SETTING THE INDUSTRY STANDARD

EDBRO RIGID INCLINOMETER

RINC01

Installation & Operating Instructions

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WARNING!

Before using this product please read and fully understand the instructions provided. This Edbro plc product is to be used for guidance purposes ONLY and must not be relied upon to prevent an accident occurring.

Edbro plc or its representatives accept no responsibility for direct or indirect damage or injury whilst using this product.

SAFETY IS THE SOLE RESPONSIBILITY OF THE OPERATOR

INTRODUCTION

The Edbro Rigid Tipper Inclinometer unit is an audio/visual aid to assist the driver in operating the vehicle in a safe manner.

Determination of the actual safe working angle of the equipment is the responsibility of the end user as Edbro has no control over the vehicle/body configuration, type of load and ground conditions whilst in use.

The Inclinometer unit displays the angle of the vehicle using a series of Ultra bright LED's. The display unit is compact measuring 130mm x 65mm x 25mm making it easy to install. The system operates on 12v - 24v supply, has a mute facility, and 6 variable maximum angle settings.

Contents of the Inclinometer kit

1 x Inclinometer Control Unit
1 x Sensor Unit c/w sensor cover
1 x Valve Unit
1 x External Voice Sounder c/w fixings
1 x Control Unit mounting bracket
2 x Grip Knob
4 x 2.9 x 9.5 ST Screw
4 x M5 x 30 Hex Bolt
4 x M5 Washer
4 x M5 Nylock Nut
60 x Black Cable Ties
1 x Quick ref. guide
1 x Instruction Manual

OPERATING INSTRUCTIONS

1. When the Inclinometer is powered on (i.e. when the ignition is switched on) the ZERO LED will flash, an audible tone will be heard and the unit will then enter STANDBY MODE.

2. Activating the Inclinometer: A single press of the MUTE/ENTER button brings the unit into ACTIVE MODE for normal operation.

   - The tipper shut off valve is opened.
   - The unit will alarm and the valve will close at the settings set in PRESET MODE. (see below).
   - The audible alarm can be muted with the push button. The alarm will be cancelled and the tipper shut off valve opened when safe operating levels are restored.
   - To return the unit to STANDBY MODE press and hold the push button.

3. PRESET MODE is entered by pressing and holding the push button when in STANDBY MODE.

   - Two beeps and flashes of the ZERO LED indicate the unit is in PRESETMODE.
   - The unit has adjustable operating levels with associated alarm levels – 2, 3, 4, 5, 6 and 7 degrees.
   - When PRESET MODE is entered LEVEL 7 LEDs flash. To select this level press the push button.
   - If the button is not pressed within three flashes of the LEDs then LEVEL 6 LEDS will flash.
   - Likewise if the button is not pressed LEVEL 5 LEDs will flash. If no levels are selected the unit will default to level 5.
   - Selection of a level is indicated by single beep and flash of the ZERO LED
   - After level selection LEDS for levels 5, 6 and 7 to the left will flash indicating that the scale is operating to the left when the sensor output is signalling left output.
   - This default setting is selected by pressing the push button. If not pressed within three flashes then the LEDS for levels 5, 6 and 7 to the right will flash.
   - This allows the signal from the sensor to be reversed if required.
   - If no direction is selected then the unit will default to the left.

- Selection of either direction will be indicated by a single beep and flash of the ZERO LED.

- After direction selection the ZERO LED will flash five times before the unit returns to STANDBY MODE.

4. During this flashing period pressing the button will place the unit in TESTMODE.

   - Three beeps and flashes of the ZERO LED will indicate TESTMODE.

   - In TESTMODE the left LEDS will increment until the preset alarm and cut off levels are reached. This simulates the unit response from inputs from the sensor. The right LEDS perform an equivalent function to the right.

   - At the end of this TESTMODE the ZERO LED will again flash five times to allow the re-entry into TESTMODE by again pressing the button.

   - If the button is not pressed within the five flashes then the unit will return to STANDBY MODE, ready for normal operation.

