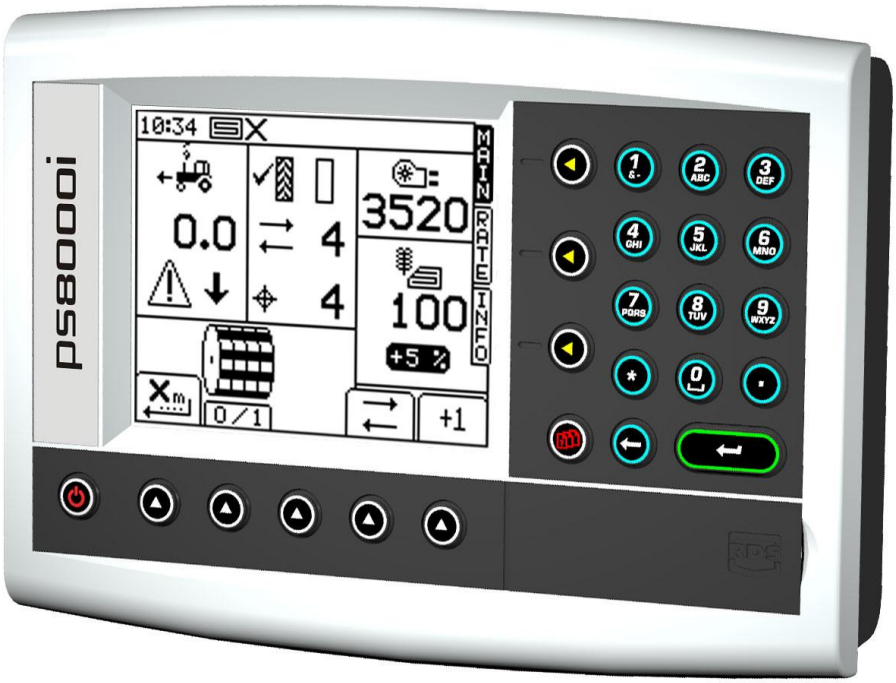


Pro-Series 8000i Artemis
Variable Rate Drill Control

Calibration

RDS Part No.:	S/DC/500-10-567
Document Issue:	2.11 : 9/5/11
Software Issue:	PS405-001 rev 27

Electromagnetic Compatibility (EMC)

This product complies with Council Directive 2004/108/EEC when installed and used in accordance with the relevant instructions.

IMPORTANT, READ THIS BEFORE USING THE PS ARTEMIS

The Pro-Series Artemis installation is a part of the Precision Farming System ("the System"). It is very important that you follow the described calibration procedures before operating the Pro-Series Artemis instrument. Calibration and operation of the Pro-Series Artemis must be in accordance with these instructions. Use of the System is subject to the following disclaimer;

1. So far as is legally permissible RDS Technology ("RDS"), or its distributors, shall not be liable, whatever the cause, for any increased costs, loss of profits, business, contracts, income, or anticipate savings or for any special, indirect or inconsequential damage whatsover (death or personal injury excluded).
2. The capabilities and functions of the Precision Farming System ("the System") are limited as set out in the specification of the System, details of which are contained in the Help files and product literature and which must be read before using the System.
3. Without prejudice to the generality of the above it is hereby acknowledged that the System is not designed nor intended to a) originate variable treatment plans or b) achieve or avoid any application rate outside application parameters, which in both cases shall be the responsibility of the operator.
4. The standard terms and conditions of RDS (except clause 7), a copy of which is available on request, apply to the supply and operation of this System.

Service and Technical Support

PLEASE CONTACT YOUR NEAREST RDS DISTRIBUTOR If unknown then contact RDS Technology Ltd for further information,

Tel : +44 (0) 1453 733300
Fax : +44 (0) 1453 733311
e-mail : info@rdstec.com
web : www.rdstec.com

Our policy is one of continuous improvement and the information in this document is subject to change without notice. Check that the software reference matches that displayed by the instrument.

