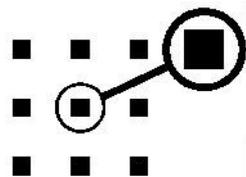


SPREADMOR **22C2**

22C2 SPREADMOR Controller

OPERATION INSTRUCTIONS

VERSION 1.0



FARMSCAN

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1.0 Introduction

1.1 General Outline

The 22C2 will automatically adjust the belt speed to maintain the selected target rate.

The 22C2 may be calibrated using either of two methods. The first method requires that the material be weighed as it falls from the gate whilst the second method requires the calculation of a factor based on the spreader manufacturer's charts supplied in the spreader manual. The factor may be fine-tuned after the first loads.

The 22C2 will also monitor spinner RPM via a sensor mounted on one of the spinners and low bin level via the bin level sensor mounted at the bottom of the bin.

The spinner can then be monitored to maintain the correct width of spread as products change. An alarm can be set to notify the operator when the spinner RPM drops below the set alarm point.

The bin low alarm is activated when the material in the bin uncovers the sensor. The sensor can thus be mounted to provide sufficient warning of a low bin level.

The built in trip meter allows for records of up to 10 trips. Each trip will record the area covered and weight of product spread. The "TOTAL" key allows a display of overall area, weight and distance covered.

2.0 Installation

2.1 Monitor Installation

When installing the monitor use the brackets, securing knobs and mounting hardware supplied to mount the monitor. Keep the following points in mind when finding the best location for the monitor.

- The monitor should be installed in the cab, clearly visible to the operator but not subject to intense heat or moisture.
- Keep the unit away from radios or other electronic equipment to minimize any risk of interference. As a precaution all connection cables should take an alternative route to other cables in the cab, especially antenna cables or clutch, solenoid and engine kill switch cables.
- Mount the unit firmly on the bracket using securing knobs supplied (AH-861). Don't use substitute bolts into the monitor.
- When installing the wiring loom ensure the green 12 way connector is inserted into the back of the monitor with the screws in the connector facing upwards.

DO NOT force the connector. If it does not connect easily check that the connector is being inserted the correct way.

- When running the tractor loom through the cab to the back of the monitor it may be easier if the green plug is removed so that the cable can be inserted through a smaller diameter hole in the cab wall etc.

Take note of the wiring of the green plug before removal.

Refer to the back panel to make sure the cable colours correspond when rewiring the plug.

- Use the cable ties supplied to secure the cable away from risk of damage.

2.2 Power Connection

Do not connect power until all other installation is complete.

Connect **power cable** from tractor loom **direct** to 12-volt DC vehicle battery terminals to ensure a clean uninterrupted source of power.

DO NOT connect power cable to alternative power source such as the starter solenoid as damage may result.

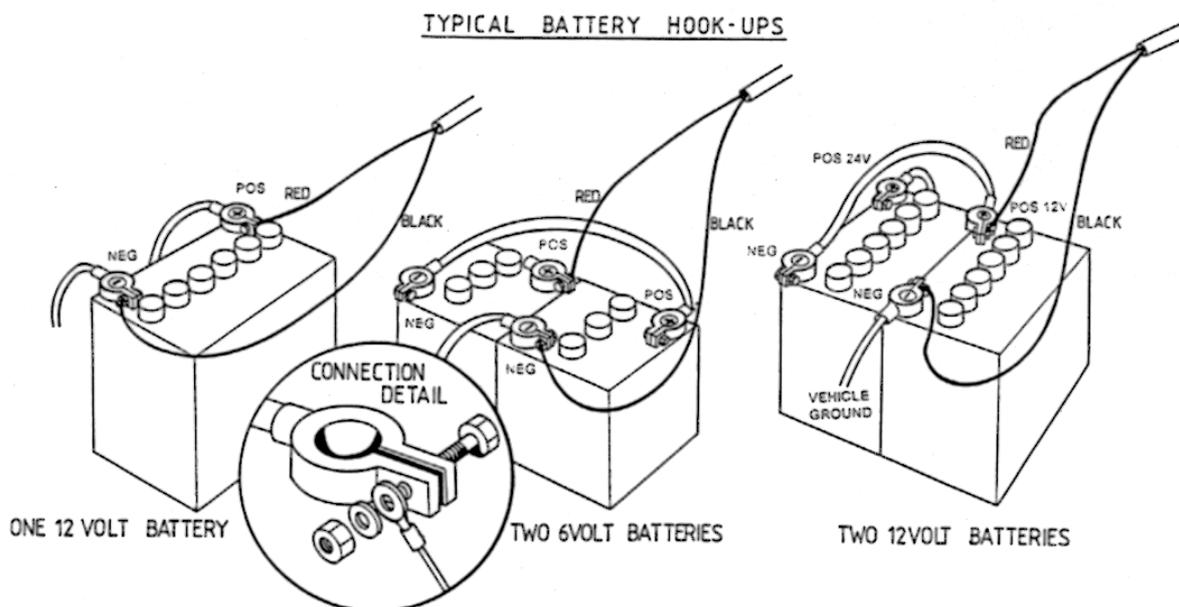
DO NOT connect other electrical equipment to the 22C2 monitor **power cable**.

Run the **power cable** away from wiring to solenoids or electric clutches.

Use cable ties supplied to secure power cable away from risk of damage.

Connections to battery terminals must be clean and tight.

WARNING - Disconnect power cable when arc welding



2.3 Wiring Loom Installation

- Lay the loom out down the length of the machine and fasten with cable ties along the body of the spreader. The drawing below shows the best location for mounting the loom.
- Don't tighten the cable ties at this stage. This allows the loom to be adjusted so that the connectors align properly with the actuator and sensors.
- When the sensors have been installed and connected to the loom, align the loom so that there is the least amount of excess cable near the sensors. When correct, tighten the cable ties.