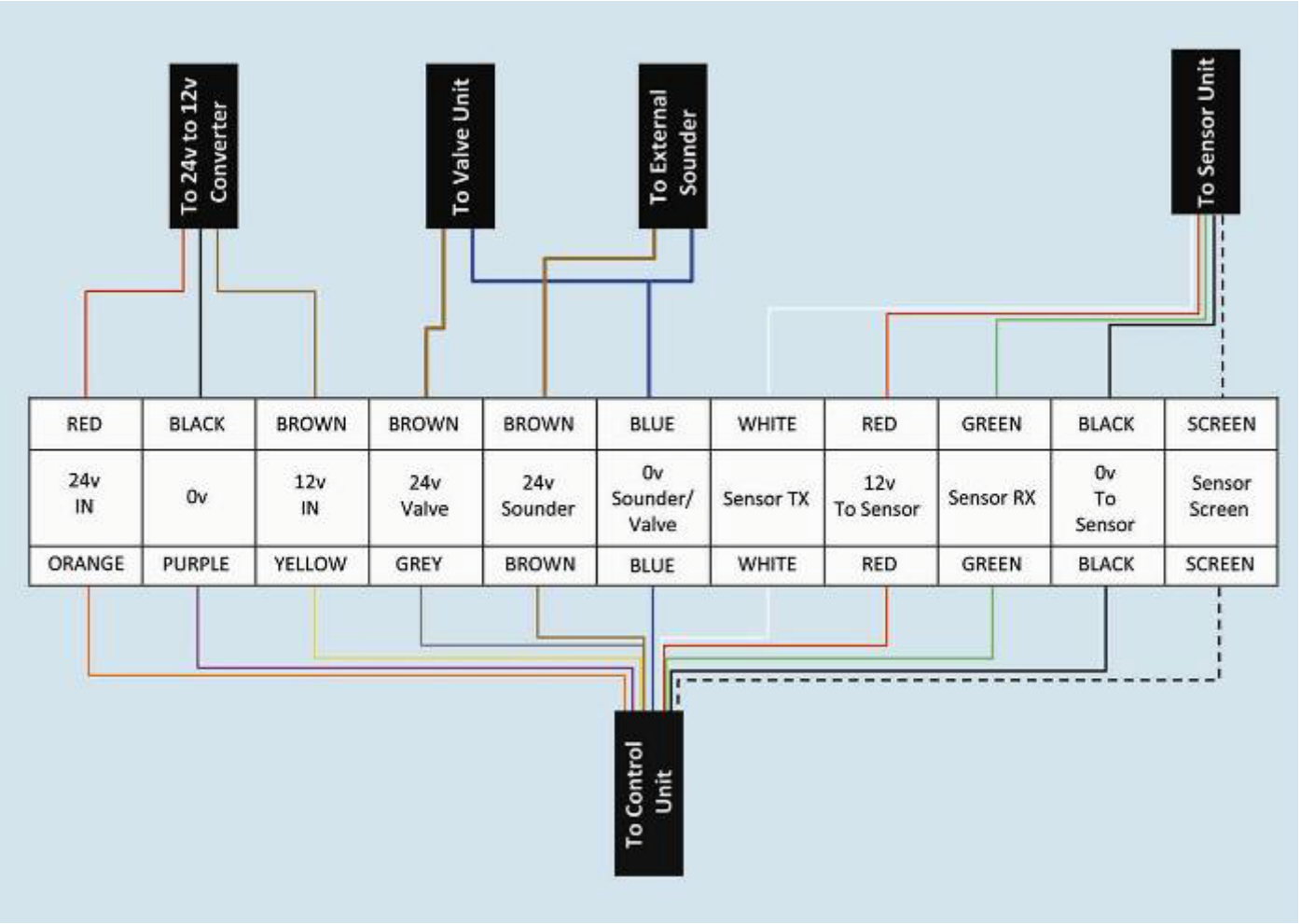
INSTALLATION ADVICE

IMPORTANT: CAREFULLY READ THIS INSTRUCTION MANUAL BEFORE STARTING THE INSTALLATION OF THE INCLINOMETER.