\UK567211.DOC

1 Initial Settings

Figure 1 illustrates the various components of a typical, dual motor Artemis installation. Any of the following drill configurations (both single and dual motor) are possible, and the Artemis head unit is configured accordingly (ref. section 1.4).

Table 1

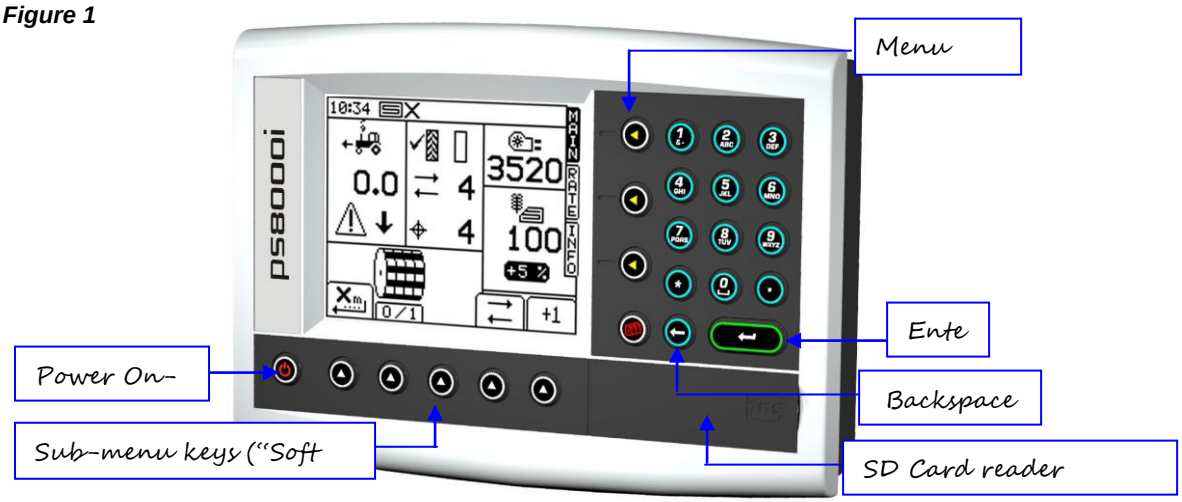
PRODUCT	'DRILL TYPE' SETTING (SCREEN 2)	METERING /MOTOR CONFIGURATION		'DRILL TYPE' SETTING (SCREEN 1)
SEED		**A**	SINGLE MOTOR/ METERING	
		B	SINGLE MOTOR / DUAL METERING	
		C	2 MOTORS / SINGLE METERING	
SEED + FERT		**D**	SINGLE MOTOR/ METERING (SEED) + SINGLE MOTOR/ METERING (FERT)	
		E	SINGLE MOTOR / DUAL METERING (SEED) + SINGLE MOTOR / DUAL METERING (FERT)	

Some screen pages vary slightly according to the instrument setup as shown above. Look for the above symbols next to the text.

1.1 Menu keys

All instrument functions are accessed by nine menu keys adjacent to the LCD display.

Figure 1



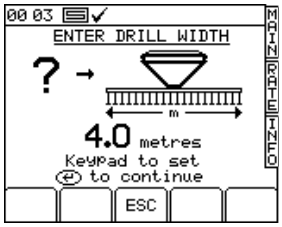
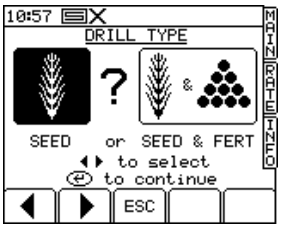
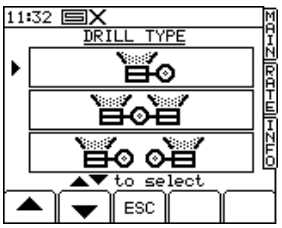
The four menu keys to the right of the screen (figure 1) access the primary screen pages (those viewed during normal operation). There are three primary screens MAIN, RATE and INFO for normal operating functions, and a SETUP screen for calibration functions.

