FIELD MATE®

E-Drive
Electric Seeder Control

Users Guide
and
Installation Manual

www.areameters.com

Ver 1.1

If you Need to Call Customer Service
Please complete the following information for future
reference:
Model* :...
Serial Number * :...
Date Purchased :..
Place of Purchase:...

 * The serial/Model Number is displayed in the
   Information Screens of the meter.

IMPORTANT:
   To obtain the highest Precision Area Measurement and Rate Control:

   – The Speed sensor must be mounted on a wheel that is not subject to slip or spin while drilling.
   – Wheel size and working width should be measured as required to ensure the sizes used by the meter, reflect the real world sizes of the drill. It is the users responsiblity to ensure the sizes in the meter are correct.
   – When work is not being measured, the meter must indicate this by going into Hold mode.ie: Hold light on, "HOLD" flashing on working screen.
   – Enter the correct *Calibration Seed Weight* and *Drilling Rate* to allow the Field Mate to calculate the correct colter RPM to suit the required drilling rate. This can be entered in the setup screens.

FIELD MATE

E-DRIVE SYSTEM OVER VIEW

SEED MOTOR

FERT MOTOR

SEED RPM

FERT RPM

SPEED

FAN

RUN / HOLD

Master Control or
FIELD MATE
www.airconnector.com

FUSE

FUSE

FIELD MATE

E-DRIVE SYSTEM OVER VIEW

SEED MOTOR

FERT MOTOR

SEED RPM

FERT RPM

LOW SEED

SPEED

FAN

RUN / HOLD

BLACK
BLUE
GREEN
BLACK
BLUE
BROWN

BLACK
BLUE
YELLOW
BLUE
BLACK
BROWN

WHITE-RED-BLACK
9MM RED
BROWN-GREEN-BLUE

BLACK
BLUE
BROWN
BROWN
BLUE

BLACK
BLUE
RED
BLACK
BROWN

BLACK
YELLOW
YELLOW
BLUE

BLACK
YELLOW
WHITE
BLUE

1 6 5 3 2 7 4 8 9 10 11 12

Manual Control of

FIELD MATE
www.arccontrol.com

FUSE

FUSE

WIRING:

Note: The first 7 wires are in one 7 core
cable. Wire from 1 to 7.

1 - BATT -   EARTH
6 - SPEED   YELLOW
5 - RUN/HOLD   WHITE
3 - SEED RPM   GREEN
2 - FERT RPM   BROWN
7 - FAN RPM   RED
4 - BATT + FOR SENSORS BLUE

Note: This is the 2nd half of the 12 pin
plug. The wires here are in the 2nd
7 core cable.

8 - FERT MOTOR CONTROL BROWN
                        GREEN
                        BLUE
9 - SEED MOTOR CONTROL WHITE
                        RED
                        BLACK
10 - LOW SEED   YELLOW
11 - NOT USED
12 - MOTOR POWER   9MM RED WIRE
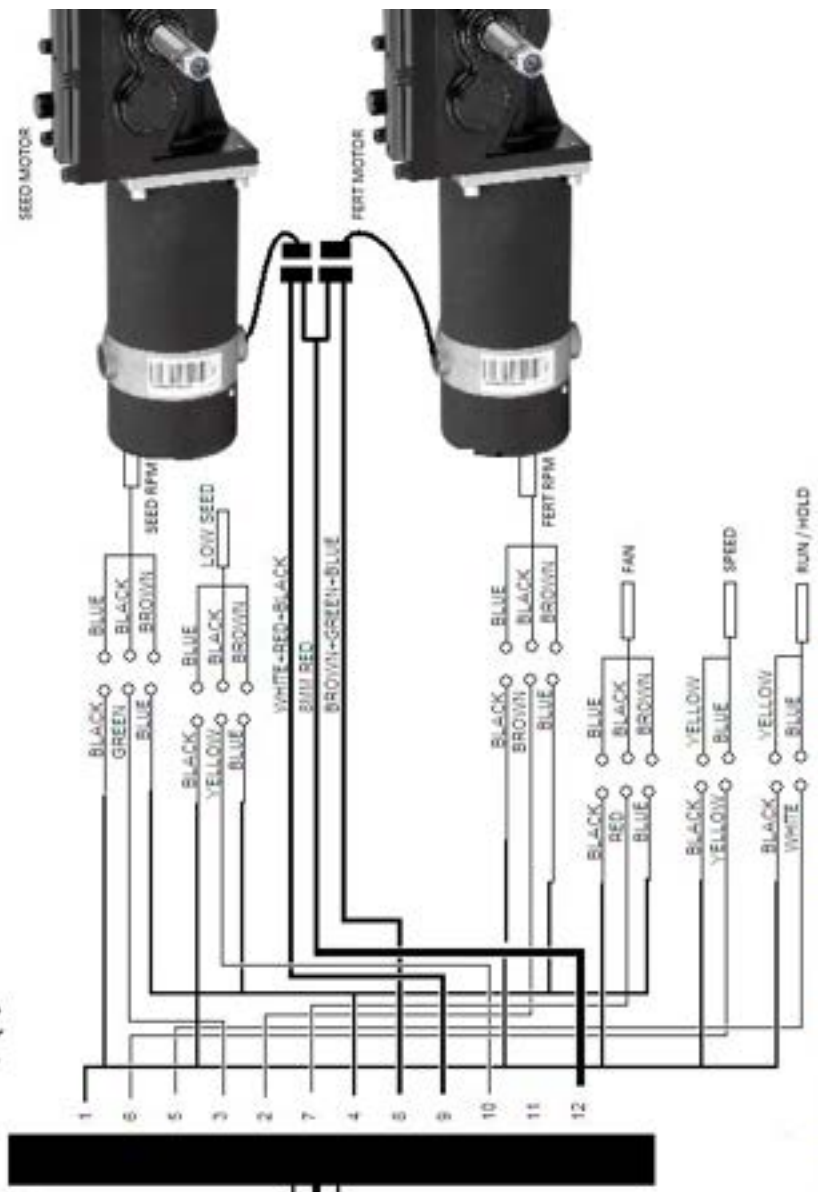
Introduction:

The FIELD MATE E-Drive Drilling Rate controller plus Area Meter have been developed to calculate land area and distance travelled during drilling while controling the speed of the colter motors to achieve a user defined drilling rate. The meter will also record Drilling hours and time stopped. While Drilling the meter can display the drilling rate in hectare per hour and Fan rpm as the desired Drilling rate is controlled. All measurements are in metric, eg: hectares, kilometers, centimeters, millimeters.

A distance sensor is mounted on the ground wheel of the drill. A fan RPM sensor is mounted on the fan motor shaft and a Run Hold sensor is mounted to detect when the drill is Drilling or not. Drilling motor RPM control is governed by the Run/hold Sensor when detects if the drill is drilling or not and drill speed. The Seed rate controller will only control the motors when the Drilling speed is above 1 KM/Hour.

To achieve the desired drilling rate the operator must enter the following:
- Calibrated Seed or Fertizer colter output weight for 10 turns of the colter.
- Distance travelled by the drill for each wheel pulse.
- Drilling Rate.
The FieldMate will now compute the colter motor rpm to achieve the desired rate based on the 3 information sets entered above.

The unit is rugged, reliable, easy to use, fits any Drilling system.

