

OPERATOR'S GUIDE



DIAG+



Innovative Vehicle Solutions

Notes on the use of this manual

This manual has been designed to assist personnel in satisfactory installation and operation of Haldex DIAG+ It is expected that this manual will be in possession of the appropriate person throughout their 'training' and 'experience' and that the manual will be used as a teaching aid following supervision of a Haldex engineer or a reminder of the correct procedure for operating Haldex DIAG+ software.

- › Use appropriate spare-parts documentation when obtaining spare parts
- › Use only genuine Haldex parts in repairs
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DIAG+ INSTALLATION

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Introduction

With DIAG+ you can use a standard personal computer to read and delete diagnostic codes, program vehicle parameters and end of line test (EOLT) the EBS, U-ABS and ITCM. The USB dongle allows communications between a standard PC and an ECU. Connections to the USB dongle are made through a cable connecting to a USB port on the computer and another cable connecting the diagnostic interface to the ECU. The vehicle parameter data is stored inside the ECU. It will remain intact even after electrical power is removed from the EBS, U-ABS and ITCM.

Note: The USB dongle is different to the RS232 interface pods as used on earlier systems.

Installation

Minimum system specification

The minimum PC or laptop specification to run the DIAG+ package is as follows:

Processor - No particular requirement
RAM - 256 megabytes
Hard drive - 30 megabytes free
MS Windows XP, 7, 8 and 10

In addition to the above, a USB port is required to connect to the USB dongle.

Downloading DIAG+

The latest DIAG+ version software can be downloaded from the Findex section of the Haldex web site.

To download follow:

- › Go to <http://www.haldex.com/>
- › Click on Trailer Guide Application
- › Click on service
- › Download software
- › Follow installation procedure

Installing the software

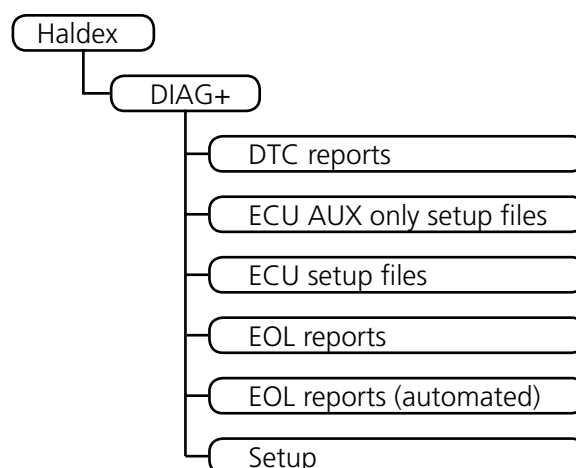
The software must be installed before the connection of the USB dongle.

- › Switch "on" your machine and enter into the desktop mode of your PC, then run the downloaded DIAG+ setup file DIAG+ 15 ROW.msi
- › Follow the on screen instructions to install the program
- › Click on "next" to proceed
- › Read the information and click on "next" to proceed
- › Choose your preferred options, and click on "next" to proceed
- › Click on "next" to proceed
- › Program now installing on the PC
- › Installation now completed
- › Click on "close" to exit

In addition to the application folders, the following folder structure is added to your computer.

On Windows 7 the Haldex folder will be located in
C:\Users\Public\Public Documents.

Note: This location will vary on other operating systems.



Installing the hardware

The DIAG+ interface kit is comprised of the USB dongle, together with its connecting cables and a transit case.

Part number	Description	
950 800 912	Diagnostic cable kit	Kit contents:
814 036 001		ECU / pc interface cable (6.5 m)
815 018 001		EB+ ISO diagnostic cable
814 011 001		EB+ SOV / pc interface cable (6.5 m)
042 623 719		Transit case



Part number	Description	
950 800 909	Interface kit	Kit contents:
815 023 001		USB pc interface (DIAG+)
042 707 309		USB cable



The dongle is provided with a multi function LED to confirm correct function of the unit as follows:

Orange: Indicates connection to USB port

Red: Indicates connection to USB and EBS / U-ABS

Green: Indicates data is being transmitted

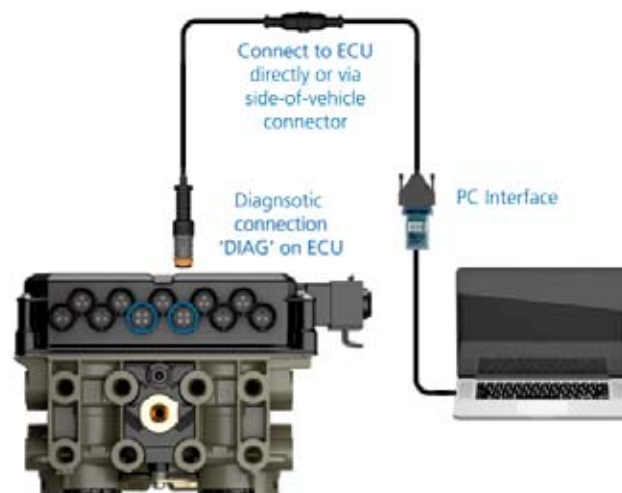
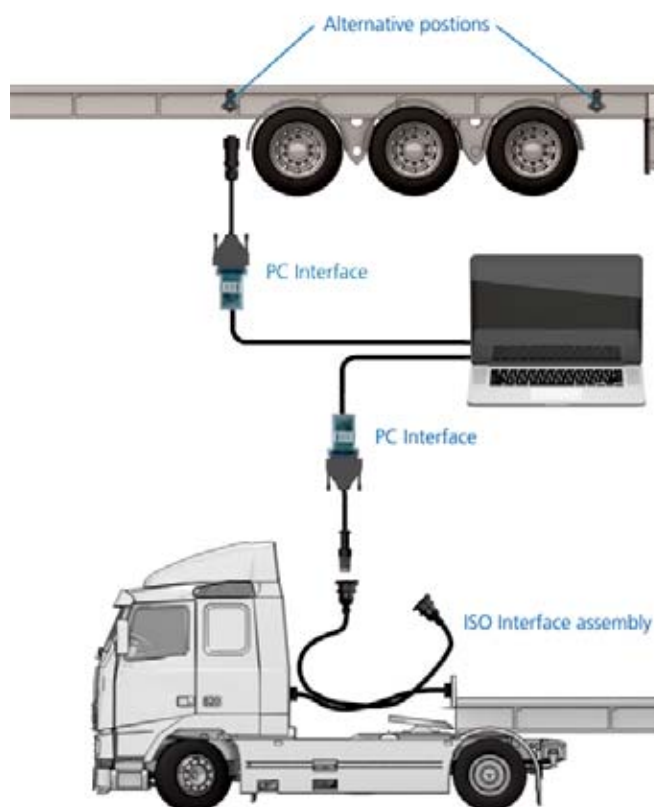
To access the EBS and U-ABS ECU via side-of-vehicle connector, connect the USB cable into a USB port on the back of your PC or laptop.

Use the ISO interface cable assembly 815018001 to access the EBS ECU by using ISO 7638 -7 pin connector (which uses pin 6 and 7 as a CAN data bus), connect the USB cable into a USB port on the back of your PC or laptop.

To access the ECU directly, connect the USB cable into a USB port on the back of your PC or laptop.

Power the EBS and U-ABS from an external 24 V dc supply (i.e. correctly rectified and smoothed) or a tractor unit. The LED light on the USB dongle should now be on, coloured red.

If it is not, please check your connections and try again.



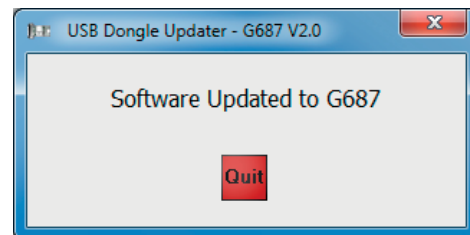
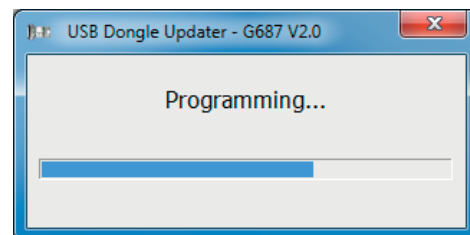
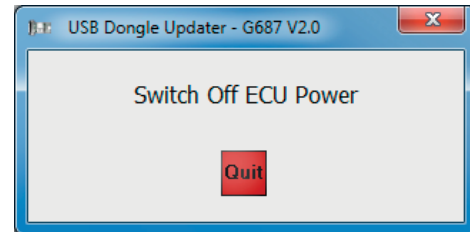
Updating the USB dongle software

The USB dongle software can be updated to the latest revision.

The required files have been downloaded along with the DIAG+ software and can be found here:

C:\Program Files\Common Files\Haldex\USB

- › Run the downloaded dongle setup file
USB_DONGLE_Flash_Updater_G687_V2_0.exe
- › Follow the on screen instructions to install the program
- › Switch "off" the power to the ECU
- › Switch "on" the power to the ECU
- › Software updating
- › Software update now complete



Updating the USB dongle driver

The USB dongle driver software can be updated to the latest revision.

The required files have been downloaded along with the DIAG+ software and can be found here:

C:\Program Files\Common Files\Haldex\USB



- › Run the downloaded dongle driver setup file
CDM v2.12.00 WHQL Certified.exe
- › Follow the on screen instructions to install the program
- › Accept the agreement, click on "next" to proceed
- › Software updating
- › Software update now complete
- › Click on "finish" to proceed
- › Restart your computer to apply these changes



Starting DIAG+

Click on the DIAG+ short cut to start the programme.

The user must read and accept the warning screen to open the DIAG+ programme.

- › Click on  to accept and start DIAG+
- › Click on  to exit without starting
- › DIAG+ software will now open
- › Now connect the USB dongle to the PC



The dongle is provided with a multi function LED to confirm correct function of the unit as follows:

- Orange: Indicates connection to USB port
- Red: Indicates connection to USB and EBS / U-ABS
- Green: Indicates data is being transmitted

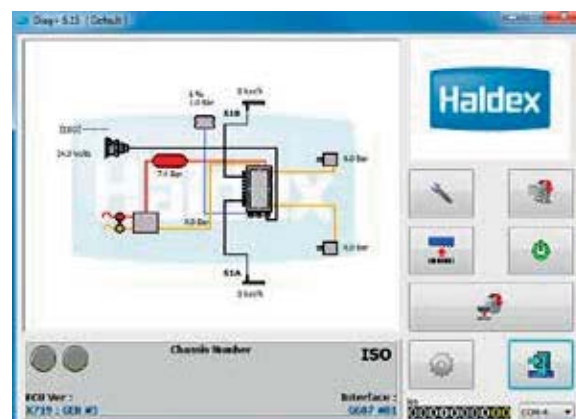


Red / green led

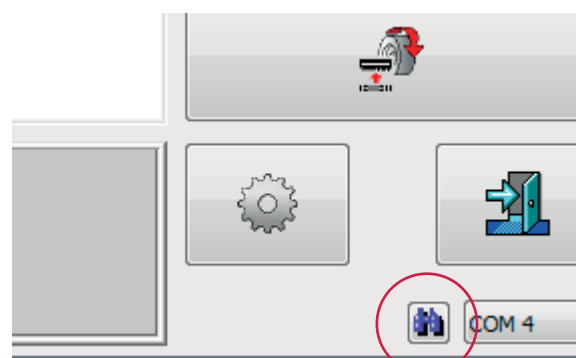
Power up the ECU. During the self check procedure the system displays the following functions:
the trailer EBS / U-ABS warning light comes 'on' and stays 'on'. One audible cycle is produced by the EPRV's (EBS valves).

At the same time the LED on the USB dongle will illuminate 'red / green' to show that it is communicating with the ECU.

The EBS / U-ABS layout schematic should now be showing in the browser window.



If no EBS / U-ABS layout is shown, click on the binoculars to auto search for the correct PC connection port.



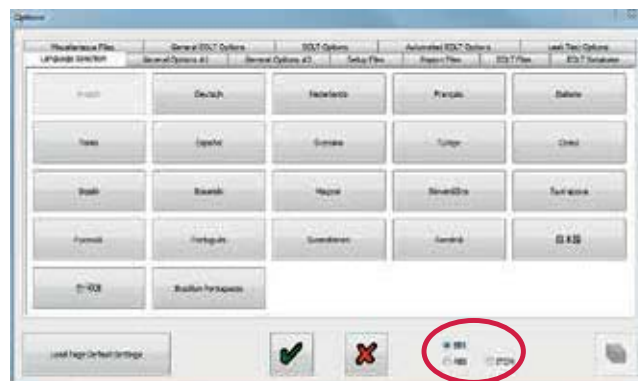
Options

The DIAG+ options can be selected by clicking on the  button.

When no ECU is connected, the DIAG+ software can be configured for any of the following:

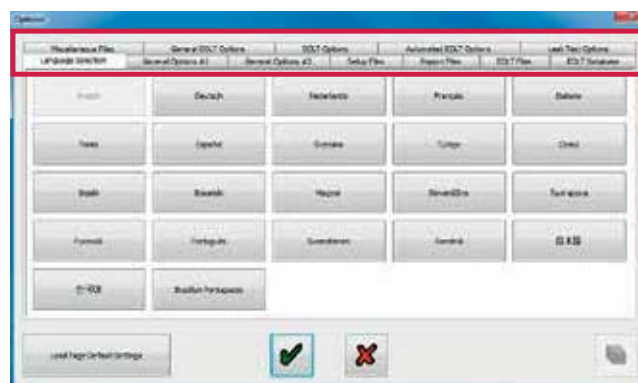
- › EBS
- › U-ABS
- › ITCM

Note: the software will auto detect which configuration is required when an ECU is connected.




The DIAG+ software can be configured by the user, using the available option tabs and menu's.

- › Language
- › General options
- › Miscellaneous / setup / report / EOLT / files
- › EOLT options
- › EOLT database
- › Leak test options




Language selection


The DIAG+ operation language can be selected by clicking on the  button.

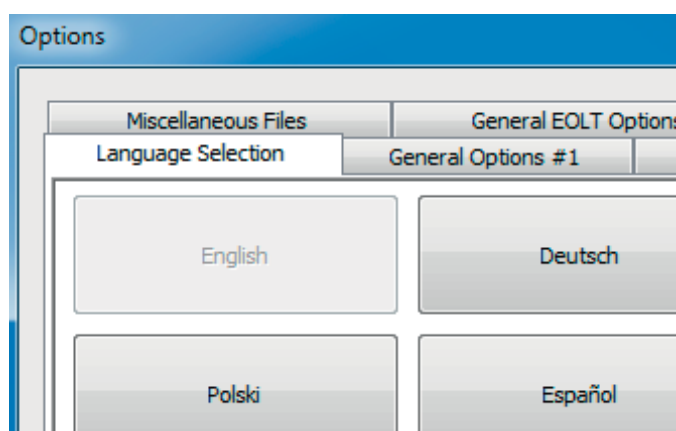
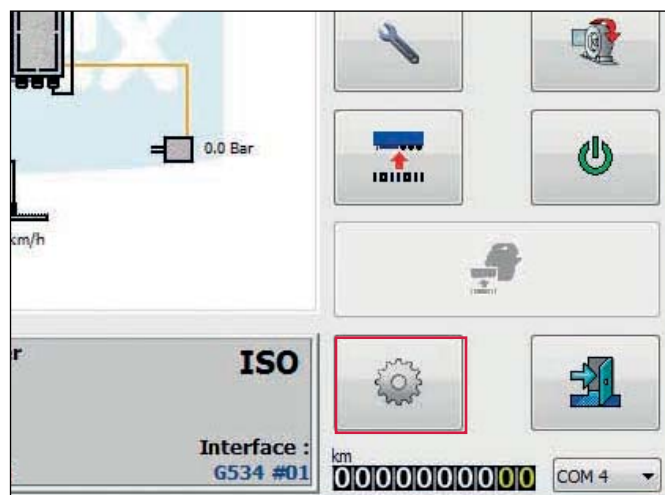
Click on the language selection tab

Select the language from the displayed options

Click on the required language button to change to the new language

Click on the  button to return to the main menu without changing the current language.

Click on the  button to change to the selected language and return to the main menu.



Troubleshooting

Screen 1

On appearance of this screen the following areas need to be checked:

- › The receive and transmit buffers have been disabled on your PC. Check the com port properties
- › Another program that uses the com port is open. Check the bottom of your PC screen and close any other programs

Screen 2

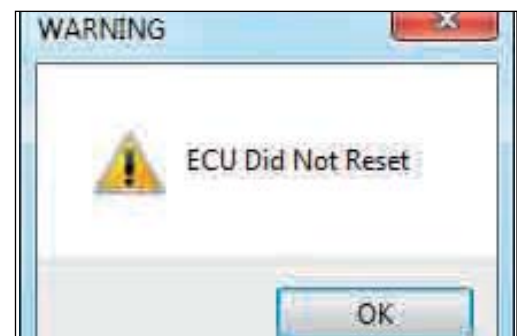
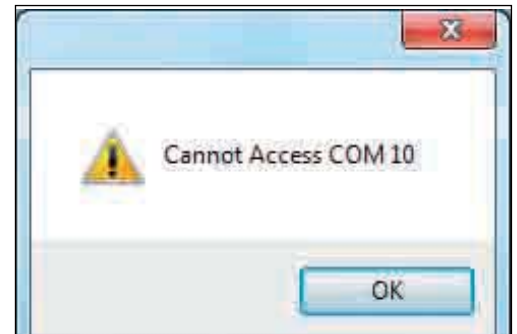
On appearance of this screen the following areas need to be checked:

- › Connections loose. Check that each plug is firmly connected
- › LED light 'off' on USB dongle. Check power supply to the ECU from the ISO 7638 (or similar 24 V supply) is 'on'

Screen 3

On appearance of this screen the system is still in system supplier mode (i.e. a command was requested within 10 secs of clicking the reset button).

- › Switch power 'off' and 'on' to the trailer



EBS

ECU connections	18
Home screen	28
Basic diagnostics	32
Tyre pressure monitoring system (TPMS)	38
Lining wear sensor (LWS)	73
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ECU connections

EB+ Gen3 2M

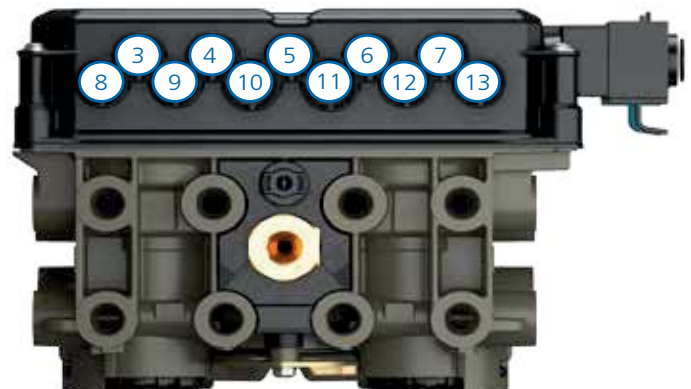
Position	Port
1	ISO 7638
2	ISO 12098 / ISO 1185 (24N)
3	AUX 1
4	AUX 2
5	AUX 3
6	AUX 4
7	AUX 5

*minimum requirement for a 2S / 2M system

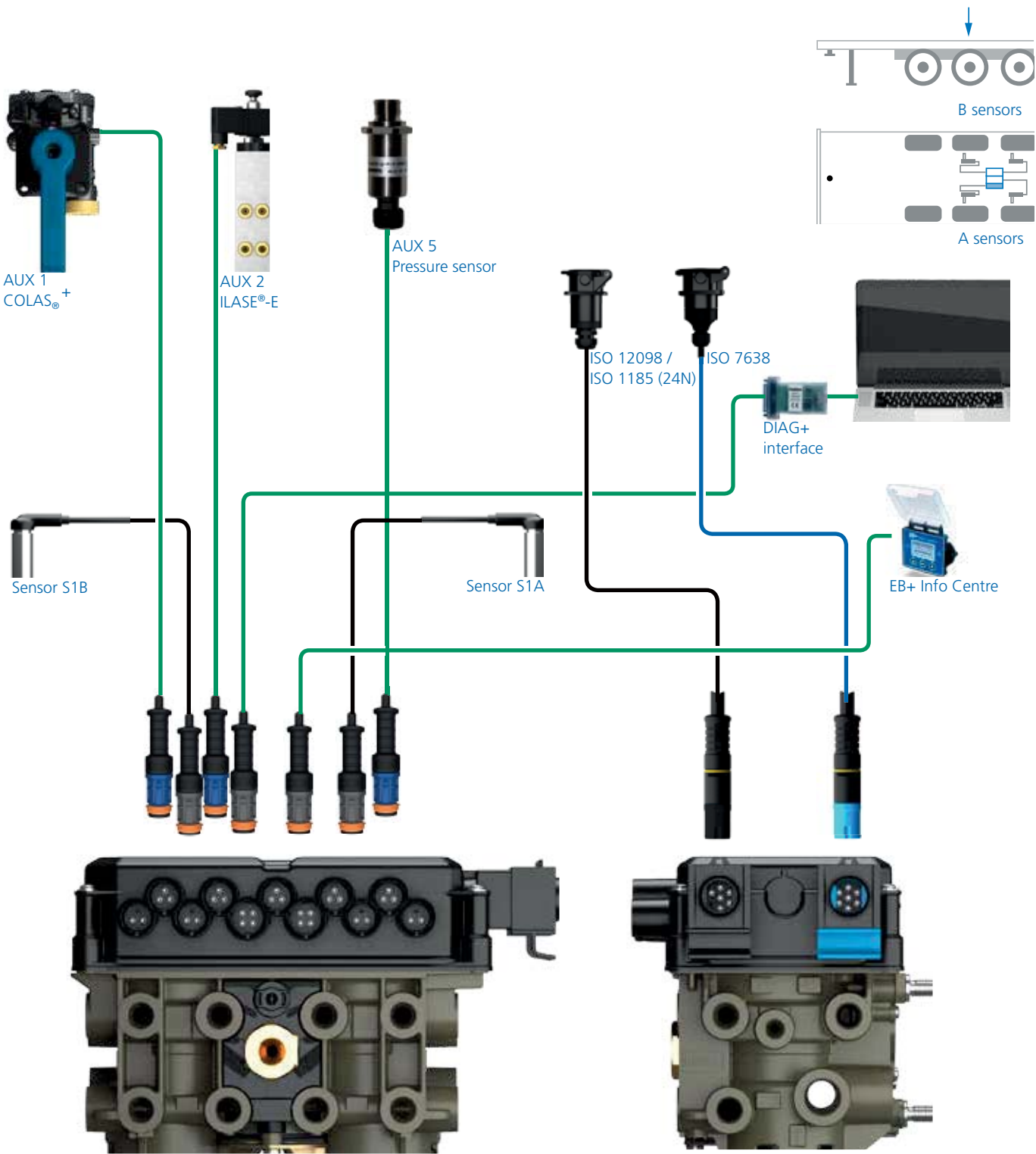
Position	Port
8	Sensor S2B
9	Sensor S1B*
10	DIAGN
11	DIAGN
12	Sensor S1A*
13	Sensor S2A



EB+ Gen3 2M



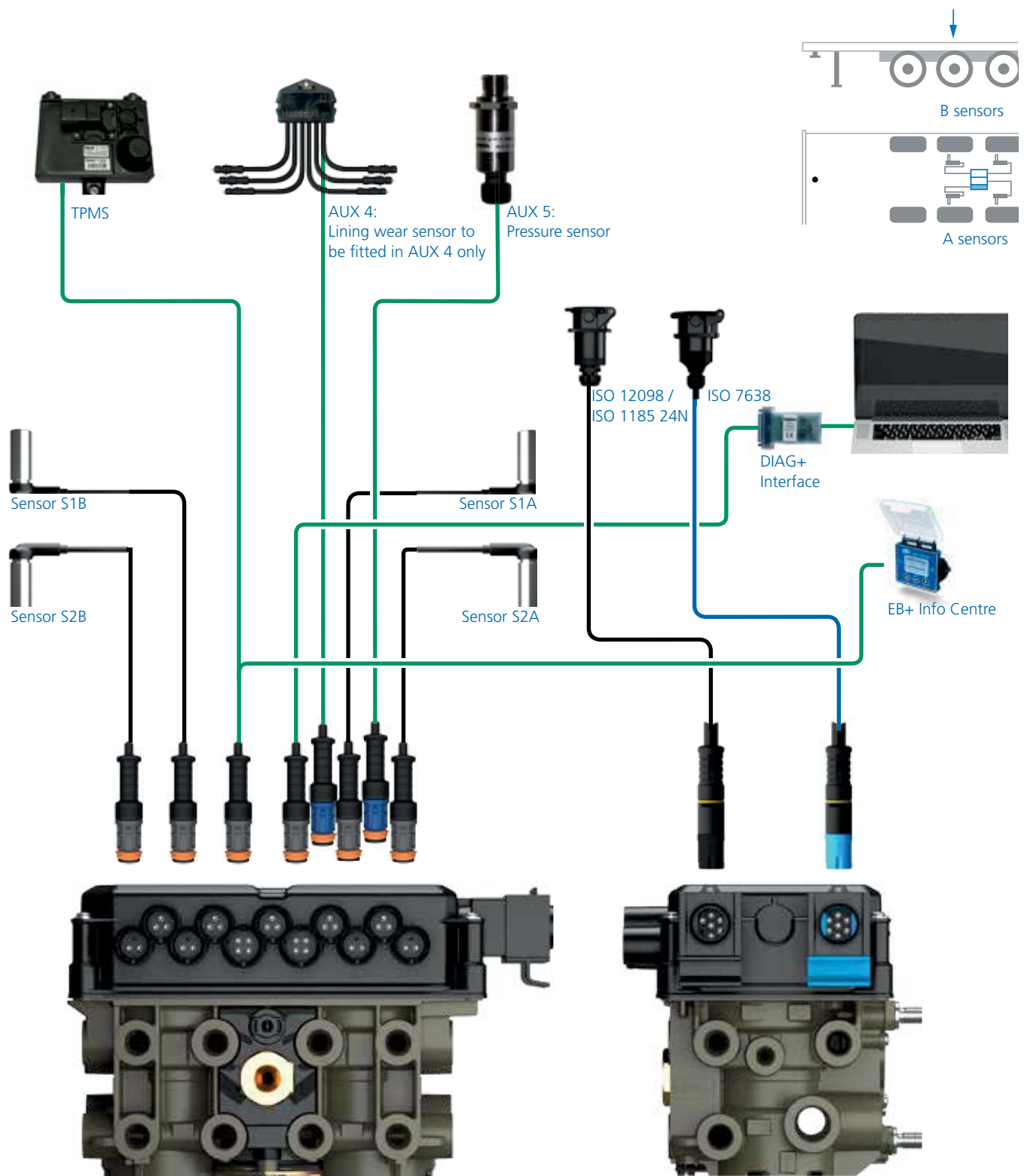
2 sensors, 2 modulators, 3 AUX, with EB+ Info Centre



