



TruckWeigh User & Technical Manual

PM Onboard

A Brand of VPG Onboard Weighing

IMPORTANT INSTALLATION INFORMATION AND LIABILITY WAIVER

Vishay PM Onboard Ltd. design and manufacture on-board vehicle weighing equipment. These installation guidelines are provided solely for the use of trained fitters and represent the correct, safe and recommended method of installation. They must be followed fully to ensure proper, safe installation. Failure to do so may result in serious consequences including, but not limited to, failure of the system to function properly and damage to the weighing equipment that could jeopardise the stability and safety of the vehicle.

***Vishay PM Onboard Ltd.* accepts no responsibility or liability for consequences arising from any improper installation of the weighing equipment including but not limited to, any misapplication or misinterpretation of the installation information contained herein.**

Strict observance of these guidelines should help to ensure accurate weight measurement and enable safe operation of the vehicle. Failure of our on-board vehicle weighing equipment due to poor installation workmanship or incorrectly installed elements remains solely the responsibility of the installer.

Vishay PM Onboard Ltd. do not accept responsibility for the structural integrity of the vehicle concerned, for any part thereof, and for its proper, safe operation.

The company also reserves the right to make any amendments and alterations to this document deemed necessary. You should ensure you have the current version of this information by contacting *Vishay PM Onboard Ltd.* prior to performing installation, such as on our website at vishaypg.com.

Vishay PM Onboard Ltd.

Design, manufacture and service of on-board vehicle weighing and overload protection systems.

Airedale House • Canal Road • Bradford • West Yorkshire • BD2 1AG UK
Tel: +44 (0) 1274 771177 • Fax: +44 (0) 1274 781178 • E-mail: obw.eur@vishaypg.com
Website: www.vishaypg.com/onboard-weighing

- TruckWeigh..... 5
 - Introduction and Scope..... 5
 - Introduction..... 5
 - Scope..... 5
- Indicator..... 6
 - Front Panel Functionality..... 6
 - Start Up and Available Main Screens..... 7
 - Display Default Settings..... 8
 - Re-Learn..... 8
 - Reset Defaults..... 8
 - Options Available in the Display..... 9
 - Changing a Parameter Value..... 12
 - How to Change a Parameter Value..... 12
 - Display Settings..... 12
 - Setting the Time and Date..... 12
 - PIN Protection..... 13
 - Setting the Net and Gross Alarms..... 14
 - Alarm Filter..... 14
 - Tare Function..... 14
 - Axle Settings..... 15
 - Axle Tares..... 15
 - Axle Spans..... 15
 - Axle Alarm Weights..... 16
 - Main Screen..... 16
 - User Settings..... 16
 - User Password Access..... 16
 - Alarm Reset – Manual or Auto..... 17
 - Packer Alarms – Manual or Auto..... 17
 - Setting or Re-Setting the Count By Option..... 17
 - Setting the Filter Option..... 17
 - Setting a Printer..... 17
 - Print Header..... 18
 - Front Panel Zero..... 18
 - Configuration Settings..... 18
 - Vehicle Configuration..... 18
 - Checking for CAN mode..... 19
 - Junction Box Configuration..... 19
 - Axle Transducer Configuration (Slope Compensation)..... 20
- Installation..... 21
 - General Information..... 21
 - Connecting the Display..... 22
 - Rear Connections..... 22
 - Connecting the Display to a Power Supply..... 22
 - Connecting Optional Sounder Alarm..... 22
 - Fitting the TruckWeigh Display..... 23

Removing the TruckWeigh Display.....	24
Power ON Jumper Resetting.....	25
Axle Transducer Installation.....	26
Transducer Attachment (Adhesive Tape).....	27
Tape Application.....	27
CAN Junction Box Installation.....	28
• Calibration.....	29
Calibration with Weigh Pads and Weighbridge.....	29
Weigh Pads Method.....	29
Weighbridge Method.....	29
Zero Inclinator.....	30
Zero Calibration.....	30
Axle Spans.....	31
• Appendix A.....	33
Application Options.....	33
Refuse Vehicles.....	33
Load/Deliver Screen.....	35
Handheld Option – 511 FreeWeigh.....	37
• Appendix B.....	38
Fault Finding & Diagnostics.....	38
Trouble Shooting.....	38
Diagnostic Information.....	39
• Appendix C.....	40
Definitions of Terms.....	40
• Appendix D.....	41
Related Information Available.....	42
• Appendix E.....	43
Configuration Options.....	443
4x2 Rigid Chassis with All Leaf Spring Suspension.....	43
6x4 Rigid Chassis with All Leaf Spring Suspension.....	44
8x4 Rigid Chassis with All Leaf Spring Suspension.....	45
4x2 Rigid Chassis with Leaf Spring and Air Suspension.....	46
6x4 Rigid Chassis with Leaf Spring and Air Suspension.....	47
4x2 Tractor/Trailer with Leaf Spring and Air Suspension.....	48
6x4 Tractor/Trailer with Leaf Spring and Air Suspension.....	49
4x2 Rigid Chassis with All Air Suspension.....	50
6x4 Rigid Chassis with All Air Suspension.....	51
4x2 Tractor/Trailer with All Air Suspension.....	52
6x4 Tractor/Trailer with All Air Suspension.....	53
Product Sheet.....	54

Introduction and Scope

Introduction

TruckWeigh is a vehicle payload optimisation, overload protection and load distribution system for use on vehicles with steel sprung or air sprung suspension, or a combination of the two.

Scope

This manual is intended as a guide to the installation, configuration and calibration of TruckWeigh.

It is only concerned with the two currently supported sensor types for use in a TruckWeigh system:

- Axle transducers that measure suspension deflection for use on mechanically sprung suspension systems.
- Air pressure transducers for use on air suspension systems.

In order to support known chassis configurations various system options can be configured using either of the above sensors, or certain combinations of the two.

Any display screenshots used in this document are intended as an illustration of the menu function being described, as such any specific detail or settings shown will differ from one installation to another.

Attention:

The TruckWeigh indicator has a certain amount of legacy functionality available through its menu structure which is not considered to be a part of the TruckWeigh program, hence is not supported and falls outside the scope of this manual.

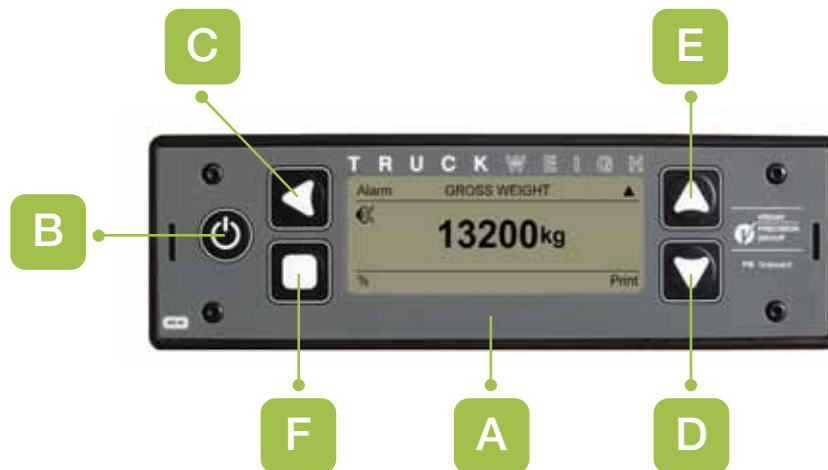
Important Notes:

There are areas of this procedure that are of particular importance to ensure a reliable and properly functioning system, and these are covered in detail in the manual:

- Axle transducer fitment and configuration – suitable location and orientation for the transducer should be carefully identified and that location should then be prepared for the transducer to be attached. Slope configuration should also be set accordingly.
- Span calibration – it is important that this is carried out with each axle loaded as close as possible to its maximum. PI% values should also be verified.

Front Panel Functionality

The various screens and menus are accessed using the four buttons located around the LCD display, described briefly below.



A LCD DISPLAY

Displays currently selected information, i.e. Gross Weight, Net Weight or menus.

The four buttons located around the LCD display each have their own functions that carry through most screens, but there are some screens where they invoke different operations. In every screen there is an indication as to what each button does located in the adjacent corner of the screen, if there is nothing displayed then that button is not currently active.

B ON/OFF BUTTON

Located to the far left of the display with a circular symbol broken at the top by a vertical line, it is used to switch the display on and off.

C LEFT ARROW BUTTON

Located to the upper left hand side of the LCD display with a left facing arrow symbol, it is generally the select/accept and edit button.

D-E UP AND DOWN ARROWS

Located to the upper and lower right hand side of the LCD display with respective up and down facing arrow symbols, these are generally used to scroll up and down lists and screens, or increment and decrement numbers.

F EXIT BUTTON

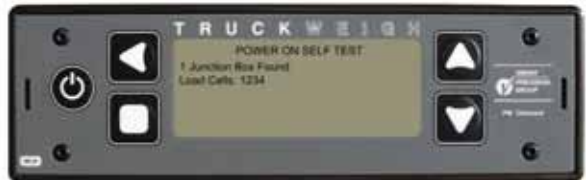
Located to the lower left hand side of the LCD display with a square symbol, it is generally the exit button.

Start Up and Available Main Screens


When the display is first powered up, it will initially show the start-up splash screen, including firmware version.



This is followed by the POWER ON SELF TEST (POST) screen where details of any connected equipment will be checked and displayed, i.e. load cells or 511 transceiver.



Main Screens

When the POST process has completed successfully the first of the main screens is displayed, as determined by the configured options, Axles, by default. These main screens can be navigated through in a cyclic order using the  up arrow button. There are 3 main screens available by default, with a further 2 that can be enabled in the Settings menu. Each screen is shown below:

AXLES



TIME/DATE

Settings Menu is accessed in this screen via the left arrow button.
(See page 12 for details).



GROSS WEIGHT



NET WEIGHT (optional)

Only available when Display Net in enabled in the Settings Menu.
Front Panel Tare may also be enabled in the Settings menu, in which case the Tare function will be available on the Exit button.



LOAD/DELIVER (optional)

Only available when Load Deliver is enabled in the Settings menu



Display Default Settings

There are accessible on the SETUP menu - Reset option, there are two options available on that screen:

1. Re - Learn
2. Reset Defaults

Re-Learn

This option is used when the display is operated with different external equipment to that originally used, for example, if an external inclinometer has been used in the past and the display is now used on a system without one. The option forces the display to check all external equipment and update its settings.



Reset Defaults

These settings can be accessed from:

Menu - Setup - Reset Defaults and are the standard settings loaded on a display when new.

Main Screens

Net Weight (if enabled)
Gross Weight
Time/Date
Axles

Display

Contrast: 3
Power On screen: NET WEIGHT
Key beep: OFF

Setup - Alarms

Mode: MANUAL
Net weight: 50 000kg
Gross weight: 50 000kg
Body up threshold: -500kg, ALARM OFF

Setup - Calibrate

Span - 2500kg

Setup - Vehicle Config

Load cells: CAN
Weigh mode: MULTI-AXLE
Axle tares: 5000kg/AXLE
Cell PI values: 16384

Setup - Settings

Count by: 50kg
Filter: MEDIUM
Zero Limit: 1000kg
Front panel tare: OFF
Display Net: OFF
Load deliver: OFF
Language: ENGLISH

Setup - Outputs

Serial Output
Printer: (DEFAULT)
Baud rate: 9600
Handshaking: OFF
Print header: ON

Scoreboard
Baud rate: 9600
Handshaking: OFF
Frequency: 5s
Acknowledge: NO

Barrier Control
Barrier: OFF
Max Incline: 3°
Front Axle Underload: OFF
Axle Overloads: 9500kg/AXLE
Filter Weight: 100kg
Filter Time: 4s

Remote channel: A
Auxillary output 1: OFF
Auxillary output 2: OFF

Setup - Set Time/Date

Daylight saving: ON (UK ONLY)

Setup - PIN Access

PIN control: MANAGER
User alarms: NO

Setup - Password

PM ONBOARD SERVICE PIN

Options Available in the Display

1. Display

When opened this option gives access to the following three sub-options:

- 1.1 Contrast
Adjustable between 1 and 8 **(Default = 3)**
- 1.2 Power-On screen
Axles **(Default)**
Net Weight **(Only available if enabled in setup)**
Gross Weight
- 1.3 Key Bleep
Off **(Default)**
On

2. Setup (Manager PIN is active by default, required to access this menu)

When opened this option gives access to eight sub-options (dependent upon Vehicle Configuration settings):

- 2.1 Alarms (Also available from the menu one level up, when the Manager PIN is enabled - default)
 - 2.1.1 Mode
Manual **(Default)**
Auto
 - 2.1.2 Net
Value of Net Weight at which the alarm will sound. **(Default = 50000KG)**
 - 2.1.3 Gross
Value of Gross Weight at which the alarm will sound. **(Default = 50000KG)**
 - 2.1.4 Body Up
 - 2.1.4.1. On/Off **(Default = Off)**
 - 2.1.4.2. Body Down
 - 2.1.4.3. Body Up Threshold **(Default = -500KG)**
 - 2.1.5 Axle 1
Value of Axle 1 Weight at which the alarm will sound. **(Default = 10000KG)**
 - 2.1.6 Axle 2
Value of Axle 2 Weight at which the alarm will sound. **(Default = 10000KG)**
 - 2.1.7 Axle 3
Value of Axle 3 Weight at which the alarm will sound. **(Default = 10000KG)**
 - 2.1.8 Axle 4
Value of Axle 4 Weight at which the alarm will sound. **(Default = 10000KG)**
 - 2.1.9 Alarm Filter
Adjustable between 1 and 10 seconds **(Default = 3s)**
- 2.2 Calibrate
 - 2.2.1 Zero
Select and confirm to perform a Zero Calibration
 - 2.2.2 Axle Spans (Axles 3 and 4 may also be available depending upon vehicle config settings)
 - 2.2.2.1 Axle 1
 - 2.2.2.1.1 Net Span Weight
Enter Axle 1 Span Weight here **(Default = 25000kg)**
 - 2.2.2.1.2 Calibrate
Select to perform Axle 1 Span Calibration
 - 2.2.2.2 Axle 2
 - 2.2.2.2.1 Net Span Weight
Enter Axle 2 Span Weight here **(Default = 25000kg)**
 - 2.2.2.2.2 Calibrate
Select to perform Axle 2 Span Calibration
 - 2.2.3 Zero Inclinometer
Select and confirm to perform a Zero Calibration on the Inclinometer
- 2.3 Vehicle Configuration
 - 2.3.1 Load Cells
 - 2.3.1.1. CAN **(Default – should not be changed for TruckWeigh applications)**
 - 2.3.1.2. Analogue (If this option is selected, some of the items below will not be available)
 - 2.3.1.3. Auto