Optional extras and :
- 16 downloadable Jobs to PC
- Window Mount
- Low seed Level detection

Warranty :

1 Year **return to factory** Warranty on Field Mate Controller, sensors and Downloading support hardware. Please ensure you agree to the warranty conditions before proceeding to purchase this product, read the warranty form at the end of this user guide. Installation wiring to sensors, wear and tear on connectors is not covered.
1. All systems under warranty repair must be returned to the Gtech NZ Ltd factory for servicing.
2. The customer will cover all costs to fault find system failure.
3. The customer will cover all costs to return goods for repair.
4. Gtech NZ is not liable for costs to fault find a faulty system or return cost of returned systems or parts of systems.
5. Gtech NZ Ltd will pay return freight costs for all warranty repaired units.

EMI Emmisssion Certification:

This Computer has the following certifications:

Certification	Country
C-Tick Z874 Class B	New Zealand, Australia
FCC	USA

Pin outs 12 Pin plug:

Pin/ number	Colour	Function
1	Black	Earth
6	Yellow	Speed
5	White	Hold
3	Green	Seed bin motor RPM sensor input
2	Brown	Fertilizer bin motor RPM sensor input
7	Red	Fan speed sensor RPM (pulse or analogue)
4	Blue	Battery power for sensors. Reverse polarity protected.
		^^^ The above seven wires are contained in one 7 core wire ^^^^
		!!!! The below seven wires are contained in one 7 core wire !!!!
8	Brown	PWM return for the Fertilizer bin motor.
	Green	
	Blue	
9	White	PWM return for the Seed bin motor.
	Red	
	Black	
10	Yellow	Low Seed
11	Link from GND	Use as earth for prime motor circuit
	----- The below RED wire is 8mm heavy duty cable ----	
12	8mm Red	Heavy 8mm red wire to supply battery power to the motors.

Specifications:

Supply volts	:	5 – 30 Volts
Max FieldMate Computer Amps:		25ma
Max Motor Current	:	15 amps per motor
Temperature	:	-5 to 65 degree/C
Input voltages	:	0 to 30 Volts
Area	:	999.99 hect
Distance	:	999.99 km
Speed	:	100 km/Hr
Wheel Size	:	999.9 cm
Width	:	9999.9 cm
Number of seed types	:	20
Number of fertilizers	:	20 (twin motor system)
Number of Jobs	:	1 (PRO version max jobs 16)
Min Motor RPM	:	5 RPM
Max Motor RPM	:	100 RPM

Features:

- Motor RPM displayed at each setup screen for an
  example speed of 10 km/hr. This ensures motor can
  always be setup in the calibration mode at an RPM with
  in the motor limits.
- Single or Double motor control
- Fan RPM monitoring (Analogue or pulses)
- Large graphically displayed numbers, easy to see.
- 3 button operation, for quick simple operation.
-Backlit display for night time working.
-Dust sealed.
-Mositure resistant.
-Strong Aluminium Case.
-Internal alarm buzzer.
-Bright light indicators.
-Easy fit velco mount. Or option window mount.
-Quick transfer from tractor to tractor.
-Reports all job information on screen.
-Automatic data Backup.
-Help Desk Phone number display.
-Data storage time with out power 20 years.
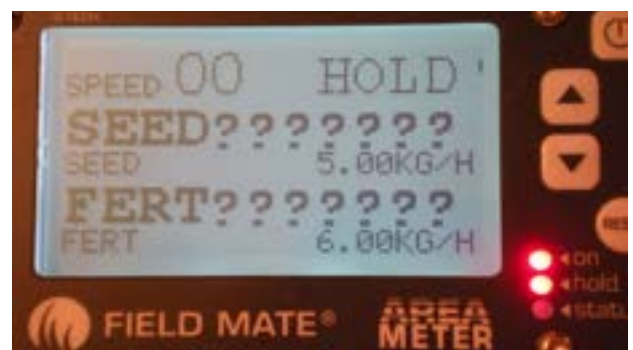-All inputs high voltage protected.

Models:

There are 4 models of the FieldMate e-Drive system.

- Model " SEEDER-ONE-X"
  Controls one motor, Seed bin only.
  1 job to record work done

- Model " SEEDER-TWO-X"
  Controls two motors, Seed and Fert bin control.
  1 job to record work done

- Model " SEEDER-ONE-PRO"
  Controls one motor, Seed bin control only.
  16 jobs to record work done
  Jobs transferable to any Windows computer