Connections shown:

ISO 7638	ISO 12098	DIAG	S1A	S1B	S2A	S2B	AUX 1	AUX 2	AUX 3	AUX 4	AUX 5
Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No	Yes

4 sensors, 2 modulators, 2 AUX, with EB+ Info Centre / TPMS



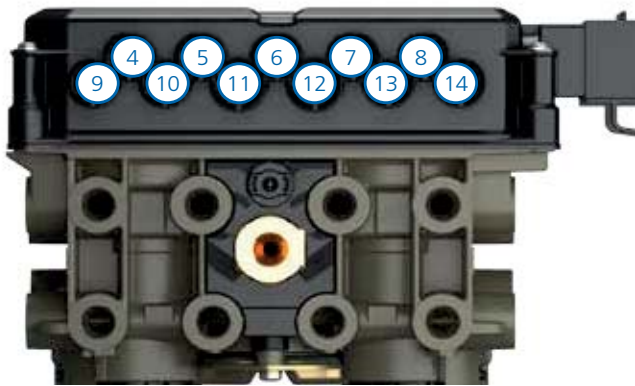
Connections shown:

ISO 7638	ISO 12098	DIAG	S1A	S1B	S2A	S2B	AUX 1	AUX 2	AUX 3	AUX 4	AUX 5
Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes

EB+ Gen3 3M



EB+ Gen3 3M



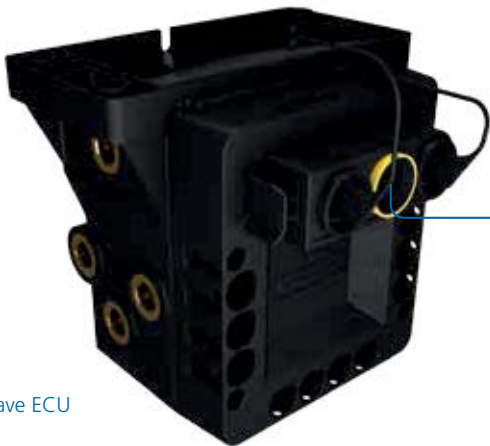
Position	Port
1	ISO 7638
2	3M link cable
3	ISO 12098 / ISO 1185 (24N)
4	AUX 1
5	AUX 2
6	AUX 3
7	AUX 4

Position	Port
8	AUX 5
9	Sensor S2B
10	Sensor S1B
11	DIAGN
12	DIAGN
13	Sensor S1A
14	Sensor S2A

Full trailer 3M system

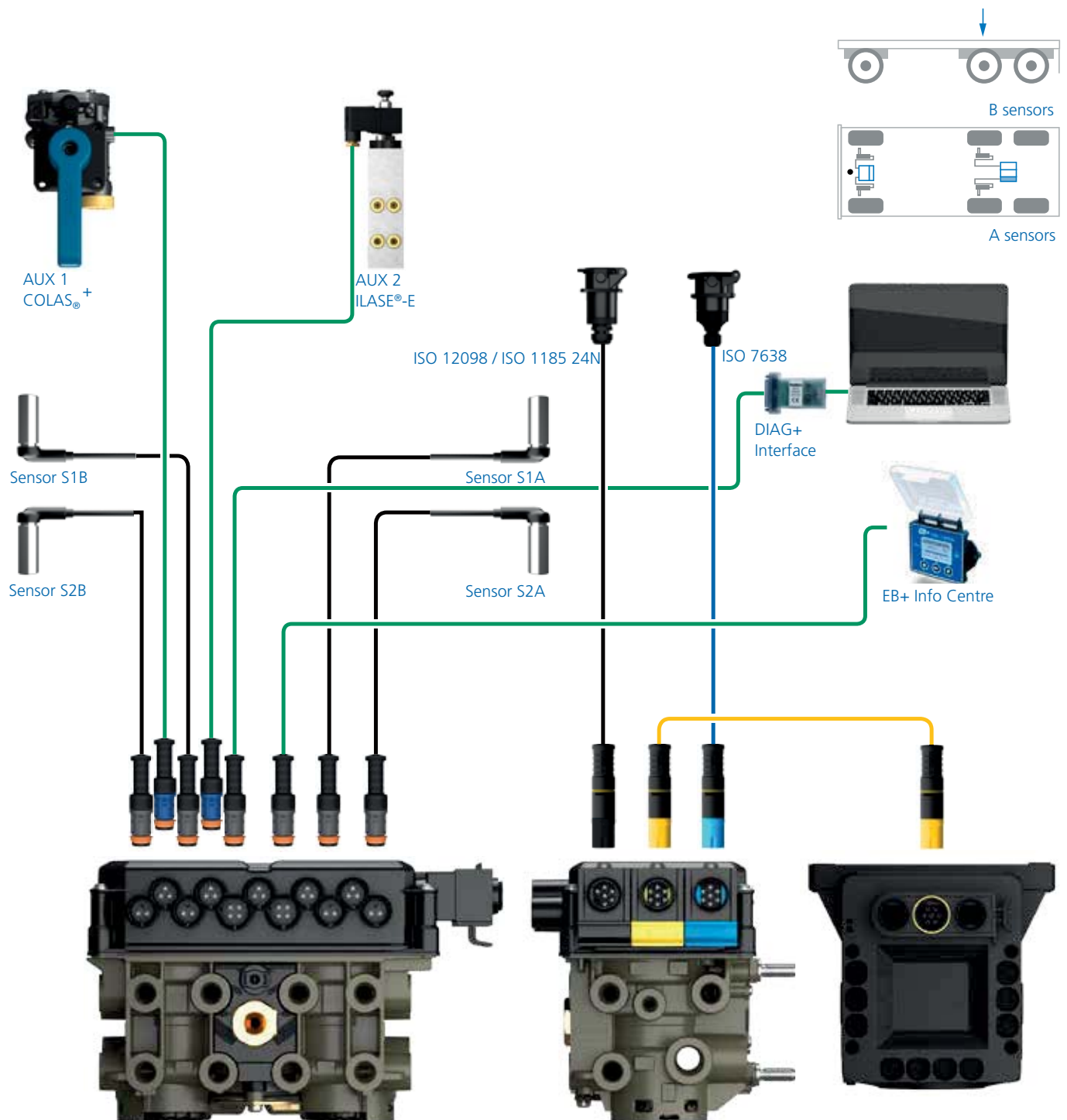
Make connection to the Slave ECU using the interconnecting cable.
It is possible to use the DIAG+ software to set the ECU parameters with only the power supply ISO 7638 and interconnection cable (Master to Slave ECU) connected. But diagnostic codes will be logged and will require to be deleted on the final vehicle installation.

Note: The EB+ Gen3 Slave assembly (ECU & valve) is only supplied as one complete unit that cannot / should not be separated.



Slave ECU

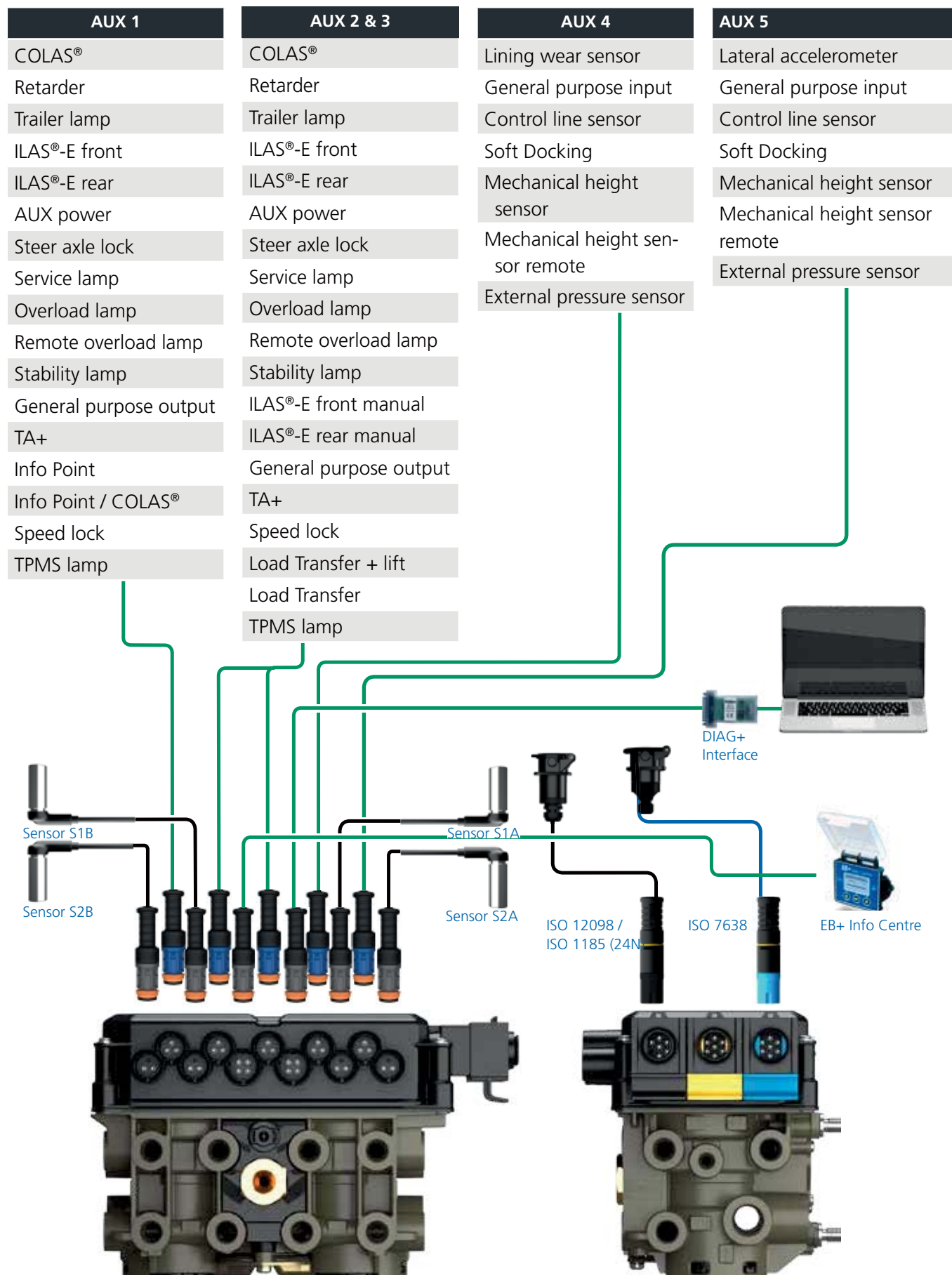
4 sensors, 3 modulators, 2 AUX, with EB+ Info Centre



Connections shown:

ISO 7638	ISO 12098	DIAG	S1A	S1B	S2A	S2B	AUX 1	AUX 2	AUX 3	AUX 4	AUX 5	3M
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes

EB+ Gen3 ECU connection identification



Auxiliary operation

Auxiliary functions are dependant on the installed EBS product.

Gen3	STD	S AUX	P AUX
823 008 xxx	Yes	Yes	No
823 034 xxx	Yes	Yes	Yes



Standard AUX (STD)

Connections: 3 outputs + 2 inputs. EB+ includes by default 5 auxiliary ports for various surrounding functions. 3 of these auxiliaries are digital, 2 are analogue inputs. These amount of inputs and outputs are sufficient for most commonly used standard trailer applications. For example ILAS®-E (= lift axle control) and COLAS® (= return to ride height) digital AUX are required, whereas for LWI (= lining wear indicator) and EB+ Soft Docking (= ramp approach system) analogue inputs are needed. In case of malfunction (short circuit / open circuit) the EB+ system generates a DTC code and the service lamp will be triggered after start up.

The Standard AUX has 5 x AUX connectors that can be configured using DIAG+.

AUX 1 - B+ voltage switched output

AUX 2 - B+ voltage switched output and monitor input

AUX 3 - B+ voltage switched output and monitor input

AUX 4 - analogue input

AUX 5 - analogue input

Programming Standard AUX using DIAG+ V6

The AUX configuration screen shows the various auxiliary connections that can be used.

- › AUX 1
- › AUX 2 red only
- › AUX 3 red only
- › AUX 4
- › AUX 5

Clicking on the drop down arrow displays a list of options that can be selected on that auxiliary.

Error message: an error message will be displayed if an auxiliary configuration is created and sent to an ECU that does not support that function.



Aux 2 and 3 are red only



Error message

Super AUX (S AUX)

The Super AUX connection was developed as there are a number of applications where trigger signals from the truck and trailer are required.

Connections via Power B (black connector)

- › 1 x 24N power supply (2 pins)
- › 3 x inputs (i.e. A, B and C) and 24 V signal (4 pins)

Already with EB+ Gen1 Haldex introduced a 'Power B' socket for backup power supply by stop light ISO 12098 / ISO1185 (24N). This link to the lighting system has been extended by the introduction of the 'Super AUX'. The connector includes an additional three digital inputs and 24 V signal supply (only use the 24 V signal supply for the Super AUX control switches). The control inputs can be linked to any auxiliary feature and this allows very sophisticated applications to be realised in a very simple manner. Some examples for controllable auxiliary features are 'traction support' and / or 'steer axle lock' and / or 'EBD' (=Electric Brake Demand). Backup power is always available by default.

Auxiliary connection cables: to use the full auxiliary functionality of "Super AUX", the following cable can be used.

814 002 3xx series

Programming Super AUX using DIAG+ V6

The "AUX configuration" screen shows the various auxiliary connections that can be used.

- › AUX 1
- › AUX 2 Red only
- › AUX 3 Red only
- › AUX 4
- › AUX 5
- › Super AUX

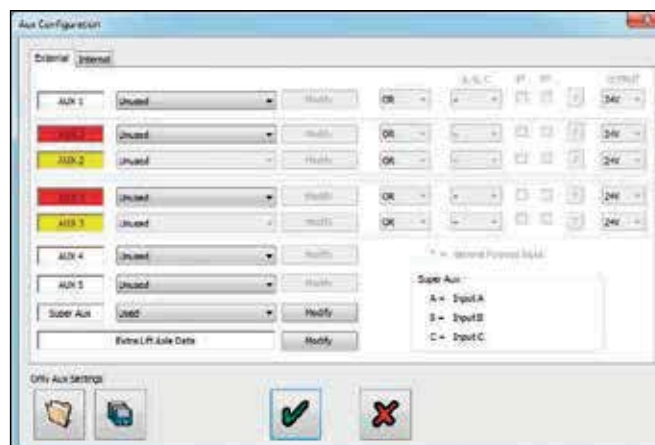
Clicking on the drop down arrow displays a list of options that can be selected on that auxiliary.

Configuring Super AUX

Click on "Modify" to configure the Super AUX inputs.



814 002 3xx series



Aux 2 and 3 are red only

Click on "Modify" to configure the Super AUX inputs

Custom Super AUX input screen

Inputs A, B and C can now be configured using the drop down boxes.

Inputs A, B and C can also be renamed to their intended activation input (e.g. door).

The required input combination can be achieved by using the drop down boxes for:


- › The input signal (e.g. door)
- › The activation level (i.e. high or low)
- › The action (i.e OR & AND)

A combined summary input statement is shown in the window at the bottom of the screen.

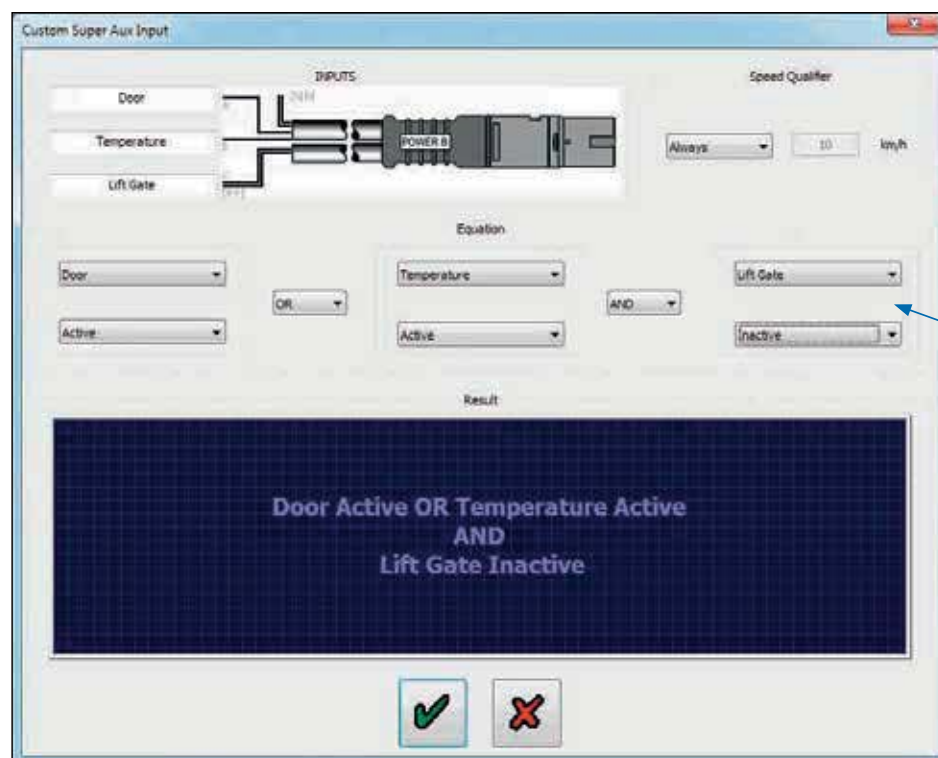
Speed qualifier

A speed signal can also be added to the final 'input statement' by using the 'speed qualifier' drop down box options.

- › Always No speed signal referenced
- › <= Less than and equal to selected km / h
- › > Greater than selected km / h

Click on the  button to cancel with no modifications.

Click on the  button to exit and keep the modifications.



Drop down boxes used to configure the input signals.

Premium AUX (P AUX)

Premium AUX allows the user to program two totally independent outputs on both AUX 2 and AUX 3. It is only available with the Premium ECU (as shown).



The Premium system provides five instead of three outputs (AUX 2 and 3 are capable to operate two separate functions). An example for an extended application could be ILAS®-E front including TA+ on AUX 2, steer axle lock on AUX 3 and COLAS® RtR on AUX 1. The twin outputs of AUX 2 and AUX 3 are colour coded red and yellow within the DIAG+ software. These colours then match the twin identifiers of the cables below.

Auxiliary connection cables

To use the full auxiliary twin functionality of the "Premium AUX" product, the following cables can be used.

- › 814 028 xxx series
- › 814 012 2xx series
- › 814 039 001

Programming Premium AUX

Programming of AUX 2 and AUX 3 on Premium AUX is only possible using DIAG+ V6 or later.

The 'AUX configuration' screen shows the various auxiliary connections that can be used.

- › AUX 1
- › AUX 2 Red
- › AUX 2 Yellow
- › AUX 3 Red
- › AUX 3 Yellow
- › AUX 4
- › AUX 5



814 028 xxx series



814 012 2xx series



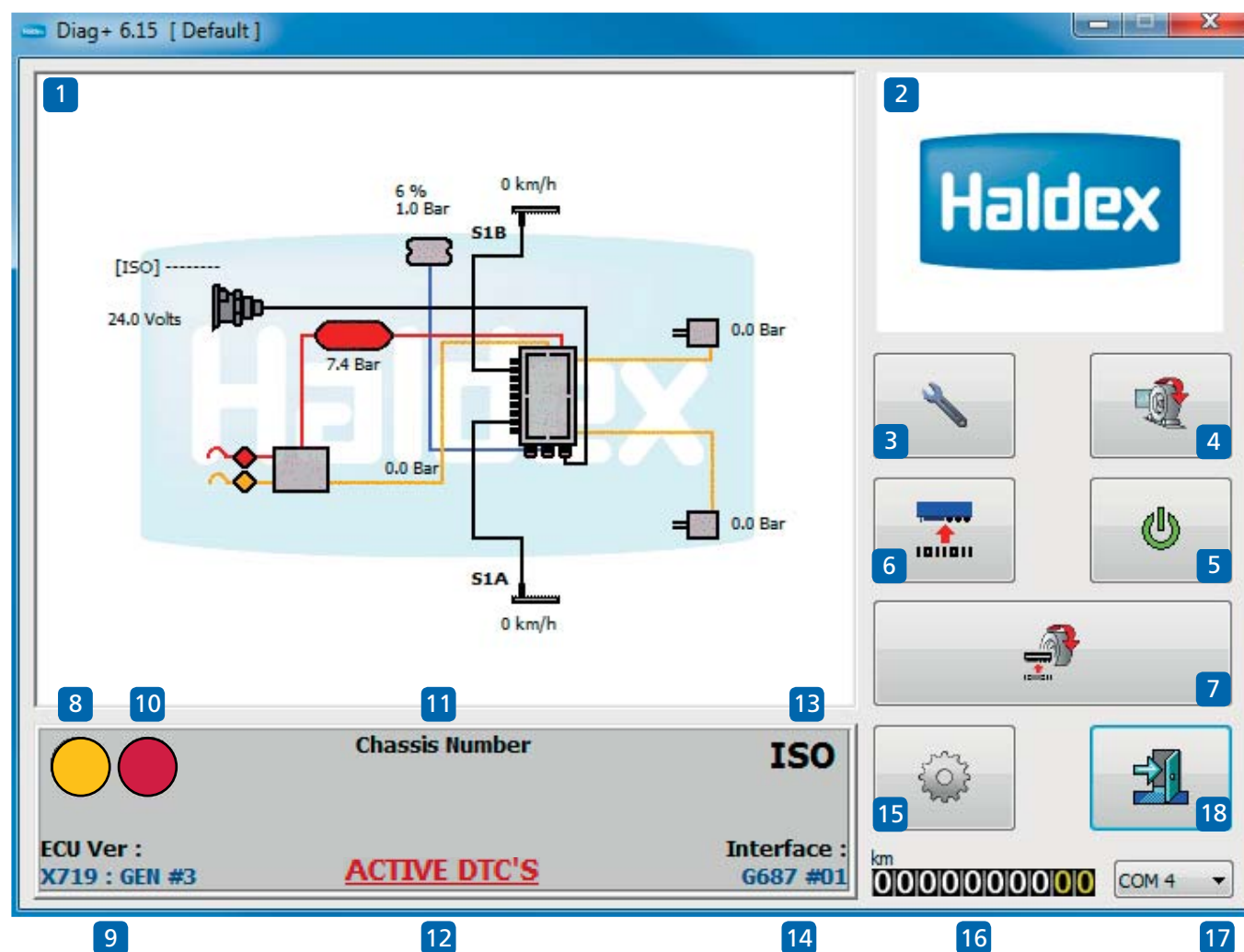
814 039 001

Super AUX

Clicking on the drop down arrow displays a list of options that can be selected on that auxiliary. Premium AUX example

- › AUX 2 (red AUX) COLAS®
- › AUX 2 (yellow AUX) ILAS®-E front
- › AUX 3 (red AUX) Service lamp
- › AUX 3 (yellow AUX) Stability lamp

Home screen



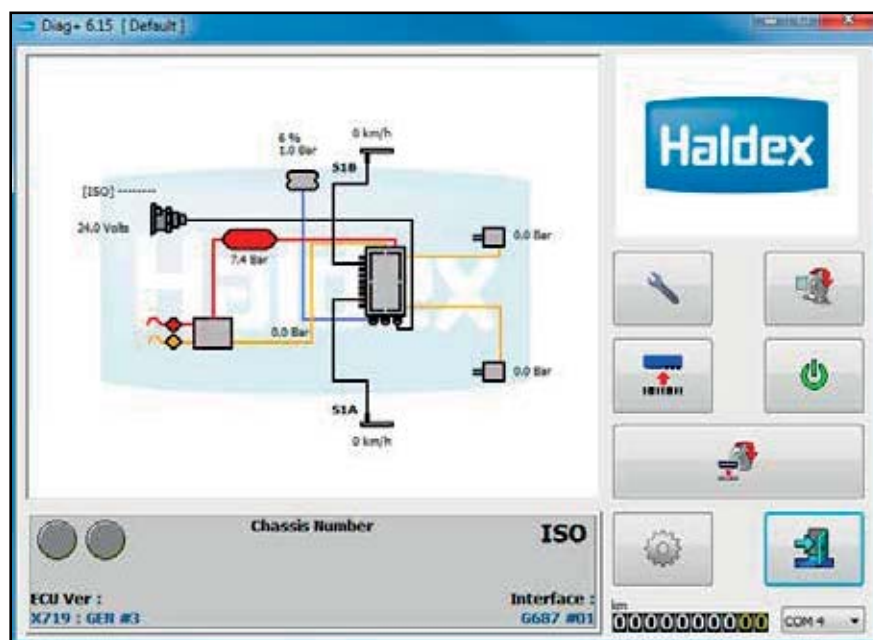
Enter into the DIAG+ program by the short-cut icon created on your desktop.