Options Available in the Display

- 2.3 2.3.2 Weigh Mode
 - 2.3.2.1. Multi-Axle **(Default – should not be changed for TruckWeigh applications)**
 - 2.3.2.2. Standard
 - 2.3.2.3. Axle
 - 2.3.2.4. Twin/5 + Air (Only visible in certain configurations)
 - 2.3.2.4. Drawbar (Only visible in certain configurations)
 - 2.3.3 JBox Config **(Only available when no junction boxes are connected, use as required at installation for configuring individual junction boxes)**
 - 2.3.3.1. Mode 0 1, 2, 3, 4
 - 2.3.3.2. Mode 1 1, 2
 - 2.3.3.3. Mode 2 3, 4
 - 2.3.3.4. Mode 3 5, 6
 - 2.3.3.5. Mode 4 7, 8
 - 2.3.3.6. Mode 5 5, 6, 7, 8
 - 2.3.4 Number Of Axles
2, 3 or 4 **(Default = 2).**
 - 2.3.5 Slope Compensation
Each configured axle can be set as Trailing, Leading or None – see Axle Transducer Fitting for more details.
 - 2.3.6 Axle Tares
Tare Weight for each configured axle are set here **(Default = 5000KG per axle)**
 - 2.3.7 Cell PI Values
PI values for each transducer can be configured here.
- 2.4 **Settings**
- 2.4.1 Count By – the size of each division by which the weight displayed is updated.
 - 2.4.1.1. 1KG
 - 2.4.1.2. 10KG
 - 2.4.1.3. 20KG
 - 2.4.1.4. 50KG **(Default)**
 - 2.4.1.5. 100KG
 - 2.4.1.6. 200KG
 - 2.4.2 Filter
 - 2.4.2.1. Low
 - 2.4.2.2. Medium **(Default)**
 - 2.4.2.3. High
 - 2.4.3 Zero Limit
 - 2.4.3.1. The limit at below which the Front Panel Tare can be used. **(Default = 1000KG)**
 - 2.4.4 Front Panel Tare
 - 2.4.4.1. On
 - 2.4.4.2. Off **(Default)**
 - 2.4.4.3. Single
 - 2.4.5 Display Net
 - 2.4.5.1. On
 - 2.4.5.2. Off **(Default)**
 - 2.4.6 Load / Deliver
 - 2.4.6.1. On
 - 2.4.6.2. Off **(Default)**
 - 2.4.7 Language – English
- 2.5 **Outputs**
- 2.5.1 Serial Output
 - 2.5.1.1. Serial Output configured as Printer **(Default)**
 - 2.5.1.1.1. Baud Rate - 1200, 2400, 9600 **(Default)**, 19200, and 57600
 - 2.5.1.1.2. Handshake – On, Off **(Default)**
 - 2.5.1.1.3. Print Header – On **(Default)**, Off
 - 2.5.1.1.4. Change Print Header - selecting this option opens another screen with four editable lines of sixteen characters that will form the print header of a weight ticket
 - 2.5.1.2. Serial Output configured as Scoreboard
 - 2.5.1.2.1. Baud Rate - 1200, 2400, 9600 **(Default)**, 19200, and 57600
 - 2.5.1.2.2. Handshake – On, Off **(Default)**
 - 2.5.1.2.3. Frequency - 0.5s, 1s, 2s, 5s **(Default)**, 10s
 - 2.5.1.2.4. Acknowledge Required – Yes, No **(Default)**
 - 2.5.1.2.5. Transmit Retries – Selectable from 1 – 5 **(Default = 2)**

Options Available in the Display

- 2.5.2. Barrier Control
 - 2.5.2.1. Barrier
 - 2.5.2.1.1. Off **(Default)**
 - 2.5.2.1.2. On
 - 2.5.2.2. Maximum Incline **(Default = 3.0°)**
 - 2.5.2.3. Front Axle(s) Underload
 - 2.5.2.3.1. Off **(Default)**
 - 2.5.2.3.2. On
 - 2.5.2.4. Axle 1 Overload **(Default = 9500kg)**
 - 2.5.2.5. Axle 2 Overload **(Default = 9500kg)**
 - 2.5.2.4. Axle 1 Overload **(Default = 9500kg)**
 - 2.5.2.5. Axle 2 Overload **(Default = 9500kg)**
 - 2.5.2.6. Axle 3 Overload **(Default = 9500kg)**
 - 2.5.2.7. Axle 4 Overload **(Default = 9500kg)**
 - 2.5.2.8. Filter Weight **(Default = 100kg)**
 - 2.5.2.9. Filter Time – adjustable between 2 and 10 seconds **(Default = 4s)**
- Remote Channel – for use with the PM511 Remote Handset.
 - 2.5.3. 2.5.3.1. Selectable from A – O **(Default = A)**
 - Aux Output 1
- 2.5.4. 2.5.4.1. Off **(Default)**
 - 2.5.4.2. Alarm
 - 2.5.4.3. Alarm Inv
 - Aux Output 2
- 2.5.5. 2.5.5.1. Off **(Default)**
 - 2.5.5.2. Barrier
 - 2.5.5.3. Inv Barrier
- 2.6. Set Time/Date

This option has two lines of text for time, date and Daylight Saving (UK only). Use the Select key to cycle through each figure, using the Up/Down keys to change the value.
- 2.7. Pin Access
 - 2.7.1. Set Manager PIN – enabled by default to the PM Onboard Service PIN. This can be set to any four digit number. This gives access to all areas of the display.
 - 2.7.2. Set User PIN – disabled by default. Can be set to any four digit number. This gives access to the standard User areas and the alarms menu.
 - 2.7.3. PIN Control
 - 2.7.3.1. Manager **(Default)**
 - 2.7.3.2. User / Manager
 - 2.7.3.3. Off
- 2.8. Reset
 - 2.8.1. Re - Learn
 - 2.8.2. Reset Defaults
- 3. **Diagnostics**
 - 3.1. System
 - 3.2. Inclinator
 - 3.3. Software Version
 - 3.4. Serial Number
 - 3.5. PI Per cent
 - 3.6. PI Value
 - 3.7. Signal
 - 3.8. Raw Net
 - 3.9. Adjusted Net
 - 3.10. External Inputs
 - 3.11. Junction Box software version
 - 3.12. Junction Box configuration

Changing a Parameter Value

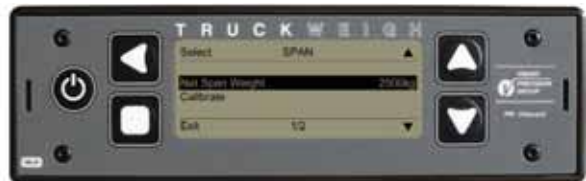
Where an on-screen parameter has a changable value against it and the value has to be changed then a standard method can be used to alter the value regardless of which screen is used.







A typical example of this would be the SPAN screen shown here:

How to Change a Parameter Value

The selected parameter is shown by the long grey bar on the parameter and value.

The value shown here is 2500kg.







1. To change this press button  (Edit). This will clear the long bar and highlight the first changable value, as shown in the screen on the right:
2. Use buttons  &  to alter the original value to the required value.
3. To move to the next value in line press button  and repeat as for line 2.
4. Once the required value is fully changed press button , this will show the new value.
5. Press button  again to leave the screen.




Display Settings

To go to these options:


1. In the Time/Date screen press the  button to open the main menu options, the Display option will already be selected.
2. Press the  button to open the display option.
3. Use the  and  buttons to move between the various options.


This screen deals with the general setup parameters affecting the display. The options are:

1. Contrast










To alter the contrast of the screen use the  button to increase/decrease the controlling value between 1 and 8.
2. Power on screen

This shows which information screen will be displayed initially.
The options are: NET Weight or GROSS Weight.
3. Key bleep

This can be set to Off or On by using the  button.

When all these options are set press the  button twice to go back to the main screens.

Setting the Time and Date

1. In the Time/Date main menu screen press the  to open the main menu.
2. Press the down arrow to go to the Setup option.
3. Press the  to open the option.
4. Use the  button to go to the Set Time/Date option.
5. Press the  to open the option.
6. Highlight the figures requiring changing and change to the new date / time - see 'Changing a Parameter Value'.
7. Turn daylight saving On as required - only used in the UK.
8. When all set press the  button to save changes, a new screen will open saying 'Set Clock - Yes/No'
9. Press the  button to OK changes (or the  button to discard).
10. Press the  button twice to return to the main screens.
11. Press the  button to go to the main Time/Date screen to check the settings.

PIN Protection

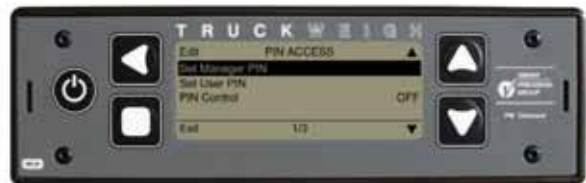
In order to preserve calibration settings, the Manager PIN is implemented by default by PM Onboard. This default PIN number is for PM Onboard use only hence is unavailable to the end user. Should access to the setup menus be required, PM Onboard can provide a onetime 'back door' PIN number to enable access. Please contact PM Onboard Service should this be required.

There are two levels of PIN access to the system:

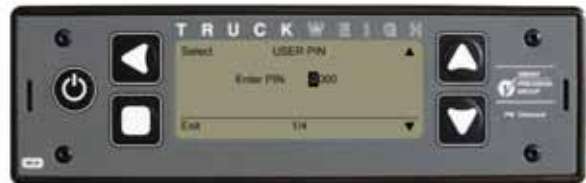
- Manager – access to all available menus.
- User – access only available to the Alarms menu if User Alarms is enabled in the PIN access screen.

1. Select Menu > Setup > PIN Access

Using the up/down keys highlight the appropriate option and press Edit the required mode.









2. Use the up/down keys to set the desired number, pressing Select moves to the next number. Once the desired PIN code is set, press Exit.



3. Press Yes to confirm the PIN code.



Setting the Net and Gross Alarms

1. In the main Time/Date screen use the  to select the menu screen.
2. Use the  to go to the Setup option.
3. Use the  to select the option.
4. The Setup screen will open with the Alarms option selected.
5. Use the  to select the option.
6. Use the  to select the NET or GROSS options as required.
7. See 'Changing a Parameter Value' for how to alter the values. (See also page 12 for full details).
8. When values altered to your requirements press the  3 times to return to the main screen.

Alarm Filter

This option (Setup - Alarms) is a built in slight delay to prevent any alarm sounding immediately if an alarm parameter is only exceeded for a short period, e.g. if the vehicle goes over a small obstruction. The period can be set between one second (default) and 10 seconds.

Alarm values can also be accessed directly from the relevant main screen by pressing the alarm button.

Tare Function

The Display Net setting must be on for this function to work.

If the Front Panel Tare option is enabled, this enables the operator to zero off the indicator, provided the displayed figure falls within the set limit (default 1000kg). When the Tare function is activated by pressing the Tare button, the display is zeroed and the symbol (T) is shown in the bottom left of the display.








A second press of the Tare button, providing that net weight still falls within the set limit (default 1000kg) deactivates the Tare function and the display reverts to the Net reading and the (T) symbol is removed.



This function has no effect on the Gross display.



Axle Settings

When the Axle options are turned on :


1. In the main Time/Date screen use the  button to select the menu screen.
2. Use the  button to go to the Setup option.
3. Use the  button to select the option.
4. The Setup screen will open.
5. Use the  button to select the Vehicle Config option and press .
6. Use the  button to select the Weigh Mode option.
7. Use the  button to scroll through the available options and select Axle.
8. Various axle related items appear in the screen list, these are:
 - Number of axles.
 - Cell positions.
 - Axle positions.
 - Axle tares.
 - Axle spans.

The number of axles on the vehicle is added using the  to select the 'Number of Axles' option and then the  button to scroll through the options. The number of axles can be set to 2, 3 or 4.


Axle Tares

Use the  button to open the Axle Tares screen.

This screen shows the Tare weight for each axle location and is similar to the Axle Positions screen.

1. Use the  button to select the option.
2. The Axle Tares screen will open, with a separate line for each axle selected previously.
3. Alter the figure for each axle tare weight - see standard parameter screens for method.


When all measurements are correct press  to leave the screen.

Press the  arrow button to go to the next axle option - Axle Spans

Axle Spans

Use the  button to open the Axle Spans screen.




This screen shows the span weight for each axle location.

1. Use the  button to select the option.
2. The Axle Spans screen will open, with a separate line for each axle selected previously.
3. Alter the figure for each axle span weight - see standard parameter screens for method.


When all measurements are correct press  to return to the Setup screen.

Axle Settings

Axle Alarm Weights

1. Use the  button to go to the Alarms option.
2. Use the  button to select the option.
3. Use the  button to scroll down the list of options, added to the list will be an option for each axle that has been added, (Axle 1, Axle 2 etc.).



A weight is shown against each axle location, this is the weight on that axle at which the alarm will sound. Highlight each axle in turn and edit the weight as for the standard parameters screen.

When all measurements are correct press  three times to go to the main screens.

Main Screen

In the main screens there will be a new screen available, press the  button to go to the new Axles screen.

This has the current weight, in Tonnes, shown for each axle.

To activate or de-activate the alarm facility press the  button, an icon  will appear on screen when the alarm is activated.

With the alarm ON, when the weight on an axle exceeds the preset weight the alarm will sound.

To print out the weights on each axle press the  button.






User Settings

User Password Access

If you have user password access you will have access to an extra item on the Menu screen. These are the user alarms.

Select the Alarms option with the  button and press the  button, the Alarms screen will open.


Here you can set the operating mode to Auto or Manual, set the Gross and Net weights at which the alarm will sound and set the Body Up alarm threshold.

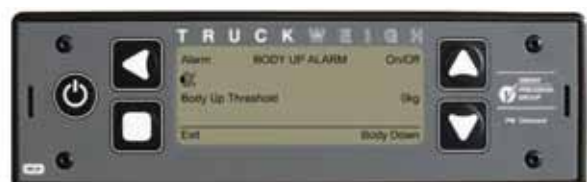
Use the  button to select an option. Use the  and  buttons to move between options and to increase or decrease the weights.



Pressing Body Up will open the Body Up Alarm screen:

This shows the (negative) weight at which the body up alarm will sound.

Use the  button to turn the alarm on or off - when turned on symbols will appear on the screen.



User Settings

Alarm Reset - Manual or Auto

The alarm will sound if the configured value is exceeded and can be silenced by the user pressing the Select button. Once the alarm has been silenced by the user, the alarm symbol in the display disappears and the alarm is disabled. Resetting the alarm can be done either manually or automatically depending upon system setup. In the Alarms setup screen the Alarms setting can be toggled between Manual and Auto.

Manual – the alarm must be manually reset by the user, by pressing the Select button, followed by the Exit button, the alarm symbol will reappear in the display.

Auto – when the payload of the vehicle falls below 50% of the configured alarm value, the alarm will automatically reset and the alarm symbol will reappear in the display. In Auto mode the alarm can also be reset manually as described above.

Packer Alarms - Manual or Auto

If the packer is full the alarm operates, if the packer is empty the alarm will be off.


Manual when the packer is emptied the alarm will have to be reset by the driver.

Auto When the packer is emptied the alarm will automatically reset itself.


Setting or Re-Setting the Count By Option


Access the Main Menu from the Time/Date screen - Menu button.

Press the down arrow button  to go to the Setup option.

Press the left arrow Select button  to open the option.

Press the down arrow button  to go to the Settings option.


Press the left arrow Select  button to open the option. The Settings screen opens with the Count By option pre-selected.

Use the left arrow Edit button  to alter the figures. You can choose from: 1kg, 10kg, 20kg, 50kg, 100 kg or 200 kg. The default is 20kg.

Press the square Exit button  to choose the required option and close the screen.


Press the square Exit button  twice more to return to the main menu.

Setting the Filter Option


Press the  button once to turn off the display. Re-start the display to use the changed option.


Access the Main Menu from the Time/Date screen - Menu button.

Press the down arrow button  to go to the Setup option.