- Model " SEEDER-TWO-PRO"
  Controls two motors, Seed and Fert bin control.
  16 jobs to record work done
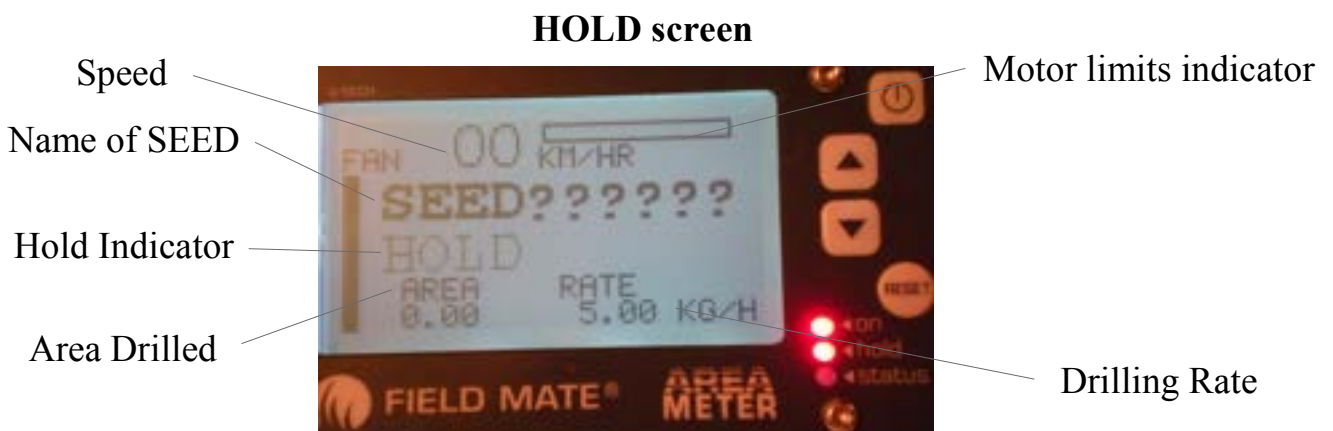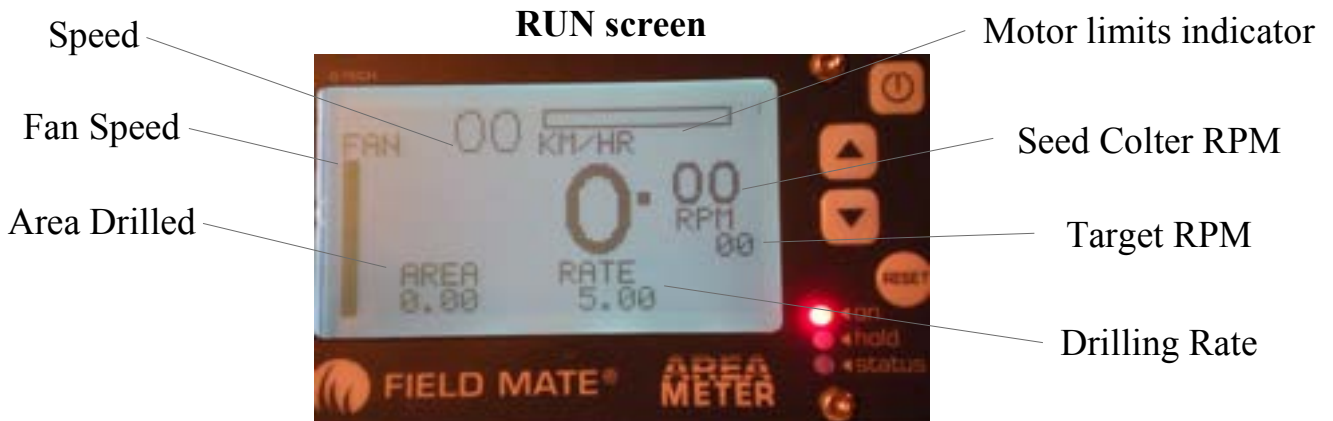 Jobs transferable to any Windows computer
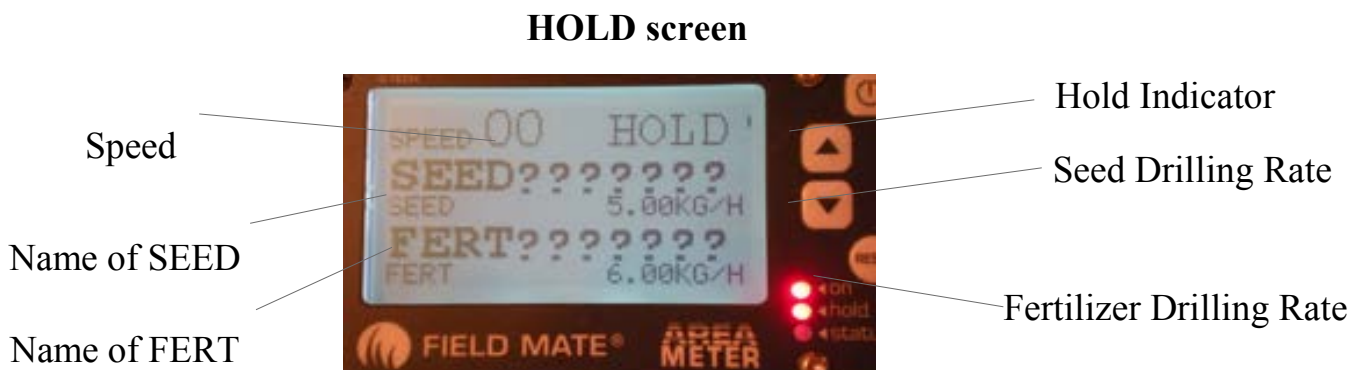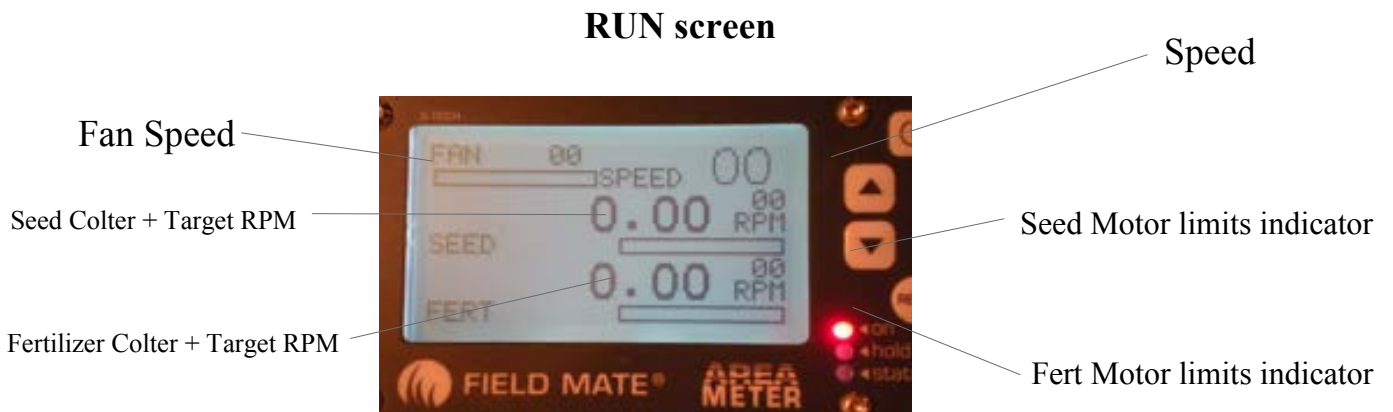

One motor system in RUN and HOLD states

Twin motor system in RUN and HOLD states

One motor system in RUN and HOLD states

RUN screen

Speed

Fan Speed

Area Drilled

Motor limits indicator

Seed Colter RPM

Target RPM

Drilling Rate

-

HOLD screen

Speed

Name of SEED

Hold Indicator

Area Drilled

Motor limits indicator

Drilling Rate

Two motor system in RUN and HOLD states

RUN screen

Fan Speed

Seed Colter + Target RPM

Fertilizer Colter + Target RPM

Speed

Seed Motor limits indicator

Fert Motor limits indicator

HOLD screen

Speed

Name of SEED

Name of FERT

Hold Indicator

Seed Drilling Rate

Fertilizer Drilling Rate

Getting Started...

1. Goto the SET SEED Screen. (quick press POWER to enter)... Keep pressing the down key from this screen until SET SEED is highlighted. Next quick press the power.

2. Select the PRIME MODE. (Highlight PRIME MODE and hold down any Arrow key)

3. Goto the Motor switch on the drill and press. (The Monitor will take control of the Motor)

- When motor stops weigh the seed .
- Repeat motor rotation and catch and weigh seed again if required.
NOTE: the weight of seed output by the drill in this setup mode.
We refer to this as the "SEED WEIGHT"!

4. Enter the Seed weight into the Monitor.

- Goto the Main screen.
- Hold down any ARROW key

Main Screen

Holding the arrow key

Setup screen for Seeding Rate.

5. Enter the Seed weight (highlight WEIGHT and hold any arrow key)

6. Exit the abve screen by quick pressing the POWER key.
   Next... Enter the Seed Rate (highlight RATE and hold any arrow key)

NOTE: !!   The RPM displayed should be between 10 and 100 RPM, if not adjust the seed weight output and repeat the SETUP process after changing the colter output .

7. Setup complete. Press the power key twice to return to the Main menu.

Repeat this process to set the rate for the second bin.

SET UP is now complete for the seeding rate and the fert drilling rate!

SETUP SUMMARY

1. Goto the SET SEED Screen. (quick press POWER to enter)

2. Select the PRIME MODE. (Highlight PRIME MODE and hold down any Arrow key)

3. Goto the Motor switch on the drill and press. (The Monitor will take control of the Motor)
   - When motor stops weigh the seed .
   - Repeat motor rotation and catch and weigh seed again if required.
   NOTE: the weight of seed output by the drill in this setup mode.
   We refer to this as the "SEED WEIGHT"!

4. Enter the Seed weight into the Monitor.
   - Goto the Main screen.
   - Hold down any ARROW key

5. Enter the Seed weight (highlight WEIGHT and hold any arrow key)

6. Exit the above screen by quick pressing the POWER key.
   Next... Enter the Seed Rate (highlight RATE and hold any arrow key)

7. Setup complete. Press the power key twice to return to the Main menu.

LETS START DRILLING !!!!

NOTE: When we drill observe the RPM bar graphs on the main scrren. If the black dot is not floating is the graph box then the motor will be running at its top or lowest RPM limits.
If this is the case re calibrate the drill again with a higher or lower seed calibration weight.
IDEAL RPM is 20-30 RPM (Suggestion)

Seeder motor limit graph

Fert motor limit graph

Speed

Seed graph. RPM indicator block at the limit. The motor is too slow.

Fert motor graph. RPM indicator block if good. The motor is in a good range to operate.

NOTE!!

KEEP AN EYE ON THESE GRAPHS WHEN YOU ARE DRILLING. ENSURE THE BLOCK IS IN A GOOD PART OF THE GRAPH.
In the case of the seed graph, we have options....
1. Increase drill speed as this will make the motor go faster.
2. **Decrease** the amount of seed weight output in the 10 TURN operation setup.

