Tramline Manual

www.areameters.com

FIELD MATE®

IMPORTANT:
To obtain the highest Precision Surface Area / Work done Measurement:

- The Speed sensor must be mounted on a wheel that is not subject to slip or spin during the Surface Area Measurement mode. ie: When not in Hold mode.
- If Radar pulse is used calibrate the Monitor over a extact 100 meter or more distance.
- Straight line operation is best suited to surface area mesurement as tight turns of implement / vehicle will result in a lesser or greater number of wheel turns. High precision mesurement is best achieved by working to straight lines.
- When using a Radar as a distance measurement device the area measurement is limited by the error of the radar system.
- Wheel size and implement working width should be measured as required to ensure the sizes used by the monitor reflect the real world sizes of the implement / vehicle. It is the users responsiblity to ensure the sizes in the monitor 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.

Warranty :

1 Year return to factory Warranty on Area Meter, sensors and Downloading support hardware.
Please ensure you agree to the warrantry conditions before proceeding to purchase this product,
read the warranty form at the end of this user guide.

Please Note :
Extend your warranty by 12 months by sending pictures of your machine with the FieldMate installed on it. Pictures of your machine, sensors mounting, monitor mounting , any comments about the product or service. We will used the pictures of your system to show other people how the FieldMate systems are being used. If you agree to give us permission for the unlimited use of your pictures/movies or comments in any of our advertising material we will extend your System warranty by 12 months.

Send the pictures or movies or comments to <u>sales@areameters.com</u> for your extended warranty.

EMI Emmisssion Certification:

Electro magnetic interference emmission certification are a series of tests that required to be passed before an electronic device can be sold. These test are related to how much electron magnetic radiation is emmitted by an electronic device.
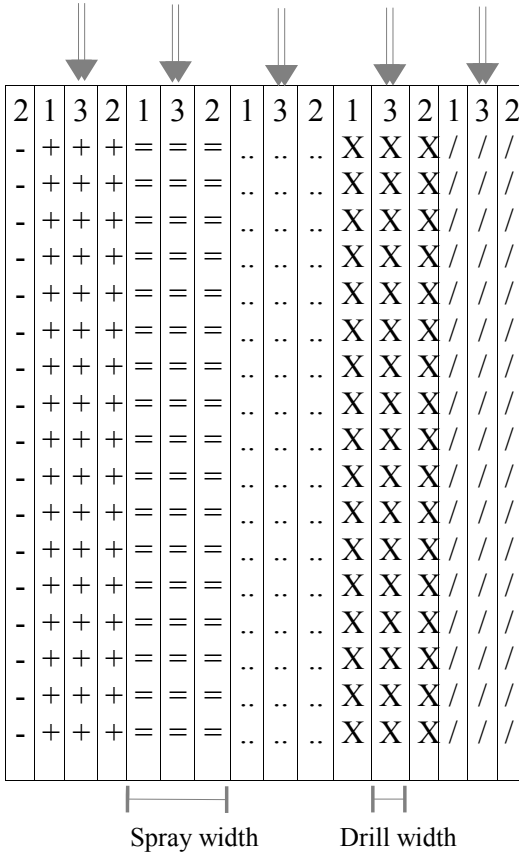
The Area meter has the following certifications and is suitable for sale in the following countries:

Certification	Countries
C-Tick Z874 Class B	New Zealand, Australia

Tramlining Examples

Tramlines on

Start here...

2	1	3	2	1	3	2	1	3	2	1	3	2	1	3	2
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/
-	+	+	+	=	=	=	..	..	..	X	X	X	/	/	/

Spray width   Drill width

Tramlining with 2 colter valves in EQUAL mode.

The spray boom is 3 drill widths wide.
The tramlining SET number will be 3.

The middle drill pass will have the tramlining control active, (swath 3).

Note: Align the tramlining system by starting with the swath set to 2.

The tramlining meter will display the following when the job starts:

Tramline	
Swath	Set
2	3

"Hold" to turn unit ON/OFF.
Or "Quick Press" to Select options.

