

Electro-Magnetic Compatibility (EMC)

This product complies with Council Directive 89/336/EEC when installed and used in accordance with the relevant instructions.



Service and Technical Support

PLEASE CONTACT YOUR NEAREST DISTRIBUTOR

If unknown then fax: 44 (0) 1453 733322

© Copyright RDS Technology Ltd 2004

Document number

S/DC/500-10-343 : Issue 3.2 : 15/8/08

\\UK343320.DOC

User Guide

Loadlog 500 Plus / Weighlog 200 Weighing System

Installation

Contents

Overview3
 System Components.....3
 Important safety precautions !4

Load sensor.....6
 Where to tee-in6
 Installing the Load Sensor.....6
 SAE Flange Coupling7
 Threaded tees8
 Tapped port8
 Load Sensor mounting.....8
 Bleeding the Load Sensor.....9
 Load Sensor connection9

Reference / Direction sensor.....10
 Ref/Dir Sensor Connection.....12

Remote Enter Switch13
 Connection.....13

Head Unit.....14
 Mounting the Head Unit14

Junction Box15

Power Supply16
 Reverse Polarity16
 External Alarm17

Testing the System17
 Printer Installation.....18
 Upgrading Weighlog 100 to Weighlog 20018
 Document History:.....19

Overview

The Weighlog 200 / Loadlog 500+ is intended for use on industrial and agricultural loading shovels, front-end loaders, tipping trailers, tipper trucks and three-point linkage mounted equipment.

It measures, displays and records the net weight lifted, normally based on sensing the lift system hydraulic pressure. Pressure sensing is problematic on certain types of equipment due to the design of the hydraulic system. In these instances strain sensing technology may be used instead.

System Components

Load sensor : This is either a 250 bar rated pressure sensor fitted in the lift ram hydraulic circuit, or in some instances it is a strain sensor mounted on the top side of the lift arm (e.g. on certain telescopic loaders).

Reference Position/Direction sensor : The pressure/strain must be measured with the mechanical linkage in the same position each time. The reference position/direction sensor is mounted near the lift arm pivot. It identifies when the lifting attachment is in the correct weighing position, and if the load is being lifted or lowered. The sensors are triggered by a magnet mounted on the side of the lift arm.

Remote Enter button: This is mounted next to the lift lever and is used to record the bucket weight.

Head Unit and wiring: The head unit is supplied with a universal mounting bracket assembly allowing it to be mounted in almost any configuration. A multi-core lead with in-line connector connects to a small junction box (the "Terminator"). Sensor and power connections are made into the junction box. The junction box has mounting holes if required.

Printer

There is a printer output for individual load totals, channel totals (Weighlog only) and the grand total. The RDS ICP200 Printer is optional. It connects to the "Terminator" junction box via a single cable for data and power.

Important safety precautions !

In addition to observing site safety requirements, before working on the machine always :-



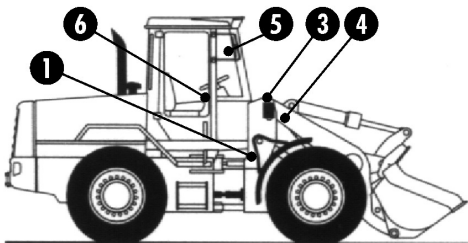
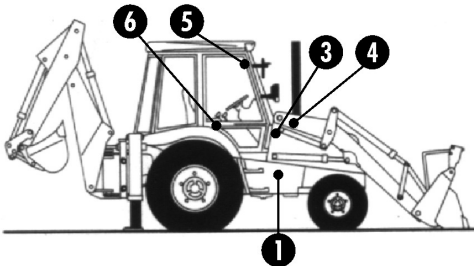
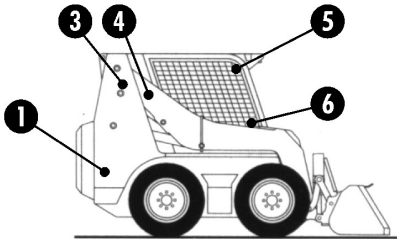
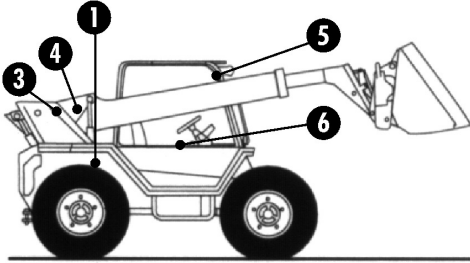
Make sure that the bucket is down on the floor and all pressure is released from the hydraulic system, before slackening off any hydraulic coupling.