Install Kit

Battery Power Cable.

Connect to battery supply capable of supplying 30amp of Current

FieldMate Motor Driver.

Mount in the tractor cab. This unit will get warm when driving the motors, so allow ventalation.

FieldMate Computer.

Available with a velcro mount or optional Window Mount. Mount in the Tractor Cab.

Motor and Sensor Cable.

Cable to power motors and sensors and gather drill status.

Installation Instructions.

1: Connect the Power.

Locate a circuit on the tractor that can deliver at least 30amp DC power at 12 or 24 volts. When connecting to this power suuply please ensure that it is fused witha 30 amp fuse.

Power cable is connected to a Fused!! 30 amp supply. Very important to fuse the power cable to the system. 30 amp fuse is recommended.

The earth cable should be a solid connection capable of passing up to 30 amps.

2: Mount the Computer.

Locate the computer where it is easy to see and use by the driver. With the Computer in a safe visual location please attach the DB15 cable to it and run it to the FIELD MATE MOTOR DRIVER.

Mount computer in easy to see and use location. A Velcro mount is the standard mounting method. Optional mounting method is a high quality window mount.

3: Mount the MOTOR DRIVER.

Locate the motor driver box is a place that will allow the device to cool as it will get a little warm when running the motors. Connect the power to this box and the DB15 cable from the computer.

The motor drive unit is mounted in this cab behind the drivers seat. Mounted here with a velcro mount to the inspection window behind the drivers seat. This unit may get warm so allow air flow to prevent unit from over heating.

The motor drive unit has a cable that connects with the other cable from the drill . Ensure these two cables can connected ok from with in the tractor cab.

4: Wire the Drill. - Run the Power cable to the Drill.

Ensure the power cable can safely connect to the power cable plug of the power box mounted in the tractor. And then with a little cable still in the cab run the rest of the cable down to the main body of the drill.

The cable from the drill plugs into the back of the tactor. This cable should connect inside the tractor cab.

5: Wire the Motor.

If a single motor system wire one motor. If a double motor system connect two motors.

Note: You will have to make a bracket up to mount the motor.

Note: You will have to make a small shaft to go from the motor output to the colter shaft end of the drill. Or you can run a chain and sprocket from the end of the motor.

Note: The motor has a min RPM of 1 and a max RPM of 100, bear this in mind if using a geared sproket system.

Note: The motor is able to rotate in any direction. Please check the motor direction is correct for your colter setup. If the direction of rotation of the motor is not correct reverse the power wires controlling the motor.

Special note: To simply and slowly make the motors rotate with out moving the drill follow these instructions:
- SETUP Screen
- Go to the 6th setup screen
- Enter into option "SEED STOPPED" to make seed motor slowly start
or
- Enter into option "FERT STOPPED" to make fert motor slowly start

NOTE!!! When finished in these screen return the value to 10000. As this will ensure the motors are off when not being used.

With the motor mechanically mounted to the colter shaft. (note you will have to build a suitable bracket and shaft connector for your drill. However do contact us as we may have a kit for your drill all ready to go!!)
Wire the power wires to the motor and the sensor wiring to the RPM sensor of the motor.

Note: Once the motor have the heavy power wires connected. Use the below procedure to work out if the motor rotational direction is the correct one for your colter. If the motor is going backwards, simply reverse the power wire to the motor. The below procedure allows you to slowly rotate the motor, checking for motor jams in you mechanical work and direction of colter shaft rotation.

1: Goto the Setup Screen in main menu.

2: 6th Set up screen. See **Seed Stopped** and **Fert stopped** option. When highlighted hold the arrow key to select.

3: Adjusting the Seed / Fert Motor speed by changing the PWM (pulse width modulation) setup.
Decrease the number to slowly start the motor. The motor will start to hum when this number is at 9000,
- If no hum check wiring.
- If at 7000 there is no rotation but have hum, check for jam in the motor / colter shaft
- When the rotation is correct, return this number to 10000 and exit the screen using a quick press of the power button.

Wiring the motor RPM sensor.
The sensor has 3 wires connects as follows.
1- Sensor BROWN wire to Battery +
2- Sensor BLUE wire to Battery -
3- Sensor BLACK wire to either the Seed RPM pulse wire or the Fert RPM pulse wire. Depending on which motor is used.

Mounting the motor.

We have a DXF file of the motor mount holes. Call us and we can send this file to you to as assist in any CAD work you may be doing.

The motor shaft should line up with the colter shaft 100%. Use a suitable shaft connection assembly to join the motor to the colter shaft.

For motor mounting ideas, see the pictures below. Call us any time to talk through any ideas if you need to.
Also we may have a bracket to suit your drill, enquire today.

Colter to motor shaft connection. A nylon tube. Keyed to the shaft and pinned at the other end to connect to the colter shaft.

Bracket . Built strong to support the motor. Note that the mount bolts holding the motor to the bracket should be loctited and lock washers fitted.

Mounting the Speed sensor.

The speed sensor is supplied with 4 magnets. Mount the magnets on a ring on a wheel that has constant ground contact. Mount the senor to be triggered by the magnets. Space between all magnet MUST BE TE SAME!

Setting up the distance travel for each wheel pulse.

This sensor is used to measure the distance travelled by the drill. This sensor when triggered lets the meter know that a defined distance has been travelled, from this signal the meter will compute speed, area, rate ,distance drilled and most importantly motor RPM.

<u>Measure the distance travelled by the drill for one distance sensor pulse.</u>

Distance pulse calibration instruction:
After the Distance Pulse sensor and magnet have been installed we now need to enter the distance travelled by the drill each time the distance sensor magnet passes the distance sensor. Follow the below instructions to enter the distance travelled pulse distance.