Press the left arrow Select button  to open the option.


Press the down arrow button  to go to the Settings option.

Press the left arrow Select  button to open the option. After accessing the settings screen press the down arrow button to highlight the filter option.

Use the left arrow Edit button  to alter the filter setting. You can choose from: low, medium or high. The default is medium.

Press the square Exit button  to choose the required option and close the screen.

Press the square Exit button  twice more to return to the main menu.

Press the  button once to turn off the display. Re-start the display to use the changed option.








Setting a Printer

The TruckWeigh overload protection system can use a variety of printers, thermal or impact. In most cases a 'Sprint' thermal printer will be used.

The default printer settings are:

9600 Baud Rate
Handshake Off
Print Header On

These settings will be OK to use without alteration. If an impact type printer is used in a situation requiring large data transfer rates then the handshaking can be turned on, to do this:




1. In the Time/Date main menu screen use the  to select the menu
2. Use the  button to select the Setup option
3. Use the  button to select the Outputs option
4. Use the  to open the Outputs screen, the screen opens with the Serial Output option selected
5. Use the  to open the option
6. Use the  button to select the Handshake option
7. Use the  to select On

User Settings

Print Header

The print header appears at the top of a printer load weight ticket and by default is: PM Onboard and the PM service telephone number.


To change the print header

1. In the Serial Output screen use the  button to scroll down the list to the 'Change Print Header' option.
2. Use the  button to open the option.
3. Select and change the existing text - see *Changing a Parameter Value* for how to do this, there is a maximum of 64 characters including spaces available.
4. When the text has been changed to your requirements then press the  button 5 times to exit out to the main screen.

Front Panel Zero









This option gives you the ability to zero the Net weight main screen. This has three options: On, Off, Single.

OFF: This option is not available.

ON: The word Zero appears in the bottom corner of the main 'Net Weight' screen. Press the  button and hold down for 3 to 5 seconds, 'Zero OK' will appear briefly on the screen and the Net weight will be zeroed. This operation can be carried out as many times as possible.

SINGLE: The operation is the same as 'ON' but can only be carried out once.

To Activate Front Panel Zero:

1. In the Time/Date main screen press the  button to open the main menu.
2. Use the  button to go to the 'Setup' option and the  button to open this.
3. Use the  button to go to the 'Settings' option and the  button to open this.
4. Use the  button to go to the 'Front Panel Zero' option.
5. Use the  button to select either OFF, ON or Single.
6. Press the  button 3 times to return to the main screens.

Configuration Settings

Vehicle Configuration

The default settings here for load cells and weigh mode should not need to be changed for any TruckWeigh application.

- Load cells mode should be set to CAN
- Weigh mode should be set to MULTI AXLE

Multi axle mode ensures that the slope compensation is used accordingly. In all cases where an axle transducer is used, slope compensation should always be set accordingly for each axle transducer. In the case of a CAN air junction box being connected, the slope compensation for those transducers is automatically set to 'Fixed'.

The number of axles should be set as required, noting that for an air system one axle group counts as 1 axle.

These settings can be checked and if necessary edited in the Vehicle Config menu.

- Select Menu > Setup > Vehicle Config.








Select the required item and edit as required.



Configuration Settings

Checking for CAN mode

The system must be configured in CAN mode. This is the default setting but should be checked using the following method.

1. In the Time/Date main screen press the Menu  button.
2. Press  button to select the Setup option.
3. Press the  button to go into the Setup menu.
4. Press the  to go to the Vehicle Config option.
5. Press the  button to select.
6. This option should be pre-set to CAN load cells, if not scroll through the available options using the  button to select.
7. Press the Exit  button 3 times to return to the main screens.

Junction Box Configuration

A newly supplied CAN junction box will always be set as Mode 0 by default. If a junction box needs to be reconfigured to a different mode as referenced in the table below, the procedure following should be observed.

Summary of CAN Junction Box Modes

Mode	Cells	Junction boxes
0	1,2,3,4 (5,6*)	4 and 6 Way*
1	1,2	4 Way and CAN Air
2	3,4	4 Way and CAN Air
3	5,6	4 Way and CAN Air
4	7,8	4 Way and CAN Air
5	5,6,7,8	4 Way

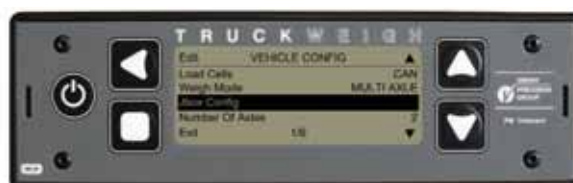
*6 way CAN junction boxes can only be set to Mode 0 and as such are configured for cells 1-6.

Note: The display should be powered up with no junction boxes connected to ensure the 'JBox Config' option is available in the 'Vehicle Config' menu.

Kit	Truck / Prime Mover					Trailer	Junction Box Modes
	Axles	Front	2 / Middle	3/ Rear	Rear		
WKTW10001	2	Steel		(Air)	Air		4 Way CAN = 1, CAN Air = 2
WKTW10002	3	Steel		Steel	Steel		6 Way CAN = 0 (Fixed)
WKTW10003	4	Steel	Steel	Steel	Steel		4 Way CAN = 0, 4 Way CAN = 5
WKTW10004 & WK1155C-274	4	Steel		Steel	Steel	Air (1 axle group)	6 Way CAN = 0, CAN Air = 4
WKTW10005	2	Steel			Steel		4 Way CAN = 0
WKTW10006 & WK1155C-276	3	Steel			Steel	Air (1 axle group)	4 Way CAN = 0, CAN Air = 3
WKTW10007 & WK1155C-27	3	Air		(Air)	Air	Air (1 axle group)	CAN Air = 1, CAN Air = 2
WKTW10008	2	Air		(Air)	Air		CAN Air = 1, CAN Air = 2

- Ensure no junction boxes are connected to the display.
- Power up the display.
- Once the display has completed its POST, connect the first junction box to be configured.

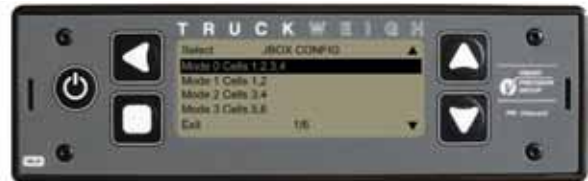
Select Menu > Setup > Vehicle Config. > JBox Config.



Configuration Settings

Junction Box Configuration...continued

Select the required junction box mode.



Confirm when prompted.



Confirmation message on completion.



The junction box configuration is now complete. If a further junction box requires configuring, disconnect the current one, connect the next one and repeat the previous instructions.

Once the required junction boxes have been configured, power down the display, connect the junction box(es) in their correct configuration and power the display back up. During POST all sensors should be detected.

Axle Transducer Configuration (Slope Compensation)

Axle transducers need to have the slope compensation setting correctly configured in order for the system to work correctly. As covered in the section on installing the sensors, their slope compensation can be Leading, Trailing or None. In order to configure this setting, the following procedure should be observed.

See Axle Transducer Installation, page 26, for more information.

Note: Ensure junction boxes are correctly configured and connected as detailed previously.

1. Power up the display.
2. Select Menu > Setup > Vehicle Config. > Slope Compensation.

Axles 1- 4 will be listed regardless of system configuration, along with their current settings.

Using the up/down keys highlight the appropriate axle and press Select to set the required mode. Any unused axles should be left set to None.

3. Press exit to return to the previous menu(s).



General Information

Refer to all sections of this manual with reference to all areas of equipment installation, configuration and calibration before proceeding.

If in ANY doubt consult your supplying agent or PM Onboard for further assistance.

Safety Information - Working on Vehicles

- When working on vehicles ALWAYS adopt safe working practices.
- It is recommended that the vehicle is supported on a ramp.
- If a ramp is not available then use adequate axle stands.
- DO NOT support the vehicle only on a jack.

General Assembly Notes

- Riv-nuts can be used to aid fastening equipment if required.
- Ensure suitable anti-corrosion precautions are taken when drilling holes.
- Contact the appropriate vehicle manufacturer to obtain recommendations.

Chassis Drilling

- DO NOT drill the top or bottom flanges of any chassis members, cross members or equipment supports to fasten this equipment.

Wiring Considerations

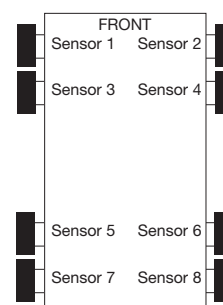
When determining where and how to run the connecting wiring a few important points should be considered:

- DO NOT mount the junction box or any wiring onto or near the fuel tank or pipes.
- DO NOT cable tie the cables to any brake pipes or exhaust pipes.
- DO use split flexible conduit or spiral - wrap to protect any cables that are exposed to adverse conditions.

Directions Used

When installing the equipment the directions are indicated with reference to the vehicle facing the direction of travel, starting with sensor 1 at Front Left Hand side (FLH), working left to right and then backwards, as illustrated below. These sensor position references are relevant to the junction box mode configuration detailed later in this manual.

The directions given are valid for Right Hand drive or Left Hand drive vehicles.



Fitting Sequence

1. Check items supplied.
2. Read and understand this manual.
3. Identify locations and positions for all items.
4. Check hole sizes in chassis/body used to run cables round vehicle. If too small drill out if possible.
5. Fit display.
6. Fit junction box(es).
7. Fit sensors and mark up connectors.
8. Connect cables and secure.
9. Connect fuses and cable to vehicle power.
10. Check installation and power up.
11. Configure sensors and junction box(es) as required.
12. Calibrate.

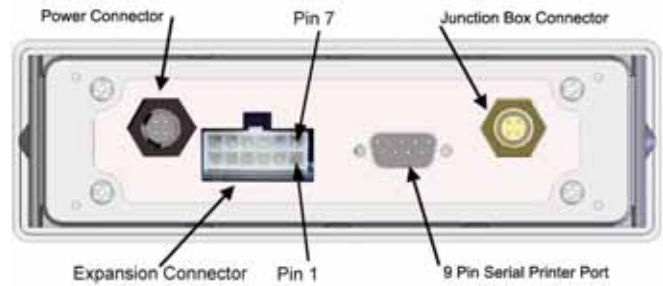
Supported Installation Combinations

Kit	Truck/Prime Mover					Trailer
	Axles	Front	2	3	Rear	
WKTW10001	2	Steel		(Air)	Air	
WKTW10002	3	Steel		Steel	Steel	
WKTW10003	4	Steel	Steel	Steel	Steel	
WKTW10004 & WK1155C-274	4	Steel		Steel	Steel	Air (1 axle group)
WKTW10005	2	Steel			Steel	
WKTW10006 & WK1155C-276	3	Steel			Steel	Air (1 axle group)
WKTW10007 & WK1155C-27	3	Air		(Air)	Air	Air (1 axle group)
WKTW10008	2	Air		(Air)	Air	

Connecting the Display

Rear Connections

Various connectors are used on the back of the TruckWeigh display. These are shown on the right.

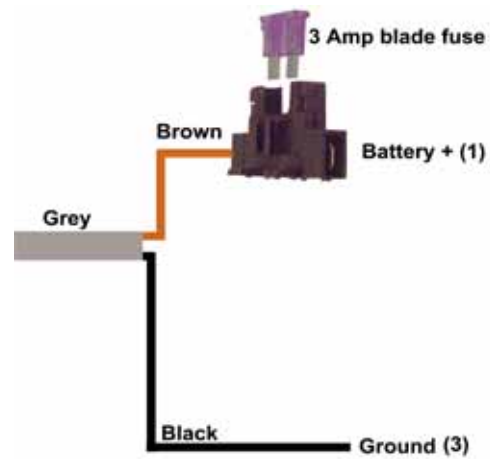


Connecting the Display to a Power Supply

The power is supplied to the display through a 3 Amp blade type fuse from the battery live (24Volt) feed.

NOTE:

The ground wire (black) is to be connected as per the vehicle manufacturer's current recommendations.



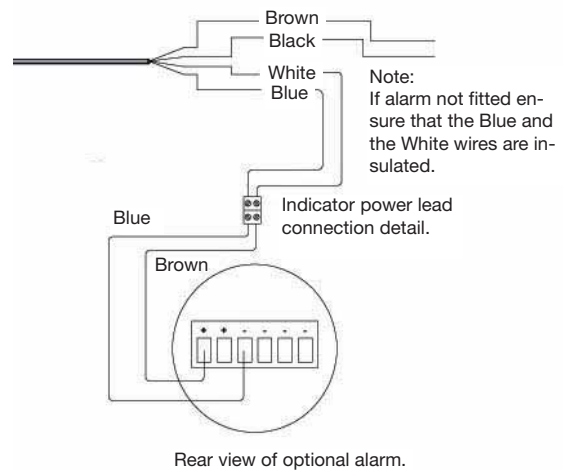
Connecting Optional Sounder Alarm

An optional external sounder alarm can be connected to the display.

This uses the blue and white wires in the power supply cable.

The blue wire is connected to the blue wire on the sounder alarm.

The white wire is connected to the brown wire on the sounder alarm.



Fitting the TruckWeigh Display

Depending upon customer requirements, there are three methods of mounting the display available:

- DIN Slot Mounted
- Bracket
- Trailer box mounted

DIN Slot Mounted

This method can be used if there is an available DIN slot in the vehicle cab, usually the dashboard, or on larger vehicles also in the trim area above the windscreen.

All required wiring should be routed through the dashboard or vehicle trim to the DIN slot for connection to the rear of the display. Once connections are complete and the display has been configured, it can then be pushed firmly into the slot, a click will be felt as the built-in security bracket engages.

IMPORTANT NOTE:

DIN/ISO 7736 is the European radio mounting standard with slot dimensions of 180mm x 50mm. In contrast with this some East Asian vehicles (i.e. Hino) have non-standard radio slots that do not conform to this standard and have slot dimensions of approximately 177mm x 47mm.

These will need to be modified in order for the display to fit correctly by careful removal of material to increase the size of the slot accordingly. If this process is carried out with sufficient care, once completed the installed display will cover the edges of the slot so the modified slot edges will be hidden from view.

This MUST only be done with the permission of the customer.

Alternatively, the dash mounting bracket method can be used if required.



DIN/ISO Radio Slot

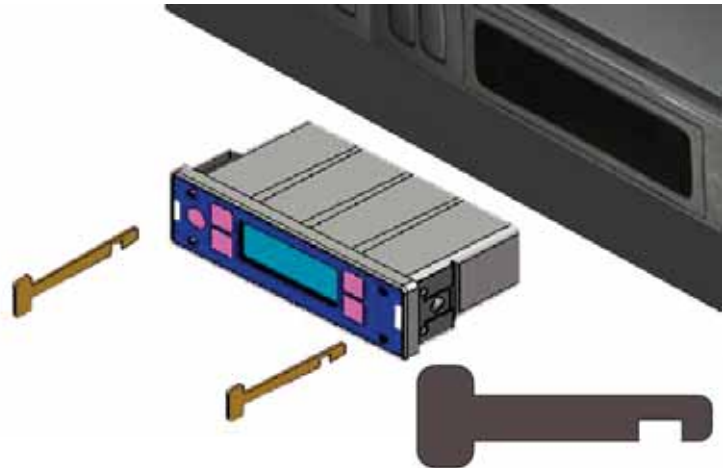
Removing the TruckWeigh Display

To remove the display from a DIN slot:

- Insert the two removal keys (notch facing downwards) into the two slots on either side of the display, just far enough to hook the notches over the fascia.
- While pressing removal tools downwards pull the display free from the DIN slot.

