FARMSCAN | jackal v3

monitor and controller series

FARMSCAN AG

www.farmscanag.com

CONTROL VERSION

3 SECTION SPRAY RATE CONTROLLER
SPEED & AREA METER
TACH (RPM) METER
BATCH METER
RATE (LIQUID OR DRY) MONITOR
PRESSURE MONITOR
TEMPERATURE MONITOR
SURVEILLANCE MONITOR
WHEEL SLIPPAGE MONITOR
COUNTER FUNCTION

FARMSCAN AG | jackal

RUN   OK

55 RATE L/Ha

18.0 SPD km/h

54.6 AREA Ha

1 2 3

FEBRUARY 2018

CONTENTS

Your new Farmscan Ag Jackal Spray Monitor & Controller system is the result of extensive infield development and will give many years of dependable service.

Once installed and calibrated, the system will automatically maintain the selected spray rate regardless of speed or pressure variations within the limits of the sprayer pump capacity and nozzle size.

This version of the Jackal is completely unlocked, un-restricted and has the full feature set of the Jackal-Basic & Jackal-Monitor. NB: Inputs consist of 1x Coil, 4x Pulse, 4x Varying Inputs. Simply add additional sensors to utilise the Jackal to its full potential.

Our onboard calibration wizard makes setup a breeze! It's simplified with the ability to enter either a factor (pulses per unit) or simply drive/run a set amount whilst the unit is counting the pulses and let the system calculate its own factor.

24 recordable trips allow the operator to track numerous jobs in a period of work and each input can be used to display information using imperial and metric units.

TECHNICAL SPECIFICATIONS

Specifications below are subject to change and are based on a fully unlocked Jackal.

Power Requirements	10 – 28 VDC @ 250mA
Display	128 x 64 Mono Graphic LCD
Operating Temperature	0 to 50˚c
Storage Temperature	-5 to 65˚c
Dimensions	135mm H x 100mm W x 30mm D
Sensor Inputs	9
Input 1 (Sine Wave)	Up to 1000 pulses per second (Freq. Coil)
Inputs 2 – 5 (Square Wave)	Up to 400 pulses per second (On/Off/Freq)
Inputs 6-9	Analog Voltage 0 – 5V
GPS	RS232 TX/RX
Ground	2
Output PWM (Coming Soon)	2
Output +12v	1
Output	4
Output current rating	2A/output

DISCLAIMER

The warranty offered on this Farmscan Ag product is limited to the repair or replacement of the faulty goods. No liability will be accepted for loss of profit or productivity. **WARRANTY IS VOID** if power and or sensors are not connected as described in this guide.

PARTS LIST

REF	PART NUMBER	DESCRIPTION	QTY
1	A-Jackal	Jackal Monitor	1
2	AH-407	Mounting Bracket	1
3^	P-321 x1	11 Way Input Plug	1 each colour
	P-322 x1	Green & Grey	
4^	AC-105	5m Power Cable	1
5^	HM-506	Screw Driver	1
Not Pictured	AM-200	Warranty Card	1
Not Pictured	AM-Jackal	Manual	1
6*	AC-4501/T	Jackal Tractor Harness 5m	1
7*	AC-4501/S	Jackal Section Harness 5m	1

^ Items **NOT** supplied when purchased as full spray control
* Items **NOT** supplied if full control kit purchased

PARTS PICTORIAL

MOUNTING & INSTALLATION

The Jackal Monitor & Spray Controller is provided with a suction window mount. An optional RAM style is also available for purchase at an additional cost.

Slide mount onto unit and push sideways to lock into place. Make sure you hear a click of the mount locking into place.

Place in a convenient position on the windscreen and using the toggle lever pictured above (Item 2), push all the way to the bottom until lever locks into position.

Note: Monitor should be mounted in a clearly visible position in the cab for the operator, but not in a position where it is subject to intense heat or moisture.

The connector on the rear of the Jackal Controller has the following connection points available for use
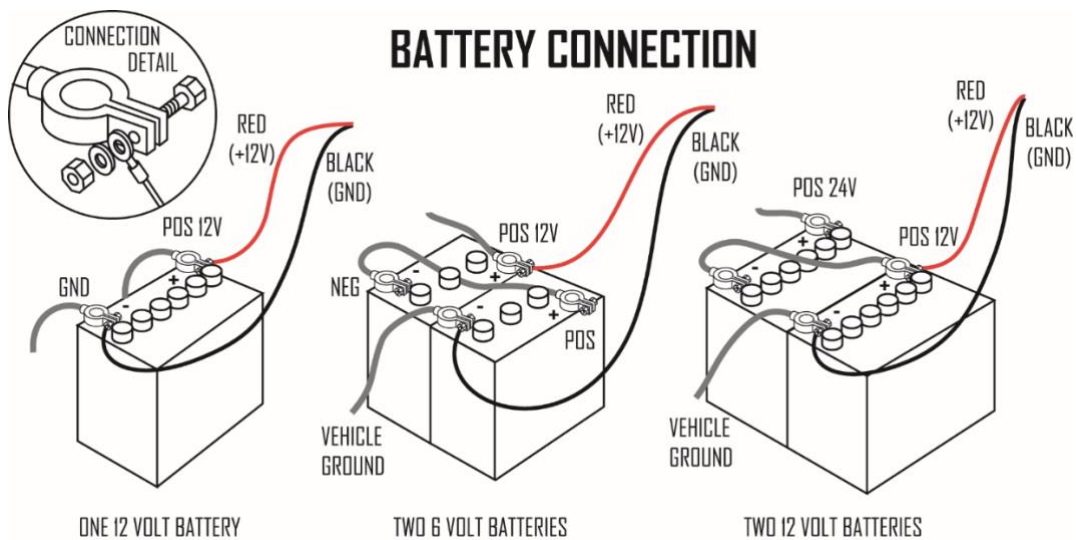
POWER CONNECTION

Power connection must come direct from the battery terminals. **WARRANTY IS VOID** if power is not connected as described in this section.

The supplied harness comes pre-terminated; however, this information is important if required in the future.

GND : Black or Red with Black Stripe
+ve 12v : Red
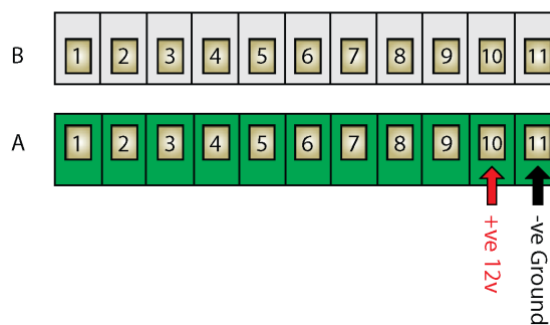
1. Connect power cable supplied **DIRECTLY TO BATTERY**
2. Ring terminals are used for battery connection and the bare end used to connect to the rear Jackal. (Refer above image for power connection)
3. Connect Ground to BATT -VE, **Terminal B11** using the **RED** with **BLACK** stripe wire
4. Connect **+12** Volts (+battery terminal) to BATT +VE, **Terminal B10** using the **red** wire
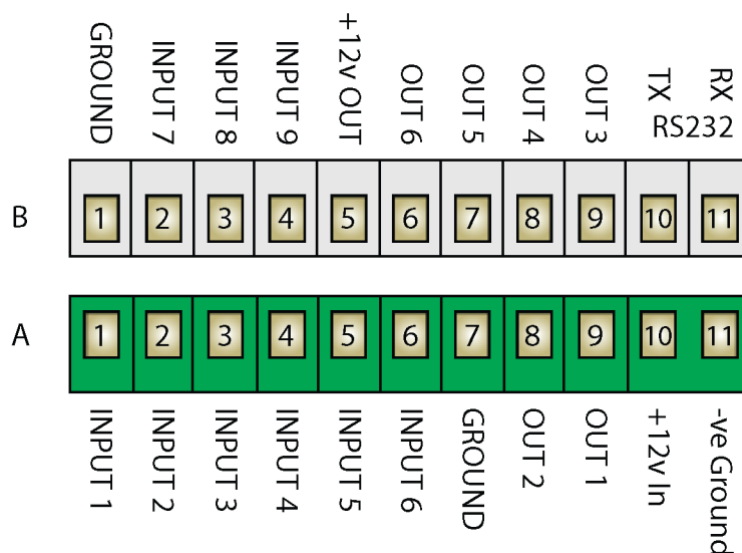5. Ensure that the battery connection to the Jackal is +**12 Volts**

Connecting 24V to the Jackal will VOID WARRANTY

Disconnect the terminal plugs from the Jackal if ARC WELDING on machinery

The connector on the rear of the Jackal Monitor & Controller has the following points available for use when the supplied Tractor & Section/Implement harness is not used.

A	BOTTOM ROW (GREEN PLUG)	B	TOP ROW (GREY PLUG)
A1	INPUT 1 1x Coil Input / Flow (Sine Wave)	B1	GROUND Earth / 0v
A2	INPUT 2^ Prox / Reed / High-Low / On-Off / Alarm	B2	INPUT 7 Varying Voltage Sensor
A3	INPUT 3^ Prox / Reed / High-Low / On-Off / Alarm	B3	INPUT 8 Varying Voltage Sensor
A4	INPUT 4^ Prox / Reed / High-Low / On-Off / Alarm	B4	INPUT 9 Varying Voltage Sensor
A5	INPUT 5^ Prox / Reed / High-Low / On-Off / Alarm	B5	+12v OUT Supply Out / Sensor Power
A6	INPUT 6 Varying Voltage Sensor	B6	OUT 6 Dump
A7	GROUND Earth / 0v	B7	OUT 5 Section 3
A8	OUT 2 GND/+12v/Run/Hold/Alarm/Freq/Batch	B8	OUT 4 Section 2
A9	OUT 1 GND/+12v/Run/Hold/Alarm/Freq/Batch	B9	OUT 3 Section 1
A10	+12v In +12v Battery	B10	RS232 TX From GPS
A11	-Ve In Ground / GND Battery	B11	RS232 RX From GPS

Need an extra Square Wave Input? Consider swapping your wheel sensor input for out T-135 GPS Speed sensor

- B5 supplies 12v out to sensors when the Jackal is turned on
- Any free INPUTS can be used as the remote/run hold function
- ^ Square Wave input Only

The Jackal Spray Controller & Monitor harness comes pre-wired for ease of install and convenience.

The following table outlines the pre-termination of this cable.

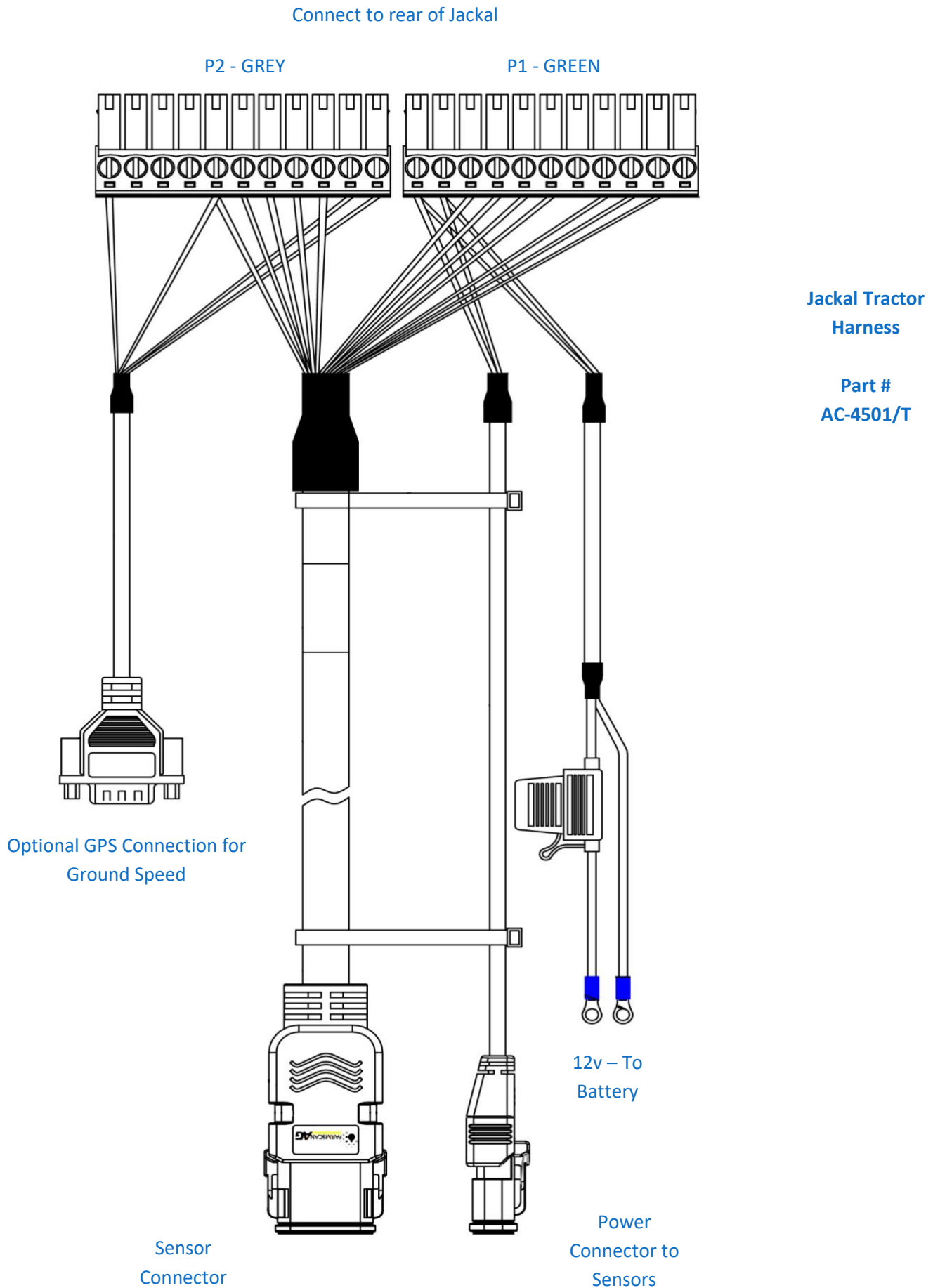| A	BOTTOM ROW (GREEN PLUG)	B	TOP ROW (GREY PLUG)
A1	INPUT 1 / NOT USED	B1	GROUND / GPS PIN 5
A2	INPUT 2 / FLOW SENSOR	B2	INPUT 7 / NOT USED
A3	INPUT 3 / TANK LEVEL SENSOR	B3	INPUT 8 / NOT USED
A4	INPUT 4 / WHEEL SENSOR	B4	INPUT 9 / NOT USED
A5	INPUT 5 / NOT USED	B5	+12v OUT / COMMON SENSOR POWER
A6	INPUT 6 / PRESSURE SENSOR	B6	OUT 6 / DUMP VALVE
A7	COMMON SENSOR GROUND	B7	OUT 5 / SECTION 3
A8	OUT 2 / MASTER MOTOR -	B8	OUT 4 / SECTION 2
A9	OUT 1 / MASTER MOTOR +	B9	OUT 3 / SECTION 1
A10	+12v IN / +12V BATTERY	B10	RS232 TX / GPS PIN X
A11	-Ve IN / BATTERY GROUND	B11	RS232 RX / GPS PIN X

Notes as below:

