



ENCODER SYSTEM OPERATING MANUAL



**This manual has been written and structured for those purchasing
Seed Spider Encoder Metering Systems with Encoder Controllers and Encoder
Motor Drivers**

**Sandbrook MacRae Limited
Pohangina Valley West
RD 14, Ashhurst
New Zealand
Tel: +64 6 329 4794
Fax: +64 6 329 4784**

www.seedspider.com

CONTENTS

1	INTRODUCTION TO USING THIS MANUAL	3
2	SAFETY.....	3
3	THE SEED SPIDER ENCODER CONTROLLER	3
3.1	ENCODER CONTROLLER OVERVIEW	4
3.2	MOTOR DRIVER OVERVIEW	5
4	THE SEED SPIDER ENCODER METERING SYSTEM	5
4.1	SEED METERING SYSTEM SPECIFICATIONS	5
5	SETTING UP FOR THE FIRST TIME.....	6
5.1	CHECK ALL ITEMS.....	6
5.2	MOUNT AND CONNECT	6
6	SETTING UP FOR SEEDING	8
6.1	SETTING UP THE ENCODER CONTROLLER.....	8
6.2	SELECTING THE APPROPRIATE SPONGE	9
6.3	CALIBRATION.....	10
6.3.1	STEP 1 - ESTABLISH TARGET WEIGHT USING METRIC MEASUREMENTS	11
6.3.2	STEP 1 - ESTABLISH TARGET WEIGHT USING IMPERIAL MEASUREMENTS	12
6.3.3	STEP 2 – ACHIEVE TARGET WEIGHT.....	14
7	SEEDING	15
8	WARNING MESSAGES/TROUBLE SHOOTING	16
9	SEED SPIDER CARE.....	18
10	ORDERING PARTS	18
11	METERING SYSTEM PARTS DETAILS	19
11.1	METERING SYSTEM PARTS DRAWING.....	19
11.2	METERING SYSTEM PARTS LIST	20
12	WARRANTY	21
12.1	WARRANTY FORM	22

1 INTRODUCTION TO USING THIS MANUAL

Congratulations for choosing Seed Spider. This manual will explain how to get the best out of your Seed Spider.

First, you should look at the section on Safety and then Setting Up For the First Time. After this you should look at the Warranty section, making sure to fill out your warranty form.

From there, you should read carefully through the manual, paying particular attention to the section on calibration. This section may seem somewhat daunting at first; however, once you have worked through the calibration procedures, they will make sense.

Finally, in all seeding situations, you should make use of the advice of your regular seed merchants and your Seed Spider dealer to ensure optimum seeding success.

2 SAFETY

- ✓ Study this operator's manual.
- ✓ Be familiar with controls and safety precautions before operation.
- ✓ Familiarise yourself with the location of all safety stickers and the associated risks being highlighted
- ✓ Keep hands, feet and clothing clear of moving parts at all times when the machine is in operation.
- ✓ Do not attempt to clear blockages while the machine is running.
- ✓ Stop the engine and wait for all movement to stop before making any adjustment to the machine.

3 THE SEED SPIDER ENCODER CONTROLLER

Seed Spider is radically different and provides many special advantages for the commercial sowing operation. This electronic metering system is extremely reliable, and is ideal for most seeding situations. Operating Seed Spider does not require high skill levels as compared with competing machines. Seeding rates can be changed with the push of a button.

The Seed Spider control system consists of an encoder controller and up to 3 encoder motor drivers, each motor driver driving up to 8 encoder metering systems. The encoder controller mounts in the cab and provides a user friendly interface to the system. The encoder motor drivers mount on the seeder for convenient connection to the metering units.