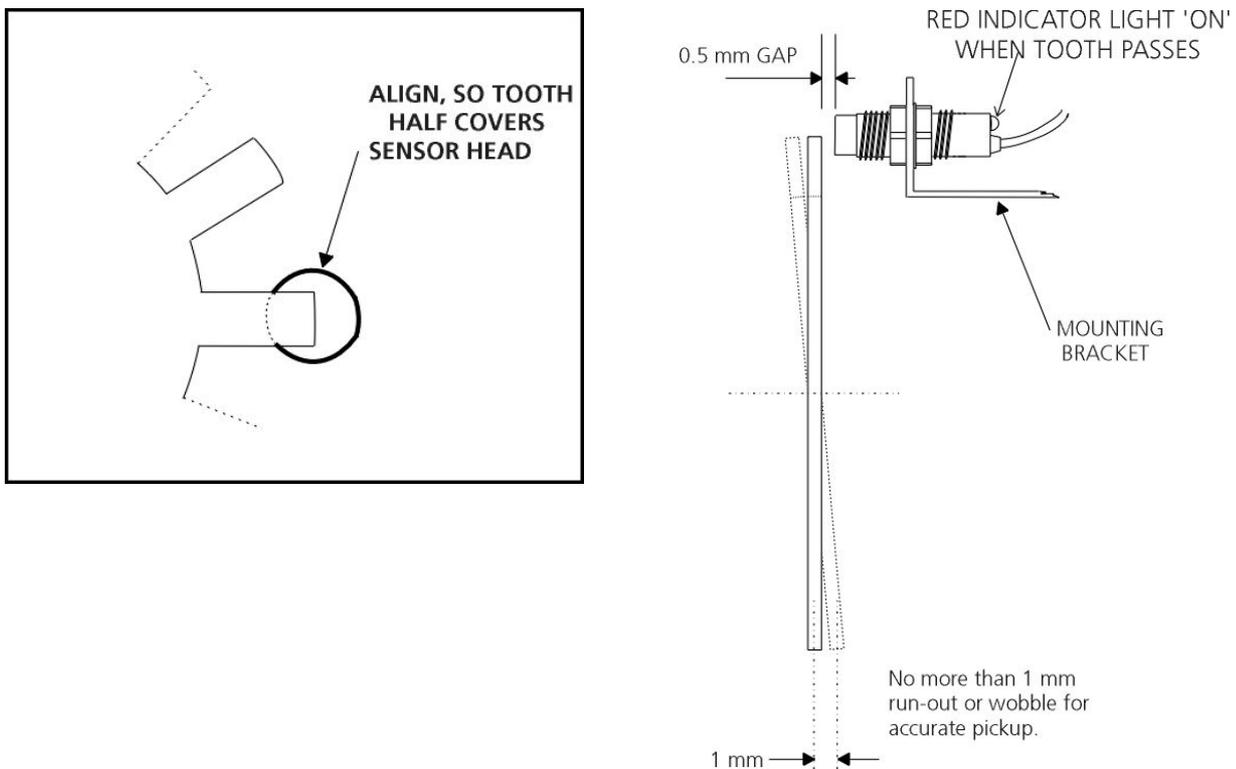
2.4 Wheel Sensor Installation

The wheel sensor is used by the controller to calculate the vehicle's ground speed so that the controller can keep the application rate the same at different speeds.

As supplied in the standard kit, the wheel sensor consists of a proximity switch. The proximity switch registers a signal when a piece of metal comes into close contact with the switch. The wheel sensor is installed on undriven ground wheel.

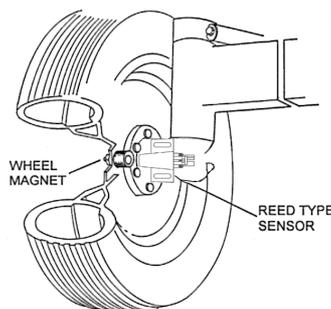
Mount the proximity switch close to a piece of metal that rotates in direct proportion with the wheel. Other wise a proximity target disc could be installed to trigger the proximity switch.

Mount the proximity switch using the bracket provided 0.5 mm (0.02") away from the tooth on the sprocket that comes closest to the proximity switch. Mount as shown in the diagrams below. The **maximum** gap is **2 mm (0.08")**.



Alternatively

A reed switch and a magnet can be used as a wheel sensor instead of a proximity sensor. This sensor must be ordered separately. If using a reed switch and a wheel magnet mount the magnet and sensor as shown below. For best results the magnet and the reed switch must be 5 to 15mm apart.

