

**RFM 2200**

**2200 RFM Monitor**

**INSTALLATION AND  
OPERATING INSTRUCTIONS**

**HIGH PRESSURE VERSION 3.0x**

**LOW PRESSURE VERSION 3.0y**

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## PARTS LIST

REF	PART NO.	DESCRIPTION	QTY
1	A-2200/4RFM	RFM RICEMASTER MONITOR	1
2	A-2403RFM	RFM RICEMASTER CONTROLLER	1
3	AC-M6001-I	IMPLEMENT LOOM	2
4	AC-M6001-T	TRACTOR CABLE RFM RICEMASTER	1
5	AA-118	FLAT GREY MAGNET	1
6	AA-110P	REED TYPE SENSOR (PACKARD)	1
7	AA-112P	COIL TYPE SENSOR (PACKARD)	1
8	AH-861	SECURING KNOB ¼"	8
9	AH-406	MONITOR MOUNTING BRACKET	1
10	AH-415	MOUNTING BRACKET – METAL	2
11	AC-101F	8m LIGHT DUTY POWER CABLE FUSED	1
12	AA-105	MAGNET (PULLEY MOUNT) 10mm x 15mm	1
13	AM-200	FARMSCAN 2YR WARRANTY CARD	1

## OPTIONS PARTS LIST

PART NO.	DESCRIPTION OF KIT
2002	WHEEL SENSOR KIT (1 - 50 KPH)
2004	RADAR SPEED SENSOR KIT (1 - 49 KPH)
2004A	RADAR INTERFACE KIT
2007	SPEEDO CABLE SENSOR KIT (1 - 100 KPH)
2008	PROXIMITY SENSOR SHAFT (1 - 9999 RPM)
2009	TAILSHAFT SENSOR KIT (1 - 1500 RPM)
2030	FLOW SENSOR KIT (8 - 200 L/MIN)
2050	FLOW SENSOR KIT (50 - 500 L/MIN)
2015	PRESSURE SENSOR KIT (0 - 500 KPA)
2025	PRESSURE SENSOR KIT (0 - 2500 KPA)
2070	ENGINE WATER TEMP SENSOR KIT (40 - 120° C)
2080	AIR PRESSURE SENSOR KIT (0-25 KPA)
2034	PULLEY SENSOR KIT (50 - 9999 RPM)
2076	SHAFT SENSOR KIT (1 - 1500 RPM)
2077	SHAFT SENSOR KIT (50 - 9999 RPM)
2060	BIN / TANK LEVEL SENSOR KIT
2201	10M EXTENDED W/PROOF JUNCTION KIT
AC-205	2 WAY 5m SENSOR CABLE EXTENSION
AC-210	2 WAY 10m SENSOR CABLE EXTENSION
AC-305	3 WAY 5m SENSOR CABLE EXTENSION
AC-310	3 WAY 10m SENSOR CABLE EXTENTION
AP-105	12 WAY BREAKAWAY PLUG
AP-106	12 WAY BREAKAWAY SOCKET

## 1.0 INSTALLATION

### 1.1 MONITOR INSTALLATION

The RFM MONITOR should be installed in the cab, clearly visible to the operator but not subject to intense heat or moisture.

Keep the unit away from radios or other electronic equipment to minimize any risk of interference. As a precaution all connection cables should take an alternative route to other cables in the cab; especially antennae cables or clutch, solenoid and engine kill switch cables.

Mount the unit firmly on the bracket using securing knobs supplied. Don't use substitute bolts into the unit.

## 1.2 POWER CONNECTION

Do not connect power until all other installation is complete.

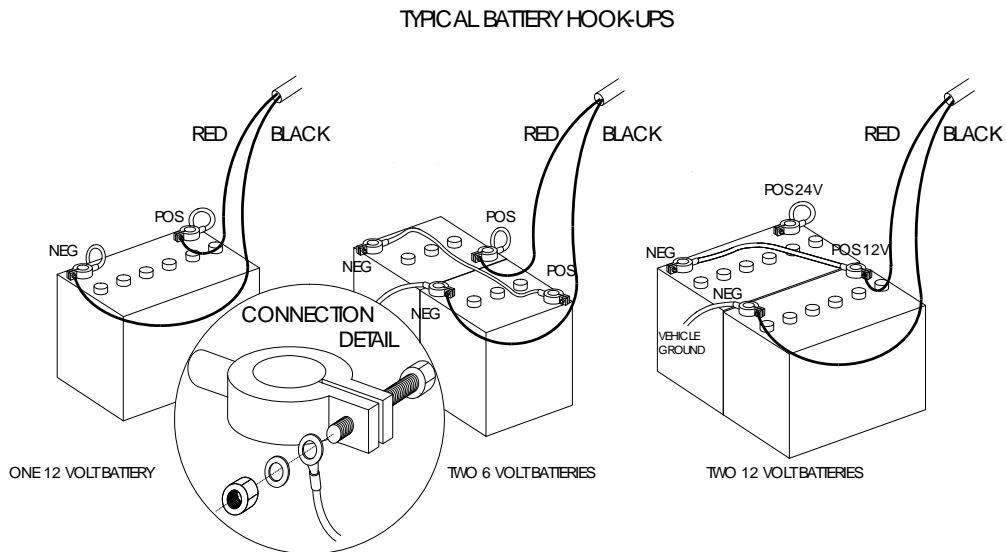
The 8 metre **power cable** must be connected **direct** to 12 volt DC vehicle battery terminals.

**DO NOT** join power cable with any other electrical equipment or the vehicle chassis, this may cause interference.

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

Connection to battery terminals must be clean and tight.

**WARNING** - Remove green connector plug at rear of monitor if arc welding on machinery.



Connect power cable to pins 10 & 11 of green connector plug as shown on next page.

## 1.3 SENSOR CONNECTIONS AND WIRING

All Farmscan sensor wires have a common colour code system.

WHITE	=	SIGNAL
BLACK	=	GROUND (COMMON)
RED	=	+ 12V SUPPLY

Some sensors such as wheel sensors and shaft sensors only have two wires (signal and ground).

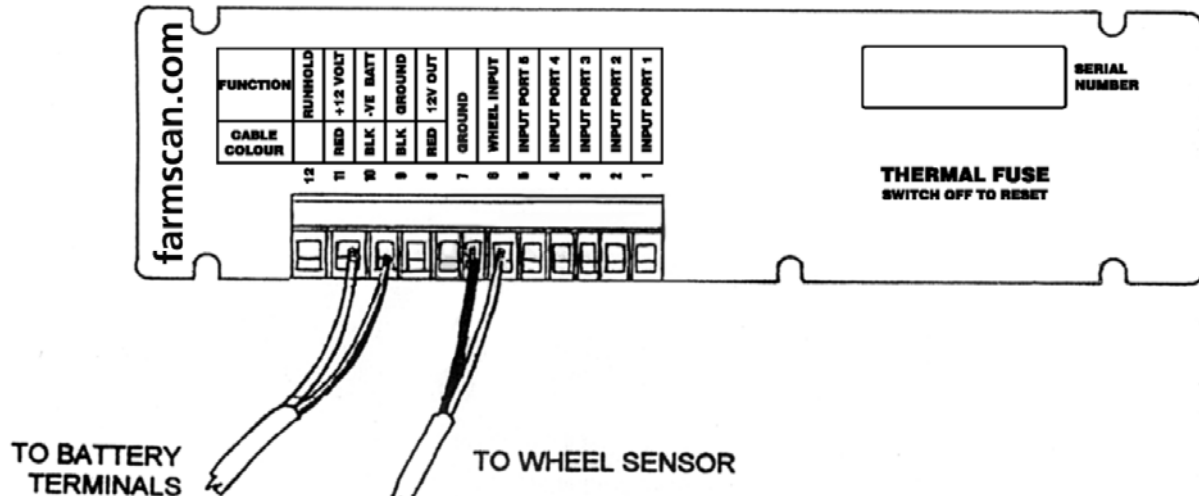
Other sensors that require +12 volts as well as signal and ground will have 3 wires, such as flow sensors, bin level sensors and radar speed sensors.

Look at the back panel of the RFM MONITOR you will see that PORTS 1 - 5 and the **wheel** input connections are marked to accept the **white** signal wire from the relevant sensor.