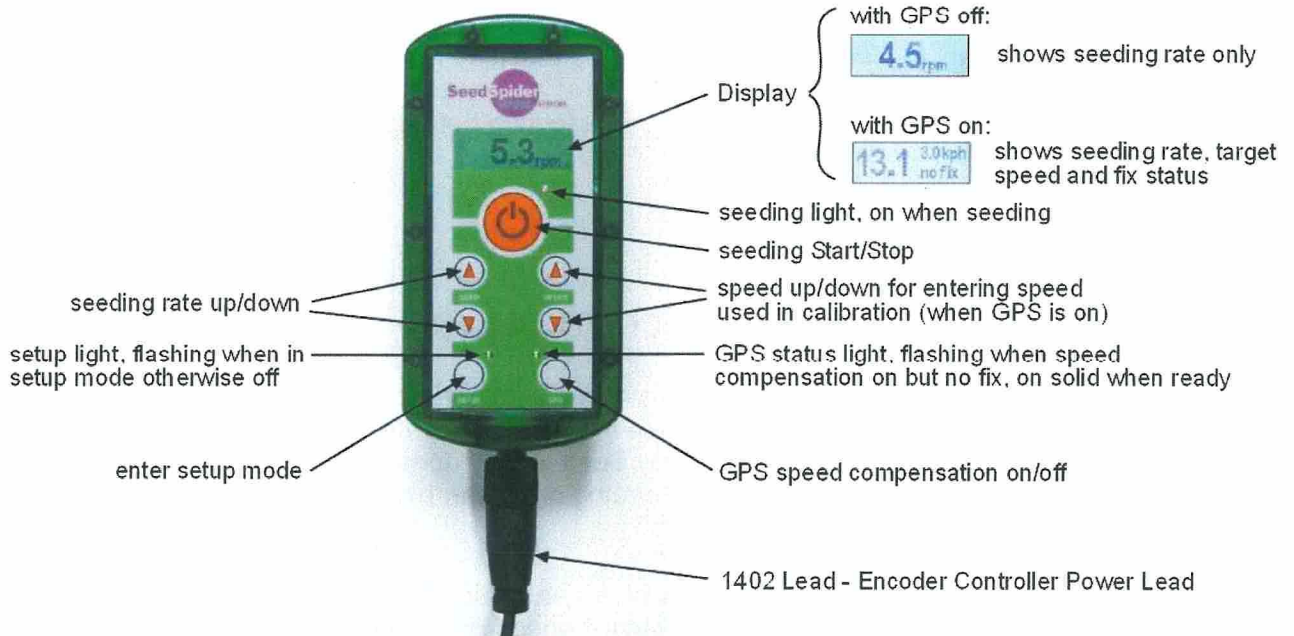


Details of the mounting of the encoder controller and encoder motor driver are detailed in the setting up for seeding section of this manual.

3.1 ENCODER CONTROLLER OVERVIEW

The encoder control system is operated from the encoder controller. The following diagram gives a brief overview of the buttons and their functions.

1400 Encoder Controller - user interface with LCD



3.2 MOTOR DRIVER OVERVIEW

The motor driver controls the metering units based on the instructions received wirelessly from the encoder controller. Up to three (3) motor drivers can connect to a single encoder controller. Each motor driver can control up to 8 metering units.

1401 Encoder Motor Driver



4 THE SEED SPIDER ENCODER METERING SYSTEM

This simple, user friendly metering system is produced from high quality materials, utilising the latest manufacturing technologies such as laser profiling and computer controlled machining. High quality materials mean your Seed Spider will have a long, maintenance free life. ISO 9002 certification ensures that the components are manufactured to uncompromising standards.

4.1 SEED METERING SYSTEM SPECIFICATIONS

Input voltage	12v DC, 18v DC maximum
Output rpm	0.3 – 35 rpm (max rpm will depend on supply voltage)
Seed container capacity	a) 7 litre (1½ gallons) transparent b) 10.5 litre (2½ gallons) transparent <i>(with optional hopper extension)</i> c) 50 litre (13 gallons) translucent
Number of outlets	1 to 6
Weight – empty	5 kg (11 pounds)
Overall height	400mm (16 inch) with 7 litre hopper
Overall width	225mm (9 inch) with 7 litre hopper
Overall length	280mm (11 inch) with 7 litre hopper

5 SETTING UP FOR THE FIRST TIME

5.1 CHECK ALL ITEMS

Check that you have the following items and that they are undamaged.

- The correct number of encoder metering systems complete with:
 - seed hopper lid (that is also used as a calibration bowl)
 - a number 1 and number 3 sponge
- Seed Spider encoder controller complete with power lead.
- The correct number of motor drivers complete with power leads.

If any parts are missing or damaged, immediately contact your Seed Spider dealer and request assistance.

5.2 MOUNT AND CONNECT

After checking that you have all the appropriate items then the next step is to mount and connect you encoder controller and encoder motor driver.

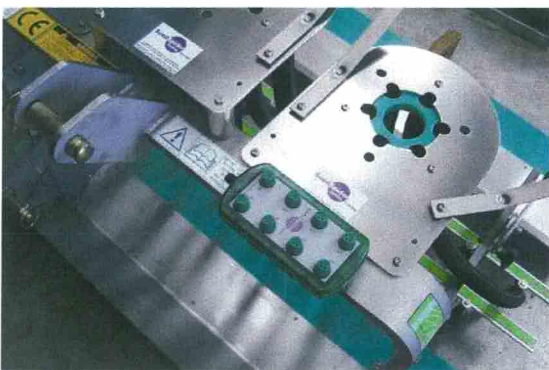


Check the supply voltage, the power supply from the tractor must NOT be greater than 18V DC.

Both the controller and motor driver come with mounting brackets. If your encoder control system has been supplied with a Roller Seeder or Sled Seeder then the motor driver mounting bracket will already be on the seeder.

If you are upgrading to the encoder control system then you will need to find a suitable mounting position for the motor driver and controller.

The motor driver contains an internal GPS receiver. Therefore, if you wish to use the GPS speed compensation feature then the motor driver must be mounted horizontally with a good view of the sky. Glass or plastic greenhouses will not significantly affect the GPS signal.



motor driver clipped into bracket



motor driver bracket

If you do not wish to use the GPS speed compensation then the motor driver can be mounted in any orientation.