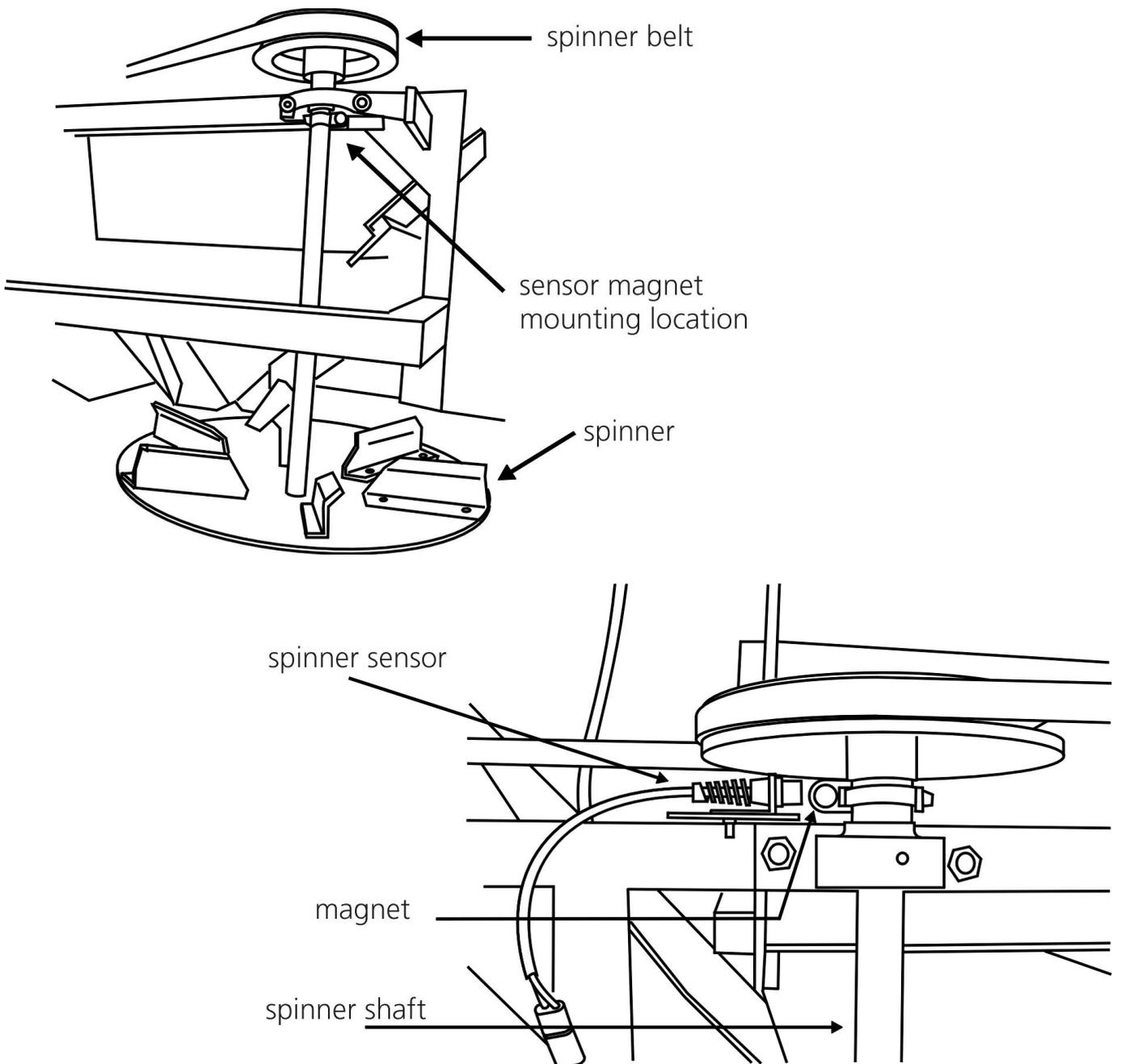


2.5 Spinner Sensor Installation

The spinner sensor supplied in the standard kit is a proximity sensor. The spinner sensor needs to be mounted on the spinner so that every time the spinner completes a rotation a piece of metal triggers the sensor. The sensor must be mounted 1 to 2 mm away from the piece of metal.

Mount the sensor using the bracket and the two slots in it. Alternatively, a target disc could be used to trigger the proximity switch. The target disc must be ordered separately, see the diagrams shown in section 2.4 to help install the target disc and proximity sensor.

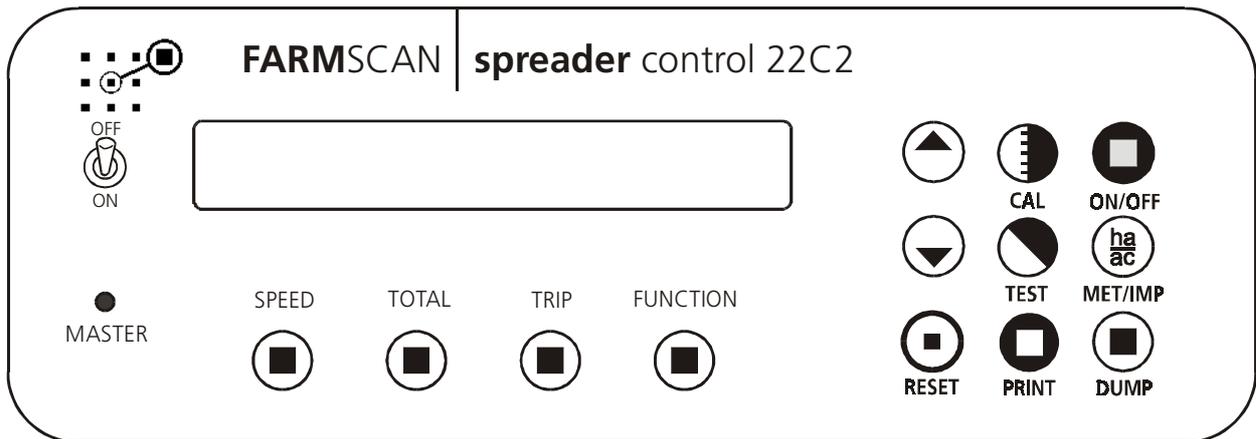
A Reed switch and a shaft magnet can also be used as a spinner sensor. The Reed switch and clamp magnet are optional and must be ordered separately. See the diagrams below to mount the Reed switch and the shaft magnet.



2.6 Belt Sensor Installation

The belt sensor consists of a proximity sensor. It is recommended that a target disc be installed on the belt to trigger the proximity sensor. The target disc must be installed on a part of the belt that turns in direct proportion with the belt. A good place to mount the disc is on the end of the belt shaft or on one of the wheels that drive the belt.

3.0 Operation



3.1 Power On/Off Key

To switch the monitor 'ON', press the  key

Whenever the monitor is switched 'ON' the display will run through a start up routine displaying version of software and the program the monitor is running.

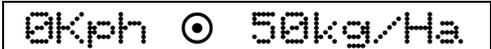
e.g. 



The version number indicates which generation of functions and features are programmed into your unit.

If an upgraded program is installed, a new version number e.g. VERSION 2.10 will be displayed.

After momentarily displaying the current program and version number, the monitor will then display the speed and the target rate.

e.g. 

If stationary the monitor will immediately go into 'hold' mode when first switched on, see section **3.12 Run/Hold Function** for an explanation of this alarm.