Prevent the machine from being accidentally started while working on it e.g. remove the ignition key, place a warning notice in the cab etc.



Keep other persons in the vicinity of the machine fully aware of your immediate intentions during installation and initial calibration.



The Weighlog system is made up of a number of standard kits, which are designed for fitment to a wide range of loaders.

Mounting positions will vary according to the type of machine, however this manual gives general guidelines that apply equally to any machine.

The installation may require some modification of the brackets provided for mounting the reference/direction sensor, but normally requires only basic handtools.

Typical mounting positions are:

1. **Pressure Sensor**
2. **-**
3. **Reference/Direction Sensor**
4. **Magnet**
5. **Head Unit**
6. **Remote Enter Button**
7. **Strain Sensor (Optional)**

Load sensor

The load sensor (fig. 2a) is connected via a flexible hose into the pressure side of the hydraulic circuit, using a tee adaptor fitting.

Depending on the machine, you may be using a threaded tee piece, SAE flange coupling, or if there is no suitable coupling you may have to drill and tap into a suitable point.

The machine is normally specified when ordering a Weighlog kit so the correct hydraulic adaptor should be in the box.



Figure 2a

Where to tee-in

1. Identify the lift hose on one of the main lift rams. Trace the pipework back towards the valve block (at some point the pipework from the other cylinder will join into a single line). Identify a suitable coupling which allows enough room to be split and the tee adaptor to be inserted, or in the absence of a suitable coupling, a point which can be drilled and tapped. The tee-in points could be anywhere between the lift cylinder and valve block but ideally should be as close as possible to the lift cylinder.



Make sure that the bucket is down on the floor and all pressure is released from the hydraulic system, before slackening off any hydraulic coupling ! Always loosen or open the cap on the hydraulic tank to release any pressure.

2. Thoroughly clean around the tee-in point before splitting, to prevent the ingress of dirt.

Installing the Load Sensor

The load sensor is fitted with a snubber to protect it from shock loading. This consists of a diagonally drilled hole 0.3 mm in diameter. It is possible to block this hole with debris causing the sensor to malfunction.

If a load sensor is installed on a machine where there may be particles of debris in the oil, or a fitter installing the system is unable to ensure the components being installed are kept clean, it is advisable to pre-fill the flexible hose with clean oil.

When a load sensor is installed the first supply of oil also contains all the debris and contamination in the pipe work feeding it. Once this pipe has filled there is no flow of oil and consequently no risk of contamination arriving at the sensor.

In order to avoid this problem we recommend that if you suspect there is a likelihood of contamination in the oil then please ensure the hose feeding the sensor is pre-filled with clean oil.



Figure 2b

Please note that the pressure sensor must be mounted with the hose connection uppermost, so that all the air can bleed out of the sensor body. If you do not mount the sensor as illustrated (fig. 2b), premature failure may occur due to air being trapped inside it.

SAE Flange Coupling

3. Fit the 1/8" BSP - 1/4" BSP Adaptor and Dowty seal to one of the two 1/8" BSP ports on the flange. Fit the blanking plug with Dowty seal to the remaining 1/8" BSP port (fig. 3).
4. Slacken and remove the four flange fixing bolts and split the coupling. Insert the flange plate ensuring that the 'O' rings are properly seated and that the 1/4" BSP port is in a convenient orientation.
5. Replace the hose using the longer bolts provided in the kit. Take care to ensure the 'O' rings stay in place. Check the 1/8" BSP port is oriented to allow room to connect the hose (fig. 4).