NOTE:

These removal keys DO NOT work in the same manner as removal keys for the likes for car radios, which when pushed into their devices actually disengage the locking mechanism to allow the unit to be removed.



Removal Tool Profile

Bracket Mounted

This method utilises a U-shaped mounting bracket to fix the display to the chosen location. Two brackets secured to either side of the display have M6 studs which locate in the slots of the U-shaped bracket, and are then secured with threaded hand knobs. This also allows the display to be rotated to achieve the optimum viewing angle.

The base of the U-shaped bracket is secured to the dashboard or other supporting surface.



Power ON Jumper Resetting

When the display is required to go ON with the vehicle ignition a jumper has to be connected across two internal pins.

This is 'Jumper 1' and is located to the right hand end of the pcb - (see Photo 1), red box.

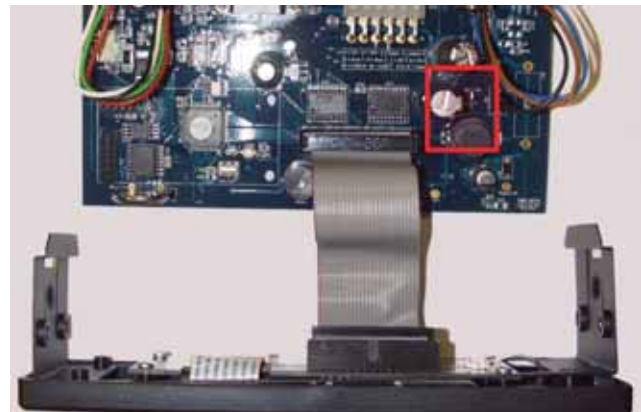


Photo 1

A close up view (see Photo 2) shows the jumper located only on one of the pins, for storage.



Photo 2

To reset the display to go ON with the ignition, disconnect and remove the display from the vehicle, open the case, remove the jumper and place over BOTH pins (see Photo 3).



Photo 3

Replace all items and replace and connect the display. Switch on the ignition, the display should now also come on.

NOTE:

This method is often used for trailer mounted displays etc.

Axle Transducer Installation

The reliable calibration and operation of TruckWeigh using axle transducers relies upon the suitable location, orientation and fixing of the transducers at the point of installation, followed by the correct setup and calibration on the TruckWeigh indicator (slope compensation and span calibration).

They can be used for any steel suspension system where they would most commonly be attached directly to a leaf spring, although it is possible to mount them on any component connected to the suspension system that exhibits sufficient movement over the complete range of suspension travel. Consideration should be given to attachment to alternative suspension components such as torque arms or anti-roll bars. As such there is no definitive rule for where and to what they should be attached.

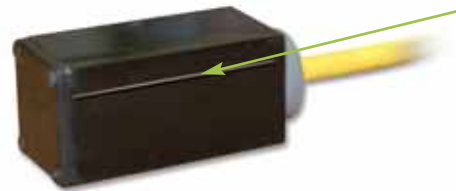
It is imperative that the chosen component is always in contact with the movement of the axle. i.e. on some multi-leaf spring systems not all of the leaves are in contact with the axle over the whole range of movement.

It is important that they must not be mounted on anything with an existing angle approaching 30 degrees.

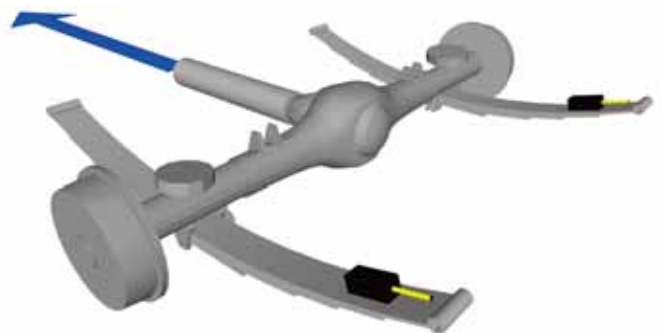
In every instance the sensor MUST be mounted in such a way that the cable exiting the sensor, points towards the fulcrum (pivot) of the chosen suspension component. The position of the sensor relative to the fulcrum and the direction of the chassis determines the slope compensation setting, i.e. a sensor in front of the fulcrum is said to be 'leading' and a sensor behind the fulcrum is said to be 'trailing'. In the case of strut type suspension the sensor can be mounted on a wishbone/arm at right angles to the chassis direction and in this case the slope compensation would be configured as 'None'.

The following illustrations are examples of some possible configurations and are by no means exhaustive.

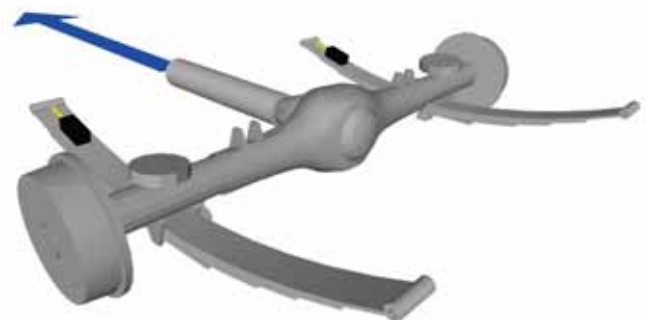
Line indicates top of sensor.



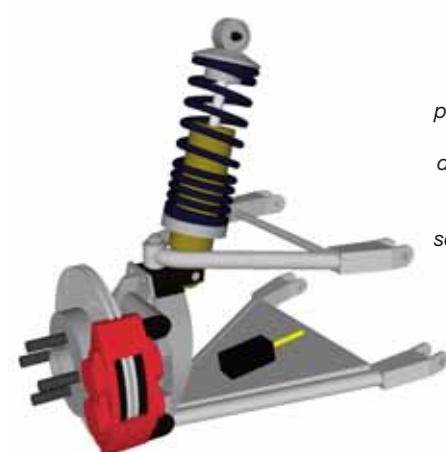
Axle sensor



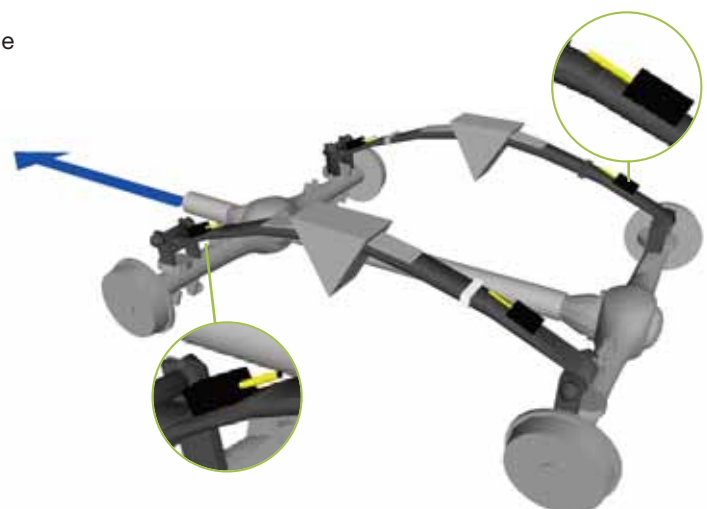
Single leaf spring axle, sensor in 'Leading' position.



Single leaf spring axle, sensor in 'Trailing' position.



Strut type suspension, sensor is perpendicular to chassis direction, hence the Slope Compensation setting is neither 'Leading' or 'Trailing', so is configured as 'None'.



Dual axle leaf spring, sensors in 'Leading' positions at the front and 'Trailing' positions at the rear.

Axle Transducer Installation

Transducer Attachment (Adhesive Tape)

The transducers are secured to their mounting point using a very high strength bonding, double sided tape, 3M type 4941.

DO NOT use any other type of bonding tape unless instructed to do so by PM Onboard.

It is assumed that the surfaces to which the sensors are to be bonded are steel or painted steel. The final bond strength is dependent upon the maximum amount of surface area contact on both the sensor and the mounting point, so a mounting surface that is as flat as possible should be chosen.

The tape adheres better and quicker if the two surfaces being bonded and their surroundings are reasonably warm. The ideal temperature range is 21°C to 38°C, with a recommended minimum of 15°C. If necessary the surfaces can be warmed up to aid the bonding process.

Under normal conditions the maximum cured bonding strength will not be achieved until approx 72 hours from application.

Tape Application

Ensure both the surfaces to be bonded are clean, dry and free of rust, loose paint, dirt etc. Rub down any rough/rusty surfaces until they are fairly smooth. Fine circular scratch lines are acceptable, but roughly ground or sanded surfaces are not.

A final rub with maroon coloured Scotch-Brite pads or similar will give a good surface.

Each kit is supplied with a number of individual 3M VHB Surface Cleaner Sachets suitable for final wipe down of the prepared surface. If this is unavailable Acetone, MEK or a 50/50 solution of Isopropyl Alcohol (IPA) and distilled water can be used instead. DO NOT use proprietary/generic cleaning products.



Example of leaf spring surface prepared for application of adhesive tape.

The cleaned surface can be prepared with a light coat of 3M tape primer 94 if required, provided that this is left to dry properly before application. Apply the tape to the suspension and apply firm pressure with a roller (1)



Remove the backing tape, locate the sensor in the correct orientation and press down FIRMLY using hand pressure or a roller, for approximately 30 seconds, to ensure that the entire adhesive surface is in contact (2) or (3).



The roller shown is a wallpaper joint roller, typically 25mm diameter x 25mm long. Anything similar can be used.



Secure the sensor in position using one or more cable ties (preferably two). Cross the cable ties if required for better security. This provides compression to the bonding tape during the curing period until maximum bond strength is achieved and is also a secondary mechanical fixing (4).

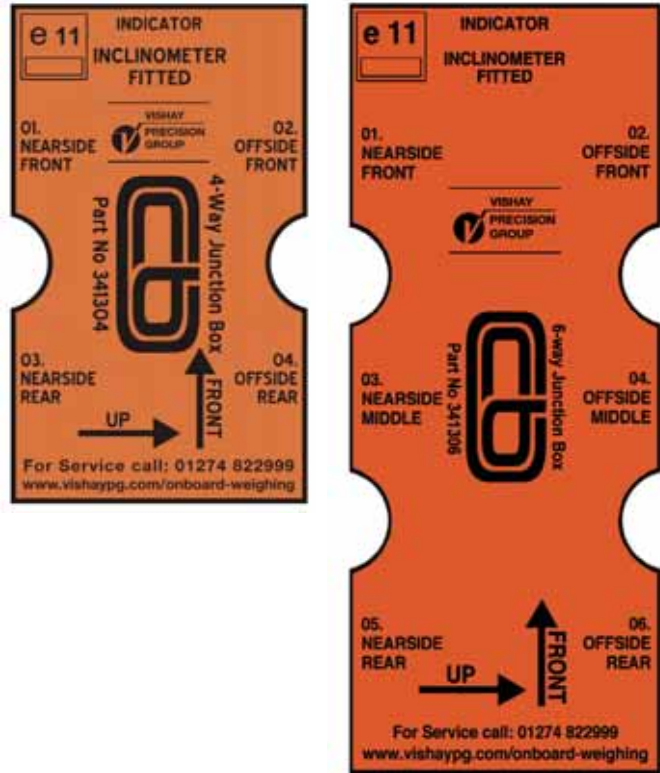


Example of completed leaf spring installation.



CAN Junction Box Installation

The TruckWeigh CAN junction box includes the reference inclinometer. As such location and orientation, prior to installation should be carefully considered. Also ensure sufficient clearance is available for connectors. The box is marked up with arrows to indicate 'FRONT' and 'UP' with respect to the vehicle chassis as shown below. In the event of two CAN junction boxes being used, only the one serving the front most axles requires to be mounted according to these guidelines. The second CAN junction box can be mounted in any orientation.



NOTE: Marking up the connectors from each sensor prior to routing the harness can be useful when connecting them to the junction box in the correct order.



Example installation of 4 way junction box

Calibration with Weigh Pads and Weighbridge

Calibration should only be carried out after all previous steps of installation and configuration has been successfully completed. The calibration should be carried out on level ground, ideally indoors or on a calm day.

It is **important** that the calibration process is completed in the following order:

1. Zero Inclinometer
2. Zero Calibration
3. Axle Spans

Zero Inclinometer sets the reference point of the junction box on level ground. Zero Calibration is performed with an empty payload and the Axle Span is performed with a full payload. It is important to note that the figures used for the axle spans are effectively net figures, **NOT** gross.

In the case of a group of axles in an air system, the whole group counts as one axle, therefore the combined figure of all axles in the group should be used as the span figure for 1 axle.

Weigh Pads Method

If weigh pads are used, it is preferable to have 1 pair per axle, i.e. 2 axles : 4 weigh pads, 3 axles : 6 weigh pads, etc. If 1 pair per axle is not possible any axles not on weigh pads should be on mats.

Very important! If using weigh pads, the axle figure is calculated by adding the readings from both nearside and offside weigh pads of an axle.

Weighbridge Method

Measuring on a weighbridge on a per axle basis can be done by driving the vehicle on to the bridge and noting the GVW, then drive one axle at a time off the weighbridge, noting the readout each time. The weight for each axle can then be calculated by simple subtraction of each previous figure as shown in the example below (may vary depending upon number of axles).

	Payload								Axle Spans
	Empty				Full				= Full - Empty
	Weighbridge		Axle		Weighbridge		Axle		
Vehicle Weight	W	9000			W₂	18000			
Axle 1	A	7500	E=W-A	1500	A₂	15500	E₂=W₂-A₂	2500	1000
Axle 2	B	6000	F=A-B	1500	B₂	13000	F₂=A₂-B₂	2500	1000
Axle 3	C	3000	G=B-C	3000	C₂	6500	G₂=B₂-C₂	6500	3500
Axle 4			C	3000			C₂	6500	3500
				9000			Total	18000	9000

Enter the alarm weights for the vehicle and each axle, obtained from vehicle plate.

Select Menu > Setup > Alarms and edit each item as required.



Zero Inclinometer

Zeroing the inclinometer is vital for a system using any axle transducers and is a vital step in the slope compensation working correctly.

In an Air-Air system this step is not required so can be omitted.

With the vehicle on level ground, zero the inclinometer.
Select Menu > Setup > Calibrate > Zero Inclinometer

Confirm when prompted.

Confirmation message on completion.



Zero Calibration

With an empty payload record the weight of each axle and the whole vehicle.

The example opposite uses weigh pads and mats. This involves some effort moving the vehicle and swapping the weigh pads and mats around in order to measure all axles.



Enter the recorded tare weights for each axle.

Select Menu > Setup > Vehicle Config > Axle Tares and edit each item as required.



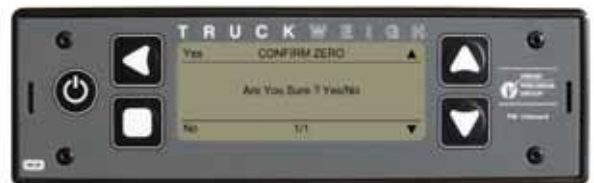
Zero Calibration

Perform a zero calibration for the entire vehicle.

Select Menu > Setup > Calibrate > Zero and confirm as required.

Confirm when prompted.

Confirmation message on completion.