The encoder controller should be mounted in a convenient position for the operator to press the start stop button and to read the LCD display. The controller can be mounted in any orientation.



Both items can be mounted using the supplied double sided tape or using the convenient screw mounting holes in the bracket. Note the supplied tape takes 24 hours to cure. Once cured the tape is very strong and if you wish to remove the mounting bracket take care not to damage it.

Now that the units are mounted they can be wired to the ignition of the towing vehicle. The units should be wired to the ignition such that they have power when the towing vehicle is switched on.

Both power leads need to be connected to the DC supply: Red or Brown +ve, Black or Blue -ve.



Poor electrical connections can cause unpredictable controller behaviour. Ensure all wires have good solid connections.

If the controller is not going to be used for extended periods then the power supply lead should be disconnected, this will prolong the life of the LCD display.



When removing the seeder from the towing vehicle don't forget to also disconnect the power lead to the motor driver mounted on the seeder!!

The encoder controller and encoder motor driver are fitted with wireless Bluetooth modules and therefore do not require any connection to each other, each unit only requires a power connection.

Now that the encoder controller and encoder motor driver are mounted and have power connections you are ready to setup for seeding.

6 SETTING UP FOR SEEDING

The first step in setting up for seeding is to ensure that the encoder controller and motor driver is correctly configured and paired for your seeding requirements. After confirming the encoder controller setup then you will need to select an appropriate sponge and calibrate for each particular seed variety.

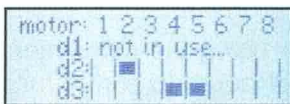
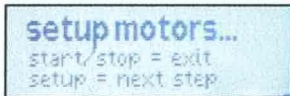
6.1 SETTING UP THE ENCODER CONTROLLER

Your Seed Spider Encoder Controller should come correctly configured for your seeding requirements. However, if you wish to make any changes to the system configuration then the following setup procedure will need to be followed.



All seed hoppers should be empty when executing the complete setup procedure.

First check the configuration. Press the setup button. An information screen is displayed indicating that the start/stop button is to exit the setup and the setup button is to continue to the next step. Press the setup button again.



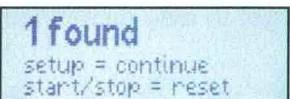
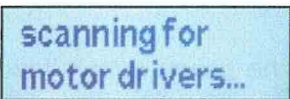
The display now shows the current configuration. In this example motor driver 1 is not in use, motor driver 2 only has motor number 2 connected and motor driver 3 has motors 4 and 5 connected.

If the displayed configuration is correct then press start/stop button to exit the setup safely. If not, press the setup button to continue. If you chose to continue then the setup process should be completed. Cancelling the setup process prior to completion will result in an incorrect configuration and the setup procedure will need to be conducted again.

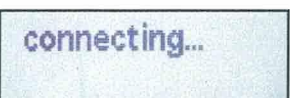


After displaying the current configuration, cancelling setup prior to completion will result in an incorrect configuration.

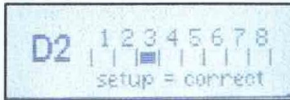
The encoder controller will first wipe the current connections and then scan for any Seed Spider Encoder Motor Drivers within range. Other Seed Spider systems nearby should be switched off during this process otherwise the controller may pick up on these other systems. This is only an issue when conducting the setup procedure, once configured the controller will only link to saved motor drivers and will not clash with nearby systems.



If the number of found motor drivers is not correct then press the start/stop button to exit the setup. First try again, if still not correct then check power connections if the number was not enough or check for nearby systems if too many were found (maximum of 3). Now run the setup again. Continue until the number found matches the appropriate number of motor drivers on the seeder. If none were found then the controller will only give the option to try again or exit.



The controller will now connect to all the found motor drivers and run through each motor driver one by one and assign a number (1, 2 or 3) to each motor driver. This number is automatically assigned by the encoder controller. If you are setting up the same motor drivers as previously then the motor driver numbering will stay the same.



After assigning the controller number the encoder controller will turn on any connected metering units and wait for confirmation from the user. In this example motor driver 2 has only one metering unit connected on the number 3 motor connection.

Connect and disconnect metering units until the display reflects the desired configuration, then press the setup button to continue to the next motor driver.

Unused motor connections should be covered with protective caps to protect from dust and moisture.



Repeat for the other motor drivers. Once there are no more motor drivers the encoder controller will display a screen confirming that the setup procedure has been completed. Pressing the setup button once more at this stage will complete the setup process.

Your encoder controller is now configured for the new arrangement. The configuration will be remembered even when the controller is switched off.

Press the start button and adjust the seeding rate up and down to test the encoder controller to ensure the encoder controller, encoder motor drivers and attached metering units are all operating correctly. If there is a problem check the setup and test all wiring before contacting your seed spider dealer.

Now is also a good opportunity to check the direction of rotation, the motor should spin counter clockwise when viewed from below the metering system.

