 80°C / -22°F to 176°F
Operating Temperature	-10°C to 70°C / 14°F to 158° F
Sensor Type	NIR camera
Resolution	1mm
Connections	Cannon Bayonet Plug, Male 6 pin A: Vbat D: ne B: Gnd E: CAN_Hi C: Input_side F: CAN_Lo
Communication bus	CAN



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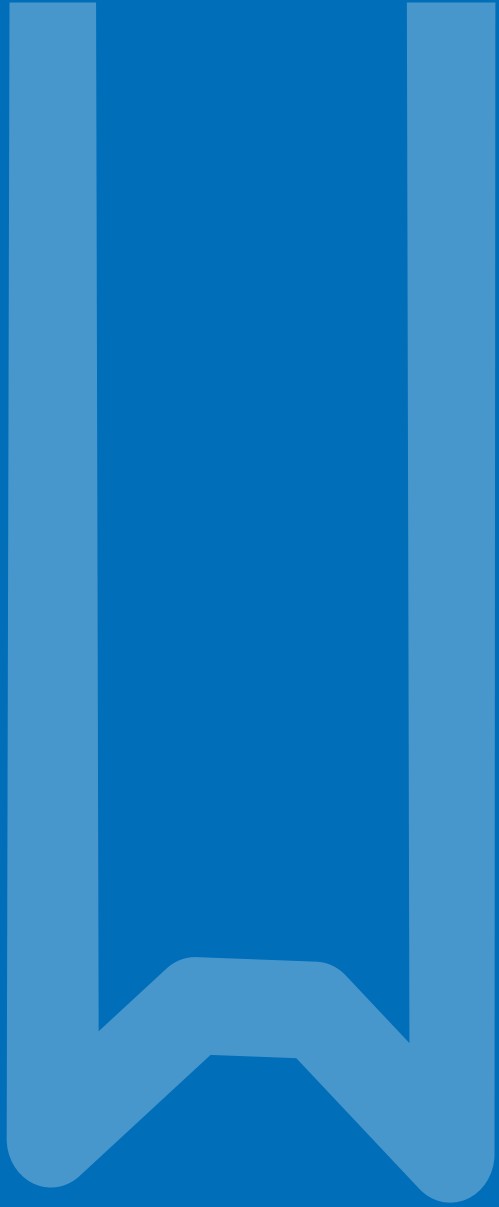

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