Axle Spans

Load the vehicle to its maximum weight, ensuring each axle is as close to its maximum weight as possible, weigh and record each axle. This step may actually result in the GVW being exceeded.

In some instances it may be necessary to add weights to the cab in order to load up the front axle sufficiently for an accurate span.

With RCV installations it may also be of benefit to position the barrier fully forward to aid increasing the weight on the front axles.



Axle Spans

These Gross figures, and the Tare figures recorded during the Zero Calibration previously can now be used to calculate the figures for the Axle Spans. The value to be entered for each axle is calculated as follows:

$$\text{Axle Span} = \text{Axle Gross} - \text{Axle Tare}$$

The information at the beginning of this section on Calibration gives more information on this procedure, along with a worked example for the Weighbridge method.

Enter the recorded gross weights for each axle.

Select Menu > Setup > Calibrate > Axle Spans.



Select each axle as required.



For each axle in turn set the Span Weight and then select Calibrate.



Confirm when prompted.



Confirmation message on completion.



Calibration complete.

Application Options

Refuse Vehicles

When TruckWeigh is fitted to a refuse collection vehicle there is the option to set up barrier control outputs.

The menu options for the barrier control outputs are used to assist in balancing the load along the length of the vehicle, with the aim of preventing the overloading (or possibly under loading) of an axle group.

Note: The outputs from TruckWeigh do not actively control the vehicle body systems (i.e. hydraulics). The system only provides outputs to the body control system which should be interpreted as a request to move the barrier.

These options should only be configured once the calibration routine has been successfully completed and figures noted during calibration may be required.



Turn Barrier Control ON (Outputs – Barrier Control – press EDIT).

Maximum Incline - This option will not operate over the default figure of 3 degrees inclination (this figure can be changed).

Front Axle Underload

Turn this to OFF - Setup - Outputs - Barrier Control.

If front axle load is less than 20% of gross vehicle weight on front axle(s) then this is used to move the barrier and put more load on the front axle(s).

Axle Overload Settings

Setup - Outputs - Barrier Control

Axle 1 overload - not currently used.

Axle 2 overload (2 or 3 axled vehicles) - set to the required overload figure.

Axle 3 overload figure (3 or 4 axled vehicles) - set to the required overload figure.

Axle 4 overload figure (4 axled vehicles) - set to the required overload figure.

Axle 1 overload – ignore.

Axes 2,3 and 4 – rear axle group set to a few hundred kg

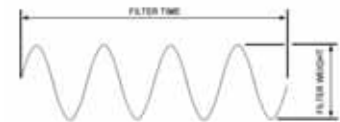
LESS than maximum. When the load on the axle group reaches this figure the barrier will move to equalise the load.

Axle Stability Filter Weight

Setup - Outputs - Barrier Control - default display is 100kg. This figure can be altered.

Axle Stability Filter Time

Setup - Outputs - Barrier Control - the default setting is 5 seconds - 2 to 10 seconds available.



This feature constantly monitors the rear axle parameters before allowing the weight distribution to be changed. The rear axle weight must stay within the 100kg (default) band for 5 seconds (default time) before outputs are used.

The maximum period is 10 seconds but the load can be set up to 99999kg.

Aux Output1

Setup - Outputs - Aux Output 1. Set this to Alarm.

Aux Output 2

Setup - Outputs - Aux Output 2. Set this to Barrier.

Load Distribution Diagrams



Application Options

Refuse Vehicles

Expansion Connector Details

The expansion connector on the rear of the display is used to send signals to the compactor and barrier. The pins are as below:

Pin 5 - Gross Vehicle Weight

0 Volts - Max GVW not reached. Compacter to operate as normal.

+24 Volts - Max GVW reached. Compacter stop request.

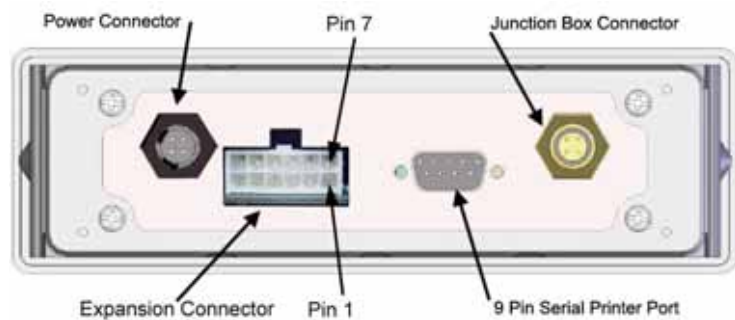
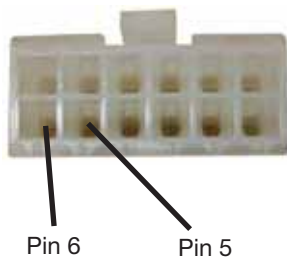
Pin 6 - Move Forward

0 Volts - No barrier movement required.

+24 Volts - Request to move barrier to front of vehicle.

The connector is a Molex 5557 series receptacle, Molex part number 39 - 01 - 2120. Farnell part number 151 - 871.

The female pin is Molex part number 39 - 00 - 0039. Farnell part number 973 - 2195.












Application Options

Load/Deliver Screen

This feature is designed to allow a user to fully load up a vehicle and then drop off parts of the total load with different customers. The weight of the part load can be printed out.

To Setup and Use Load/Deliver:

1. In the Time/Date main screen press the  button to open the main menu.
2. Press the  button to highlight the Setup option.
3. Press the  button to open the option.
4. Use the  button to scroll to and highlight the Settings option.
5. Press the  button to open the option.
6. Use the  button to scroll down to the Load/Deliver option.
7. Use the  button to toggle the option between ON and OFF as required.
8. Press the  button three times to return to the main screens.
9. Use the  button to scroll to the Load/Deliver screen shown here:













Adding part loads to a vehicle - example

These details assume that the Tare, Net and Gross are set.

The example assumes a net weight of 20 000kg, and a gross weight of 50 000kg.

There are three part loads: 7000kg, 8000kg and 5000kg, giving a total of 20 000kg.

The Net Weight and Gross Weight should appear on their respective main screens.







1. Press the  button.
2. Load the vehicle with the first part load (7000kg). This will be shown on the screen.
Press  to print the first reading on the load ticket.
3. Press and hold the  button until the displayed value resets to zero.
4. Load the second part (8000kg) and zero. Press  to print the second reading on the load ticket.
5. Load the third part (5000) and zero. Press  to print the third reading on the load ticket.
6. Access the Load/Deliver main screen using the  button.
7. Press the  button, the alarm symbol  will disappear.
8. Press the  button again, a load figure will appear and the ALARM at the top of the screen will change to EDIT.
9. Print out the ticket with the  button.

Application Options

Load/Deliver Screen

The figure shown on the previous screen (5000kg) is the amount at which the alarm will sound.





For this example set the figure to the first part load of 7000kg.

1. Press the  button until the word 'Edit' appears at the top left of the screen and the load figure of 5000kg is highlighted.
2. Press the  button again and the figure will have the first digit highlighted.
3. Use the  button to move along the figure and the  and  buttons to alter the figure to suit the first part of the load required (7000kg).
4. Press  twice to return to the first screen.

The weights for the second and third part loads are set in the same manner.

The accumulated load is shown on the screen.

Delivering a load to three different sites - example

1. These details assume that the Tare, Net and Gross are set.
2. The example assumes a net of 20 000kg, and a gross of 50 000kg.
3. There are three part loads: 7000kg, 8000kg and 5000kg, giving a total of 20 000kg.
4. The Net and Gross should appear on their respective main screens.
5. Load the total delivery weight onto the vehicle (20000kg).
6. On arrival at the first delivery site set the alarm to 7000kg - see previous example.
7. Press the  (ON-SITE) button, this will print out the load ticket header and time etc.
8. Deliver the first part of the load. The alarm will sound when the set value is reached.
9. Press and hold the  button until the displayed value on screen is zeroed.
10. Press the  button, the value of the first part of the load will be added to the ticket. Pass over the weight ticket.
11. Press the  (OFF-SITE) button.

To deliver the rest of the load move to the next delivery point.

Reset the alarm required for the second delivery (8000kg).

Repeat parts 7 to 11.

Reset the alarm required for the third delivery (5000kg).

Repeat parts 7 to 11.

Example Load/Deliver Tickets:

1. If Tare is Zero - no gross.

```

-----
      PM onboard
      www.obwvpg.com
-----
      Tel:01274-822999
-----
Time           10:26
Date           04/07/11
-----
Net            12850kg
Gross          22850kg
Axle 1         12.6T
Axle 2         10.1T
-----
    
```

2. Net and Gross weights used.

```

-----
      PM onboard
      www.obwvpg.com
-----
      Tel:01274-822999
-----
Arrive Site
Time           13:30
Date           05/07/11
-----
Net            12850kg
Gross          22850kg
-----
Load           1950kg
Load           2000kg
Deliver        1350kg
-----
Site Total     2600kg
-----
Depart Site
Time           13:31
Date           05/07/11
-----
Net            15450kg
Gross          25450kg
-----
    
```

Application Options

Handheld Option - 511 FreeWeigh

When using a 511 handheld remote with the display, this is plugged into the expansion connector at the rear of the display. The display has different communication channels (A - O) available to link with the 511 FreeWeigh.

Remove the display from the mounting and plug in the sender unit to the expansion port on the back of the display.

Locate the sender unit on the dashboard or near the roof so that the aerial has a good range.

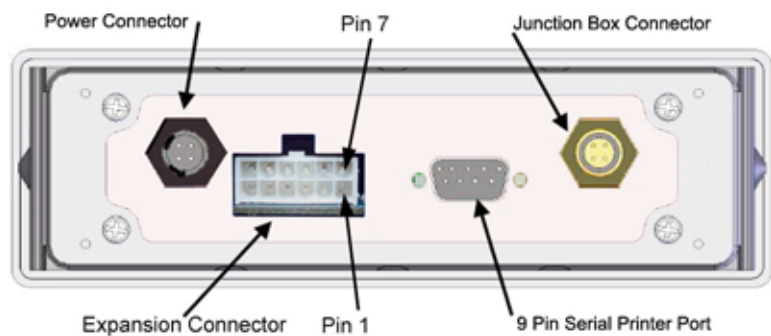
Replace the display.

The 511 FreeWeigh remote has the same A - O channels available. You will need to select one of these that does not interfere with other equipment.

Set the display to the same channel:

- From the Setup menu go to Outputs.
- Scroll down to Remote Channel with the DOWN arrow button.
- The default channel is 'A'.
- Press the EDIT button to select any other channel.
- Press the EXIT button three times to go back to the main screens.

Read the 511 FreeWeigh information for setting up and using the remote:
511 FreeWeigh - 511/info/130106



Fault Finding & Diagnostics



Trouble Shooting


Fault	Possible Solution
No Power to Display	The display should be protected by a 3 Amp inline blade fuse, check this fuse and associated wiring to ensure power is reaching the display.
Display Locked Out	If the display is locked out, i.e. unresponsive to any key presses, try the following: <ol style="list-style-type: none"> 1. Turn off the display with the On/Off button 2. Remove power to the display for approximately 15 seconds. This can be achieved by either <ul style="list-style-type: none"> • Removal of the (grey) power cable from the rear of the display. • Removal of the fuse from the display power supply. 3. Reconnecting power to the display and power up normally with the On/Off button.
Backlight Flashing	This indicates a firmware update error. Repeat the firmware update process.
Bad or Inconsistent Reading	This could be a axle air pressure transducer or junction box not working, or a broken / cut cable. Any defective item will be shown on the startup screen. To see this remove power from the system for about 10 seconds and then restart.
Error Messages	These would be shown on the start-up screen or weighing screens in the event of a sensor or junction box being disconnected or developing a fault. The number of the junction box or sensor would be displayed.
PI Values	PI values would typically be similar for similar sensors, with an acceptable range of 80% - 120%. A sensor reading significantly different from the others may indicate a faulty sensor.

Fault Finding & Diagnostics

Diagnostic Information

When the option is selected this screen opens in the first of ten screens. These screens are for information only and cannot be altered.

Use the  or  buttons to access the other diagnostic screens available.

Use the PRINT facility () from any screen to print out a list of parameters shown in diagnostics.

1. System.
2. J/box Configuration.
3. J/box Software Version.
4. Adjusted Net.
5. Raw Net.
6. Millivolts.
7. PI Value.
8. PI Percent.
9. Serial Number (of each load cell).
10. Software Version (of each load cell).
11. Inclinometer.

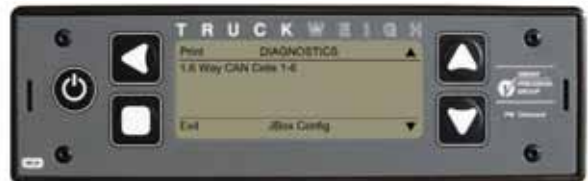
1. System Screen

This screen shows the battery voltage, the excitation voltage and the installed software serial number and version.



2. Junction Box Configuration

This screen shows the configuration of the junction box. Shown is a 6 way junction box with CAN cells 1 to 6.



3. Junction Box Software Version

This screen shows the installed software version of the junction box, shown is version 02.05.



4. External Inputs

This screen gives an indication of the current state of the two external inputs - low or high.



5. Adjusted Net Screen

This shows the payload seen by each load cell, using a diagram to show where each load cell is positioned on the vehicle. If a dotted line (- - - -) is shown against a load cell this could indicate a faulty cell or faulty/broken cable. This could also be a faulty Suzi connector, if used.



6. Raw Net Screen

This shows the total load seen by each load cell, not taking into account zero. If a dotted line (- - - -), as above, is shown against a load cell this could indicate a faulty cell or faulty or broken cable. This could also be a faulty Suzi connector, if used.



Fault Finding & Diagnostics

Diagnostic Information

7. Signal (Millivolts) Screen

This is the millivolt representation of the A / D and shows the millivolt output from the strain gauge bridge, for each load cell. If a zero figure is shown against a load cell this could indicate a faulty cell or faulty or broken cable. This could also be a faulty Suzi connector, if used.

This screen is intended to be mainly used by a PM Onboard engineer, or when passing on information to a PM Onboard engineer.



8. PI Value Screen

This shows the P.I. value (after calibration) for each load cell. Ideally this should be 16384 for each cell. If one of the readings is very different from the others this would indicate a faulty cell. This could also be a faulty Suzi connector, if used.

This screen is intended to be mainly used by a PM Onboard engineer, or when passing on information to a PM Onboard engineer.



9. PI Percentage Screen

This shows the P.I. percentage for each load cell. Acceptable values are from approximately 80% to 120%. If one of the readings is very different from the others this would indicate a faulty cell.

If the system is set up as a 5th wheel and air then the front and rear may differ but must match left and right.



10. Serial Number Screen

This shows the current serial number of each load cell. Every load cell is given a unique serial number when the initial factory calibration is carried out. These numbers will be updated automatically if a load cell is changed. If no serial number is shown against a load cell this is an indication that the cell is faulty or a cable is faulty or broken. This could also be a faulty Suzi connector, if used.



11. Software Version Screen

This shows the current software version of each load cell. Every load cell is given the current software version number when the initial factory calibration is carried out. The version number will be updated automatically if a load cell is changed for one with a different version. If no version number is shown against a load cell this could indicate a faulty cell or faulty or broken cable. This could also be a faulty Suzi connector, if used.