- The Jackal sprayer harness is wired to suit the Farmscan Ag control valve bank (see below).
- This cable can be modified for different valve bank assemblies.
- Please refer to your implement supplier or auto electrician to determine the current requirement and wiring if you are not using a Farmscan Ag control valve bank.
- If you are connecting to a 2 Wire section valve you will require a 2-3 Wire Converter **(Farmscan Ag Part Number A-2091)**
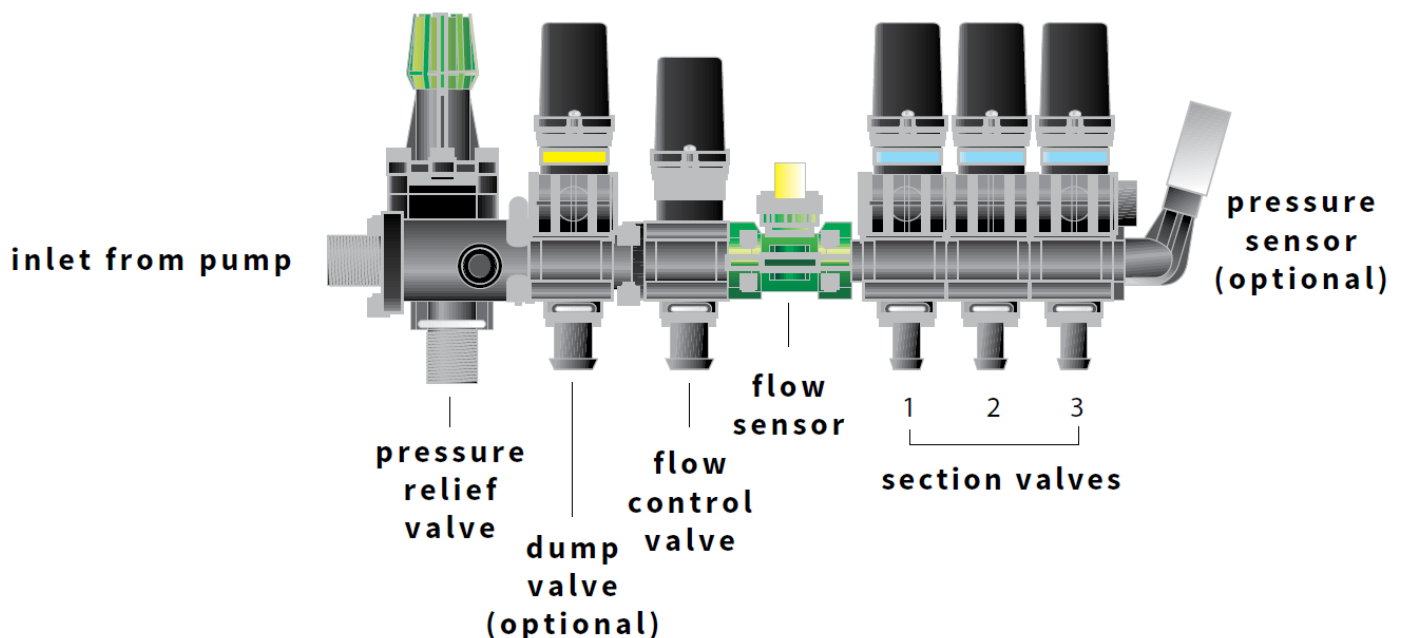
Example – Farmscan Ag 3 Section Valve Bank
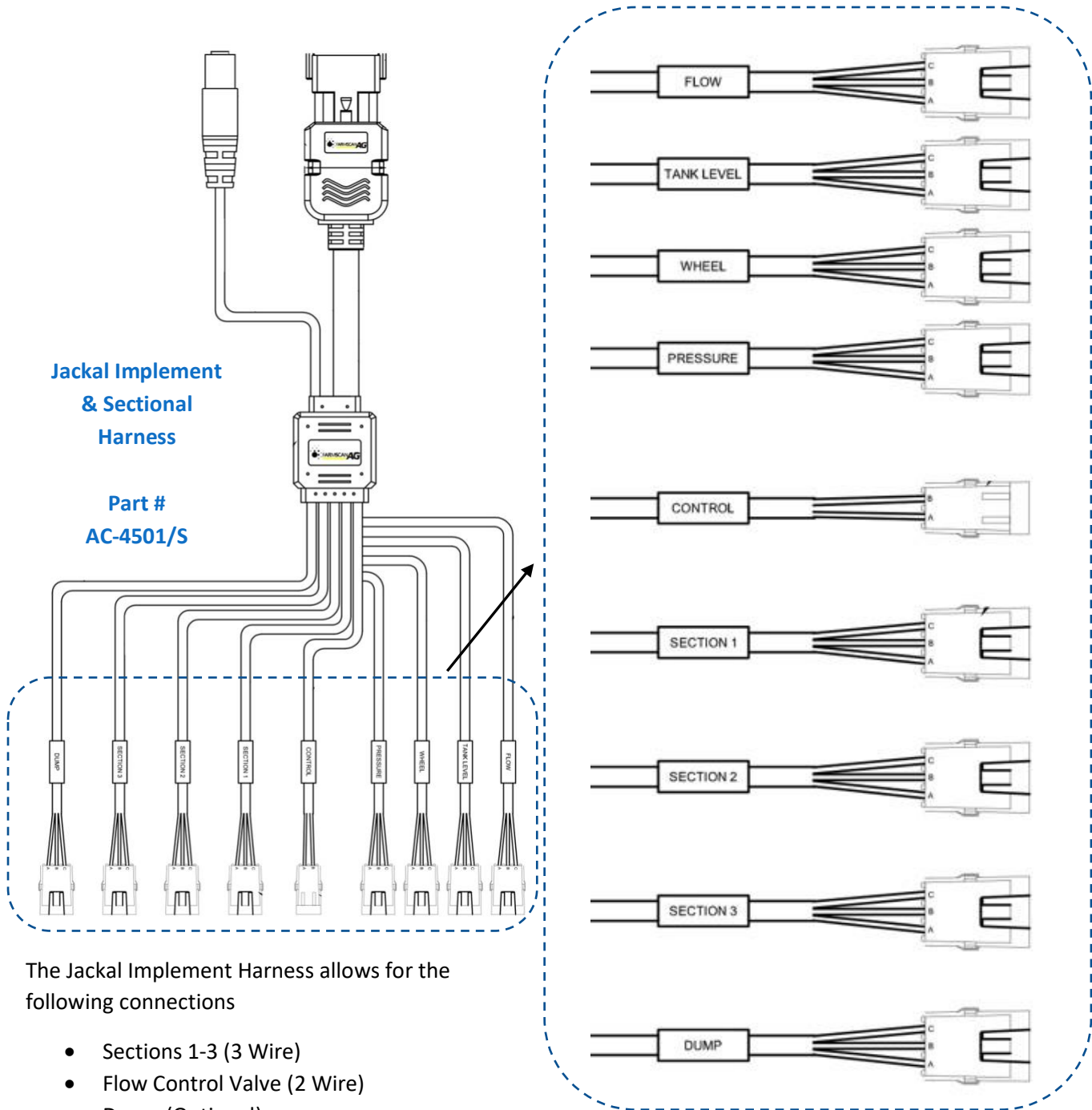**(Farmscan Ag Part Number AA-24V1/3)**

Overview of Tractor Harness as below

Connect to rear of Jackal

P2 - GREY

P1 - GREEN

Jackal Tractor
Harness

Part #
AC-4501/T

Optional GPS Connection for
Ground Speed

12v – To
Battery

Sensor
Connector

Power
Connector to
Sensors

IMPLEMENT/SECTION HARNESS

Overview of Implement/Section Harness as below

Jackal Implement & Sectional Harness

Part # AC-4501/S

The Jackal Implement Harness allows for the following connections

- Sections 1-3 (3 Wire)
- Flow Control Valve (2 Wire)
- Dump (Optional)
- Pressure
- Wheel Input (Speed)
- Tank Level Sensor
- Flow Meter (3 Wire)

NB: There are different variations of the above cable. Some come with bare ends to self-terminate, pre-installed plugs or Packard.

Packard Adapters are as follows:

- AC-7722 – Packard to Flow Control
- AC-7721 – Packard to Section Valves

⚠ **WARNING**   **Connect to implement as required. Unused connectors and wires should be taped back to avoid weather corrosion or accidental shorting and damage.**
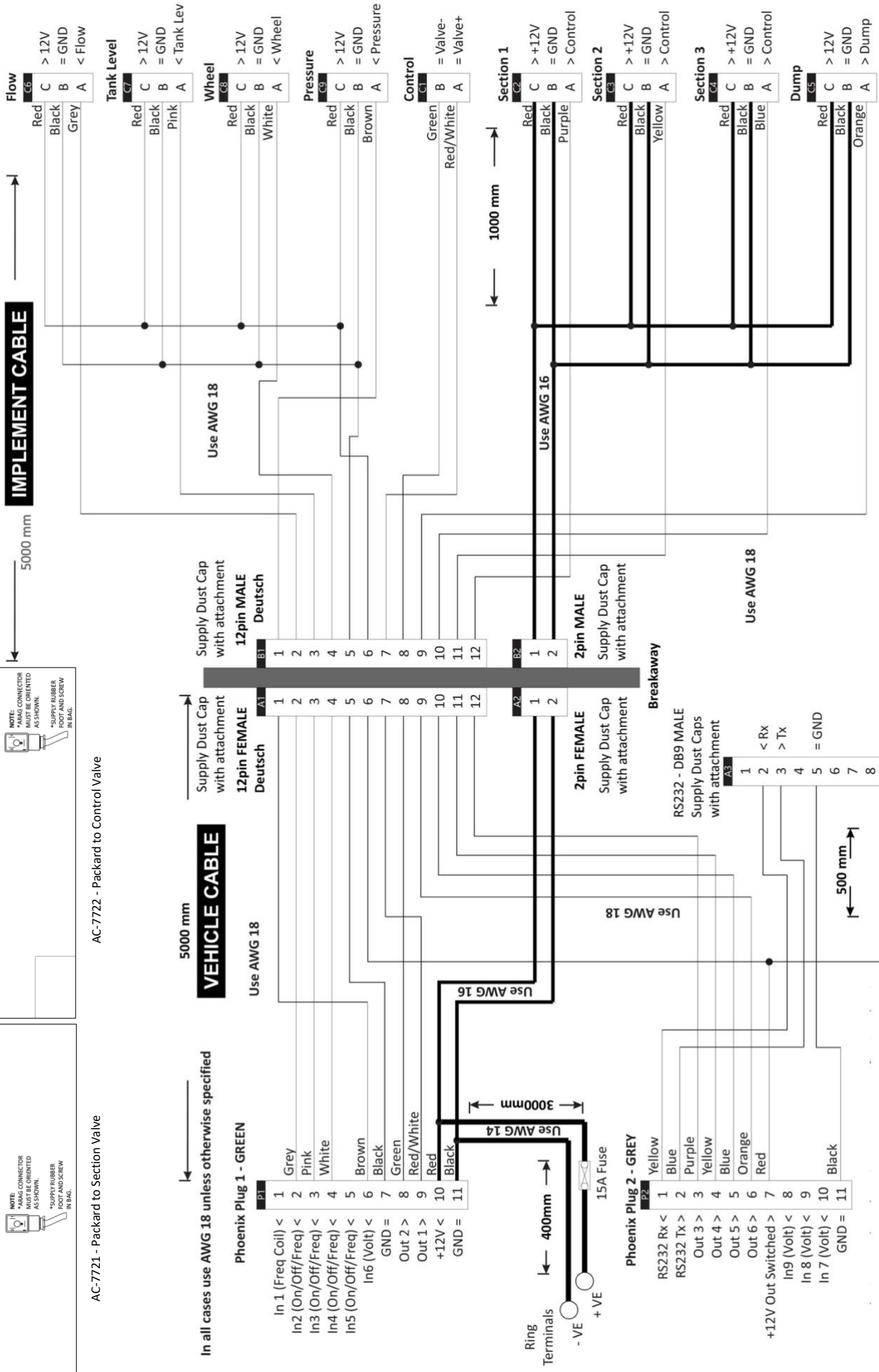**NB: All Red Wires are +12v (live when Jackal is on) – DO NOT SHORT**   ⚠ **WARNING**

IMPLEMENT CABLE

Flow C6
Red — C — > 12V
Black — B — = GND
Grey — A — < Flow

Tank Level C7
Red — C — > 12V
Black — B — = GND
Pink — A — < Tank Lev

Wheel C8
Red — C — > 12V
Black — B — = GND
White — A — < Wheel

Pressure C9
Red — C — > 12V
Black — B — = GND
Brown — A — < Pressure

Control C1
Green — B — = Valve-
Red/White — A — = Valve+

Section 1 C2
Red — C — > +12V
Black — B — = GND
Purple — A — > Control

Section 2 C3
Red — C — > +12V
Black — B — = GND
Yellow — A — > Control

Section 3 C4
Red — C — > +12V
Black — B — = GND
Blue — A — > Control

Dump C5
Red — C — > 12V
Black — B — = GND
Orange — A — > Dump

Use AWG 18
Use AWG 16
Use AWG 18
5000 mm
1000 mm

AC-7722 - Packard to Control Valve

2m [C-211]
Red — K2 — 1 — > Motor+
Black — 2 — > Motor-
3

NOTE: *ARAG CONNECTOR MUST BE ORIENTED AS SHOWN. *SUPPLY RUBBER FOOT AND SCREW IN BAG.

Motor+ > A — Red
Motor- > B — Black

AC-7721 - Packard to Section Valve

2m [C-003]
Black — 1 — > +12V
Black — 2 — = GND
White — 3 — > Section Control

NOTE: *ARAG CONNECTOR MUST BE ORIENTED AS SHOWN. *SUPPLY RUBBER FOOT AND SCREW IN BAG.

Section Control > A — White
GND = B — Black
+12V > C — Red

VEHICLE CABLE

Supply Dust Cap with attachment
12pin MALE Deutsch — B1
1 2 3 4 5 6 7 8 9 10 11 12

Supply Dust Cap with attachment
12pin FEMALE Deutsch — A1
1 2 3 4 5 6 7 8 9 10 11 12

2pin MALE — B2
1 2

2pin FEMALE — A2
1 2

Breakaway

RS232 - DB9 MALE
Supply Dust Caps with attachment
A3
1
2 — < Rx
3 — > Tx
4
5 — = GND
6
7
8
9 — > +12V

500 mm

Supply Dust Cap with attachment

Use AWG 18
Use AWG 16
Use AWG 18
5000 mm

In all cases use AWG 18 unless otherwise specified

Phoenix Plug 1 - GREEN P1
In 1 (Freq Coil) < — 1 — Grey
In2 (On/Off/Freq) < — 2 — Pink
In3 (On/Off/Freq) < — 3 — White
In4 (On/Off/Freq) < — 4 — Brown
In5 (On/Off/Freq) < — 5 — Brown
In6 (Volt) < — 6 — Black
GND = — 7 — Green
Out 2 > — 8 — Red/White
Out 1 > — 9 — Red
+12V < — 10 — Black
GND = — 11 — Black

3000mm
400mm
Use AWG 14
Use AWG 16

Ring Terminals
15A Fuse
- VE
+ VE

Phoenix Plug 2 - GREY P2
RS232 Rx < — 1 — Yellow
RS232 Tx > — 2 — Blue
Out 3 > — 3 — Purple
Out 4 > — 4 — Yellow
Out 5 > — 5 — Blue
Out 6 > — 6 — Orange
+12V Out Switched > — 7 — Red
In9 (Volt) < — 8
In 8 (Volt) < — 9
In 7 (Volt) < — 10 — Black
GND = — 11

The following examples will help to determine appropriate sensor input connections into the Jackal **IF** you choose to alter the pre-terminated cable to your specifications.

TWO WIRE "COIL" – YELLOW END SENSOR OR 2 WIRE FLOW METER
KIT # 2034, 2077, AA-230S/RCS

These kits will all include a "coil" type sensor. The coil type sensor is a 2 wire sensor (normally yellow end) and only uses a ground/earth wire and a signal wire.

This input is also used with 2 wire (sine wave) flow meters.

The diagram to the right shows which terminals to connect your sensors to.

Insert the black ground wire to either **(A7 or B1)** and the white/coloured signal wire into **(A1)**

Use the wizard to setup the port and calibrate a sensor once installed.

GND : Black
SIGNAL : White
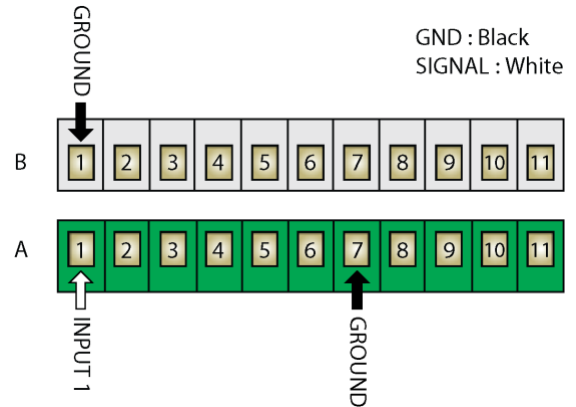
TWO WIRE "REED" – BLACK END SENSOR
KIT # 1007P, 2009, 2076

These kits will all include a "reed" type sensor. The reed type sensor is a 2 wire sensor (normally black end) and only uses a ground/earth wire and a signal wire.

The diagram to the right shows which terminals to connect your sensors to.

Insert the black ground wire to either **(A7 or B1)** and the white/coloured signal wire into any **(A2-A5)**

Use the wizard to setup the port and calibrate a sensor once installed.

GND : Black
SIGNAL : White
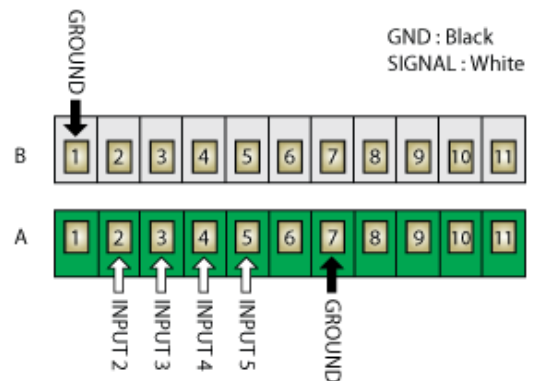
THREE WIRE – PROX SENSOR OR 3 WIRE FLOW METERS
KIT # AA-2010P, AA-123P, AA-125, AA-242, AA-230X, AA-232X, AA-231

These kits will all include a "reed" type sensor. The reed type sensor is a 3 wire sensor and uses a ground/earth wire, a signal wire and a 12v power wire.

A Prox sensor can be used for wheel speed or RPM.

This input is also used with 3 wire (square wave) flow meters.

The diagram to the right shows which terminals to connect your sensors to.

Insert the ground wire to either **(A7 or B1)** and the sensor wire into any **(A2-A5)** and the power wire to **(B5)**

Use the wizard to setup the port and calibrate a sensor once installed.
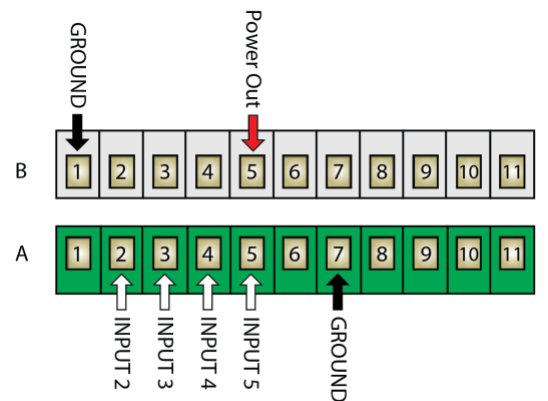
Polmac : A Signal (Green) | B Ground (White) | C Power (Brown)
Prox : A Signal (Black) | B Ground (Blue) | C Power (Brown)

## THREE WIRE "ANALOGUE/VOLTAGE" – PRESSURE SENSOR OR DEPTH SENSOR
KIT # AA-114, AA-119-H, AA-119-L, AA-430

These kits will all include an "analogue" type of sensor. The analogue sensor is 3 wire and uses a ground/earth wire, a signal wire and a 12v power wire.

Typical sensors would include Pressure & Depth.

The diagram to the right shows which terminals to connect your sensors to.