The **black** wires (common) from each sensor can be connected together and shared between pins 7 or 9.

e.g. In the drawing the wheel sensor is connected to Pin 6 (white) and Pin7 (black)

### 2200 RFM

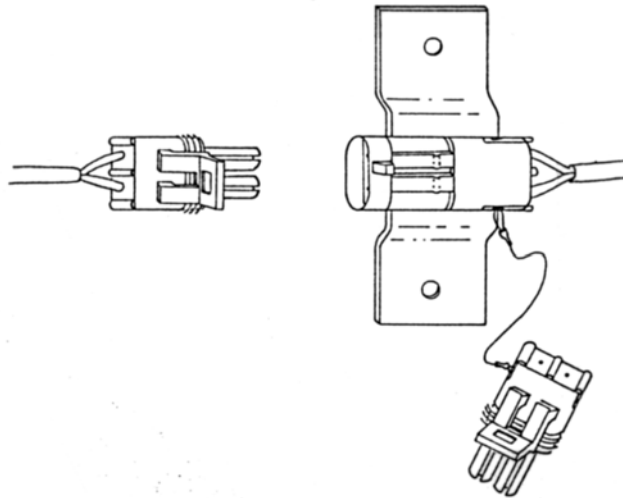


If a **flow sensor** with 3 wires was connected to Port 5, the connection would be as follows:

WHITE WIRE	TO	PIN 5 (PORT 5 SIGNAL)
BLACK WIRE	TO	PIN 9 (COMMON)
RED WIRE	TO	PIN 8 (+12 V OUT)

## 1.4 SENSOR CABLING

Each sensor is supplied with a 5 metre length of 2 way or 3 way cable with weatherproof sealed connector at the sensor end. A bracket and clip is supplied to mount the connector at the rear of a tractor if using the cable as a breakaway implement connection.



If using cables as an implement breakaway, be sure to join the dust plugs when the implement connection is in use.

Extension cables are available in 5 or 10 metre lengths with matching connectors and dust caps.

### OPTIONAL EXTENSION CABLES

AC - 205	2 WAY / 5 METRE EXTENSION CABLE
AC - 210	2 WAY / 10 METRE EXTENSION CABLE
AC - 305	3 WAY / 5 METRE EXTENSION CABLE
AC - 310	3 WAY / 10 METRE EXTENSION CABLE

When multiple sensors are used on an implement, the 2201 10 metre "EXTENDED JUNCTION BOX" is a simple solution that provides all the rear panel connections in a remote weatherproof junction box.

A Breakaway plug and socket should be ordered separately if the junction box is fitted onto an implement.

Order:	AP-105	12 Way Brylite Plug
	AP-106	12 Way Brylite Socket

Use the 5 metre cables supplied with each sensor to join into the junction box connectors.

## 1.5 WHEEL SENSOR INSTALLATION

The standard **wheel sensor** supplied with the surveillance kit, consists of a sensor and magnet to be fitted onto any **undriven** ground wheel.

Install the wheel sensor on an **undriven** front tractor wheel or onto a trailed implement wheel using one of the optional 2 way extension cables or the 2201 extended junction kit.

Alternatively, if the wheel sensor is not practical you can choose from any of the optional speed sensing kits explained in section 3.3.

### WHEEL SENSOR INSTALLATION PROCEDURE

Bolt the wheel magnet onto the wheel in a position that allows it to sweep directly past the wheel sensor within 15 - 20 mm once every rotation.

The magnet can be mounted anywhere in a radius from centre of the wheel. Near the hub will ensure the best ground clearance.

The sensor must be rigidly bolted to an existing structure, ideally in a protected position.

If mounting the sensor on a steered wheel, make sure the sensor moves with the steering mechanism to maintain equal clearance between the magnet and sensor when turning from lock to lock.

Connect sensor to cable supplied and use cable ties to secure cable away from potential damage. Allow enough slack for axle movement and steering.

Connect wheel sensor to plug at rear of surveillance monitor.

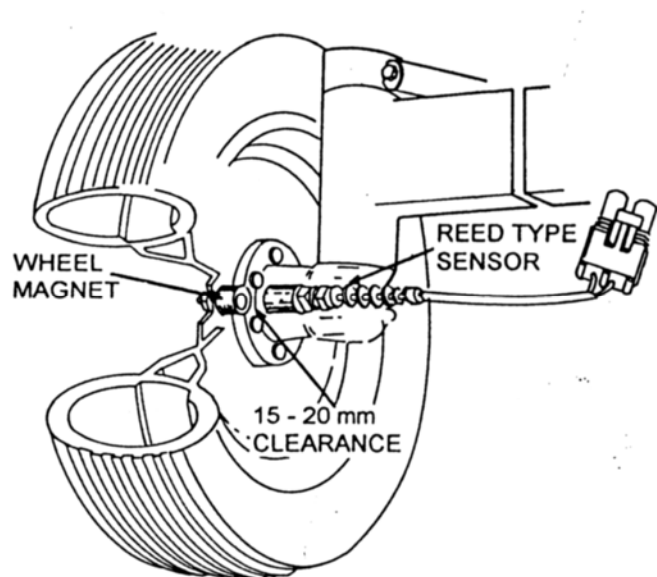
WHITE WIRE	TO	WHEEL PIN 6
BLACK WIRE	TO	GROUND PIN 7

Snip off unnecessary dust plugs.

### NOTES :

Four different magnet mounting ideas.

- 1) Drill through wheel rim and bolt magnet on.
- 2) Braze magnet nut onto rim and screw magnet into nut.
- 3) Cut thread off magnet and araldite magnet to rim.
- 4) Knock out a wheel stud and make up a piece of flat bar with suitable holes each end.
- 5) Bolt the magnet to one end and secure the flat bar under the wheel stud adjusted to the required position.





## 1.6 SPLIT WIDTH LINKING INSTALLATION

The RFM MONITOR is able to accept up to three separate width calibrations for left, centre and right boom operation by making a connection from existing controlling switches to the RFM MONITOR.

To make the connection work, your existing boom control switch panel must be operating from the same 12 volt DC source as your RFM MONITOR.

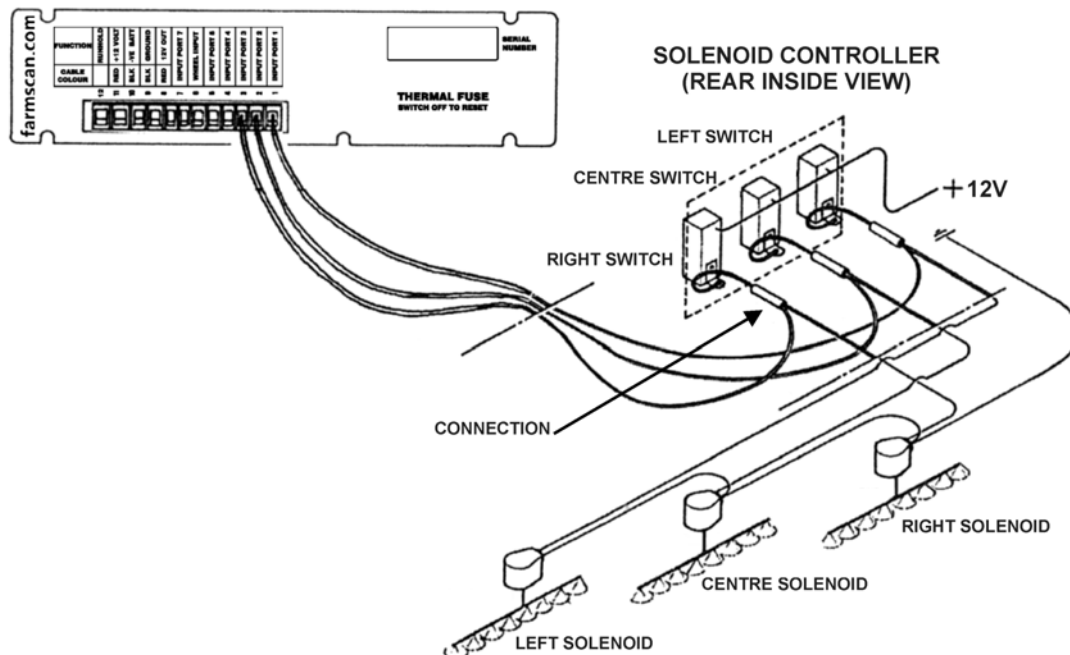
Simply run a separate single core wire from signal Ports 1, 2 & 3 (white) of the RFM MONITOR to each of the respective left, centre and right controlling switches on your boom control panel.