Torque the bolts as per the manufacturers recommendation. If this is not known use the following torques:

3/4" flange	21-29 lb-ft	2.8-3.9 kgm
1" flange	27-35 lb-ft	3.6-4.8 kgm
1 1/4" flange	35-45 lb-ft	4.8-6.2 kgm

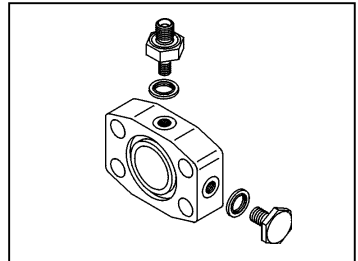


Figure 3

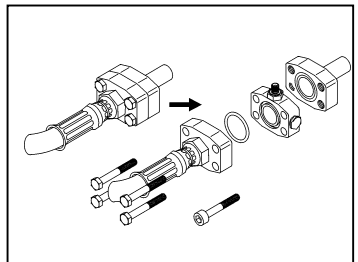


Figure 4

Threaded tees

BSP, JIC or Metric sizes are available.

A 1/4" BSP male - 9/16" JIC male adaptor is supplied as standard in kits for the USA. If this part is required, but not found in your kit, then contact the RDS distributor, who can supply this fitting ref. RDS Part No. S/HY/500-9-055

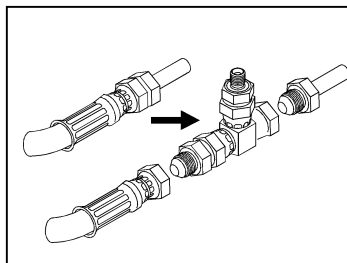


Figure 5

Tapped port

In cases where there is no suitable coupling, you must drill and tap a 1/8" BSP port into a convenient pipe block. If possible remove the component to be drilled.

Centre punch and drill a 3mm pilot hole. Open out to 8.8mm dia x 10mm deep then tap 1/8" BSP.

Ensure all swarf is flushed out of the pipework, then fit a 1/8" BSPM - 1/4" BSPM adaptor using a Dowty seal between the adaptor and block faces. (fig. 6a).

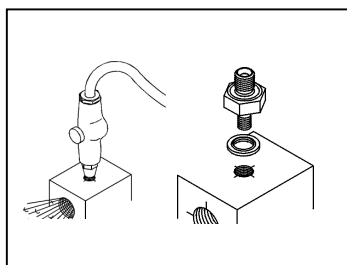


Figure 6a

Load Sensor mounting

6. Connect the hydraulic hose to the tee fitting and route the hose towards the back of the loader frame. Connect to the load sensor and mount the sensor in a well protected position where it can be easily reached for servicing.

NOTE: Mount the pressure sensor in a well protected area, in an upside down position (fig 6b).

This helps prevent air bubbles hitting and damaging the diaphragm of the sensor.

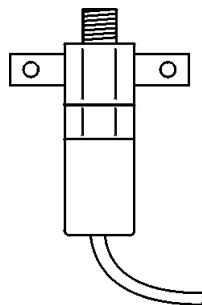


Figure 6b

Bleeding the Load Sensor

This can be done whenever is most convenient during the installation procedure.

Lift the boom so that it is a few inches off the floor. Have an assistant loosen the hydraulic fitting to allow any air bubbles to escape. You may have to bleed the sensor more than once. It is recommended that the machine is worked for 5 to 10 minutes and then the bleeding procedure is repeated.

Load Sensor connection

- Connect the extension cable to the "Weatherpak" connector on the sensor lead and route inside conduit back to the junction box. Cable-tie the conduit securely to existing hydraulic lines or conduits.

Avoid coiling excess cable - it is best practice to cut the cable to the required length and re-crimp.

- Connect the wires according to the label on the junction box lid (fig. 7) :

Colour	Function	Terminal #
Red	+V	10
Blue	0V	9
Green	Signal	7

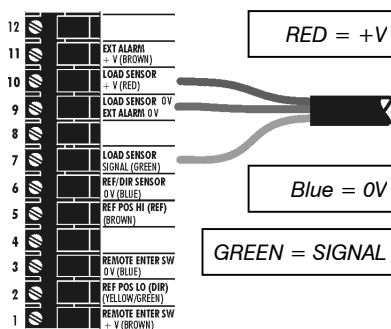


Figure 7

NOTE: There is no provision for strain relief on these connections. It is recommended that sensor cables are cable-tied back next to the junction box.