3.2 Imperial / Metric Key

Press the  key to change any readout on display between metric and imperial.

e.g.

AREA 10.0Ha

AREA 25.0Ac

NOTE:

"IMP/MET" key is not active during calibration. All calibration factors must be entered in metric values.

3.3 Dump Key

Use the  key to manually activate the belt to empty the bin whilst stationary. Belt speed can be increased or decreased from 0 (slowest) to 99 (fastest) using the  or  keys.

3.4 Cal Key

Pressing the  key will step through a series of set up factors that need to be entered for the monitor to work correctly. The calibration section of this manual explains each of these set-up factors in greater detail.

3.5 Test Key

The "TEST" key provides a means of testing that the sensors and controlling electric motor are working correctly. The test function is also used in the calibration procedures.

Press the  key and the "DISTANCE TEST" will appear.

e.g.

DISTANCE TST 0

The distance test enables the operator to test the wheel sensor mounted on the wheel. Each time the magnet passes the sensor the monitor will beep and count the pulse.

To reset the pulse-count back to zero press the  key.

Test Key cont'd

Pressing the  key again will display "SPINNER TST".

e.g.

SPINNER TST 0

The spinner test will beep and count up each time the magnet on the spinner shaft passes the coil sensor.

NOTE: The sensor will only activate when the magnet passes the sensor quickly. Turning the spinner by hand may not activate the test function.

To reset the spinner count press the  key
RESET

Pressing the  key again will display "VALVE TST".

e.g.

VALVE TST 17.2P/s

The "VALVE TEST" figure indicates the number of pulses per second received from the belt sensor. The pulses per second should increase or decrease as the controlling electric motor speeds up or slows the belt down using the  or  key.

The belt sensor is okay if the number changes continuously and smoothly from a low to a maximum belt speed.

3.6 Print Key

The 22C2-N has a print facility that will print out trip area, weight and distance for each trip (1-10) or all trips. Use the optional 2040 Printer Kit connected to the adapter cable provided in the kit.

Press the  key and the monitor will display the current trip to be printed.

e.g.

PRINT TRIP 1 ?

To print another trip e.g. trip 2, press the trip key and use the  or  arrow keys to select the required trip then press "PRINT" again.

To print all the trip information, select Print then use the  or  arrow keys to change the display to "PRINT ALL TRIPS".

e.g.

PRINT ALL TRIPS?

When the correct option is displayed press  key again and the display will say "PRINTING" and the printer will begin to operate.

If there is no trip data the controller will display "NO TRIP DATA" and printing will cease.

NOTE:

Each trip data takes approx. 16 secs to finish printing. Printing 'ALL TRIPS' will take approx 3 mins.

3.7 Reset Key

To reset total area & weight, distance, trip area & weight and timer, press the  key and follow the prompts on the screen. The  key can also be used to return the monitor to the base target rate quickly. See section **3.11**  **Rate Key** for further details.

3.8 Speed Key

Press the  key to display the current working speed and the spinner rpm.

e.g.

15kph  764RPM

An alarm can be set to notify the operator that the spinner RPM has dropped below a set point. The following display will appear accompanied by an audible beep to warn the operator when the rpm has dropped below this point.

e.g.

SPINNER SLOW

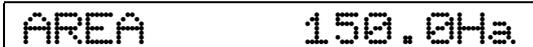
See section **4.5.4 Spinner (RPM) Alarm** for the details on how to set the spinner alarm point.

3.9 Total Key

The "TOTAL" key is used to display total area covered, total weight applied and total distance travelled.

Area, weight and distance readings are only incremented when "UNIT OFF HOLD" & travelling with the jockey wheel engaged.

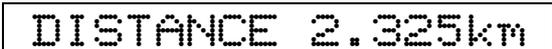
Press  key once to display total "AREA".

e.g. 

Press  key again to display total "WEIGHT".

e.g. 

Press  key again to display total "DISTANCE".

e.g. 

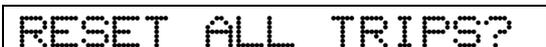
TO RESET TOTALS press  key once to start reset process.

Total area, total weight and total distance are reset simultaneously; this can be done at the start of a spreading program to keep overall records.

e.g. 

Press  again to complete reset process OR **to abort reset process**, press any other key.

After reset of "TOTALS" you will have the **option** to reset all trip memories at the same time

e.g. 

Press  again to reset all trips OR **to abort reset of all trips**, press any other key.

3.10 Trip Key

The "TRIP" key allows the display of a sub total for area covered and weight applied. The trip function has 10 resetable memories to keep a tally of the areas and weights for 10 different plots or loads.

To display the current trip area press  key once.

e.g.

TRIP 1	12.5Ha.
--------	---------

Press  key again to display trip 1 weight

e.g.

TRIP 1	0.85t
--------	-------

TO RESET TRIP MEMORY Press  key to start reset process

e.g.

RESET TRIPS 1?

Press  key again to complete reset process OR **to abort reset process**, press any other key.

To change to another Trip memory, press the  or  arrow keys to change the current trip number on display.

e.g.

TRIP 2	0.00t
--------	-------

NOTE:

Previously engaged trips can be viewed or reactivated by using the 'up' and 'down' keys to display and hence activate any one of the 10 trip memories 1-10. Whichever trip number is displayed will be active when working.

3.11 Rate Key

The rate readout is the amount of material being spread per hectare or acre.

Press the  key to display the rate readout.

e.g.

15kph  70kg/Ha

The rate that is displayed is the target spreading rate. Based on the **density** of the material, **gate setting**, **width** over which material is being spread and **speed**, the controller will increase or decrease the belt speed via the controlling electric motor to attain the target rate. See section **4.4.1** for information on setting the target rate.

To increase or decrease the spreading rate while operating use the  or  keys. The amount of change in the rate from each press of the arrow keys can be set to any amount, e.g. 5, 10, 20% per step up or down from the standard target rate. This is referred to as the **STEP SET**. See section **4.5.1 Step Set** for instructions on changing the step set.