PORT 1	=	LEFT SECTION
PORT 2	=	CENTRE SECTION
PORT 3	=	RIGHT SECTION

Connect the linking wire to the switched terminal that becomes live (+ 12 V) when the boom solenoid is open (operating).

**IMPORTANT :** Whichever Ports 1, 2 or 3 are used must be enabled for split width calibration (see Section 3.4).

The solenoid valves must be physically connected to enable 'SPLIT WIDTH CALIBRATION'. If the solenoid valves become disconnected, then 'SPLIT WIDTH CALIBRATION' will not function.



## 1.7 REMOTE RUN / HOLD INSTALLATION

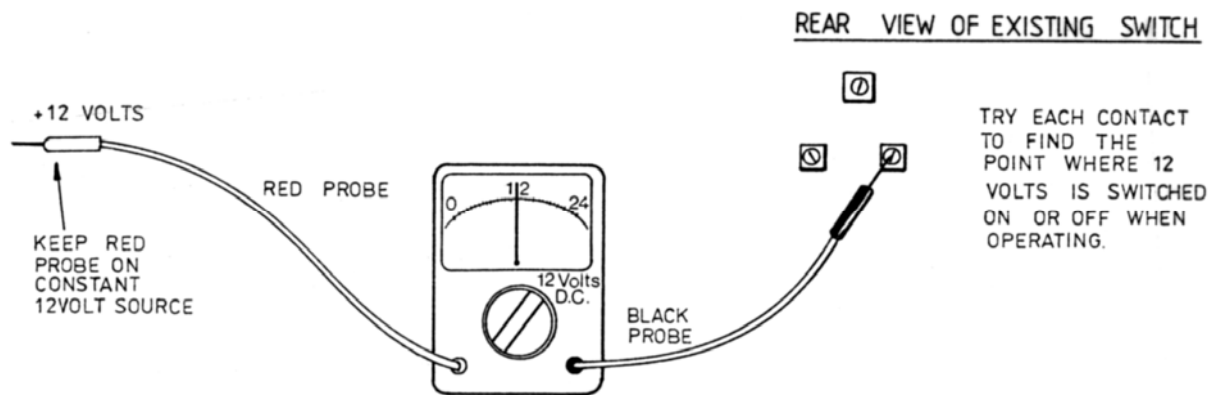
The RUN / HOLD function may be activated or deactivated by making or breaking an electrical connection from Pin 12 of the RFM MONITOR to any existing 12 - 13.8 V DC electrical device that is switched on or off whenever the machine is engaged (working).

**NOTE :** If using **split width linking**, it is not necessary to connect the remote run / hold function, because the monitor will go on hold when all widths are off.

The wire connected from run / hold Pin 12 must make connection to ground (negative) either when the machine is engaged or when the machine is disengaged.

The switch and monitor must be all on the same 12 Volt source.

Use a multimeter or testlight to find a contact point that is switched to ground when your implement is engaged or disengaged.



## 2.0 OPERATION

### 2.1 GENERAL OUTLINE

The 2200 RFM MONITOR is designed to provide a complete range of machinery monitoring functions in one unit.

The basic monitor provides speed, area and distance readouts with connection of a wheel sensor supplied in the kit.

Up to five additional machinery functions can be monitored by connecting appropriate sensors into the five spare ports of the RFM MONITOR (Ports 1 - 5).

Each Port can be set to accept any one of a variety of different sensor functions. (See "PORT / SENSOR COMPATIBILITY" CHART - Page 4).

This means you can fit different sensors to various machines and simply change the setting of each Port to suit the type of sensor installed.

When the RFM MONITOR is supplied standard on a new machine, refer to separate instructions to find which sensor options are installed on the machine and which ports will need to be activated (enabled).

### 2.2 MEMORY BACK-UP

An inbuilt memory backup system will hold all calibration and accumulated totals in memory for at least 1 month after disconnection from the 12 Volt DC power source.

### 2.3 POWER ON / OFF KEY

Whenever the monitor is switched **on** the display screen will firstly confirm which software program is installed.

e.g. 

<b>SURVEILLANCE</b>
---------------------

The version number immediately follows this:

e.g. 

<b>VERSION 3.0y</b>
---------------------

The version number relates to the functions and features programmed into your unit.

If ever an upgraded program is installed, a new version number e.g. "VERSION 3.0y" will be displayed.

The readout will always display the speed readout after switching on.

e.g. 

<b>SPEED 0.0 KPH</b>
----------------------

If any alarm points are active when the monitor is switched **on**, press the “RUN / HOLD” key to silence the beeper.

## 2.4 IMPERIAL / METRIC KEY

Press the “IMP / MET” key to change any readout between **metric** and **imperial** equivalents.

e.g. 

<b>SPEED 10.0 MPH</b>
-----------------------

 IMPERIAL IS ‘UK IMPERIAL’  

<b>SPEED 16.0 KPH</b>
-----------------------

**NOTE :** “IMP / MET” key is not active during calibration. These must be entered in metric values.

## 2.5 RUN / HOLD KEY

The “RUN / HOLD” key has dual functions, press it once to place the ‘MONITOR ON HOLD’.

e.g. 

<b>MONITOR ON HOLD</b>
------------------------

Press “RUN / HOLD” again to place the ‘MONITOR OFF HOLD’

e.g. 

<b>MONITOR OFF HOLD</b>
-------------------------

When in ‘HOLD’ mode, all alarms and accumulating readouts such as “AREA”, “DISTANCE” and the “ELAPSED TIMER” are stopped.

The monitor will repeat the monitor on hold warning every 30 seconds to remind the operator everything is on hold.

## REMOTE RUN / HOLD

As an alternative to manually activating the “RUN / HOLD” key you can automatically place the monitor on hold by connecting a wire from the rear panel of the surveillance monitor to any electrical device (e.g. clutch switch) that is activated whenever the machine is operational. See Section 1.7 for connection details.

## 2.6 SPEED KEY

Press the “SPEED” key once to display ground speed

e.g. 

<b>SPEED 14.6 KPH</b>
-----------------------

Press the "SPEED" key again to display current work rate expressed as "HECTARES PER HOUR".

e.g. **AREA 43.2 HA / H**

## 2.7 TOTAL KEY

### AREA TOTAL

Press "TOTAL" key once to display "TOTAL AREA" worked.

e.g. **TOTAL 2750 HA**

The area total can be reset at the start of a sowing / harvesting season and left to accumulate daily to keep track of overall areas worked.

To reset "AREA TOTAL" press "RESET" key once to start reset process.

e.g. **RESET TOTAL ?**

Press "RESET" again to complete reset process or to abort reset process, press any other key to escape.

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

e.g. **RESET ALL TRIPS ?**

Press "RESET" again to reset all trips or to abort reset process, press any other key to escape.

### DISTANCE TOTAL

Press "TOTAL" key again to display "TOTAL DISTANCE".

e.g. **DISTANCE 45.65 KM**

To reset "DISTANCE" press "RESET" key once to start reset process.

e.g. **RESET DISTANCE ?**

Press "RESET" again to complete reset process or to abort reset process, press any other key to escape.

## DISTANCE ALARM

Press "TOTAL" key again to display "DISTANCE ALARM"

e.g. **DIST ALM 00.000 M**

**centimetres**  
**metres**  
**100s of metres**  
**kilometers**

The distance meter can have an alarm point set to give an audible beep at set distance intervals

e.g. For post hole positions or plotting a laser levelling grid map.

**NOTE :** High accuracy plotting points require small wheel sensor pulse intervals available with speedo cable, tailshaft or radar ground speed sensor options.

1000 METRES = 1 KILOMETRE

Use 'UP' or 'DOWN' key to set "DISTANCE ALARM" point.

e.g. **DISTANCE ALM 0.030M** ie : every 30 metres

To start the distance alarm select "DISTANCE" and press "RESET" to zero "DISTANCE" at starting point.

e.g. **DISTANCE 0.000KM**

To cancel the distance alarm select "DIST ALM" then press "RESET" key to zero distance alarm.

e.g. **DIST ALM 0.000M**

To stop or start "TOTAL AREA" and "DISTANCE" meter press "RUN/HOLD" key (this can be remotely activated see Section 2.5).