"Hold" to adjust Tram count Up/Down.
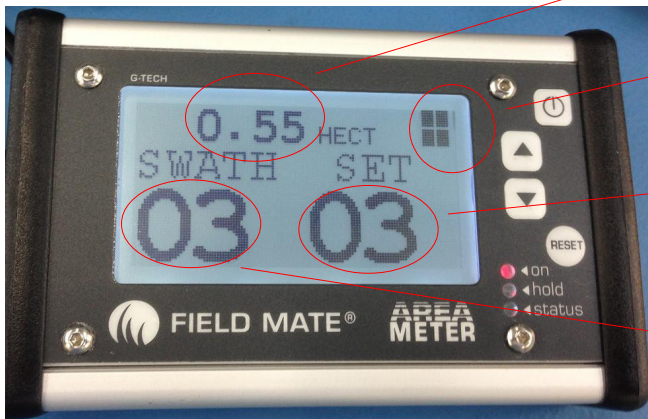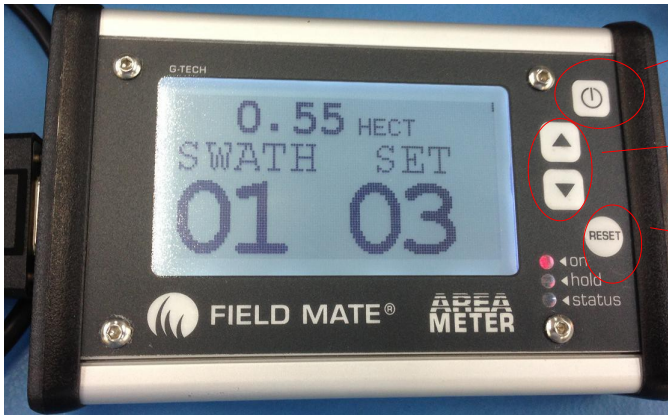Or "Quick Press" to navigate the menus.

"Hold' to reset the monitor.
Or "Quick Press" to switch between manual or automatic tramline counting mode.

Area Drilled

Tramlining indicator

Tramline Set number. Set by the user.

Swath count. Counts up as the drill lifts up.

Pin outs 12 Pin plug:

Pin	Function	Colour
1	Earth	Black
6	Speed	Yellow
5	Run/Hold	White
3	Shaft 1	Green
2	Shaft 2 / Low Seed	Brown
7	shaft 3 / Bale Counter	Red
4	Power	Blue
8	Tramline +	White/Green
9	Tramline -	Yellow/Brown
10	Solenoid +	Red
11	Solenoid -	Black
12	Spare	

Specifications:

Supply volts	:	5 – 30 Volts
Current	:	25ma
Tramline Current	:	max 2 amp loading (Heavy Duty System has 25Amp loading)
Solenoid Current	:	max 2 amp loading (Heavy Duty System has 25Amp loading)
Temperature	:	-5 to 55 degree/C
Input voltages	:	5 to 30 Volts
Area	:	999.999 hect
Distance	:	999.999 km
Wheel Size	:	999.9 cm
Width	:	9999.9 cm

Features:

-Tramlining control - Support Round and Line tramlining.
                 - Single or Double Colter clutches
                 - Disable and Manual over ride controls
-Area Calculator
-Report screen
-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 mount sticks to tractor window.
-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.
-Aluminum enclosure.
-All inputs high voltage protected.
-Various mounting choices.

Introduction:

The FIELD MATE Area Meter has been developed to calculate Land area, distance travelled etc, while tramline seed drilling. All measurements are in the metric, eg: hectares etc.

Tramlining is the crop drilling method that results in unplanted crop lines in the field being used to give guidance to a conventional Sprayer. The Spray boom length is matched to the drill planting width to ensure that the tramlines are correctly spaced.

A Sensor is mounted on the input shaft to the colter gearbox (or drill or tractor wheel)to allow area, distance and drill speed to be calculated. A second sensor is mounted on the drill pivot points to allow detection of the drill lifting, as occurrs when each drill swath (bout) is completed. (This pivot sensor is set to detect planting swath (bout) has been completed.)

The meter keeps track of how many bouts have been completed and controls the colter clutches accordingly. The meter supports single and dual colter clutch installations, round and line tramlining methods can be achieved with this meter.

The Meter computes and provides control for the Colter clutch only. (Your drill manufacturer can supply the drill colter clutches, the cutches are NOT part of the FM-TRAM or FM-TRAM PRO kit.) The meter is in RUN mode when drilling and is in HOLD mode when the drill is lifted high enough to make the pivot point sensor meet the magnet.

The FM-TRAM PRO holds 16 jobs that can be stored and downloaded into an office computer allowing for simple, tidy and easy paper work. All downloaded jobs carry a unqiue tracking number to make client job tracking easy.

Models

Pro and Standard version of the tramliner are available.

Pro versions allow 16 Job data transfer to PC.

EMI Emmisssion Certification:

