

## CONTENTS

<b>1.0</b>	<b>INTRODUCTION</b> .....	<b>2</b>
1.1	MINITRAC FEATURES .....	2
1.2	MINITRAC SPECIFICATIONS .....	3
1.3	OUTPUT BOX SPECIFICATIONS .....	3
<b>2.0</b>	<b>INSTALLATION</b> .....	<b>4</b>
2.1	SYSTEM LAYOUT .....	4
2.2	MOUNT CONTROLLER .....	4
2.3	MOUNT OUTPUT BOX (IF INCLUDED).....	4
2.4	MOUNT SPEED ENCODERS.....	4
2.4.1	Gearbox Encoder .....	4
2.4.2	5 <sup>th</sup> Wheel Encoder .....	5
2.5	PUMP ENCODERS .....	5
2.5.1	Positive Displacement Pumps.....	5
2.5.2	Air Atomised Systems.....	5
2.6	POWER CONNECTION .....	5
2.7	PLUG IN CONNECTIONS.....	5
<b>3.0</b>	<b>SAFETY PRECAUTIONS</b> .....	<b>6</b>
<b>4.0</b>	<b>SET UP</b> .....	<b>6</b>
4.1	KEYPAD LAYOUT DIAGRAM .....	6
4.2	TO ACCESS SET UP PROGRAM .....	6
4.3	SPEEDOMETER CALIBRATION .....	7
4.4	PUMP VOLUME AND PAINT SOLIDS VOLUME CALIBRATION .....	7
4.5	PUMP & SPEED ENCODER INDICATORS .....	8
4.7	SPOT LENGTH ADJUSTMENT .....	9
4.8	SPEED SIMULATOR PROGRAM .....	9
<b>5.0</b>	<b>OUTPUT BOX (OPTIONAL EXTRA)</b> .....	<b>10</b>
<b>6.0</b>	<b>TRIGGER</b> .....	<b>11</b>
<b>7.0</b>	<b>JOB NUMBERS</b> .....	<b>11</b>
7.1	TO ACCESS JOB NUMBERS.....	11
7.2	INCIDENTAL MARKINGS .....	12
<b>8.0</b>	<b>QUALITY CONTROL WITH MINITRAC</b> .....	<b>13</b>
8.1	COUNTING METRES .....	13
8.2	COUNTING LITRES .....	13
<b>9.0</b>	<b>PAINTING WITH MINITRAC</b> .....	<b>14</b>
<b>10.0</b>	<b>SAVING JOB RECORDS</b> .....	<b>15</b>
10.1	SAVING TO JOBCARD VIEWER.....	15
10.1.1	Downloading to the Dataplug .....	15
10.2	MANUAL RECORDING.....	17
10.3	VIEW THE TOTAL DISTANCE AND TOTAL LITRES COUNTERS.....	17
10.4	TO CLEAR THE TOTAL DISTANCE AND TOTAL LITRES COUNTERS .....	18
10.5	CLEAR ALL COUNTERS.....	18
<b>11.0</b>	<b>TIPS FOR MORE EFFICIENT PAINTING</b> .....	<b>18</b>
11.1	LINE LENGTH ADJUSTMENT .....	18
11.2	SPOTTING OUT .....	19
<b>12.0</b>	<b>SERVICE &amp; SUPPORT</b> .....	<b>20</b>
<b>13.0</b>	<b>APPENDICES</b> .....	<b>21</b>
13.1	SYSTEM LAYOUT & WIRING GUIDELINES .....	21
13.2	ROADMARKING PATTERNS & DEFAULT GUN SETTINGS.....	21
13.3	QUICK REFERENCE INSTRUCTIONS .....	21
13.4	TROUBLESHOOTING .....	21
13.5	EDITING MINITRAC AND OUTPUT BOX .....	21
<b>INDEX</b> .....		<b>22</b>