Before mounting the Inclinometer Control Unit, following points should be taken into consideration:

- Ensure the tipper body is empty.
- Park the tipper on firm level ground.
- Check for any overhead obstructions before raising the tipper body **in particular overhead power lines.**
- Prop the tipper body following manufacturer instructions before underneath it.
- If the vehicle cab has to be tilted forward, ensure all heavy and loose objects are removed from the cab to avoid any items falling through the windscreen.
- The Inclinometer needs to take power from a 24vDC Ignition switched feed (live when the ignition is in the on position). We recommend that power for the Inclinometer is picked up from the following:
    - A fuse spare located in the vehicles fuse box. This is often marked 'Auxiliary' or 'AUX'.
    - Or the vehicle cigarette lighter socket. Be sure to check that it is 24vDC ignition switched.
    - Any other suitable 24vDC ignition switched supply.
    - We DO NOT recommend connecting to the following circuits:-
    - The braking system (ABS, EBS)
    - Engine management
    - If you are unsure always consult the vehicle manufacturer handbook.
    - Ensure the Inclinometer Control Unit does not obstruct items such as gear shift, brake handle, pedals, switches and other controls.
    - The control unit must not obstruct the driver's line of sight – this can lead to MOT failure.
    - When choosing the position for the Inclinometer bear in mind how easily the cables can be routed and hidden behind the dashboard and facia panels.

Junction Box Wiring Diagram



INSTALLATION INSTRUCTIONS

1. Using the two Control Unit mounting brackets, two Grip Knobs and four 2.9 x 9.5 ST screws mount the unit to a suitable location in the cab.

2. Place the Data connection unit behind the dash/fascia of the cab. The ideal position is behind the passenger foot well panel. Connect the cable marked 'POWER' to the vehicle electrical supply. The BLUE lead is connected to the vehicles 'GROUND' or '0v' (on most modern vehicles the chassis is ground, always check with a voltage meter). The FUSED lead is connected to the vehicle +24v this should be an ignition switched supply.

3. Connect the cable marked 'SENSOR' to the sensor socket on the Inclinometer control unit. The sensor cable needs to be routed through the dash of the vehicle, through the bulkhead to the exterior of the cab. The sensor cable is routed through the vehicle dash and exits through cable gland in passenger foot well (often found on Scania vehicles). By removing the cover and the dash panel in the passenger foot well, the sensor cable can be routed to the outside of the vehicle (some DAF, Foden & other vehicles) The valve cable should be routed through the cab and brought out behind the PTO control handle

4. Connect the push on terminals to the valve unit. The valve is not polarised so it does not matter which way round this is done.

5. The Valve Unit has three ports, air in, air out and exhaust. They are marked on the valve as 'IN', 'OUT' and 'EXH'. The valve needs to be connected to the PTO airline marked 'TIP' or 'UP'. If it is not marked on the rear of the PTO control the correct air line can be found by the following procedure:

    - With the PTO in the 'HOLD' position remove one of the air lines from the connectors in the rear of the PTO control, it is often better to start with one in the centre (remember which connector you removed the airline from).

    - With one air line removed, engage the PTO control, and then put the PTO control into the 'TIP or 'UP' position. If air escapes from the rear of the PTO control you have found the 'TIP' or 'UP' air line.

    - If no air escapes or air escapes as soon as the air line is removed from the connector this is NOT the correct airline. Re-connect the air line to the PTO control and repeat the procedure with one of the other air lines.

Once you have located the 'TIP' or 'UP' air line the valve unit needs to be connected so that it will interrupt it. Make sure the airflow passes through the valve as marked on the valve body.

6. The Sensor Cable should now be running from the inside of the vehicle to the exterior.

   - On most vehicles it can be routed though a gland or electrical cover. Then following the vehicles electrical cable loom to the rear of the cab. YOU MAY NEED TO TIP THE CAB AT THIS POINT

   - The Sensor Cable should be secured to the vehicle's existing cable loom with cable ties.

   - Ensure the cable is not routed such that it can be damaged or trapped when the cab is returned to the normal position and that the cable is kept away from hot surfaces.

7. Install and calibrate the Sensor.

The accuracy of the system depends on the sensor installation being done with precision and accuracy. The Sensor should be attached to the middle of the rear most cross member or the nearest one accessible to the rear of the trailer.

Connect all the cables together before fitting the Sensor.

- Clean the top of the cross member and place the Sensor on top.

- Switch on the Inclinometer, and observe the reading on the LCD display on the Control Unit. An audible warning should also be heard from the Control Unit and Sensor. i.e. 1 beep = 1 degree, 2 beeps = 2 degrees….and so on.

- If the cross member is level then the display will show a Zero, and no beep.