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The Area meter has the following certifications and is suitable for sale in the following countries:
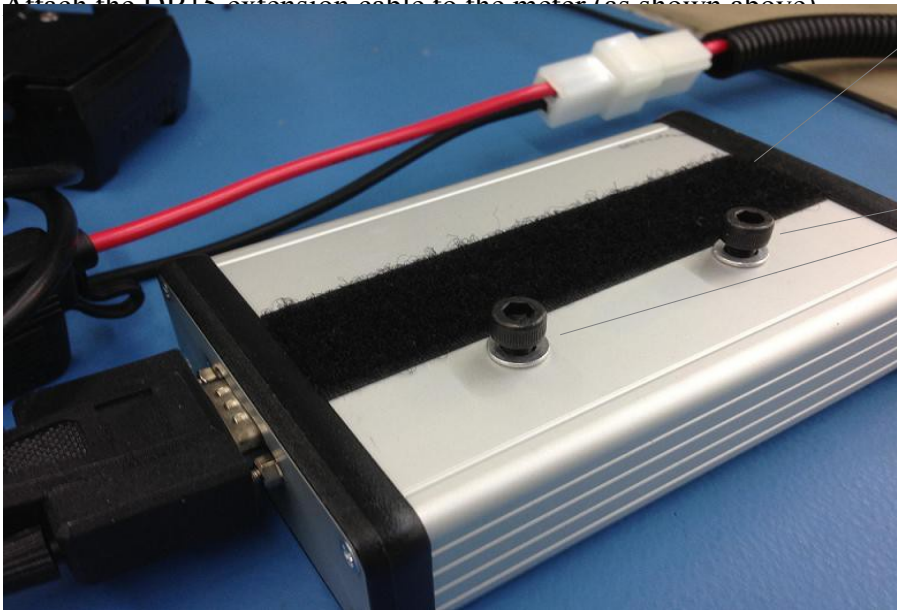
Certification	Countries
C-Tick Z874 Class B	New Zealand, Australia

1: Mounting:

The mounting options are velcro, Solid mounting and the ram mount.

Velcro mounting

Attach the DB15 extension cable to the motor (as shown above)

Solid mount screws

2: Connect Drive unit:

3.   Fit Run-Hold Sensor :

The Run/Hold sensor detects when the drill is drilling (Run Mode) or lifted up and not drillling (Hold Mode).
A Sensor is mounted on a pivot arm of the drill to detect if the drill is lifted up. This sensor is used to count the tramlining swaths.
Here is what we do to mount the Hold sensor :
1: Select a pivot arm to mount the Run/hold sensor to.
2: Mount a magnet to the pivot arm. The location of the magnet will be such that the Run-Hold sensor and magnet meet when the drill is lifted up. When the sensor and magnet meet the Monitor is in HOLD mode, and area recording will cease, and the Tramline count will increment by 1..
3: One wire of the Hold Sensor is connected to Ground, then other hold sensor wire is connected to the hold sensor input wire.

Help: Use a multimeter to test the run/hold sensor, triggering occurs when the magnet meets the end of the sensor. Lift cutter unit up and down to, switch closes when the cutter is not cutting.

Sensor trigger Operation:

Magnet triggers sensor when passing this end.
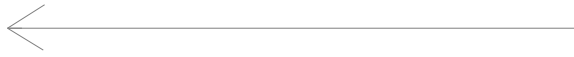
Sensor position   Hold sensor

## 4: Fit Distance pulse sensor:

Speed input pulse to the monitor can be supplied from either:
- Reed switch sensor pulse
- Radar pulse from tractor or radar sensor.

Refer to the below circuit for the place to connect the speed pulse.
The Speed pulse for the radar or reed switch input can be connected to either of the following connections.
- Pins 1 and 6 of the 12 way connector
Pin 1 is Ground, Pin 6 is signal

- Pins 1 and 3 on the 3 pin Radar input connector
Pin 3 is Ground, Pin 1 is signal
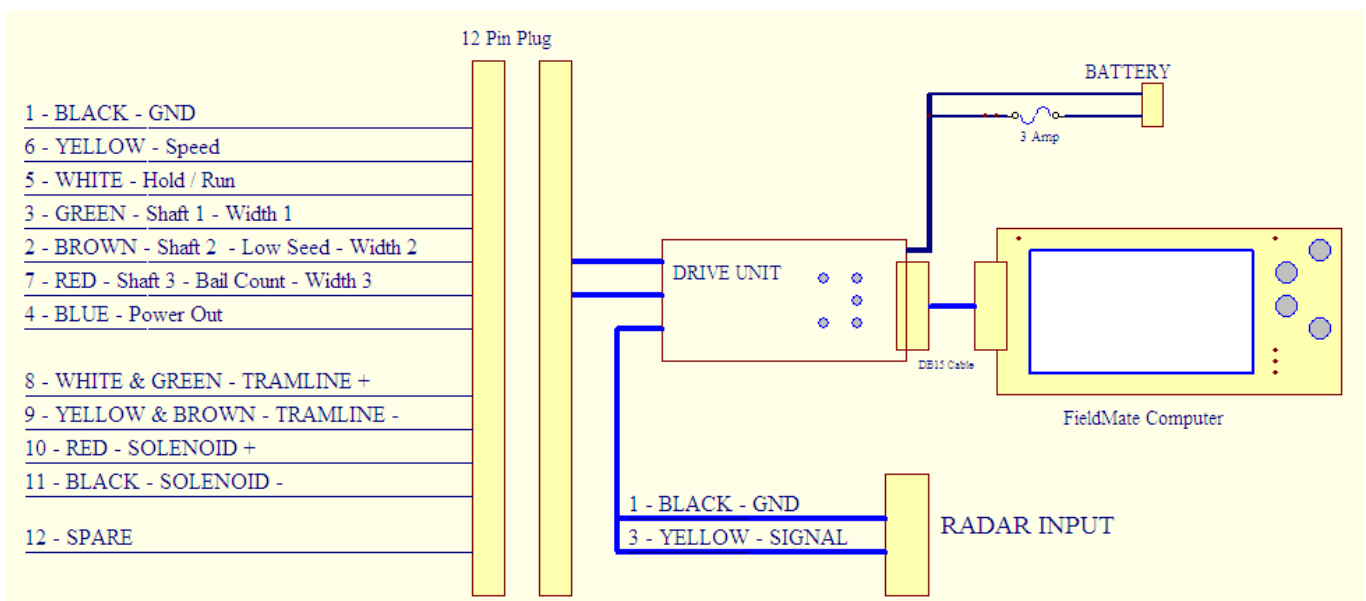
Reed Switch Speed Sensor Installation