Understanding the home screen display

01	Browser window (e.g. EB+ Gen3 system layout)	10	System warning lamp
02	Video screen	11	Chassis number
03	Service	12	Shows active diagnostic trouble codes
04	'End-of-line Test' (EOLT) procedure	13	Power source indicator
05	Reset the ECU	14	Interface version number
06	Read, setup and program the ECU	15	Options
07	Automated EOLT (option)	16	Odometer reading (total distance)
08	System information lamp		Trip 1 odometer & trip 2 odometer
09	ECU software version number	17	PC connection port indication
		18	Exit the DIAG+ program

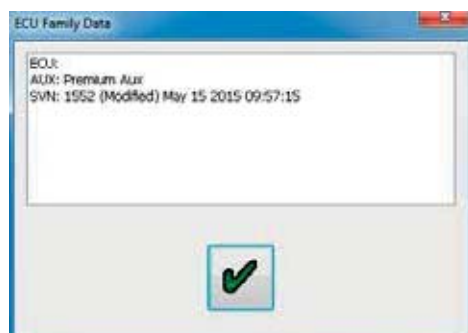
Connected ECU and dongle information

- › Click on the ECU software version number to display the type of ECU that is connected.
- › Click on the interface version number to display the connected dongle data.



[Click to display the connected ECU data \(ECU Ver\)](#) - [Click to display dongle data \(Interface\)](#)

ECU connected example.



Dongle connected example.



Reading EBS pressures, speeds and voltage

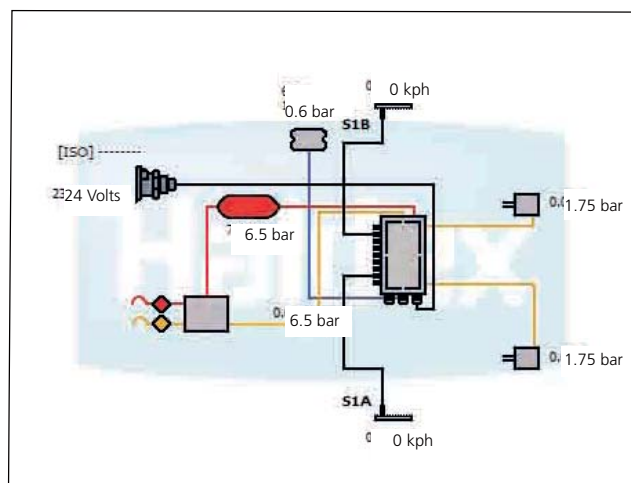
Connect emergency and service pressure lines.

Observe the values of the system pressures and voltage on the browser window displayed on the schematic of the EB+ system.

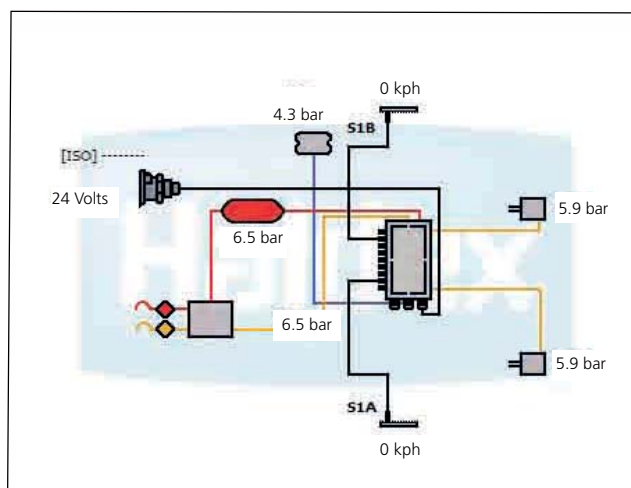
Example:

The following should be displayed.

- › Pressure values are from the load plate data for an unladen trailer. The reservoir pressure is shown as 6.5 Bar minimum, but can be whatever is used in the workshop



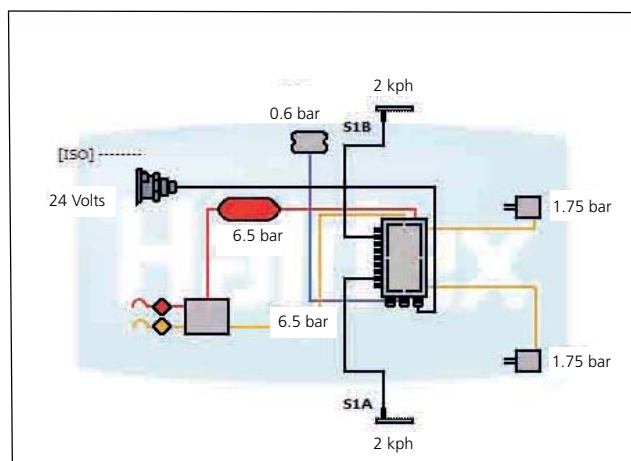
- › Pressure values are from the load plate data for a laden trailer



- › Wheel speeds will be displayed.
On rotation of the sensed wheels, the speed value will be displayed

Example:

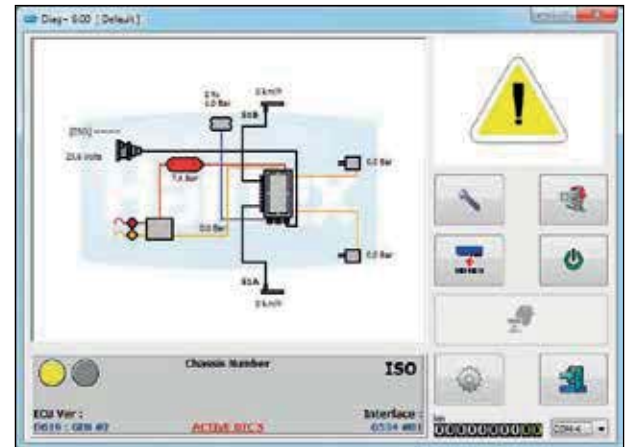
1 rev / 2 sec (30 rpm) ~ 4 kph for 80 tooth
5 kph for 90 tooth
6 kph for 100 tooth



Secondary main screen display

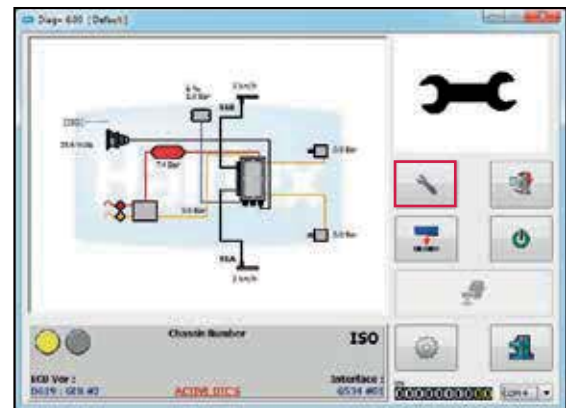
A flashing 'warning' symbol indicates a system warning.

This alternates with the following symbols:



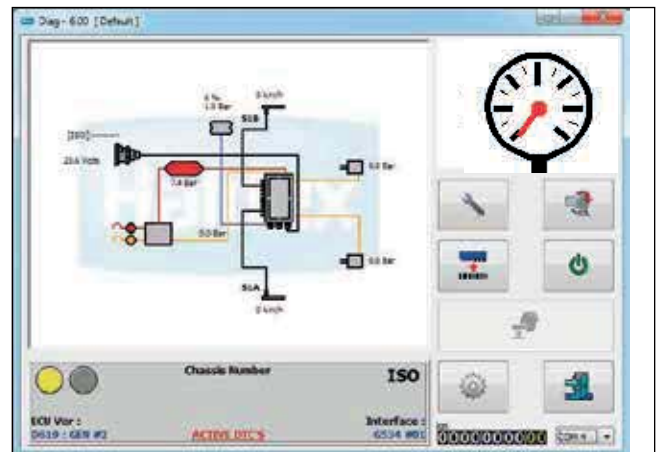
A flashing 'spanner' symbol. This indicates presence of an 'active' diagnostic trouble code

Click on the  button to read / delete DTC.




A flashing 'gauge' symbol. This indicates the reservoir pressure is below 4.5 bar or above 9.8 bar

Note: End of line test reservoir pressure requires to be 1 bar above laden brake output pressure to the trailer.



Basic diagnostics (service menu)


Trailer warning lamp “on”


Click on the  button to reset the ECU and wait 10 seconds before proceeding.

Observe the trailer warning lamp.

The warning lamp should display what has been set in the 'lamp setting' section of the ECU Setup.

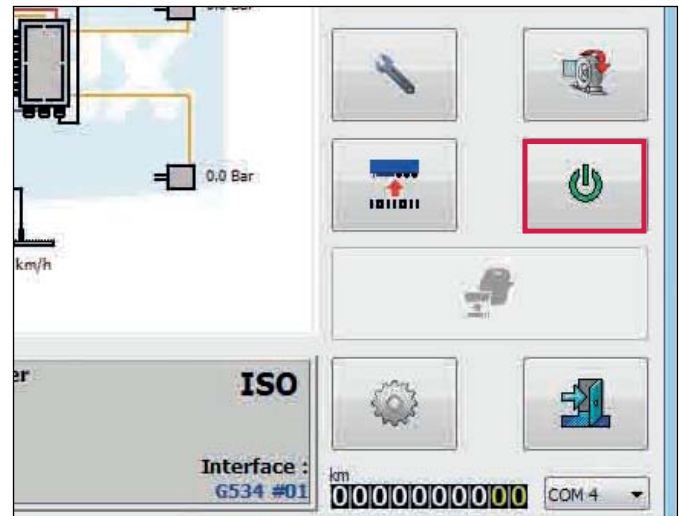
Note: If the trailer warning lamp comes 'on' and stays 'on' there are diagnostic trouble codes (DTC) present which need to be cleared or the system air pressure is below 4.5 bar.

Click on the  button on the main screen then

Click on the  button on the service menu to show any stored DTC's.


If there are no DTC's detected the following screen will appear.

Click on the  button to accept and exit.




Reading DTC's

Click on the  button on the main screen.

Click on the  button on the service menu to show any stored DTC's.



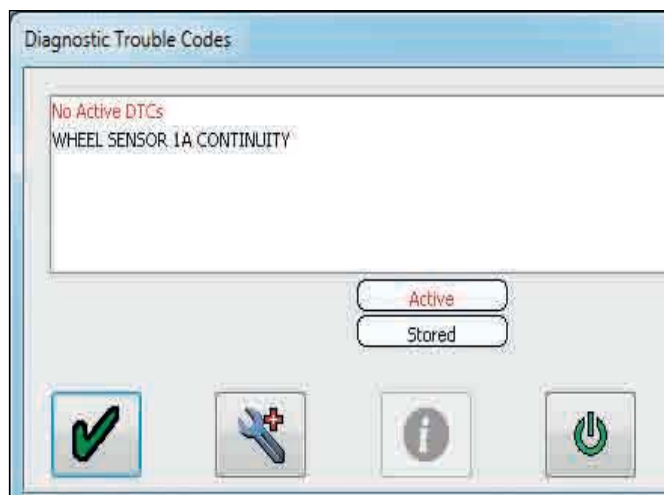
Any active DTC will be displayed in red (e.g. Wheel Sensor 1A Continuity).

Repair the active DTC and reset the ECU by pressing the  button or switch 'off' then 'on' the power to the ECU.




If there is no active DTC, it will display 'no active DTC's' in red.

Any repaired DTC will transfer into the ECU memory (i.e. stored DTC).



Deleting stored DTC's


All stored DTC's can be deleted.

Click on the  button to delete the stored DTC.


ECU deleting the stored DTC.

No active & no stored DTC's present.

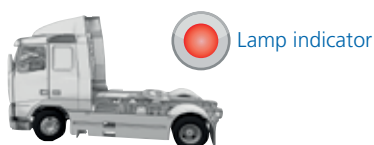
Click on the  button to exit.

Click on the  button to exit to the main menu.

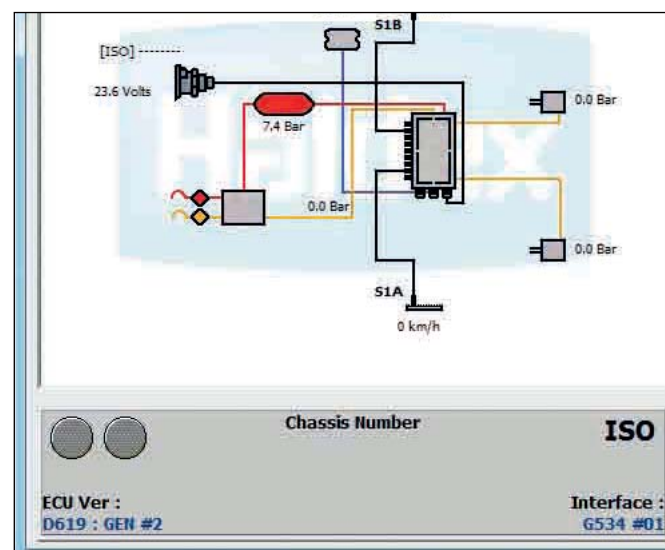
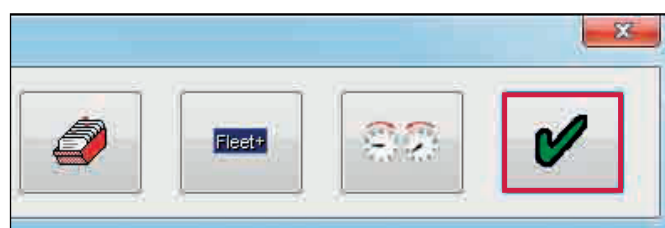
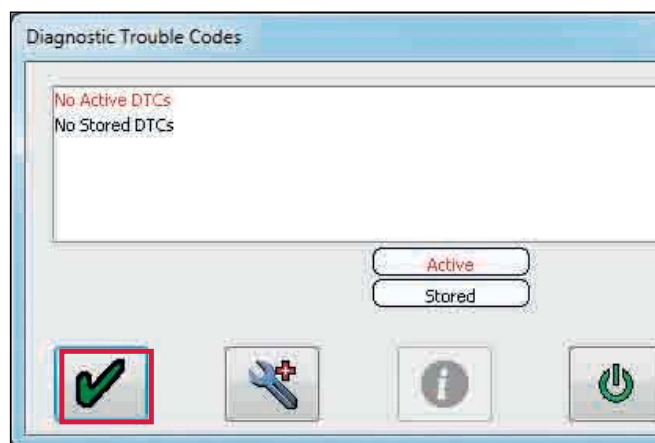
The DIAG+ main screen will appear.

Reset the ECU by clicking on the  button or switch 'off' then 'on' the power to the ECU, but do not exit the DIAG+ program.


Observe the trailer warning lamp. The warning lamp should display what has been set in the 'lamp setting' section of the ECU Setup.





Note: If the trailer warning lamp comes 'on' and stays 'on' there are DTC's present which need to be cleared as above or the system air pressure is below 4.5 bar.

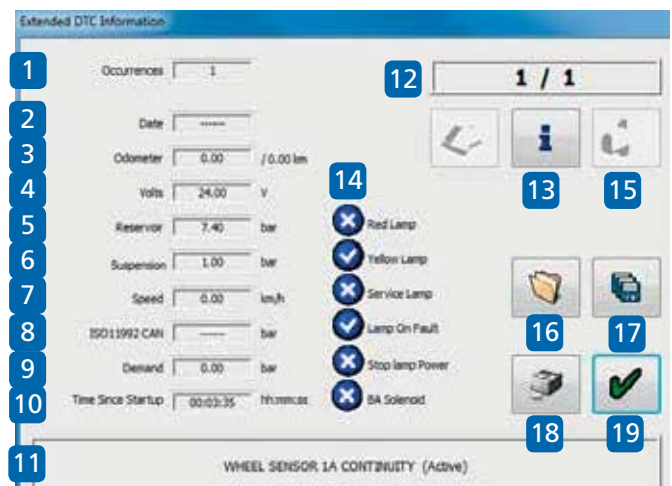
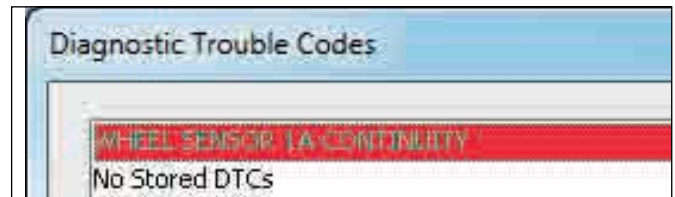



Reading extended diagnostic codes

On active and stored DTC's, double click on any DTC or click on the  button to display the extended DTC information.

Extended DTC screen display:


- › The number of times the DTC occurred (max 254 events). The event is logged every time the ECU is powered. The following data relates to the 1st time the DTC occurred
- › Date reading. Recorded when a EB+ Info Centre is installed. Updated every 10 mins. (example shows no connected EB+ Info Centre)
- › Odometer reading when fault first occurred / total distance.
- › Volts reading.
- › Reservoir pressure (full information available on ECU version A272 onwards)
- › Suspension bag pressure (full information available on ECU version A272 onwards)
- › Speed at which the DTC occurred (example shows vehicle stationary)
- › Electric control line pressure CAN lines pins 6,7 on ISO 7638 (example shows a 5 pin ISO 7638 installed)
- › Pressure reading on the service (yellow) line while braking.
- › Total time, from ECU power up, when DTC occurred
- › Description of DTC
- › Order and quantity of DTC
- › Additional DTC information
- › Status flags of signal requests and system. Refer to Haldex for further interpretation
- › Flashing icons:
 -  DTC from ECU
 -  DTC from file
- › Read extended DTC file from disc. To read this file you must enter the 'extended DTC information' screen
- › Save extended DTC file to disc
- › Print extended DTC and Exit

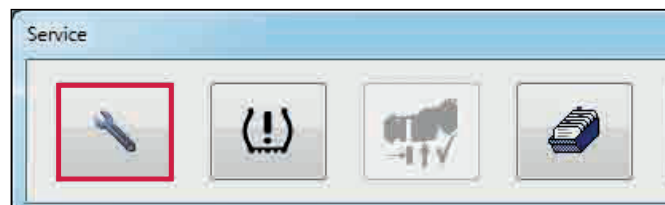


Note: Click on the  button for further detail on each diagnostic trouble code for example "Wheel speed sensor continuity".

Diagnostic trouble codes (DTC)

A full list of DTC's is available from the DIAG+ software.

To access the list click on the  button on the service menu.



Click on the  button (i.e. ECU connected).



Click on the  button.



Click on the required DTC for possible causes.

For example "wheel sensor 1A continuity"

DTC Info

DTC Code	Full name	Short name
0x01	WHEEL SENSOR 1A CONTINUITY	S1A CONT
0x03	WHEEL SENSOR 1A SIGNAL INTEGRITY	S1A SIGNAL
0x04	WHEEL SENSOR 1A OUTPUT LEVEL	S1A OUTPUT
0x09	WHEEL SENSOR 1B CONTINUITY	S1B CONT
0x0B	WHEEL SENSOR 1B SIGNAL INTEGRITY	S1B SIGNAL
0x0C	WHEEL SENSOR 1B OUTPUT LEVEL	S1B OUTPUT
0x11	WHEEL SENSOR 2A CONTINUITY	S2A CONT
0x13	WHEEL SENSOR 2A SIGNAL INTEGRITY	S2A SIGNAL
0x14	WHEEL SENSOR 2A OUTPUT LEVEL	S2A OUTPUT
0x19	WHEEL SENSOR 2B CONTINUITY	S2B CONT
0x1B	WHEEL SENSOR 2B SIGNAL INTEGRITY	S2B SIGNAL
0x1C	WHEEL SENSOR 2B OUTPUT LEVEL	S2B OUTPUT
0x21	REMOTE VALVE SENSOR	REMOTE VALVE SENSOR
0x22	REMOTE VALVE MODULATOR	REMOTE VALVE MODULATOR
0x23	REMOTE VALVE CABLE	REMOTE VALVE CABLE
0x24	REMOTE VALVE SLOW RECOVERY	REMOTE VALVE SLOW RECOVERY
0x29	AUX 1	AUX 1
0x2A	AUX 1	AUX 1
0x2B	AUX 1	AUX 1
0x2C	AUX 1	AUX 1

Open or short circuit in the wiring to wheel speed sensor.

Check the electrical connectors for correct installation and for corrosion, also check the wiring for damage and possible scuff marks.

If the failure occurs at first start-up, please check:

- > Is ECU programming in accordance with the wheel sensor configuration (2 or 4 sensors)?
- > Is the sensor extension cable linked to the correct ECU port?
- > Is the wheel speed sensor correctly connected to the sensor extension cable?

If the above is OK, check wheel speed sensor and the extension cable (Multimeter):

- > Is an alternating current output voltage generated by the wheel speed sensor (multimeter)?
- > Is the resistance of the sensor in the permissible area ($> 1.0 < 2.4 \text{ k}\Omega$)?
- > Is there a short circuit possible in the wiring?

If no failure is detected check the internal ECU control circuit:

- > Connect the plug of the defective side (e.g. S1A) to the ECU port of the opposite side (in this case S1B), and the plug S1B with the port S1A. Reset ECU and clear all DTCs.
- If the initial DTC is displayed again then the ECU is faulty.
- If a different DTC is monitored (instead of S1A... -> now S1B...) the sensor extension cable or the sensor is faulty. In this case repeat the tests above.
- > After this test don't forget to RESET the original configuration!!

After repairing in all cases run the EOLT!

Position of the wheel speed sensor in the driving direction:
For all configurations (ECU right/left) and systems (1M/2M/3M)

1st sensed axle:
S1A = left / S1B = right

Tyre pressure monitoring system (TPMS)

TPMS component references

Receiver control unit (RCU)

The RCU receives sensor information, determines the system status and sends it to the EBS via the trailer CAN.



Part number 815052001

Wheel unit sensor (WUS)

The WUS measures the pressure and temperature inside the tire and transmits all the measurements by RF to the RCU.

TPMS trigger

The trigger is used to force the WUS to transmit its identification code (ID) to the RCU.



Part number 042727209

There are two modes of operation:

› Functional Mode

This is the operating mode of the WUS, all WUS functions are available.


› Test Mode

The WUS is shipped in Test Mode to save the battery capacity.



Part number 815053001

To open TPMS

Click on the  button on the DIAG+ main menu.

Click on the  button.

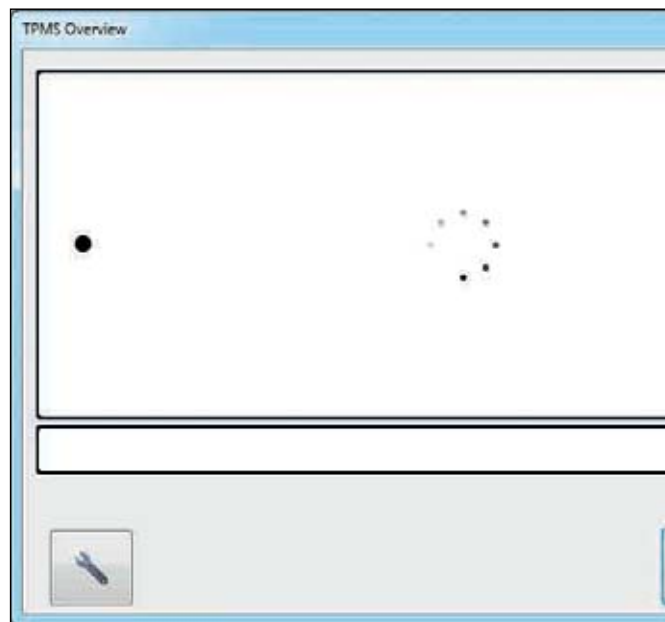


TPMS setup dialogue screen

TPMS initial setup

Note: Before entering the TPMS section of DIAG+ for the first time (i.e. initial setup) ensure that the TPMS RCU is connected to the EB+ ECU and the power is switched 'on'.