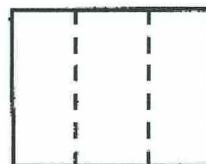
6.2 SELECTING THE APPROPRIATE SPONGE

Your Seed Spider metering system is supplied with two different sponges (*numbered 1 & 3*) to provide accurate metering over a wide range of different seed types.

When calibrating your metering system, if you are not sure which sponge best suits a particular seed, start off with the number 1 type. If you do not get the desired rate, or if seeds do not flow smoothly through the unit, change to the number 3 type. If you are still having difficulties achieving the desired rate then contact your nearest Seed Spider dealer to see if a number 2 or number 4 sponge would be more appropriate.

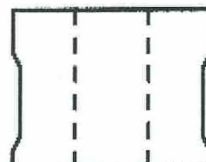
NUMBER 1

*The one to start off with
Suitable for most seed sizes and shapes
Ideal for smaller seeds and lower rates*



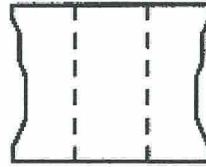
NUMBER 2 (Optional)

*Ideal for medium sized seeds
and higher rates of small seeds
(rarely required)*

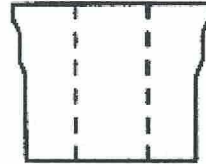


NUMBER 3

For larger seeds and higher rates

**NUMBER 4 (Optional)**

For even larger seeds, used in conjunction with a maize metering plate. (rarely required)



The sponges are fitted from the underside of the metering unit. Remove the rubber retaining ring from around the drive shaft, fit the sponge and then replace the ring. Sponges should be replaced as a set on the machine to ensure consistency between units. Sponges are a consumable item and will require periodic replacement as the sponge material deteriorates over time.



Worn or deteriorated sponges may affect seeding rate

6.3 CALIBRATION

Complete previous sections of this chapter prior to calibrating. The rate through the seed metering unit is a result of several factors including sponge selection, the set seeding rate on the encoder controller and the travel speed of the towing vehicle. Even if using the GPS speed compensation a target travel speed must be chosen for calibration. As a guide you should travel between 2–10kph (1-6 mph). See the following chapter on seeding for greater detail on ground speed.

The two general steps for calibrating are outlined below; these are then described in greater detail in their respective sections.

STEP 1 – Establish the target weight that matches your desired seeding circumstances.

This is a calculation to establish the required weight of seeds per minute to match your desired seed spacing down the row or desired rate for a given area. This is detailed twice in the following sections, once using metric measurements and once using imperial.

STEP 2 – Achieve the target weight.

This is a trial and error process to find the controller setting that delivers the target weight of seed in one minute (calculated in step 1).



GPS speed compensation must be OFF during the calibration process.

6.3.1 STEP 1 - ESTABLISH TARGET WEIGHT USING METRIC MEASUREMENTS

This section details how to calculate the target weight using metric measurements, see the following section for details using imperial measurements.

The target weight can be calculated based on a desired spacing down the row or based on a rate per area when planting seed beds (row crops). Both approaches are detailed below.

Using Desired Spacing Down Rows with Metric Measurements...

1. Decide on a seed spacing along each row. Find the number of **seed per metre** from the chart below:

Seed spacing along row - mm	5	7.5	10	15	20	30	40	50	60	80	100
Number of seeds per metre	200	133	100	67	50	33	25	20	17	13	10

2. Establish distance travelled in one minute at desired speed of travel, **metres per minute**. Use the chart below:

kph	1	2	3	4	5	6	7	8	9	10	11	12
metres/min	17	33	50	67	83	100	117	133	150	167	183	200

3. Ask your seed merchant for details on the number of **seeds per gram**, for the particular seed being sown.

If this information is not available:

- Count out a small number of seed (*a teaspoon full is normally enough*).
- Accurately weigh sample (*if necessary, a drug store will have accurate scales*).
- Divide the total number of seeds by the weight.
- Record the result for future reference.

4. Input the information gathered above, into the following formula:

seeds per metre (*each row*) x metres per minute (*ground speed*) x number of outlets (*from metering system*) ÷ seeds per gram = **grams per minute (target weight)**

➡ Now you have the target weight you can move on to STEP 2.

Using a Rate per Area when Planting Seed Beds (Row Crops)...

To find **spacing** from **seeds per hectare**:

area of hectare (*square metre*) ÷ bed width (m) (*furrow to furrow*) x number of lines (*furrow to furrow*) ÷ seeds per hectare = **spacing (m)**

10,000 ÷ x ÷ = m

To find **seeds per hectare** from **spacing**

area of hectare (*square metre*) ÷ bed width (m) (*furrow to furrow*) x number of lines (*furrow to furrow*) ÷ spacing (m) = **seeds per hectare**

$$10,000 \quad \div \quad \quad \quad \times \quad \quad \quad \div \quad \quad \quad =$$

To find **seeds per gram** from **seeds per kilogram**

seeds per kilogram ÷ 1000 = **seeds per gram**

To find **seeds per minute** from **desired speed of planter/tractor**

metres per kilometre x desired speed (km/h) (*of planter/tractor*) ÷ 60 minutes ÷ spacing (m) (*each line*) = **seeds per minute** (*each line*)

$$1,000 \quad \times \quad \quad \quad \div \quad \quad \quad \div \quad \quad \quad =$$

To find target weight in **grams per minute** from **metering unit**

seeds per minute ÷ seeds per gram x number of outlets = **grams per minute**
(*from metering unit*) (*from metering unit*)

➡ Now you have the target weight you can move on to STEP 2.