Distance sensor installation:

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 monitor will compute speed, area, rate and distance drilled.

Mounting option to suit a RUN/HOLD setting of "SPEEDO":

This mounting method will see the distance sensor get mounted to monitor the magnet attached to the drill metering shaft gearbox INPUT . This shaft will stop turning when the drill is lifted at the headlands.

NOTE:The Speed sensor must be mounted on a WHEEL OR SHAFT that is not subject to slip or spin during the Surface Area Measurement mode. ie: When in RUN mode.

Below are pictures of this type of installation. The "RUN/HOLD" setting is "SPEEDO" for this sensor mounting choice. When the drill is lifted to stop planting, the magnet mounted onto the drill colter shaft gearbox input shaft will stop rotating; the monitor will detect this, the speed is then set to zero and lastly the meter will go into HOLD mode.
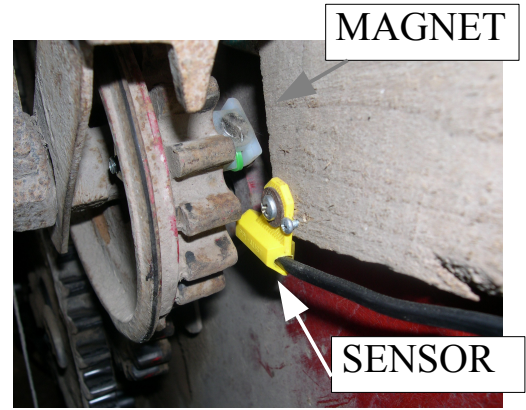
MAGNET

SENSOR

The above drill had the distance sensor magnet mounted on a shaft that rotated once every 15 meters. The magnet should pass the end on the sensor. An air gap of up to 1cm is allowed between the sensor and magnet.

Measure the distance travelled by the drill for one distance sensor pulse.

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. Stop immediately when 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 measurement into the PULSE DIST screen.

                    Distance pulse sensor calibration is complete !

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.
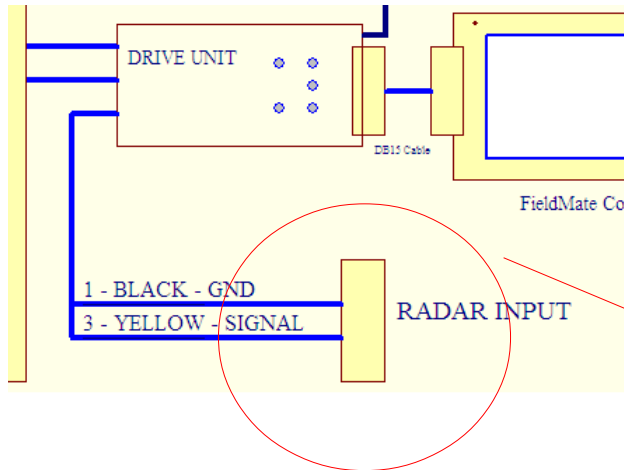
Other places that the distance sensors can be located.

The above installation is on a Great Plains drill.

Radar Speed Pulse Installation

Step 1: Connect the radar pulse. (Connect to either of these connections)

DRIVE UNIT

DB15 Cable

FieldMate Co

1 - BLACK - GND
3 - YELLOW - SIGNAL   RADAR INPUT

12 Pin Plug

1 - BLACK - GND
6 - YELLOW - Speed
5 - WHITE - Hold / Run
3 - GREEN - Shaft 1 - Width 1
2 - BROWN - Shaft 2 - Low Seed - Width 2

Connect the radar input into either of these connections.

Connect the RADAR pulse wire in to the "SIGNAL" or "YELLOW-SPEED" terminals as seen in the diagrams.