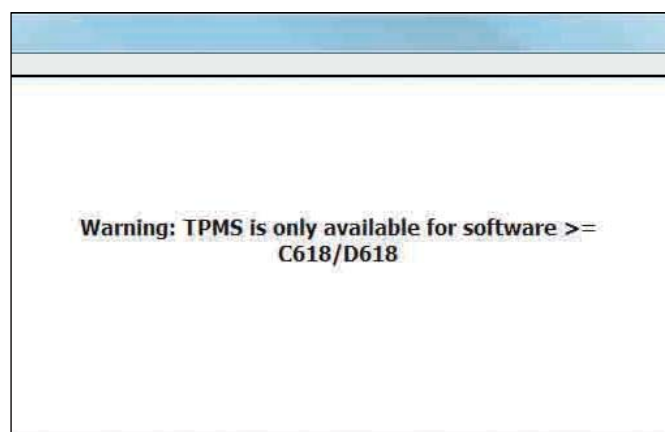
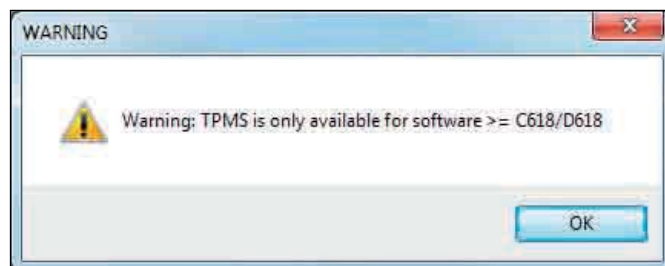
When the overview screen opens DIAG+ reads the configuration information.




Warnings

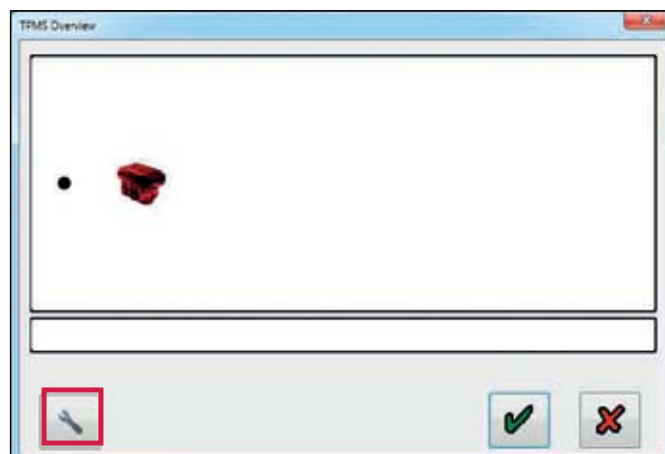
If the EB+ software does not support TPMS then a warning dialogue is shown to the user.

TPMS is only available for software later than revision number 618.



This screen shows that an RCU is connected, but the EB+ has not yet been configured for a TPMS RCU.

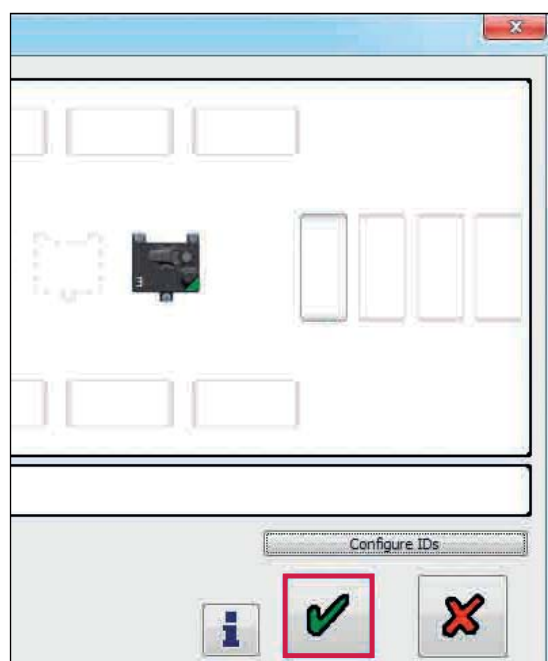
Click on the  button (spanner) to configure a TPMS RCU.




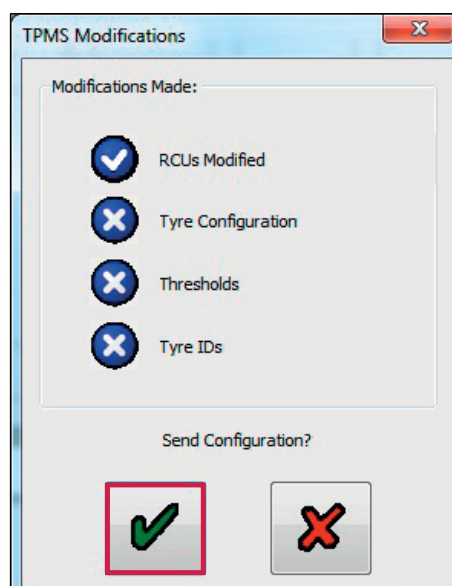
Note: If an RCU is to be added to the system then it needs to be connected to the EB+ ECU prior to entering the setup screen. It is then shown with a green triangle in the corner.

Up to 3 RCU's can be added to the TPMS system.



Click on the  button to configure.



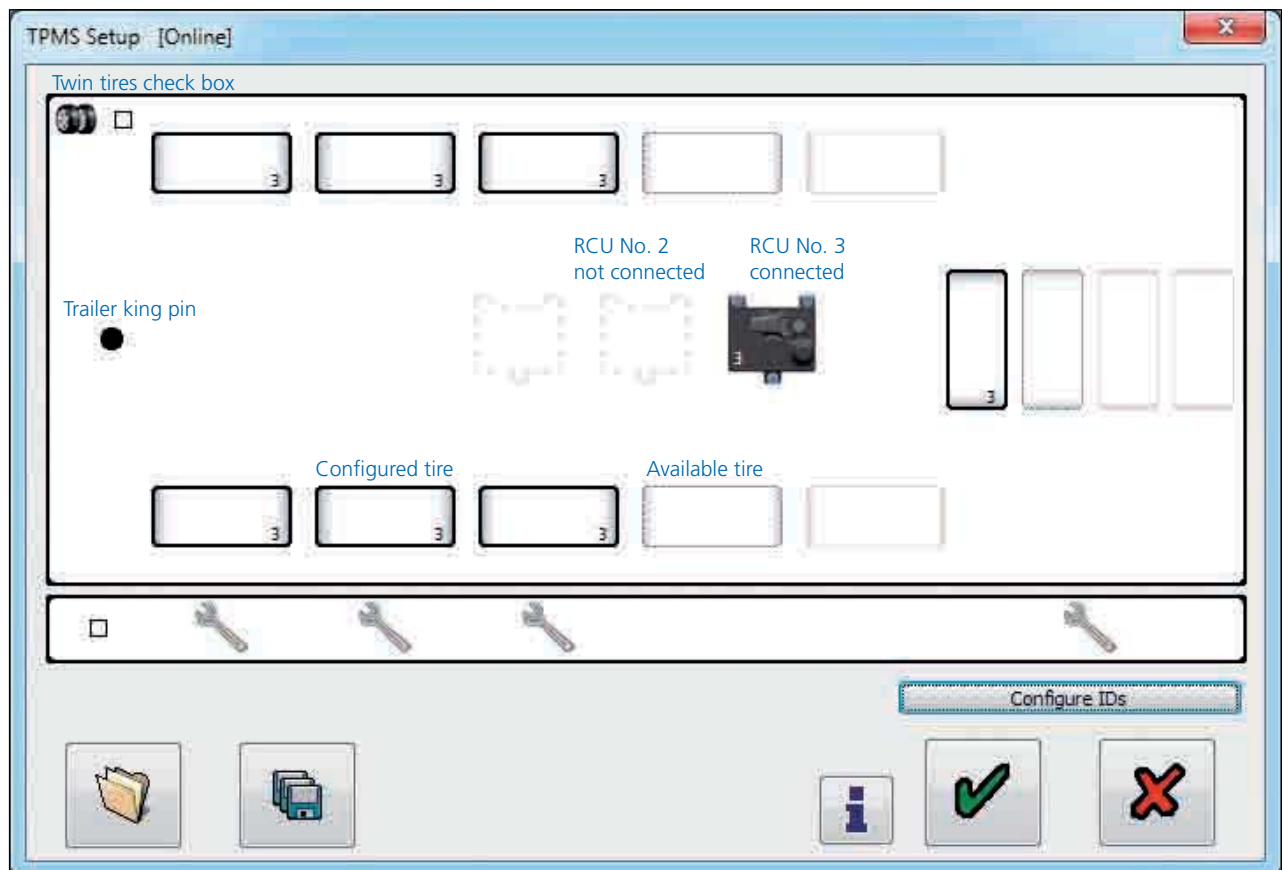
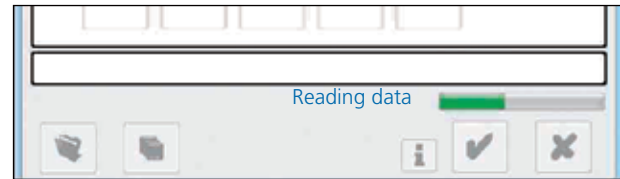
Click on the  button to add the RCU to the EB+ configuration.



TPMS setup dialogue

Click on the  button then click on the  button to enter into the TPMS setup dialogue screen.

On entry, any data not yet read from any connected RCU is retrieved.



The diagram allows the user to see all possible tire locations.

- › Configured tires are shown with a bold outline
- › TPMS axles to be configured from the front (i.e. nearest to the king pin) to the rear of the trailer, with no gaps
- › Spare tires to be configured from the front (i.e. nearest to the king pin) to the rear of the trailer, with no gaps
- › Available tires have a thin dashed outline
- › Unavailable tires have a dotted outline

The RCUs are shown in the centre of the screen.

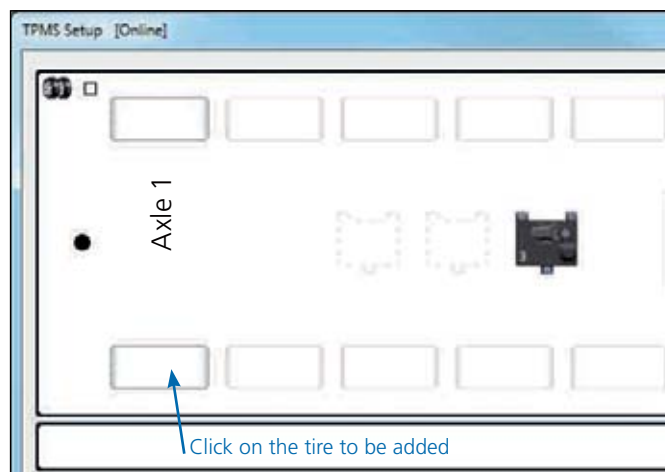
- › RCUs that are connected are shown as pictures
- › RCUs that aren't connected are shown with a dashed outline

Adding and configuring a tire

The tires on the axle which is nearest to the king pin will always be added first (i.e axle no. 1)

Step 1:

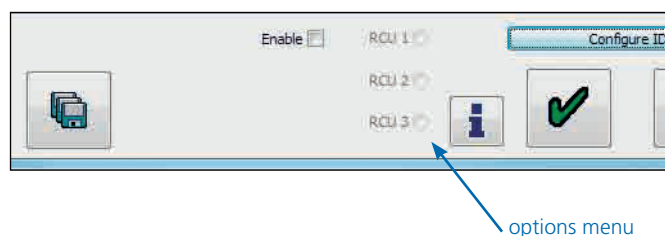
RCU connected but no tires configured.
Click on the first tire to be added.



Step 2:

Clicking on the tire opens the options menu.

The selected tire will be flashing.



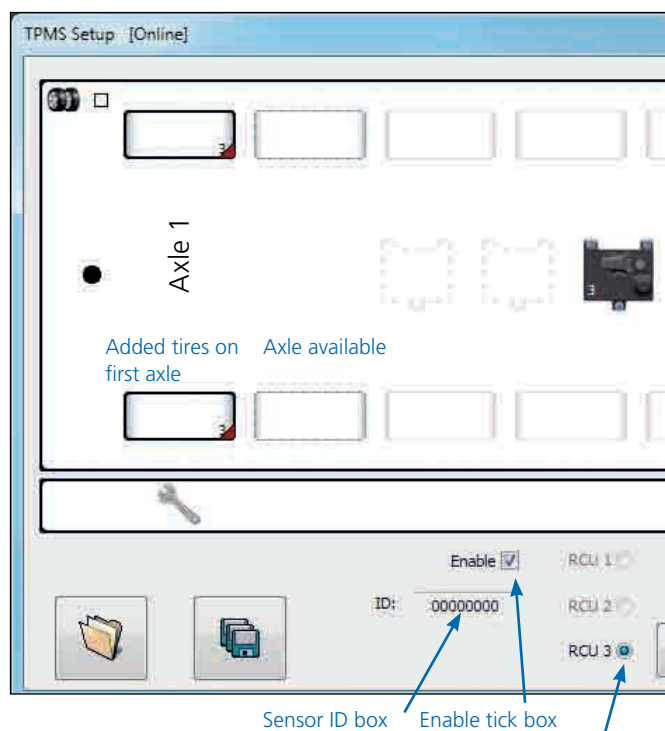
Step 3:

Click on the enable tick box to add the tire.

Note: The opposite tire (i.e. tire across the axle) will also be enabled when the enable tick box is selected.

The enabled tire will now show the RCU number to which it is connected (i.e. RCU 3) and a red corner indicating that no ID has been set for that tire.

The first axle is now enabled and the next axle is now available.



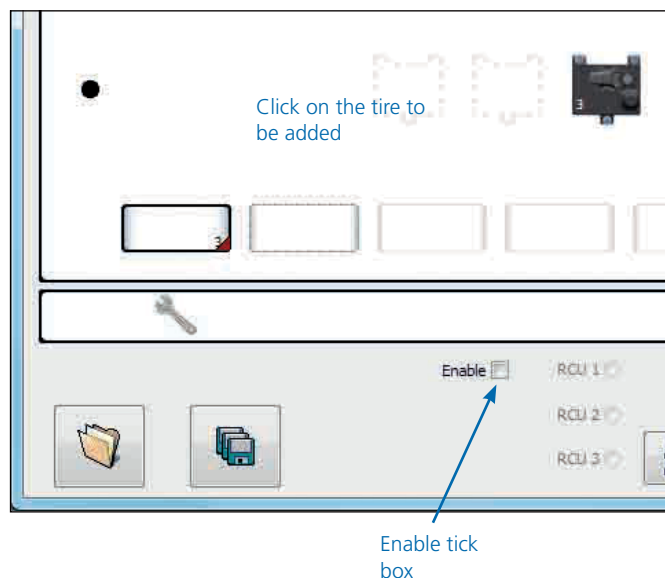
Step 4:

Select the next tire to be added.

The selected tire will be flashing.

Clicking on the tire opens the options menu.

Click on the enable tick box to add the tire.

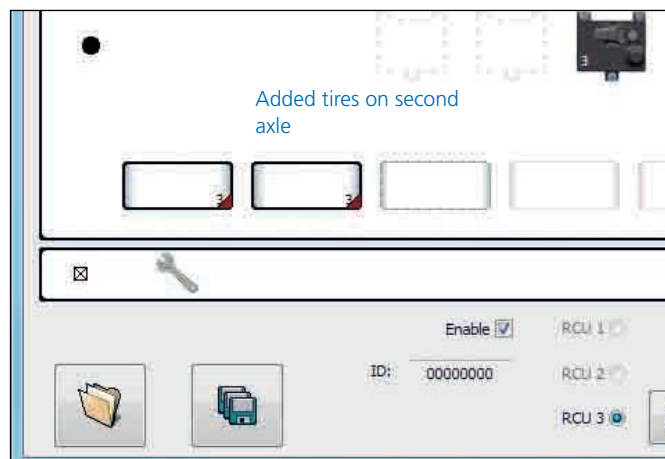


Step 5:

The second axle is now enabled and the next axle is now available.

Note: The opposite tire (i.e. tire across the axle) will also be enabled when the enable tick box is selected.

The enabled tire will now show the RCU number to which it is connected (i.e. RCU 3) and a red corner indicating that no ID has been set for that tire.



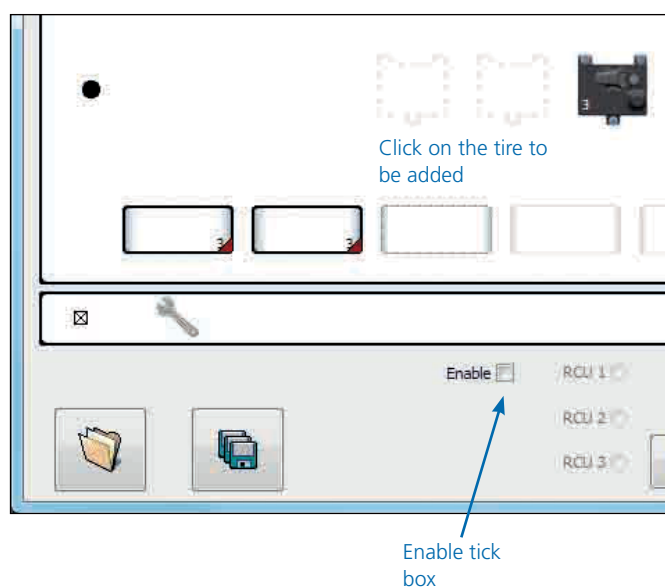
Step 6:

Select the next tire to be added.

The selected tire will be flashing.

Clicking on the tire opens the options menu.

Click on the enable tick box to add the tire.

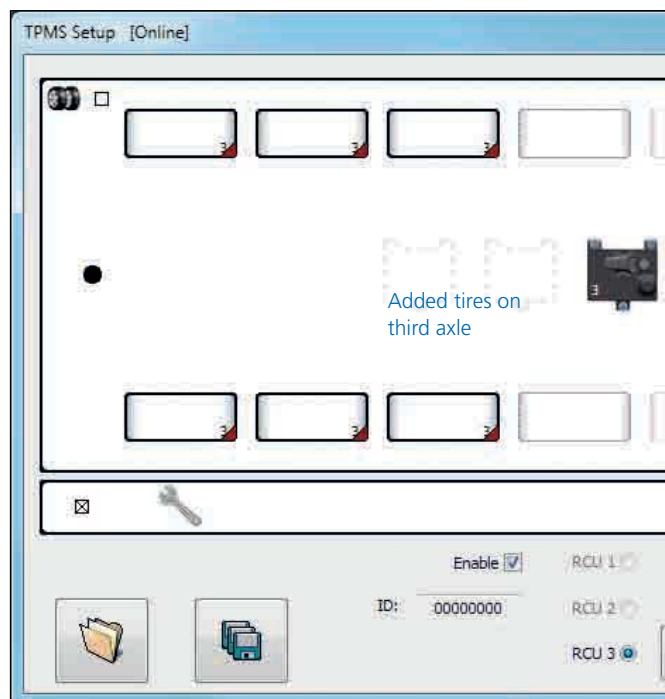


Step 7:

The third axle is now enabled.

Note: The opposite tire (i.e. tire across the axle) will also be enabled when the enable tick box is selected.

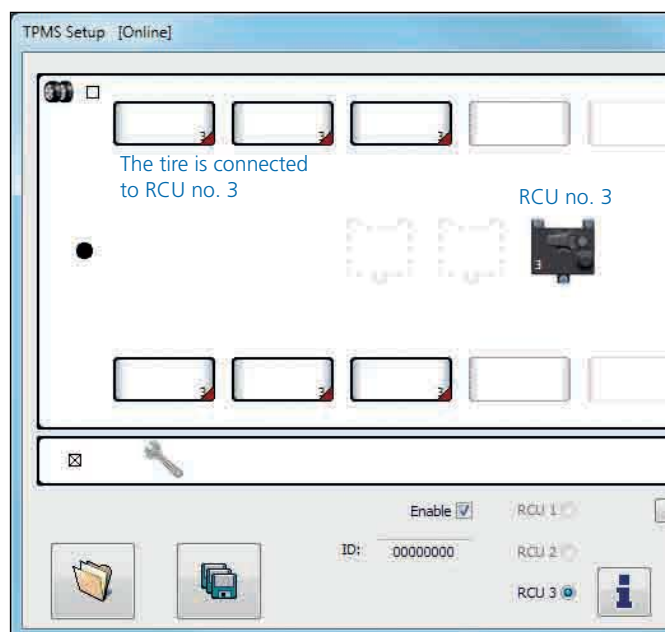
The enabled tire will now show the RCU number to which it is connected (i.e. RCU 3) and a red corner indicating that no ID has been set for that tire.



Each configured tire displays the RCU number to which it is connected.

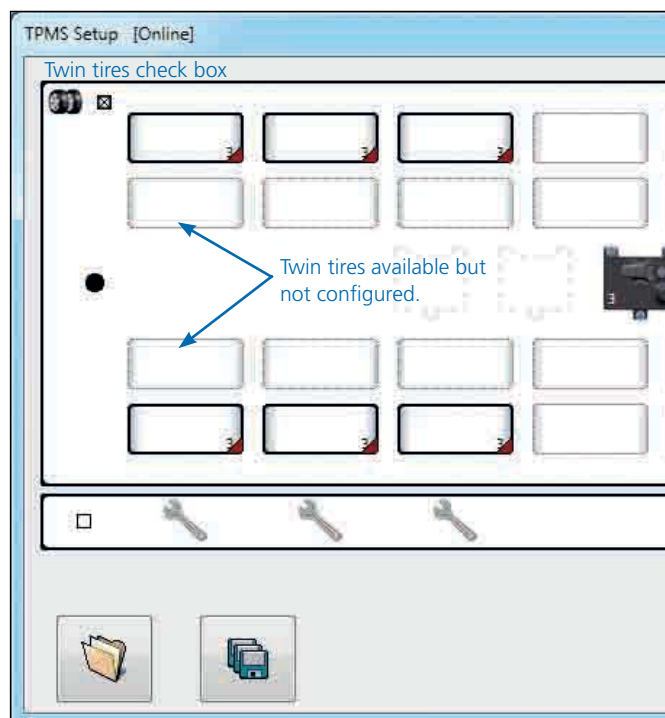
Alternative tire selection method

Using your mouse, you can also "right click" to enable or disable any configured or available tire on the TPMS setup dialogue screen.

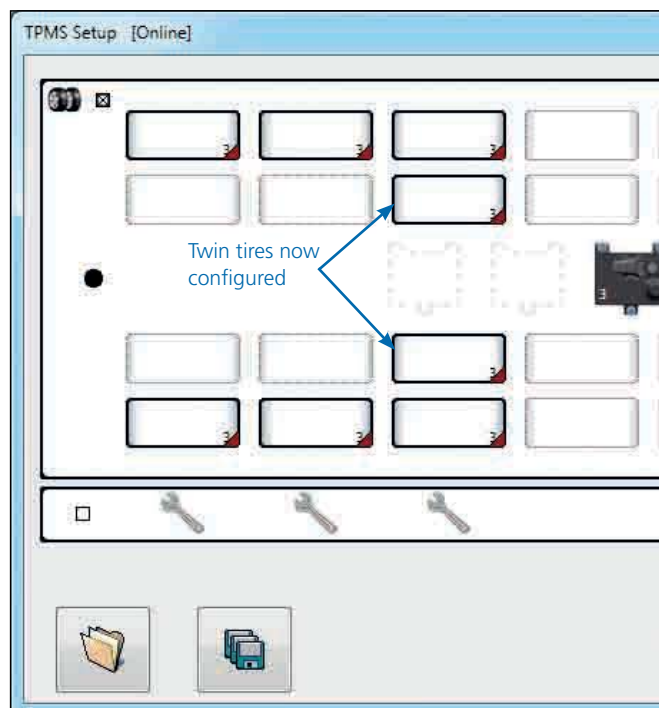


Trailers with twin tires

If the trailer has twin tires then the check box in the top left of the screen can be selected to configure the inside wheels.



The tires can now be enabled.



On clicking on a connected RCU, information about the RCU is displayed at the bottom of the screen:

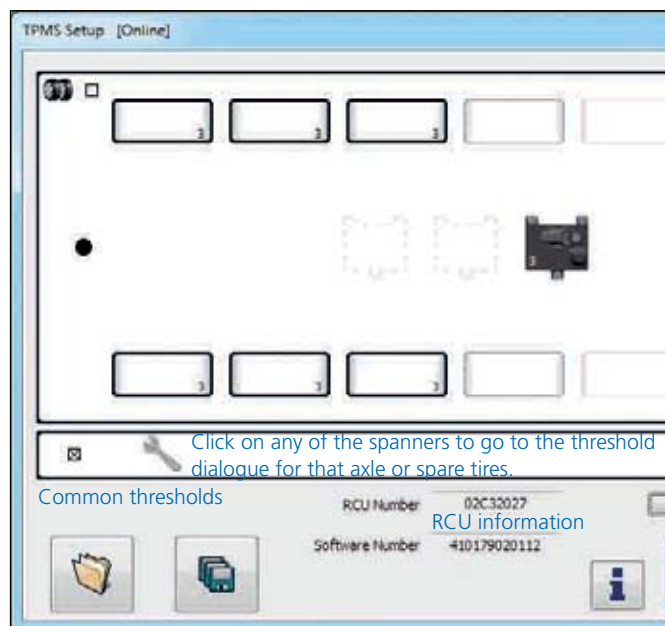
Common thresholds

If common thresholds are required for all running tires check the common thresholds box. If separate thresholds are required for each axle then uncheck the common thresholds box so that thresholds can be set for each axle independently.

- › Common thresholds 1 x spanner
- › Separate thresholds 1 x spanner for each axle
- › Spare tire thresholds Always 1 x spanner for all spare tires

Any selected tire or RCU flashes to inform the user of their selection. Any selected object can be de-selected by clicking on a blank area of the screen.