Insert the ground wire to either **(A7 or B1)** and the sensor wire into any **(A6 or B2-B4)** and the power wire to **(B5)**

Use the generic wizard to setup the port and calibrate a sensor once installed.
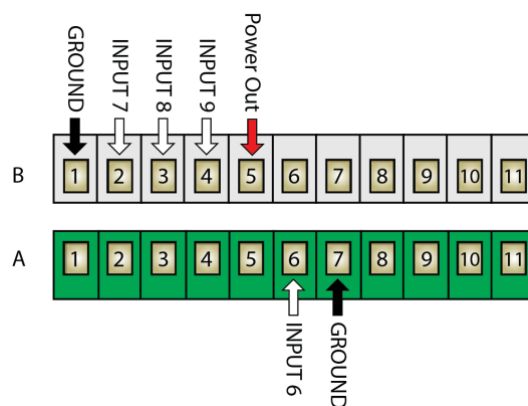
THREE WIRE "BIN/TANK LEVEL"
KIT # 2060, A-2220P

These kits will all include an "on/off, high/low, empty/full" type of sensor. The analogue sensor is 3 wire and uses a ground/earth wire, a signal wire and a 12v power wire.

A typical sensor would include a Bin/Tank Level Sensor.

The diagram to the right shows which terminals to connect your sensors to.

Insert the ground wire to either **(A7 or B1)** and the sensor wire into any **(A2-A5)** and the power wire to **(B5)**

Use the generic wizard to setup the port and calibrate a sensor once installed.
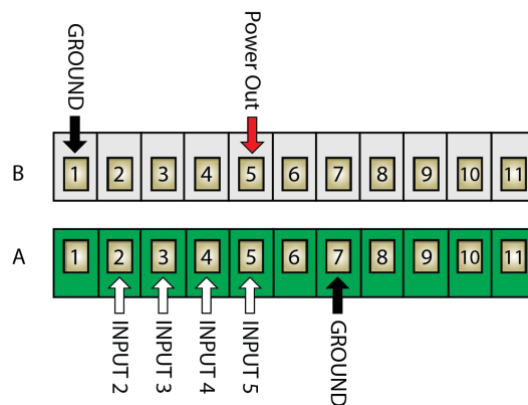
GPS
KIT #T-135

GPS units supplied from Farmscan Ag are pre-programmed and ready to use with the Jackal Monitor.

The diagram to the right shows which terminals to connect your GPS to.

Insert the black or green wire to **(B1)** and the white or yellow wire into **(B11)** and the red wire into **(B5)**

Use the wizard to setup the port and calibrate once installed.

NB: If you BYO GPS please ensure: GGA, VTG, RMC, 5Hz and a baud rate over 19200kbps.
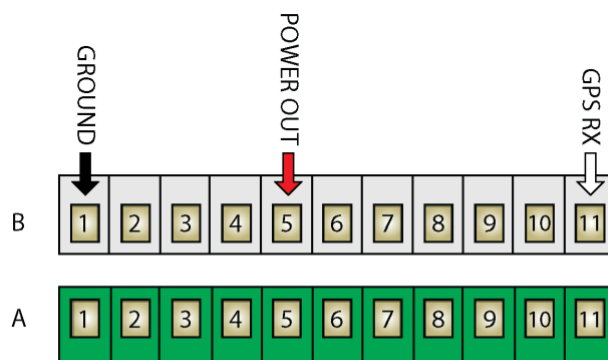
GND : Black
SIGNAL : White
POWER : Red

BATCH (SOLENOID)
KIT # 1501

The Batch function is designed to measure bulk water into a spray tank via either a bottom or top fill system. The minimum flow rate for effective operation is 75 L/min to a maximum of 750L/min using our standard 2" flow sensor.

Water may be pumped, or gravity fed through the flow sensor, which will give accurate readings providing no air enters the system. The Flow sensor can be installed on either the suction or pressure side of the water delivery system, and the readout will count up to display the total litres delivered.
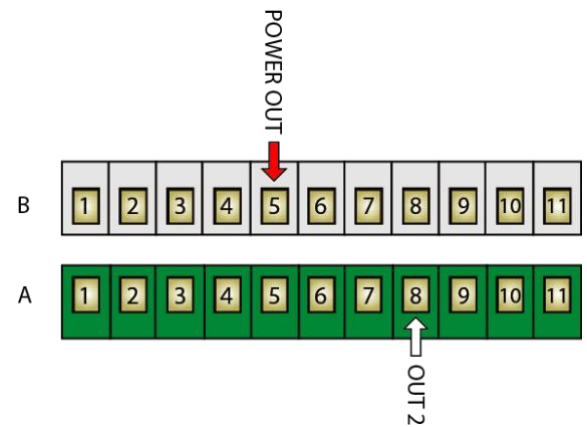
Alternatively, the TANK BATCHMETER may be automated by installing either the SOLENOID SHUTOFF option which will automatically stop the flow after the readout counts down to zero from a preset batch total.

When using the Jackal as a batch meter with liquid, please ensure the appropriate flow meter is setup as per the previous instructions.

Insert one wire to **(B5 POWER OUT)** and the other wire into **(A8 OUT 2)**

Use the wizard & instructions to setup the port and calibrate once installed.

If water quality is doubtful, water intake should be filtered via an 80-mesh filter before the flow sensor, to avoid foreign matter clogging / jamming the turbine. Chemicals may be introduced into the water stream without causing damage to the flow sensor, but some chemicals may damage or reduce the solenoid diaphragm life, particularly if undiluted.

REMOTE RUN/HOLD (ACTIVATE BY INPUT)

The Jackal Monitor can connect an external Run/Hold trigger (e.g. Remote Switch) & wire into any unused INPUT port **(A1-A6 & B2-B4)**

This allows the Jackal to be remotely placed on hold or run mode from an external source or switch without having to press the Run/Hold button on the Jackal itself. When the external Run/Hold is active on any input the Run/Hold button on the Jackal is then disabled.

Insert the ground wire from your external switch to any of the unused ports as mentioned above.

NB: In some cases, you may have to use an automotive relay to provide the appropriate ground output.
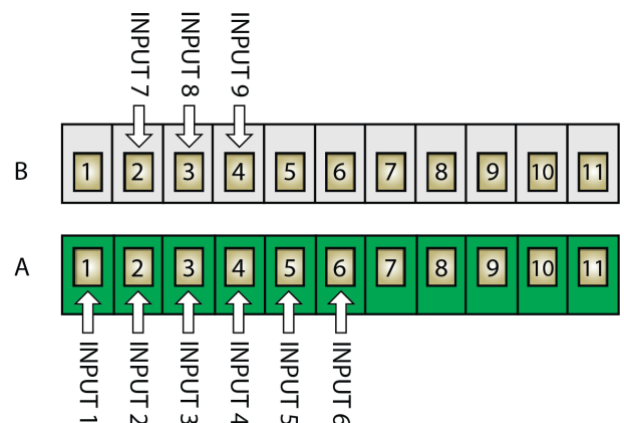
NORMALLY ON	NORMALLY OFF
WHEN A CIRCUIT EXISTS BETWEEN THE SELECTED INPUT AND GROUND (GND), SELECTING NORMALLY ON WILL RESULT IN THE JACKAL GOING INTO HOLD MODE	SELECTING NORMALLY OFF WILL RESULT IN THE REVERSE I.E. THE JACKAL WILL BE IN RUN MODE UNTIL THE CIRCUIT IS BROKEN AFTER WHICH IT WILL GO INTO HOLD MODE.

Enable the remote run/hold via **OTHER SETTINGS** as further described on **PAGE 44.**
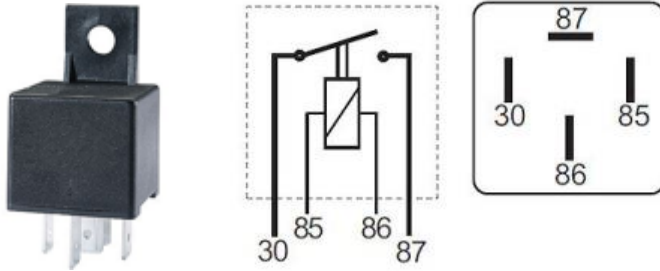
The Jackal Monitor has the ability to Run/Hold an external device such as a remote clutch switch.

This allows you to press the Run/Hold on the Jackal to enable an external operation.

NB: This function is used in conjunction through an automotive relay.

Example: Hella Automotive Relay (12v / 30A) – 4RA003510-08
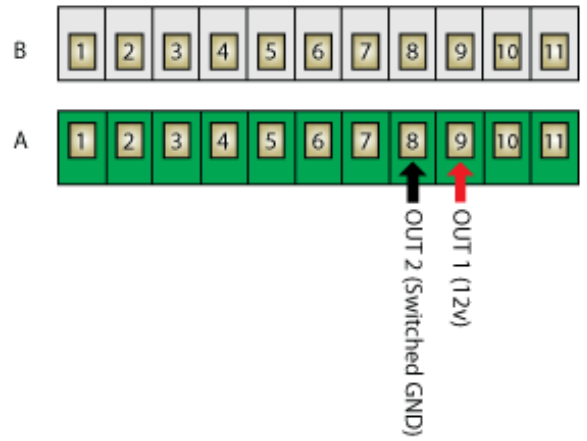
Pin 86 to **B9 Out 1** (Jackal 12v Supply Out)
Pin 85 to **B8 Out 2** (Switches Output)
Pin 30 to **12v in** (Direct to Vehicle Battery)
Pin 87 to **Positive Side** of switch *(Ensure negative/ground on other side of switch returns to battery)*

Enable the remote run/hold out by:

From the front screen press **SETUP**

Highlight **OUTPUTS** and press **SELECT**
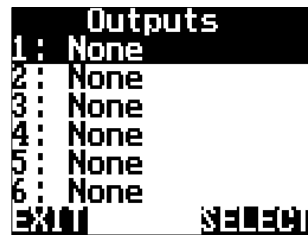
Highlight **1: NONE** and press **SELECT**
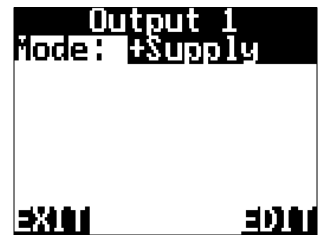
Press **EDIT** and change to **MODE: +Supply**
Press **EXIT**
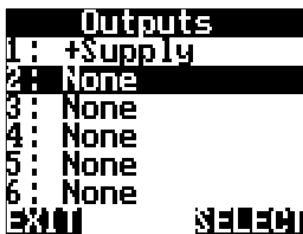
Highlight **2: None** and press **SELECT**
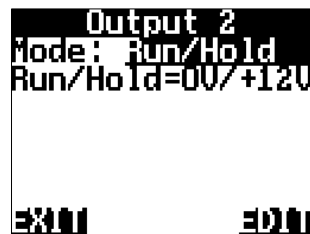
Press **EDIT** and change to **MODE: Run/Hold**
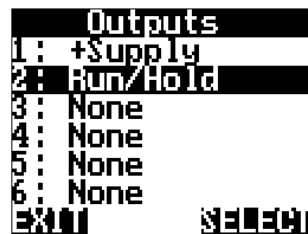
Highlight **RUN/HOLD** and **EDIT** to =0V/+12V

Press **EXIT** when done.
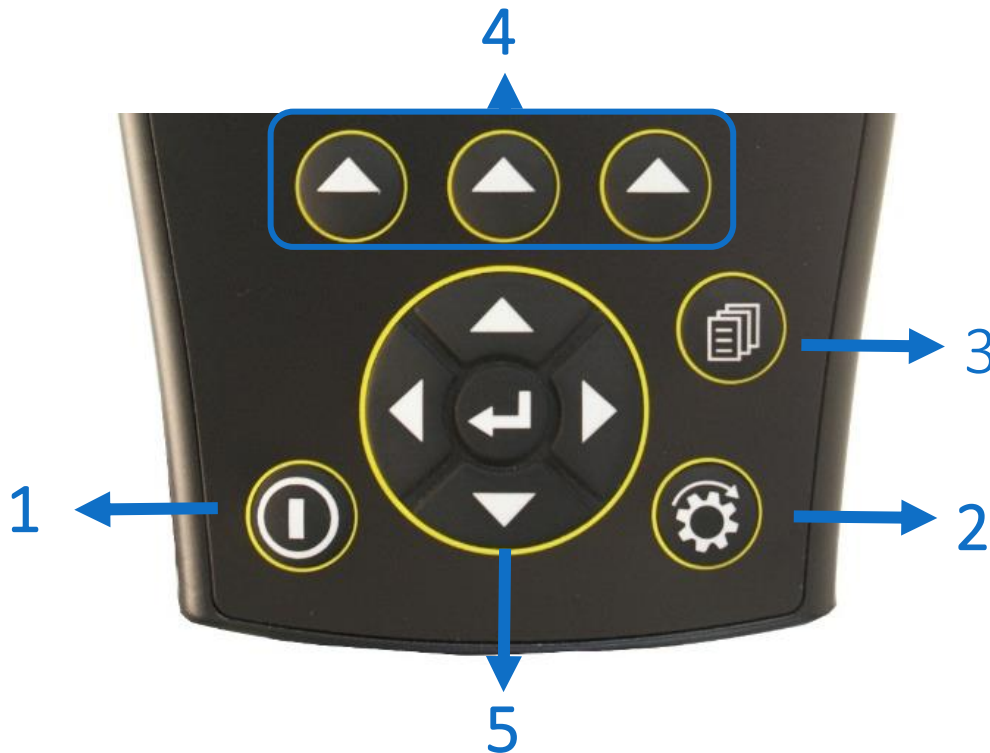
BUTTON FUNCTIONS

1. **Power On/Off button**

   a. Power is turned on by pressing the **ON/OFF** button for 1 second.

   b. Power is turned off by holding the **ON/OFF** button for 2 seconds.

2. **Run/Hold button**

   a. The **RUN/HOLD** button has a dual function.

      a. Press **RUN/HOLD** once to place the 'MONITOR ON HOLD'.

      b. Press **RUN/HOLD** again to resume operation.

   b. The **RUN/HOLD** state is indicated in the top left-hand corner of the screen. When the monitor is in RUN mode, the unit displays RUN to signify that the monitor is active.

   c. When the monitor is in **HOLD** mode the unit displays the word "**HOLD" & "BEEPS"** every 2 seconds

3. **Page button**

   a. The **PAGE** button is used to scroll through BATCH mode screens or Spray Control functions.

4. **Select button (3 of)**

   a. The Jackal has 3 buttons placed directly under the LCD. These buttons will change function in different menus.

   b. The function of the button is indicated at the bottom of the screen directly above the button.

5. **Navigation button (Up, Down, Left, Right, Enter)**

   a. The Round navigation (**NAV**) buttons are used to navigate **UP/DOWN/LEFT/RIGHT** in calibration screens as well as scrolling through the display lines on the main screen.

   b. **ENTER** is used to select the option highlighted onscreen.

The Jackal can display one, two or three lines of live information at any one time.

Using the middle **NAV/Enter** button allows you to toggle between the different display modes when multiple inputs are being used.

Example: 1 Line

Example: 2 Line

Example: 3 Line

The level of Jackal unlock will determine what options are viewable and available to be edited.

Use the NAV button down to reveal further menu information

Wizard	Run a predefined wizard for setting up the Jackal Monitor as: • Sprayer (Automatic Mode) • Area/Speed Wheel • Area/Speed GPS • Tachometer (Fast & Slow option available) • Flow Meter • Slippage Meter • Generic Wizard
Inputs	Manually enable or edit ports in which sensors are connected to.
Front Screen	Enable/define/order/edit/name the lines on the front screen. Select the number of decimal places displayed and edit the alarms.
Other Settings	Change speed input, implement & section widths, external run/hold alarm notification *s*ettings (beep & on hold), language options, speed simulation for diagnostics.
Outputs	This menu is used to control the Jackal outputs. Refer to this manual and edit the outputs described ONLY to prevent damage to external sensors connected to the Jackal.
GPS/Serial	When an external GPS is connected view and ensure the GPS is setup correctly. Setup baud rate and confirm GPS messages (NMEA messages RMC or GGA+VTG are required) Latitude, Longitude, heading, speed, date & time.
About Jackal	Shows current version of Jackal software and unlock codes installed on the unit.
Diagnostics	Shows current input voltage, temperature and input diagnostics.
Factory Reset	Returns the Jackal to factory default.

SPRAYER (WIZARD)

The Jackal can be setup to control an application rate when using both a speed & flow input. It offers Fully Manual, or Manual with auto dump valve open when stopped & Full Rate Control when varying speed.

Rates and 3 sections can be controlled from the main screen

Sensors Required:

- Wheel Sensor/GPS for Speed & Area calculation
- Flow meter (any style) to display Litres

Available Connections: Refer to Installing Sensors from **PAGES 9-11**

NB: The following setup uses information from multiple pages in this manual.
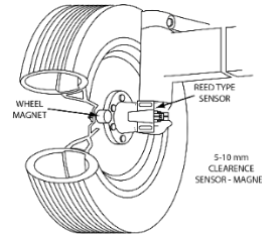
SETUP – AUTO MODE

From the front screen press **SETUP**

Highlight **WIZARD** and press **SELECT**
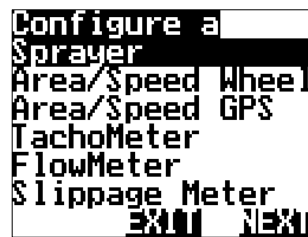
Highlight **Sprayer** and Press **NEXT**

Select Spray Mode

Auto: Requires Speed & Flow Input. Auto rate adjust

Manual: Adjust the Flow Control Valve Manually

PAGE 18
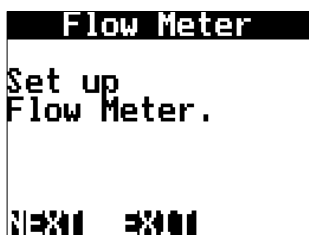
Press **NEXT** to setup your Flow Meter

NB: Please have your Pulse Per Litre (PPL) factor from your flow meter to hand

Press the **DOWN** arrow to the Manual Ratio value of 500.00 & Press **EDIT** to change the unit of Pulse.