Step 1:   Power up the meter.
Step 2:   Scroll down to the SETUP screen.
Step 3:   Enter the SETUP screen and scroll down to the PULSE DIST setting.
Step 4:   Enter the PULSE DIST screen.
        In this screen each time the Magnet passes the Distance Sensor the meter will beep. This beep is used to set up the distance measurement.
        A: Drive the tractor forward with drill attached and drill drilling and stop immediately the first beep is heard. When the beep is heard, mark where the drill is currently positioned.
        B: Drive forward until the meter beeps a second time and stop immediately.
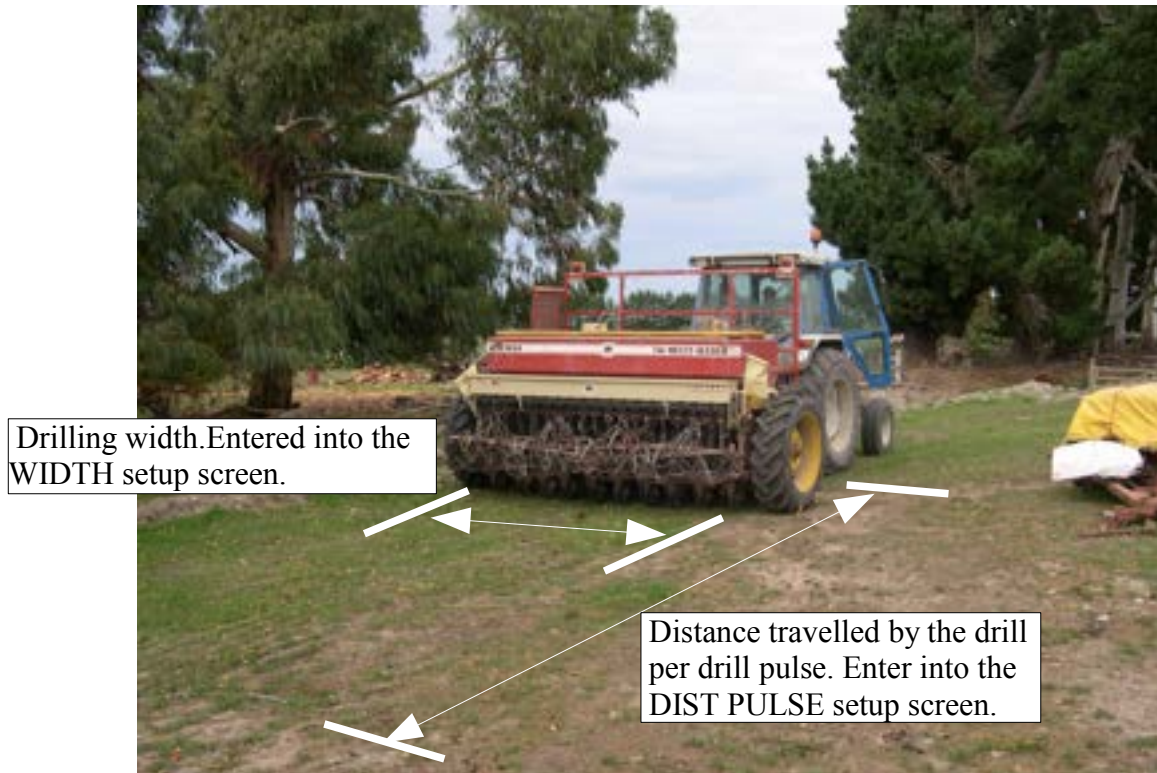   C: Measure the distance travelled by the drill between the 2 beeps.
Step 5: Enter this distance into the DIST PULSE screen.
        Note: a recommended distance pulse of between 20 and 40 CM is recommended.

Distance pulse sensor calibration complete.

Example of measuring the drill pulse distance

Drilling width.Entered into the WIDTH setup screen.

Distance travelled by the drill per drill pulse. Enter into the DIST PULSE setup screen.

Distance travelled by the drill per drill pulse. Measure this distance accurately with a tape measure and enter this number into the meter.

SETUP
CONTRAST   22
DEBOUNCE   10%
RUN/HOLD RUC SW HIGH
DIST PULSE 250.0 CM
WIDTH   0.0 CM
                NEXT
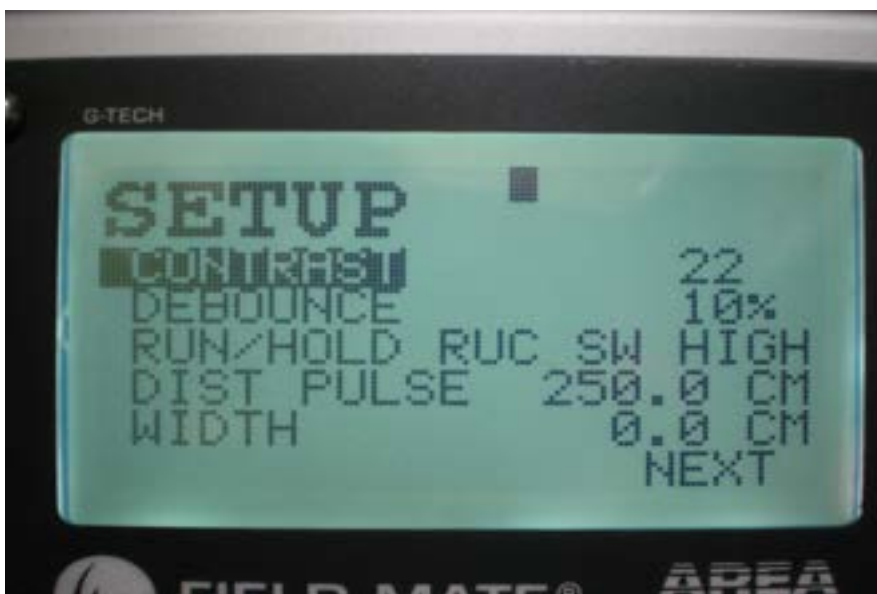
Mounting the RUN / HOLD sensor.

This sensor when triggered and the drill is moving instructs the motors to start, hence drilling begins.

This sensor is mounted on the drill so and magnet triggers the sensor when the drill is at a position to start the drilling operation.
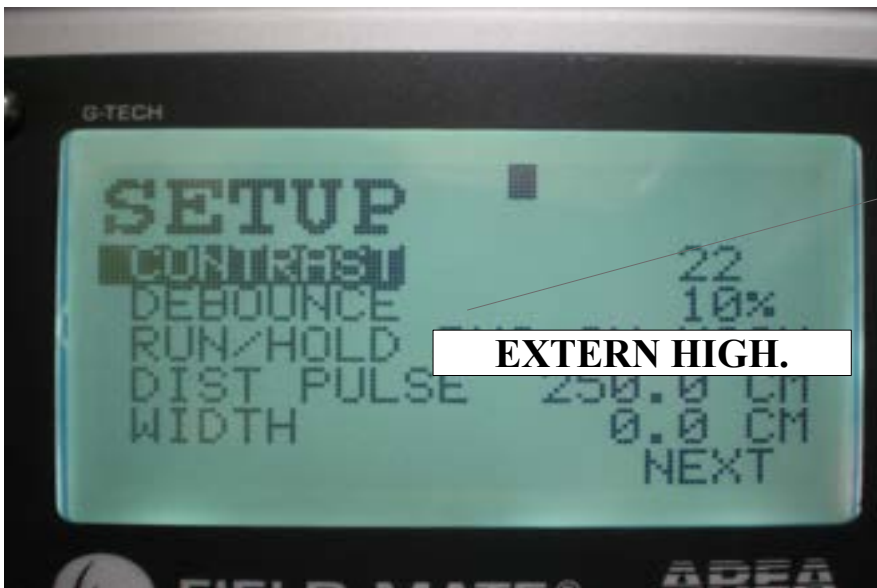
See picture below...

Distance pulse number goes in here....

Sensor

Magnet

RUN HOLD OPTION SHOULD BE EXTERN HIGH.

EXTERN HIGH.

Set up and installation is now complete! For more info or questions please contact us.

To follow is more info about the system.

Thank you!

Job Menu:

Allows us to manage what Job we are on.
Allows us to load up a previously used Seed type .
Allows us to load up a previously used Fert type .

Selecting a JOB:

This is done when a job is to be reset or restarted. A PRO has 16 jobs and there fore selecting
any of these jobs can be done by this method. A Job that has a "XX.XXX.XX" in the date location is an un allocated
job.

1: In the Main Menu scroll to JOB.
2: Quick Press "ON" to enter a JOB. Scroll to JOB using the ▲ or ▼ keys.
3: Hold ▲ or ▼ to select the job for adjusting.
4: Scroll to SELECT in the JOB SETUP screen Using ▲ or ▼. At SELECT hold ▲ or ▼ to select the job.
   This job will be the current Job that work is logged to. Date and Time renewed . Job Totals and Job Name remain
   untouched.

Reset a JOB:

   1: In Main Menu scroll to JOB.
   2:Quick Press "ON" to enter JOB. Scroll to JOB using the ▲ or ▼ keys.
   3: Hold ▲ or ▼ to select the job for adjusting.
   4:Scroll to RESET in the JOB SETUP screen Using ▲ or ▼.
   5: At RESET hold ▲ or ▼ to reset the job. All Totals, Date, Time and Name for this job will be cleared.
   Caution: Data cannot be recovered after this event.