Any configured axle or spare tires will display a spanner / spanners in the information box. Clicking the spanner loads the threshold dialogue.



The dialogue title reflects which section of tires are currently being viewed / modified.


Any threshold can be enabled or disabled by checking or un-checking the 'enable' box for that threshold.

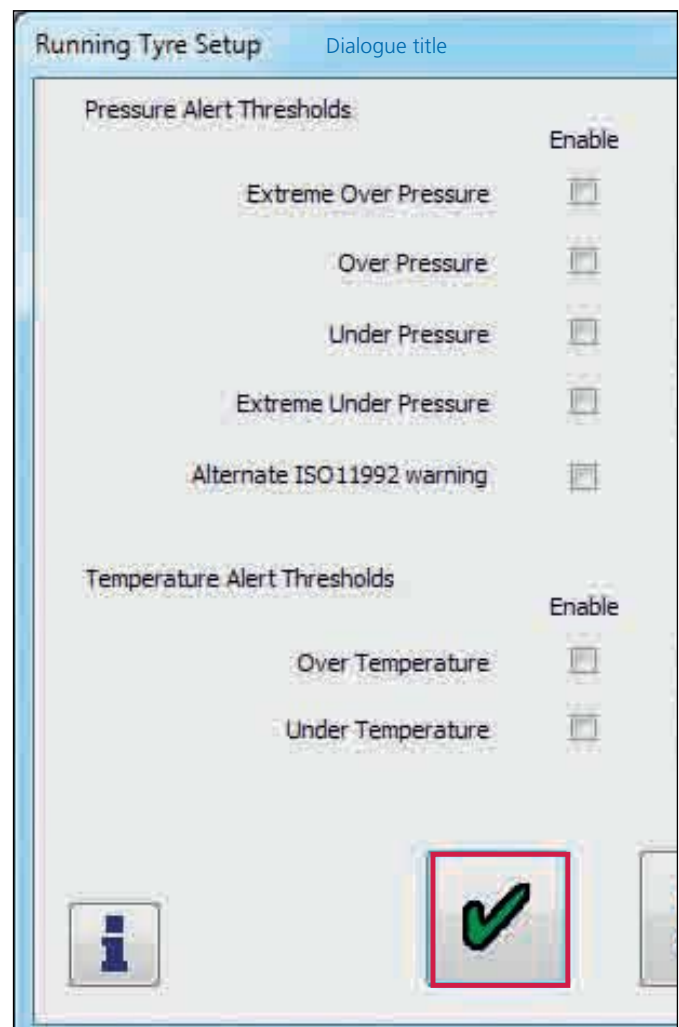
If either a temperature threshold is entered and is out of range or a pressure threshold is entered above range then on moving away from that edit box the relevant limit replaces the user-entered value. For example if the extreme over pressure value is set to 15 bar; on moving to another editable box this will be replaced by 14 (which is the highest configurable pressure). If a pressure threshold is below the valid range (i.e. 0) then on moving away from that box the 'enable' check box will become unchecked.

Click on the  button to go back to the setup dialogue with any modified data entered being lost.

Alternate ISO11992 warning:

This feature is for backwards compatibility with some vehicles and generally should not be used; when this option is enabled the worse-case tire alerts are output for every tire on the vehicle.

Click on the  button to display a new dialogue asking if the user is sure they want to send the thresholds to the RCU.

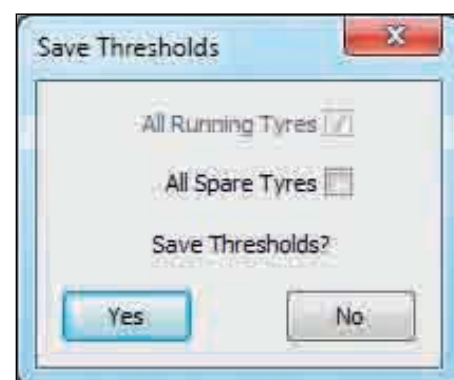


If the "All running tires" checkbox is checked then the thresholds will be sent to all configured running tires. This will be automatically selected if common thresholds have been selected in the TPMS setup screen.

If the "All spare tires" checkbox is checked then the thresholds will be sent to all configured spare tires. This checkbox will only be available if spare tires have been previously configured.

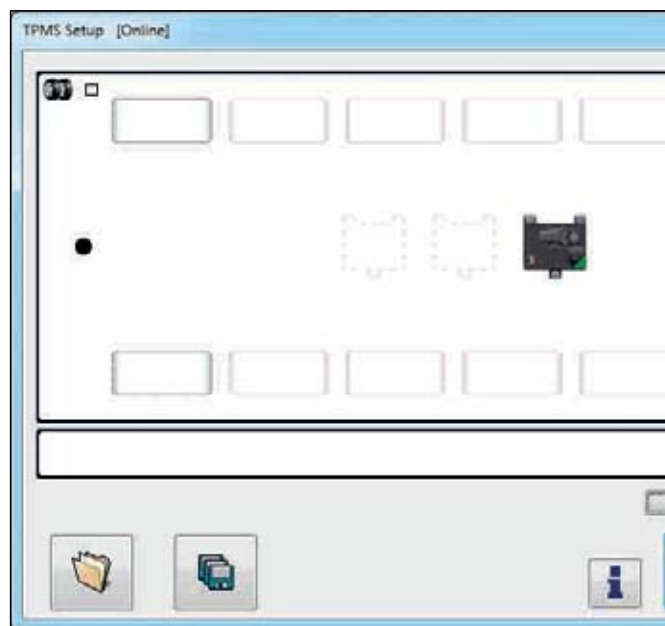
If 'no' is selected then the user is taken back to the threshold dialogue screen.

If 'yes' is selected then the thresholds are saved in memory ready to be sent to the system.



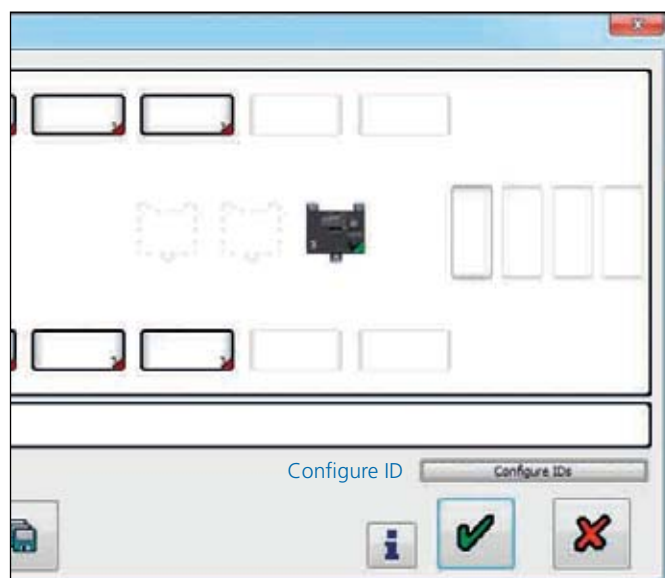
No TPMS tires have been added to the RCU configuration.

The user must add tires to the RCU before continuing.



The tires have been added to the RCU configuration.

Click on the "Configure IDs" button to add the WUS IDs to each tire.



TPMS trigger

The TPMS trigger is used to force the WUS to transmit its ID to the TPMS RCU.



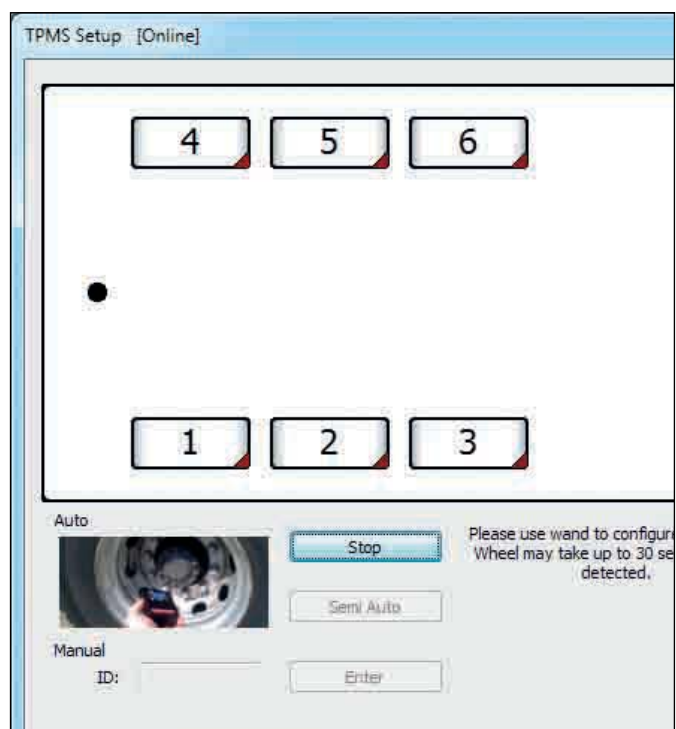
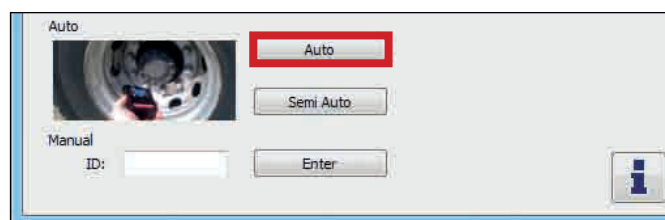
WUS configuration modes:

There are three different modes to assign the WUS ID to the tire, auto mode, semi auto mode and manual mode.


Note: The following procedures applies to both single and twin tire configurations.

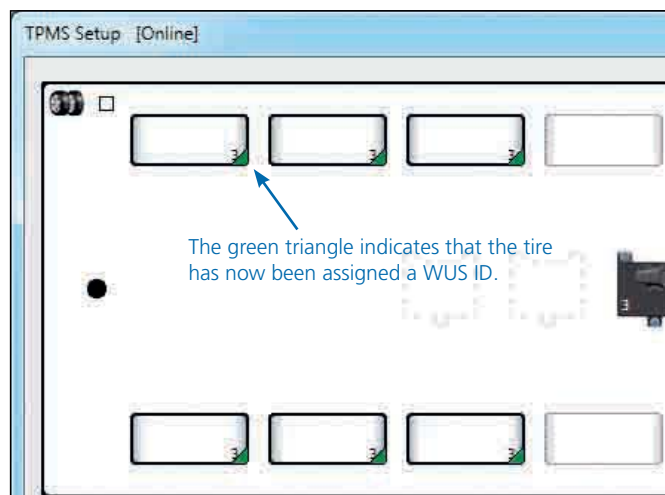
1. Auto mode

- › Step 1. Press the 'auto' button and note the order in which the tires are numbered
- › Step 2. Go to the selected wheel on the trailer
- › Step 3. Go to the wheel to configure and place the tire with the antenna of the trigger facing the tire wall at the top of the wheel. Hold down the "force" button until a blow-down can be heard (the number of blow-downs represents the axle number). If a blow-down is not heard within 30 secs, move the trigger around the wheel following the tire wall.
- › For twin wheels, unmount the outside wheels prior to doing the installation.
- › If an incorrect blow-down is heard (the number of blow-downs does not match with your axle number), stop the procedure on DIAG+, check the information and restart it from the tire you still need to configure.
- › Step 4. Move onto the next wheel.
- › Repeat steps 3 and 4 until all wheels are configured.





All TPMS configured tires have now been assigned their WUS ID's.

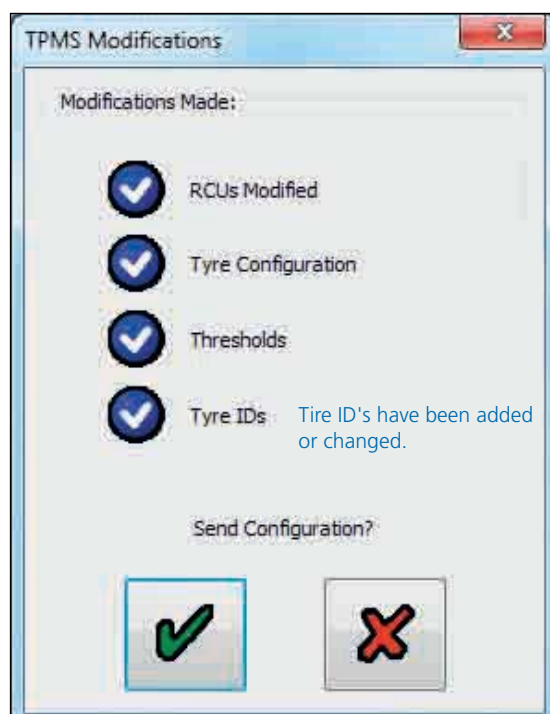
Click on the  button to continue.



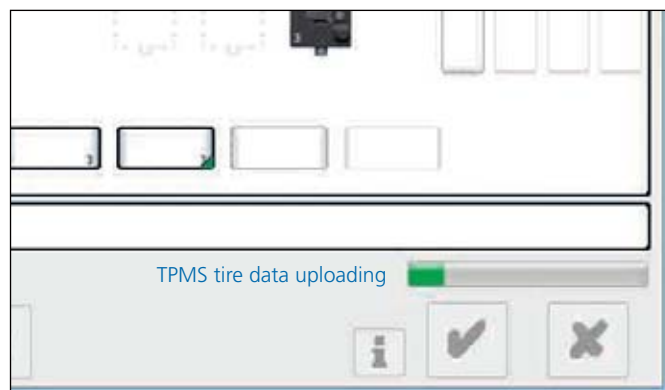
The TPMS modification screen shows which TPMS parameters have been changed, and are ready to upload to the RCU.

Click on the  button to continue to upload the new TPMS parameters to the RCU.

Click on the  button to exit back to the TPMS setup screen without uploading the modified parameters.



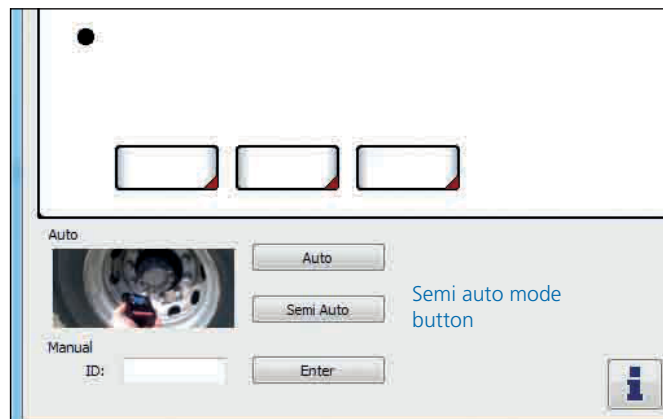
The RCU is now being updated with the changed parameters. Upon completion the user automatically returns to the 'overview screen'.



2. Semi-auto mode

Step 1. Select the first tire to configure by left-clicking it.

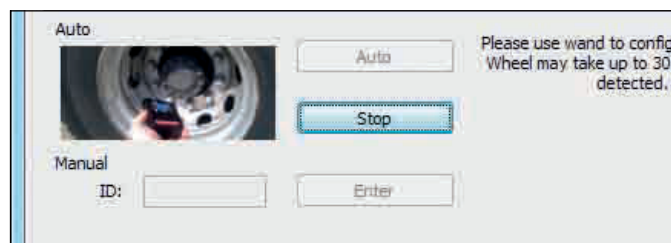
Step 2. Press the 'semi-auto' button.



Step 3. a) Go to the wheel to configure and place the tire with the antenna of the trigger facing the tire wall at the top of the wheel. Hold down the "force" button until a blow-down can be heard (the number of blow-downs represents the axle number). If a blow-down is not heard within 30 secs, move the trigger around the wheel following the tire wall.

b) For twin wheels, unmount the outside wheels prior to doing the installation.

c) If an incorrect blow-down is heard (the number of blow-downs does not match with your axle number), stop the procedure on DIAG+, check the information and restart it from the tire you still need to configure.



Step 4. a) Return to the setup screen and left-click the next tire you want to configure.

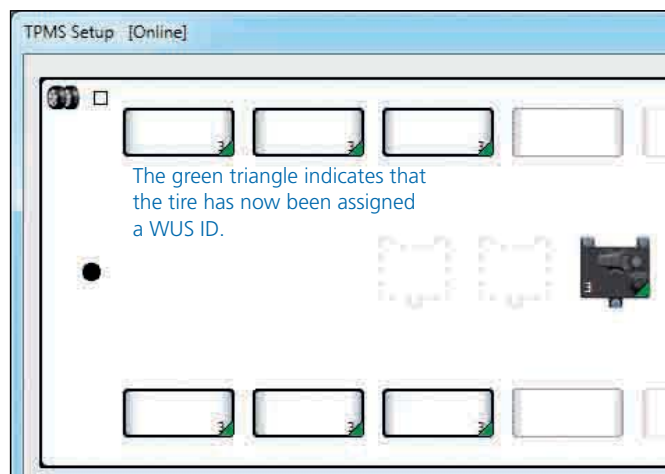
b) Repeat steps 3 and 4 until all tires are configured.

Step 5. When all tires have IDs set, press the tick button.





All TPMS configured tires have now been assigned their WUS ID's.

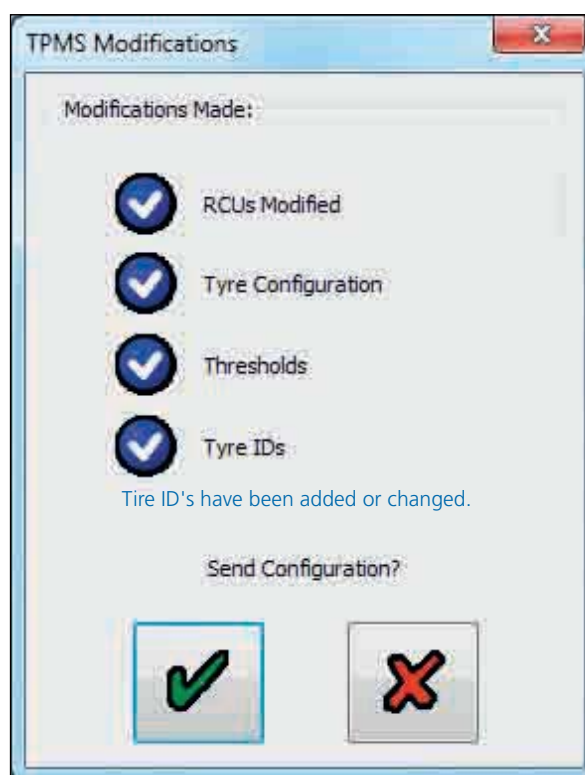
Click on the  button to continue.



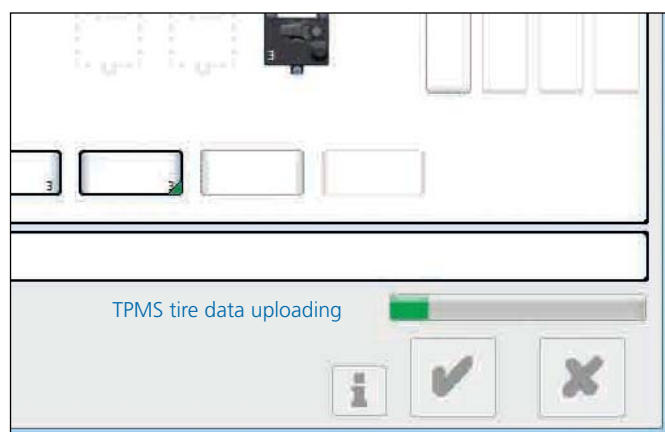
The TPMS modification screen shows which TPMS parameters have been changed, and are ready to upload to the RCU.

Click on the  button to continue to upload the new TPMS parameters to the RCU.

Click on the  button to exit back to the TPMS Setup screen without uploading the modified parameters.

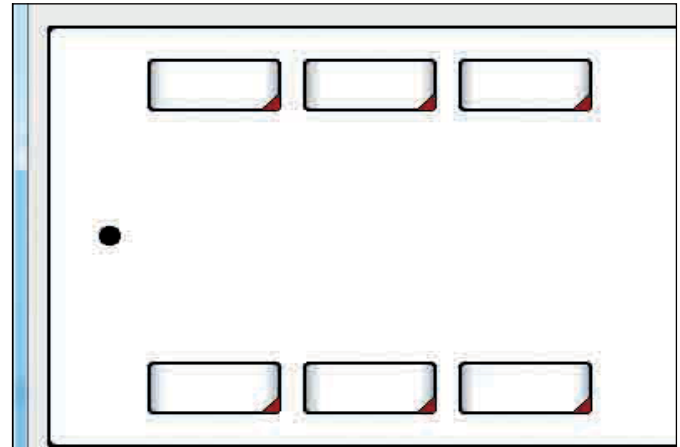


The RCU is now being updated with the changed parameters. Upon completion the user automatically returns to the 'overview screen'.



3. Manual mode

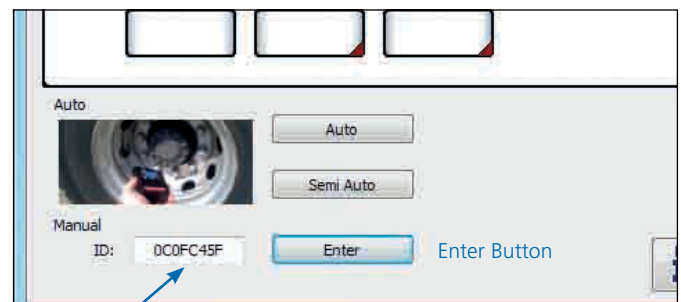
Step 1. Select the tire to configure by left-clicking it.



Step 2. Enter the WUS ID for that tire, by typing it into the ID box.

Step 3. a) Press the enter button to move onto the next wheel.

b) Repeat steps I to III until all tires are configured.

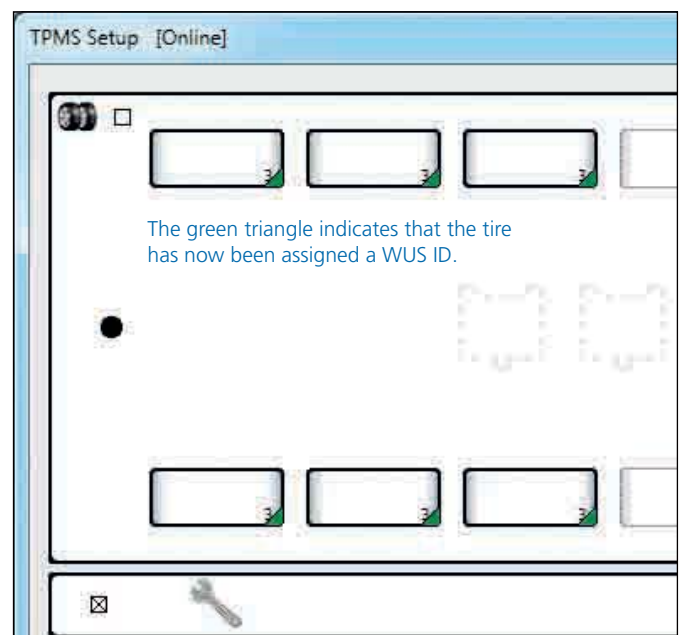


Type WUS ID in this box


Step 4. When all tires have IDs set then press the tick button.


All TPMS configured tires have now been assigned their WUS ID's.

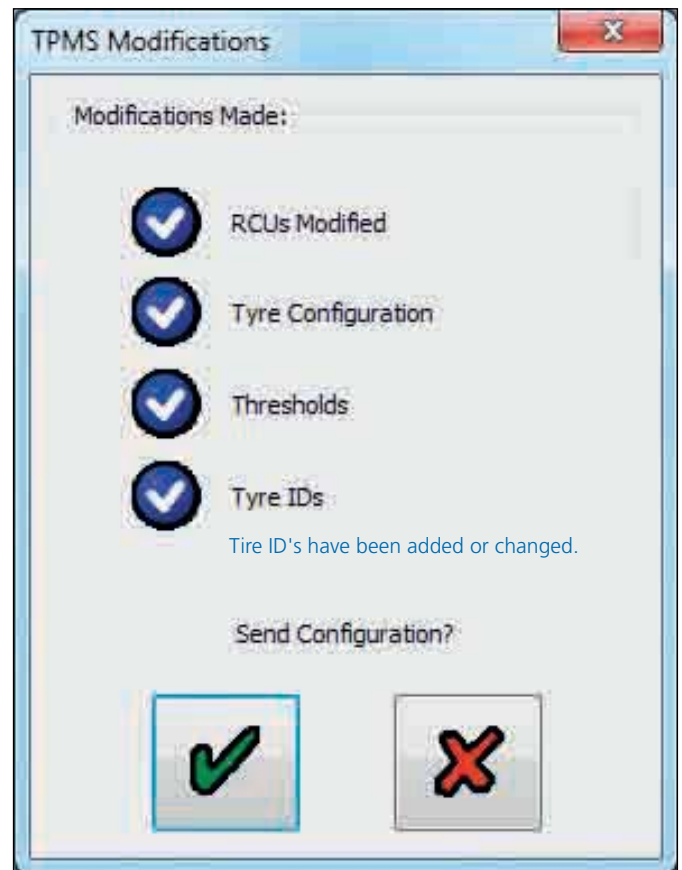
Click on the  button to continue



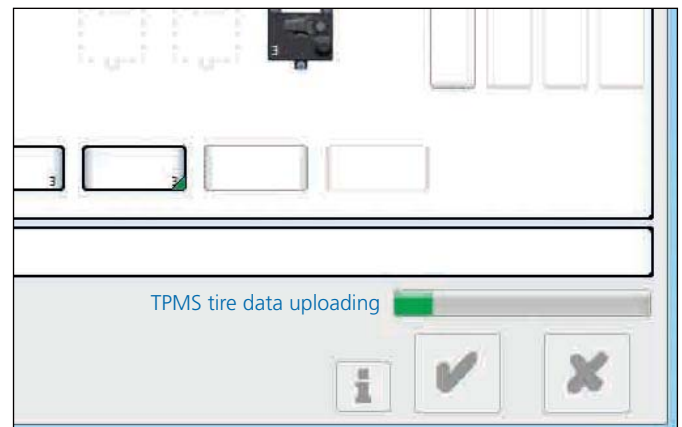
The TPMS modification screen shows which TPMS parameters have been changed, and are ready to upload to the RCU.