Using the **NAV** buttons enter the PPL factor as displayed on **the flow meter tag.** Press **EXIT** when done.
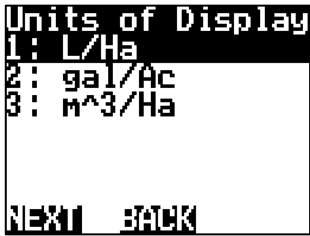
Press **NEXT** to accept the new manual ratio (PPL)

```
Units of Display
1: L/Ha
2: gal/Ac
3: m^3/Ha


NEXT    BACK
```

Using the **NAV** buttons select how you would like the **UOD** to be displayed on the front screen.
Press **NEXT**

```
Alarm Settings
Alarm Min: 0.00
Alarm Max: 0.00



NEXT  BACK  EDIT
```

You have the option to set Alarm Min/Max points if required. Using the **NAV** buttons select and **EDIT** as required. Press **NEXT**

```
Select a Name

Current:
    RATE


NEXT  BACK  EDIT
```

Change the input name if you desire, Press **EDIT,**
or Press **NEXT**

```
Speed Sensor

Set up
Speed input.

Wheel sensor
or GPS?
WHEEL BACK  GPS
```
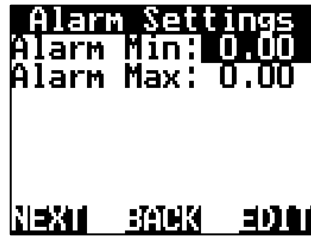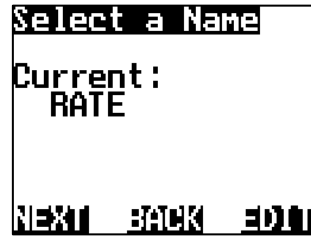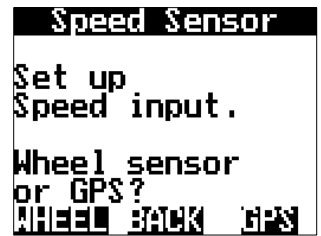
Select **WHEEL** or **GPS** to setup the speed input. This depends on the speed option you have purchased.
For Wheel:
Refer to Page 21 & 23

For GPS:
Refer to Page 24

```
Spray Boom

Set up
Boom Sections.

# Sections:     3
NEXT  SKIP  EDIT
```

Press **EDIT** and change the number of sections required to control.
Press **NEXT**

```
Boom Width
Implement Width:
    12.000m
Section1:   4.000
Section2:   4.000
Section3:   4.000
NEXT  BACK  EDIT
```

Using the **NAV** & **EDIT** keys, highlight and edit the section width values as required. The Section Widths will also Total and be displayed. Press **NEXT**

```
Preset Rates
Unit: L/Ha
RateA  :    50.00
RateB  :    60.00
RateC  :    70.00
Step   :     5.00
NEXT  BACK  EDIT
```
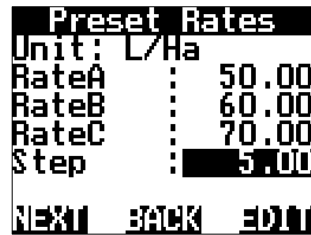
Using the **NAV** & **EDIT** keys, highlight and edit the "Quick set Rates" & Quick rate Step Value.
Press **NEXT**

The Jackal has the ability to have **Preset Rates** across the bottom of the screen. Example 50l/ha, 60l/ha etc.

The Step rate allows you to easily up the rate by this amount quickly from the front screen.

Press **NEXT**

```
Preset Rates
Hold   @ 4.0km/h
Stop   @ 2.0km/h




NEXT  BACK  EDIT
```
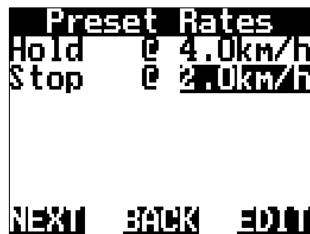
Using the **NAV** & **EDIT** keys, highlight and edit the **HOLD** & **STOP** values as described below

Press **NEXT**
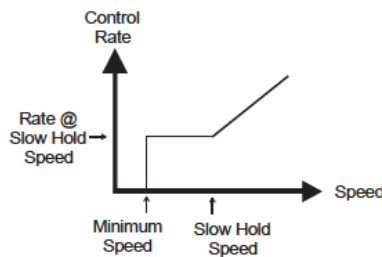
- The Slow Hold Speed function is used to avoid loss of spray coverage caused by loss of pressure when travelling too slow or when reducing the target rate below the recommended minimum for the nozzles.
- If the implement is travelling below this speed (but above the minimum speed) then flow control is regulated as if the implement were travelling at the Slow Hold Speed.
- NOTE: Slow Hold is an optional function that can be set to operate at a minimum speed equivalent to the minimum recommended pressure for a given target rate (speed-based).
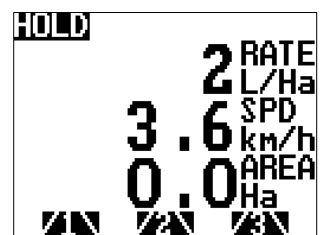- **STOP**: Will simply put the Jackal on hold at a set speed.

```
Select a Name

Current:
    AREA


NEXT  BACK  EDIT
```

Change the input name if you desire, Press **EDIT,**
Press **NEXT**

```
Tank Level

Set up
Tank Level
Sensor?

NEXT  SKIP
```
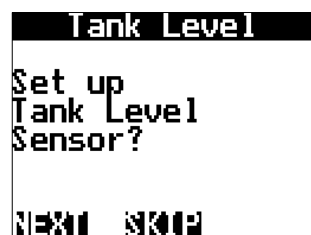
If you wish to setup a Tank Level Sensor please refer to **PAGE 36.** If not, Press SKIP

```

    Wizard
Configuration
  Successful

NEXT
```

Press **NEXT** to finalise the Wizard and return to the front screen

```
HOLD
         2 RATE
           L/Ha
     3.6 SPD
           km/h
     0.0 AREA
           Ha
```

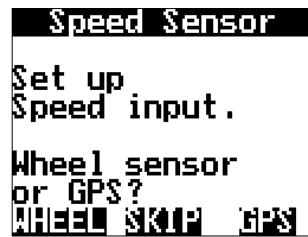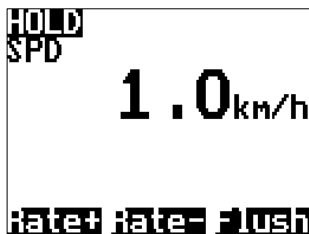THIS ENDS THE AUTO SET WIZARD SETUP FOR SPRAYER SETUP

The Jackal can be setup to work in **MANUAL** mode in the event of no wheel speed or flow meter input. Manual mode simply allows adjustment of the flow control valve. In the event of a dump valve being installed, manual mode will close the dump valve & open all sections when the Run/Hold button is pressed.

Sprayer Select sprayer mode AUTO EXIT MANUAL	**Pressure Sensor** Set up Pressure Sensor. NEXT SKIP	**Speed Sensor** Set up Speed input. Wheel sensor or GPS? WHEEL SKIP GPS	**Spray Boom** Set up Boom Sections. # Sections: 3 NEXT SKIP EDIT
Select **MANUAL**: To Adjust the Flow Control Valve Manually	Press **SKIP**	Press **SKIP**	Press **EDIT** and change the number of sections required to control. Press **NEXT**
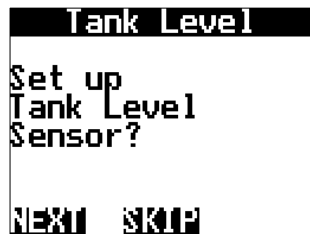
Boom Width Implement Width: 12.000m Section1: 4.000 Section2: 4.000 Section3: 4.000 NEXT BACK EDIT	**Tank Level** Set up Tank Level Sensor? NEXT SKIP	**Wizard Configuration Successful** NEXT	**HOLD SPD** 1.0km/h √1 √2 √3
Using the **NAV** & **EDIT** keys, highlight and edit the section width values as required. The Section Widths will also Total and be displayed. Press **NEXT**	Press **SKIP**	Press **NEXT** to finalise the Wizard and return to the front screen	When you return to the **Front Screen** the Jackal needs to display a value. *We have chosen a generic speed input from GPS.*

HOLD SPD 1.0km/h Rate+ Rate- Flush	**You can now manually adjust your flow control valve by pressing the Rate + or Rate -**
Press the **PAGE** button to display Rate+/- Flush	

THIS ENDS THE MANUAL SET WIZARD SETUP FOR SPRAYER SETUP

Once the Sprayer Wizard has been run you are now ready to start spraying. Familiarise yourself with the Spray Controller layout as described below.

The Jackal Spray Controller Menu is laid out in 4 easy to use menus. These can be easily accessed by pressing the

PAGE button
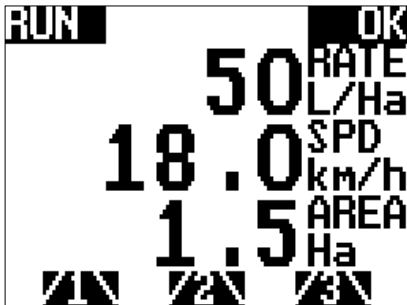
Default **Section On/Off Control** & **Run Screen**
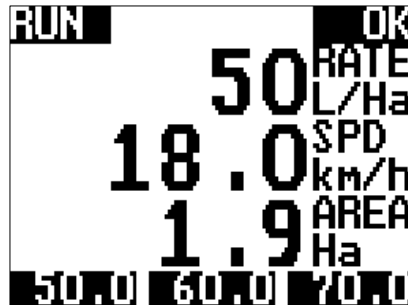
Pre-Set A/B/C Rate Screen
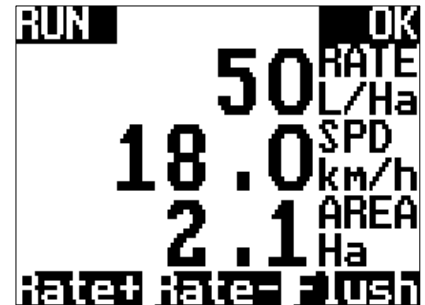
Step Rate Adjust & **Flush** Screen

Alarm, **Trip** & **Setup** Layout

DEFAULT RUN & HOLD SCREEN
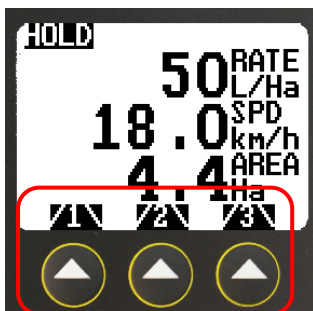
Sections can be individually turned On/OFF by pressing the soft keys underneath the sections numbers "/x\"

Pressing the Run/Hold button changes the Jackal from **HOLD** to **RUN**
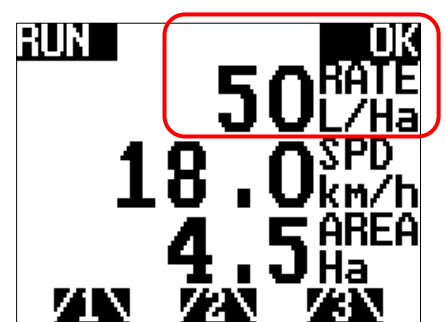
The LIVE rate in L/Ha is displayed and if the desired target is reach, **OK** will also be displayed
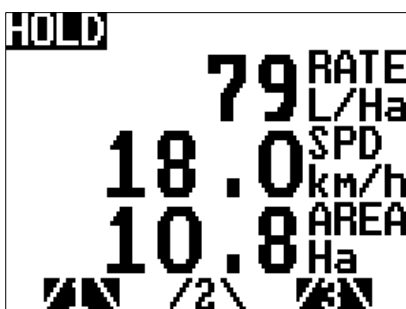
Example shows **Section 2** as OFF

Example - **HOLD**
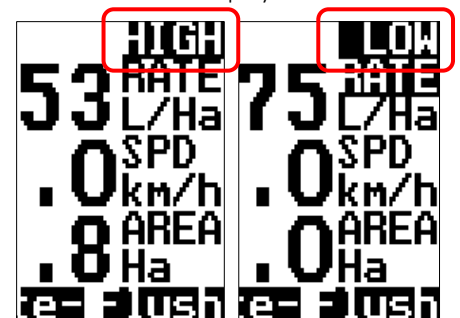
Both **HIGH** & **LOW** rate warnings are also displayed

PRESET RATES SCREEN

Quick Pre-set rates allows you to change rates on the go with ease. The Jackal will control up or down to the desired rate depending on vehicle speed.
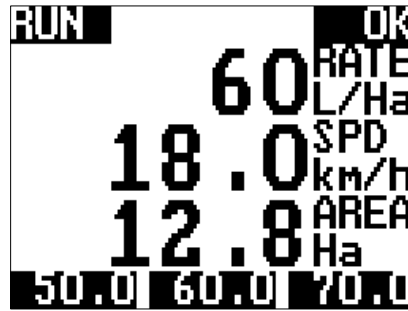
Pre-Set Rates can be changed via

SETUP > FRONT SCREEN > RATE

RateA/B/C/D
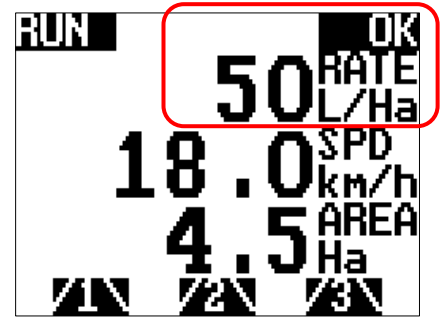
When changing rates, the Jackal will adjust the master control valve to allow more or less flow.

NB: If you believe the rate is not being maintained correctly when you speed up and slow down, it's possible the Flow Control Valve is opening back to front.

Please refer to the OUTPUTS on

PAGE 45 to swap the + & - Outputs

MANUAL RATE/STEP ADJUST & FLUSH
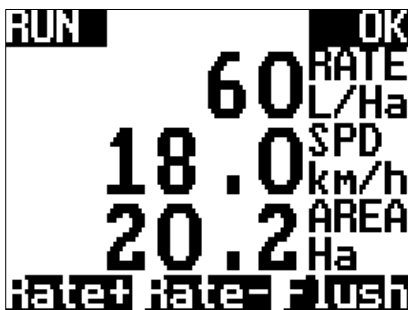
The **Rate +** & **Rate (STEP) –** allows you to adjust your flow rate with the Pre-Defined **STEP** rate previously input via the Wizard.
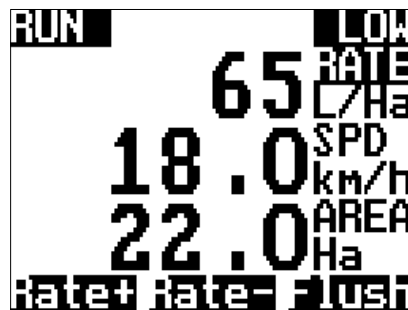
Your STEP be changed via

SETUP > FRONT SCREEN > RATE
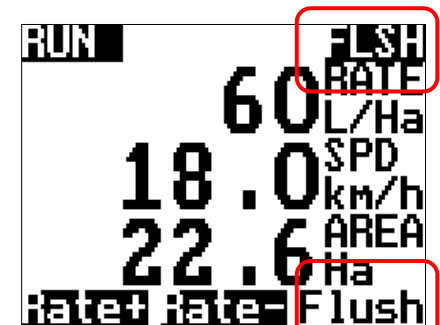
The **FLUSH** function will enable the full flow rate possible on your system.

Dump valve will close & all sections and control valve will open fully.

** Manual Rate **

REFER TO PAGE 18

AREA & SPEED METER SETUP (WIZARD)

The Jackal can display Speed & Area in any combination of km/Ha or mph/acre.

A pickup can be mounted either on a wheel hub or shaft. (Example image right)

NB: THERE SHOULD BE A 5-10MM CLEARANCE BETWEEN SENSOR AND MAGNET

Sensors Required:

- Wheel sensor pickup 2 (Reed) or 3 wire (Proximity)
- Magnet (Used with 2 wire sensor)
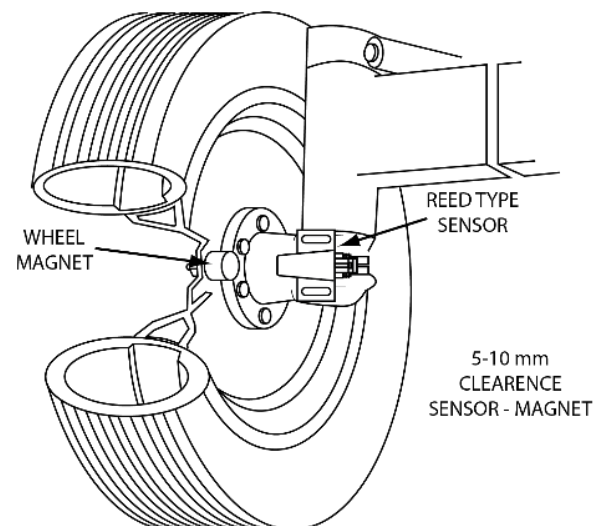
Available Connections: Refer to Installing Sensors from **PAGES 9-11**.

NB: The Implement harness has 3 wires by default. If using our standard wheel sensor kit, please only use the black & colored wire. The RED (Positive) does not need to be connected. – Trim this back or cover with heat shrink to prevent shorting out.