Note: If a radar ground Connection is not available it does not have to be connected.
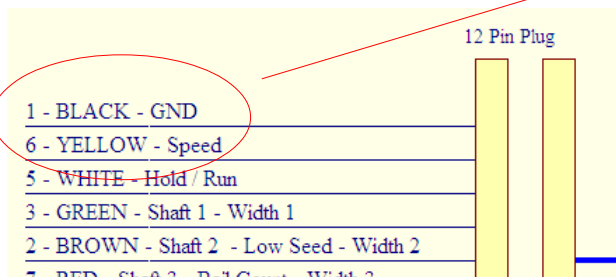
STEP 2: Set up the Radar Pulse count number

- When the Radar pulse wires are connected goto the SETUP screen.
  (From the MAIN screen press the down arrow 8 times)

- When "SETUP" is high lighted, then "quick press" the monitor ON/OFF button.

- Now you will be in the first SETUP screen. "CONTRAST" will be the first item in this
  Screen. Press the the down arrow "31" times until "SPEEDO PULSE " is high lighted.

- Hold any "ARROW" button down to enter the "SPEEDO PULSE" Screen.

- When in the "SPEEDO PULSE" screen use the arrow buttons to set the pulse count to 50.
  Once the setting is 50, then press the On/Off button "twice" to exit the screen to the main
  menu.

STEP 3: <u>Set up the distance Travelled for the "50" Radar Pulses.</u>

- When "SETUP" is high lighted, then "quick press" the monitor ON/OFF switch.

- Now you will be in the first SETUP screen. "CONTRAST" will be the first item in this
  Screen. Press the the down arrow "3" times until "DIST PULSE" is high lighted.

- Enter DIST PULSE by holding down any ARROW button.

- Set the DIST PULSE number to "50.0" cm using the ARROWS buttons.

- Once the setting is 50.0 cm, then press the On/Off button "twice" to exit the screen to the
 Main menu.

STEP 4: <u>Drive 100 meters... Verify 100 meters is travelled.</u>

- When "SETUP" is high lighted, then "quick press" the "UP" arrow 3 time to "DISTANCE".

- With "DISTANCE" high lighted quick press the ON/OFF button once.

- Quick press the down ARROW button until the "DISTANCE TOTAL" is displayed. Zero this
  number by holding the RESET switch down for 5 seconds.

- Drive the 100 meters that has been pre measured.

!!!! If 100 meters is not recorded on the monitor, then adjust the DIST PULSE number until the
Monitor measures 100 meters in this test.

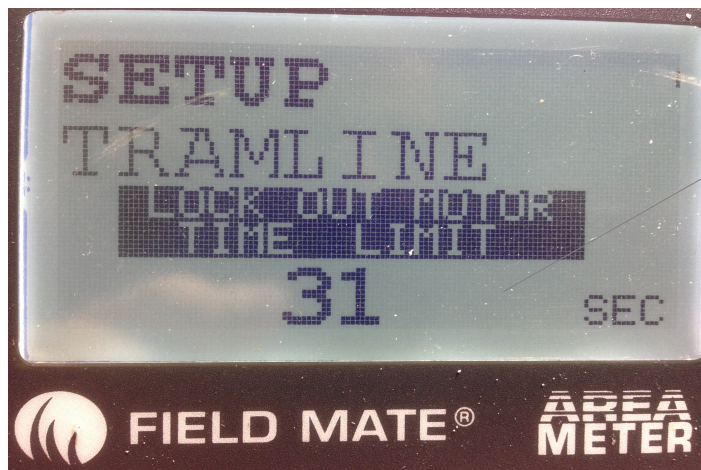# 7: Set Power cut out for linear actuator motors:

Set the amount of time that power is applied to the linear actuator motors. The motor is powered for the time set in the set up screen.
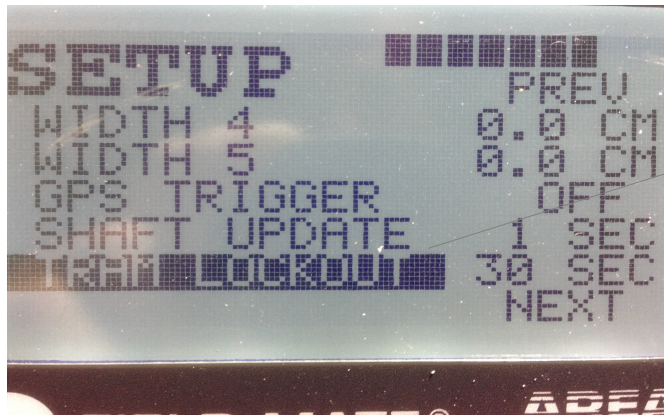
Goto the last screen in the set up menu.

High light the option.

Select the option by holding down any arrow button.

In the timer set up screen , use the arrow keys to select the on time for power to be applied to the actuator motors.