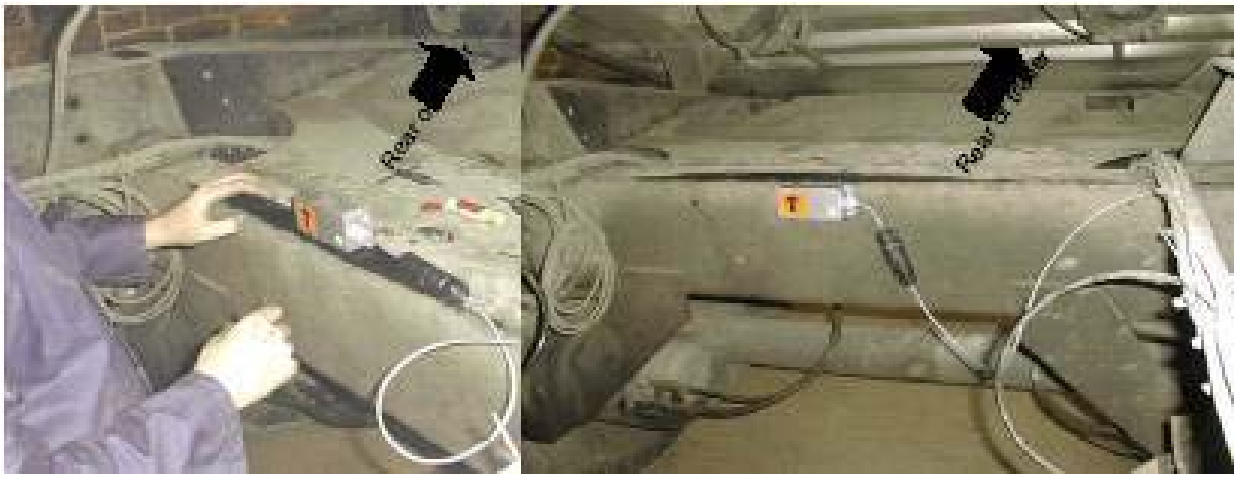
- Should the Inclinometer show that it is not level, establish which way the trailer is leaning. (+ / -), and make a note of the LCD reading.

- The Sensor is very sensitive and can fluctuate between two numbers, so allow it enough time to stabilise.

- Disconnect the Sensor, mark and drill a small hole in the cross member, with the Sensor being placed in the middle of the cross member. Secure the sensor to the cross member with one bolt which will allow the Sensor to be pivoted to position. Reconnect the Sensor and switch the Inclinometer on. The Sensor can now be pivoted until the previous reading is matched, again allowing for the (+ / -).

- Mark and drill the remaining three holes, again test for calibration before tightening all the bolts, then finally applying a locking solution.

Note: If you are fitting the Inclinometer to multiple vehicles it may be worth investing in a digital protractor which can measure the exact angle of the vehicles chassis. Precision mounting of the sensor will result in increased accuracy of the Inclinometer.



8. Mount the Sensor Cover over the Sensor Unit using four M5 x 40 HEX bolts. Use Silicone sealant or other waterproof sealant to make a waterproof seal between the Sensor Cover and the trailer cross member.

Fig A

The front of the sensor must face towards the cab as in figure 'A'. Occasionally it is not possible to mount the sensor directly to a rear cross member so that the front faces the cab. See figure 'B'.