6.3.2 STEP 1 - ESTABLISH TARGET WEIGHT USING IMPERIAL MEASUREMENTS

This section details how to calculate the target weight using imperial measurements, see the previous section for details using metric measurements.

The target weight can be calculated based on a desired spacing down the row or based on a rate per area when planting seed beds (row crops). Both approaches are detailed below.

Using Desired Spacing Down Rows with Imperial Measurements...

1. Decide on seed spacing along each row. Find the number of **seeds per foot** from the chart below:

Seed spacing along row - inch	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.5	3	4
Number of seeds per foot	48	24	16	12	10	8	7	6	5	4	3

2. Establish distance travelled in one minute at desired speed of travel, **feet per minute**. Use the chart below:

mph	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
feet/min	44	88	132	176	220	264	308	352	396	440	484	528

3. Ask your seed merchant for details on the number of **seeds per ounce**, for the particular seed being sown.

If this information is not available:

- Count out a small number of seed (*a teaspoon full is normally enough*).
- Accurately weigh sample (*if necessary, a drug store will have accurate scales*).
- Divide the total number of seeds by the weight.
- Record the result for future reference.

4. Input the information gathered above, into the following formula:

seeds per foot (*each row*) x feet per minute (*ground speed*) x number of outlets (*from metering system*) ÷ seeds per ounce = **ounces per minute (target weight)**

➡ Now you have the target weight you can move on to STEP 2.

Using a Rate per Area when Planting Seed Beds (Row Crops)...

To find **spacing** from **seeds per acre**:

area of acre ÷ bed width (inch) x number of lines ÷ seeds per acre = **spacing (inch)**
(*square inch*) (*furrow to furrow*) (*furrow to furrow*)

6,272,640 ÷ x ÷ = inch

To find **seeds per acre** from **spacing**

area of hectare ÷ bed width (inch) x number of lines ÷ spacing (inch) = **seeds per acre**
(*square inch*) (*furrow to furrow*) (*furrow to furrow*)

6,272,640 ÷ x ÷ =

To find **seeds per ounce** from **seeds per pound**

seeds per pound ÷ 16 = **seeds per ounce**

To find **seeds per minute** from **desired speed of planter/tractor**

inches per mile x desired speed (mph) ÷ 60 minutes ÷ spacing (inch) = **seeds per minute**
(*of planter/tractor*) (*each line*) (*each line*)

1,000 x ÷ ÷ =

To find target weight in **ounces per minute** from **metering unit**

seeds per minute ÷ seeds per ounce x number of outlets = **ounces per minute**
(*from metering unit*) (*from metering unit*)

➡ Now you have the target weight you can move on to STEP 2.

6.3.3 STEP 2 – ACHIEVE TARGET WEIGHT

Now that you have calculated the theoretical weight of seed to meet your seeding requirements you need to find the seeding rate setting to achieve the target weight. This is a trial and error process as outlined below.

1. If you haven't already done so, select and fit the appropriate sponge pad to each metering unit (refer to 6.2 for details on sponge selection).
2. Place one seed metering unit on top of the lid, using the lid as a bowl to collect the seed from the unit.
3. Fill the seed hopper.
4. On the Encoder Motor Controller turn the GPS speed compensation OFF. When off the blue GPS LED light will be off and the speed will not be displayed.
5. Press the 'SEED' up and down arrows to select the desired setting. If it is a new seed type to sow then estimate an initial setting – try half way.
6. Press the start button on the encoder controller.
7. Run the seed metering system for 60 seconds, collecting all the seeds leaving the system in the plastic calibration bowl (*hopper lid*) provided.
8. Weigh the total collected seed.
9. Adjust the seeding rate on the encoder controller and repeat steps 5 and 7 until the target weight is achieved. Ensure no errors are displayed for the chosen seeding rate.

Not all controller settings will suit all seeds, ensure seeds flow smoothly through the unit at the desired rate setting. If extremely high or low rates cannot be achieved, simply adjust the desired travel speed to suit and redo the calculations detailed previously.

Once the target weight has been achieved make a note of...

- ✓ seed variety
- ✓ sponge type
- ✓ seeding rate
- ✓ travel speed

When next sowing that seed variety adjust the encoder controller to that seeding rate and travel at the speed used in calculations. More detail in the following chapter on seeding.