Name a JOB:

1: In Main Menu scroll to JOB.
2: Quick Press "ON" to enter JOB. Scroll to JOB using the ▲ or ▼ keys.
3: Hold ▲ or ▼ to select the job for adjusting.
4: Scroll to NAME in the JOB SETUP screen Using ▲ or ▼. At NAME hold
   ▲ or ▼ to name the job.
5: At the NAME job screen ▲ will change letter, ▼ will goto the next letter
   space. A maximum of 11 letters can be entered.
6: Quick press "ON" to exit.

View a JOB:

1: In Main Menu scroll to JOB.
2: Quick Press "ON" to enter JOB. Scroll to JOB using the ▲ or ▼ keys.
3: Hold ▲ or ▼ to select the job for adjusting.
4: Scroll to VIEW in the JOB SETUP screen Using ▲ or ▼. At VIEW hold
   ▲ or ▼ to select the job. Report screen will be displayed.
5 : Use ▲ or ▼ to scroll through the job report.
6: Quick press "ON" to exit. Viewing job does not unset the selected job.
7: When exiting to the Main Menu, the Job Report is set back to the Current Selected Job Number.

Selecting previously saved seed.

1. Scroll to NEW SEED.
2. Hold an arrow key down to enter New Seed.
3. In the "New Seed Select" sereen" quick press the up/down arrows to move through the 20 seeds in storage.
4. To select a seed to use or a blank one to use and modify simply... Hold down a arrow key to select.
    Then the screen will head up with "SEED MATERIAL .... Then the index number of the seed will show.
5. Here the seed info can be edited by highlighting a choice . Eg: seed name and holding the arrow key down to select.
6. To exit quick press power to return to the main menu.
    New seed selection complete.

Selecting previously saved fert.

1. Scroll to NEW FERT.
2. Hold an arrow key down to enter NEW FERT.
3. In the "New Fert Select" sereen" quick press the up/down arrows to move through the 20 ferts in storage.
4. To select a fert to use or a blank one to use and modify simply... Hold down an arrow key to select.
    Then the screen will head up with "FERT MATERIAL .... Then the index number of the fert will show.
5. Here the fert info can be edited by highlighting a choice . Eg: fert name and holding the arrow key down to select.
6. To exit quick press power to return to the main menu.
    New seed selection complete.

Information about all screens and menus:

Operate Menu:

1: In Main Menu scroll to OPERATE .

2: Quick Press "ON" to enter OPERATE Mode.

3: Use the ▲ to display the following information types:
- AREA
- AREA sub (Reset this by holding down the ▲ or ▼ key)
- DISTANCE (Total distance travelled, combines the RUN and HOLD distances)
- WEIGHT of seed and fert spread
- RATE, amount of hect per hour are being spread
- SPEED
- Seed motor RPM
- Fert motor RPM
- Fan motor RPM + Seed and fert motors

4: Quick press "ON to Exit to Main Menu.

Fert motor graph is on all operate screens

Fert motor graph is on all operate screens

Setup Menu:

1: In Main Menu scroll to SETUP .
2: Quick Press "ON" to enter SETUP Mode.
3: Use the ▲ or ▼ keys to toggle scroll through the various setup options.
4: When at the required Setup option, to enter the Option hold down ▲ or ▼
  key to enter the Setup mode for the Option.
5: When in the Option use the ▲ or ▼ keys to adjust the options settings. EG:

Screen 1:

- CONTRAST.	Allows display clarity to be set up.
- DEBOUNCE.	Allows meter to monitor use extremly slow ground wheels or coulter shafts to generate speed . Typically set to 10% .
- RUN / HOLD.	Set to EXTEN HIGH. For detecting if drill is in drilling mode or not.
- DIST PULSE.	Is the distance travelled by the drill each time the speed sensor is triggered.
- WIDTH.	Is the width of the drill. This number is used to work out area drilled & motor RPM.

Screen 2:

- DATE.	Set date here.
- SUPPORT.	Enter a HELP DESK Phone number here of who to ring for Area Meter support.
- UNIT ID.	Allows the unit to be named. Allows easy identification of a Meter.
- TIME	Set time here
- SEED UPDATE.	Sets the update rate for the PWM for seed motor. Dynmically set in software.

Screen 3:

- FERT UPDATE.	Sets the update rate for the PWM for seed motor. Dynmically set in software.
- MAX SEED RPM.	MAX rpm of the seed motor... 2200
- MAX FERT RPM.	MAX rpm of the fert motor... 2200
- MIN SEED RPM.	MIN rpm of the seed motor ... 32
- MIN SEED RPM.	MIN rpm of the fert motor... 32

Screen 4:

- SEED RATIO	Ratio of the seed motor gear box to colter shaft... 21.000
- FERT RATIO	Ratio of the fert motor gear box to colter shaft... 21.000
- SEED PULSE	Number of pulse from the RPM sensor of the seed motor... 8
- FERT PULSE	Number of pulse from the RPM sensor of the fert motor... 8
- LOW SEED	Defines if the low seed detection is enabled and the sensor polarity... OFF

Screen 5:

- FAN ALARM	If 0 then no fan monitor. Else the number set here is the min RPM for the fan... 0
- ALARM BUZZ.	Defines if the alarm sounds if error condition occurs ... ON
- SPEED LOCK.	If speed is greater than this number the motor are locked out, if 0 not used. ... 0. if Set to 300, then at speeds over 30km/hr the motors will stop.
- SPEED PULSE.	Number of speed pulses to count before the DIST PULSE distance is travelled.. 1
- SPARE 4	not used.

Screen 6:

- FAN PULSE	Number of fan pulses per rev of the fan motor. 99 is the max number of fan pulses per rev of the fan motor. If higher than 99 pulses the monitor will configure the fan input as an analogue fan input.
- AUTO SAVE.	Time interval for the meter auto saving date when machine is not moving.
- SEED STOPPED.	PWM setting for seed motor. Used to test motor and slow start if needed. Always return to the off PWM setting of 10000 after returning from this menu.
- FERT STOPPED.	PWM setting for fert motor. Used to test motor and slow start if needed.Always return to the off PWM setting of 10000 after returning from this menu.
- IMP NAME.	Name for implement, as reported on the report

Screen 7:

- SEED START	Seed motor PWM setting that is applied to the motor when the motor is being started from 0 rpm. This number is set in accord with the effort required for the motor to start turning the seeder unit shaft.
- FERT START	Fert motor PWM setting that is applied to the motor when the motor is being started from 0 rpm. This number is set in accord with the effort required for the motor to start turning the fertilizer unit shaft.
- SPARE 7	not used.
- RATE CORRECT	Used to adjust the rate if for what ever reason the drill is not metering out the requested rate. If this number is 1.0000" then the programed rate is unchanged. If this number is 1.1000 then the drilling rate is 10% above the programmed rate. If this number is 0.9000 then the drilling rate is 90% of the programmed rate.
- SPARE 8	not used.

Info Menu: (See this by holding the power ans reset key down at power up)

1: In Main Menu scroll to INFO .

2: Quick Press "ON" to enter INFO Mode.

3: Use the ▲ or ▼ keys to toggle scroll through the various information screens.

4: Display a varity of information that may be useful to the user, or in some cases a valuable tool in working out if the area meter doing that job you want it to do. There are also low level information here that give insight into the correct operation of the computer system that makes this area meter what it is. Information may prove to be a useful tool used during installation.