SETUP

From the front screen press **SETUP**

Highlight **WIZARD** and press **SELECT**
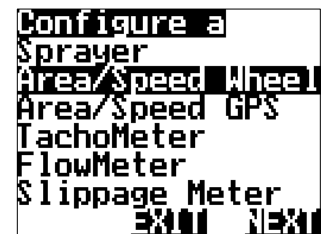
Highlight **Area/Speed Wheel** and Press **NEXT**
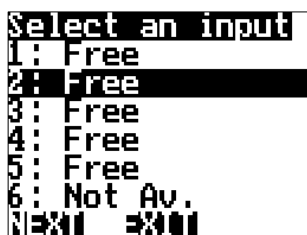
Highlight the **INPUT** number the speed is connected into the back of Jackal & press **NEXT**
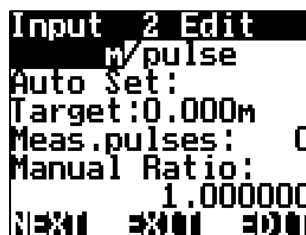
Leave the unit of pulse calibration method as **M**

Choose your calibration method

Auto Set > PAGE 22

Manual Ratio > PAGE 23

CALIBRATION (AUTO SET)

1. Ensure that the sensor and pickup are end-end before continuing
2. Mark bottom centre of tyre on which the sensor is fitted and peg ground in corresponding position
3. Measure out a known distance to calibrate i.e. 20m-100m
4. Peg the corresponding point i.e. at the 20/100m mark

Input 2 Edit m/pulse Auto Set: **Target:0.000m** Meas.pulses: 0 Manual Ratio: 1.000000 **NEXT START EDIT**	**m to Calibrate:** 20.0000 **EXIT DEL INS**	**Input 2 Edit** m/pulse Auto Set: **Target:20.00m** Meas.pulses: 0 Manual Ratio: 1.000000 **NEXT START EDIT**	**Input 2 Edit** m/pulse Auto Set: **Target:20.00m** Meas.pulses: 66 Manual Ratio: 1.000000 **STOP**
Select **TARGET** Select **EDIT**	Using the **NAV** buttons enter your measured distance. i.e. 20.0000 Press **EXIT** when done.	Press **START** and move forward slowly. This will allow pulses to register.	When you arrive at the center mark point of tyre to peg press **STOP**

Input 2 Edit m/pulse Auto Set: **Target:20.00m** Meas.pulses: 66 Manual Ratio: 1.000000 **CALC**	**Input 2 Edit** m/pulse Auto Set: **Target:20.00m** Meas.pulses: 66 Manual Ratio: 0.303030 **NEXT START EDIT**	**Other Settings** Speed Input: 2 No. Sections:N/A Implement Width: **12.000m** Section1: N/A Section2: N/A **NEXT EXIT EDIT**	**Units of Display** 1: Ha 2: Ac 3: m^2 4: km^2 **NEXT EXIT**
Press **CALC.** This will divide the distance travelled by the number of pules registered.	**MANUAL RATIO** will now be updated to reflect the calibration factor. Press **NEXT**	Using the NAV buttons and pressing **EDIT** enter your implement width in (m). e.g. **12m** Press **NEXT**	Using the **NAV** buttons select how you would like the area to be displayed on the front screen. Press **NEXT**

Alarm Settings Alarm Min: **0.00** Alarm Max: 0.00 **NEXT EXIT EDIT**	**Select a Name** Current: AREA **NEXT BACK EDIT**	**Display km/h on front screen?** **YES EXIT NO**	**Select a Name** Current: SPD **NEXT BACK EDIT**
You have the option to set Alarm Min/Max points if required. Using the **NAV** buttons select and **EDIT** as required. Press **NEXT**	Change the input name if you desire, Press **EDIT,** Press **NEXT**	Select either **YES** or **NO** to display Speed on the front screen with the area covered.	Change the input name if you desire, Press **EDIT** Press **NEXT**

Wizard Configuration Successful **NEXT**	Press **NEXT** to finalise the Wizard and return to the front screen

RUN **AREA** **3.03** Ha SPD **10.8** km/h **ALARM TRIP SETUP**

THIS ENDS THE AUTO SET WIZARD SETUP FOR SPEED/AREA METER

CALIBRATION (MANUAL RATIO)

1. Ensure that the sensor and pickup are end-end before continuing
2. Mark bottom centre of tyre on which the sensor is fitted and mark ground in corresponding position
3. Drive ONE full rotation of the wheel, returning the mark point on tyre to bottom centre
4. Measure between the two points.
   o This is your Manual Ratio (Example 1.24m)

Select **MANUAL RATIO** Select **EDIT**	Using the **NAV** buttons enter your measured distance. i.e. 1.240000 Press **EXIT** when done.	Press **NEXT**	Using the **NAV** buttons and pressing **EDIT** enter your implement width in (m). e.g. **12m** Press **NEXT**
Using the **NAV** buttons select how you would like the area to be displayed on the front screen. Press **NEXT**	You have the option to set Alarm Min/Max points if required. Using the **NAV** buttons select and **EDIT** as required. Press **NEXT**	Change the input name if you desire, Press **EDIT** Press **NEXT**	Select either **YES** or **NO** to display Speed on the front screen with the area covered.
Change the input name if you desire, Press **EDIT**, Press **NEXT**	Press **NEXT** to finalise the Wizard and return to the front screen		

THIS ENDS THE MANUAL RATIO SET WIZARD SETUP FOR SPEED/AREA METER

The Jackal can display Speed & Area in any combination of km/Ha or mph/acre.

A wheel sensor is not required when using a GPS. GPS purchased from Farmscan Ag are pre-programmed. If you BYO please ensure the following:

- GPS programmed with RMC – GGA - VTG NMEA messages.
- Any Baud Rate of - 4800,9600,19200,38400,115200 @ 5hz minimum.

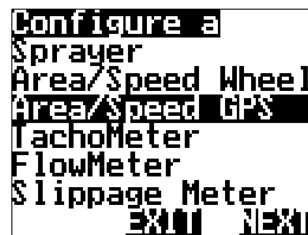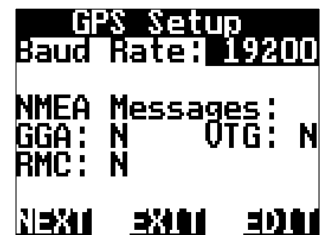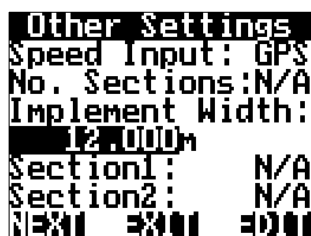**Available Connections:** Refer to Installing Sensors from **PAGES 9-11**

SETUP

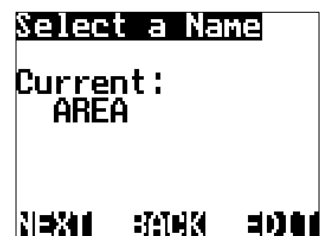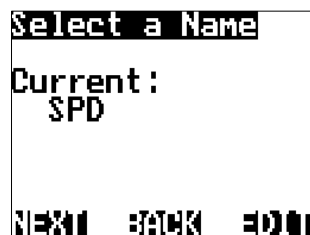|			
HOLD ALARM TRIP SETUP	Setup Wizard Inputs Front Screen Other Settings GPS / Serial About Jackal EXIT SELECT	Configure a Sprayer Area/Speed Wheel Area/Speed GPS TachoMeter FlowMeter Slippage Meter EXIT NEXT	GPS Setup Baud Rate: 19200 NMEA Messages: GGA: N VTG: N RMC: N NEXT EXIT EDIT
From the front screen press **SETUP**	Highlight **WIZARD** and press **SELECT**	Highlight **AREA/SPEED GPS** and press **NEXT**	Press the **EDIT** button to change the baud rate, when the correct baud rate is selected the corresponding NMEA message will be acknowledged with a Y. Press **NEXT**
Other Settings Speed Input: GPS No. Sections:N/A Implement Width: 12.000m Section1: N/A Section2: N/A NEXT EXIT EDIT	Units of Display 1: Ha 2: Ac 3: m^2 4: km^2 NEXT EXIT	Alarm Settings Alarm Min: 0.00 Alarm Max: 0.00 NEXT EXIT EDIT	Select a Name Current: AREA NEXT BACK EDIT
Using the **NAV** buttons and pressing **EDIT** enter your implement width in (m). e.g. 12m Press **NEXT**	Using the **NAV** buttons select how you would like the area to be displayed on the front screen. Press **NEXT**	You have the option to set Alarm Min/Max points if required. Using the **NAV** buttons select and **EDIT** as required. Press **NEXT**	Name the input if you desire, Press **EDIT**. e.g. SPEED Press **NEXT**
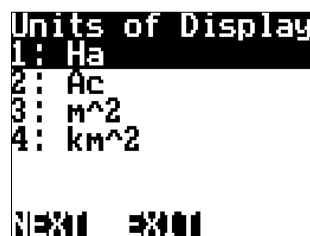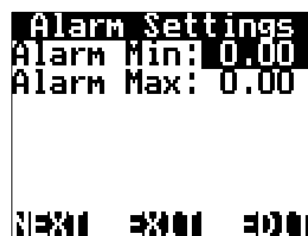
Display km/h
on front screen?
 	
YES   EXIT   NO
	Select a Name
	
	Current:
	   SPD
	
	NEXT BACK EDIT
		Wizard
		Configuration
		Successful
		
		NEXT
			RUN
			AREA
			     3.03 Ha
			SPD
			     10.8 km/h
			ALARM TRIP SETUP

Select either **YES** or **NO** to display Speed on the front screen with the area covered.	Change the input name if you desire, Press **EDIT**, Press **NEXT**	Press **NEXT** to finalise the Wizard and return to the front screen	THIS ENDS THE SETUP FOR SPEED/AREA METER USING GPS INPUT

The Jackal can display an rpm (Revolutions per minute) which is useful for monitoring fans or shafts. Available in slow & fast options.
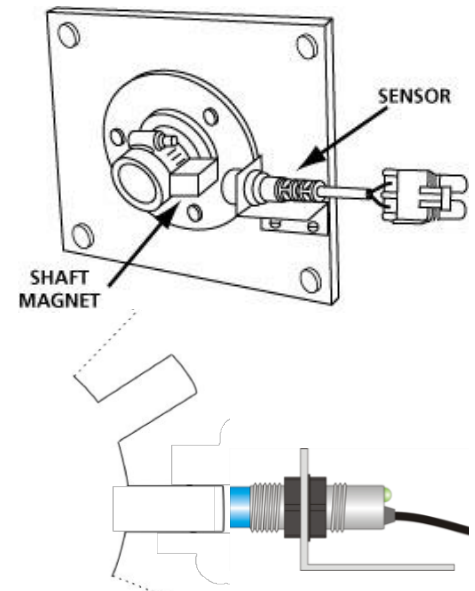
NB: THERE SHOULD BE A 5-10MM CLEARANCE BETWEEN SENSOR AND MAGNET OR 2-5MM BETWEEN PROX AND PICKUP

Sensors Required

- Shaft Sensor pickup 2 (Reed or Coil) or 3 wire (Proximity)
- Magnet (Used with 2 wire sensor)

Available Connections: Refer to Installing Sensors from **PAGES 9-11**
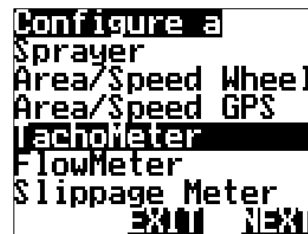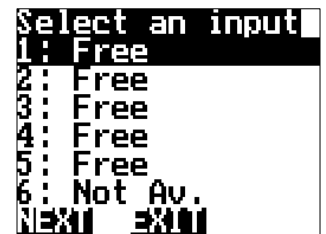
The example uses Input 1 – Coil (Yellow end sensors)

SETUP

|			
From the front screen press **SETUP**	Highlight **WIZARD** and press **SELECT**	Highlight **TACHOMETER** and press **NEXT**	Highlight and select the appropriate sensor **INPUT** and press **NEXT**
Leave the default value of **pulse/rev** and press **NEXT**	Select MANUAL RATIO Select EDIT The manual ratio is the number of magnets (reed or coil sensor) or bolt heads/teeth (for proximity). In most cases the ratio will be **1.** or Press **NEXT**	**FOR LOW RPM (1rpm-20rpm)** Press the **DOWN** button and change **VeryLowSpeed** from **NO** to **YES** by pressing **EDIT** Press **NEXT** when done	Leave the default value of RPM. Select **NEXT**
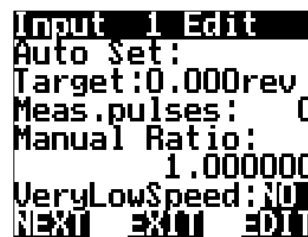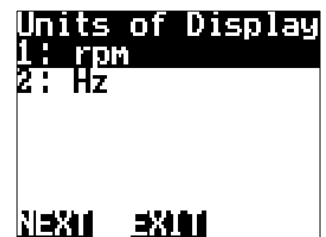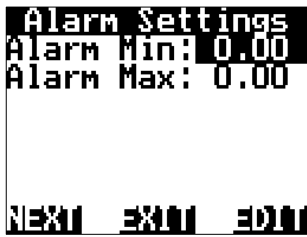
Alarm Settings	Select a Name		RUN
Alarm Min: 0.00	Current:	Wizard	TACH
Alarm Max: 0.00	TACH	Configuration	60rpm
		Successful	
NEXT EXIT EDIT	NEXT BACK EDIT	NEXT	ALARM TRIP SETUP

You have the option to set Alarm Min/Max points if required. Using the NAV buttons select and **EDIT** as required. Press **NEXT**
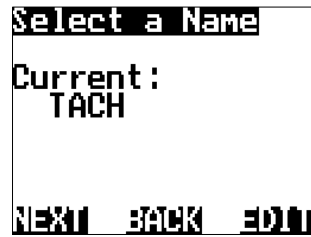
Change the input name if you desire, Press **EDIT**, Press **NEXT**

Press **NEXT** to finalise the Wizard and return to the front screen

THIS ENDS THE WIZARD SETUP FOR A TACHOMETER

The Jackal can be configured to monitor liquid products. If only one input is used the Jackal main screen will display the flow information of your choice. If the Jackal is also setup and installed with a Wheel Sensor input, the Jackal can be setup to display L/Ha for example.

NB: AT NO STAGE CAN THE JACKAL MONITOR TAKE INTO ACCOUNT MULTIPLE SPRAY SECTIONS TURNING ON/OFF. TALK TO USE ABOUT THE JACKAL CONTROL SERIES.

Sensors Required

- 2 Wire Flow Sensor (Sine Wave)
- 3 Wire Flow Sensor (Square Wave)

Available Connections: Refer to Installing Sensors from **PAGES 9-11**

The example uses Input 2 – Polmac Flow Sensor

SETUP
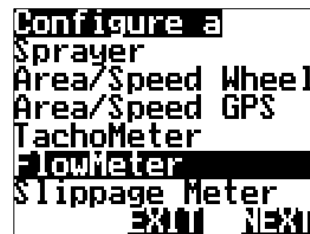
From the front screen press **SETUP**	Highlight **WIZARD** and press **SELECT**	Highlight **FLOWMETER** and press **NEXT**	Highlight and select the appropriate sensor **INPUT** as described above and press **NEXT**
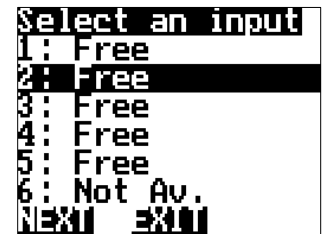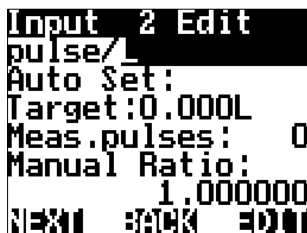
Edit the unit of Pulse or leave as is.

Choose your calibration method

Auto Set > PAGE 28

Manual Ratio > PAGE 29

CALIBRATION (AUTO SET)

1. Ensure tank has water & pump is ready
2. Have a bucket ready to collect the water
3. Have a measuring device to measure the amount of liquid

```
Input  2 Edit
pulse/L
Auto Set:
Target:0.000L
Meas.pulses:    0
Manual Ratio:
        1.000000
NEXT  START EDIT
```

Highlight **TARGET** & press **EDIT**

```
m to Calibrate:
        20.0000




EXIT  DEL  INS
```

Using the **NAV** buttons enter the target amount (L) to be measured. i.e. 20.0000
Press **EXIT** when done.

```
Input  2 Edit
pulse/L
Auto Set:
Target:20.00L
Meas.pulses:    0
Manual Ratio:
        1.000000
NEXT  START EDIT
```

Press **START**, & let water flow. This will allow pulses from the flow meter to register and the number of pulses will be displayed next to Meas.pulses:

```
Input  2 Edit
pulse/L
Auto Set:
Target:20.00L
Meas.pulses:4540
Manual Ratio:
        190.250000
        STOP
```

When the desired test volume has been reached press **STOP**

```
Input  2 Edit
pulse/L
Auto Set:
Target:20.00L
Meas.pulses:4831
Manual Ratio:
        190.250000
        CALC
```

Press **CALC**. This will divide the measured amount by the number of pules registered.

```
Input  2 Edit
pulse/L
Auto Set:
Target:20.00L
Meas.pulses:4831
Manual Ratio:
        241.550000
NEXT  START EDIT
```

MANUAL RATIO will now be updated to reflect the calibration factor.