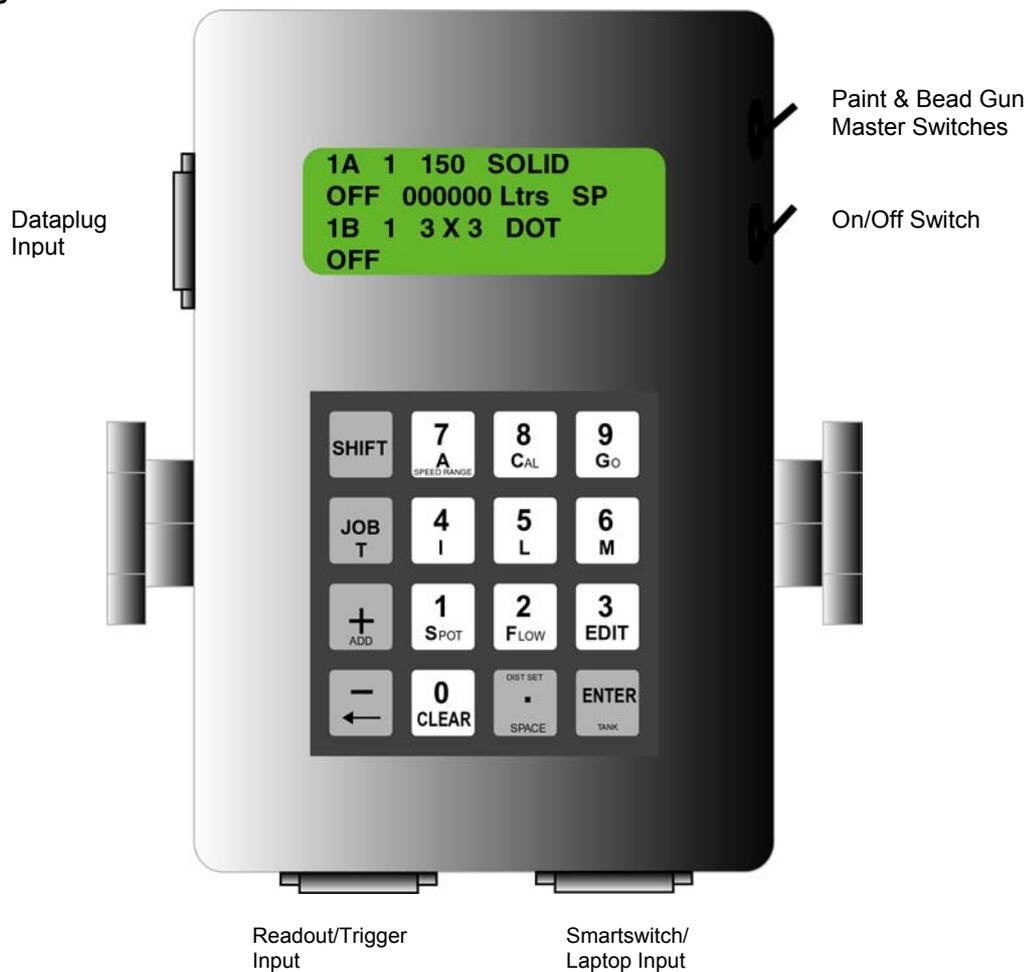
## 1.0 INTRODUCTION

Use MINITRAC to control, measure and monitor all types of paint and roadmarking operations

MINITRAC is an electronic controller for small trucks, ride on vehicles or walk-behind machines. It is supplied pre-programmed.

OUTPUT BOX is used with MINITRAC to provide total flexibility of gun outputs.

### Minitrac



### 1.1 MINITRAC Features

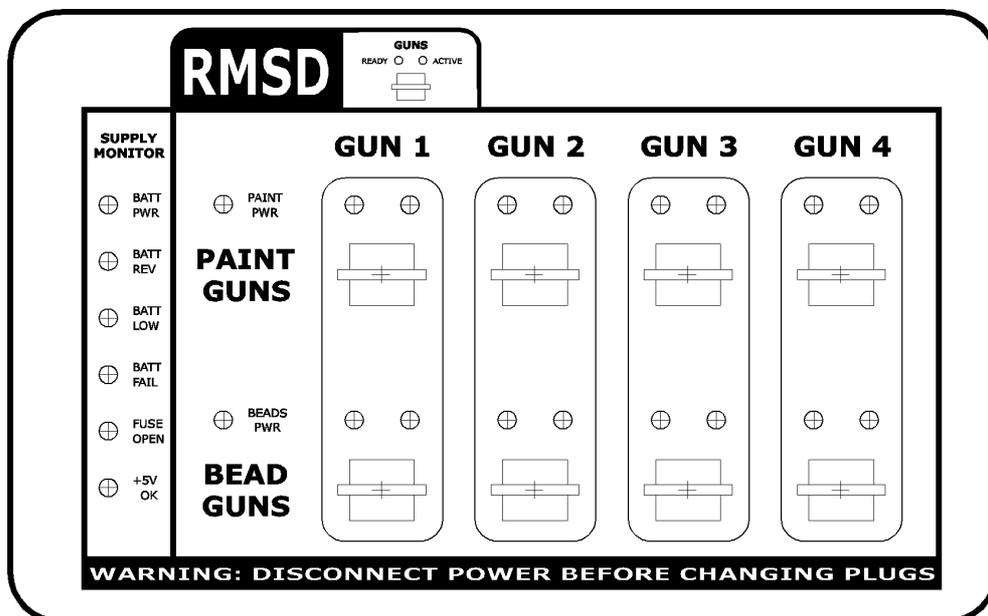
- Simultaneously paint two independent patterns plus mark polydots and RPMs
- Calibrate each gun individually for line length adjustment
- Customise line gap and length by text entry
- Supplied pre-programmed MINITRAC has a total of 81 user programmable patterns available
- Easy operation and installation plus laptop computer interface
- Alpha numeric keypad for easy set up and one touch operation
- View activities on the easy to read four line, 20 character back lit LCD

- Remote LCD readouts can be mounted on the front or rear of your equipment to display paint thickness and vehicle speed
- Master power and master gun & bead switches for fast shut off
- Speedo input from gearbox or 5th wheel encoder - easily calibrated to any vehicle
- QA Function: MINITRAC keeps accurate records of work done. Totalisers show metres painted and litres used for each pattern (for 2 colours). Litres used measured to 1/1000<sup>th</sup> of a litre and metres painted can be measured to 0.1% accuracy.
- Download summarised data to JOBCARD VIEWER for accurate records of work completed
- Internal battery stores data when power is off
- Use MINITRAC with OUTPUT BOX to send patterns separately or simultaneously to any gun

## 1.2 MINITRAC Specifications

- Size 155mm x 150 mm x 75mm
- Electrical requirements 12 - 28 volts, unit is fully protected against shorts, voltage spikes and reversals
- Operating temperature 0 - 45°C (higher temperature option available)
- Operating speed range 0 - 30km/h
- Trigger and all wiring supplied
- Requires RMSD ENCODER for optimal performance

### Output Box



## 1.3 OUTPUT BOX Specifications

- Size 200mm x 160mm x 75mm
- Electrical requirements 12 - 28 volts, unit is fully protected against shorts, voltage spikes and reversals
- Operating temperature 0 - 45°C
- Plug in connections for easy wiring

---

## 2.0 INSTALLATION

**Before you start, check that your package includes the following:**

MINITRAC Controller  
Mounting Bracket  
1 Trigger  
Wiring Cables  
Wiring Diagrams

### Optional Extras

OUTPUT BOX  
LCD Readouts for Speed and Thickness  
RMSD Speed Encoder  
Pump Encoder



**Note: MINITRAC should be installed by an RMSD trained technician or a qualified auto electrician. Product installed incorrectly will not be covered by warranty.**

### 2.1 System Layout

Refer to Appendix 13.1 for the System Layout and Wiring Guidelines.