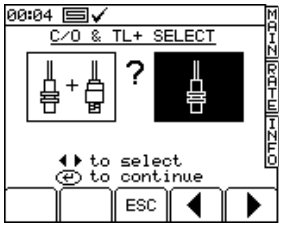
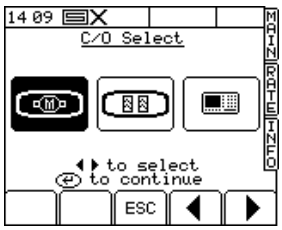
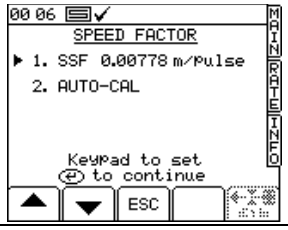
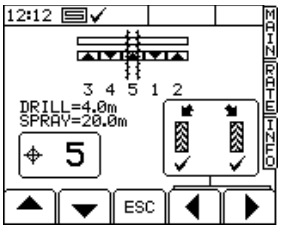
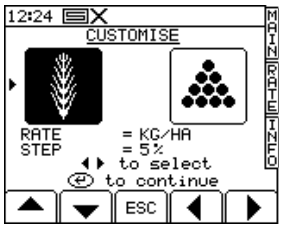
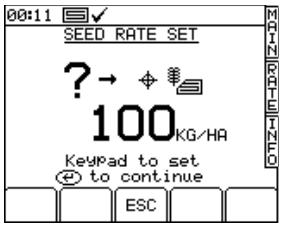
The five sub-menu keys below the screen control the various display functions and settings for each of the primary screen pages. Text or icons are displayed adjacent to the sub-menu keys to denote their function.

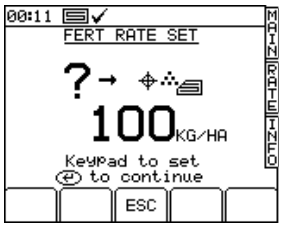
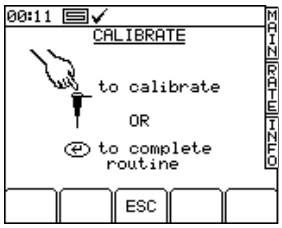
1.2 'Power-On Reset' – Initial setup routine

The 'power-on reset' calibration routine is normally only performed by a technician when the drill is set up on installation. This routine should not need to be repeated again unless the memory is corrupted.

It does not however, set up every parameter for a particular drill, for example some settings for the metering motor(s). These settings are done separately via the Cal. Menu (ref. Sections 7, 8).

#	Step	Display	Configuration applicable to: (ref. Table 1)				
			A	B	C	D	E
1	**Start Setup routine** Press the bottom left menu key while this screen is displayed.		☐	☐	☐	☐	☐
2	**Return to factory default settings** Follow the screen prompts		☐	☐	☐	☐	☐
3	**Select Language** Follow the screen prompts		☐	☐	☐	☐	☐
4	**Set Drill Width** Follow the screen prompts		☐	☐	☐	☐	☐
5	**Select single or dual product configuration** Refer to Table 1 if necessary		☐	☐	-	☐	☐
6	**Select the motor/metering unit configuration** Refer to Table 1 if necessary		☐	☐	☐	☐	☐