Press **NEXT**

```
Units of Display
1: L/min
2: gal/min
3: m^3/hr
4: m^3/min
5: m^3/s
6: gal/hr
NEXT  BACK
```

Using the **NAV** buttons select how you would like the UOD to be displayed on the front screen.
Press **NEXT**

```
Alarm Settings
Alarm Min: 0.00
Alarm Max: 0.00




NEXT  EXIT  EDIT
```

You have the option to set Alarm Min/Max points if required. Using the **NAV** buttons select & **EDIT** as required. Press **NEXT**

```
Select a Name
Current:
  RATE




NEXT  BACK  EDIT
```

Name the input if you desire,
Press **EDIT**
or Press **NEXT**

```
Wizard
Configuration
Successful


NEXT
```

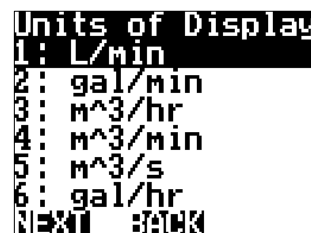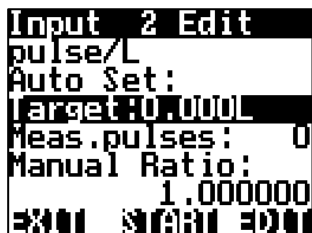The Wizard is now complete.
Press **NEXT**

```
RUN
RATE
62.10 L/min

ALARM TRIP SETUP
```

You will be returned to the Front Screen.

THIS ENDS THE AUTO SETUP WIZARD FOR FLOW METER

REFER TO PAGE 30 TO SETUP AS RATE MONITOR L/Ha

Manual set allows for the manual input of a known pulse per litre (PPL) factor. The pulse per litre factor can be obtained from the flow meter manufacture or from the plastic tag attached to the flowmeter.
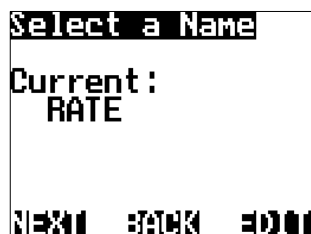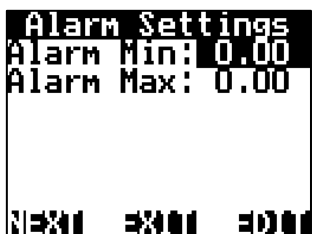
Input 2 Edit	pulse/L:	Input 2 Edit	Units of Display
pulse/L	668.000000	pulse/L	1: L/min
Auto Set:		Auto Set:	2: gal/min
Target:0.000L		Target:0.000L	3: m^3/hr
Meas.pulses: 0		Meas.pulses: 0	4: m^3/min
Manual Ratio:		Manual Ratio:	5: m^3/s
1.000000		668.000000	6: gal/hr
EXIT START EDIT	EXIT DEL INS	EXIT EDIT	NEXT BACK

| Highlight 1.000000 under **MANUAL RATIO** & press **EDIT** | Using the NAV buttons enter the PPL factor as displayed on the flow meter tag. i.e. 91.2 Press **EXIT** when done. | Press **NEXT** to accept the new manual ratio (PPL) | Using the NAV buttons select how you would like the UOD to be displayed on the front screen. Press **NEXT** |

Alarm Settings	Select a Name		RUN
Alarm Min: 0.00	Current:	Wizard	RATE
Alarm Max: 0.00	RATE	Configuration	49.85 L/min
		Successful	
NEXT EXIT EDIT	NEXT BACK EDIT	NEXT	ALARM TRIP SETUP

| You have the option to set Alarm Min/Max points if required. Using the NAV buttons select & **EDIT** as required. Press **NEXT** | Name the input if you desire, Press **EDIT** or Press **NEXT** | The Wizard is now complete. Press **NEXT** | You will be returned to the Front Screen. |

THIS ENDS THE MANUAL CALIBRATION WIZARD SETUP FOR FLOW METER

** IT IS ADVISED TO CHECK YOUR MANUAL CALIBRATION BY MEASURING OUT A KNOWN QTY TO CONFIRM PPL** THIS CAN BE DONE BY COMPLETING THE CALIBRATION AUTO SET ON THE PREVIOUS PAGE (28)
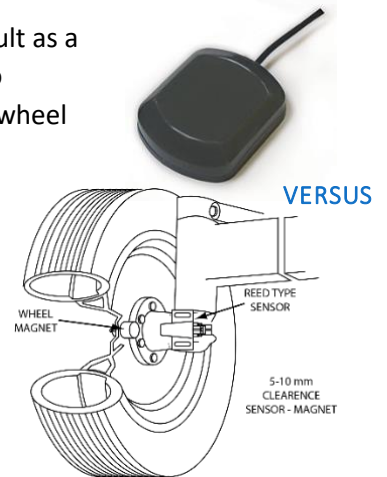
The Jackal Monitor can allow the operator to compare two inputs and provide the result as a percentage. This is applicable when speed over ground is not necessarily equivalent to rotational speed of the wheel/s. This will enable you to set up a comparison between wheel speed and actual speed (using GPS)

Sensors Required:

- Wheel sensor input (wheel or shaft pickup)
- GPS

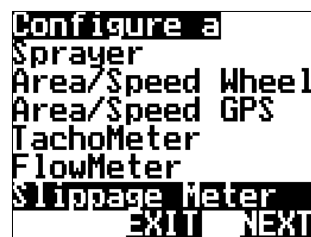**Available Connections:** Refer to Installing Sensors from **PAGES 9-11**

VERSUS

WHEEL MAGNET

REED TYPE SENSOR

5-10 mm CLEARENCE SENSOR - MAGNET

SETUP

```
HOLD



ALARM TRIP SETUP
```

From the front screen press **SETUP**

```
        Setup
Wizard
Inputs
Front Screen
Other Settings
Output
GPS / Serial
EXIT        SELECT
```

Highlight **WIZARD** & press **SELECT**

```
Configure a
Sprayer
Area/Speed Wheel
Area/Speed GPS
TachoMeter
FlowMeter
Slippage Meter
        EXIT   NEXT
```

Highlight **SLIPPAGE METER** press **NEXT**

```
Wheel Sensor On
1: Free
2: Free
3: Free
4: Free
5: Free
6: Free
NEXT   EXIT
```

Highlight the **INPUT** number X: the WHEEL sensor wire is connected into on the rear of the Jackal & press **NEXT**
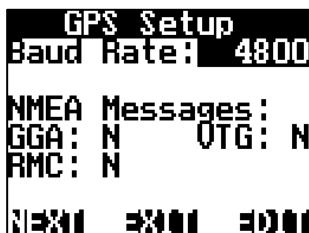
```
   GPS Setup
Baud Rate:   4800

NMEA Messages:
GGA: N     OTG: N
RMC: N

NEXT  EXIT  EDIT
```

Press the **EDIT** button to change the baud rate, when the correct baud rate is selected the corresponding NMEA message will be acknowledged with a Y. Press **NEXT**

```
Calibrate Slip

Wheel:  1.00  Hz
GPS:     1.00km/h
Drive >3 km/h
Slip: -69 %

NEXT   EXIT
```
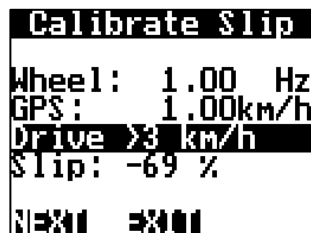
As indicated, drive above 3km/hr

```
Calibrate Slip

Wheel:  4.00  Hz
GPS:     4.00km/h
Calibrating...
Slip: -28 %

NEXT   EXIT
```
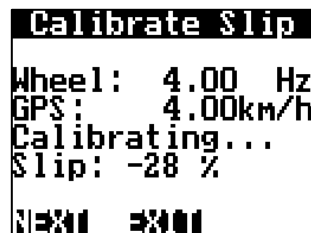
Wheel input will then increment up (displayed in Hz) & GPS speed will start to show.

```
Calibrate Slip

Wheel:  3.80  Hz
GPS:     4.00km/h
Calibrating...
Slip:    0 %

NEXT   EXIT
```
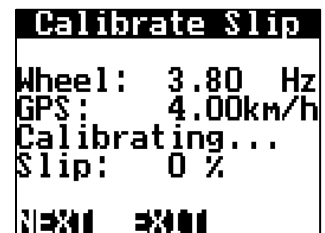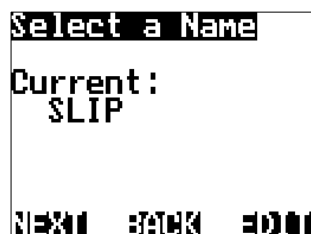
As the system self-calibrates the slip % will get closer to 0%.

When the slip has settled close to 0% press **NEXT**
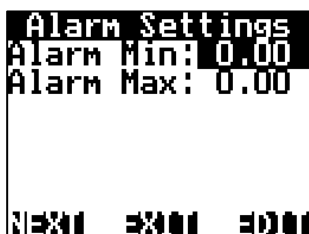
```
Alarm Settings
Alarm Min: 0.00
Alarm Max: 0.00



NEXT   EXIT  EDIT
```

You have the option to set Alarm Min/Max points if required. Using the NAV buttons select & EDIT as required. Press **NEXT**

```
Select a Name

Current:
   SLIP



NEXT  BACK  EDIT
```

There is no need to EDIT the name. It will default to GPS Press **NEXT**

```
Display km/h
on front screen?



YES   EXIT    NO
```

Finally acknowlege that you wish to also display Speed (km/hr) on the front screen with the area covered. Press **YES**

```
    Wizard
Configuration
  Successful

NEXT
```

The Wizard is now complete. Press **NEXT.**
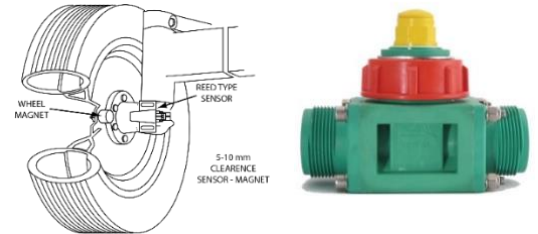
THIS ENDS THE SETUP WIZARD FOR WHEEL SLIPPAGE

The Jackal can be setup to display an application rate when using both a speed & flow input.

Rates can be displayed in common formats such as L/Ha

Sensors Required:

- Wheel Sensor/GPS for Speed & Area calculation
- Flow meter (any style) to display Litres

Available Connections: Refer to Installing Sensors from **PAGES 9-11**
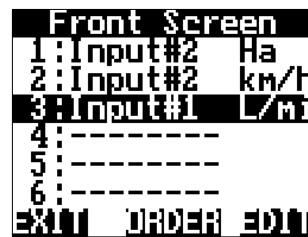
SETUP LIQUID (L/HA)

1. Follow the setup guide on page **20** for "Speed/Area Meter setup"
2. Follow the setup guide on page **26** for "Flow Meter Setup"
3. Follow the steps as described below

From the front screen press **SETUP**	Highlight **FRONT SCREEN** & press **SELECT**	Highlight the line in which the Flow Meter is connected to. e.g. 3: Input#3 L/min **Press EDIT**	Highlight the **UNIT** & press **EDIT** to change the unit to **L/Ha**.
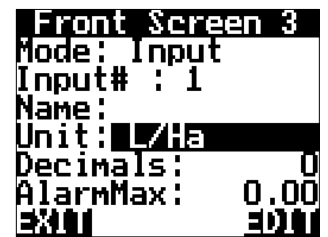
Press **EXIT** 3 times to return to the front screen.

Jackal will now display the flow rate as L/Ha with Area & Speed

At no stage can the Jackal take into account multiple sections turning on an off and adjusting the Ha to suit. This feature is available in our Jackal-Control series.

THIS ENDS THE SETUP FOR RATE METER SETUP AS L/Ha

The Jackal can be setup to display an application rate when using both a speed & pulse input from a shaft or other pickup.

Rates can be displayed in common formats such as kg/Ha

Sensors Required

- Shaft sensor kit (2076) - 2 wire or
- Proximity sensor kit (2010P) (3 wire)

Available Connections: Refer to Installing Sensors from **PAGES 9-11**
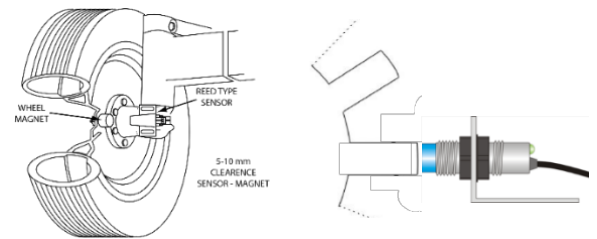
SETUP

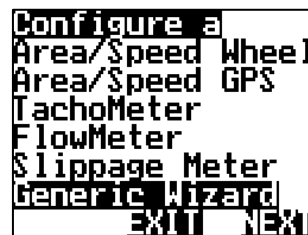1. Follow the steps below to setup the Jackal to display a pulse/kg (**accumulation**)

Note:

a) Ensure there is product in the bin/tank to calibrate
b) Have a bucket ready to catch the product
c) Have a set of scales (e.g. Farmscan Ag Part # 2199) ready to weigh the product

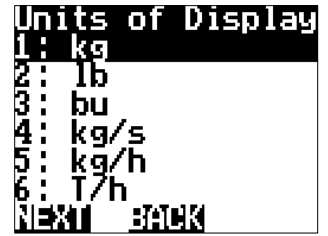|			
From the front screen press **SETUP**	Highlight **WIZARD** & press **SELECT**	Highlight **GENERIC WIZARD** & press **NEXT**	Highlight the **INPUT** number where the sensor wire is connected into on the rear of the Jackal & press **NEXT**
Choose your unit of pulse by pressing the **EDIT** **E.g. pulse/kg**	Highlight **TARGET** & press **EDIT**	Using the **NAV** buttons enter the target amount (kg) to be measured. i.e. 10.0000 Press **EXIT** when done.	Prime the Bin/Tank until product flows & then stop it. Press **START** on the Jackal, Run Bin & let product flow. This will allow pulses from the sensor to register and the number of pulses will be displayed next to **Meas.pulses:**
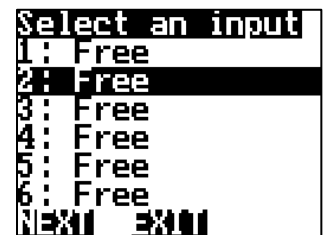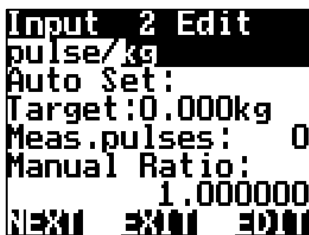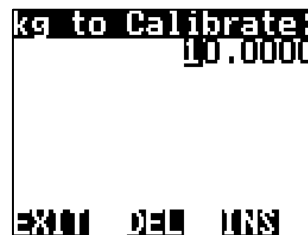
Input 2 Edit	Input 2 Edit	Input 2 Edit	Units of Display
pulse/kg	pulse/kg	pulse/kg	1: kg
Auto Set:	Auto Set:	Auto Set:	2: lb
Target:10.00kg	Target:10.00kg	Target:10.00kg	3: bu
Meas.pulses:2744	Meas.pulses:2744	Meas.pulses:2744	4: kg/s
Manual Ratio:	Manual Ratio:	Manual Ratio:	5: kg/h
1.000000	274.400000	274.400000	6: T/h
NEXT CALC EDIT	NEXT START EDIT	NEXT START EDIT	NEXT BACK

When the scales measure the desired test volume, i.e. 10kg, stop the Bin/Tank. Press **STOP**	Press **CALC.** This will divide the measured amount by the number of pules registered.	**MANUAL RATIO** will now be updated to reflect the calibration factor. Press **NEXT**	Using the **NAV** buttons select how you would like the Unit Of Display to be displayed on the front screen. I.e. **kg** Press **NEXT**

It's recommended to do this test 3 times to get an average pulse count per kg
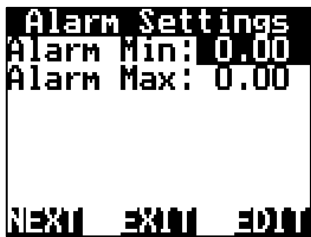
Alarm Settings	Select a Name	Wizard Configuration Successful	RUN Input#2
Alarm Min: 0.00	Current:		15.77 kg
Alarm Max: 0.00			
NEXT EXIT EDIT	NEXT EXIT EDIT	NEXT	ALARM TRIP SETUP
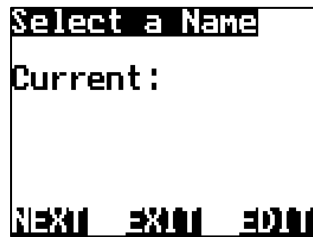
You have the option to set Alarm Min/Max points if required. Using the NAV buttons select & **EDIT** as required. Press **NEXT**	Name the input if you desire, Press **EDIT** or Press **NEXT**	The Wizard is now complete. Press **NEXT**	You will be returned to the Front Screen. *kg will now accumulate*

2. Follow the setup guide on **PAGE 21** for "Speed/Area Meter setup
3. Follow the steps as described below

SETUP SOLID (KG/HA)

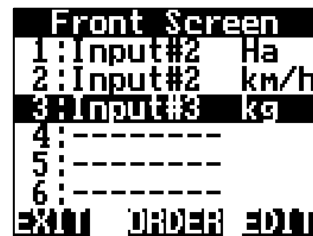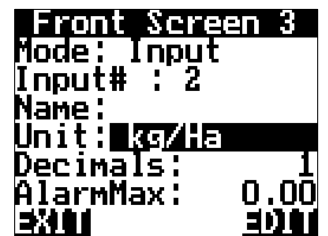| RUN	Setup	Front Screen	Front Screen 3
7.65 Ha	Wizard	1:Input#2 Ha	Mode: Input
13.0 km/h	Inputs	2:Input#2 km/h	Input# : 2
1.09 kg	Front Screen	3:Input#3 kg	Name:
	Other Settings	4:--------	Unit: kg/Ha
	Output	5:--------	Decimals: 1
	GPS / Serial	6:--------	AlarmMax: 0.00
ALARM TRIP SETUP	EXIT SELECT	EXIT ORDER EDIT	EXIT EDIT

From the front screen press **SETUP**	Highlight **FRONT SCREEN** & press **SELECT**	Highlight the line in which the Metering sensor is connected to. e.g. 3: Input#3 kg Press **EDIT**	Highlight **UNIT** & press **EDIT** to change the unit to **kg/Ha**. Change the Decimals displayed if desired also

| RUN	
7.18 AREA Ha	
14.4 SPD km/h	
11.0 kg/ Ha	
ALARM TRIP SETUP	

Press **EXIT** 3 times to return to the front screen.