Reference / Direction sensor

First establish with the operator the most convenient weighing position to suit the loading operation. The sensor and magnet must be arranged so that the magnet is opposite the sensor face at the weighing position (fig 10). The sensor cables are tagged to identify the sensors - 'R' for the reference sensor and 'D' for the direction sensor.

NOTE: *If you have to take the sensor clamp apart, on re-assembly the reference sensor must be uppermost.*

1. Lift the bucket to the height you want to be the weighing position.
2. General purpose sensor and magnet mounting brackets are provided which can be modified if necessary. The sensor can be mounted parallel (fig. 8) or at right angles (fig. 9) to the lift arm.

When deciding how and where to mount the sensor and magnet, note that in all cases :-

- (a) the sensor must be positioned at least 300mm away from the lift arm pivot point (fig. 8 and 9).
- (b) the magnet should pass the end of the sensor, 10mm to 30mm away from it in the orientation shown (fig. 10).



Take care positioning the brackets to ensure that they will not foul the lift mechanism when the arms are fully raised!

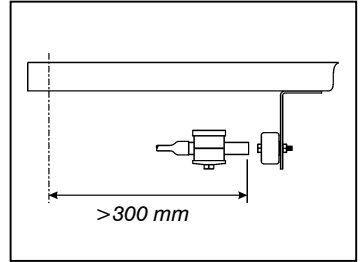


Figure 8

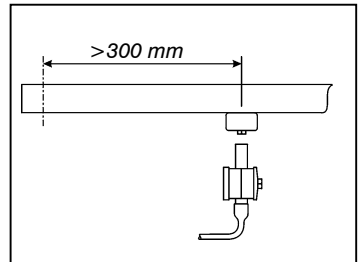


Figure 9

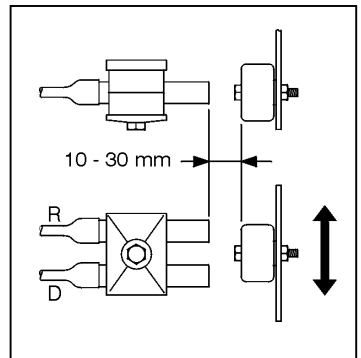


Figure 10

3. Mark the hole positions. Drill and tap 2 holes M8 to attach the sensor bracket, and 2 holes M6 in the lift arm for the magnet bracket*.

* In some cases the magnet can be mounted directly onto the lift arm but you must fit a fibre washer between the magnet and the arm.



Do not drill the lift arm above the centreline (neutral axis) of the lift arm ! (fig. 11)

4. Fit the brackets. Attach the magnet using the stainless steel set screw with the fibre washer between the magnet and mounting face.
5. Route all cables through the conduit provided in the kit. Cable tie the conduit at 300mm (12") spacing following where possible existing pipe work or cabling. You must pass the conduit through the chassis pivot point on articulated loaders (fig. 12). Do not secure the cables to the vehicle loom.

6. Assemble the reference and direction clamp assembly as shown in figure 13. The bracketing is designed so that the assembly may be installed to either side of the machine, by rotating the angle bracket 90 degrees.

Remove the original M8 bolt from the green Nylon Clamp, and replace it with the longer M8 x 60 mm. Then tighten with the sensors in the correct position.

The clamp with sensors should then be inserted into the clamp holder, and tightened into position by using the M8 self-locking nut supplied.

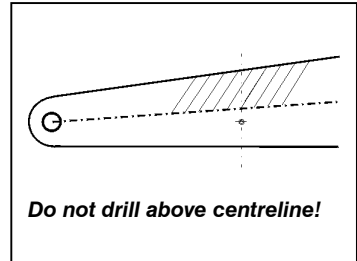


Figure 11

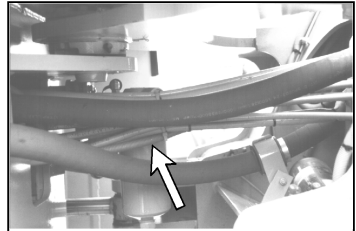


Figure 12

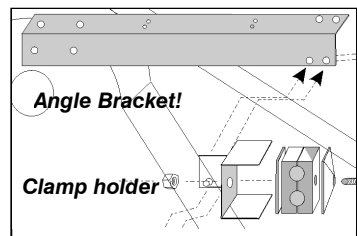


Figure 13

The whole assembly can then be bolted to the Angle Bracket at the suitable angle for the specific installation, using the two M6 x 16mm bolts and nuts provided.