Note: The motors will power up for this time only when going into and out of tramline mode. Set this time to ensure the motor has time to fully close or open.
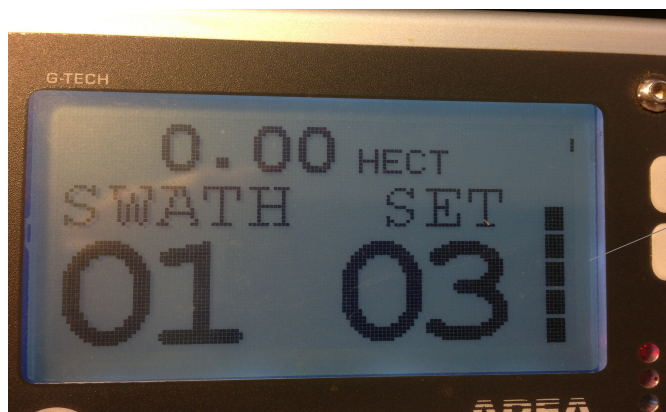
This bar graph will count down on the main screen to indicate when power is applied the motor.

When the graph disappears off the screen the power is no longer applied to the motor.

8: Wire the Tramlining Motor/s and Solenoid:

Connect the linear actuator motor wires to this connector pins 8 and 9. Wire the polarity of the motors as required to get the open or close state of the actuators correct.

Connect the Soleniod to the Pin 10 and pin 11.

12 Pin Plug

1 - BLACK - GND
6 - YELLOW - Speed
5 - WHITE - Hold / Run
3 - GREEN - Shaft 1 - Width 1
2 - BROWN - Shaft 2 - Low Seed - Width 2
7 - RED - Shaft 3 - Bail Count - Width 3
4 - BLUE - Power Out

8 - WHITE & GREEN - TRAMLINE +
9 - YELLOW & BROWN - TRAMLINE -
10 - RED - SOLENOID +
11 - BLACK - SOLENOID -

12 - SPARE

D

1 - BL
3 - YE
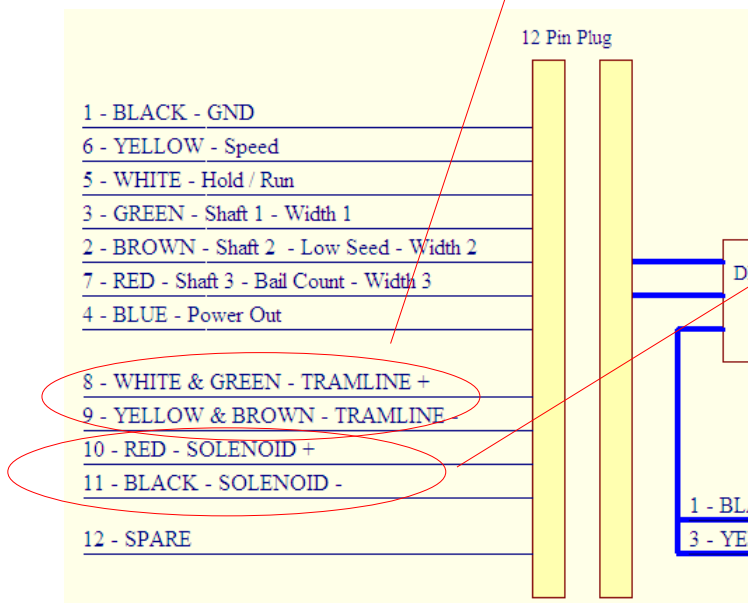
9: Set the Tramling Control

STEP 1: Set the TRAMLINE TYPE to EQUAL.

- When "SETUP" is high lighted, then "quick press" the monitor ON/OFF switch.

- Now you will be in the first SETUP screen. "CONTRAST" will be the first item in this
  Screen. Press the the down arrow "18" times until "TRAM TYPE" is high lighted.

- Enter the "TRAM TYPE " screen by holding down any ARROW button.

- Set the 'TRAM TYPE" to "EQUAL" using the ARROWS buttons.

- Once the setting is "EQUAL", then press the On/Off button "twice" to exit the screen to the
  Main menu.

STEP 2: Set the TRAMLINE SWATH count.

- When "SETUP" is high lighted, then "quick press" the monitor ON/OFF switch.

- Now you will be in the first SETUP screen. "CONTRAST" will be the first item in this
  Screen. Press the the down arrow "19" times until "TRAM SWATH" is high lighted.

- Enter the "TRAM SWATH" screen by holding down any ARROW button.

- Set the 'TRAM SWATH" to the swath number count you want to tramline on. EG " 3 ".
Adjust the swath line count using the ARROWS buttons.

- Once the set, then press the On/Off button "twice" to exit the screen to the
 Main menu.

Scroll Main Menu:

Using the ▲ or ▼ buttons move up and down the menu options. The double size text is the selected menu. Enter any of the selected menu items by a quick press of the "ON" button.

Job Menu:

Selecting a JOB:

This is done when a job is to be reset or restarted. A FieldMate FM-DRILL 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.

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
- DISTANCE
- RATE Hect/Hr
- SPEED
- Low Seed Alarm Status (optional)

4a: Delete the displayed total by holding down ▲ or ▼ keys for 6 seconds.
4b: In Option screens holding down the ▲ or ▼ for 6 sec turns the alarm on/off.
5: Use the ▼ key if the"Run Hold Mode" is "Keys", to switch the Field Mate
    into/out of Hold.
6: Quick press "ON to Exit to Main Menu.