12. Inclinometer

This screen shows the degree of Pitch (front to back movement of the vehicle) and Roll (side to side movement of the vehicle). The inclinometer is set on level ground or a weighbridge, if a reading is seen that is obviously wrong (e.g. 15 degrees when the vehicle is on level ground) then re-zero the inclinometer.



Definition of Terms

Tare Weight

The weight of an empty vehicle but including the weight of a full fuel tank and the weight of the driver.

Net Weight

The weight of the maximum load that the vehicle is legally allowed to carry. This is the Gross weight less the Tare weight.

Gross Weight

The maximum legally allowed overall weight of the vehicle, i.e. the Tare weight plus the Net weight.

Related Information Available

This manual assumes that the display and all other associated equipment has been fitted to the vehicle and calibrated. Here are details of separately available related PM Onboard documents.

- 1. Driver Guide**
This covers adding a 511 FreeWeigh handheld remote to a TruckWeigh system and integrating both.
- 2. PM Onboard Printer Guide**
Printer guides are available for the range of printers used with PM Onboard equipment and cover basic operating functions and maintenance requirements.
If one is required please quote the printer model.
- 3. 511 FreeWeigh Handheld Remote**
This covers adding a 511 remote to a TruckWeigh system and integrating both.

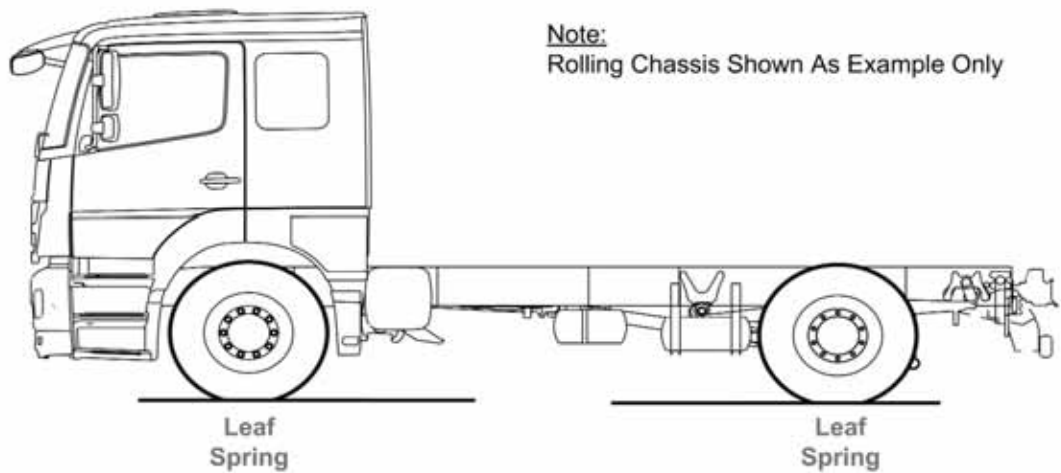
Configuration Options

4x2 Rigid Chassis with All Leaf Spring Suspension

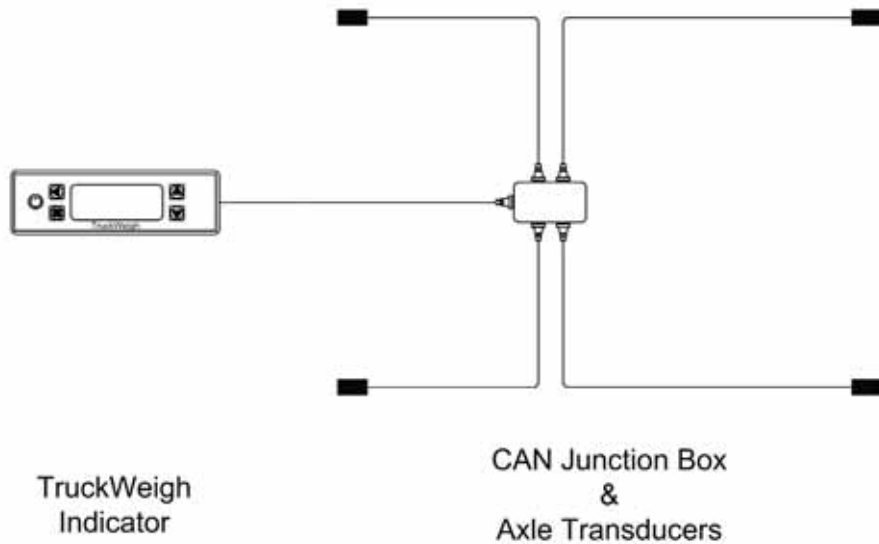
KIT REF

WKTW10005

Vehicle Chassis



System Diagram



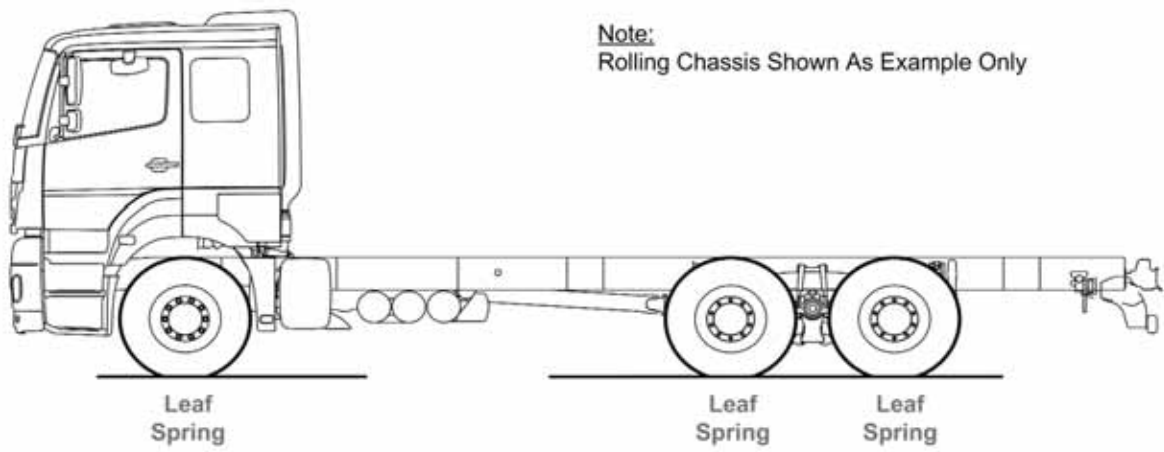
Configuration Options

6x4 Rigid Chassis with All Leaf Spring Suspension

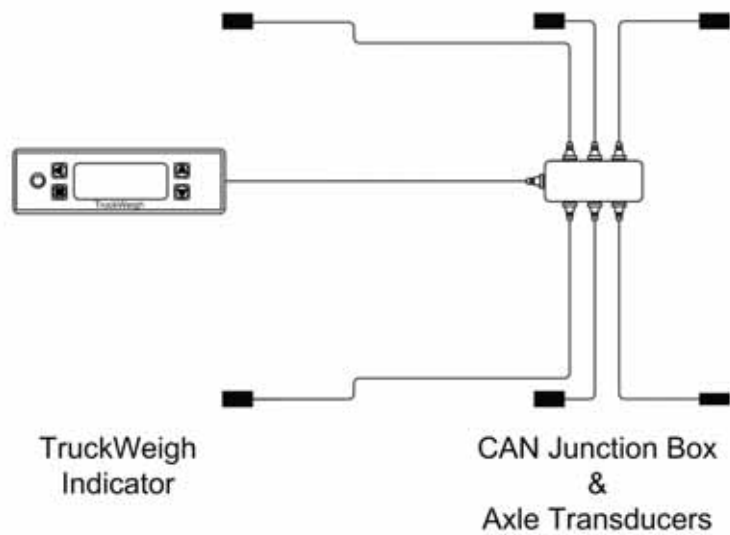
KIT REF

WKTW10002

Vehicle Chassis



System Diagram



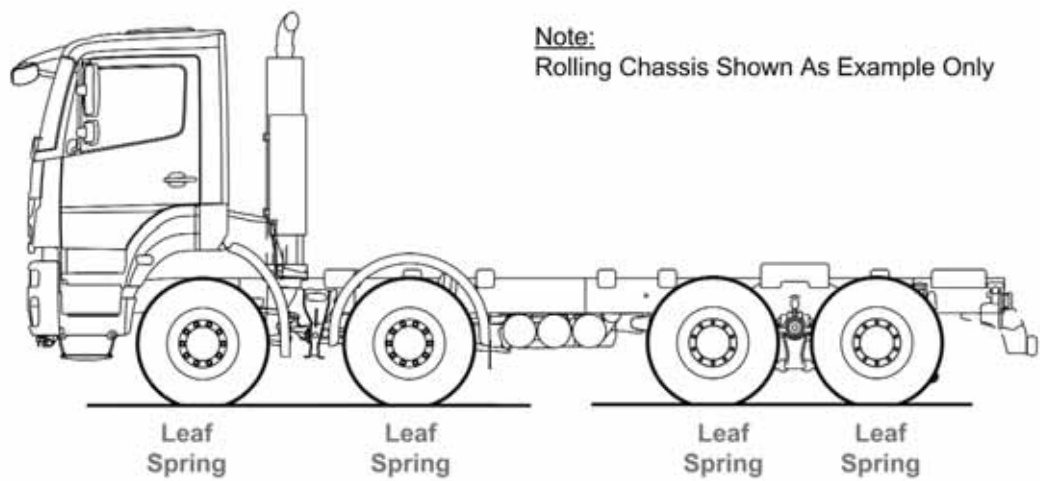
Configuration Options

KIT REF

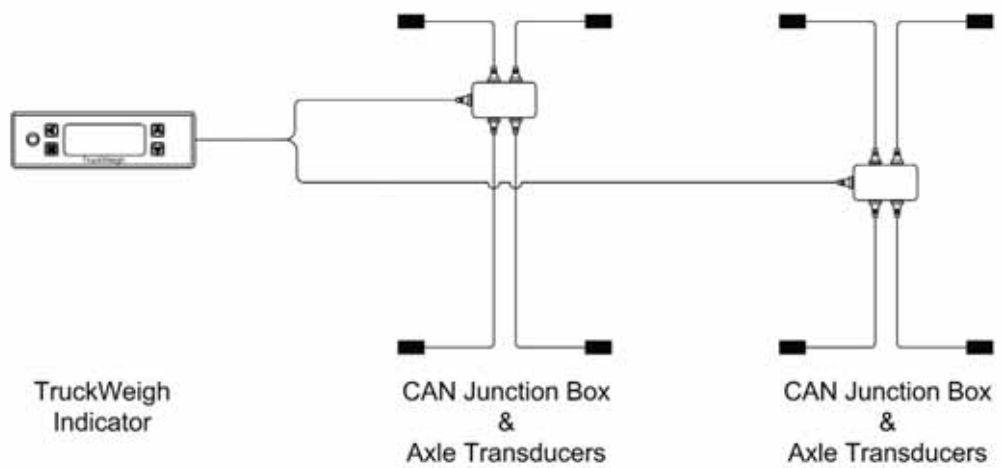
8x4 Rigid Chassis with All Leaf Spring Suspension

WKTW10003

Vehicle Chassis



System Diagram



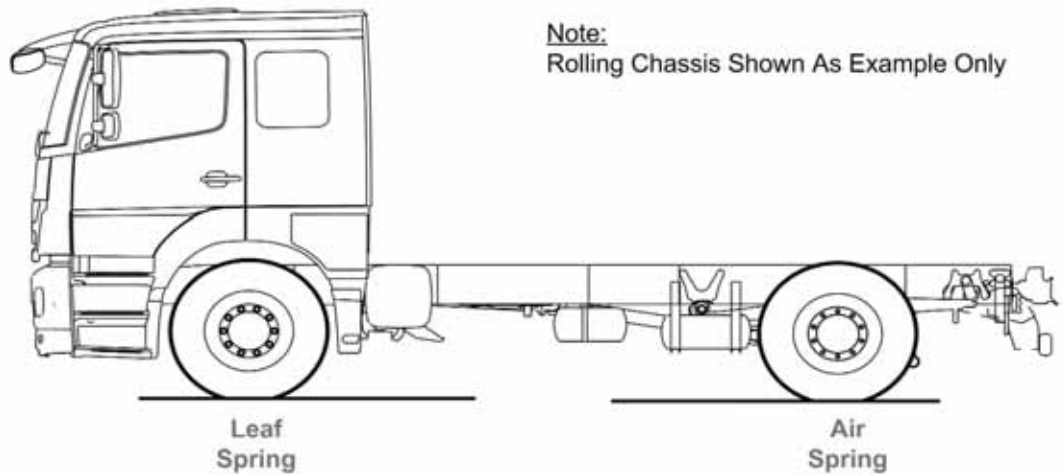
Configuration Options

KIT REF

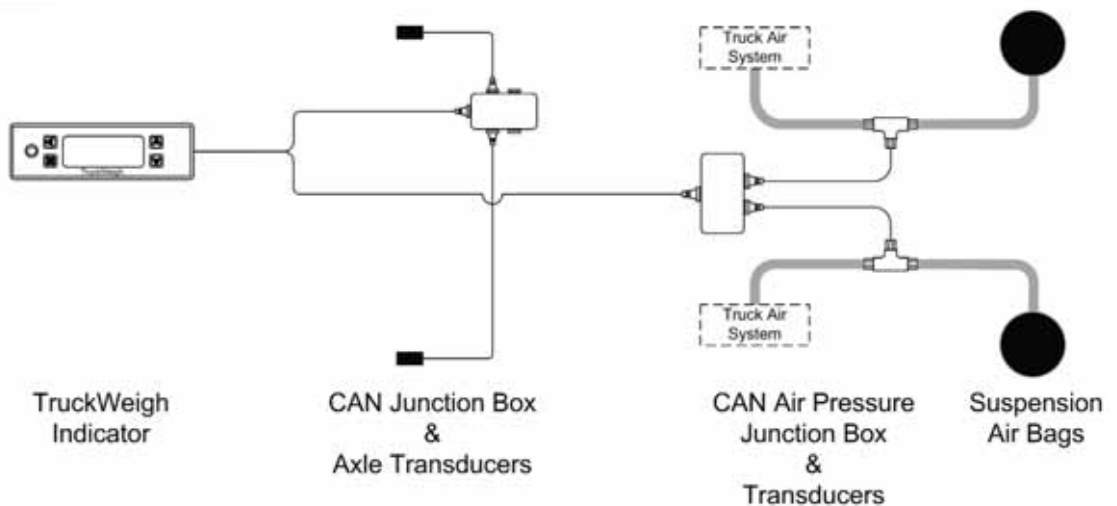
4x2 Rigid Chassis with Leaf Spring and Air Suspension