## 2.8 TRIP AREA KEY

The "TRIP AREA" key allows the display of the sub total area for each separate plot of land worked. The "TRIP AREA" function has 10 resetable memories to keep record of areas worked in different plots.

To display the current trip memory press "TRIP AREA" key.

e.g. 

<b>TRIP 1</b>	<b>56.2 HA</b>
---------------	----------------

Trip 1 may be reset to zero at any time or kept as a record by changing to Trip 2, as explained below.

To reset trip memory press "RESET" key to "START" reset process.

e.g. 

<b>RESET TRIP 1 ?</b>
-----------------------

Press "RESET" key again to complete reset process.

e.g. 

<b>TRIP 1</b>	<b>0.00 HA</b>
---------------	----------------

To change current trip memory press 'UP' or 'DOWN' key to change current trip number on display.

e.g. 

<b>TRIP 2</b>	<b>0.00 HA</b>
---------------	----------------

**NOTE :** Trip records can be viewed or reactivated by using the 'UP' and 'DOWN' keys to change the current trip memory. Whichever trip number is displayed will be active when working.

## LOAD AREA

Load area is a separate area meter that can be reset after every bin or tank refill to check coverage rates.

Press "TRIP AREA" key again to display "LOAD AREA".

e.g. 

<b>LOAD 14.5HA</b>
--------------------

To reset load area press "RESET" key once to instantly reset load area total.

e.g. 

<b>LOAD 0.00HA</b>
--------------------

## LOAD ALARM

A 'LOAD AREA' alarm point may be set to alert the operator when a bin should be full or empty after completing a set amount of area. e.g. The seeder box will have one round left at 26.0 HA.

To set load alarm press "TRIP AREA" key again to display "LOAD ALARM".

e.g. 

<b>LOAD ALM 0.0 HA</b>
------------------------

Use 'UP' and 'DOWN' keys to set the load area alarm point.

e.g. 

<b>LOAD ALM 26.0 HA</b>
-------------------------

To start load alarm press "TRIP AREA" key to select "LOAD AREA" then **reset** load area total after refilling bin / tank.

To cancel load alarm press "TRIP AREA" key to select "LOAD ALARM" then **reset** load alarm to zero.

**NOTE :** "RUN / HOLD" key or remote "RUN / HOLD" will start / stop trip area and load area meters to keep the tally right.

## 2.9 TIMER KEY

The "TIMER" key allows display of the "ELAPSED TIME" of machine operation.

The 'ELAPSED' timer can be **reset** to zero at any point. The "RUN / HOLD" key will stop / start the elapsed timer.

If required the 'ELAPSED' timer may be programmed with an elapsed time alarm point which can serve as a warning of a due maintenance interval.

Press the "TIMER" key to display the elapsed timer.

eg 

ELAPSED	00:00
---------	-------

  
 HOURS MINUTES

To reset elapsed timer press the "RESET" key.

## TIMER ALARM

An elapsed time alarm may be set to activate after the "ELAPSED" display counts up to a set point.

To set timer alarm press "TIMER" key again to display "SET TIMER".



Use 'UP' and 'DOWN' key to set duration of time to elapse before alarm will activate.

eg 

SET TIMER 00:00
-----------------

  
•••••  
HOURS MINUTES

To start timer press "TIMER" key to display "ELAPSED TIME" then press "RESET" to start timer counting up from zero.

To cancel timer press "TIMER" key to display "SET TIMER" then press "RESET" to zero, timer alarm.

## 2.10 FUNCTION KEY

The "FUNCTION" key will display in sequence whichever optional functions have been enabled for "PORTS 1 – 5" in the calibration cycle.

Refer to the "SENSOR COMPATIBILITY CHART" to make sure the correct sensor is connected to the correct port for the required function.

**NOTE :** The ports must be enabled before the "FUNCTION" key will operate.  
See Section 3.4.

If no ports are enabled, then the "FUNCTION" key has no function when pressed.

e.g. 

<b>NO PORTS ENABLED</b>
-------------------------

If for example 'PORT 1' is enabled for "SHAFT 1", then the "FUNCTION" key would display the activity for 'SHAFT 1' when pressed.

e.g. 

<b>SHAFT 1 750 RPM</b>
------------------------

If 'PORT 2' was also enabled as 'SHAFT 2', then the "FUNCTION" key would display the current status of "SHAFT 2" when pressed a second time.

e.g. 

<b>SHAFT 2 STOPPED</b>
------------------------

Some functions such as "FLOW" on 'PORT 5' have multiple displays when you press the "FUNCTION" key in succession.

e.g. 

<b>RATE 55.0 L / HA</b>
-------------------------

<b>VOL USED 1250 L</b>
------------------------

<b>FLOW / MIN 22.5 LPM</b>
----------------------------

Some function displays such as "VOL USED" can be **reset** when you refill the tank.

e.g. 

<b>VOL USED 0.0 L</b>
-----------------------

Press "RESET" key to reset "VOL USED" display.

## FUNCTION DISPLAYS AND ALARMS EXPLAINED

Before the "FUNCTION" key will operate the required function must be enabled for each port 1 - 5 - see Calibration Section 3.4.

### SHAFT MONITORING (PORTS 1-5)

Press the "FUNCTION" key to display the RPM of whichever shafts 1 - 5 have been enabled - see Calibration Section 3.4.

The working range is 1 - 9999 RPM, depending on sensor type and capability

e.g. 

<b>SHAFT 1 750 RPM</b>
------------------------

Below 1 RPM the display would show "SHAFT STOPPED".

e.g. 

<b>SHAFT 1 STOPPED</b>
------------------------

### SHAFT ALARMS

There are three possible alarm choices for each of the Shafts 1 - 5

Refer to calibration details Section 2.5 to set your choice.

1. "SHAFT BELOW RPM" - Alarms at 5 second intervals immediately the RPM falls below the 'LO ALARM POINT' set for that shaft.

e.g. 

<b>SHAFT 1 LO 700</b>
-----------------------

2. "SHAFT ABOVE RPM" - Alarms at 5 second intervals immediately the RPM rises above the RPM 'HI ALARM POINT'.

e.g. 

<b>SHAFT 1 HI 800</b>
-----------------------

3. "SHAFT STOPPED ALARM" - activates if any of the shafts 1 - 5 are not active for more than 5 seconds.

e.g. 

<b>SHAFT 1 STOPPED</b>
------------------------

**NOTE :** If no alarm point has been set for either "HI" or "LO" then the monitor will display whichever shaft has stopped but will not sound an alarm.

For alarm points under 10 RPM the waiting time is extended before the 'SHAFT

STOPPED' alarm is activated.

Press the "RUN / HOLD" key to silence the shaft alarm when the machine has stopped.

### **BIN / TANK LEVEL MONITORING (PORTS 1 & 2).**

The 2060 Bin / Tank sensors can be set to activate a warning for full or empty (low) bin conditions - refer to Calibration Section 3.4 and 3.5.

For full bin operation, the sensor is mounted at a point towards the top of the bin.

For low bin operation the sensor is mounted towards the bottom of the bin.

When the "FUNCTION" key is pressed you can display the current status of each bin sensor.

e.g. 

<b>BIN 1 FULL</b>
-------------------

or 

<b>BIN 1 OK</b>
-----------------

or 

<b>BIN 2 LOW</b>
------------------

Whenever a sensor changes from "OK" to "FULL" or "LOW" the alarm will sound and the relevant warning will be displayed - the alarm will repeat at 45 second intervals to remind the operator.

### **COUNTER FUNCTION (PORT 3)**

The "COUNTER" function allows a tally of events activated by any switch operation.

Refer to Calibration Section 3.4.

For example, this may be the counting of bales expelled from a baler, or shaft rotations of an Auger feeding out grain to livestock.

You can use any sensor or switch that suits the application.

Press the "FUNCTION" key to display the counter operation.

e.g. 

<b>COUNTER</b>	<b>0</b>
----------------	----------

Press the "RESET" key to zero the counter.