### 2.2 Mount Controller

Mount the MINITRAC controller using the bracket supplied. We recommend that the controller be mounted in the centre of the driver's cab just below the top of the dashboard. This keeps it out of the sun, clear of the gear lever and passenger legs and within reach of either side.

### 2.3 Mount Output Box (If included)

The OUTPUT BOX is mounted vertically, at the rear of the vehicle in a protected position (eg steel enclosure). To minimise wiring mount the OUTPUT BOX close to the guns.

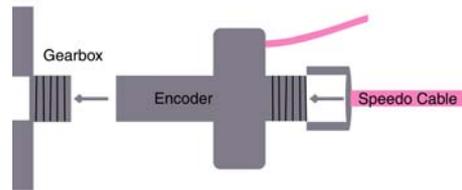
**Note:** Each gun has an individual plug and wiring. Do not wire paint and bead gun circuits in parallel. Refer to the System Layout and Output Box Wiring Guidelines in Appendix 13.1.

### 2.4 Mount Speed Encoders

Speed encoders may be either gearbox or 5<sup>th</sup> wheel.

#### 2.4.1 Gearbox Encoder

If using a Gearbox Encoder screw this onto the gearbox speedometer takeoff in place of the speedometer cable. The speedometer cable is then replaced onto the thread provided on the encoder. See the diagram that follows.



**!** Take care not to place any force onto the encoder shaft. The drive pins must engage the gearbox drive slot.

### 2.4.2 5<sup>th</sup> Wheel Encoder

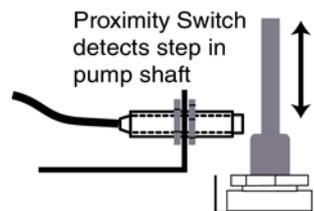
If using a 5<sup>th</sup> wheel encoder mount it on the inside wall of a rear tyre.

**!** Care must be taken to ensure the encoder wheel is not running on the edge of the tyre where it could cause damage to the tyre wall.

## 2.5 Pump Encoders

### 2.5.1 Positive Displacement Pumps

Positive displacement pumps require an Omron proximity switch. Part No: E2E -X5ME1 (2m). This must be fastened onto the side of the pump using a bracket and bolts (not supplied).



### 2.5.2 Air Atomised Systems

Air atomised systems require a positive displacement flow sensor eg TRIMEC MP 25.

## 2.6 Power Connection

Must be direct from the battery. **! Important** - To ensure proper operation have a solid earth to both the chassis and the battery. (Wires not supplied)

## 2.7 Plug in Connections

Refer to the System Diagram (13.1) for plug in loom connections.

Connections must be made from the MINITRAC, to the battery input, the OUTPUT BOX (if included), the paint guns, the bead guns, the paint pump, the speed encoder, and triggers and readouts (as required). All looms are supplied.

**Note:** For the gun connections – wires must be connected to the relevant plug and to the air solenoids. Ensure the solenoid remains waterproof.

### 3.0 SAFETY PRECAUTIONS

**PAINT AND GUNS** – Roadmarking guns operate at high pressure and roadmarking paint is highly toxic. Operators using RMSD equipment must ensure no people are within the gun firing range while setting up and using the equipment.

**SWITCHES** – The Master Gun switches must be turned off between all jobs.

**STATIC STRAPS** – Good quality static straps should be fitted to all vehicles using RMSD equipment (including support vehicles). This will extend the life of your equipment and reduce the possibility of operating staff receiving electrostatic shocks while working. Severe static on your vehicle will affect the operation of RMSD equipment.

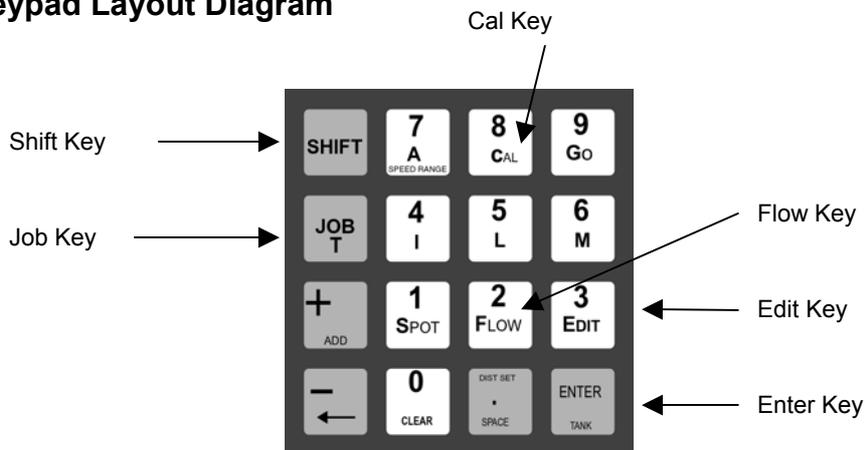
**HIGH VOLTAGE POWER AND HIGH FREQUENCY EMISSIONS** - All electronic equipment can be damaged by high voltage power and high frequency emissions eg near airports, and large industrial plants such as smelters. If you are working in such an area we recommend you turn off all electronic equipment.

### 4.0 SET UP

Before operating MINITRAC for the first time in a new vehicle it is necessary to calibrate the system to your vehicle roadmarking requirements. Follow the instructions below to complete calibration set up.

Use the keypad to access the Set Up Program.