WKTW10001

Vehicle Chassis



System Diagram



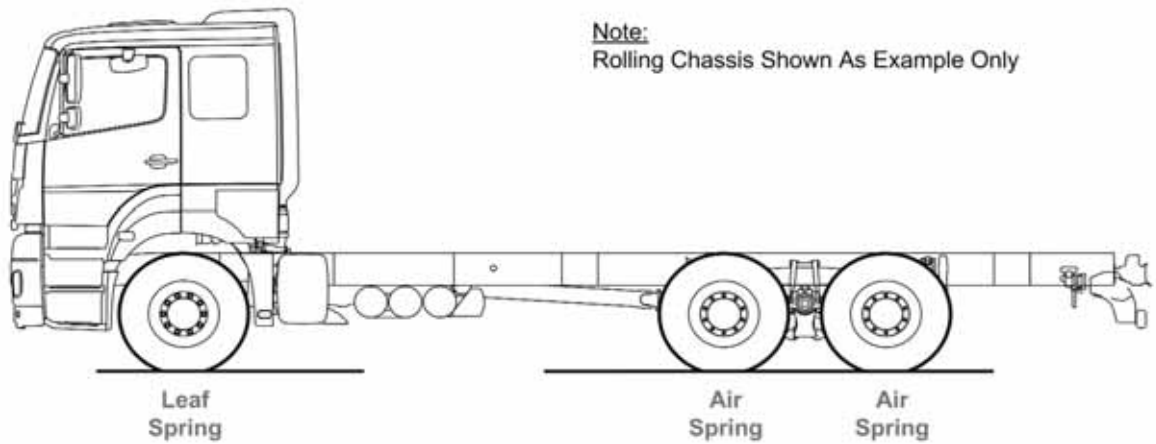
Configuration Options

6x4 Rigid Chassis with Leaf Spring and Air Suspension

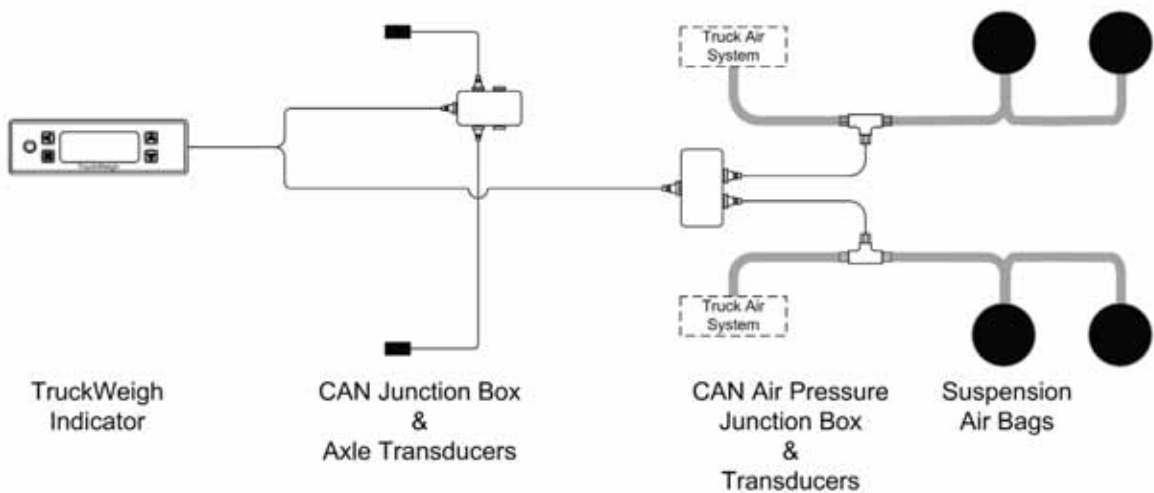
KIT REF

WKTW10001

Vehicle Chassis



System Diagram



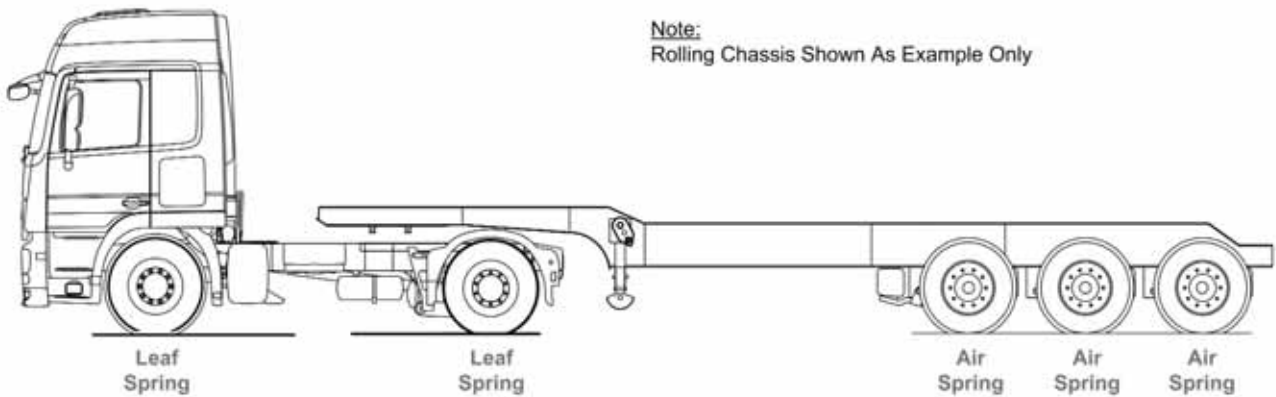
Configuration Options

KIT REF

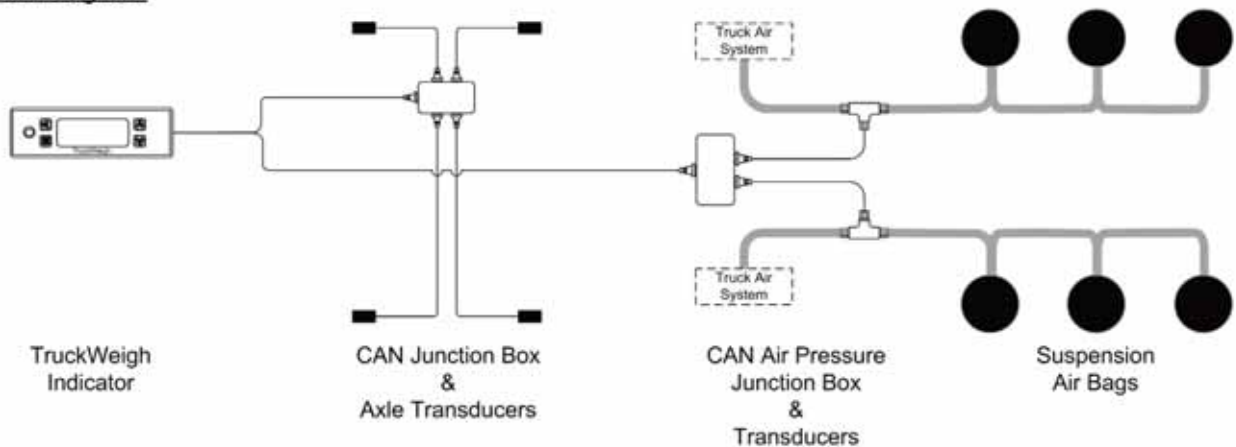
4x2 Tractor/Trailer with Leaf Spring and Air Suspension

Tractor Kit
WKTW10006
Trailer Kit
WK1155C-27

Vehicle Chassis



System Diagram



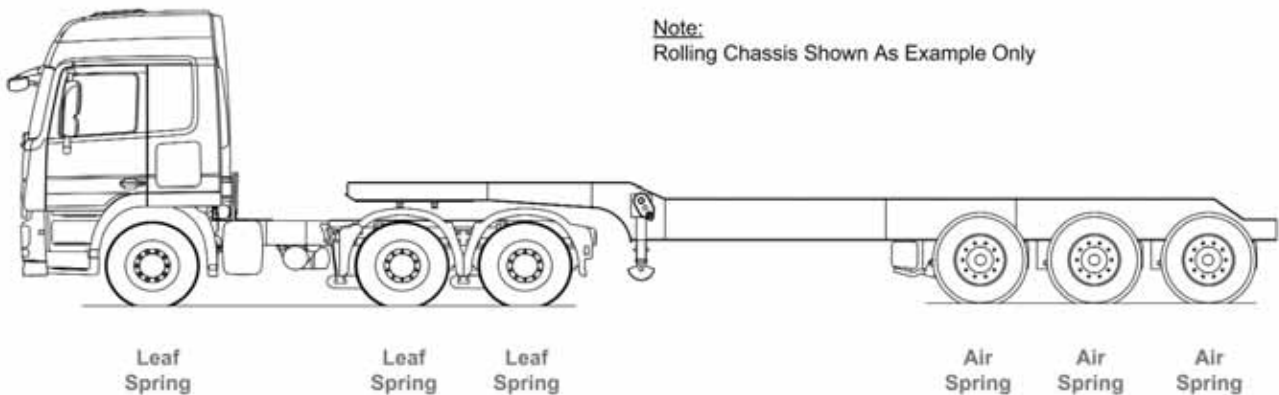
Configuration Options

KIT REF

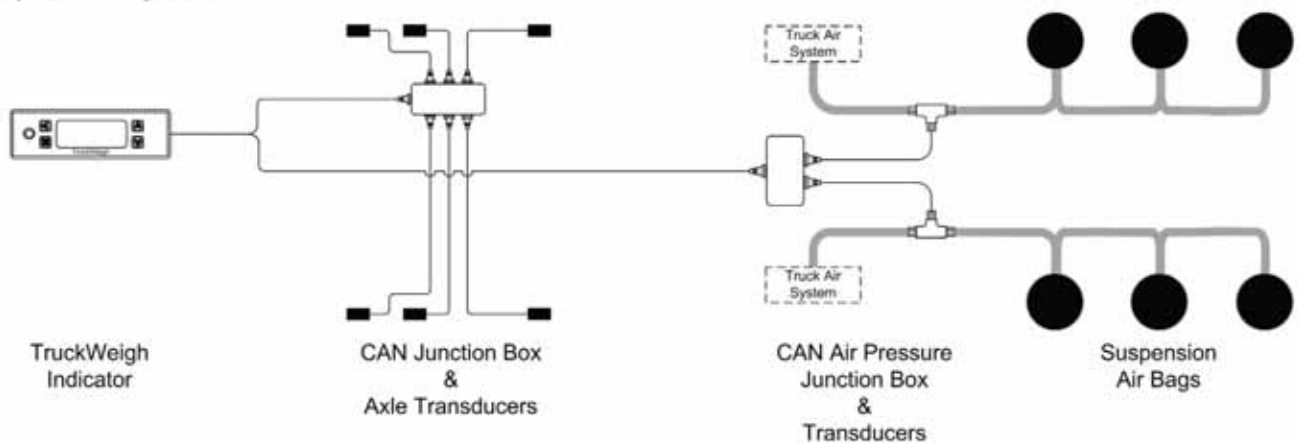
6x4 Tractor/Trailer with Leaf Spring and Air Suspension

Tractor Kit
WKTW10004
Trailer Kit
WK1155C-27

Vehicle Chassis



System Diagram



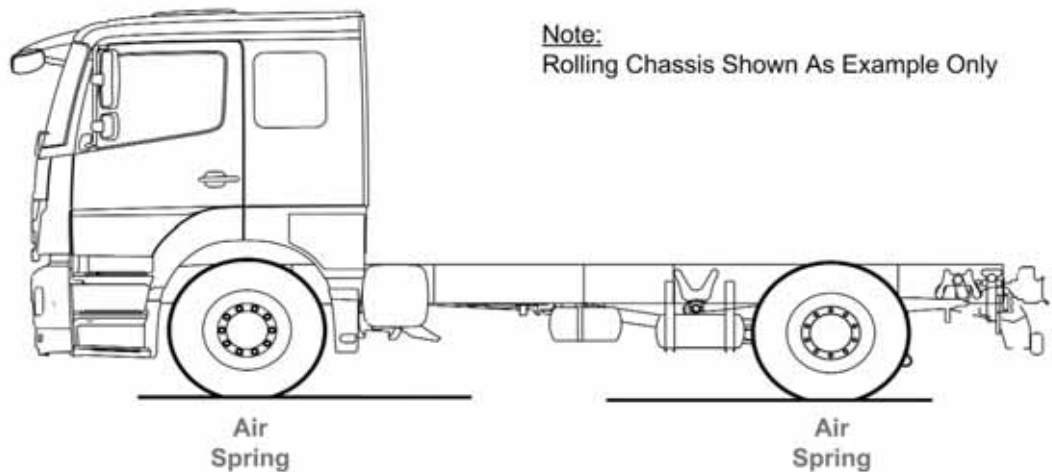
Configuration Options

KIT REF

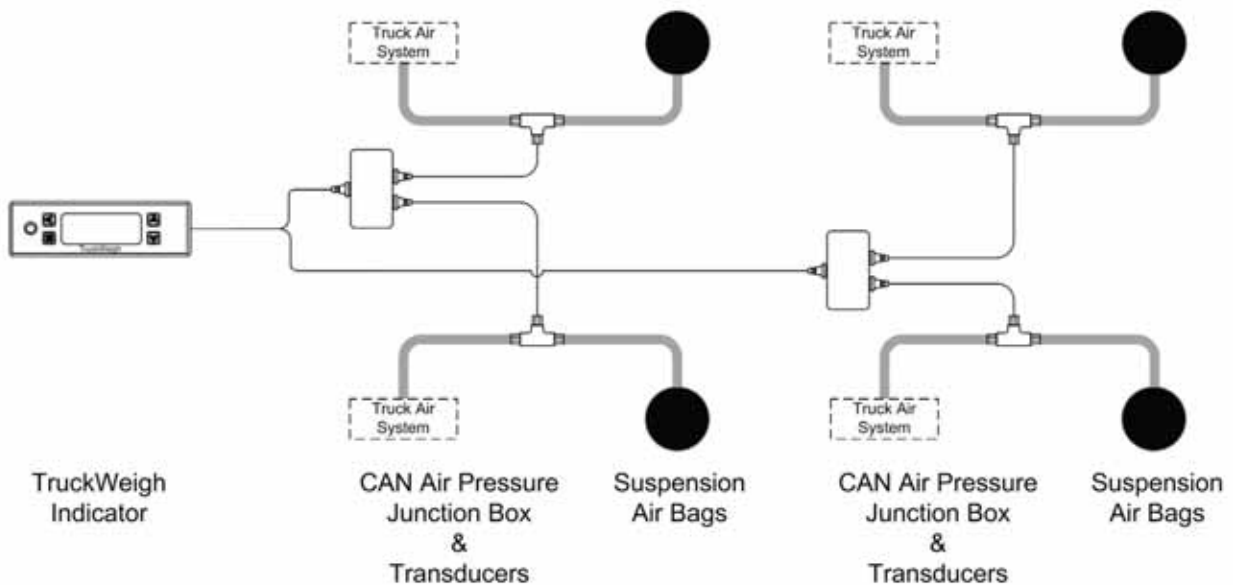
4x2 Rigid Chassis with All Air Suspension