When the rate has been changed an arrow will appear on the display. This arrow reminds the operator which way the rate has been adjusted from the target rate.

e.g.

15kph  77kg/Ha

To return back to the base target rate quickly, press the  key.

e.g.

15kph  70kg/Ha

If the controller cannot achieve the desired rate, the monitor will display one of the following alarms.

RATE TOO LOW

e.g.

RATE TOO HIGH

3.12 Run/Hold Function

The "RUN/HOLD" function is activated by the ground speed sensor switch on the front panel. Whenever the speed is zero (wheel is stationary), the monitor will go "ON HOLD" stopping the trip, total and distance functions from accumulating.

The "UNIT ON HOLD" message will re-appear every thirty seconds accompanied by an alarm to remind the operator the monitor is not accumulating.

e.g. 

The monitor will go "OFF HOLD" and the trip and total functions will begin to accumulate as soon as speed is detected.

e.g. 

3.14 Bin Level Sensor (Optional)

The optional A-2220P bin/tank level sensor can be fitted to the bin to detect a low bin level and give a visual and audible warning to the operator.

e.g. 

To cancel "BIN LOW" message on the screen:

- Press any other key.
- Re-fill bin
- Put "UNIT ON HOLD".
- Set "BIN SENSOR" calibration setting to 'OFF'. See Section 4.5.5 Bin Sensor Alarm.

NOTE: "BIN LOW" message will re-appear if monitor goes "OFF HOLD" and bin is still empty.

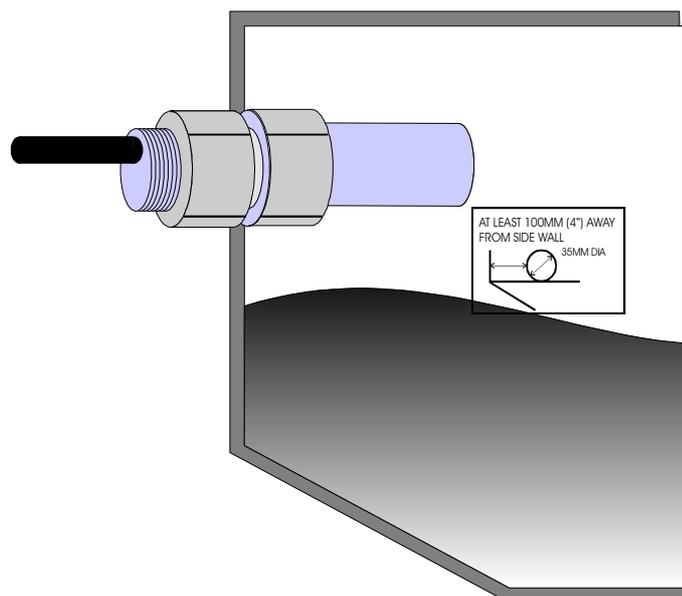
INSTALLATION

Install the sensor through the bin wall by cutting a 35mm clearance hole at the bottom of the bin.

The sensor must be at least 100mm (4inches) away from any adjacent sidewall.

Some bins empty from one side first, so it pays to observe the unloading characteristics before making any holes.

When the sensor is plugged into the harness, the light at the rear (cable entry side) of the sensor glows brightly when the sensor is uncovered and dims when the sensor is covered.



4.0 Calibration

4.1 General Outline

The 22C2-N contains 3 calibration menus:

- 1 Level 1 Calibration Menu.
Easily accessible.
Used to change settings that may vary frequently.
- 2 Level 2 Calibration Menu.
Accessible through a simple sequence of key presses.
Factors in this menu may not need to be altered frequently.
- 3 Level 3 Calibration Menu.
Accessible to the manufacturer only.

Variable factors need to be entered into the first two calibration menus before operation.

All calibration factors must be entered in **metric** units only. To adjust the factor displayed, use the

 or  arrow keys to change the displayed value.

Holding the  or  arrow keys will cause the numbers to change faster.

To save a calibration figure into memory, press the  key after the required figure is set. The monitor will then proceed to the next calibration function in that menu.

To exit from the calibration routine, press any other operation key (e.g. "RATE") to return the controller to normal operation.

4.2 Memory Backup

An inbuilt memory backup system will hold all calibrations and accumulated totals in memory whenever the power is switched off.

Memory will last for at least 3 months after disconnection from the 12 Volt DC power source.

4.3 Calibration Warning

A calibration checking system incorporated into the system will warn you if any calibration factors are lost from memory or change value without your knowledge.

If for any reason a calibration factor does change value, a continuous series of beeps will sound and the display will indicate which calibration factor has altered.

e.g.

CHECK CALS!

In this case the operator must press the  key to check and re-enter the correct factor. Save this factor by pressing  "CAL" key again. Press any other key (e.g. "SPEED") to return to normal display.

4.4 Level 1 Calibration

Press the  key at any time during operation to go into the level 1 calibration menu.

4.4.1 Gate Setting

Pressing the "CAL" key will display the gate setting.

e.g.

GATE SETTING 1

Use the spreader manufacture's recommendations to set the correct gate setting for the product and required application rate.

Gate setting can be changed using the up or down keys.

e.g.

GATE SETTING 2

Press the "CAL" key to proceed to the next step.

4.4.2 Target Rate

With target displayed, the  or  arrow keys can be used to set the base target spreading rate.

e.g.

TARGET 100kg/Ha

Press the  key to proceed to "DENSITY".

4.4.3 Density

Density of a material is the weight the material (in kgs or tonnes) for a volume of 1 cubic metre. This value is provided by the manufacturer of the product and must be entered here as tonnes per cubic metre.

Note: 1000kg = 1 tonne
 750kg = 0.75 tonne

Use the up and down arrow keys to enter the correct value.

e.g.

DENSITY 0.75t/m³

Press the "CAL" key to proceed to width.