If required, a counter alarm point may be set to activate at a set number - refer to calibration Section 3.5.

e.g. 

<b>COUNT ALM</b>	<b>60</b>
------------------	-----------

## PRESSURE FUNCTION (PORT 4)

The 'PRESSURE' function is suitable for spray line pressure measurement or airseeder air pressure. There are two types of pressure sensor available for sprayline pressure and one for fan pressure measurement.

### Sprayline Pressure Measurement

2015	PRESSURE SENSOR	( 0 - 500 KPA )
2025	PRESSURE SENSOR	( 0 - 2500 KPA )

### Fan Pressure Measurement

2080	AIR PRESSURE SENSOR	( 0 - 25 KPA )
------	---------------------	----------------

**NOTE :** There are two versions of the **2200 RFM** Monitor available for higher or lower pressure requirements.

**VERSION 3.0x**

is used in conjunction with the 2015 and 2025 pressure sensors for **higher** pressure requirements.

**VERSION 3.0y**

is used in conjunction with the 2015 and 2080 pressure sensors for **lower** pressure requirements.

Refer to calibration section 3.4 to enable the correct type of sensor.

Press the "FUNCTION" key to display the pressure.

e.g.

**PRESSURE 320 KPA**

**NOTE :** It is normal to have a residual reading of 5 - 10 KPA with no pressure on air pressure sensors. Sprayline pressure sensors have a residual reading of 1 - 2 KPA on airseeder.

If required you may set 'HI' or 'LO' pressure alarm points. Refer to Calibration Section 3.5.

e.g.

**PRESSURE HI 450**

OR

**PRESSURE LO 120**

## TEMP FUNCTION (PORT 4)

The "2070 ENGINE TEMP SENSOR" is a radiator water / engine temperature sensor that will give a readout of temperature in the range 40 ° - 120 ° Centigrade. Refer to Calibration Section 2.5.

A 'HI TEMP ALARM POINT' may be set as a warning of increased water temperature.

**NOTE :** Loss of radiator water will not necessarily cause the "HI TEMP ALARM" to activate due to lack of heat contact.

Refer to Calibration Section 3.5 for details.

For temp operation press the "FUNCTION" key to display "TEMPERATURE".

e.g. 

<b>TEMPERATURE 90°C</b>
-------------------------

**Temp Alarm:** The "HI TEMP" warning will activate as a priority alarm regardless of any other function selected if the temperature exceeds the alarm point.

e.g. 

<b>TEMP HI 108°C</b>
----------------------

The "RUN / HOLD" will not silence the temperature alarm.

## FLOW FUNCTION (PORT 5)

When the 'FLOW' function is enabled for Port 5, the application rate, volume used and flow rate will be displayed when the "FUNCTION" key is pressed in succession. Refer to Calibration Section 3.4.

An alarm may be set for low tank and excessive rate variation.

There are two sizes of flow sensor kit available to suit different flow rates and pressures.

1. 2030 1" FLOW SENSOR KIT ( 8 - 200 L / MIN )  
MAXIMUM PRESSURE - 1000 PSI (6896 KPA)
2. 2050 2" FLOW SENSOR KIT ( 50 - 500 L / MIN )  
MAXIMUM PRESSURE - 145 PSI (1000 KPA)

Alternative flow sensors may also be compatible - refer to Computronics with details.

## FLOW OPERATION

To maintain accurate rate and volume readings, the correct width, wheel and flow sensor, calibrations must be set - refer to Section 3.4.

Press the "FUNCTION" key to display "APPLICATION RATE".

e.g. 

<b>RATE 75.1 L / HA</b>
-------------------------

Press "IMP / MET" key to convert to "GALLONS PER ACRE".

e.g. 

<b>RATE 6.8 G / AC</b>
------------------------

**NOTE :** If using **split width calibration**, the rate reading will alter when different boom sections are activated. Refer to Section 3.2 for **split width calibration**.

Press "FUNCTION" key again to display **accumulated volume**.

e.g. 

<b>VOL USED 1540 L</b>
------------------------

Press the **reset** key to zero **volume used** after refilling the tank.

e.g. 

<b>VOL USED 0 L</b>
---------------------

Press "FUNCTION" key again to display **flow rate**.

e.g. 

<b>FLOW/MIN 32.1 LPM</b>
--------------------------

## FLOW ALARMS

Based on entering the tank capacity as a calibration factor, the monitor will give an alarm when all but 100 litres of the total has been sprayed.

e.g. 

<b>TANK 100 L LEFT</b>
------------------------

For example if the tank holds 2000 litres, then the alarm will activate when the **volume used** reaches 1900 litres.

Based on entering a target application rate and allowable error percentage as a calibration factor, the monitor will give a "RATE HI" or "LO" alarm.

Refer Calibration Section 3.5.

For example if the target rate is set for "50 L / HA" and the allowable error is set for 10% then the alarm will activate outside these limits.

e.g. 

<b>RATE HI 58 L / HA</b>
--------------------------

OR 

<b>RATE LO 42 L / HA</b>
--------------------------

The alarm may be silenced by pressing "RUN / HOLD" which will also hold the area meter.

If the rate error calibration is set to zero % then the rate of application will be displayed, but there will be no alarm when the rate varies.

## FAN MONITORING FUNCTION (PORT 5)

When Port 5 is enabled for "FAN" the "FAN SPEED" is displayed by pressing the "FUNCTION" key. Refer to calibration Section 3.4.

e.g. 

<b>FAN 3500 RPM</b>
---------------------

If the fan stops then the display will indicate "FAN STOPPED".

e.g. 

<b>FAN STOPPED</b>
--------------------

## FAN ALARM

A fan RPM Alarm Point may be set for both over or under RPM - see Calibration Section 3.5.

**Fan slow alarm** -activates at 5 second intervals immediately the RPM falls below the slow alarm point and repeats at 5 second intervals.

e.g. 

<b>FAN SLOW 3300</b>
----------------------

**Fan fast alarm** - activates at 5 second intervals immediately after the RPM rises above the fast alarm point and repeats at 5 second intervals.

e.g. 

<b>FAN FAST 3800</b>
----------------------

**NOTE :** Press "RUN / HOLD" to silence the alarm when machinery is not working.

## 3.0 CALIBRATION

### 3.1 GENERAL INFORMATION

Variable information such as machinery "WIDTH" and "WHEEL" size must be entered into the calibration memory before you can operate the surveillance monitor as a speed / distance / area meter.

If you wish to use any of the various sensor options connected to Ports 1 - 5. You must enable (activate) each Port for the required function - see Calibration 3.4.

The "CAL" (Calibration) key takes you through a series of set-up questions. Each time you press "CAL", the next question will be displayed to the left of the screen.

e.g. 

<b>WIDTH</b>	<b>12.20 M</b>
--------------	----------------

Use the 'UP' or 'DOWN' arrow key to change the calibration factor and press "CAL" again to step onto the next question.

When you use the 'UP' / 'DOWN' keys, notice the numbers change slowly at first then faster if you continue to hold the key.

The **reset** key can be used to zero any calibration factors on display.

If you wish to step back to a previous "CAL" option, you must press a function key, eg "SPEED", to escape the "CAL" routine then start again.

### 3.2 WIDTH CALIBRATION

The "WIDTH" calibration is simply a measure of the **effective** implement width in METRES.

Press "CAL" key to display "WIDTH" and use 'U'P and 'D'OWN' keys to set correct width.

e.g. 

<b>WIDTH</b>	<b>12.20 M</b>
--------------	----------------

### SPLIT WIDTH CALIBRATION (OPTIONAL)

In situations where the width may be split into two or three sections, for instance a sprayer with left, centre and right boom control you can enter separate left, centre and right widths so that area and rate readouts will be corrected whenever the width of operation changes. This will also act to place the monitor in 'HOLD' mode whenever **all** width switches are turned off.

To enable this possibility (see Installation Section 1.6 Split Width Linking) and (Calibration Section 3.4 Port 1, 2 and 3 left, centre, right widths).



## ! IMPORTANT

Split Width calibration procedure will not work unless Ports 1, 2 and / or 3 are enabled for width detection and the appropriate electrical connections are made between the left centre and right controlling switches to Ports 1, 2 & 3.