#	Step	Display	Configuration applicable to: (ref. Table 1)				
			A	B	C	D	E
7	**Select Area Cutout / Tramline Advance Configuration** Separate Area Cutout sensor. L/R marker sensors fitted. Tramline advance triggered from marker sensors. *NOTE: Increase debounce time if false counts occur in operation.* Tramline advance triggered via Area Cutout sensor.		☐	☐	☐	☐	☐
8	**Select the location of the Area Cutout input** Connected to MCM (Std installation) Connected to HBM (Front Tank Installation only) Connected directly to Head Unit		☐	☐	☐	☐	☐
9	**Calibrate Forward Speed Sensor** The default setting of 0.0078m / pulse is for an RDS radar sensor. If factor is known, set via keypad, otherwise perform an 'Autocal' routine to automatically calculate the cal factor.		☐	☐	☐	☐	☐
10	**Set Tramline sequence.** Use the UP/DOWN arrow keys to select the sequence for the drill/sprayer width combination. Use the LEFT/RIGHT arrow keys to select the start bout		☐	☐	☐	☐	☐
11	**Select units (kg/ha or seeds x 1000/m^2) and Rate step.** The rate step is the % step when adjusting the rate up or down during normal operation.		☐	☐	☐	☐	☐
12	**Set SEED rate.** Use keypad to set SEED target rate.		☐	☐	☐	☐	☐

#	Step	Display	Configuration applicable to: (ref. Table 1)				
			A	B	C	D	E
13	**Set FERT rate (if configured for dual product).** Use keypad to set FERT target rate.		–	–	–	☐	☐
14	**Option to perform product calibration, (or press ENTER to end the routine).** With dual motor configurations (C, D or E). each motor has its own priming switch and are calibrated in turn. *NOTE 1: For configuration B, you must measure the product from BOTH metering units.* *NOTE 2: With a 'CAL NUDGE' routine (ref. section 2.8.2 of the Operators manual) however, as the priming switch is not used, the instrument does not automatically sense which motor is being calibrated. You are prompted to select LEFT/ RIGHT or SEED/FERT.*		☐	☐	☐	☐	☐

2. Product calibration

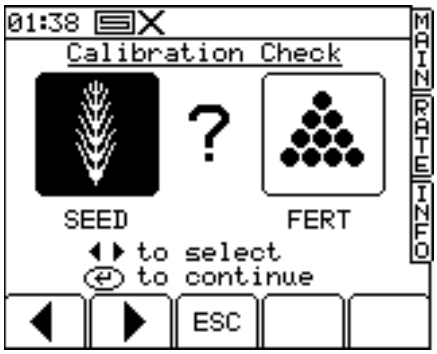
2.1 Initial product calibration

Set up the drill in the usual way for a bucket test.

1. From the SETUP screen, press the key.

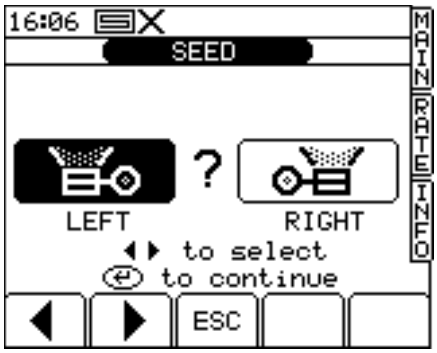
2a. If the instrument is configured for dual products, first select the product you want to calibrate (fig.2).

Figure 2: Dual product/Single metering



2b. Or if configured for dual metering, select the metering unit to be calibrated (fig. 3).