Click on the  button to continue to upload the new TPMS parameters to the RCU.

Click on the  button to exit back to the TPMS Setup screen without uploading the modified parameters.



The RCU is now being updated with the changed parameters. Upon completion the user automatically returns to the 'overview screen'.

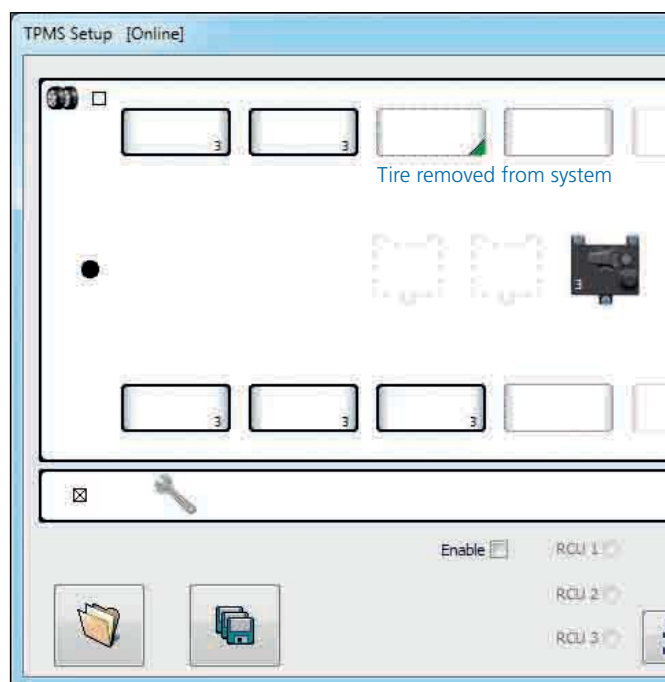
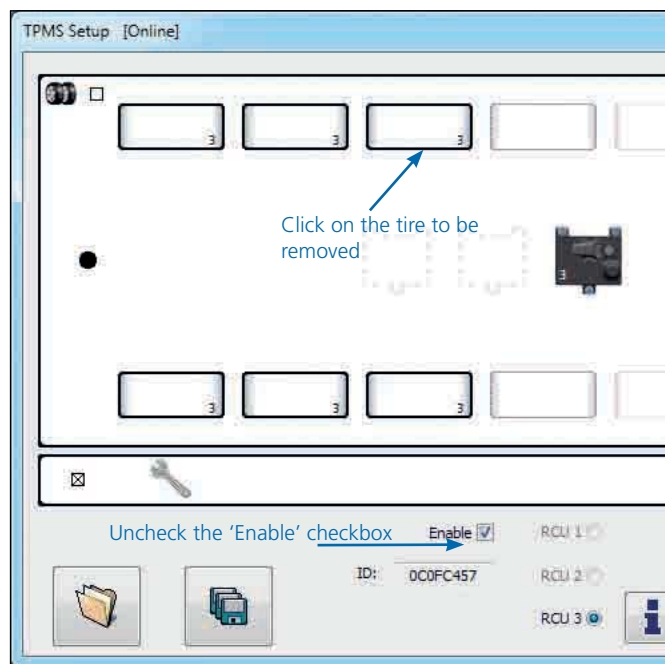


Tire removal procedure

› Click on the tire to be removed

› Uncheck the 'Enable' checkbox.

› Tire removed from system.



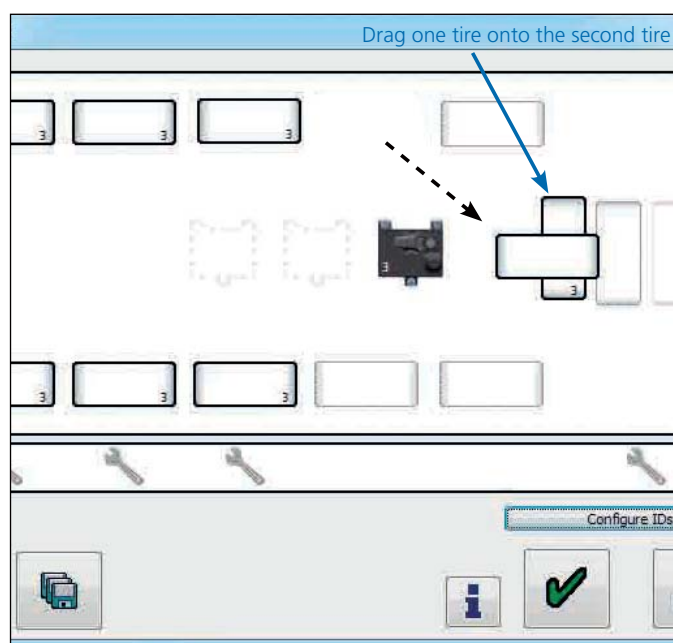
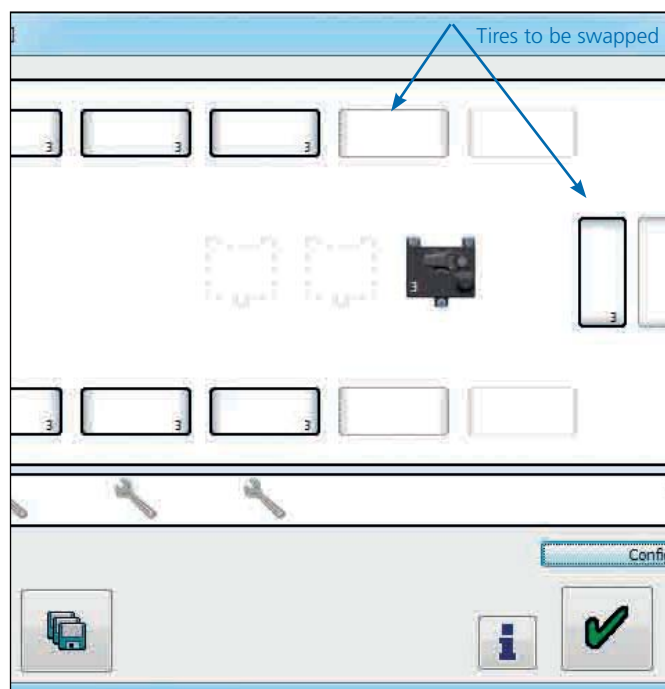
Alternative method

Using your mouse, you can also "right click" to enable or disable any configured or available tire on the TPMS setup dialogue screen.

How to swap a tire

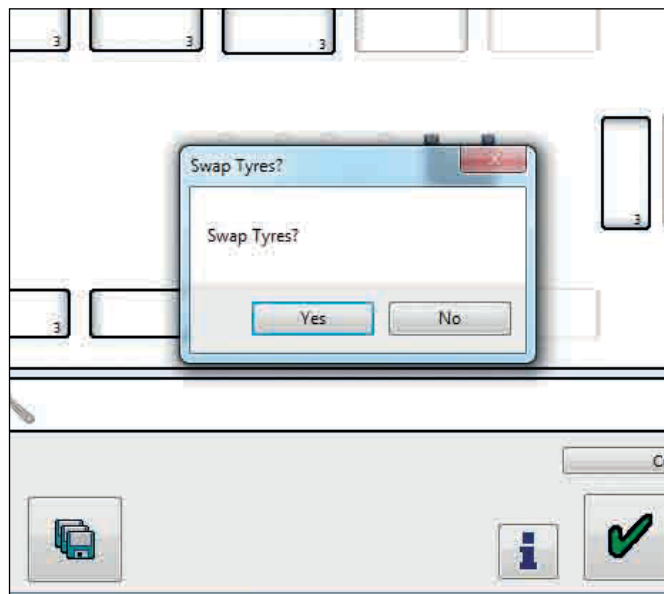
Tires can be swapped by clicking and dragging one tire onto another. To drag a tire there must be nothing currently selected. When the user lets go of the tire above another one a dialogue will ask the user if they want to swap the tires. When the dialogues are displayed the 2 selected tires move up and down to indicate which tires are about to be swapped.

Tire swap example:

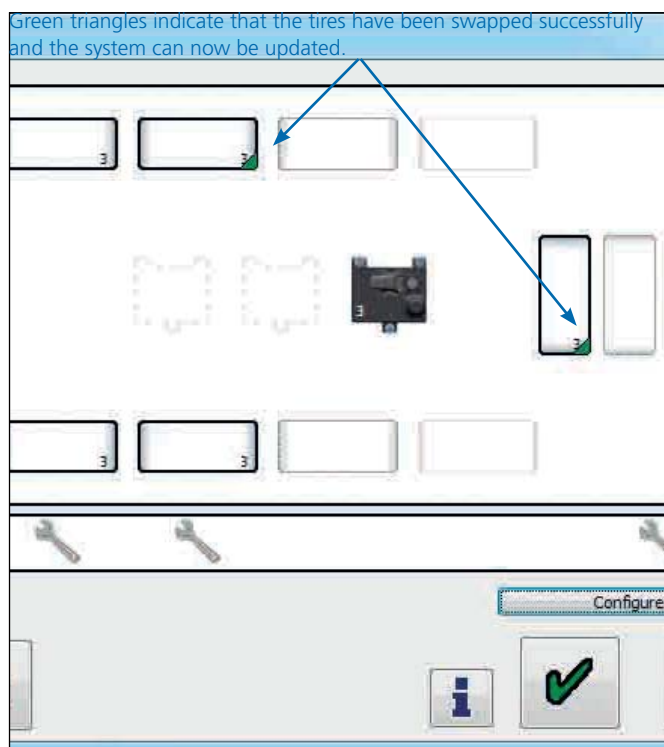


The two selected tires move up and down to indicate which tires are about to be swapped.


Confirmation is required before the tires are swapped.

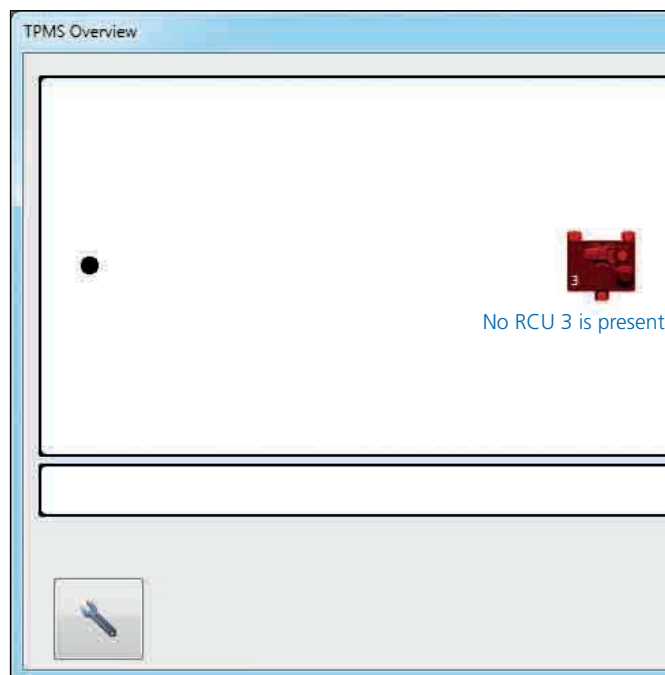


If any tire has been modified (added, removed, ID or RCU number changed) and is ok to send then a green triangle is shown in the bottom right of that tire. If it has been modified but there is an error then a red triangle is shown.



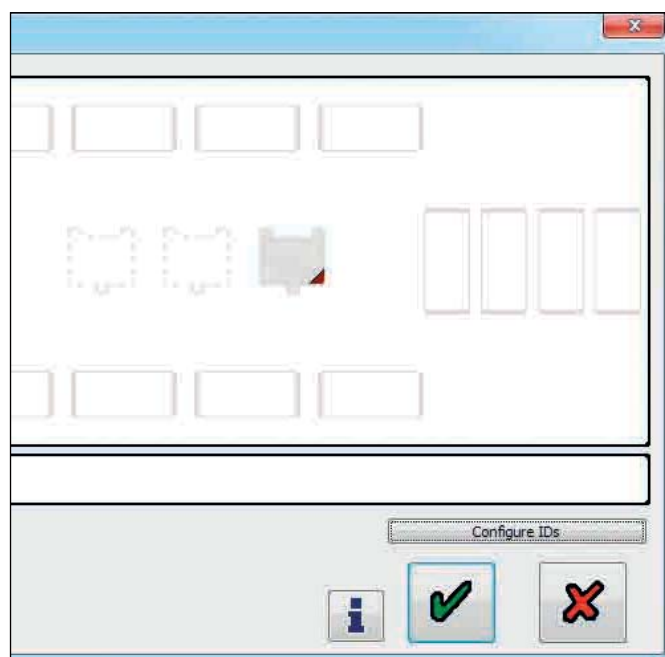
If a RCU is to be removed it needs to be disconnected prior to entering the setup screen.

Click on the  button to enter the setup dialogue screen.




When the setup dialogue loads, the removed RCU will be shown in grey with a red triangle.

Click on the  button to remove the RCU.

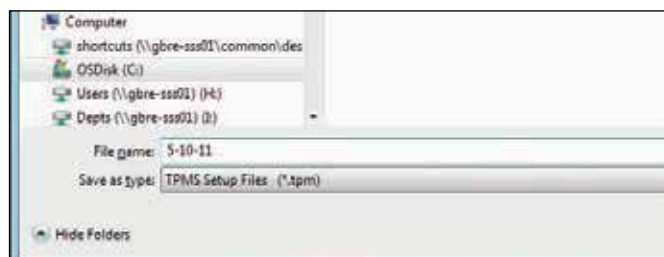


Saving the TPMS configuration file


On completing the TPMS configuration click on the  button to save the current configuration and stay in the TPMS setup (online) screen.

Enter a name for the configuration file and press the save button.

Note: WUS IDs are not saved to the file, so on loading a TPMS configuration the IDs then need to be set.



Opening a TPMS configuration file

Click on the  button to read a TPMS configuration file from disk.

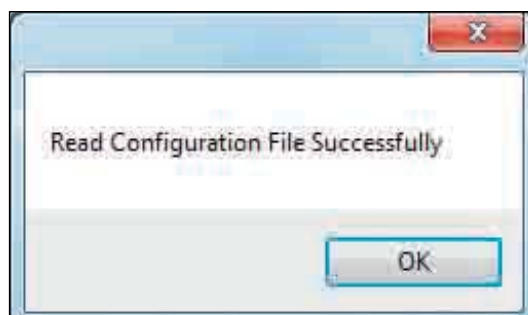


Click to highlight the required file and click the open button.



Click ok button to open file in the TPMS setup (online) screen.


Note: WUS IDs are not saved to the file, so on loading a TPMS configuration the IDs then need to be set. Refer to the 'Adding WUS ID's to Tires section'.



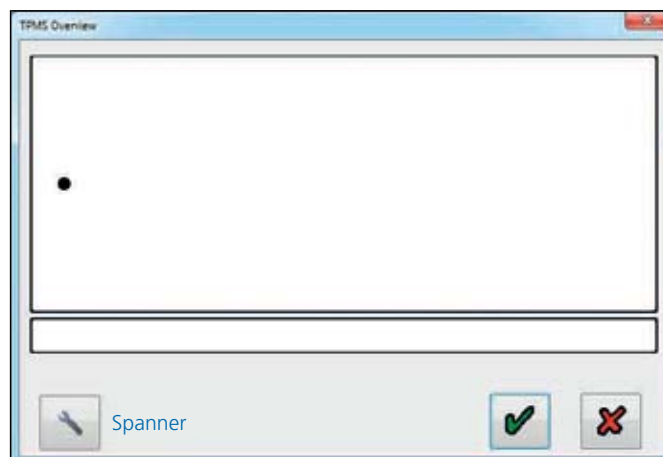
Troubleshooting

TPMS not available

The ECU is not configured for TPMS and no RCU is connected.

Click on the  button if you want to create a TPMS configuration.

Then go to TPMS Setup offline.



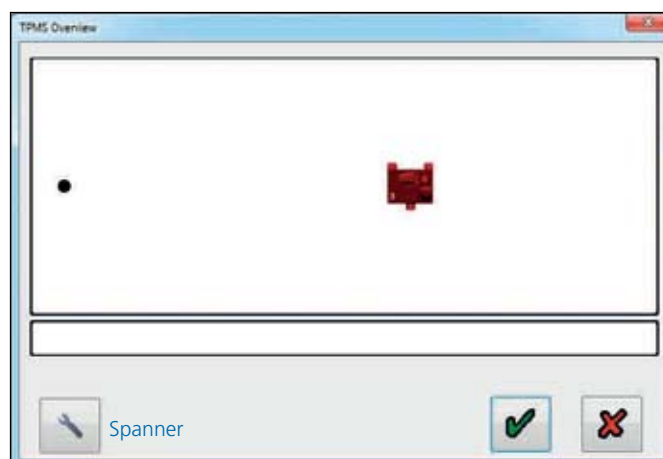
RUC missing

The ECU is configured for TPMS and an RCU is not connected or recognised (i.e. faulty RCU or cable).

Click on the  button.


Then go to removing an RCU, online section.

Note: As up to 3 RCUs are supported it is possible to have a combination of missing and connected RCUs.

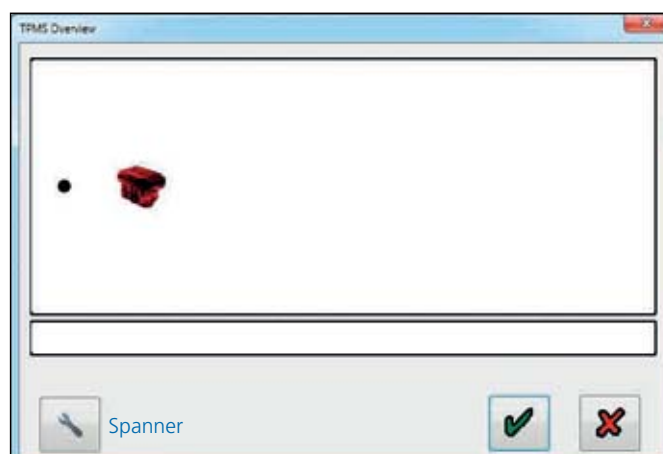


EB+ not configured for TPMS RCU

This screen shows that an RCU is connected, but the EB+ has not yet been configured for a TPMS RCU.

Click on the  button (spanner) to configure a TPMS RCU.

Then go to adding an RCU.



TPMS setup (offline)

Creating a TPMS configuration

It is possible to partially complete a system configuration offline from the vehicle (i.e. not connected to EB+).


It is possible to save the configuration on your computer as a TPMS file type (*.tpm).

This can be retrieved later when online (i.e. connected to EB+).

Click on the  button to enter the service bar.



Ensure that EB+ is not connected.

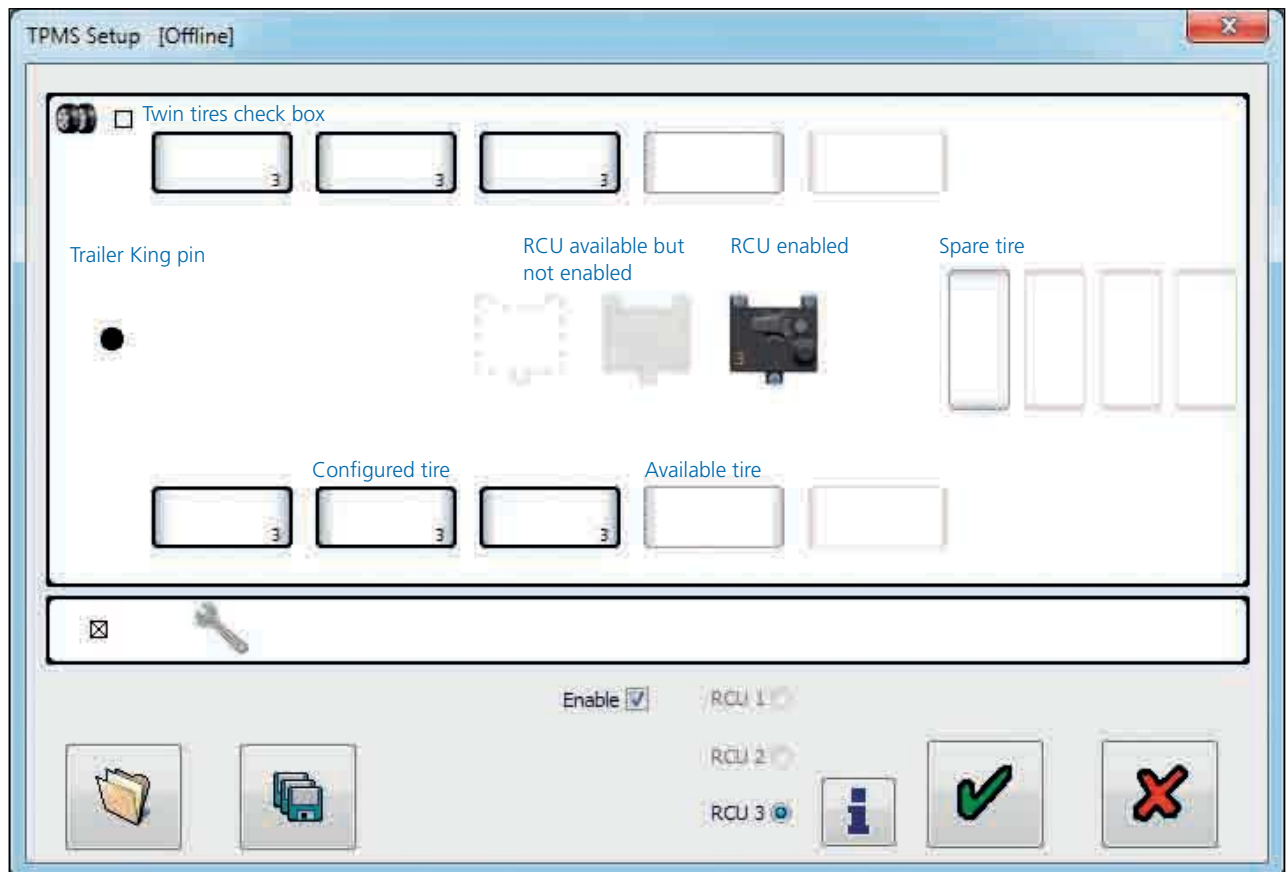
Click on the  button to enter the TPMS (offline) screen.



TPMS offline screen.



TPMS setup dialogue screen




The diagram allows the user to see all possible tire locations.

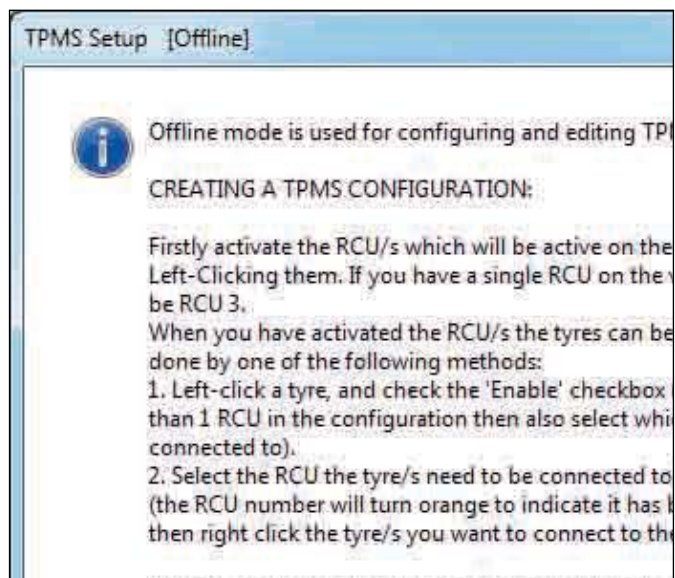
- › Configured tires are shown with a bold outline
- › TPMS axles to be configured from the front (i.e. nearest to the king pin) to the rear of the trailer, with no gaps
- › Spare tires to be configured from the front (i.e. nearest to the king pin) to the rear of the trailer, with no gaps
- › Available tires have a thin dashed outline
- › Unavailable tires have a dotted outline

The RCUs are shown in the centre of the screen.