### SPLIT WIDTH CALIBRATION PROCEDURE

1. Turn left, centre and right boom control switches OFF. Turn master boom control switch **on**. (Beware of upside down switches on American boom control units.
2. Press "CAL" key to display "WIDTH".
3. Turn on **left** boom switch **only** to display "WIDTH LEFT".

e.g. 

<b>WIDTH L 5.40 M</b>
-----------------------

4. Use 'UP' / 'DOWN' keys to set correct "LEFT WIDTH".
5. Turn **left** boom switch **off** then repeat process 3. & 4. for the **centre** and **right** sections.
6. When all widths are set, turn all switches **on** together to display the overall width

e.g. 

<b>WIDTH ALL 12.20 M</b>
--------------------------

7. Turn all width switches or master switch **off** to display "WIDTH OFF".

e.g. 

<b>WIDTH OFF 00.00 M</b>
--------------------------

**NOTE:** split width calibration will not work if sprayer solenoids disconnected from wiring.

### 3.3 WHEEL CALIBRATION

The wheel factor is a measurement of distance travelled between pulses from the wheel input sensor.

There are various types of wheel input sensors available, to suit different applications. Choose an appropriate sensor to minimise potential slippage error caused by driven wheels or to get more pulses for slower working speeds.

1. **2002 WHEEL SENSOR KIT** (standard with monitor kit).  
Suits free rolling tractor or implement wheel with at least one metre rolling circumference or more.
2. **2004 RADAR SPEED SENSOR KIT** (optional)  
Provides high accuracy, totally independent ground speed monitoring, ideal for 4WD tractors and front assist tractors with linkage implements and slow working speeds.

3. **2004A RADAR INTERFACE KIT** (optional) allows connection to existing tractor ground speed radar sensor.
4. **2007 SPEEDO CABLE SENSOR KIT** (optional)  
Screws inline with existing speedo drive cable, suits most Japanese 4WD vehicles with M22 x 1.5 Thread.
5. **2008P PROXIMITY SENSOR KIT** (optional)  
Picks up metal objects rotating on shaft e.g. Bolt head or teeth of a sprocket, well suited to high rotation speed or to give multiple pulses on a slow moving shaft.
6. **2009 TAILSHAFT SENSOR KIT** (optional)  
Suits installation on FIXED tailshaft, utilises magnet on 100mm hoseclamp and switching type sensor. (magnet can be transferred to other size hoseclamps).
7. **2076 SHAFT SENSOR KIT** (optional)  
Suits installation on drive shaft related to ground wheel drive, provides 32mm hose clamp magnet and switching type sensor.

## WHEEL CALCULATION PROCEDURE

1. If the wheel input sensor is subject to changing tyre load, then half fill tank / bin.
2. Measurement procedure must be performed in the field, not on a tarmac (recheck measurement when moving from hard to soft conditions).
3. Switch monitor **on** and press "TEST" key to display "TEST WHEEL" counter.

e.g. 

<b>TEST WHEEL 0</b>
---------------------

4. Creep vehicle forward and watch the counter increment on every sensor pulse. Stop exactly on a pulse, then press **reset** key to bring **test wheel** counter back to zero.
5. Peg ground at bottom centre of any wheel as a starting reference point for measurement.
6. Drive forward for approximately 25 metres or more and stop exactly on a pulse update.

e.g. 

<b>TEST WHEEL 14</b>
----------------------

7. Now measure the exact distance travelled and divide the pulses counted into the distance covered. e.g. Distance 25.86 metres ÷ 14 pulses = 1.847 M / PULSE
8. Now press "CAL" key to display "WHEEL" calibration and use 'UP' / 'DOWN' keys to enter the correct wheel factor.

e.g. **WHEEL 1.847 M**

**NOTE:** At slow working speeds - under 8 kph additional magnets or another sensing means may be required for optimum response of monitor speed and rate readouts.

Use this formula to check for suitability and if the answer is less than 3 you will require more pulses for a smooth response.

$$\frac{\text{Slowest Working Speed}}{\text{Wheel Factor}} \quad \text{eg} \quad \frac{4 \text{ kph}}{1.847\text{m}} = 2.16$$

With 2 magnets the result would be acceptable.

$$\text{eg} \quad \frac{4 \text{ kph}}{1.847 \times \frac{1}{2}} = 4.33$$

### 3.4 DEFINE PORTS CALIBRATION

After connecting any of the optional sensors to ports 1 - 5 of the MONITOR, you must define (set) which functions are required for each Port.

When you finish defining all the ports continue to press the "CAL" key to display and set any variable information such as alarm points or targets related to the activated functions.

#### DEFINE PORTS PROCEDURE

1. Press "CAL" key until "DEFINE PORTS" is displayed - the default is always "NO".

e.g. **DEFINE PORTS/NO** (Press CAL key again at the NO prompt to go straight to the alarm Calibrations if you have already enabled the required Ports).

2. Use 'UP' key to change from "NO" to "YES".

e.g. **DEFINE PORTS/YES**

3. Press "CAL" key again to display "PORT 1" status.

e.g. **PORT 1 DISABLED**

Use 'UP' / 'DOWN' keys to select the required function for PORT 1.

e.g. **PORT 1 DISABLED**      **NO FUNCTION**

**PORT 1 SHAFT 1**      **SHAFT 1 - 9999 RPM**

**PORT 1 BIN 1**      **FULL / EMPTY BIN 1**

<b>PORT 1 WIDTH L</b>	<b>SPLIT WIDTH (LEFT)</b>
-----------------------	---------------------------

Press "CAL" key to step to "PORT 2" function options.

Use 'UP' / 'DOWN' keys to select the required function for "PORT 2".

<b>PORT 2 DISABLED</b>	<b>NO FUNCTION</b>
<b>PORT 2 SHAFT 2</b>	<b>SHAFT 1 - 9999 RPM</b>
<b>PORT 2 BIN 2</b>	<b>FULL / EMPTY BIN 2</b>
<b>PORT 2 WIDTH C</b>	<b>SPLIT WIDTH (CENTRE)</b>

Press "CAL" key to step onto "PORT 3" function options and select the required function.

<b>PORT 3 DISABLED</b>	<b>NO FUNCTION</b>
<b>PORT 3 SHAFT 3</b>	<b>SHAFT 1 - 9999 RPM</b>
<b>PORT 3 COUNTER</b>	<b>EVENTS COUNTER</b>
<b>PORT 3 WIDTH R</b>	<b>SPLIT WIDTH (RIGHT)</b>

Press "CAL" key to step onto "PORT 4" function options and select the required function.

<b>PORT 4 DISABLED</b>	<b>NO FUNCTION</b>
<b>PORT 4 SHAFT 4</b>	<b>SHAFT 1 - 9999 RPM</b>
<b>PORT 4 PRESS 25</b>	<b>PRESSURE SENSOR</b> <b>0 - 25 KPA (Low Pressure Version 3.0y)</b>
<b>PORT 4 PRESS 500</b>	<b>PRESSURE SENSOR</b> <b>0 - 500 KPA (Low and High Pressure)</b>
<b>PORT 4 PRESS 2500</b>	<b>PRESSURE SENSOR</b> <b>0 - 2500 KPA (High Pressure Version 3.0x)</b>
<b>PORT 4 TEMP</b>	<b>TEMP SENSOR 40 - 120 °C</b>

Press "CAL" key to step onto "PORT 5" function options and select the required function.

<b>PORT 5 DISABLED</b>	<b>NO FUNCTION</b>
<b>PORT 5 SHAFT 5</b>	<b>1 - 9999 RPM</b>

PORT 5 FLOW	FLOW SENSOR
-------------	-------------

PORT 5 FAN	FAN SPEED
------------	-----------

Press "CAL" key again to proceed into "CALIBRATION ALARMS" and "SET POINTS" for the various sensors enabled on Ports 1 - 5.

### 3.5 CALIBRATION ALARMS

After defining Ports 1 - 5, continue to press the "CAL" key in succession to step through the various alarm points or calibration settings related to each sensor function.

Use the 'UP' / 'DOWN' keys to set the required alarm points or leave the alarm point at zero for **no alarm**.

e.g. 

S1 LOALM 650 RPM	(SHAFT 1 LOW ALARM)
------------------	---------------------

To cancel an **alarm** press **reset** to zero the alarm point.

e.g. 