4.4.4 Width

The "WIDTH" is the effective width over which material is being spread. Use the up or down arrow keys to enter the width in metres.

e.g.

WIDTH 10.00m

This is the end of level 1 calibration factors

4.5 Level 2 Calibration

Press and hold the  key when in level 1 calibration menu, to proceed to setup level 2 calibration factors.

4.5.1 Step Set

The Step Set is the amount the target rate can be changed up or down when using the arrow keys to change the rate on the go. e.g. 5%, 10%, or 50% steps.

Use the arrow keys to set the steps as desired.

e.g.

STEPSET ↑↓ 7%

NOTE:

If operating under GPS rate map control, the step set may be used but your selection will be automatically overridden anytime the computer commands the rate to change.

Press the  key again to proceed to the wheel factor.

4.5.2 Wheel

The wheel factor is the distance covered per rotation of the wheel. Carry out the procedure below to establish this value.

Press the  key until "DISTANCE TST" is displayed.

e.g.

DISTANCE TST 0

Crawl the spreader forward and stop when the "DISTANCE TST" beeps and counts up (when the wheel magnet and sensor are aligned).

e.g.

DISTANCE TST 1

Peg the ground at the bottom centre of the spreader main ground wheel tyre.

Press the  key to reset the "DISTANCE TST" counter to 0.

Drive forward in a straight line until the monitor has counted to approximately 10, stopping exactly on a beep count.

(If you go past a beep don't reverse; go forward to the next beep.)

e.g.

DISTANCE TST 11

Measure the distance from the peg to the bottom centre of the same tyre.

Divide the distance travelled by the number displayed on the screen.

e.g. $15.7\text{m} \div 11 = 1.427$ Wheel Factor

Press and hold the  key to enter Level 2 calibration set-up. Press the  key again to display "WHEEL" and use the  or  arrow keys to enter the wheel factor.

e.g.

WHEEL 1.427m

Press the  key to set the slow hold speed.

4.5.3 Slow Hold Speed

Below a certain minimum speed, accurate control of the hydraulic motor controlling the belt speed, may not be achievable.

This is particularly true if the spreader is forced to travel too slow.

By setting a slow hold speed, the controller will prevent the hydraulic motor from slowing down past this minimum speed.

If slow hold is set for 8 km/h, then below 8 km/h the belt speed is held constant.

e.g.

SLOW HOLD 8Kph

WARNING: Operating below the slow hold speed will result in over application and activation of the 'RATE HIGH' alarm.

TO DETERMINE SLOW HOLD SPEED

1. Calibrate 22C2-N as normal for the required rate.
2. Start spreading at normal speed then slow down until rate displayed on the controller is erratic.
3. Take note of the ground speed readout and use this point for the slow hold speed.

Use the  or  arrow keys to enter the desired slow hold speed.

Press the  key again to set the spinner RPM alarm point.

4.5.4 Spinner (RPM) Alarm

The spinner alarm is the slow rpm alarm point for the spinner. Whenever the spinner rpm drops below this value the monitor will beep and warn the operator that there is a problem with the spinner.

Use the  or  arrow keys to enter this value or set to zero for no alarm.

e.g.

RPM ALARM 1200

This is the end of level 2 calibration factors.

4.6 Gate Calibration (Level 3)

In order for the 22C2-N to work correctly over the full range of the gate setting, the pulses per cubic metre (**P/m³**) factor needs to be set.

This factor can best be described as the number of belt sensor pulses required by the 22C2 to detect the flow of 1 m³ of material.

The gate calibration will have to be determined for each gate setting.

This will only need to be performed **once** when the 22C2-N is first installed, but must be done for each product before starting to spread in the field.

To determine Gate Calibration Factor

1. Measure the width of the gate in metres.
2. Measure the diameter of the roller on which the belt sensor is mounted.
3. Measure the thickness of the belt, double it and add it to the diameter of the roller. This is the overall diameter of the roller.

e.g.	Diameter of roller	=	100mm		
	Thickness of belt	=	12mm		
	Double the thickness	=	12 x 2	=	24mm
	Overall diameter of roller	=	100 + 24	=	124mm
	Overall diameter of roller in metres	=	124 ÷ 100	=	0.124m

4. Select the gate opening setting (ie. 1, 2, 3 ...9, 10)
5. Measure the height of the opening (in metres) for that particular gate setting.
6. Determine the number of pick-ups for the belt sensor for each revolution of the roller.
7. The pulses per cubic metre is then determined by doing the following:

Pulses per cubic metre (P/m³) = 0.3183 x (Number of pick-ups) ÷ [(width of the gate) ÷ (height of the opening) ÷ (overall diameter of the roller)].

e.g.

Width of gate	=	600mm	=	0.6m
Overall diameter of roller	=	124mm	=	0.124m
Height of gate opening	=	155mm	=	0.155m
Number of pick-ups	=		=	12

$$\begin{aligned} \text{Pulses per cubic metre (P/m}^3\text{)} &= 0.3183 \times 12 \div 06 \div 0.155 \div 0.124 \\ &= 331.2 \\ &= 331 \text{ (rounded)} \end{aligned}$$

Gate calibration (level 3) continued...

The set up section for the gate calibration can be found by switching the monitor on and pressing the "CAL" key to display "GATE SETTING 1".

Press and hold the "TEST", "PRINT" and "SPEED" keys simultaneously to enter the gate calibration menu.

e.g.

```
GATE 1 40000P/m3
```

Press the "CAL" key to select the required gate setting.

e.g.

```
GATE 2 20000P/m3
```

Press the up or down arrow keys to enter the corresponding gate calibration factor.

e.g.

```
GATE 2 331P/m3
```

When all the gate calibration factors for all the gate settings have been entered, press and hold the "CAL" key to return to the level 1 calibration menu.