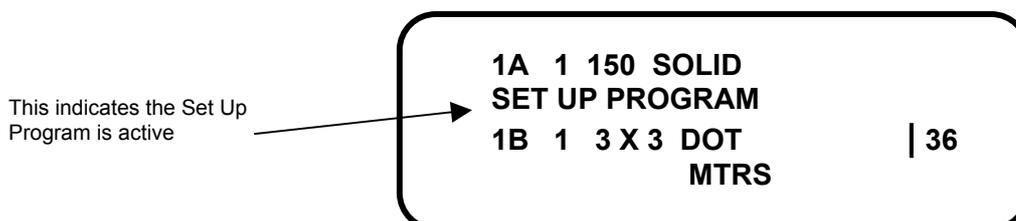
#### 4.1 Keypad Layout Diagram



#### 4.2 To Access Set Up Program

Hold down **SHIFT** and press and release **ENTER**. SETUP PROGRAM will be displayed on the screen.

**Note:** When you use MINITRAC for the first time the screen will display the details pre-set for Job 1A and 1B. At all other times it will display the last job open.



### 4.3 Speedometer Calibration

**Step 1** Measure an accurate 100m test strip and position the vehicle at the start line



**Step 2** Enter the SETUP PROGRAM - hold down **SHIFT** and press and release **ENTER**.

**Step 3** When the screen shows SETUP PROGRAM hold down **SHIFT** and press and release **CAL (8)**. The screen will read as follows:

**DRIVE FOR 100  
METRES THEN STOP  
ENTER TO QUIT  
PULSE/METRE = 100.00**

**Step 4** Drive the 100 m test strip. While the vehicle is moving the screen will read as follows:

**DRIVE FOR 100  
METRES THEN STOP  
ENTER TO QUIT  
"COUNTING"**

**Step 5** Stop the vehicle at the end of the 100 metre test strip. After 5 seconds the screen will automatically display the speedometer calibration. See the example below:

**DRIVE FOR 100  
METRES THEN STOP  
PULSES PER METRE = 9,700  
PULSE/METRE = 97**

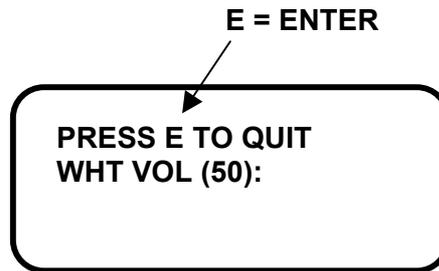
**Step 6** After 5 seconds the screen display will return to the last job open

### 4.4 Pump Volume and Paint Solids Volume Calibration

It is essential that each litre pumped registers on the counter as a litre. Before starting this calibration check the litre measurement with a known container.

**Step 1** Enter the SETUP PROGRAM - hold down **SHIFT** and press and release **ENTER**.

**Step 2** Hold down **SHIFT** and press and release **FLOW (2)**. The screen will read as shown below.



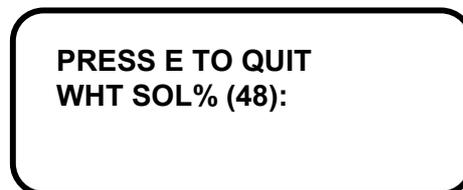
**Step 3** Use the number keys to enter the correct volume for the white pump (1/100ths of a litre per one stroke of the pump).

**Note:** The pump volume is listed by the pump manufacturer. You can also calculate the volume by measuring a trial quantity through the pump. If you are using a positive displacement flow sensor refer to the RMSD technician for advice in setting this value.

Press **ENTER** to continue.

**Step 4** The screen will now show the yellow pump. Use the number keys to enter the correct volume for the yellow pump and press **ENTER**. **If you are not using yellow paint ignore this prompt and press ENTER to continue.**

The screen will show the paint solids volume:



**Step 5** Use the number keys to enter the paint solids volume for the white paint and press **ENTER**

**Step 6** Use the number keys to enter the paint solids volume for the yellow paint and press **ENTER**. **If you are not using yellow paint ignore this prompt and press ENTER to continue.**

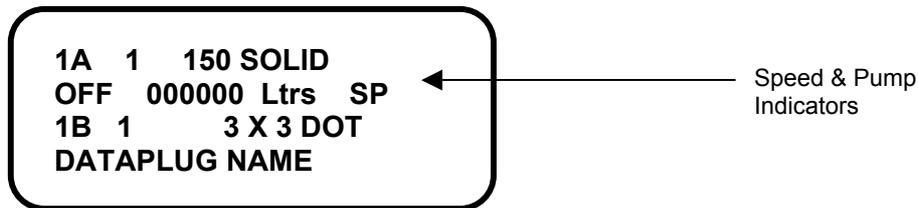
For wet film thickness enter the solid volume as 100%. For dry film thickness enter the solid volume as per the paint manufacturer's batch information.

**Step 7** Pump paint through the system to ensure that each litre registers precisely on the counter. To ensure accuracy measure out a quantity larger than 1 litre eg 10 litres.

#### **4.5 Pump & Speed Encoder Indicators**

These indicate correct pump and speed encoder operation.

**Step 1 Press Clear (0).** The screen will show two indicators at the end of the second line (**S** and **P**).



**Step 2 Speed Encoder Indicator**

Move the vehicle as slowly as possible. If the **S** indicator is alternating (+ to **S**) the gearbox encoder is operating correctly.

**Step 3 Pump Encoder Indicator**

If the **P** indicator is alternating (+ to **P**) the paint pump is operating correctly.

**4.6 Thickness Gauge (Optional)**

Paint line width is determined by gun height. For the thickness gauge to provide an accurate reading, gun height must be correct and the line width must be entered in MINITRAC. The line widths have been preset for each pattern. If you need to change the preset descriptions refer to Line Width in Appendix 13.5.

Solid content must be set according to the manufacturer's batch information. See Set Up Instructions Section 4.4. **Note:** For wet film thickness enter the Solid Volume as 100%.