Jackal will now display the flow rate as L/Ha with Area & Speed

THIS ENDS THE SETUP FOR RATE METER SETUP AS kg/Ha

The Jackal can be configured as a Batch Meter to use a flow sensor and optional solenoid valve to meter liquid volumes & cease flow. The output of the Jackal is suitable for direct connection to a 12V solenoid valve.
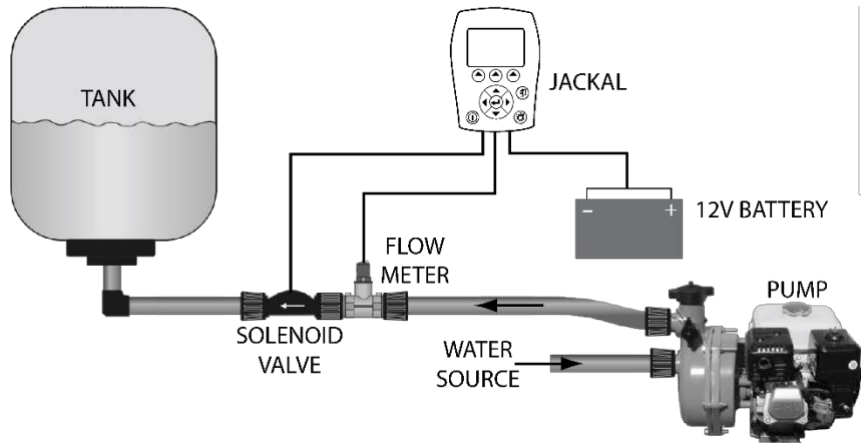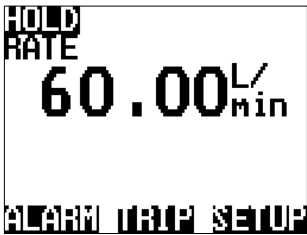
Sensors Required:

- Flow meter (any style)
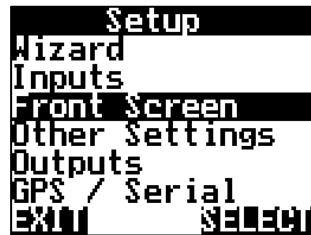- 1501 (Optional, from Farmscan Ag) or any 12V Solenoid Valve

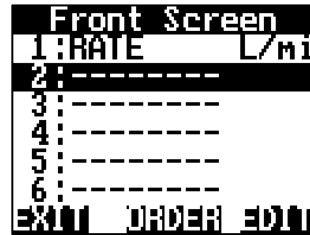**Available Connections:** Refer to Installing Sensors from **PAGES 9-11**

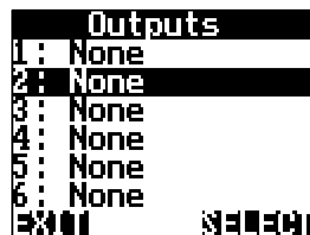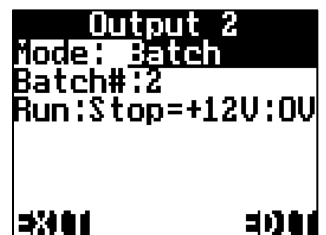|	
From the front screen press **SETUP**	Highlight **FRONT SCREEN** & press **SELECT**
Select an **UNUSED** front screen position & press **EDIT**	Press **EDIT** to select **BATCH.** NB: **INPUT #** should match flow meter input. Change if necessary (Normally 2)
Highlight **UNIT** & press **EDIT** to change Unit to **L**	Highlight **TARGET** & press **EDIT** to change the batch volume required.
Using the NAV buttons enter the **volume required.** Press **EXIT** when done	Using the NAV buttons press **DOWN** and **EDIT** the **COUNT** to batch **UP** or **DOWN**. Press **EXIT** when done
Press EXIT again CONTINUE INSTRUCTIONS IF A SOLENOID IS INSTALLED OR SKIP TO OPERATION	Highlight **OUTPUTS** & press **SELECT**
Highlight 2: None & Press **SELECT** to edit Output 2	Press **EDIT** and change the MODE to **BATCH**
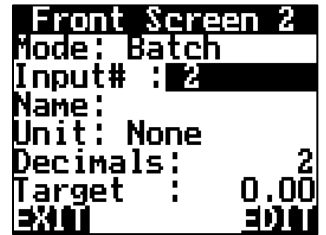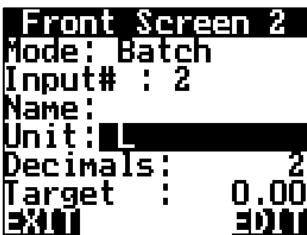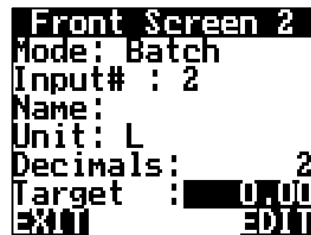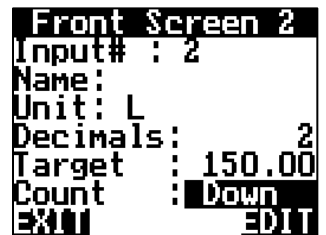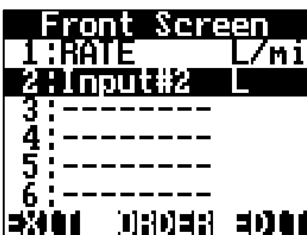
Output 2 Mode: Batch Batch#:2 Run:Stop=**+12V:0V** **EXIT** **EDIT**	**Output 2** Mode: Batch Batch#:2 Run:Stop=**0V:+12V** **EXIT** **EDIT**	**HOLD** **RATE** **60.00** L/min Input#1 **0.00** 150 L **START RESET**	
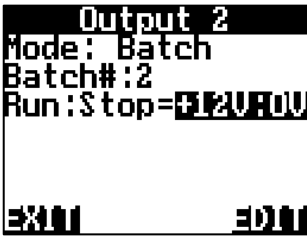
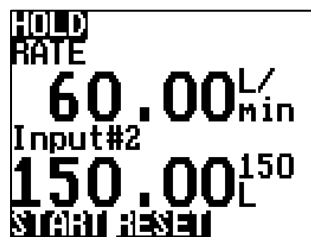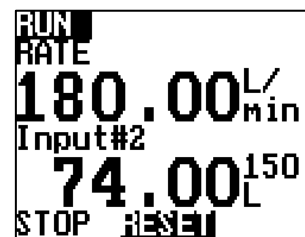|			
Highlight & **EDIT** the **Run:Stop** value to **0V:+12V**	Highlight & **EDIT** the Run to Stop voltage. The option allows the output selected to pull from: **+12v to 0V or** **0v to 12v** ⬅	Press **EXIT** 3 times to return to the Front Screen	IF YOU FIND DURING THE FIRST BATCH OR ON STARTUP YOUR SOLENOID IS WORKING IN REVERSE – CHANGE THE RUN:STOP VALUE
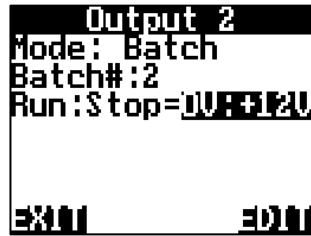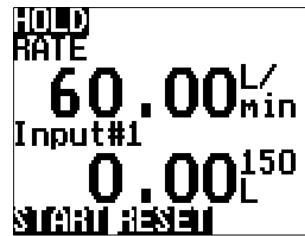
OPERATION

HOLD **RATE** **60.00** L/min Input#2 **0.00** 150 L **RESET**	**HOLD** **RATE** **60.00** L/min Input#2 **150.00** 150 L **START RESET**	**RUN** **RATE** **180.00** L/min Input#2 **74.00** 150 L **STOP RESET**	**HOLD** **RATE** **359.28** L/min Input#1 **151.57** 150 L **ALARM TRIP SETUP**
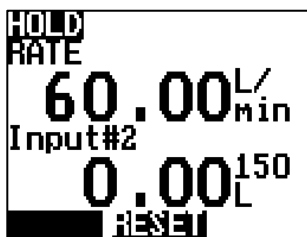
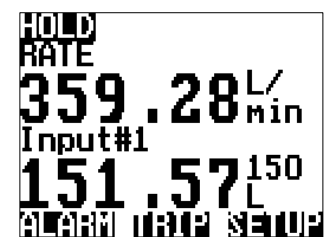|			
Start by pressing the **PAGE** button and toggle between **ALARM TRIP SETUP** **To** **lllllll RESET**	Press **RESET** to clear the count value followed by **START**. Water will flow and the batch will start to either count **UP** or count **DOWN** as selected.	**START** will toggle to **STOP** if you need to restart a batch. **RUN/HOLD** also performs the same action Press **RESET** if required.	If you need to keep a record of your batch, press the **PAGE** button and press the **TRIP** button to save. More about **TRIPS** on **PAGE 40**

TIP: If you want to see a Total Litres displayed (rather than L/Min) – Change the FRONT SCREEN value from L/Min to L

Refer to the Flow Meter Setup

HOLD
RATE
291.73 HOLD L
Input#1
0.00 150 L
START RESET
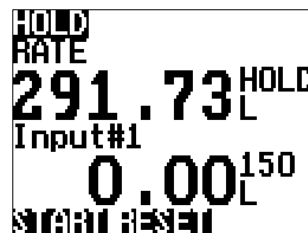
All Values can be reset or saved when using the TRIP functions

THIS ENDS THE SETUP FOR A LIQUID BATCH METER

BIN LEVEL SENSOR

The Jackal can be configured with a bin level sensor for detecting empty/full. All Farmscan Ag sensor will register as High/Low (H/L) for liquid or solid.

Sensors Required:

- Bin Level Sensor (A-2220P Sensor or 2060 Kit)

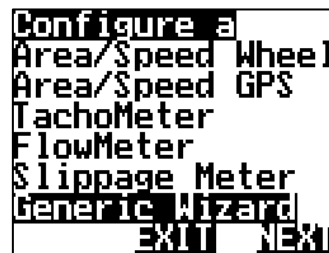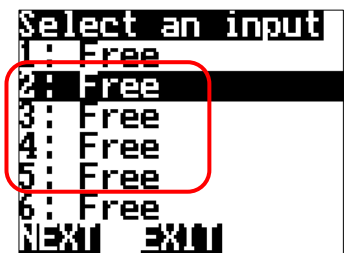**Available Connections:** Refer to Installing Sensors from **PAGES 9-11**

SETUP

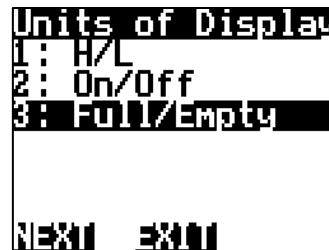|			
HOLD / **ALARM TRIP SETUP**	**Setup** Wizard / Inputs / Front Screen / Other Settings / Output / GPS / Serial / **EXIT SELECT**	**Configure a** Area/Speed Wheel / Area/Speed GPS / TachoMeter / FlowMeter / Slippage Meter / Generic Wizard / **EXIT NEXT**	**Select an input** 1: Free / 2: Free / 3: Free / 4: Free / 5: Free / 6: Free / **NEXT EXIT**
From the front screen press **SETUP**	Highlight **WIZARD** & press **SELECT**	Highlight **GENERIC WIZARD** & press **SELECT**	Highlight the **INPUT** number **(2-5)** to where the sensor wire is connected into on the rear of the Jackal & press **NEXT**
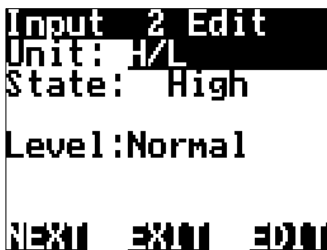
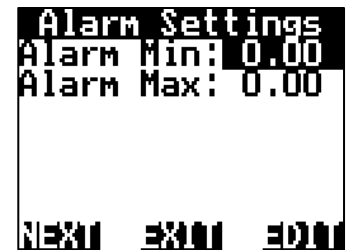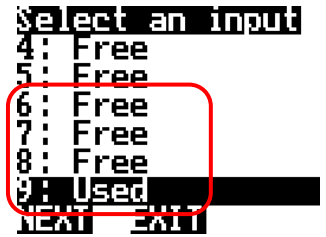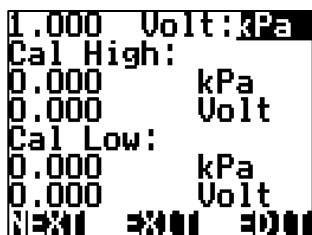|			
Input 2 Edit Unit: H/L / State: High / Level:Normal / **NEXT EXIT EDIT**	**Input 2 Edit** Unit: H/L / State: High / Level:Normal / **NEXT EXIT EDIT**	**Units of Display** 1: H/L / 2: On/Off / 3: Full/Empty / **NEXT EXIT**	**Alarm Settings** Alarm Min: 0.00 / Alarm Max: 0.00 / **NEXT EXIT EDIT**
Press **EDIT** to change the unit to **H/L (high/low)** – Other options include On/Off, Full/Empty	State will updated "Live" For example. Low = bin empty, High = bin full. Test by placing hand around sensor.	Press **NEXT** Highlight the Unit of Display that you wish to be displayed on the front screen. Press **NEXT**	You have the option to set Alarm Min/Max points if required. Using the NAV buttons select & **EDIT** as required. Press **NEXT**

Custom Name BIN1 / **EXIT DEL INS**	**Wizard Configuration Successful** / **NEXT**	**HOLD** BIN1 **Full** / **ALARM TRIP SETUP**	**HOLD** BIN1 **Empty** / **ALARM TRIP SETUP**
Name the input if you desire, i.e. BIN1. Press **EDIT** & **EXIT**	Press **NEXT**. Wizard is now complete. Press **NEXT**	Press **EXIT** to return to the front screen Example - Full	Example - Empty

THIS ENDS THE SETUP FOR A BIN LEVEL SENSOR

AIR/VOLT/DEPTH/%/TEMP PRESSURE SENSOR

The Jackal can be configured to read & display a pressure sensor, voltage, percentage, temperature and display as: kPa, psi, bar, Volt, %, ˚C. Farmscan Ag recommends sensors that can be powered by 12v but output from 0-5v in a linear style. Call us if you are unsure.

Sensors Required:

- AA-119H or AA-119L (Farmscan Ag Pressure Sensor)
- Any other style that outputs a voltage. I.e. Position sensor (AA-430) for displaying depth as a percentage (%)

Available Connections: Refer to Installing Sensors from **PAGES 9-11**

The example uses Input 9 – Liquid Pressure Sensor

CALIBRATION (MANUAL)

The example below details setting up **a LIQUID PRESSURE SENSOR**.
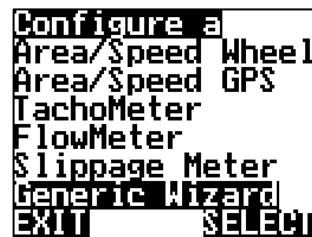
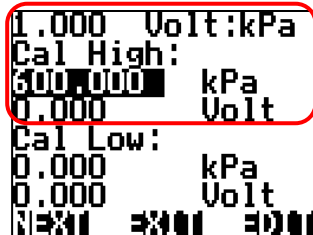|			
HOLD ALARM TRIP SETUP	Setup Wizard Inputs Front Screen Other Settings Output GPS / Serial EXIT SELECT	Configure a Area/Speed Wheel Area/Speed GPS TachoMeter FlowMeter Slippage Meter Generic Wizard EXIT SELECT	Select an input 4: Free 5: Free 6: Free 7: Free 8: Free 9: Used... NEXT EXIT
From the front screen press **SETUP**	Highlight **WIZARD** & press **SELECT**	Highlight **GENERIC WIZARD** & press **SELECT**	Highlight the **INPUT** number **(6-9)** to where the sensor wire is connected into on the rear of the Jackal & press **NEXT**

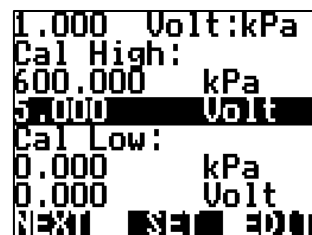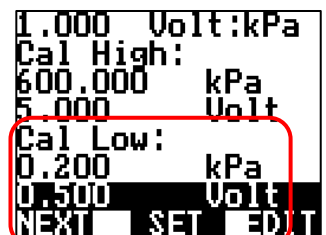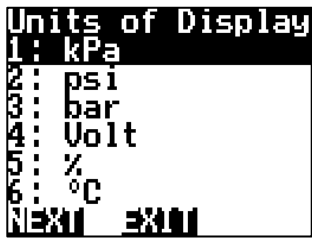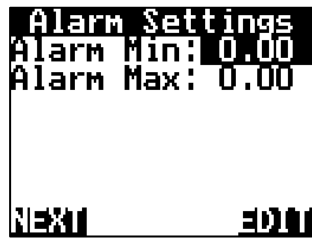|			
1.000 Volt:kPa Cal High: 0.000 kPa 0.000 Volt Cal Low: 0.000 kPa 0.000 Volt NEXT EXIT EDIT	1.000 Volt:kPa Cal High: 600.000 kPa 0.000 Volt Cal Low: 0.000 kPa 0.000 Volt NEXT EXIT EDIT	1.000 Volt:kPa Cal High: 600.000 kPa 5.000 Volt Cal Low: 0.000 kPa 0.000 Volt NEXT SET EDIT	1.000 Volt:kPa Cal High: 600.000 kPa 5.000 Volt Cal Low: 0.200 kPa 0.500 Volt NEXT SET EDIT
Press **EDIT** to change the unit. kPa, psi, bar, Volt, %, ˚C. i.e. kPa	Highlight the 1ˢᵗ **CAL HIGH** value and **EDIT** the field to set the maximum the device will be able to display. I.e. 600kPa. Current input voltage of input is displayed in the top left corner.	Using the manufactures guide set the maximum voltage of the sensor. e.g. 5.000v by pressing **EDIT**	Repeat the previous 2 steps to set the minimum range of the sensor. Press **NEXT** when done
	NB: If manufacture values are not available, please refer to PAGE 39 for LIVE calibration instructions		

Units of Display
1: kPa
2: psi
3: bar
4: Volt
5: %
6: °C
NEXT   EXIT

. Highlight or confirm the
UOD (Unit of Display)
eg kPa.
Press **NEXT** when done

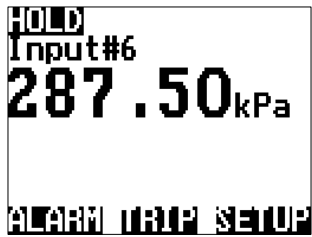**Alarm Settings**
Alarm Min: 0.00
Alarm Max: 0.00

NEXT   EDIT

You have the option to set
Alarm Min/Max points if
required. Using the NAV
buttons select & **EDIT** as
required. Press **NEXT**

Select a Name
Current:

NEXT   EXIT   EDIT

Name the input if you desire,
Press **EDIT**
or Press **NEXT**

**Wizard
Configuration
Successful**

NEXT

The Wizard is now complete.
Press **NEXT**

HOLD
Input#6
287.50kPa

ALARM TRIP SETUP

You will be returned to the
front screen

THIS ENDS THE MANUAL SETUP FOR A VARAIBLE VOLTAGE INPUT SENSOR (LIQUID)

The Jackal also allows for a semi-automatic setup when the voltage values are unknown for a particular voltage input. A live voltage readout is displayed in the top left-hand side when the sensor is active.