Install the angle bracket as shown in figure 14.

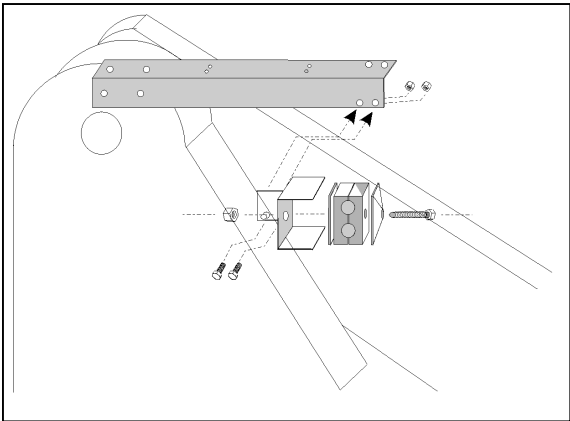


Figure 14

Ref/Dir Sensor Connection

Connect the extension cable to the "Weatherpak" connector on the sensor lead route along with the Load Sensor Lead back to the junction box.

Connect the wires according to the label on the junction box lid (fig 15):

Colour	Function	Terminal #
Blue	Common	6
Green		
Red	Ref. Sig.	5
Yellow	Dir. Sig.	2

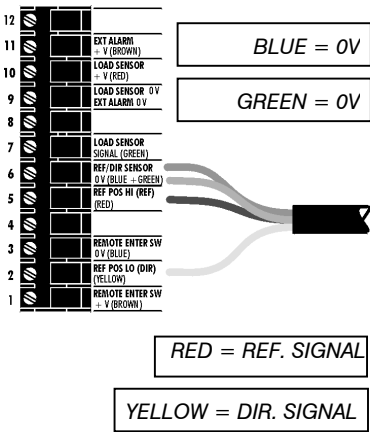


Figure 15

NOTE: There is no provision for strain relief on these connections. It is recommended that sensor cables are cable-tied back next to the junction box.

Remote Enter Switch

Mount the Remote Enter Switch either on the lift lever using a hose clip, or where it is easily accessible next to the lift lever (fig. 16).

Route the cable back to the junction box.

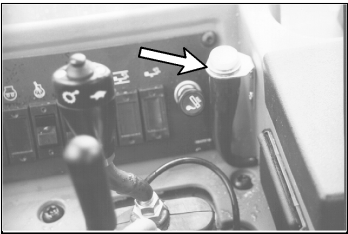


Figure 16

Connection

Connect the wires according to the label on the junction box lid (fig 17):

Colour	Function	Terminal #
Blue	0V	3
Brown	Signal	1

NOTE: There is no provision for strain relief on these connections. It is recommended that sensor cables are cable-tied back next to the junction box.

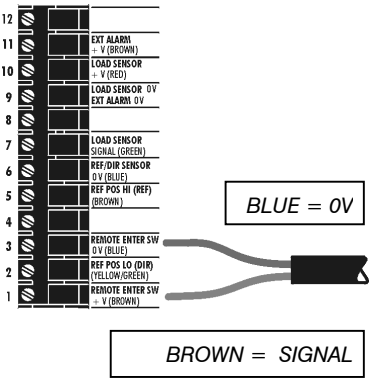


Figure 17

Head Unit

Confirm with the machine operator on where to mount the head unit in the cab. The head unit must not restrict the view out of the cab, nor impede the use of the controls. The head unit is fitted with a multi-core lead with in-line connector, terminating with an 18-way IDC type connector, ready for connection into the "Terminator" junction box.

Mounting the Head Unit

The head unit is supplied with a separate mounting kit comprising the following parts :

- 1 Long Bracket
- 1 Short Bracket
- 3 Clamping Knobs
- 1 Cover Plate
- 1 Mounting Plate
- 2 Self Tapping Screws

1. Snap the cover plate into the recess of the long bracket (it only fits one way).
2. The instrument mount is designed to offer maximum flexibility in positioning the head unit, either from the right hand side of the cab, from the dashboard or from an overhead position.