- › RCUs that are enabled are shown as pictures
- › RCUs that are available but not enabled are shown in grey
- › RCUs that aren't available are shown with a dashed outline

Information screen

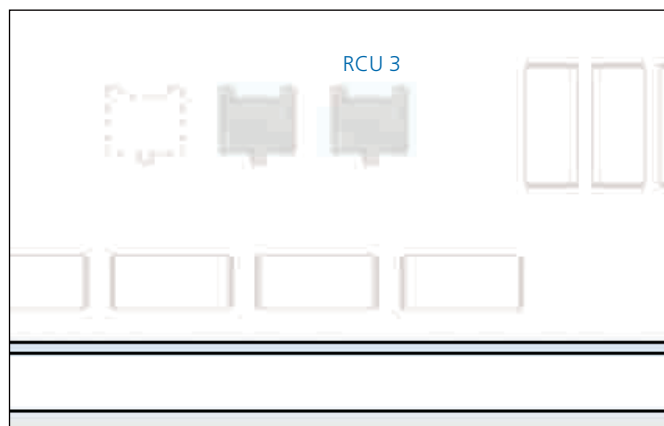
Click on the  button for further information on creating a TPMS configuration.



Creating a TPMS configuration

Adding an RCU:

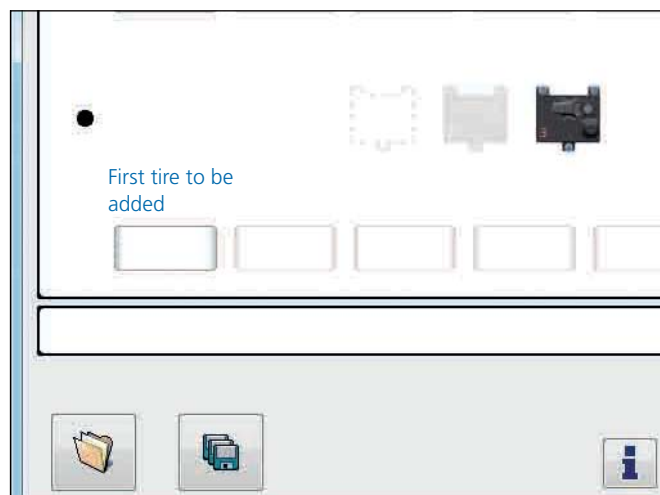
Click on RCU 3 to add it to the TPMS setup.



Adding tires

RCU 3 now showing as active, with the first two available tires ready for configuration.

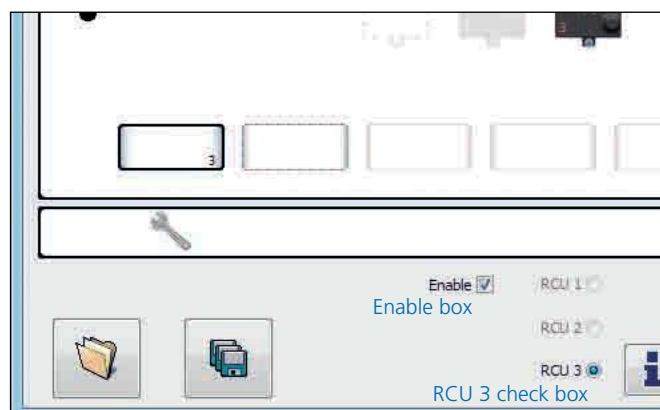
Click on the first tire to be added



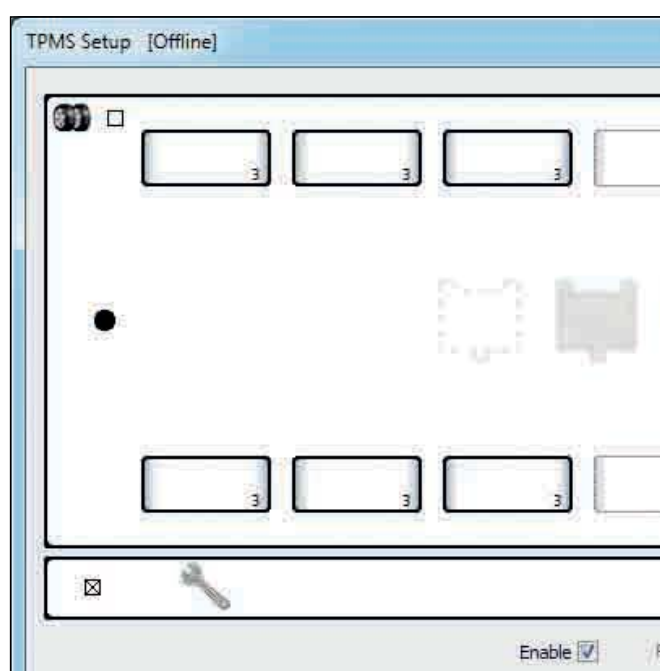
Click the tire enable box to add the highlighted tire.

Ensure RCU 3 check box is also ticked

Repeat this process until all required tires are 'enabled' and shown on the screen.

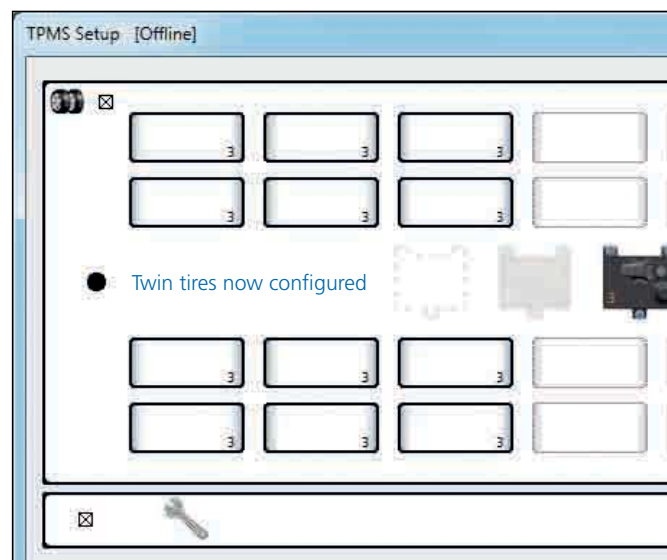
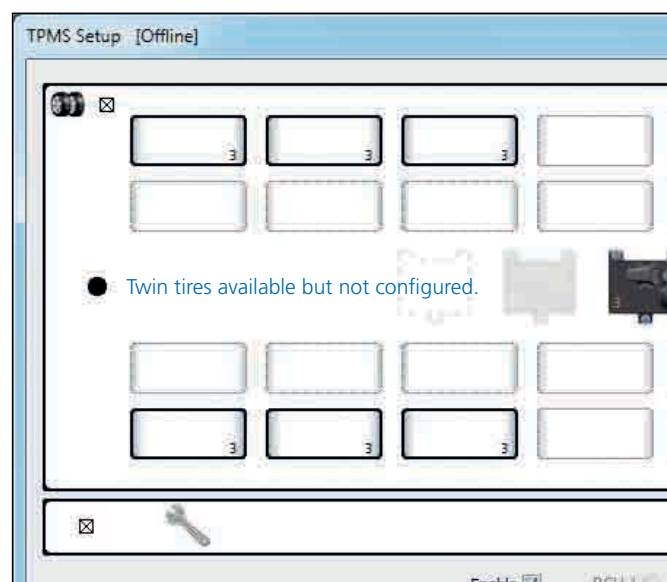
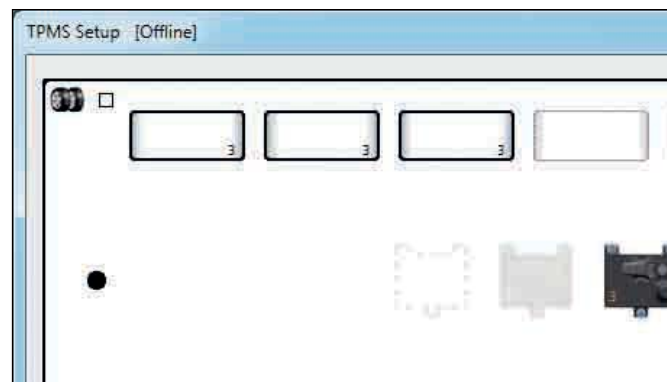


TPMS tires now added.



Trailers with twin tires

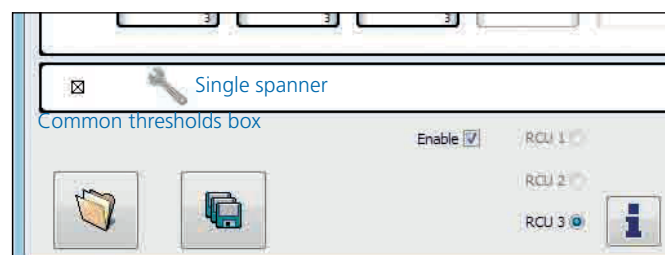
If the trailer has twin tires then the check box in the top left of the screen can be selected to configure the inside wheels.



Common thresholds

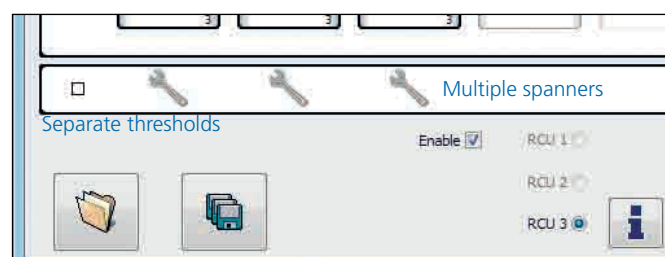
If common thresholds are required for all running tires check the common thresholds box. If separate thresholds are required for each axle then uncheck the common thresholds box so that thresholds can be set for each axle independently.

- › Common thresholds 1 x spanner
- › Separate thresholds 1 x spanner for each axle
- › Spare tire thresholds Always 1 x spanner for all spare tires



Separate thresholds

Separate thresholds 1 x spanner for each axle

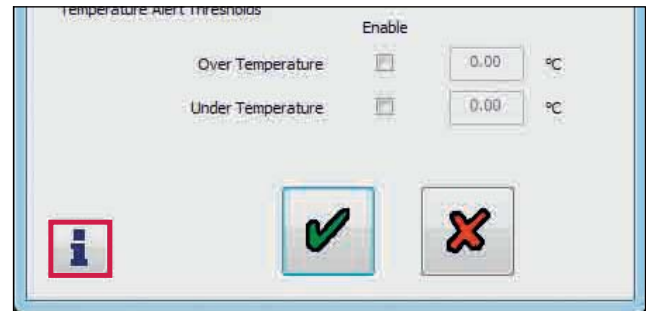



Click on the spanner to show the threshold dialogue.

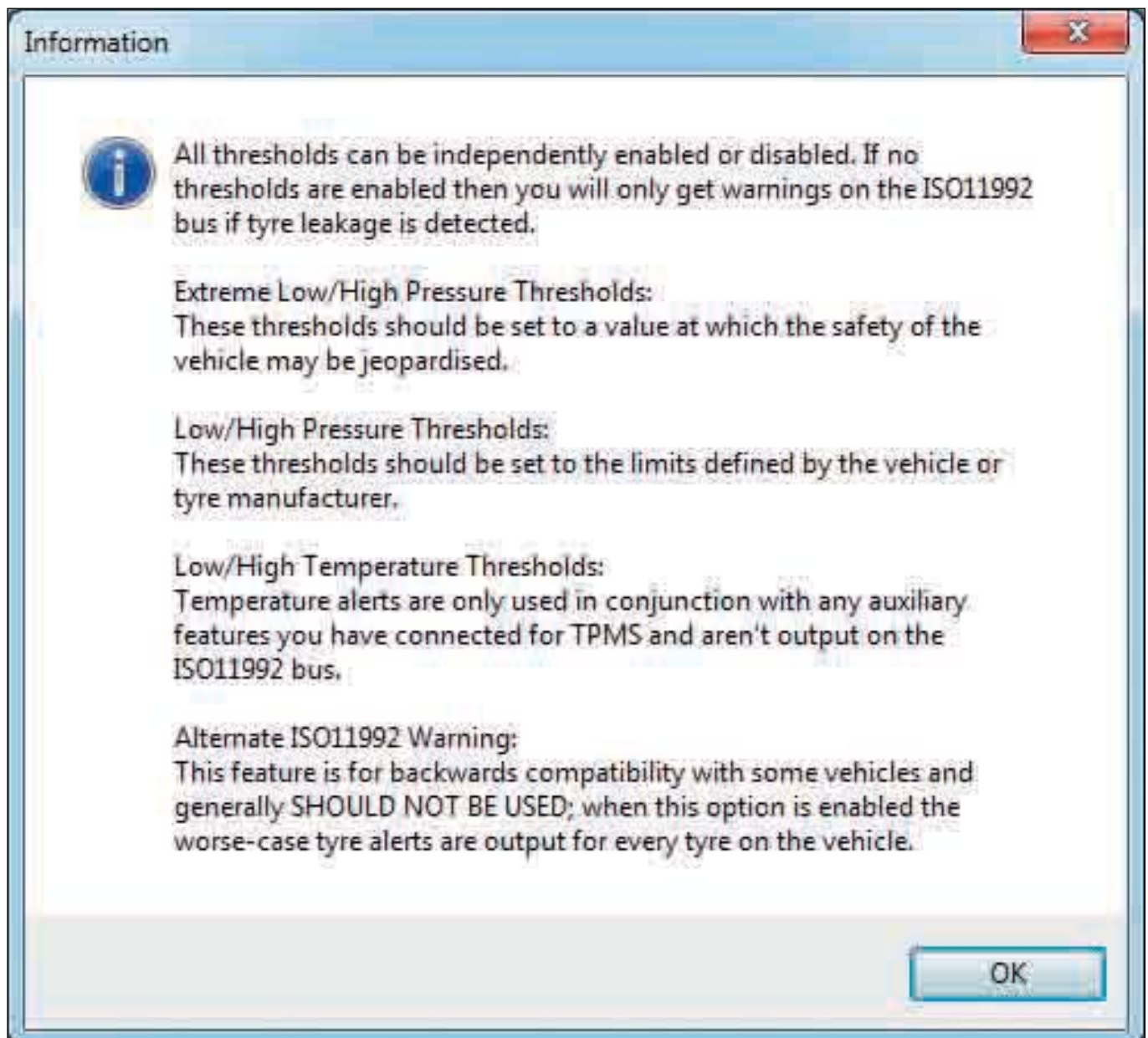



All thresholds can be independently enabled or disabled.


If no thresholds are enabled then you will only get warnings on the ISO 11992 bus if tire leakage is detected.




Click on the  button for further information on tire threshold setting and values.



Click on the  button to exit and save the configured tire thresholds.

Click on the  button to exit without saving the configured tire thresholds.



The 'Pressure Alert Thresholds' window contains two sections: 'Pressure Alert Thresholds' and 'Temperature Alert Thresholds'. Each section has an 'Enable' checkbox, a numerical input field, and a unit dropdown. The 'Pressure' section includes 'Extreme Over Pressure', 'Over Pressure', 'Under Pressure', 'Extreme Under Pressure', and 'Alternate ISO 11992 warning'. The 'Temperature' section includes 'Over Temperature' and 'Under Temperature'. All units are currently set to 'Bar' for pressure and '°C' for temperature. At the bottom, there are three buttons: an information icon, a green checkmark, and a red X.

Alert Type	Enable	Value	Unit
Extreme Over Pressure	<input type="checkbox"/>	0.00	Bar
Over Pressure	<input type="checkbox"/>	0.00	Bar
Under Pressure	<input type="checkbox"/>	0.00	Bar
Extreme Under Pressure	<input type="checkbox"/>	0.00	Bar
Alternate ISO 11992 warning	<input type="checkbox"/>		
Temperature Alert Thresholds			
Over Temperature	<input type="checkbox"/>	0.00	°C
Under Temperature	<input type="checkbox"/>	0.00	°C

Click on 'yes' to save to memory the configured tire thresholds.

Click on 'no' to return to the threshold screen without saving.



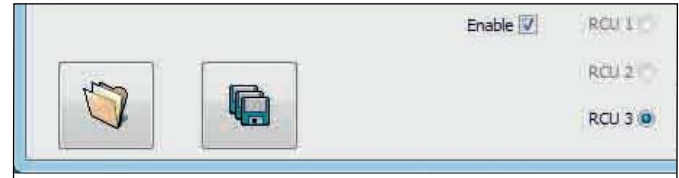
The 'Save Thresholds' dialog box has a title bar with a close button (X). It contains a text field with 'All Running Tyres' and a checkbox that is checked. Below this is the question 'Save Thresholds?' and two buttons: 'Yes' and 'No'.

Save Thresholds?

Yes No

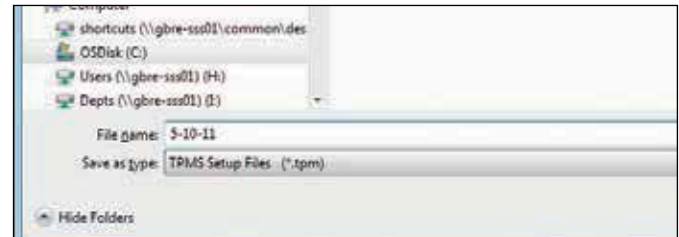
Saving the TPMS configuration file

On completing the TPMS configuration click on the save button to save the current configuration stay in the TPMS setup (offline) screen.



Enter a name for the configuration file and press the save button.

Note: WUS IDs cannot be assigned in offline mode and are not saved in a TPMS configuration file.



Opening a TPMS configuration file

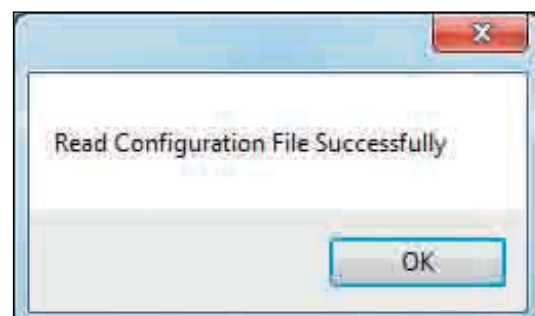
Click on the  button to read a TPMS configuration file from disk.



Click to highlight the required file and click on the 'open' button.



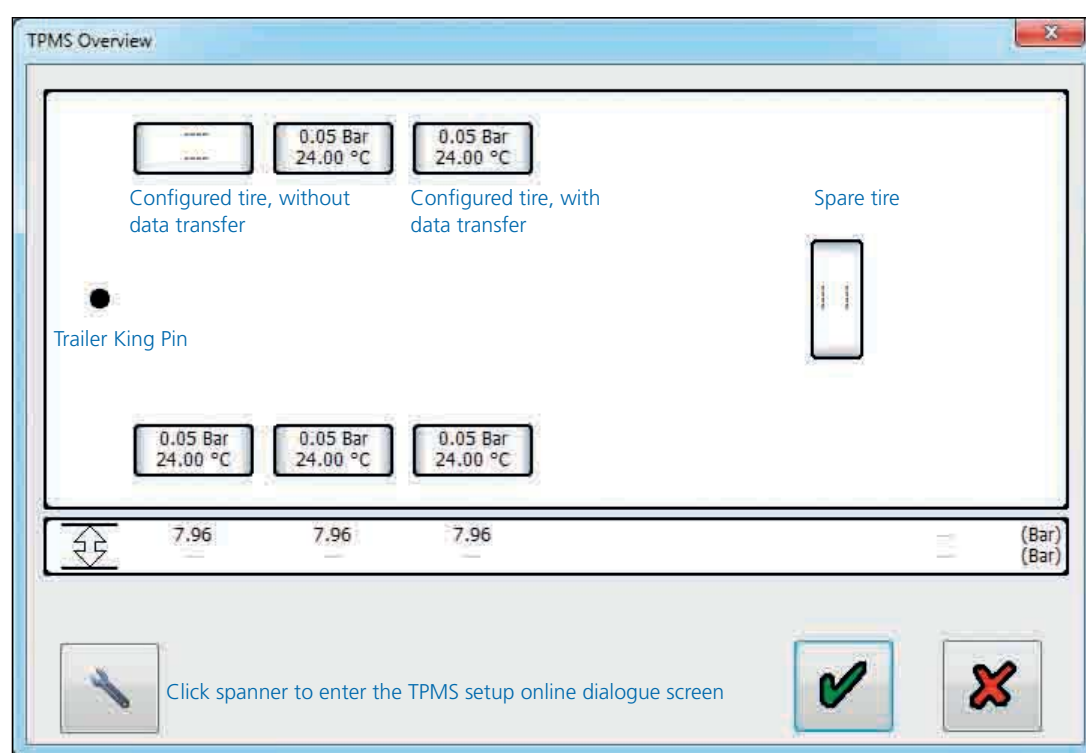
Click 'ok' button to open file in the TPMS setup (offline) screen.



TPMS overview screen

Main overview screen

The overview screen shows all the configured tires, each containing its pressure and temperature (i.e. if data has been received).



'---' is displayed if no tire data has been received.

Note: It can take up to ten minutes to receive all tire data. System should improve in starting time over time. Moving the vehicle can also help as the wheel sensors automatically transmit more information over 20kph due to an internal trigger.

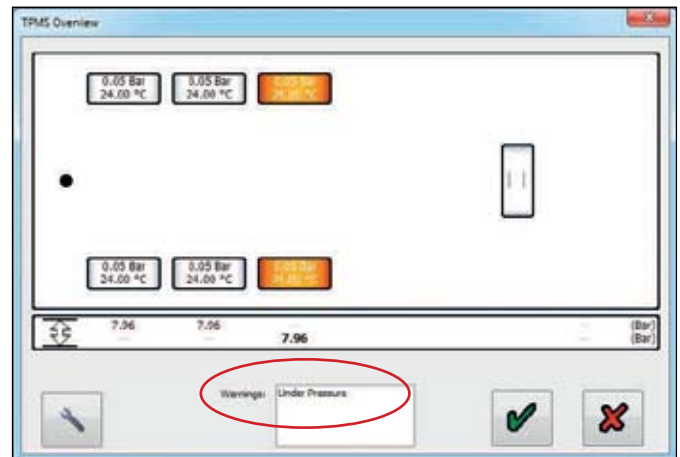
Tire warnings

If any tire has warnings then the tire is either orange or red:

Orange colour	Over / under pressure and over / under temperature as set in the threshold dialogue.
Red colour	Extreme over / under pressure as set in the threshold dialogue and a faulty wheel unit sensor (WUS).

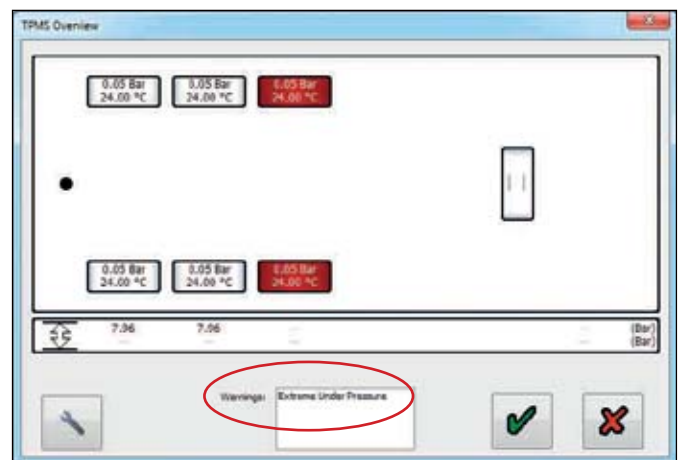
Click on the faulty tire (i.e. orange or red) to display the warning information at the bottom of the screen.

Normal threshold alert warnings.



Under pressure warning

Extreme threshold alert warnings.

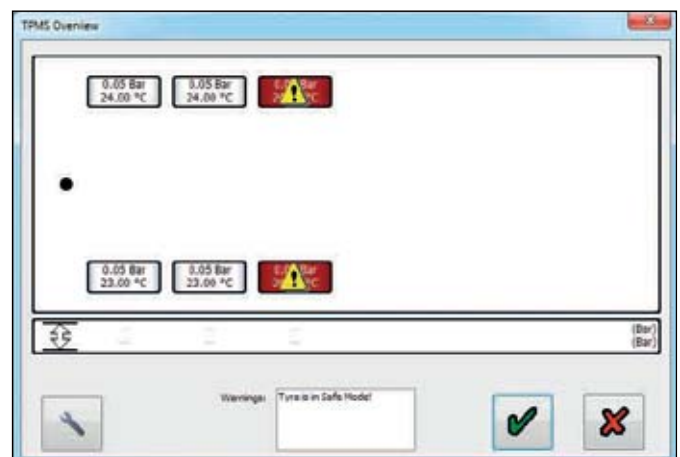


Extreme under pressure warning

Safe mode:

When two or more tires have been previously changed, and not yet configured (i.e. two or more new WUS id's are now present and two or more id's are now missing).

The user now needs to configure the new tires in the TPMS setup screen (i.e. clicking the spanner).



Displaying alert thresholds

The thin box below the tire layout shows a set of high and low thresholds for each configured axle. Hovering the mouse over this box shows the current threshold being displayed, clicking on it cycles through the thresholds. If any threshold is disabled '---' is displayed.

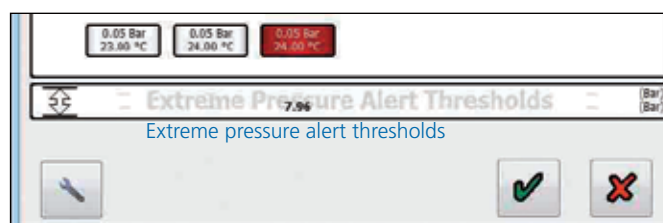
The order of thresholds is:

1. Pressure alert thresholds
2. Extreme pressure alert thresholds
3. Temperature alert thresholds

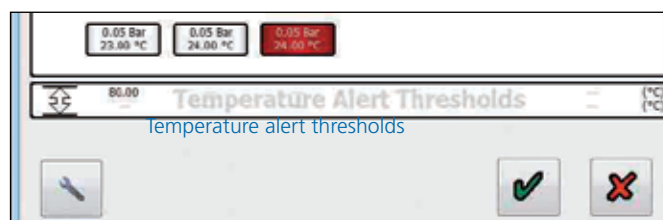
Pressure alert thresholds.