7 SEEDING

Your encoder controller is setup and calibrated and now you are ready to seed. To start seeding follow the below steps

- fit the appropriate sponge to each seed metering unit
- fill the seed hoppers
- adjust the required seeding rate on the encoder controller
- if desired, turn on the GPS speed compensation and adjust the speed to the speed used in calibration calculations
- check there are no errors displayed on the LCD
- press the start button as you start moving, accelerate to the chosen travel speed as quickly as practicle.



The GPS speed compensation will alter the seeding rate while seeding and compensate for the difference between actual travel speed and the travel speed used in calibration calculations (set on the controller). It is not designed to act as a start/stop seeding control system.

While seeding it is important to maintain a constant ground speed. Even when using the GPS speed compensation feature, the more consistent the travel speed the better the results. As a guide you should travel between: 2 – 10 kph (1 – 6 mph).

If the towing vehicle has no speedometer, speed can be determined by measuring the distance travelled in a given time frame. Select a gear and engine revs of the towing vehicle and travel a constant speed for one minute. Measure the distance and use the following table to determine the corresponding speeds.

METRIC	kph	1	2	3	4	5	6	7	8	9	10	11	12
	<i>metres/min</i>		17	33	50	67	83	100	117	133	150	167	183

IMPERIAL	mph	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
	<i>feet/min</i>		44	88	132	176	220	264	308	352	396	440	484

If the buzzer sounds or a warning message is displayed while seeding then this indicates that the encoder controller can not meet the required seeding demand. Continuing to seed without addressing the issue will result in an incorrect planting rate. Further information is detailed in the following chapter.



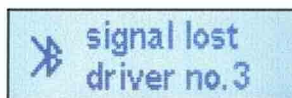
If the planter is operated with the buzzer sounding an error will occur in planting rate

8 WARNING MESSAGES/TROUBLE SHOOTING

The LCD display will blink with warning messages if there is a scenario that may result in an error in planting rate. Therefore the LCD should be checked prior to the start of seeding to ensure the controller has not encountered any potential issues.

The encoder controller is also fitted with a loud buzzer to warn the operator of scenarios that will result in an error in planting rate. The buzzer will sound for all scenarios but only while seeding is turned on.

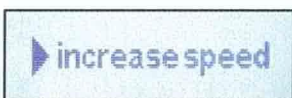
The following warning messages are possible:



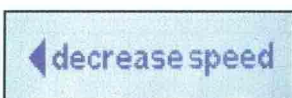
This message indicates that the Bluetooth wireless connection to a motor driver has been broken. The respective motor driver is detailed in the message. The motor driver is not able to receive commands from the encoder controller and will remain in the current state until the link is established again or the power is removed. When seeding, if the link does not establish again before you wish to stop, turn off the towing vehicle to stop seeding. Seeding will not start if there is a signal loss error. Check all wiring connections.



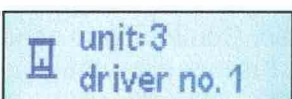
The unit has lost the GPS fix, possibly due to an obstruction or atmospheric conditions. The respective motor driver that has lost the fix (each motor driver contains its own GPS receiver) is detailed in the message. If seeding the motor driver will not compensate for speed variation and the seeding rate will match the controller set seeding rate. This message is only shown while seeding, if there is no fix when seeding is off then this will be indicated by 'no fix' displayed on the controller window. The GPS blue LED will also blink when there is no GPS fix.



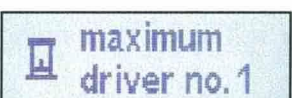
This message will only appear when using GPS speed compensation. The encoder controller can not turn the metering units slow enough to meet the seeding requirements at the current travel speed, increase travel speed.



This message will only appear when using GPS speed compensation. The encoder controller can not turn the metering units fast enough to meet the seeding requirements at the current travel speed, decrease travel speed.



This message indicates that the numbered metering unit(s) on the numbered motor driver is currently not turning. Check that the motor is plugged in and that the encoder controller setup reflects the connected configuration.



When this message is displayed it indicates that the motor driver is providing as much power as possible to a motor but the motor is still not reaching the required rpm. The motor speed will not match the displayed speed. If using GPS speed compensation then you can reduce your travel speed or in all cases reducing the set rpm will eliminate this error.

no motor drivers
run setup

If the controller has not been setup then it will not know which motor drivers to connect to and this message will be displayed. Seeding will not start when this message is displayed. Run through the setup procedure to configure the controller and motor drivers.

Common problems that are not displayed can often easily be diagnosed as per below.