S1 LOALM 0 RPM
----------------

#### SHAFT 1 - 5 ALARM CALIBRATION (PORTS 1 - 5)

For each of the enabled Shafts 1 - 5, you may set a LO or HI alarm point.

Press the "CAL" key in succession to select each alarm setting. Use 'UP' / 'DOWN' key to set each alarm point then press "CAL" to step onto the next selection.

e.g. 

S1 LOALM 150 RPM	(SHAFT 1 LO ALARM)
------------------	--------------------

e.g. 

S1 HIALM 750 RPM	(SHAFT 1 HI ALARM)
------------------	--------------------

Set zero to disable any alarm point.

#### BIN / TANK 1 & 2 ALARM CALIBRATION (PORTS 1 & 2)

For each of the enabled "BIN / TANK" level sensors you must nominate if the alarm is for 'FULL' or 'LOW' level. Press the "CAL" key in succession to display BIN ALARM status, then use 'U'P / 'D'OWN keys to toggle between 'FULL' or 'LOW' bin activation.

e.g. 

BIN 1 ALARM FULL
------------------

Activates when the sensor is completely covered for 3 seconds or more.

e.g. 

<b>BIN 1 ALARM LOW</b>
------------------------

Activates when sensor is completely uncovered for 3 seconds or more.

### COUNTER ALARM CALIBRATION (PORT 3)

If the counter function is enabled for Port 3 then a counter total alarm point may be set.

Press the "CAL" key to display "COUNTER ALM" and use 'UP' / 'DOWN' keys to set desired **counter alarm point**.

e.g. 

<b>COUNTER ALM 520</b>
------------------------

This will activate the alarm after 520 counts. Set zero for no alarm.

### PRESSURE CALIBRATION (PORT 4)

Press "CAL" key to display "PRESSURE LO" or "HI" alarm point, then use 'UP' / 'DOWN' keys to set required alarm points.

e.g. 

<b>PRESS LO 150 KPA</b>
-------------------------

<b>PRESS HI 450 KPA</b>
-------------------------

Set zero for no alarm on "HI" or "LO".

### TEMP CALIBRATION (PORT 4)

If the "TEMPERATURE" function is enabled you can set a "HI TEMP" alarm point only.

Press "CAL" key to display "TEMP HI" alarm point, then use 'UP' / 'DOWN' keys to set required **alarm point**.

e.g. 

<b>TEMP HI 110 ° C</b>
------------------------

Set zero for no alarm.

### FLOW CALIBRATION (PORT 5)

When using the flow sensor press the "CAL" key to step through the following options. Then use 'UP' / 'DOWN' keys to set the data.

1. Set the target application rate.

e.g. 

<b>SET RATE 75.0 L/HA</b>
---------------------------

2. If you want an alarm for excessive rate variation you must also set the allowable % error (0% ERROR = NO ALARM).

e.g. 

<b>ERROR 10%</b>
------------------

This means the "HI" or "LO RATE ALARM" will activate if the rate varies outside + / - 10% of the set rate.

3. To activate the 100 litre low tank alarm, enter the spray tank holding capacity.

e.g. 

<b>TANK VOL 1500 L</b>
------------------------

4. The correct flow sensor "PULSE PER LITRE (PPL)" factor must be entered. This is essential for accurate operation.

e.g. 

<b>FLOW PPL 110.5</b>
-----------------------

All flow sensors output a slightly different number of pulses per litre of liquid throughput. This may vary due to plumbing differences, wear or liquid viscosity.

Each Farmscan flow sensor is factory tested and has a unique PPL factor engraved on the underside of the flow sensor body e.g. PPL 110.5.

The factory PPL factor is true for water and will be accurate to within +/- 2% over the entire operating range of the flow sensor.

More accurate calibration can be achieved using the flow PPL calibration procedure explained on the next page.

## **FLOW PPL CALCULATION PROCEDURE**

If you would like to check or improve the flow sensor accuracy, follow this procedure:

1. Make sure the flow sensor is fully primed with the liquid to be measured.  
(A ball valve or solenoid valve shut off system should be installed down stream to stop / start the test).

2. Prepare a container of known quantity to catch the output.

20 LITRES OR MORE FOR 1" FLOWSENSOR  
100 LITRES OR MORE FOR 2" FLOWSENSOR

3. Press "**TEST**" key until "TEST FLOW" is displayed and press **reset** to clear any total on display.

e.g. 

<b>TEST FLOW 0</b>
--------------------

4. Open the valve until the required test batch quantity is obtained and take note of the total "TEST FLOW" pulses counted.

e.g. 

<b>TEST FLOW 2344</b>
-----------------------

5. Check the liquid quantity with a graduated jug, then divide the pulses by the number of litres.

e.g.            LITRES        =     21.4  
                  PULSES       =     2344  
                  2344 ÷ 21.4 =     109.5 ppl

6. Now press "CAL" key until "FLOW PPL" is displayed and set the correct flow PPL factor using the 'UP' / 'DOWN' keys.

7. e.g. 

<b>FLOW PPL 109.5</b>
-----------------------

Recheck the calibration a couple of times to be sure.

## **FAN CALIBRATION (PORT 5)**

If the "FAN" function is enabled for Port 5, then you may set a slow or fast fan RPM alarm point.

Press "CAL" key in succession until fan alarm point is displayed.

e.g. 

<b>FAN SLOW 0 RPM</b>
-----------------------

Use 'UP' / 'DOWN' keys to set the required slow RPM alarm point.

Press "CAL" key again to step to "FAN FAST" alarm point.

e.g. 

<b>FAN FAST 0RPM</b>
----------------------

Use 'UP' / 'DOWN' keys to set the required fast RPM alarm point.

**NOTE :**        Set zero RPM for either fast or slow if no alarm point is required.



### 3.6 REMOTE RUN / HOLD CALIBRATION

If the "RUN / HOLD" facility is being activated remotely, the connection may be either to an existing switch that turns power **on** to run the machine, e.g. electric over hydraulic control. Alternatively, power may be **off** when the machine is operating, e.g. an electric clutch that is normally engaged **without** power and disengages **with** power on.

Press the "CAL" key in succession to display the "RUN / HOLD" calibration.

When the remote "RUN / HOLD" calibration is set to "DISABLED", then only the front panel "RUN / HOLD" key is able to be used.

e.g. 

<b>RUN/HOLD DISABLED</b>
--------------------------

To activate the remote "RUN / HOLD" function for power on to run, use 'UP' / 'DOWN' keys to set "RUN / HOLD ACTIVE ON".

e.g. 

<b>R / HLD ACTIVE ON</b>
--------------------------

To activate the remote "RUN / HOLD FUNCTION" for power off to run, set "RUN / HOLD ACTIVE OFF".

e.g. 

<b>R / HLD ACTIVE OFF</b>
---------------------------

Whenever the monitor is in "RUN MODE" (active), the front key panel "RUN / HOLD" can still be used to place the monitor in "HOLD" mode.

### 3.7 CALIBRATION WARNING

The RFM MONITOR has a unique protection system that compares and checks all your calibration settings to warn if any calibration factor becomes corrupted (changes value without your knowledge).

This is not a regular occurrence, but could be caused in a 'noisy' electrical environment e.g. An old petrol truck with wire ignition leads or faulty alternator.

When a corruption is detected, the monitor will beep continuously and the readout will display "CHECK CAL" warning.

e.g. 

<b>CHECK CAL</b>
------------------

Press the "CAL" key and check all calibration factors.

See the next page for the total reset procedure to be performed if "CHECK CAL" is displayed.

## TOTAL RESET PROCEDURE

It is recommended that if the "CHECK CAL" warning is displayed, a total reset should be performed. See below.

- 1.) Switch unit off
- 2.) Hold finger on reset key
- 3.) Switch unit on leaving your finger on the reset key.
- 4.) After startup sequence has been completed remove your finger from the reset key and go into the calibration mode and re-enter all figures.