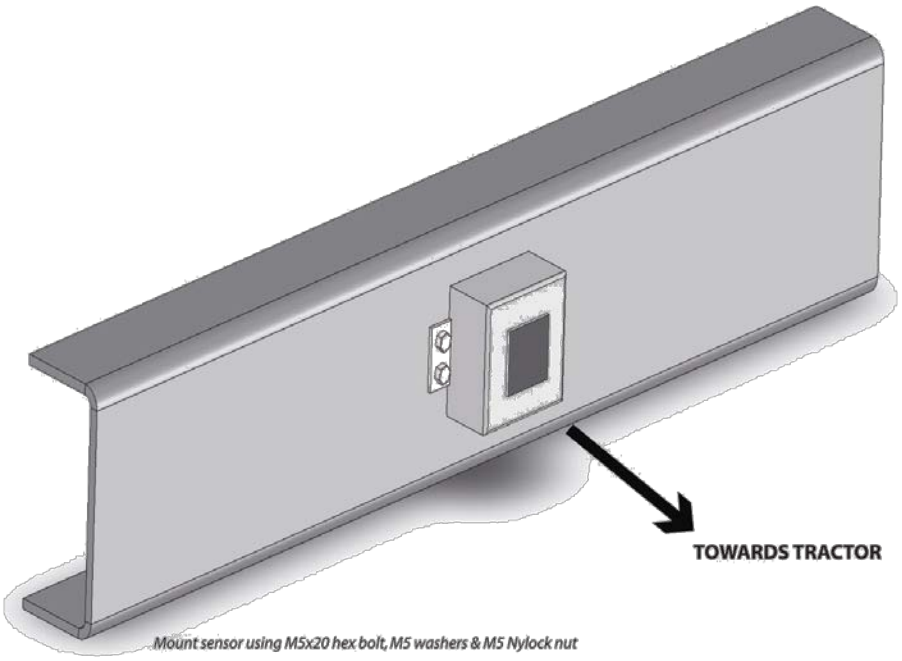
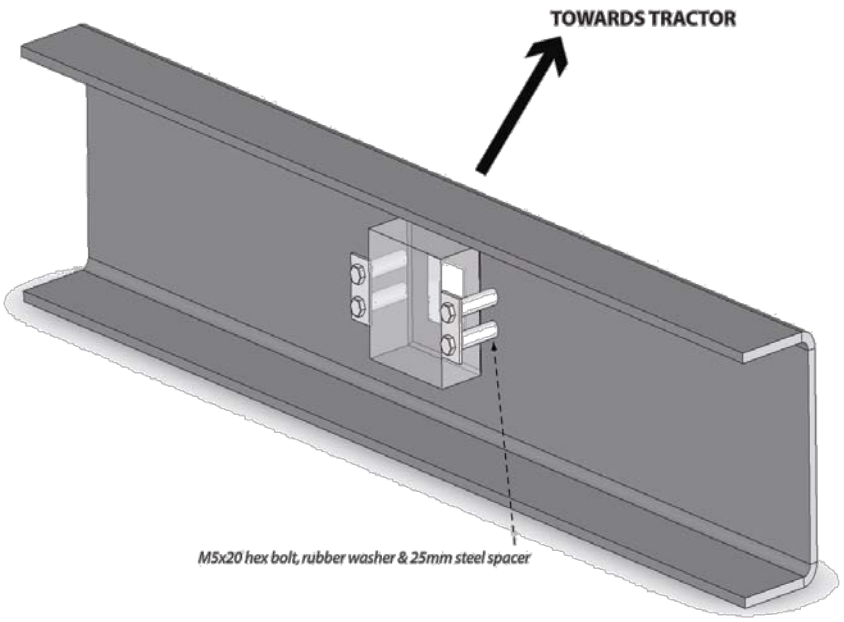


Fig B

If the sensor cannot be mounted as shown in fig A above it must be mounted as in fig B. Use the four M5x50 Hex Bolts, four rubber washers & four 25mm Steel Spacers. M5x50 Hex Bolt, Rubber Washer & 25mm Steel Spacer.



TECHNICAL SPECIFICATIONS

Standard Kit

Operating Voltage:	12-24V DC
Nominal Operating Current:	400mA
Size:	W 130mm x H 65mm x D 25mm
Weight:	155g
Nominal Operating Temperature:	-5°C to +55 °C
Measurement Range:	+/- 7°
Warning Tone:	High pitch pulsed buzzer approx 85db
Visual Warning:	High Intensity coloured LED's
Power Indicator:	High Intensity green LED
Mute Facility:	System can be muted once activated
Sensor Resolution:	+/-0.1°

Tipper Cut Off Valve

Operating Voltage:	12 or 24V DC
Nominal Operating Current:	170mA
Operating Pressure:	0-125 psi
Operating Temperature:	0°C to +50 °C

Voice Warning Sounder

Operating Voltage:	12-24V DC
Nominal Operating Current:	500mA
Sound Level:	85db
Frequency:	Speech

M.I.R.A. tested for on and off highway (sounder only)

Protection Ratings

External Electronic Connections: IP68
Sensor Casing: ABS IP68
Sensor Shield: Water/Impact resistant Rigid Tipper Inclinometer

SERVICE RECORD

Date	Details	Engineer
	Manufactured and tested. Installed at: …… Vehicle …… Reg: ……	