Area Menu:

1: In Main Menu scroll to AREA .
2: Quick Press "ON" to enter AREA Mode.
3: Use the ▲ to display the following information types:
- AREA. Area amount for the current job.
- AREA SUB. Sub area total that can be reset anu time.
- AREA Total. Area of all jobs done by the meter.
4: Use the ▼ the key if the"Run Hold Mode" is Keys to switch the Field Mate into and out of Hold.
5: Quick press "ON to Exit to Main Menu.

Distance Menu:

1: In Main Menu scroll to DISTANCE .
2: Quick Press "ON" to enter DISTANCE Mode.
3: Use the ▲ to display the following information types:
- DISTANCE Sub Total. Total distance calculated for the selected job.
- DISTANCE Total. Accumulated distance of area for all jobs worked.
4: Use the ▼ key if the"Run Hold Mode" is "Keys", to switch the Field Mate
    into and out of Hold.
5: Quick press "ON to Exit to Main Menu.

Speed Menu:

1: In Main Menu scroll to SPEED .
2: Quick Press "ON" to enter SPEED Mode.
3: Use the ▲ key to display the following information types:
- RATE , Hect/Hr.   - Time in Run mode.
- Time in Hold mode.   - Total job time.
- Max speed.   - Average Speed.
- Temperature.   - Time.
- Date.   - Area of current job.
- Distance or current job.   - Working machine width.
- Speedo displayed on full screen.
4: Delete the displayed total by holding down ▲ or ▼ keys for 6 seconds.
5: Use the ▼ key if the"Run Hold Mode" is "Keys", to switch the Field Mate
    into and out of Hold.
6: Quick press "ON to Exit to Main Menu.

Calculator Menu: *Designed for Rectangle shape bondary area calculation only.*

1: In Main Menu scroll to CALCULATOR .
2: Quick Press "ON" to enter CALCULATOR Mode.
3: Use the ▲ key to toggle between LENGTH and WIDTH distance recording.
   While in Length or Width mode, if the machine travels, regardless if in Run
   or Hold mode the distance is recorded to that total.
4: Press the ▼ key to display the AREA result of the Width and Length
   distances. In area mode the WIDTH or LENGTH numbers are not effected by
   the machine moving.
4: Delete the displayed total by holding down ▲ or ▼ keys for 6 seconds.
5: Quick press "ON to Exit to Main Menu.

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 extremly slow coulter shaft typically set to 10% .
   - RUN / HOLD. The meter will go into HOLD mode as define be the setting here. For a Seed Drill,
                  RUN/HOLD setting would be the "SPEEDO". When the when the Drill is drilling, the
                  colter gearbox input shaft turns, the meter is in RUN mode. The meter is in HOLD mode
                  when the colter gearbox input shaft stops turning.
   - WHEEL SIZE. Is the distance travelled by the drill each time the colter gearbox input shaft turns one
                  complete rev. This number is use to work out area, distance and drill speed.
   - WIDTH.   Is the drilling width of the drill. This number is used to work out area cut.

   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.
   - REPORT Data. Down load report control, this allows a Short or Long Job report format to be printed out.
   - TIME.   Set time here.

   Screen 3:
   - SEED STATE. If low the low seed alarm is selected, this setting allows for eeither a positive or negative
                  switching sensor when the seed is low.
   - Shaft 1 RPM. (Note**)
   - Shaft 2 RPM. (Note**)
   - Shaft 2 RPM. (Note**)
   - Bail Counter. (Note**)

   Screen 4:
   - TRAM TYPE. Select here tramlining mode:
            OFF -   Turns tramlinig off
            ROUNDS -   Used when "Round and Round" tramlings, with 2 colter clutches.
            EQUAL -   Used when "Straight Line" tramlings, with 2 colter clutches.
            LOCKED ON -   Lockes on tramlining clutches
            RESET -   Resets all Tramling bout counts.
            TWICE -   Used when "Straight Line" tramlings, with 1 colter clutch.
            ROUND TWICE - Used when "Round and Round" tramlings, with 1 colter clutches.

   Continued next page ...