If testing the thickness gauge using the simulator you must be actively painting. (ie paint must be going through the system). Do not move the vehicle during testing.

**4.7 Spot Length Adjustment**

**Step 1** Hold down **SHIFT** and press and release **ENTER** to enter the SETUP PROGRAM

**Step 2** Hold down **SHIFT** and press **SPOT (1)**. The screen will show the following:



**Step 3** Use the +, - Keys to adjust the line spot length. **Note:** This amended spot length will now apply to all spot patterns.

**Step 4** Press **ENTER** to return to normal operation.

**4.8 Speed Simulator Program**

Use this program to test the system operation.

**Step 1** Enter the SETUP PROGRAM – hold down **SHIFT** and press and release **ENTER**

**Step 2** Hold down **SHIFT** and press and release **GO (9)**. The screen will read as shown below.

TO SET SPEED  
USE "+", "-" KEYS  
ENTER TO QUIT  
SPEED = 000

**Step 3** Press **+** until a value 1 - 10 is selected. This equates approximately to 1 - 10 Km on the speedo. Use **-** (←) to reduce the value.

**Step 4** Press **ENTER** when the simulated speed has been selected and then use the triggers, guns and other equipment at the selected speed to test the system operation.

**Note:** If testing the thickness gauge using the simulator you must be actively painting. (ie paint must be going through the system). Do not move the vehicle during testing.

**Ensure no people are within the gun firing range.**

**Step 5** Use the equipment at different simulated speeds until you are satisfied all components are working correctly.

**Step 6** To return to normal operation repeat steps 1-4 to set the SPEED value to 0.

## 5.0 OUTPUT BOX (Optional Extra)

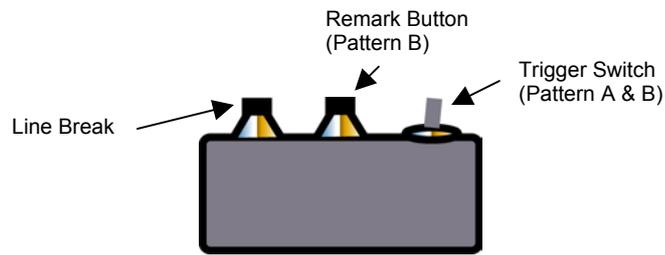
The OUTPUT BOX drives the gun solenoids. Using OUTPUT BOX the MINITRAC can direct the patterns to any combination of guns.

Default gun selections via OUTPUT BOX have been preset into your MINITRAC. The preset selections are set out in Appendix 13.2.

The gun selection is entered behind the bar character on the MINITRAC screen. For example for Solid (Pattern A) to Gun 2 and Dots (Pattern B) to Gun 3 the entry is | 36

If you need to change the preset OUTPUT BOX settings please refer to the editing instructions in Appendix 13.5.

## 6.0 TRIGGER



The roadmarking patterns are selected in MINITRAC and then painting is activated by the trigger. Use the left hand trigger for the left hand guns and the right hand trigger for the right hand guns.

**Trigger Switch** Use this to paint Pattern A or Pattern B. Set the trigger switch forward for Pattern A, back for Pattern B and centre for off.

**Remark Button** Use this to paint intermittent Pattern B dots. This is helpful when remarking old work.

**Line Break** Hold down this button to stop painting briefly without clearing the pattern settings. For example to stop painting over an RPM.

## 7.0 JOB NUMBERS

MINITRAC records are kept by Job Number. Each Job Number contains a group of preset roadmarking patterns. Each pattern has an A and B setting. Usually Pattern A is a solid line and Pattern B dots. Both settings (A and B) are visible on the screen at the same time.

9 Job Numbers have been preset with the roadmarking patterns listed in Appendix 13.2.

To change the roadmarking pattern descriptions to meet your individual requirements follow the editing instructions in Appendix 13.5.

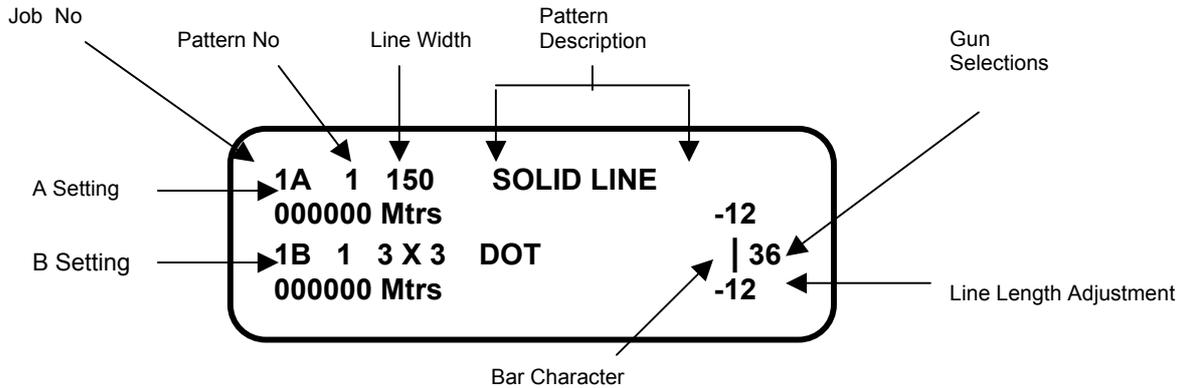
### 7.1 To Access Job Numbers

Press **JOB**. The screen will beep and prompt you to enter the Job Number. The screen will look similar to the one below:-

<b>JOB#?</b>	
<b>000000 Mtrs</b>	<b>- 12</b>
<b>1B 1 3 x 3 DOT</b>	<b>  36</b>
<b>000000 Mtrs</b>	<b>- 12</b>

Use the keypad to enter the job number and the pattern number.