Follow the previous 5 steps, followed by:

Press **EDIT** to change the unit. kPa,psi,bar,Volt,%,˚C. i.e. kPa	Engage the implement and/or adjust the pressure manually to the low point the sensor will need to operate in.	The voltage will now be displayed. e.g. **1.75v**. In the above example we can set the minimum of **1kPa** by **HIGHLIGHTING** & **EDITTING** the values as required. Press **SET**. This will copy the live voltage into the **CAL LOW** voltage point	Repeat the previous 2 steps for the **CAL HIGH** values

Highlight or confirm the UOD (Unit of Display) e.g. kPa Press **NEXT** when done	You have the option to set Alarm Min/Max points if required. Using the NAV buttons select & **EDIT** as required. Press **NEXT**	Name the input if you desire, Press **EDIT** or Press **NEXT**	The Wizard is now complete. Press **NEXT**

You will be returned to the front screen

THIS ENDS THE AUTO SETUP FOR A VARAIBLE VOLTAGE INPUT SENSOR (LIQUID)

The Trips page allows <u>accumulating</u> values to be saved and recalled at a later time.

Examples include Area, Distance, Weight, Volume etc. Instantaneous readings such as Speed, Flow & Rate etc. are not able to be recorded.
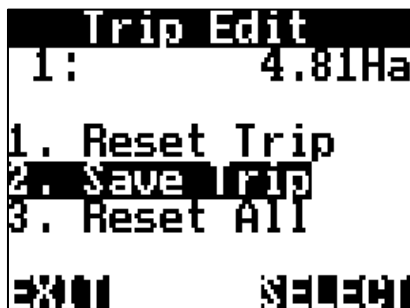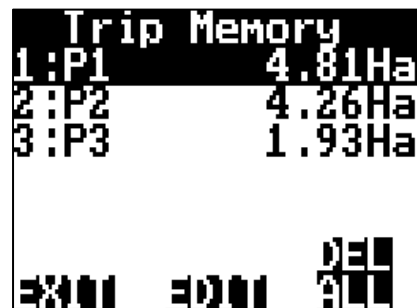
- From the front page press **TRIP**

The screen above allows you to SAVE/RESET individual trips or view SAVED TRIPS

By pressing the **SAVE/RESET** you have the ability to Reset Trip | Save Trip | Reset All

By pressing **2. Save Trip** it will be stored in the SAVED TRIPS option

You can now view the SAVED TRIPS. You also have the ability to **EDIT** and name the Trip or **DEL ALL** (Delete All Trips)

When you return to the TRIPS page the Trip will continue to accumulate. (Like above)
You will need to SAVE/RESET the trip if you want to start from Zero (0) again

Alarms are set on a per-front-screen-display-line basis. High/Low Alarm points can be set for any input including: speed, hectares, RPM, Pressure, Bin/Tank Levels.

Alarms will be displayed visually (on screen flash) and made audible.

- To **EDIT** your alarms re-run the wizard by pressing **SETUP** from the front screen.
- OR – **RUN SCREEN > SETUP > FRONT SCREEN**

Your existing settings will not be lost during the wizard re-run.

Wizard (Above) or **Manual (Right)** alarm points.
Example of a Shaft Alarm set at
Min of **1000rpm** & Max of **3000rpm**.
Press **EDIT** to adjust these values

Manual/User setup Alarm points via the
MENU > FRONT SCREEN >EDIT Input #

When the alarm point is reached e.g.: over 3000rpm the line will FLASH notifying you of the alarm point.

Press **ALARM** to enter the page showing all Alarms (active and inactive) to reset the alarm.

In the example above Line 1 is ^ over the alarm set point. If it was below it would show 1v.
You have 3 options:

=AUTO: As soon as the value moves back within the Min & Max range the monitor will automatically reset the alarm.

REFER TO OUTPUTS ON PAGE 44

IF YOU WANT TO CONNECT AN

EXTERNAL ALARM

=ON: When the alarm is activated it will remain ON until you enter the ALARM menu and manually reset

=OFF: You can disable the alarm altogether

INPUTS

Each Input Is designated to display certain values as described below. Ensure you are plugged into the appropriate port for your sensor.

RUN SCREEN > SETUP > INPUTS

- **Input 1 (A1) – Coil Only (Sine Wave)**
  - m/ft/yd/in/km/mi/pulse
  - pulse/kg/lb/L/gal/bu/rev/bale/unit/each/T/m^3

- **Input 2-5 (A2-A5) – Square Wave**
  - m/ft/yd/in/km/mi/pulse
  - pulse/kg/lb/L/gal/bu/rev/bale/unit/each/T/m^3
  - Full/Empty – On/Off – H/L

- **Input 6-9 (A6, B2-B4) – Varying Voltage**
  - Volt: kPa/psi/bar/volt/%/˚C/
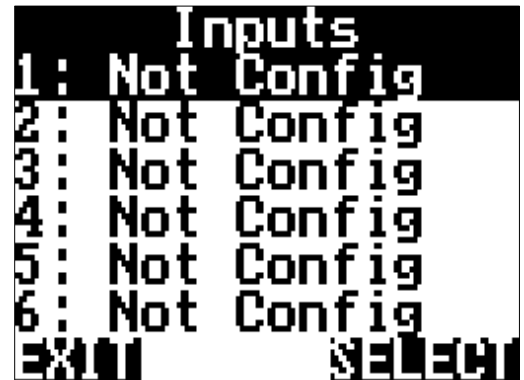
Once your inputs are setup and calibrated you now need to display them on the front screen

GENERIC WIZARD

The generic wizard allows to manually setup your Jackal in a customised method. You can also setup the Jackal to your requirements without using the wizard and navigating each menu by enabling and calibrating each port as required. Refer to the previous wizard guides to assist with manual setup.
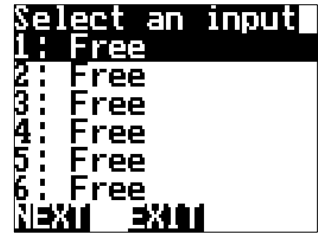
From the front screen press **SETUP**	Highlight **WIAZRD** & press **SELECT**	Highlight **GENERIC WIZARD** & press **SELECT**	Highlight the appropriate port the sensor is connect to and press **NEXT**
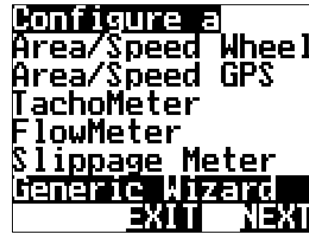
FRONT SCREEN

RUN SCREEN > SETUP > FRONT SCREEN

When your inputs have been enabled and calibrated you can now choose to display the values in our chosen formats on the front screen. You can have up to 3 line items per page and viewable at all times. If more lines are added you can use the NAV buttons to scroll through each screen.
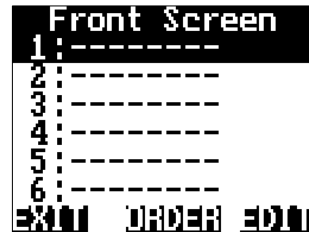
NB: Selectable units realte to the input type. E.g: **Input 1** setup as a **rev/pulse** could display **rpm** or **hz** as the unit
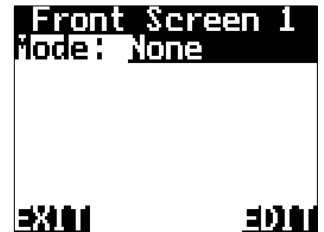
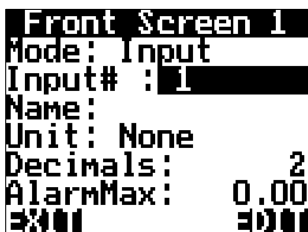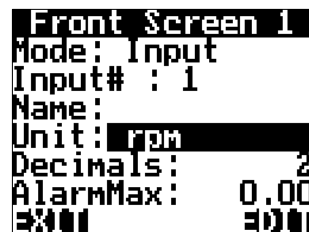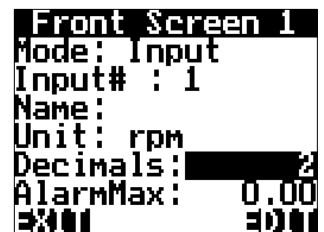|			
From the front screen press **SETUP**	Highlight **FRONT SCREEN** & press **SELECT**	Highlight the line you want to display the first value & press **EDIT**	Press **EDIT** to enable the line mode

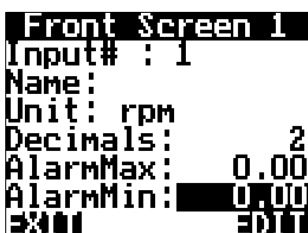|			
Highlight **INPUT #** and press **EDIT** to associate the calibrated **INPUT** to the line	Highlight **NAME** and **EDIT** the input name for easy indetifaction. Eg Shaft	Highlight **UNIT** and press **EDIT** to select the approprate unit associated with the calibrated input	Highlight **DECIMALS** and press **EDIT** to change the number of decimals displayed on the front screen
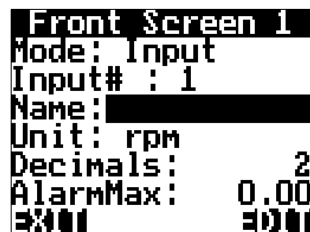
Highlight and **EDIT** the Max & Min Alarm settings if required

FRONT SCREEN (ORDER)

The front screen menu allows you to order the front screen line items. Highlight the line you wish to move, press **ORDER** (a ***** will appear to the left) then press **PLACE** to accept when you have chosen the new order.

```
 Front Screen
1:Input#1  rpm
2:Input#2  Ha
3:Input#2  km/h
4:--------
5:--------
6:--------
EXIT    ORDER
```

```
 Front Screen
1*Input#2  km/h
2:Input#1  rpm
3:Input#2  Ha
4:--------
5:--------
6:--------
     PLACE
```

```
 Front Screen
1:Input#2  km/h
2:Input#1  rpm
3:Input#2  Ha
4:--------
5:--------
6:--------
EXIT    ORDER
```

OTHER SETTINGS

RUN SCREEN > SETUP > OTHER SETTINGS

Other Settings is used to edit the following options.

```
Other Settings
Speed Input:    4
No. Sections:   3
Implement Width:
   12.000m
Section1:   4.000
Section2:   4.000
EXIT        EDIT
```
Quicky **EDIT** the **Speed Input**

```
Other Settings
Speed Input:    4
No. Sections:   3
Implement Width:
   12.000m
Section1:   4.000
Section2:   4.000
EXIT        EDIT
```
Quickly EDIT the **Implement width**, **Number of Sections** & Individual Section Widths

```
Other Settings
   12.000m
Section1:   4.000
Section2:   4.000
Section3:   4.000
Extern.Run/Hold:
Disabled
EXIT        EDIT
```
Enable/Disable External Run/Hold Function (As described on **PAGE 11-12**)

```
Other Settings
Section2:   4.000
Section3:   4.000
Extern.Run/Hold:
Disabled

AlarmBeep:     2s
EXIT        EDIT
```
By changing the Alarm Beep (in seconds) you can define how long audible "Beeps" can be heard during the Alarm alert before acknowledgment is required. Press **EDIT** to change these options.

```
Other Settings
Section3:   4.000
Extern.Run/Hold:
Disabled

AlarmBeep:     2s
AlarmOnHold:No
EXIT        EDIT
```
EDIT the **AlarmOnHold** from YES/NO. This option allows you to have alarms active while the Jackal is ON HOLD

```
Other Settings
Disabled

AlarmBeep:     2s
AlarmOnHold:No
Language:
English
EXIT        EDIT
```
Change the Jackal to your local Language by pressing **EDIT**

```
Other Settings

AlarmBeep:     2s
AlarmOnHold:No
Language:
English
SimultSpeed:No
EXIT        EDIT
```
Simulate Speed allows you to test the Jackal while stationary.

When the feature is enabled **YES** - return to the front screen to reveal a manual speed adjust.

```
HOLD
          0 RATE
            L/Ha
       0.0 SPD
            km/h
       0.0 AREA
            Ha
Spd+ Spd-  0km/h
```
If the feature does not appear. Press the **PAGE** button reveal the new option. Adjust your speed to the test rate required.

** Return to the menu to disable when finished **

The Outputs menu should be used with caution and only as described in this instruction guide.

Failure to do this can damage sensors connected to existing inputs. This menu allows you to OUTPUT voltage & other values outputs 1-6.

RUN SCREEN > SETUP > OUTPUTS

The following Outputs are available

- GND
- + 12v Supply
- Run/Hold
- AlarmAny
    - Ability to activate an external alarm, e.g. External speaker or light. A 12v output will be triggered when AlarmAny is active. – You cannot select an alarm to an output.
- Alarm #
    - Ability to activate an external alarm (as above) on a **chosen port against a specific alarm**. E.g. an external red light could be wired in and activated for a fan alarm and a yellow light could be wired in and activated for a shaft alarm. When multiple alarms are active the available Alarm# will start at "0"
- Freq (Radar Output)
- Batch (As described on **PAGE 34**)
- Section
- Rate +
- Rate –
- Dump All
- Dump #
- Clutch All
- Clutch #
- Section +
- Section –
- Rate PWM
- Rate PVG32
- Rate 5v
- Ratio
- Volt (Varying Voltage)
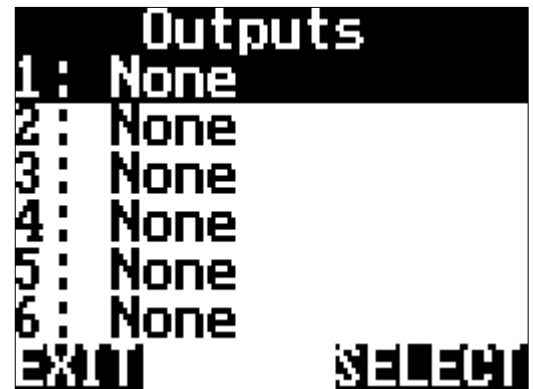
For further explanation of setups of your OUTPUTS please contact our Farmscan Ag Service Department.

SPRAY CONTROL VALVES WORKING BACK TO FRONT

When using the Jackal Spray Wizard outputs are automatically setup for your convenience. However, this information is provided below as an overview of the setup.

In some circumstances your control valve may work back to front, i.e. opening when it should be closing. The output screen allows you to swap the direction rather than change the physical wiring.
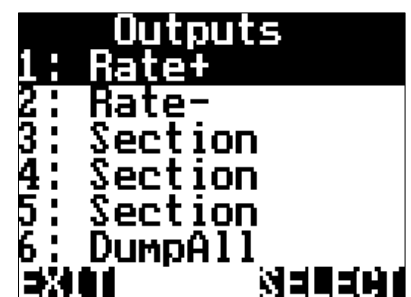
Output 1: Rate +   **Output 2: Rate –**
Output 3: Section 1   Output 4: Section 2
Output 5: Section 3   Output 6: Dump Valve (if installed)

GPS/SERIAL

The GPS/Serial menu allows you to confirm that the GPS connected to the Jackal is function correctly.

By pressing the **SETUP** followed by **EDIT**, confirm the correct strings and Baud rate.

The NMEA messages will change from **N** to **Y**

ABOUT JACKAL

Displays the Firmware version that's installed on the Jackal.

This screen also allows you to **UNLOCK** your Jackal to further functionality.

Please contact Farmscan Ag should you wish to purchase an unlock code.

DIAGNOSTICS

This screen provides the following information:

- **Voltage**   Displays a live input voltage to the Jackal
- **Temp**   Displays the current Jackal Temperature
- **Input 1**   Displays the wheel input pulse into the Jackal
- **Input 2**   Displays the rpm input pulse into the Jackal
- **Input "x"**   When further inputs are enabled they will also be displayed for easy diagnostics

FACTORY RESET

WARNING

This screen allows you to return the Jackal to factory defaults.

All values will be lost after pressing **RESET.**

Power cycle the Jackal to confirm all settings are reset.

AM-JACKAL-C / FEBRUARY 2018