Figure 3: Single Product/Dual metering

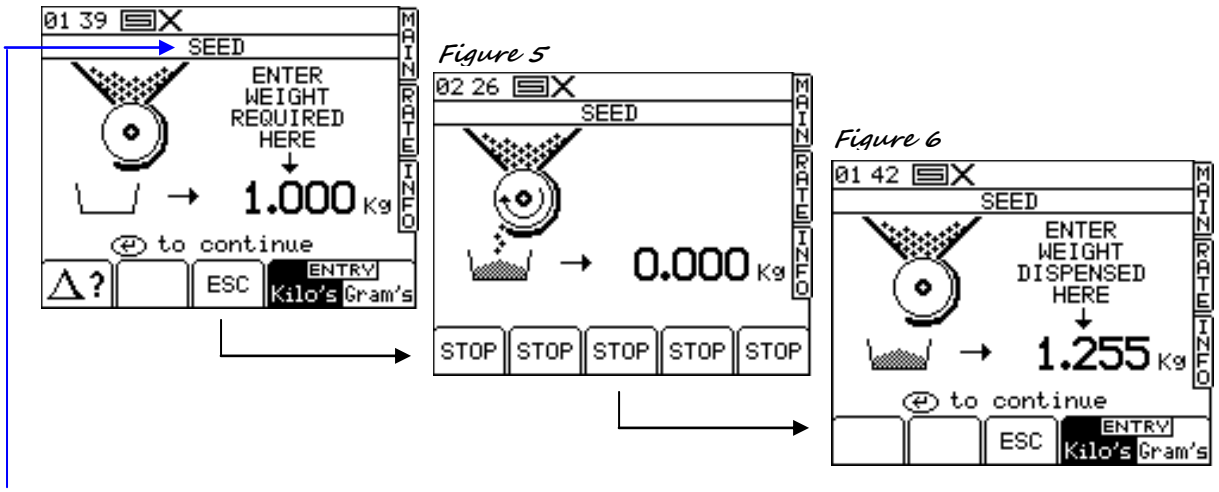


3. Otherwise, select the desired units then enter the weight required to be metered out (fig.4) and press ENTER. The metering unit will then operate at the programmed calibration speed to dispense the correct amount of product, then stops. The instrument then displays a weight figure *based on the existing programmed product calibration factor*.

NOTE: If a priming switch is employed for calibration the calibration routine will commence from fig. 5.

4. Weigh the contents of the container, and then enter the *ACTUAL* weight dispensed (fig. 6) and press ENTER to confirm.

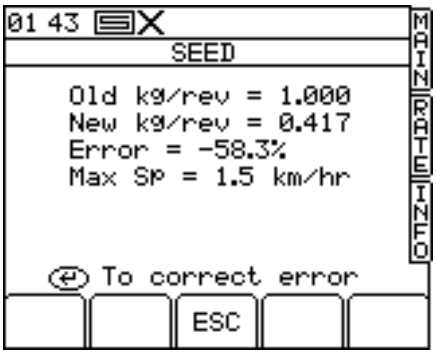
Figure 4



NOTE: The heading will be either SEED / FERT / LEFT / RIGHT according to steps 2a , 2b.

5. Press ENTER again for the instrument to re-calculate and display the new calibration factor in kg/rev, the error %, and the maximum forward speed that is permissible based on the application rate set for the product (fig.7).

Figure 7



6. Press ENTER again to confirm and store the new calibration factor, or press ESC to return to the SETUP menu screen.

It is recommended to reset the PART TOTAL to zero before commencing drilling. This will enable you after drilling an area, to quantify any error in the calibration factor by logging the theoretical amount of product used against a known amount used (a whole bag for example).

You can then adjust the calibration factor precisely, if necessary (section 2.2).

NOTE: Systems fitted to 'Accord' type metering mechanisms.

When changing from a low rate to a high rate i.e. 3kg/ha to 100kg/ha use the following procedure:

1. *Move the metering slide to a position for the higher rate.*
2. *Operate the product calibration routine, dispense a suitable amount of product and enter the weight gained. The error will be considerable but press enter to correct the calibration factor and continue (see FIG 15).*
3. *Now program the required application rate (see Operation manual section 2.3).*
4. *Perform the product calibration routine again, the error this time will be marginal. Accept the error and begin drilling.*

When changing from a high rate to a low rate i.e. 100kg/ha to 3kg/ha use the following procedure:

1. *Move the metering slide to a position for the lower rate.*
2. *Operate the product calibration routine and enter the weight gained. If using the priming switch simply dispense a small amount of product and enter the weight. The error will be considerable but press enter to correct the calibration factor and continue (see fig. 7).*
3. *Now program the required application rate. (see Operation manual section 2.3).*
4. *Perform the product calibration routine again this time dispensing a suitable amount of product. The error this time will be marginal. Accept the error and begin drilling.*

2.2 'CALIBRATION NUDGE' - Adjusting the calibration factor

The 'calibration nudge' procedure enables you to adjust the existing calibration factor without having to redo a bucket test.