The screen will look similar to the one below:



## 7.2 Incidental Markings

Incidental roadmarkings such as pedestrian crossings, stop signs, direction arrows, fire hydrants etc can be recorded in MINITRAC. There is no standard setting for incidental markings. The specific incidental markings you require have to be pre-programmed by RMSD into your system.

Incidental markings are recorded as specific patterns in the selected Job number and accessed by pressing the appropriate job and pattern number. The example below is for **pedestrian crossings**:

Select the job number and pattern number set for pedestrian crossings. The screen will read similar to the one below.



Paint the pedestrian crossing.

Hold down **SHIFT** and press the **+** key to add the new pedestrian crossing to the total number of pedestrian crossings painted.

The litres used to paint the total number of pedestrian crossings painted is displayed next to the word OFF when the pattern is deselected. Press **CLEAR (0)** to deselect the pattern.

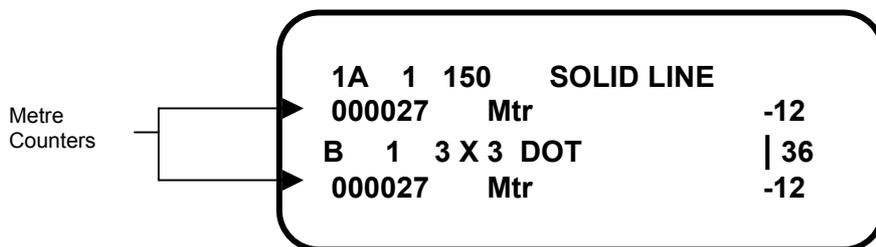


## 8.0 QUALITY CONTROL WITH MINITRAC

MINITRAC counts the metres painted and the total litres of paint used for each roadmarking pattern within each job number. The counts are stored and can be retrieved at the end of the day for quality control and charge out purposes. If you have JOBCARD VIEWER the counts can be automatically downloaded to your office computer. For further information on retrieving information from MINITRAC refer to Section 9.0.

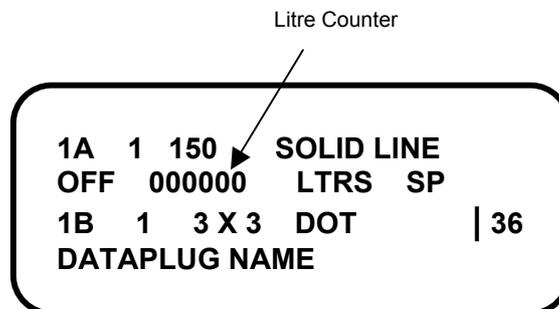
### 8.1 Counting Metres

Metres are only counted when the trigger is activated and painting is taking place. An active screen looks similar to the one below:



### 8.2 Counting Litres

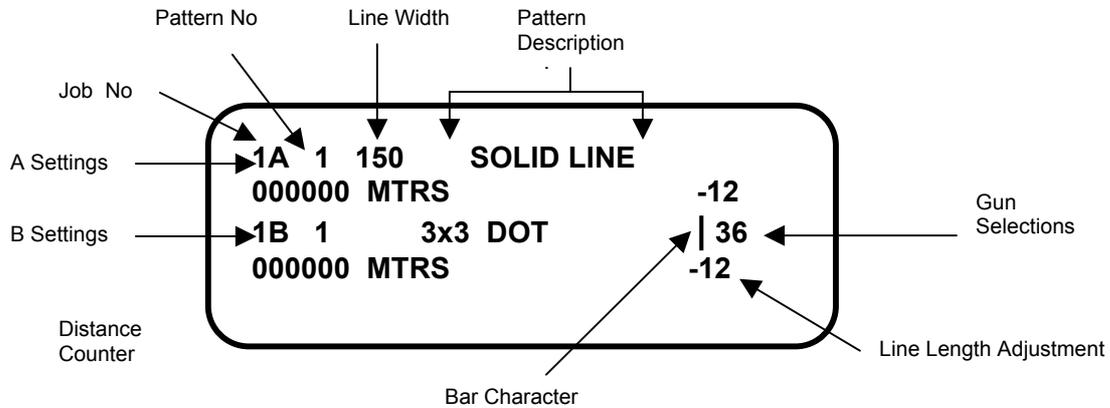
The total litres used to paint pattern A and B is displayed next to the word OFF when the pattern is de-selected. Press **CLEAR (0)** to deselect the pattern.



**!** FOR ACCURATE COUNTING IT IS IMPORTANT TO PRESS CLEAR (0) WHEN PAINTING OPERATIONS ARE FINISHED FOR EACH PATTERN

## 9.0 PAINTING WITH MINITRAC

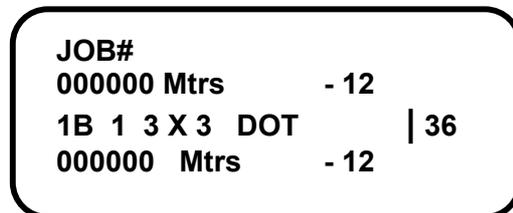
### MINITRAC Screen Layout



**Step 1 Turn On The Master Gun Switches.** These are located on the right hand edge of the MINITRAC unit.

#### Step 2 Enter The Job Number And The Pattern Number

Press **JOB**. The screen will beep and prompt you to enter the Job Number. The screen will look similar to the one below:-



Enter the job number and the pattern number

#### Step 3 Clear The Counters (If Necessary)

Hold down **SHIFT** and press **CLEAR (0)**. This will clear both the metre and the litre counter for the pattern selected.

**YOU ARE NOW READY TO PAINT**

#### Step 4 Painting

Use the trigger to paint the pattern selected.

#### Step 5 Stop Painting

At the end of the pattern press **CLEAR (0)**. This will disarm the Gun and prevent any further painting or counting.