Screen 0:	- Meter logo graphic
Screen 1:	- Help desk info
Screen 2:	- Distance travelled pulse detection timing and detection info screen.
Screen 3:	- Meter model infomation.
	- Firmware release info
	- Hours that the meter has been running, powered up and calculating area.
	- LCD contrast setting and backlight voltage on/off control state.
Screen 4:	- Computer Temperature.
	- Voltage level applied to the meter.
	- Serial number.
	- LOW SEED State
Screen 5:	- Software error detection. Should be all 0.
	- PWR is the number of power ups that the meter has had.
	- BOD may get counts, this is a low power detection.
Screen 6:	- Auto save count down timer.
	- Average speed.
	- Time and distance calculator numbers.
Screen 7:	- Real Time Clock/Calendar timer information
	- Run Hold state number.
	- Area calculator numbers.
	- Time number.
Screen 8:	- Real rate verse filtered rate.
	- Area calculator numbers
Screen 9:	- All motors rpm monitor screen
Screen 10:	- Calcs to work out seed motor RPM
Screen 11:	- Calcs to work out seed motor PWM
Screen 12:	- Calcs to work out FERT RPM
Screen 13:	- Calcs to work out FERT PWM

Report Menu:

1: In Main Menu scroll to REPORT .
2: Quick Press "ON" to enter REPORT Mode.
3: Use the ▲ or ▼ keys to toggle scroll through the various Report screens eg:

        Screen 1:   - Displays job number + name+FERT and SEED names.
        Screen 2:   - Area worked in RUN mode.
        Screen 3:   - Distance travelled in RUN mode.
                                - Distance travelled in HOLD mode.
        Screen 4:   - Weight output for seed and fert.
        Screen 5:   - Time moving in RUN mode.
                                - Time stopped in RUN mode.
        Screen 6:   - Time moving in HOLD mode.
                                - Time stopped in HOLD mode.
        Screen 7:   - Total time spent on this job.
        Screen 8:   - Wheel turns in RUN mode.
                                - Wheel turns in HOLD mode.
        Screen 8:   - Measurements used for this job. Wheel size and width.
        Screen 9:   - JOB start time and date.
        Screen 10:   - Details of the material spread

4: While at the first report screen hold down the ▼ key to view the report of the next job. (PRO meters only)
5: While at the first report screen hold down the ▲ key to view the report of ALL jobs total. (PRO meters only)
6: Quick press "ON to Exit to Main Menu.

Clearing the Meter.
*Hold the Reset key down for 5 seconds to delete the current job information.

Reset all Jobs:
1: Turn FIELD MATE tm Off.
2: Hold down the ▼ key, "RESET ALL JOBS" is displayed and a scroll bar
   counts across at the bottom of the screen.
3: Repeat step 2, 3 times to reset all the job totals.
4: The reset is complete when "RESET ALL JOBS DONE" is displayed.

Using the "FieldMate Reporter" software.

Use this application to down load Job information from any PRO series Meter.

   1: Connect the Meter to the down load cable attached to the office PC.
      A : The Meter should connect to a DB15 cable
      B : The DB15 cable connects to a USB serial converter with DB15 adaptor fitted.
      C : The USB coverter is connected to the USB port of the office PC.

   2: Start the FieldMate Reporter software by double clicking on the icon.
      Note: If the reporter software is not installed, install from the factory supplied CD, or
                down load the install files from *www.areameters.com* .

   3: Ensure that the FM-DRILL PRO is turned on. This software will automatically detect that a PRO version
      FieldMate area meter is connected. When this occurs the "DOWN LOAD *READY*" button is displayed.

   4: With the FM-DRILL PRO connected to the computer. Press the "DOWNLOAD READY" button. The
   data is instantly returned fromthe meter. At this point the "PRINT" and "SAVE" buttons will be enabled.
      Note 1 :   If a " DOWNLOAD READY " button is not observed, check that the comm port that is
                   connected to the FM-DRILL PRO is the correct port. If required select the correct comm
                   port using the "Connect Port" button.

   5: Once the job info is down loaded, click on the job buttons to display the work done for each job.

   6: To save the job info to a file press the "File Save" button.

   7: Any or all job data can be printed at any time, using the "Print" button..

   8: The Field Mate Reporter Application will only operate with the PRO.
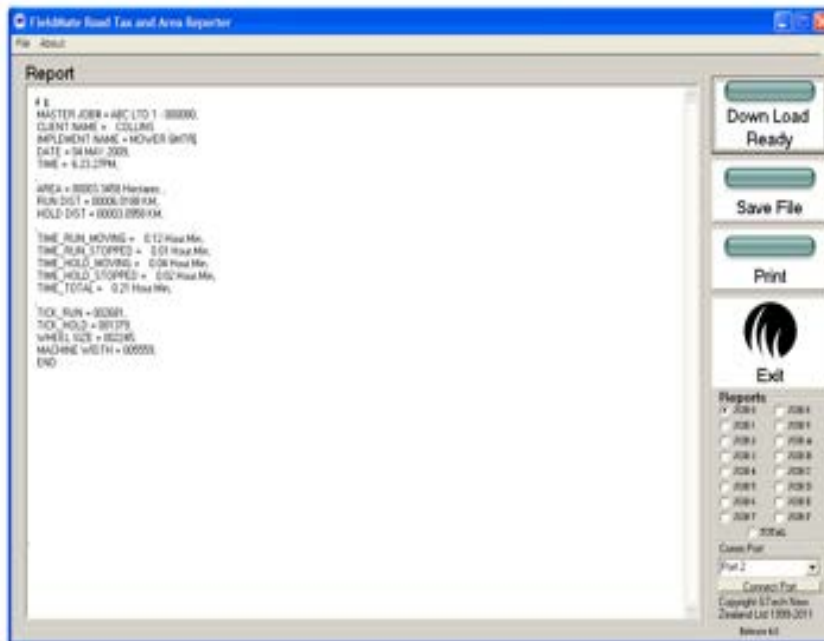
**The FieldMate Area Meter can record all your machine based agricultural activites,
making invoicing and job tracking a breeze.**

Example of A job report

```
0
MASTER JOB# = EDRIVE 123  - 000001,
CLIENT NAME =                ,
IMPLEMENT NAME = E SEEDER    ,
DATE = 04.FEB.2013,
TIME =  8.50.47PM,
,
 AREA = 00000.0000 Hectares ,
,
SEED DRILLED WEIGHT = 0000000.00 KG ,
,
FERT DRILLED WEIGHT = 0000000.00 KG ,
,
 RUN DIST = 00000.0000 KM,
 HOLD DIST = 00000.0000 KM,
,
 TIME_RUN_MOVING =     0.00 Hour.Min,
 TIME_RUN_STOPPED =    0.00 Hour.Min,
 TIME_HOLD_MOVING =    0.00 Hour.Min,
 TIME_HOLD_STOPPED =    0.00 Hour.Min,
 TIME_TOTAL =    0.00 Hour.Min,
,
 TICK_RUN = 000000,
 TICK_HOLD = 000000,
 WHEEL SIZE = 000200,
 MACHINE WIDTH = 003000,
 SEED MOTOR PULSES = 000008,
 SEED COLTER RATIO = 021000,
 FERT COLTER RATIO = 021000,
,
 Seed.,
 Seed Number = 000001,
Name = SEED???????,
 SEED WEGHT = 00150.0 GRAMS,
 SEED RATE = 0005.00 KG/HA,
,
 Fert.,
 Fert number = 000004,
Name = FERT???????,
 FERT WEGHT = 00750.0 GRAMS,
 FERT RATE = 0100.00 Kg/HA,
 END
```

Special job tracking number

Date and time of job

Area drilled, plus weight of material planted

Break down of hours spent on this job ...

Configuration of seed drill use to generate this report

Seed details of type, weight and rate.

Fert details of type, weight and rate.