Assemble the two brackets, and mounting plate with clamping knobs, and attach to the head unit.



Figure 18

NOTE: *Either the long or short bracket can be attached to the head unit, whichever gives the most suitable orientation.*

As you will notice, you can index each pivot point on the mounting bracket to to angle the head unit in relation to the mounting plate.

3. Having established the orientation for the bracket, fix the mounting plate to the cab with the self tapping screws provided.



Do not drill into a ROPS or FOPS frame.

If you are fixing the mounting plate to plastic e.g. the dashboard or other cab moulding, it is recommended to use M4 screws with mudwing washers to strengthen the mounting point.



Do not attempt to adjust the mounting bracket assembly without first slackening off the clamping knobs sufficiently. You will only succeed in damaging the bracket otherwise.

Junction Box



The Junction Box or "Terminator" as it is also known, provides for connecting the 18-core head unit cable, all sensors and the power supply.

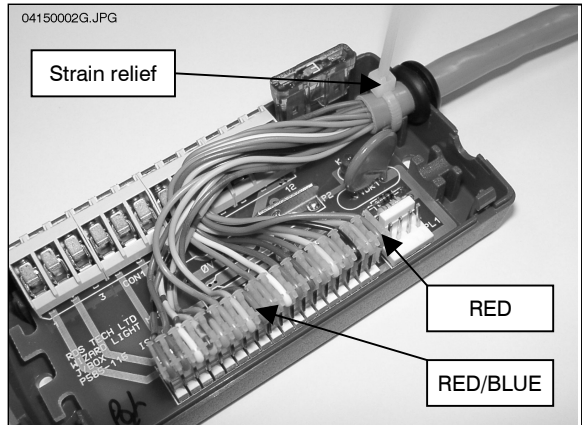
The Terminator is not sealed. It must be located where it will be protected from EXCESSIVE MOISTURE AND DIRT

1. The Base Moulding can be mounted using the screws provided, or can be left in-line with the cables.
2. Connect the head unit lead onto the PCB header PL2.

NOTE: The red wire on the 10-way plug goes to pin 1 on the PCB connector.

The blue/red wire on the 8-way plug goes to pin 11 on the PCB connector (fig. 19a).

Figure 19a



3. Locate the cable grommet onto the moulding, and cable-tie the head unit lead onto the moulded cable saddle to provide strain relief.
4. Connect the sensors. The wiring connections are printed on the lid of the Terminator, and are also given in the appropriate sections in this manual.

NOTE: Cable tie the cables entering the end of the box to the PCB as shown in figure 19b.

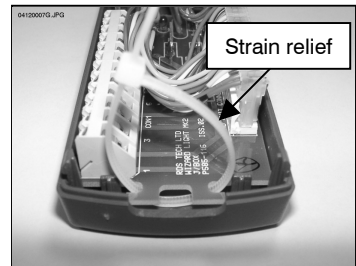


Figure 19b

Power Supply

The Terminator is fitted with a 3A fuse, varistors for protection from voltage transients and a power-on LED.

The head unit does not have an integral On-Off switch, and is normally powered on via the ignition circuit. However, a separate toggle switch is provided in the installation kit should this be preferred.

6. Using the power lead provided, connect from a switched live point (e.g. from the ignition circuit) to the spade terminals marked 0V and +V.

If preferred, panel mount the toggle switch at a suitable point (1/2" dia drill required) and connect in-line to a permanently live point (e.g. a suitable feed into the fuse box).



Do not connect the power supply to the screw terminal block.

Reverse Polarity

If you inadvertently have the power supply connections reversed, nothing will work.

The head unit has reverse polarity protection and will not be damaged.

The LED on the Terminator PCB will not light if the 0V and +V connections are reversed.

If the instrument does not power up when you switch the ignition on, then:

- (a) check you have connected to a suitable point on the vehicle electrical system as described above.
 - (b) If (a) is OK but the LED is not lit, check the polarity is correct.
 - (c) If the LED is lit but the head unit does not come on, check that the 18-way connector is properly connected.
7. Once all is OK, clip the lid on the Terminator. To remove the lid, squeeze the sides of the base inward to release the clips.