#### Step 6 Turn Off The Master Gun Switches

**!** **TURN OFF THE MASTER GUN SWITCHES BETWEEN ALL JOBS**

---

## 10.0 SAVING JOB RECORDS

**!** MINITRAC stores data for a maximum of 9 jobs. When you have used all 9 jobs the data must be recorded manually or saved to JOBCARD VIEWER. The system should then be cleared ready for new data.

**Note:** Data can be recorded/saved if you have done less than 9 jobs. As a minimum, data should be recorded/saved daily.

**!** It is important to clear all data from MINITRAC after you have recorded/saved the information.

### 10.1 Saving To Jobcard Viewer

The Dataplug is used to transfer the information from MINITRAC to JOBCARD VIEWER in your office computer. Using the Dataplug means you do not need to manually record information from MINITRAC. The data is automatically downloaded to the Dataplug file you select.

**Note:** The data from all 9 jobs is downloaded to the Dataplug file you select. It is important to clear all MINITRAC counters after downloading. Up to 7 sets of 9 jobs can be downloaded to selected files in a single Dataplug. (Refer to JOBCARD VIEWER instructions for Dataplug file set up).

#### 10.1.1 Downloading to the Dataplug

**Step 1** Ensure the vehicle is stopped, painting operation is finished and the Master Gun Switches are off. Plug the Dataplug into the designated outlet.

**Step 2** Hold down **SHIFT** and press **GO (9)** at the same time. The screen will read as below. **Note:** The screen will prompt you to plug in your Dataplug if you have not already done so.

**SAVE: "FILE NAME"**  
**PLUG: "PLUG NAME"**  
**+ - TO SELECT FILE**  
**ENTER TO CONTINUE**

**Step 3** Use the **+ -** keys to scroll through the file names and select the file you wish to save the data to. Press **ENTER** to continue. The screen will read as below:

**SAVE: 'FILE NAME'  
PLUG: 'PLUG NAME'  
PRESS +, THEN ENTER  
TO SAVE**

**Step 4** Press + , then **ENTER** to download the information. To exit without saving the data just press **ENTER** and MINITRAC will return to normal operation. When downloading the screen will read as shown below:

**WAIT.....  
DOWNLOAD SAVING**

The screen will tell you when the download is complete. See below:

**DOWNLOAD COMPLETE**

**Step 5 Clear all Counters.** The screen will prompt you as shown below:

**CLEAR ALL COUNTERS  
PRESS CLEAR,  
THEN ENTER**

Press **CLEAR** and then **ENTER** to clear the counters.

**! Note: IF YOU DO NOT CLEAR THE COUNTERS NEW DATA WILL BE ADDED ON TOP OF EXISTING DATA AND YOUR RECORDS WILL BE INCORRECT.**

After 5 seconds MINITRAC will return to normal operation.

**Step 6** Remove the Dataplug

**Step 7** Follow your Jobcard Viewer instructions to transfer the information from the Dataplug into your office computer.

## 10.2 Manual Recording

**Step 1** Turn off the Master Gun Switch.

**Step 2** Enter the JOB Number, Press **JOB** followed by the Job Number when prompted on the screen.

**Step 3** Enter the Pattern Number

**Step 4** Record the individual metres painted for Pattern A and Pattern B.

Metres Painted	1A	1	150	SOLID LINE	
			000125	MTRS	-12
	1B	1	3x3	DOT	36
			000125	MTRS	-12

**Step 5** Press **CLEAR (0)** to view the total litres used for Pattern A and Pattern B combined.

1A	1	150	SOLID LINE	
OFF		000347	LTRS	SP
1B	1	3X3	DOT	36

**Step 6** Record the litres used.

**Step 7** To clear the readings. Hold down **SHIFT** and press **CLEAR (0)**

**Step 8** Repeat steps 4-7 for the next pattern number.

**Step 9** Return to steps 2- 8 for other Job Numbers.

**Step 10** Clear all counters. Use this step if you have not already cleared the counters in Step 7. This clears all the individual pattern distance and litre counters for all jobs.

**Note:** If you do this you will lose all record of your work. Press the following 3 keys simultaneously **7 DIST SET ENTER**.

## 10.3 View The Total Distance and Total Litres Counters

This reading shows the cumulative total litres of paint used for all jobs recorded plus the cumulative total distance painted.

**Note:** The vehicle must be stopped to access this reading.

To view the totals press **ENTER**.

The screen will display the totals as shown below:

<b>DIST PAINTED:</b>	<b>000500</b>
<b>WHITE LTR:</b>	<b>000220</b>
<b>YELLOW LTR</b>	<b>000167</b>

After 5 seconds MINITRAC will return to normal operation.

#### **10.4 To Clear the Total Distance and Total Litres Counters**

This clears the cumulative total distance and the cumulative total litres counters.

**Step 1** Hold down **SHIFT** and press **ENTER**.

**Step 2** Hold down **SHIFT** and press **DIST SET**. The screen will read as below:

**CLEAR DIST & LITRES  
PRESS 0, THEN ENTER  
TO CLEAR**

Press **CLEAR (0)** and then **ENTER** to clear the counters. This clears both the total distance and total litres counters for yellow and white paint. To exit without clearing the counters just press **ENTER** and MINITRAC will return to normal operation.

MINITRAC will return to normal operating mode after 5 seconds.

#### **10.5 Clear All Counters**

This clears all the individual pattern distance and litre counters for all jobs.