## 4.0 TROUBLESHOOTING 2200 RFM

PROBLEM	POSSIBLE CAUSE / REMEDY
1. NO POWER TO MONITOR WHEN ON / OFF KEY PRESSED	a) Remove power from rear of surveillance for 60 seconds to reset internal fuse. Reconnect power and test. b) Test voltage is 12 - 13.8V dc from battery. c) Check that <b>red</b> wire is to +ve Pin 11 and <b>black</b> wire is to -ve Pin 10. d) Check that no other electrical device is connected to the same power cable. e) Unable to locate fault - contact nearest dealer or authorised service agent.
2. LCD DISPLAY DROPS OUT OR GREY SQUARES APPEAR ON HALF THE READOUT.	a) If display rectifies when engine running this indicates battery in poor condition. b) If problem persists when engine running, then voltage supply is low or low current is problem due to poor connection at battery, corroded inline fuse holder in power cable, or other equipment connected to power cable. c) Clean battery terminals and power cable connections. d) Make sure power cable is direct to battery terminals.
3. "CHECK CAL" ON DISPLAY - INDICATES CALIBRATION FACTORS LOST FROM MEMORY.	a) See calibration warning instructions Section 3.8 in this manual. b) If problem occurs regularly, then it is probably caused by outside interference. See "Interference Causes and Remedies" troubleshooting section 19 c) Alternatively, "CHECK CAL" will be caused by failure of memory backup chip. In this case all calibrations will be lost from memory whenever the power switch is turned "OFF". See section 2.2 this manual.
4. SPEED READOUT TOO FAST OR TOO SLOW	a) Re check "WHEEL" calibration is measured correctly and measured in metres eg 2.445 metres.

## TROUBLESHOOTING 2200 RFM

PROBLEM	POSSIBLE CAUSE / REMEDY
5. SPEED READOUT JUMPY	<p>a) Make sure magnet is facing sensor correctly as shown in section 2.4 "WHEEL SENSOR INSTALLATION". (Use of an alternative magnet may cause problems due to wrong orientation.)</p> <p>b) Check that wheel magnet is 15 - 20 mm away from wheel sensor as they pass. Magnet too close can cause jumpy speed.</p> <p>c) If readout is jumpy, it indicates that the impulses from the sensor are inconsistent. Check for poor or intermittent connection to sensors.</p> <p>If speedo sensor, check that drive cable is not binding.</p> <p>Is the wheel loose?</p> <p>d) If fault can not be found, press "TEST" key on monitor until "TEST WHEEL" is displayed. Drive slowly forward and listen to the beeps. The sound should be consistent and steady at a fixed speed. If the sound is jumpy, wiring is OK, then replace sensor.</p> <p>e) If the beeps can be heard whilst stationary, then interference could be the cause. See Troubleshooting Section 19 "interference Causes and Remedies".</p>
SPEED READOUT STAYS AT ZERO	<p>a) Check wheel calibration is set correctly - not zero.</p> <p>b) Check clearance between wheel magnet and sensor is 15 - 20mm.</p> <p>c) Press "TEST" key to display "TEST WHEEL" then disconnect sensor at furthest point from monitor</p> <p>d) Use a short piece of wire or long nose pliers to make a short circuit across the pins corresponding to black and white wires of sensor cable connected to the monitor.</p> <p>e) If the monitor beeps with short circuit then monitor and wiring okay- replace sensor.</p> <p>f) If no response repeat short circuit test at draw bar connection back to monitor. If beep ok, then cable to sensor at fault.</p> <p>g) If still no response, short circuit across pins 6 and 7 of green connector plug into monitor. If beep ok, then cable to draw bar at fault.</p> <p>h) If no response, return monitor to your nearest Farmscan dealer or authorised Farmscan service agent.</p>

## TROUBLESHOOTING 2200 RFM

PROBLEM	POSSIBLE CAUSE / REMEDY
7. WHEEL SENSOR TEST PROCEDURE	<p><u>DO NOT</u> TEST WHEEL SENSOR WITH A TEST LIGHT, USE A MULTIMETER ONLY.</p> <p>a) Disconnect wheel sensor from cable.</p> <p>b) Switch multimeter "ON" and select "OHMS" scale.</p> <p>c) Touch test probes together and meter needle should swing to right of scale indicating "0" OHMS resistance. (If digital meter display - should read zero).</p> <p>d) Move wheel sensor magnet away from sensor and connect test probes to wheel sensor pins. If meter goes to zero, then sensor is short circuit (faulty). If the meter stays to the left of scale, hold wheel magnet in front of sensor, meter should go straight to zero. If meter fails to change, then sensor is open circuit. (faulty)</p>
8. TOTAL AND TRIP AREA INCORRECT	<p>a) Check "SPEED" readout is correct and steady - if not, this will affect the area totals. See Troubleshooting Section 4</p> <p>b) Recheck width calibration is set correctly in <u>metres</u>.</p> <p>c) Is the machine overlapping or overcounting headlands.</p>
9. TOTAL AND TRIP AREA WON'T RECORD	<p>a) Check that "SPEED" readout is working. If not see Trouble shooting Section 4.</p> <p>b) Press "RUN/HOLD" key to make certain monitor is "OFF HOLD".</p> <p>c) If remote 'RUN / HOLD' not used then switch to "CAL" and check that Remote Run / Hold option is "<u>DISABLED</u>".</p>
	<p>d) If remote 'RUN / HOLD' is used, then switch implement on and monitor should go "OFF HOLD". If reverse occurs, then switch to "CAL" mode and reverse run / hold active off / on calibration.</p>

## 5.0 INTERFERENCE CAUSES AND REMEDIES

CAUSES	REMEDIES
Noisy wire ignition leads on petrol engine or pump motor.	Replace with carbon leads. Fit suppressors to coil and distributor.
Faulty Alternator	Exchange it
Other electrical equipment running off monitor power cable	Run separate power cable <b>direct</b> to 12V battery for monitor.
Calibrations get corrupted when solenoids / clutch switched off.	Make sure monitor has its own separate power cable direct to 12V battery. Fit diode across solenoid coil / clutch to clamp spike. Run power cable physically away from solenoid / clutch wiring.

NEED MORE HELP?

- a) Contact nearest Farmscan Dealer.
- b) Contact Computronics International P/L  
 6 Sarich Way, Technology Park  
 Bentley 6102, Western Australia  
 Phone: +61 8 9470 1177 (all hours)  
 Fax: +61 8 9470 2855  
 Email: [service@farmscan.com](mailto:service@farmscan.com)  
 Web: [www.farmscan.com](http://www.farmscan.com)

**PORT/SENSOR COMPATIBILITY CHART**

		SENSOR OPTION	2002 WHEEL SENSOR	2004 RADAR SPEED SENSOR	2007 SPEEDO SENSOR	2008 PROXIMITY SENSOR	2009 TAILSHAFT SENSOR	2030 FLOW SENSOR	2050 FLOW SENSOR	2015 PRESSURE SENSOR	2025 PRESSURE SENSOR	2070 ENGINE TEMP SENSOR	2080 AIR PRESSURE SENSOR	2034 PULLEY SENSOR	2076 SHAFT SENSOR	2077 SHAFT SENSOR	2060 BIN / TANK SENSOR	OTHER	
		RANGE	1 - 50 KPH	0.5-50 KPH	0 - 100 KPH	1-9999 RPM	1-1500 RPM	8-200 L/MIN	50-500 L/MIN	0-500 KPA	0-2500 KPA	40-120°C	0-25 KPA	50-9999 RPM	1-1500 RPM	50-9999 RPM	FULL / EMPTY		
PORT	FUNCTION																		
PORT 1	SHAFT 1					•	•									•			
	BIN 1																	•	
	WIDTH L																		REF 3.6
PORT 2	SHAFT 2					•	•									•			
	BIN 2																	•	
	WIDTH C																		REF 3.6
PORT 3	SHAFT 3					•	•									•			
	WIDTH R																		REF 3.6
	COUNTER					•	•									•			
	TONNAGE					•	•									•			
PORT 4	SHAFT 4					•	•									•			
	PRESSURE 0-500									•									
	PRESSURE 0-2500/0-25										•		•						
	TEMP											•							
PORT 5	SHAFT 5													•			•		
	FLOW							•	•										
	FAN					•								•			•		
WHEEL INPUT	SPEED SENSOR	•	•	•	•	•									•				

**NOTE:** \* Version 3.0y Software must be installed to enable the 'LOW AIR PRESSURE' function.