5.0 Parts List

ITEM	PART No.	DESCRIPTION	QTY
1	A-22C2-N	SPREADMOR CONTROLLER	1
2	AH-406	MOUNTING BRACKET	1
3	AH-861	SECURING KNOBS ¼"	2
4	AA-2009P	PROX TYPE SENSOR	3
5	P-006	12 PIN TERMINAL BLOCK	1
6	AM-22C2-N	22C2-N INSTRUCTION MANUAL	1

6.0 Troubleshooting Guide

PROBLEM		CAUSE	REMEDY
1.	MONITOR DOES NOT TURN ON	Fuse Blown.	<ul style="list-style-type: none"> Replace 20 Amp at rear of monitor. If there is no fuse then the monitor uses internal Poly-Fuses. These will cut out if the monitor is drawing too much current and will automatically restore power when the fault has been repaired.
		Monitor not connected correctly.	<ul style="list-style-type: none"> Connect black from loom directly to -ve side and red to +ve side of battery. Check there is 12V between pins 10 & 11 on the green plug at the back of the monitor.
		Interference	<ul style="list-style-type: none"> Make sure no other electrical device is connected to the monitor power cable. Do not share power with other devices such as foam markers, using 22C2 loom.
		Poor battery connections.	<ul style="list-style-type: none"> Ensure battery terminals are clean & tight. Check in-line fuse holder (if fitted) for blown fuse or corrosion.
2.	MONITOR TURNS ON AND THEN TURNS OFF WHEN ACTUATOR MOVES. (Ensure Truck/Tractor engine is running)	Not enough power to the monitor.	<ul style="list-style-type: none"> Run power cable directly to battery. Do not share power with other devices such as foam markers, using 22C2 loom
		Poor battery connections	<ul style="list-style-type: none"> Ensure battery terminals are clean & tight. Check in-line fuse holder (if fitted) for blown fuse or corrosion
3.	LCD DISPLAY DROPS OUT OR GREY SQUARES APPEAR ON READOUT.	Not enough power to the monitor	<ul style="list-style-type: none"> See TROUBLESHOOTING 2 above.
		Monitor not connected directly to battery.	<ul style="list-style-type: none"> Connect black from loom directly to -ve side and red to +ve side of battery. Do not share power with other devices such as foam markers, using 22C2 loom
		Faulty battery.	<ul style="list-style-type: none"> Replace battery.
		Poor battery connections	<ul style="list-style-type: none"> Ensure battery terminals are clean & tight. Check in-line fuse holder (if fitted) for blown fuse or corrosion.

PROBLEM		CAUSE	REMEDY
4.	MONITOR LOSING CALIBRATION VALUES.	Poor power connection or inadequate power source.	<ul style="list-style-type: none"> Run power cable directly to battery. Do not share power with other devices such as foam markers, using 22C2 loom
		Poor battery connections	<ul style="list-style-type: none"> Ensure battery terminals are clean & tight. Check in-line fuse holder (if fitted) for blown fuse or corrosion
		Interference	<ul style="list-style-type: none"> Ensure 2-Way and other electrical equipment positioned 1m away from 22C2 monitor.
		Wire ignition leads causing interference (Petrol trucks)	<ul style="list-style-type: none"> Fit carbon leads to ignition system.
5.	UNSTABLE OR NO SPINNER RPM.	Spinner magnet is missing or incorrect distance from sensor.	<ul style="list-style-type: none"> Ensure gap between sensor and magnet is 10 – 15mm. Move sensor away from magnet until reading is stable.
		Break in wiring loom.	<ul style="list-style-type: none"> Press the "TEST" button until "SPINNER TST" is displayed. Disconnect spinner sensor from loom and short across loom pins. Monitor should beep and count each time the pins get shorted together if wiring OK. If monitor does not count pulses, check for breaks in the loom by shorting the green and black wires together in the 9-pin break away plug and at the back of the monitor. If no response directly at monitor, return monitor for repair.
		Interference in loom. (Usually accompanied by another action, such as machine moving or CB coming on).	<ul style="list-style-type: none"> Ensure loom does not run close to other electrical cables. Ensure 2-Way and other electrical equipment positioned 1m away from 22C2 monitor
		Faulty or incorrect sensor. (Correct sensor has a yellow end cap)	<ul style="list-style-type: none"> Unplug sensor and use a multimeter to check resistance of sensor pins is 50 – 70 Ohms. Replaced with Farmscan Part No. AA-112P if faulty.

	PROBLEM	CAUSE	REMEDY
6.	UNSTABLE OR NO SPEED READOUT. (Can be checked by setting monitor to Distance and driving known distance)	Wheel magnet missing or incorrect distance from sensor.	<ul style="list-style-type: none"> • Ensure gap between sensor and magnet is 10 – 15mm.
<p>Distance calibration factor incorrect or zero.</p>		<ul style="list-style-type: none"> • See Section 4.9 DISTANCE in manual. 	
Break in wiring loom.		<ul style="list-style-type: none"> • Press the "TEST" button until "DISTANCE TST" is displayed. Disconnect wheel sensor from loom and short across pins of loom. Monitor will beep and count each time pins get shorted together if wiring and monitor OK. • If monitor does not count pulses check for breaks in the loom by shorting the white and black wires together in the 9-pin break away plug and at the back of the monitor. • If no response directly at the monitor, return monitor for repair. 	
		Faulty or incorrect sensor. (Correct sensor is black)	<ul style="list-style-type: none"> • Press the "TEST" button until "DISTANCE TST" is displayed and rotate the wheel. Monitor will beep and count each time wheel magnet passes sensor. • If no response unplug the wheel sensor and short pins of loom plug. • If monitor counts, replace sensor. • To test the wheel sensor, measure the continuity (resistance) of the sensor with a multimeter. The multimeter should show a closed circuit (short) only when the magnet passes the sensor. Replace with Farmscan Part No. AA-110P if faulty.
7.	INCORRECT AREA. (Note: Does not record hectares when "Monitor On Hold".)	Inconsistent speed.	<ul style="list-style-type: none"> • Drive at consistent speed and check that readout is fairly stable. If speed readout unstable see TROUBLESHOOTING 6 above.
DISTANCE CALIBRATION FACTOR incorrect.		<ul style="list-style-type: none"> • See Section 4.9 DISTANCE in manual and ensure distance calibration factor measured correctly. 	