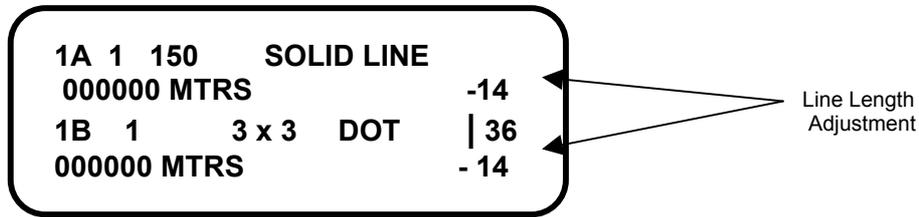
**!** **IF YOU DO THIS YOU WILL LOSE ALL RECORD OF YOUR WORK**  
Press the following three keys simultaneously **7 DIST SET ENTER**

### **11.0 TIPS FOR MORE EFFICIENT PAINTING**

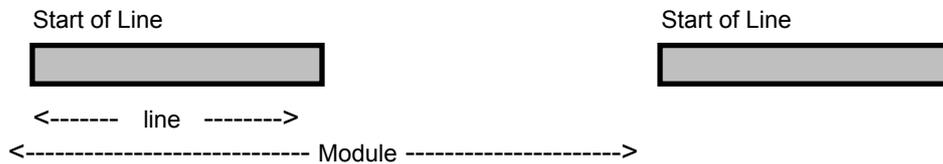
#### **11.1 Line Length Adjustment**

To compensate for slow gun shut off adjust the length of the line painted (the module) by shutting off the gun a number of pulses early. This provides for precise markings.

This screen is always on view when painting. The line length adjustment numbers indicate the correction required. - = shortened, + = lengthened. Use the + and - buttons to adjust the length of the line painted.



This value will vary in extreme temperatures and with stiff gun components, however, it has no effect on the overall module length i.e. line plus gap.



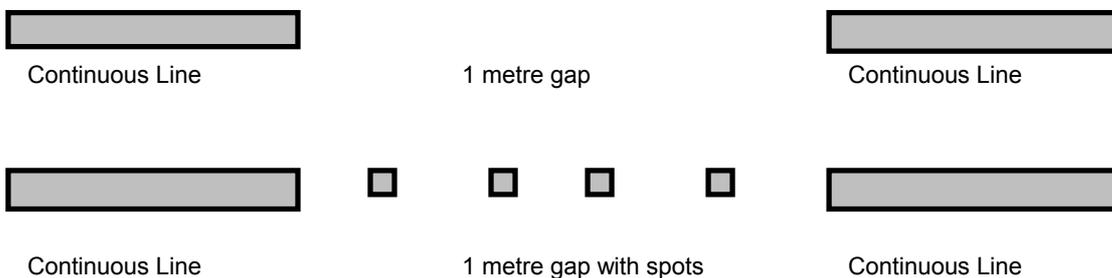
If measuring a module length, measure from the start of a line to the start of the next line (including the gap).

**Note:** Measuring the module from the end of the line is inaccurate as the spring return may vary.

## 11.2 Spotting Out

This is a function used to mark out RPM spaces and setouts with a Spot Gun

**Note:** When spots are placed within a gap the total gap length is not altered i.e. a 1 metre gap with 4 x 50mm spots remains a 1 metre gap overall.



To use the Spotting Out function the line length adjustment must be correct and a spotting pattern selected.

Eg G7.5LSC - LS = Line Spot

---

**To adjust the length of the Spot:**

**Step 1** Hold down **SHIFT** and press **ENTER** to enter the SETUP PROGRAM

**Step 2** Hold down **SHIFT** and press **SPOT (1)**. The screen will show the following:

TO SET SPOT  
USE "+", "-" KEYS  
ENTER TO QUIT  
SPOT = 012

**Step 3** Use the +,- Keys to adjust the line spot length. **Note:** This amended spot length will now apply to all spot patterns.

**!** **IMPORTANT: FOR ACCURACY A FIXED SPEED MUST BE MAINTAINED DURING SPOT MARKING**

## 12.0 SERVICE & SUPPORT

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## **13.0 APPENDICES**

**13.1 System Layout & Wiring Guidelines**

**13.2 Roadmarking Patterns & Default Gun Settings**

**13.3 Quick Reference Instructions**

**13.4 Troubleshooting**

**13.5 Editing MINITRAC and OUTPUT BOX**

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## INDEX

- 5th Wheel Encoder, 5
- Appendices, 21
- Clear All Counters, 18
- Clear Counters, 14
- Clear Total Distance, 18
- Clear Total Litres, 18
- Counting Litres, 13
- Counting Metres, 13
- Downloading to the Dataplug, 15
- Editing MINITRAC & OUTPUT BOX, 21
- Gearbox Encoder, 4
- Installation, 4
- Job Numbers, 11
- Job Record Retrieval, 15
- Jobcard Viewer, 15
- Keypad Layout Diagram, 6
- Line Length Adjustment, 18
- Manual Recording of Data, 17
- MINITRAC Features, 2
- MINITRAC Specifications, 3
- Mount OUTPUT BOX, 4
- OUTPUT BOX, 10
- OUTPUT BOX, 3
- OUTPUT BOX Specifications, 3
- Paint Solids Volume Calibration, 7
- Painting, 14
- Painting More Efficiently, 18
- Plug In Looms, 5
- Power Connection, 5
- Pump & Speed Encoder Indicators, 8
- Pump Encoder, 5
- Pump Volume Calibration, 7
- Quality Control, 13
- Quick Reference Instructions, 21
- Roadmarking Patterns, 21
- Safety Precautions, 6
- Saving Job Records, 15
- Saving to Jobcard Viewer, 15
- Service & Support, 20
- Set Up MINITRAC, 6
- Speed Encoders, 4
- Speed Simulator Program, 9
- Speedometer Calibration, 7
- Spot Length Adjustment, 9
- Spotting Out, 19
- Stop Painting, 14
- Thickness Gauge, 9
- Tips for More Efficient Painting, 18
- Trigger, 11
- Troubleshooting, 21
- View Total Distance and Total Litres, 17
- Wiring Diagrams, 21