External Alarm

An external alarm is optional. Mount the alarm buzzer where it will stay dry.

Wire into the junction box as shown (Fig. 20).

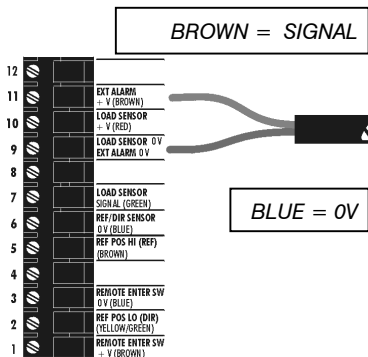


Figure 20

Testing the System

1. Switch the power on.

The alarm should beep once and the display will come on.

2. Lift the bucket through the weighing position (Dynamic Weighing Mode).

The alarm should beep twice. The display should indicate a number which is meaningless until the system is calibrated.

If the display shows "Err" then there is no signal from the load sensor.

3. Press the Remote Enter Button.

With a weight displayed onscreen, the alarm should beep. This verifies the operation of the system and you should then proceed with weight calibration.

Printer Installation

Connect the printer lead Part No. S/CB/327-1-025 onto the 4-way connector in the terminal box as shown (Fig 21), and the 9-way 'D' connector onto the back of the printer.

This lead also provides the printer power supply.

Locate the cable grommet onto the moulding, and cable-tie the head unit lead onto the moulded cable saddle to provide strain relief.

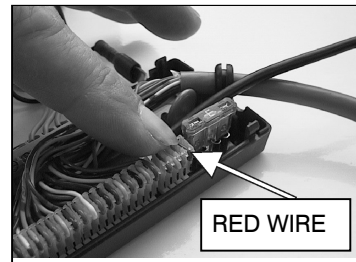
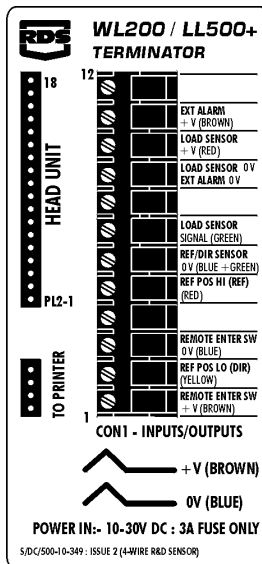
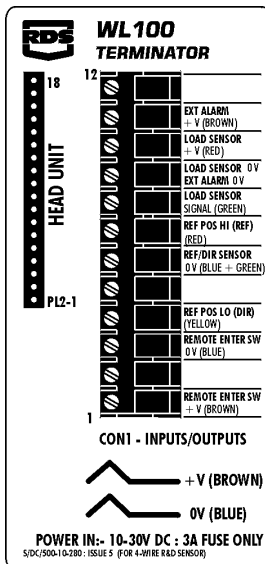


Figure 21

Upgrading Weighlog 100 to Weighlog 200

If changing a Weighlog 100 head unit for a Weighlog 200 head unit, please note that some of the sensor connections must be moved as follows:-



3-wire Ref./Dir. Sensor:

Move the Yellow/Green wire from terminal 4 to terminal 2.
Move the Brown wire from terminal 7 to terminal 5.

4-wire Ref./Dir. Sensor:

Move the Yellow wire from terminal 4 to terminal 2.
Move the Red wire from terminal 7 to terminal 5.

Load sensor:

Move the green wire from terminal 8 to terminal 7.

Apply the new junction box label provided in the kit.

Document History:

Issue 1: 07/6/02	Original Issue - As UK262-4 + Addendum for printer + Wiring changes.
Issue 2: 23/10/02	Ref. p.10 "Bleeding the Load Sensor" Ref. p.12 Added section "Choice of Magnet".
Issue 3: 12/3/03	p.14 – 4-wire R&D sensor, p.21 – testing the Remote Enter Button p.22 – 4-wire R&D sensor
Issue 3b: 9/9/04	p.3, p.16 - ref. 'Qikmate' connector
Issue 3.2 15/8/08	Removed reference to red magnet / Reformatted pages