Example of configuration

(Press any arrow key during boot up while connected to the "Field Mate Reporter" application to obtain this report)

```
 GENERAL SYSTEM DATA:,
wheel_circumference = 000200,
speedo_debounce_limit = 000015,
run_hold_sensor = 000001,
drill_width = 003000,
backlight_mode = 000001,
unit_type = 000001,
lcd_contrast = 000022,
PWM_Enabled = 000000,
motor_1_connected = 000000,
motor_2_connected = 000000,
drill_wheel_pulse_rev = 000003,
Reference_speed = 000004,
reference_rpm = 000005,
machine_model = 000052,
speed_hours_moving = 000006,
speed_hours_run_stopped = 000735,
speed_hours_hold_moving = 000000,
speed_hours_stopped = 000000,
Support number = 0211535759 ,
,

,
SEEDER SETUP VARIABLES:,
seed rate = 000500,
fert rate = 010000,
drill_width = 003000,
shaft_1_rpm_limit = 000300,
seed max rpm = 022000,
seed min rpm = 000010,
seed max colter rpm = 000000,
seed min colter rpm = 000000,
fert max rpm = 022000,
fert min rpm = 000010,
seed motor to colter ratio = 021000,
fert motor to colter ratio = 021000,
speedo_pulse_count_per_distance = 000001,
shaft_1_rev_pulse (seed) = 000008,
shaft_2_rev_pulse (fert)= 000008,
seed_stopped_pwm = 010000,
chain_stopped_pwm = 010000,
shaft_update_time = 000001,
seed_motor_pwm_update_rate = 000005,
fert_motor_pwm_update_rate = 000004,
max fert motor rpm = 022000,
max seed motor rpm = 022000,

,
SEED PRODUCT SETTINGS:,

,
 Seed Material #000001,
 Name = SEED???????,
 Seed Weight = 00150.0 GRAMS,
 RATE = 0005.00 KG/HA,          ........................  reports all 20 seed types stored in the system

,
 FERT PRODUCT SETTINGS:,

,
 Fert Material #000001,
 Name = FERT???????,
 Fert Weight = 00200.0 GRAMS,
 FERT RATE = 0005.00 KG/HA,          ........................  reports all 20 fert types stored in the system
```

User System Settings from SETUP Menu.

☐

CONTRAST	25
DEBOUNCE	10
RUN/HOLD	EXTERN HIGH
DISTANCE PULSE	
WIDTH	

☐☐

DATE	Now !
SUPPORT	
UNIT ID	
TIME	Now !
SEED UPDATE	

☐☐☐

FERT UPDATE	
MAX SEED RPM	
MAX FERT RPM	
MIN SEED RPM	
MIN FERT RPM	

☐☐☐☐

SEED RATIO	
FERT RATIO	
SEED PULSE	
FERT PULSE	
LOW SEED	

☐☐☐☐☐

FAN ALARM	
ALARM BUZZ	
SPEED LOCK	
SPEED PULSE	
SPARE 4	

☐☐☐☐☐☐

RATE ALARM	
AUTO SAVE	
SEED STOPPED	
FERT STOPPED	
IMP NAME	

☐☐☐☐☐☐☐

SPARE 5	
SPARE 6	
SPARE 7	
RPM CONSTANT	906
SPARE 8	

"FIELD MATE" EXPRESS LIMITED WARRANTY AND LIMITATION OF LIABILITY AGREEMENT

Where the word "FIELD MATE™" Area Meter appears it means the "FIELD MATE™" Area Meter circuit board which includes a hard ware component and a leased Firmware component and/or Field Mate Download Application, enclosure and wiring assembly only. Does not refer to any additional wiring added to the "FIELD MATE™" Area Meter system during installation. The Firmware running in the "FIELD MATE™" Area Meter and/or Field Mate Download Applicationis a zero fee leased copy and is not part of the "FIELD MATE™" Area Meter purchase agreement. The Firmware and/or Field Mate Download Application lease runs for the life of the product. G-Tech NZ Ltd remains the sole owner of the Firmware running in the "FIELD MATE™" Area Meter and/or Field Mate Download Application.

Express Limited warranty.

G-TECH NZ LTD warrants the "FIELD MATE™" Area Meter to be free from defects in materials and workmanship for a period of 12 months from the original date of sale to the end user or for a period of eighteen months from the date of factory shipment, whichever is sooner. If the product fails, customers should at their cost return the "FIELD MATE™" Area Meter to G-TECH NZ LTD. At the exclusive option of G-TECH NZ LTD , to either :

    (a)   Repair the "FIELD MATE™"Area Meter .

    (b)   Replace the "FIELD MATE™" Area Meter .

    (c)   If G-TECH NZ LTD is unable to replace / repair or correct firmware or hardware errors, G-TECH NZ LTD will refund the price paid for the "FIELD MATE™"Area Meter .

These are your sole remedies for any breach of warranty.

The warranty does not apply to "FIELD MATE™" Area Meter's which have been improperly installed, subjected to extremes beyond the limits of G-TECH NZ LTD specifications, or which have been physically damaged. Nor does it apply to "FIELD MATE™" Area Meter's found to be defective due to abuse, electrical discharge, under temperature, over temperature, improper power application , damage resulting from acts of war or any damage incurred due to acts of nature, salt or fresh water immersion or spray, or improper or unauthorized repair. Freight charges for products returned to G-TECH NZ LTD should be pre-paid by the customer. G-TECH NZ LTD will prepay freight charges for returning the "FIELD MATE™" Area Meter to the customer, provided that the "FIELD MATE™" Area Meter proved defective under the terms and conditions of the warranty.

Note:
Non G-TECH NZ LTD authorized individuals are discouraged from performing repairs on G-TECH NZ LTD products. Opening of the product by unauthorized individuals will void the product warranty. Damage incurred as a result of non G-TECH NZ LTD service attempt will be considered abuse and repairs will not be covered under warranty or standard repair pricing by G-TECH NZ LTD .

Limitation of liability

In no event will G-TECH NZ LTD or any person involved in the creation, production or distribution of the G-TECH NZ LTD "FIELD MATE™" Area Meter be liable to you on account of any claim for any damages including any lost of profits , lost savings, or other special, incidental, consequential, or exemplary damages, including but not limited to any damages assessed against or paid by you to any third party, rising out of the use, liability to use, quality or performance of the G-TECH NZ LTD "FIELD MATE™" Area Meter , even if G-TECH NZ LTD or any such person or entity has been advised of the possibility of damages or for any claim by any other party. ***G-TECH NZ LTD total liability under any provision of this agreement is in any case limited to the amount actually paid by you for the "FIELD MATE™" Area meter.***

Description of other rights and limitations.

Limitations on reverse engineering, Decompilation and Disassembly. You may not reverse engineer, decompile, disassemble or upload the Firmware.

Rental. You may not rent or lease the "FIELD MATE™"Area Meter .

Copyright. All title and copyrights in and to the "FIELD MATE™"Area Meter , the accompanying printed material and copies of the firmware are owned by G-TECH NZ LTD. You may not copy the printed material accompanying the "FIELD MATE™" Area Meter . All rights not specifically granted under this agreement are reserved by G-TECH NZ LTD.

ACCEPTANCE OF TERMS

I the under signed Purchaser of the "FIELD MATE™" Area Meter computer have read the above Warranty and Limitations of liability Agreement and agree to the conditions and limitations as stated above.

Unit Serial Number   :   ....

Start Date of Agreement   :   ....

Purchaser Company Name   :   ....

Purchaser Address   :   ....

                                    ....

Purchaser Name Printed   :   ....

Purchaser Signed   :   ……………………………….……………………..