- TRAM SWATH. Set the tramlinind bout count control.
  Both the "ROUND" and "ROUND TWICE" setting format are displayed as a number "A .B". Where A is the Swath count and B is the number of times the drill goes into hold to make an increase in the A number. When current " A .B" number matches the set "A .B" number the Tramlining solenoids will operate.
  Both the "EQUAL" and "EQUAL TWICE" setting format is displayed as a number "A". Where A is the Swath count, as the drill goes into hold the A number increases. When current "A" number matches the set "A" number the Tramlining solenoids will operate.
- SEED DEBOUNCE. Used when calculating the seed weight per hectare. This unit is in seconds and is used to prevent switch bounce on the slow turning colter shaft. Typical value 5 sec. (Optional*)
- SEED WEIGHT. Used when calculating the seed weight per hectare. This unit is measured in grams and is the amount of seed planted per coulter shaft rotation. This number is worked out by:
- Filling the drill with seed
        - Turn the coulter shat 1 complete rev and catch the seed output by the colter shaft.
        - Weigh the seed.
        - Enter the seed weight into this menu setting. The weight entered here is gram units. (Otional*)
- SEED COMPARE. The user can enter a seed planted weight. Once that amount of seed has been planted, the alarm will sound for 5 seconds. The Seed Compare Weight typically would match how much seed has been put into the drill during a refill. The weight entered here is in .1kg units. (Optional*)
Screen 5:
- MULTI WIDTH. (Note**)
- Polarity.   (Note**)
- Width 1.   (Note**)
- Width 2.   (Note**)
- Width 3.   (Note**)

INFO Menu:

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 1: Support screen.
    - HELP DESK PHONE, displays phone number to ring if support is required. This number would typically be the dealer who sold the meter to you and as a result has all the answers to any questions you may have.
Screen 2: Speed system screen.
        More info see www.areameters.com
Screen 3: Model information.
        More info see www.areameters.com
Screen 4: System Information
        More info see www.areameters.com
Screen 5: Software Operation.
        More info see www.areameters.com
Screen 6: Software counters and controls
        More info see www.areameters.com
Screen 7: Software counters and controls
        More info see www.areameters.com
Screen 8: Software counters and controls
        More info see www.areameters.com
Screen 9: Shaft monitoring information
        More info see www.areameters.com
Screen 10: Software counters and controls. (note**)
Screen 11: Options enabled on this meter
        More info see www.areameters.com
Screen 12: System information to calculate Seed weight per Hectare. (note**)

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

** Note: Not required for a drilling operation.

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.
      Screen 2:   - Area drilled.
      Screen 3:   - Distance drilled.
      Screen 4:   - Time drlling.
                              - Time not drilling.
      Screen 6:   - Wheel turns while drilling (Run mode).
                              - Wheel turns while not drilling (Hold mode).
      Screen 7:   - Sizes used to calculate the area for this job.
      Screen 8:   - JOB Start date.
                              - JOB Start time.

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

Clearing the Meter.

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.

Reset all the Meter Totals:
1: Turn FIELD MATE tm Off.
2: Hold down the ▲ key, "RESET ALL TOTALS" is displayed and a scroll bar
   counts accross at the bottom of the screen.
3: Repeat step 2, 3 times to reset all the job totals.
4: The reset is completed when "RESET ALL TOTALS DONE " is displayed.

Using the Meter.

Here is how to get going:

      Setup the Meter in the Tractor.....
      1: Install the meter into the tractor.
      2: Install colter clutch or clutches at the correct spacing for the sprayer wheel base.
      3: Install a sensor on the Drill colter gearbox input shaft (or drill wheel).
      4: Install the RUN/ HOLD sensor on the drill. This sensor will detect when the drill is lifted up (not planting,
         HOLD mode) and down (planting, RUN mode). This sensor is used to count the SWATH or ABOUT count
         for tramlining modes.
      5: Enter the drilling width into the meter.
      6: Enter the distance travelled by drill per colter gearbox input shaft turn (or drill wheel turn).
      7: Enter the date and time in the meter.
      8: Select the Tramlining mode used.
      9: Enter the Tramling set number.

      Start Drilling .....
      1: Get to the paddock ready for drilling.
      2: Reset the job in the meter. (This will ensure that the last job drilled is cleared)
      3: Start the job.
      4: Depending on where the Tramlining Drilling is starting you may need to force the tramlining counts to a
         starting tramline number. This will line up the Tramlines with the sprayer for starting a new tramlining job.
         See Tramlining examples for the below for details.
      5: Job is now started , start drilling and at any time can easily see how much land has been cut, rate
         of cutting, time taken to cut area, speed etc. In the tramlining mode the the current tramling count is seen.
         When the meter is tramlining the meter will flash the status light and beep every second.
      6: When the job is complete see the job report by going to the Report Menu.
      Ready for next job ....

User System Settings from SETUP Menu.

☐

CONTRAST	25
DEBOUNCE	10
RUN/HOLD	EXTERN LOW
WHEEL SIZE	
WIDTH	

☐ ☐

DATE	
SUPPORT	
UNIT ID	
REPORT	
TIME	

☐ ☐ ☐

SEED STATE	
Shaft 1 RPM	-
Shaft 2 RPM	-
Shaft 3 RPM	-
Bail Count	-

☐ ☐ ☐ ☐

Tram Type	EQUAL
Tram Swath	3
Seed Debounce	-
Seed Weight	-
Seed Compare	-

☐ ☐ ☐ ☐ ☐

Multi Width	-
Polarity	-
Width 1	-
Width 2	-
Width 3	-

"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   :   ....