WKTW10008

Vehicle Chassis



System Diagram



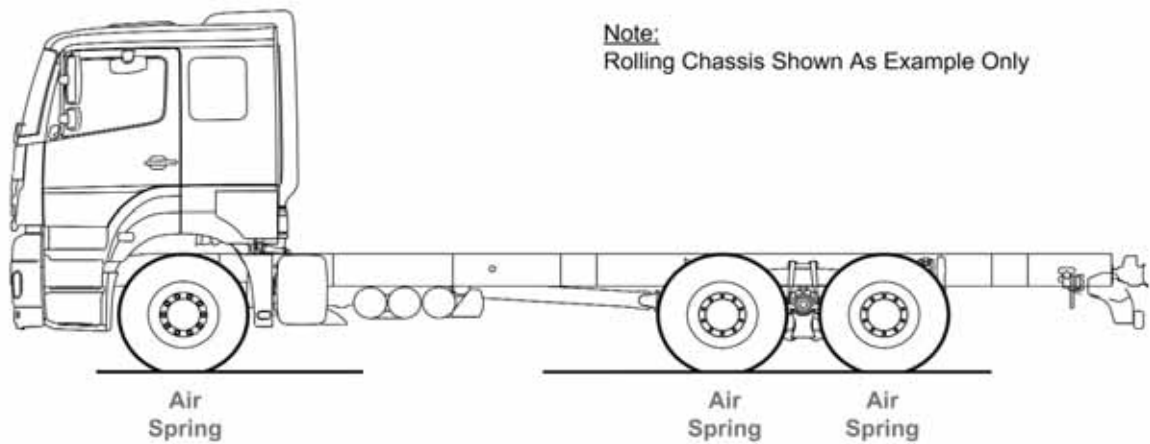
Configuration Options

6x4 Rigid Chassis with All Air Suspension

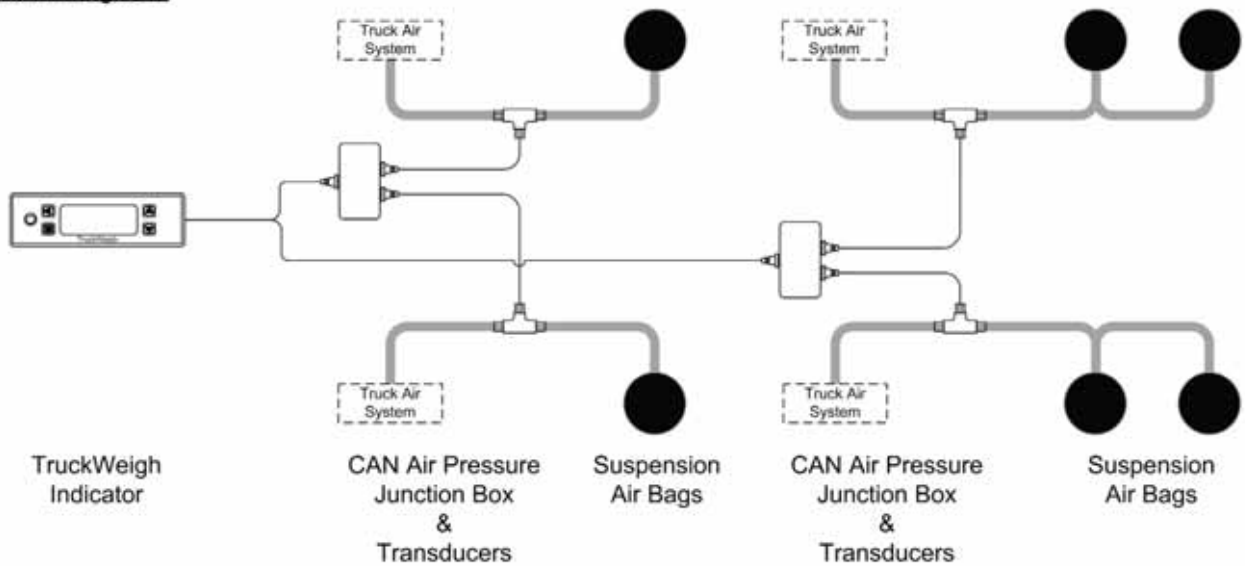
KIT REF

WKTW10008

Vehicle Chassis



System Diagram



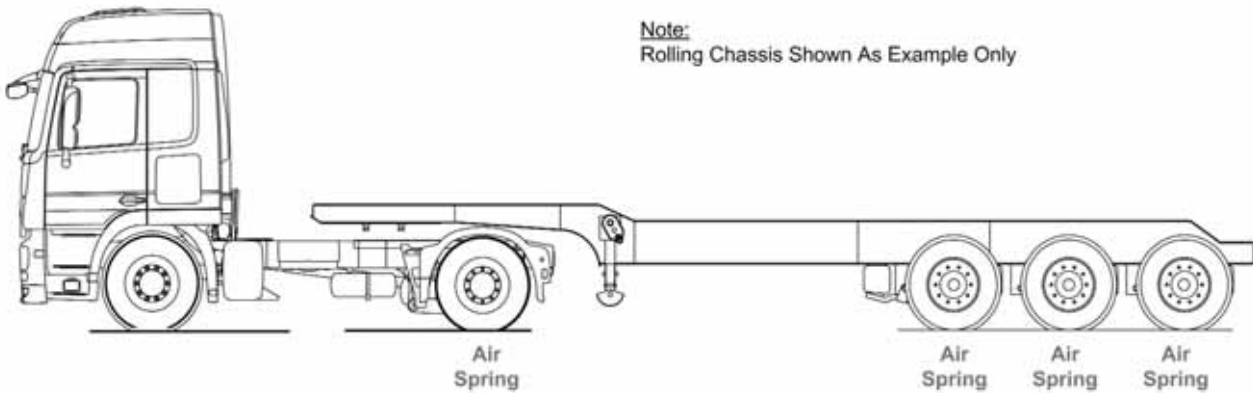
Configuration Options

KIT REF

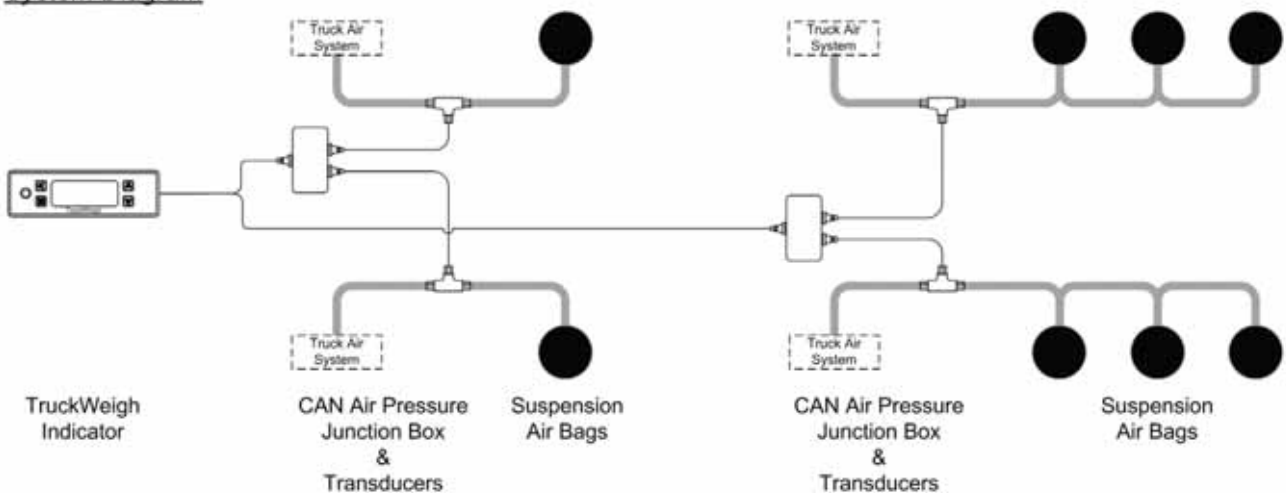
4x2 Tractor/Trailer with All Air Suspension

Tractor Kit
WKTW10007
Trailer Kit
WK1155C-27

Vehicle Chassis



System Diagram



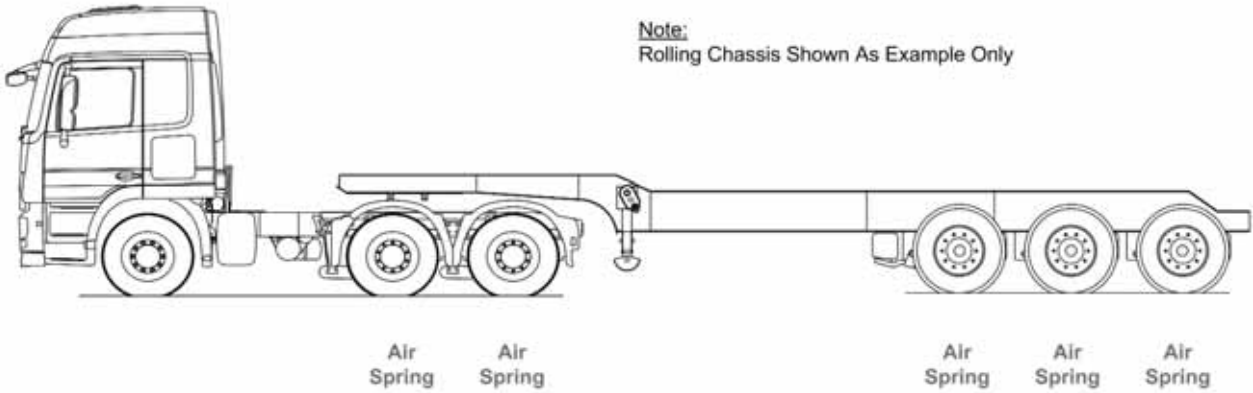
Configuration Options

KIT REF

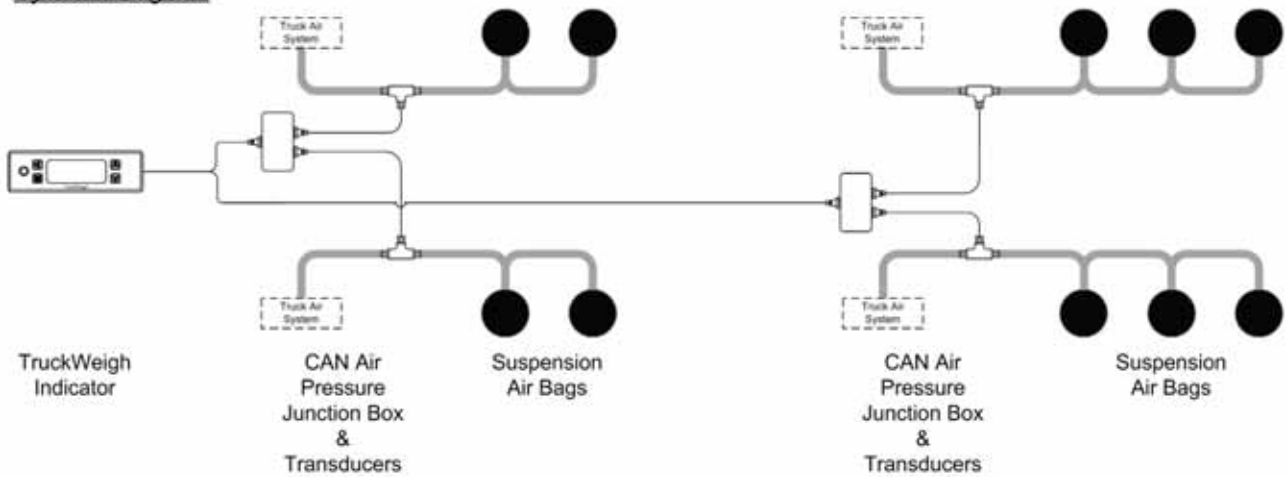
6x4 Tractor/Trailer with All Air Suspension

Tractor Kit
WKTW10007
Trailer Kit
WK1155C-27

Vehicle Chassis



System Diagram





TruckWeigh PM Onboard

A Brand of VPG On-Board Weighing



TruckWeigh Indicator

Axle Overload Protection System Optimise Your Payload and Avoid Fines

TruckWeigh is specifically designed for all vehicles with mechanical and/or air spring suspension. PM Onboard have combined features of its patented axle transducer technology and proven 1155 digital indicator to provide a low cost overload protection and payload optimisation system. TruckWeigh is simple to install and offers cost effective overload protection for new and existing vehicles.

Axle Protection

TruckWeigh has no moving parts and is not susceptible to wear or slipping out of calibration because of stretched springs which are common in other axle protection systems. Combinations of PM Onboard's patented axle transducers and/or air pressure transducers obtain the loading condition of each axle or axle group.

TruckWeigh Digital Indicator

Specially engineered for on-board use, the TruckWeigh indicator is a versatile display designed to suit a variety of trucks from 7.5tonne to 50tonne GVW. Its mounting flexibility ensures that it is suitable for both DIN radio mount and dash mount.

The indicator provides overload protection for individual axles and for the complete vehicle.

The indicator can connect to the 511 FreeWeigh, handheld remote display.

Trailer Identification

Where tractor and trailer combinations are swapped, TruckWeigh automatically recognises the overload protection system on the trailer, so there is no need to recalibrate every time the trailer is swapped.

Packer Plate Shutdown

The packer plate shutdown function ensures overloading is prevented by inhibiting the compaction unit when the gross or net alarm point is reached. An override key switch allows the compaction unit to be switched back on by an authorised person.

Barrier Control

The intelligent barrier control provides a signal that can be used to drive the barrier forward to redistribute the load across the rear axles, preventing overloading.

Telematics Output

Connection to third party tracking systems is easily achieved via TruckWeigh's standard telematics output.



DIN Radio Mount



Dash Mount



Axle Transducer



Air Pressure Transducer

PM Onboard

Airedale House • Canal Road • Bradford BD2 1AG

Ph: +44 (0)1274 771177 • Fax: +44 (0)1274 781178

E-mail: obw.eur@vishaypg.com

www.obwvpg.com

Axle Overload Protection

Features and Benefits

- Accuracy $\pm 3\%$ FSD (90 – 100%)
- Simple to operate
- Easy to fit to new and existing vehicles
- No driver input required
- Axle and gross overload protection
- 7.5 – 50tonne GVW
- Rugged for harsh environments
- AxleWatch
- Trailer identification
- Packer plate shutdown
- Intelligent barrier control
- Overload alarm, audible or visual
- Balanced load distribution
- Maximise payload capacity
- Reduce vehicle wear and tear and fuel consumption
- Protect your licence
- Avoid fines and overload endorsements



Vehicle Overload



Easy to Setup Menus



Axle Overload



User Defined Display



Alarm Set Points

Optimise Your Payload and Avoid Fines

Features	Standard	Option
Gross vehicle overload	•	
AxleWatch - individual axle overload	•	
Built in alarm sounder	•	
Trailer swap - trailer identification	•	
Packer plate shutdown	•	
Intelligent barrier control	•	
CAN bus	•	
RS232 output	•	
Password protection	•	
Telematics output	•	
Printer - thermal		•
Printer - heavy duty		•
Custom printer headers		•
External sounder		•
511 FreeWeigh		•

DISCLAIMER: ALL PRODUCTS, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE. Vishay Precision Group, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay Precision Group"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product. The product specifications do not expand or otherwise modify Vishay Precision Group's terms and conditions of purchase, including but not limited to, the warranty expressed therein. Vishay Precision Group makes no warranty, representation or guarantee other than as set forth in the terms and conditions of purchase. To the maximum extent permitted by applicable law, Vishay Precision Group disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability. Information provided in datasheets and/or specifications may vary from actual results in different applications and performance may vary over time. Statements regarding the suitability of products for certain types of applications are based on Vishay Precision Group's knowledge of typical requirements that are often placed on Vishay Precision Group products. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. No license, express, implied, or otherwise, to any intellectual property rights is granted by this document, or by any conduct of Vishay Precision Group. Product names and markings noted herein may be trademarks of their respective owners.

Where the World Goes
for Precision Measurement and Control

PM Onboard

Airedale House • Canal Road • Bradford BD2 1AG

Ph: +44 (0)1274 771177 • Fax: +44 (0)1274 781178

E-mail: obw.eur@vishaypg.com

www.vishaypg.com

**Where the World Goes
for Precision Measurement and Control**