1. First note down the PART TOTAL for the product displayed in the INFO screen. This is the theoretical quantity that the instrument has calculated.

   From the SETUP menu, press either the key (CAL. CHECK), or the key (DRILL SETUP).

If the instrument is configured for dual products, first select the product you want to calibrate (fig.2).

If configured for dual metering units, likewise, first select the left or right unit (fig.3)

2. From either screen, press the key to select the 'Calibration Nudge' screen (fig.8).

Figure 8

Figure 9

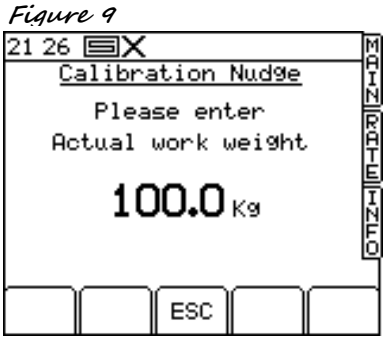
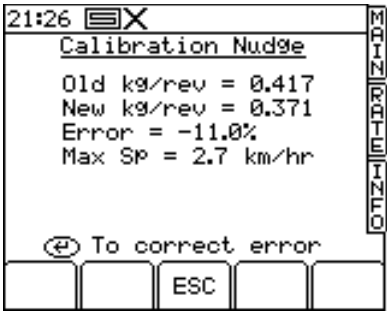


Figure 10



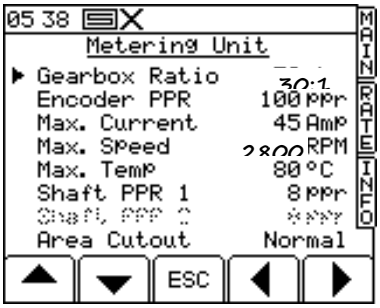
3. Enter the theoretical ('Expected') weight noted from the INFO screen at step 1 and press ENTER twice.
4. Enter the actual weight dispensed and press ENTER twice.
5. The cal factor is re-calculated and displayed along with the % error and maximum forward speed (fig.10). Press ENTER again to store the new factor.

3. Other Settings

3.1 Metering unit(s) setup

3. Factory Setup

3. Metering Unit(s)



If the instrument is configured for dual products, first select the product.

If configured for dual metering units, likewise, first select the left or right unit.

The only settings that may need changing are,

(i) 'Shaft PPR 1' and 2: - This equals the no. of magnets on the magnet carrier fitted to the metering shaft(s). The magnet carrier **[9]** supplied in kit ref. P/ART2/SINGLE has 3 magnets, therefore set '3 ppr'.

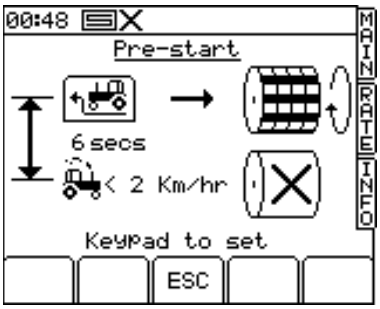
(ii) 'Area Cutout':- 'Normal' is set if the sensor is grounded when *out of work*, and 'Inverted' is set if the sensor is grounded when *in work*.

3.2 Pre-start function

Particularly useful in the case of a front-mounted hopper, the pre-start function helps to avoid an un-seeded area on entering work. It starts the metering unit at the calibration speed while the drill is still stationary, and 'primes' the drill so that the seed reaches the coulters just as the drill enters work.

2. Drill Config.

2. Pre-start



The pre-start time is established by trial and error. Simply enter the required value.

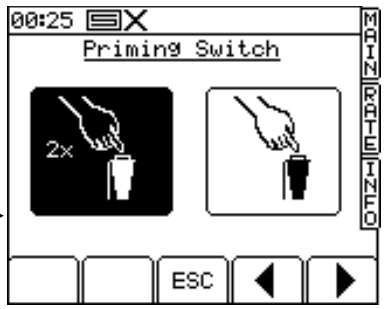
The metering motor will run at the calibration speed for the preset time limit, or until the forward speed exceeds 2km/hr, when full proportional control then takes over.