Problem: Seeding rates vary between metering systems or motors stalling

Check:

- All electrical connections, poor electrical connections can cause unpredictable controller behaviour.
 - The clearance between the pad driving spigot and the motor bush
 - Sponge wear, try swapping sponges and if the problem follows the sponge the problem is with the sponge.
-

Problem: Metering system does not run

Check:

- Power supply. Your metering system requires a reliable power supply. 12volts when the vehicle is not running, and 12 to 14volts when the engine is running. Measure the voltage across the main power supply lead.
 - That the main power supply has a reliable earth connection
 - All electrical connections
 - The encoder controller setup
-

Problem: Seeds are not flowing through the metering system

Check:

- Direction of rotation of the motor (should be clockwise if viewed from above)
 - That the correct sponge is fitted (refer to sponge selection section)
-

Problem: Seeds are not exiting the ground opener tubes

Check:

- For blockages in opener tubes and seed hose
-

Problem: Seeding rate is lower or higher than that calibrated for

Check:

- Calibration calculations. Recalibrate if necessary.
 - Power supply (see notes above).
 - That the motor driver is mounted correctly and free from obstruction.
 - The sponge is dry, and in good condition. Look for indentations or signs of wear. Replace if necessary.
-

If problem cannot be resolved, contact your Seed Spider dealer.

9 SEED SPIDER CARE

On completion of seeding:

- Empty seed from hopper.
- Remove the sponge from the seed metering system and place it in the plastic container provided.
- Store the sponge out of direct sunlight.
- Do not leave seeds trapped between the sponge and the metering plate when not in use. This may leave permanent indentations in the sponge, causing inaccurate seeding with subsequent use.
- The encoder controller and motor driver units are shower proof only. Prolonged exposure to rain, or hosing may result in damage to the electronic components.
- Store your Seed Spider Metering System in a dry location.
- Disconnect the encoder controller if it will not be used for some time, this will extend the life of the LCD display.

Note that failure to adhere to the above care guidelines may dramatically shorten the effective life of your sponges.

10 ORDERING PARTS

Seed Spider Parts are available from your local Seed Spider dealer.