PROBLEM		CAUSE	REMEDY
7.	INCORRECT AREA continued...	WIDTH CALIBRATION FACTOR incorrect.	<ul style="list-style-type: none"> Is machine not overlapping or under lapping. Press "CAL" until "WIDTH" is displayed, using the ▲ ▼ keys enter realistic width.
		Jockey wheel making insufficient contact.	<ul style="list-style-type: none"> Check if jockey wheel is bouncing excessively.
8.	TOO MUCH OR TOO LITTLE PRODUCT USED.	Incorrect DISTANCE CALIBRATION FACTOR.	<ul style="list-style-type: none"> See TROUBLESHOOTING 6 above.
		Incorrect AREA recorded.	<ul style="list-style-type: none"> See TROUBLESHOOTING 7 above
		Incorrect PULSE/KG CALIBRATION FACTOR	<ul style="list-style-type: none"> See SECTION 4.5.5 PULSE/kg FACTOR in manual.
		Gate operating at significantly different height to calibration height.	<ul style="list-style-type: none"> Recalculate new PULSE/kg factor for new target. See SECTION 4.5.5 PULSE/kg FACTOR in manual.
9.	MANUAL OPERATION	To bypass automatic rate application.	<ul style="list-style-type: none"> Flick the switch on the 22C2 front panel and press the "DUMP" key. Change the rate using the ▲ ▼ keys. The front panel switch stops automatic control of the belt spreading rate.

	PROBLEM	CAUSE	REMEDY
10.	GATE JAM WARNING (Reset the GATE JAM warning by pressing the CAL key then RATE key or by turning the monitor off and then on.)	Incorrect PULSE/KG factor. (Actuator moves using ↑↓ keys when stationary.)	<ul style="list-style-type: none"> • Check to see if actuator has stopped at full open or full closed position. • Check PULSES/KG calibration factor is correct, see SECTION 4.7 PULSE/KG FACTOR.
Gate limits set incorrectly. (Actuator moves using ↑↓ keys when stationary.)		<ul style="list-style-type: none"> • If PULSE/KG factor is correct and target rate is realistic, check gate limits are set correctly. See SECTION 4.4 SETTING UP THE ACTUATOR. 	
Gate jammed.		<ul style="list-style-type: none"> • Check the actuator has not jammed by removing the bolt at the base of the actuator and moving the gate by hand. 	
Dirty or faulty plugs.		<ul style="list-style-type: none"> • Check the green 12-pin plug at rear of monitor is firmly inserted in to monitor. Check both the 9 pin breakaway plug and the 6-pin plug (near the actuator) have all pins fastened securely to wires (Pulling gently on wires will test). • Check contact quality of all pins, damaged or dirty pins will not give correct signal. 	
No feedback from actuator. (The actuator will ONLY move UP or DOWN during ACTUATOR TST.)		<ul style="list-style-type: none"> • Press TEST on the monitor until ACTUATOR TST is displayed. Use the ↑↓ keys on the monitor to move the actuator, the monitor display should increase or decrease between values -917 & 20. • If values do not change then actuator feedback is faulty. • If actuator does not move then see TROUBLESHOOTING below. 	

	PROBLEM	CAUSE	REMEDY
10.	GATE JAM WARNING cont'd.	No feedback from actuator....cont'd	<p><u>Actuator only moves UP</u></p> <ul style="list-style-type: none"> • Unplug the 6-pin plug at the actuator. The monitor should read a high value near 20. Short the BLACK and PURPLE wires together, taking care not to short the RED and BLACK wires together. • If the monitor reads a low value near -917 then return for repair or replace actuator with part A-122 if faulty. • If the value displayed does not change go to green 12-pin plug at the back of monitor, leaving actuator unplugged. Repeat test changes by shorting across pins 3 and 9 of 12-pin plug. • If there is no change in reading on the monitor then return the monitor for service. • If actuator test displays a value near -917 check wiring loom for breaks. <p><u>Actuator only moves DOWN</u></p> <ul style="list-style-type: none"> • Using a multimeter ONLY check for 12V between the RED and BLACK wires at the actuator plug. • If there is 12V, return actuator for repair or replace actuator with part A-122 if faulty. • If there is no 12V then go to green 12-pin plug at the back of monitor. Test for 12V between pins 8 and 9 of the green 12-pin plug. • If there still is no 12V then return monitor for repair. • If there is 12V then check the wiring loom for breaks.

PROBLEM		CAUSE	REMEDY
10.	GATE JAM WARNING cont'd.	No Power to actuator.	<ul style="list-style-type: none"> Connect BLUE and YELLOW wires from actuator (or use ACTUATOR TST cable supplied with kit) directly to battery. If actuator does not move, reverse wires. <p>WARNING: ACTUATOR WILL MOVE SUDDENLY.</p> <ul style="list-style-type: none"> If actuator does not move return actuator for repair or replace actuator with part A-122 if faulty. If actuator moves re-connect 6 pin plug to monitor, press TEST on the monitor until ACTUATOR TST is displayed. <p>Pressing the ↑↓ keys will send 12V to the actuator along the BLUE and YELLOW wires.</p>

6.1 Summary of Alarms

Alarm Type	Reference
BIN LOW	Section 3.14 Bin Level Sensor (Optional) page 16
RATE TOO HIGH	Section 3.11 Rate Key page 15
RATE TOO LOW	Section 3.11 Rate Key page 15
SPINNER SLOW	Section 3.8 Speed Key page 12 Section 4.5.4 Spinner (RPM) Alarm page 21
UNIT ON HOLD	Section 3.12 Run/Hold Function page 16
UNIT OFF HOLD	Section 3.12 Run/Hold Function page 16