3.3 Priming Switch

You can select either latching or non-latching operation of the momentary-action priming switch(s).

2. Drill Config.

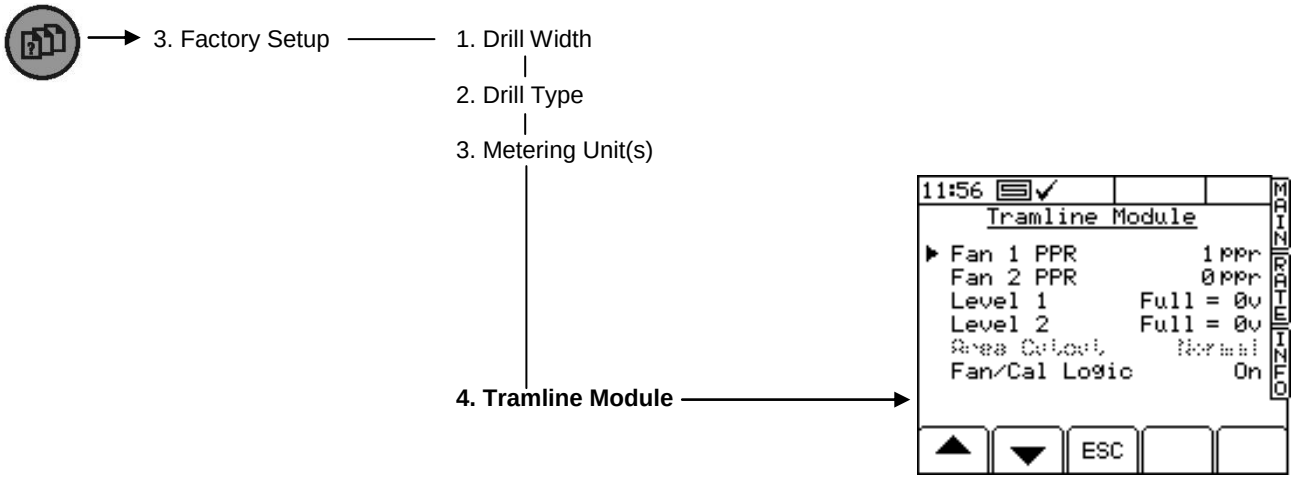
1. Instrument
2. Pre-start
3. C/O & TL Select
4. **Priming Switch**



LATCHING: The priming switch is pressed and released to start the motor. It is then pressed and released a second time to stop the motor.

NON-LATCHING: The priming switch must be pressed and held to run the motor.

3.4 Fan speed sensor / Hopper Level sensor(s)



(i) ‘Fan 1 PPR’ - This equals the no. of magnets on the magnet carrier fitted to the fan shaft.

(ii) ‘Fan 2 PPR’ - As above for fan 2. When set to 0 ppr, the 2nd fan display is not shown on the operating screen.

(iii) ‘Level 1’:- ‘Full = 0V’ - Hopper 1 level sensor is grounded when the hopper is full. ‘Empty = 0V’ - Hopper 1 level sensor is grounded when the hopper is empty.

(iv) ‘Level 2’:- As above.