Or contact Seed Spider Parts Sales direct on

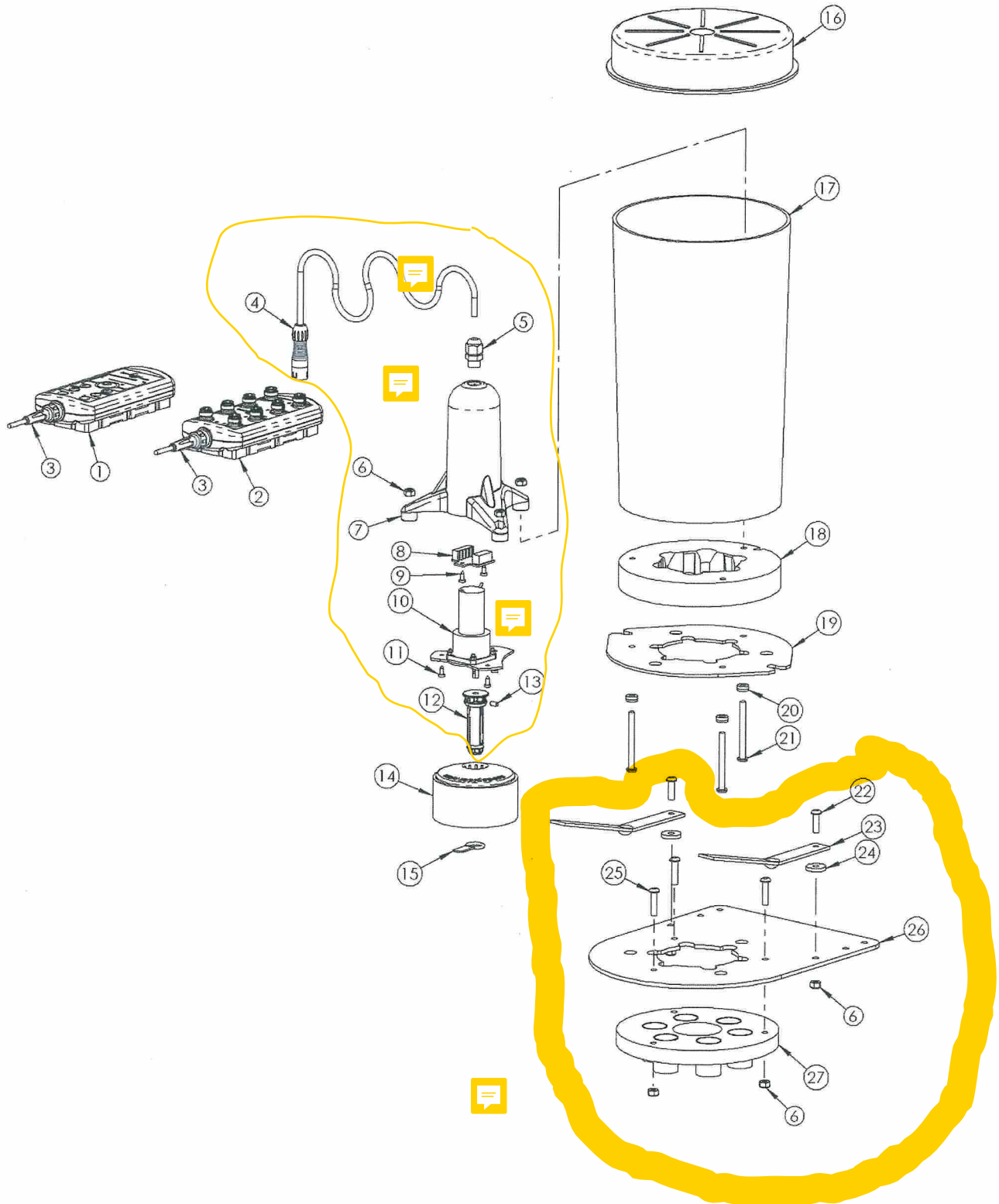
Tel: +64 6 329 4794

Fax: +64 6 329 4784

Email: parts@seedspider.com

11 METERING SYSTEM PARTS DETAILS

11.1 METERING SYSTEM PARTS DRAWING



11.2 METERING SYSTEM PARTS LIST

Drawing Reference	Number per Unit	Description	Part Number
1	1	Encoder controller - user interface with LCD	1400
2	1	Encoder motor driver	1401
3	2	Lead - encoder controller power lead	1402
4	1	cordset - male 5 core - green colour coding	1420
5	1	gland	1038
6	8	M6 stainless steel nyloc nut	S6NN
7	1	Motor cover - black plastic	1041
8	1	Circuit board - motor interface	1410
9	2	6g x 3/8" PT self tapping screw (zinc)	M6G3/8PTS
10	1	Encoder motor complete with mounting plate	1103
11	3	6g x 3/8" PT self tapping screw (ss)	S6G3/8PTS
12	1	Pad driving spigot	10519
13	1	M4 x 8mm grub screw ss	M48GS
14	1	sponge – number 1 (with container)	1045.162
	1	sponge – number 3 (with container)	1045.362
15	1	Pad retaining ring	10517
16	1	metering system lid (calibration bowl)	2145
17	1	polycarbonate seed hopper (7 litre)	2141
18	1	plastic metering plate (x = number of outlets)	1033.x
19	1	metering system locating plate (lever type)	2131
20	3	Locating stud - button head conversion bush	2122
21	3	metering plate bolt – M6x60 (button head)	S660BH
22	2	lever pivot bolt – M6x20 (button head)	S625BH
23	2	Lever	2132
24	2	lever pivot washer	2134
25	3	collector plate bolt – M6x30 (button head)	S630BH
26	1	metering system base plate (lever type)	2130.1
27	1	plastic collector plate (G2) – with 1" tubes OR	2127
	1	plastic collector plate (G2) – with 5/8" tubes (not shown)	2129
Options			
	1	seed hopper – 50 litres	2142
	1	polycarbonate seed hopper extension (extra 3.5 litres)	2143

12 WARRANTY

Your Seed Spider is under warranty against defects in materials or workmanship for a period of one year from the date of retail sale.

Defective systems must be returned to the manufacturer's within the warranty period. Components will be replaced or repaired at factory discretion. This warranty applies only to those systems that have been installed and operated in accordance with published instructions.

This warranty is in lieu of all warranties, expressed or implied, and the manufacturer expressly disclaims all other warranties, including without limitations any implied warranties of merchantability and fitness for a particular purpose.

The manufacturer liability under this warranty shall not exceed the cost of the product. Under no circumstances shall the manufacturer be responsible for equipment on which its systems are installed, field service calls relating to this equipment, or for indirect, consequential or special damages.

For warranty service please retain the system to point of purchase.

12.1 WARRANTY FORM

Seed Spider Metering System Warranty Form

To be completed and faxed or posted within 30 days of purchase to:

Sandbrook MacRae Limited
Pohangina Valley West
RD 14
Ashhurst
NEW ZEALAND
Tel: +64 6 329 4794
Fax: +64 6 329 4784

DATE OF PURCHASE _____

SERIAL NUMBER _____

NAME OF PURCHASER _____

ADDRESS _____

TEL _____ FAX _____

NAME OF DEALER _____

DEALER ADDRESS _____



DECLARATION OF CONFORMITY

89/392EEC, 91/368/EEC, 93/44/EEC and 93/68/EEC

Sandbrook MacRae Limited
Pohangina Valley West
RD14
Ashhurst
New Zealand

Product Type: Seed Spider Seed Metering System

Covered by Technical File Number: CE 7000 (a, b & c)

Standards & Regulations used:

The Supply of Machinery (Safety) Regulations 1992, Statutory Instruments number 3073 of 1992

The Supply of Machinery (Safety) (Amendment) Regulations 1994, Statutory Instruments number 2063 of 1994

Place of issue: New Zealand

Authorised Representative: Michael Baas
Engineering Manager

Declaration:

I declare that as an authorised representative, the above information in relation to the supply and manufacture of this product, is in conformity with the stated standards and other related documents following the provisions of 89/392EEC, 91/368/EEC, 93/44/EEC and 93/68/EEC directives.

Signature of Authorised Representative:

Michael Baas

Date: 15th August 2003