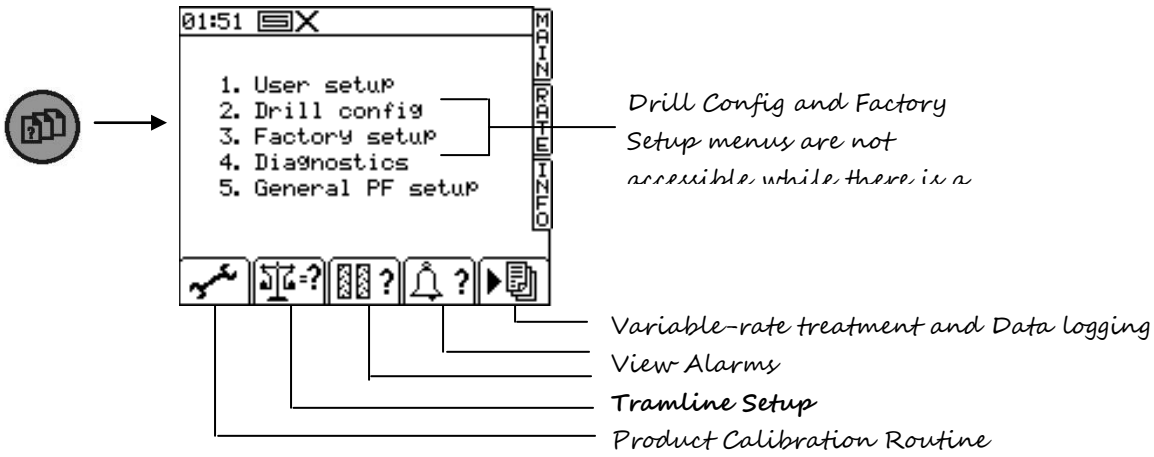
(v) ‘Fan/Cal Logic’:- ‘On’ / ‘Off’ With default setting ‘On’ , metering calibration is inhibited if the fan is operating.

3.5 PF / Data logging setup

Please refer to the ‘GPS, Data Logging and Transfer’ manual ref. S/DC/500-10-573 for further information

4. The SETUP menu

NOTE: The parameters in bold are also set as part of a 'Power-on reset' routine (see section 1.2)



1st Level	2nd Level	Parameter	Setting [default]
1. User Setup	1. Display	Contrast Brightness	
	2. Speed Sensor Factor	S.S.F. Auto-Cal Routine	[0.00778] m/pulse
	3. Customise	Product Rate Step	[Seed] /Fert [kg/ha] / Seed/m2] [5%]
	4. Time / Date		
	5. Helpline		
	6. Language		
2. Drill Config.	1. Instrument	IP HI	[Pulled Up] / Pulled Down [In work] / Out of work
	2. Pre-start	Time	[5 sec]
	3. C/O & TL Select		
	4. Priming Switch		
	5. Change PIN		
3. Factory Setup	**1. Drill Width**		
	2. Drill Type	*(Ref.Table 1)*	
	3. Metering Unit(s)	Gearbox Ratio Encoder PPR Max. Current Max. Speed Max. temp Shaft PPR 1 Shaft PPR 2 Area Cutout	[30]:1 [100] pulse per rev [45] amp [2800] rpm [80] deg C [8] pulse per rev [0] pulse per rev [Normal] / Inverted

	4. Tramline Module	Fan PPR	[1] pulse per rev
		Level 1	0V = [Full] / Empty
		Level 2	0V = [Full] / Empty
	5. Change PIN		
4. Diagnostics	1. Instrument		
	2. Metering Unit		
	3. Tramline Module		
	4. History		
	5. Software Versions		
5. General PF Setup	1. Logging Interval	Log by [Time] / Dist.	[2s] / 6m
	2. Tag Names		
	3. Function Name/Value	F1 – F12	
	4. GPS Antenna Offset	x , y	0 , 0 m
	5. GPS Home Location	Radius	[0] km
	6. Ports Setup	Top Port	[Not Used]
		Bottom Port	[Not Used]

Document history:

Issue 1:	7/8/07	Original issue
Issue 2:	2/11/09	Area Cutout input configuration (p.6) Metering unit setup - section 3.1 Fan Speed Setup - section 3.4 Setup menu - section 4
Issue 2.18/3/10		p.9 - ref. Fig15 should be fig.7 p.11 - section 3.1: add notes p.13 cross ref. 'sect.1.4' should be 'sect 1.2'
Issue 3:	9/5/11	Change S/W ref. on front page PS405-001 rev.27