Extreme pressure alert thresholds.





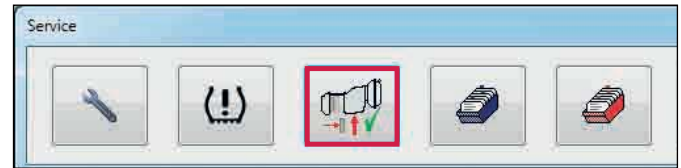
Temperature alert thresholds.



Lining wear sensor (LWS)

This feature must be set in the AUX 4 configuration.

Click on the  button and check if a DTC 'AUX 4' is listed. If identified click on the  button to enter the lining wear info screen.



Lining wear information screen

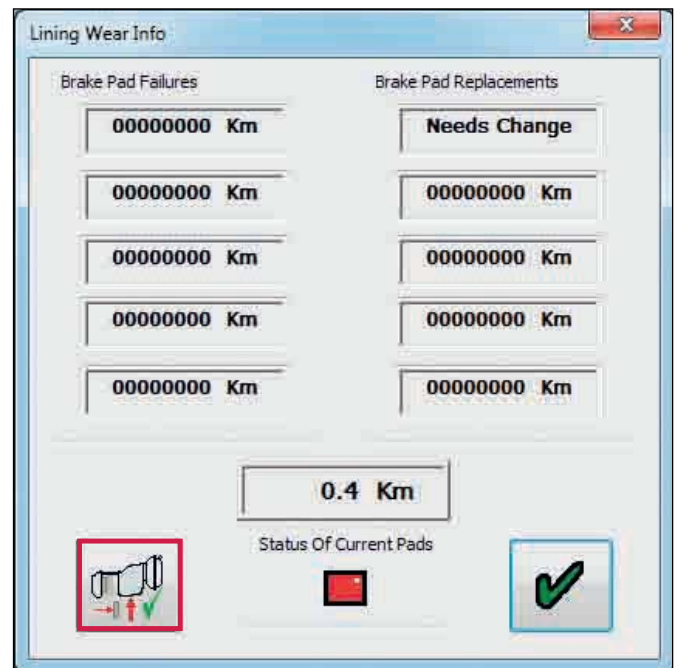
The following screen will appear which lists the history of the changes of linings (last five recorded).

The left hand column records when the brake pads (lining wear sensor) has worn. The right hand column records or indicates when the brake pads have been replaced or require replacing.

If the 'status of current pads' indication is coloured red and the info indicates 'needs change', exit DIAG+, switch power 'off' to ECU and repair appropriate linings.

Then re-enter to DIAG+ and 'lining wear info' screen.

Click on the  button to reset the LWS.




The following screen appears.
Click on button marked 'ok'.



The following should occur:

- In the 'brake pad replacements' column, the 'needs change' is replaced by a figure in km.
- The 'status of current pads' indicator changes from red to green.

On 'lining wear info' screen click on the  button to exit to the main screen.

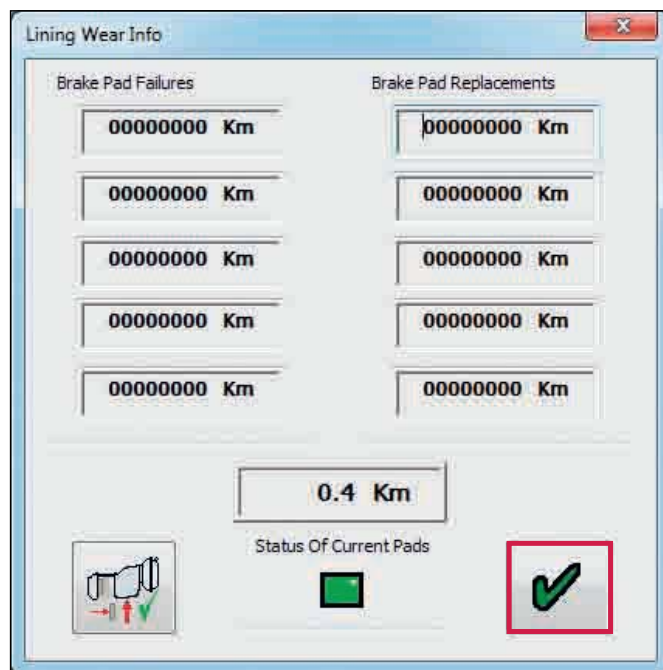
Note: Diagnostic code 'AUX 4' is deleted automatically.

General

When linings are in good condition or to review the 'lining wear info' screen, enter as described above.


The following screen will be displayed.

The 'status of current pads' indication is coloured green.
Record any necessary details for future reference.



ECU modification record

Click on the  button on main screen then

click on the  button (blue box) on the service menu.

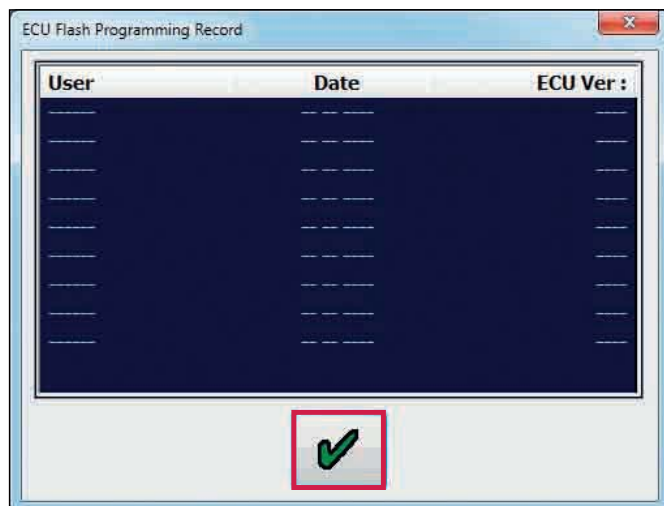


The following screen appears.

This is a record of when the ECU has been programmed.

The user can be the computers name or log on name or 'Info C' representing Info Centre. The display shows up to ten recent users.

Click on the  button to exit.



ECU flash programming record

ECU flash programming record

Click on the  button on main screen then

click on the  button (red box) on the service menu.

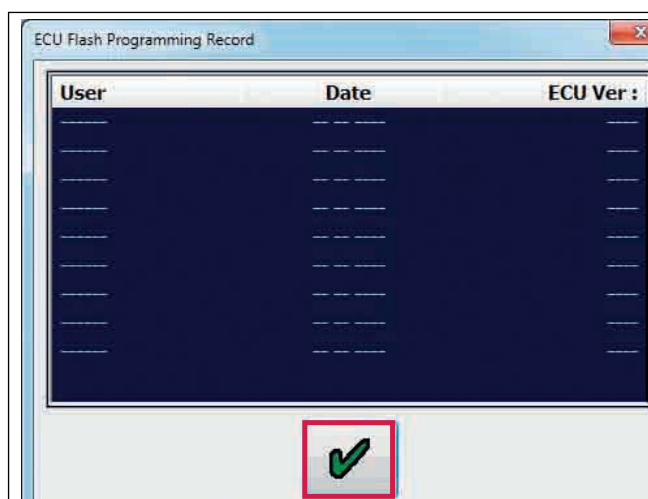


The following screen appears.


It works by displaying the last ten flash programming events, sorted most recent first, in the same manner as DIAG+ programming record. When the ECU flash memory is reprogrammed to version B310 / B311 or later, a record is made in the ECU memory (containing details of the computer used, the date and the ECU version).

Note: Records from older ECU versions will display a message of 'no data available !'.

Click on the  button to exit.



Fleet+

Click on the  button in the service menu to enter the Fleet+ download screen.



The user can download either Fleet+ Version 2 or V3 (.fpf data file) from the ECU depending on which Fleet+ version is being used.

Downloading Fleet+ data

Click to highlight either V2 or V3 on the screen.



Click on the 'save to file' button to download the Fleet+ data from the ECU.

Fleet+ data is now downloaded from the ECU.




Enter the file name and select the 'save' button.

Note: The Fleet+ file cannot be viewed using DIAG+




Fleet+ data (.fpf file) has now been downloaded and saved.

Click on the  button to return to the service menu.

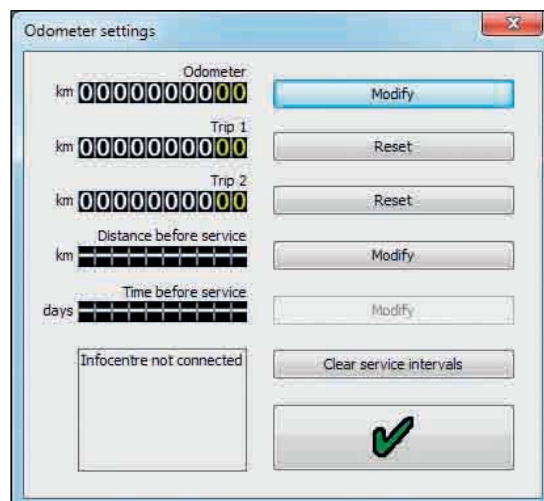


Odometer settings

Click on the  button to open the trailer odometer settings screen.

The odometer setting screen allows you alter the following:

- › The trailer odometer
- › The trailer trip 1
- › The trailer trip 2
- › The trailer service intervals



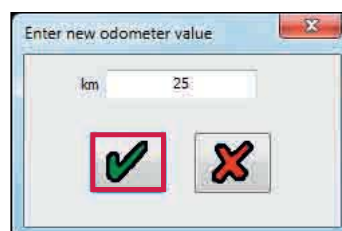
The trailer odometer

Example:

Click on the 'modify' button to change the trailer odometer mileage.

Enter the required mileage (e.g. 25 km)

Click on the  button to accept this value.

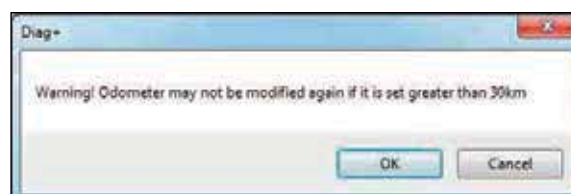


Warning:

The user may only modify the mileage once if a value greater than 30 km is entered.

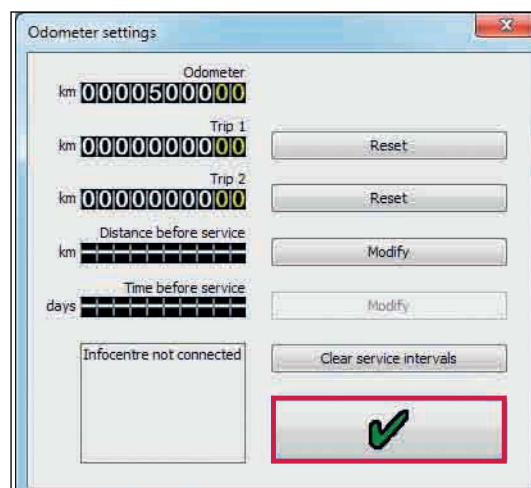
Click on the 'ok' button to accept or the 'cancel' button to return to the menu without altering the mileage.

The trailer odometer has now been changed to 25 km.



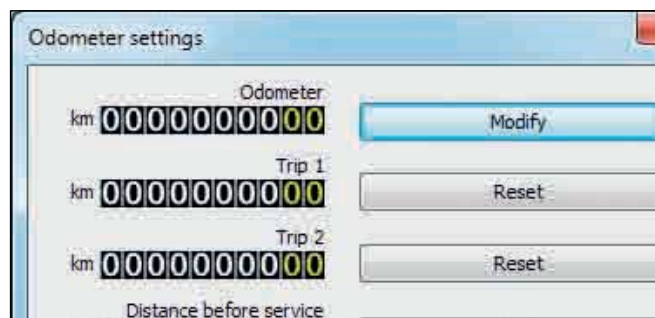
The odometer 'modify' button will disappear if a value greater than 30 km is entered into the odometer (e.g. 5000 km).

Click on the  button to accept this value.




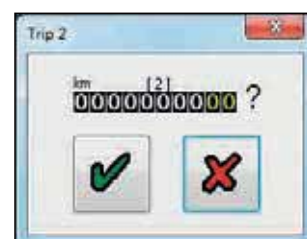
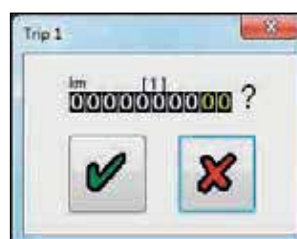
Resetting trailer trip 1 and trip 2

Click on the 'reset' button adjacent to trip 1 or trip 2 displays.



Click on the  button to reset the trip.

Click on the  button to return to the odometer settings menu without resetting the trip.




Service intervals

Click on the 'modify' button adjacent to the service interval display.

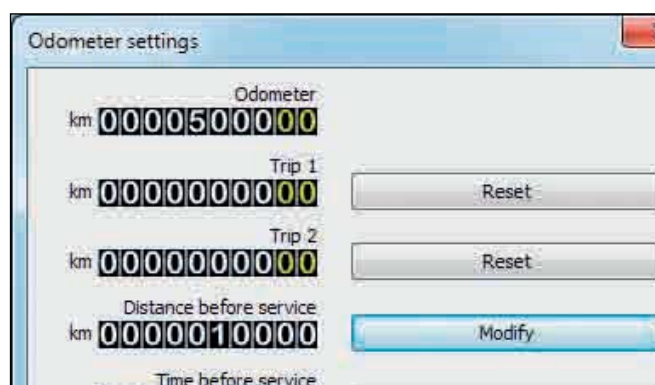
Enter the required mileage.

Click on the  button to accept the mileage.

Click on the  button to return to the odometer settings menu without changing the value.



The trailer service interval has now been changed to 10000 km.

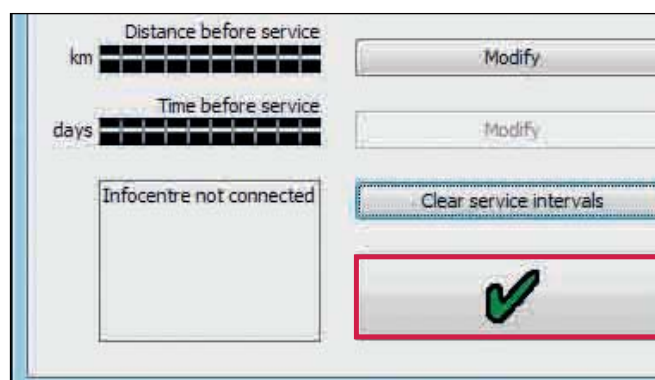


Clear service intervals


Click on the 'clear service intervals' button to reset the current service interval values.

Distance before service has now been reset.

Click on the  button to accept this value



Setting parameters (configure menu)

Click on the  button to configure, read, setup and program the ECU.



1

2

3

4

5


6

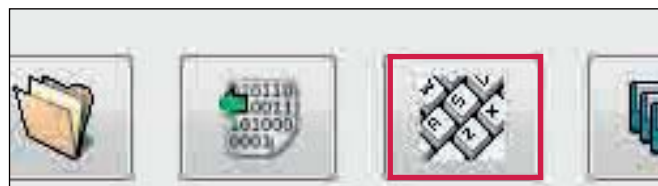
7

Program ECU Menu

- 1 Read ECU configuration from a previously saved file.
- 2 Read configuration info from the ECU.
- 3 Edit ECU parameters and configuration.
- 4 Save ECU configuration to a file.
- 5 Program ECU with current configuration info.
- 6 Print current ECU configuration information - load plate.
- 7 Ok - Exit the 'program ECU' menu.

ECU parameters

Click on the  button to edit the ECU parameters and configuration.



Edit ECU setup menu

- 1 Walk through button.
- 2 Setup the ECU configuration and layout.
- 3 Setup load plate configuration.
- 4 Display trailer information.
- 5 Setup AUX configuration data.
- 6 Setup wheel scale configuration.
- 7 Setup lamp flash configuration.
- 8 Ok - Exit the ECU setup.

Note: The following sections have default settings as shown below:

- 5 Auxiliaries - not used (unused).
- 6 Wheel scaling - 306 rev/km, 520 Rdyn (mm) and 100 no. of teeth exciter.
- 7 Lamp sequence - on/off.

If these are correct go to trailer information.

EBS ECU configuration

Click on the  button on the ECU setup screen.

Configuration group

The following (1 of 6) screen will appear.

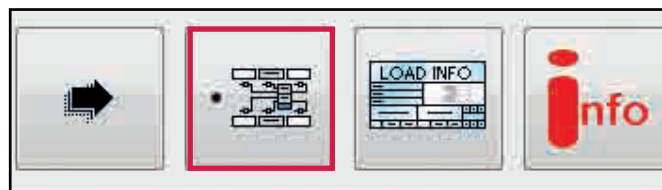
- 2M side by side
- 1M (EB+ Gen1 only)
- 2M axle by axle
- 2M non-integrated (EB+ Gen1 only)
- 3M full trailer
- 3M semi trailer

The configuration group title is shown at the top right of the screen in which below are left and right arrow boxes to enable to toggle between the configuration screens.

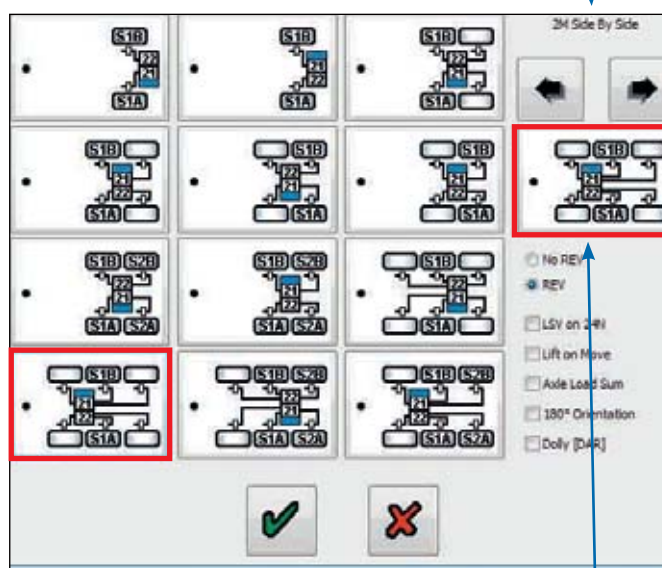
Click on one of the boxes on the left side of the table selecting your system layout.

A view on the right side of the table is the chosen ECU configuration and layout.

Note: The ECU configuration has a default setting of: 3 axle trailer, 2 sensors on centre axle, ECU left hand installation.



Chosen configuration group (e.g. 2M side by side)



Chosen ECU configuration and layout

If box 1 is selected this adjusts the working parameters in the presence of No REV.

If box 2 is selected (as shown) this adjusts the working parameters in the presence of a REV.

If box 3 is selected (as shown) load sensing function is available together with ABS on backup powering ISO 1185 (24N).

If box 4 is selected, any automatic lift axles will not raise until move away (when the lamp goes out). It is to enable roller testing of all axles even when unladen.

(Note: Use for the UK vehicle test authority).

If box 5 is selected this allows the weight of the trailer to be indicated in the cab if the truck supports this function.

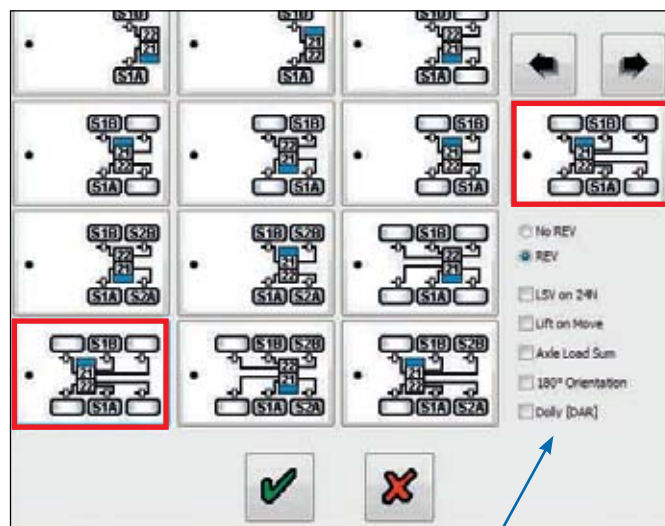
If box 6 is selected this eliminates crossing of the sensor cables.

If box 7 is selected this modifies the left and right pressure control for dollies to prevent unwanted torque steer.

Note:

Boxes 1-2 you can select one or the other

Boxes 3-7 you can select from none to all.



1

2

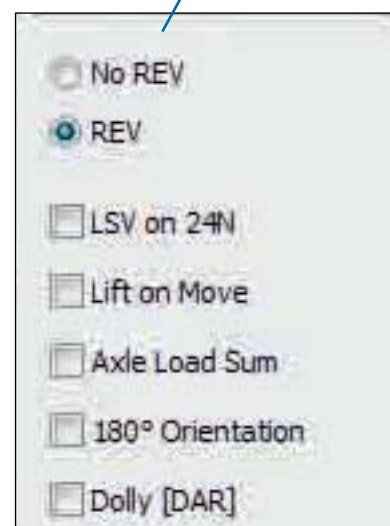
3

4

5

6

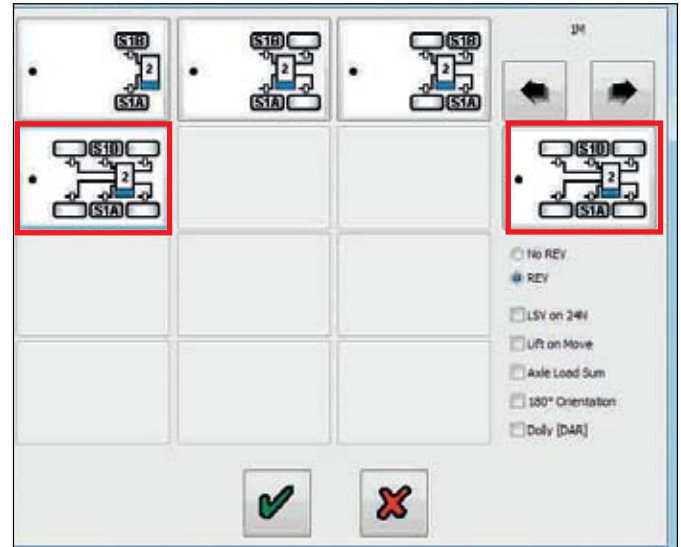
7



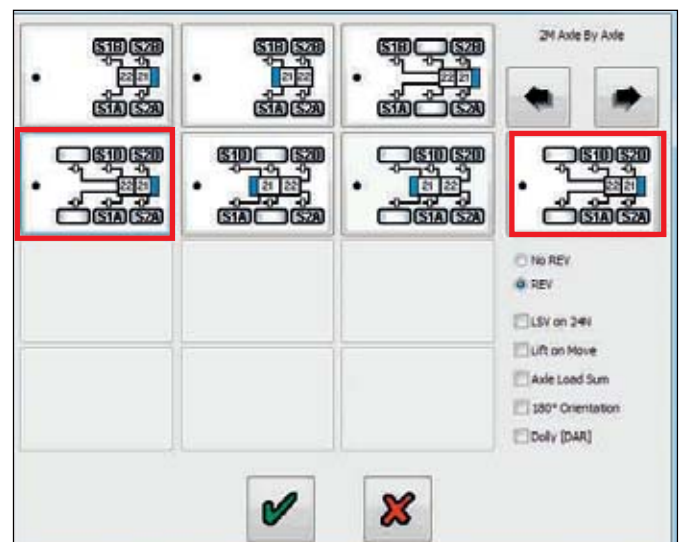
Click on the  button to accept.

1M configuration screen. EB+ Gen1 systems only.

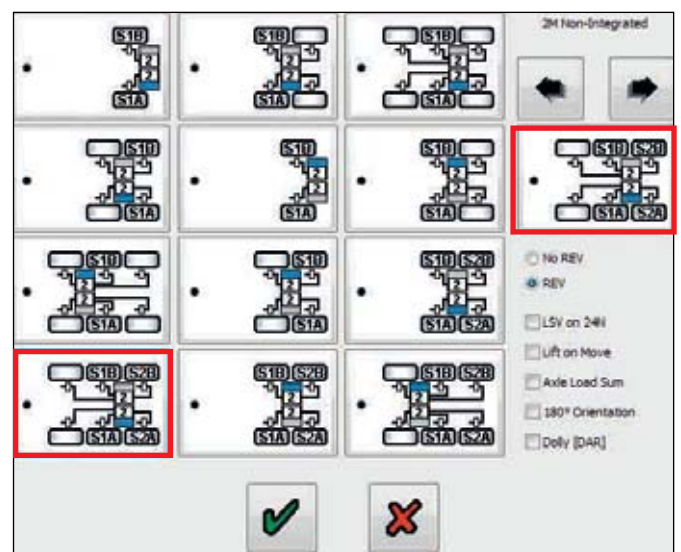
Note: Position of ECU can be left, right, front or rear.



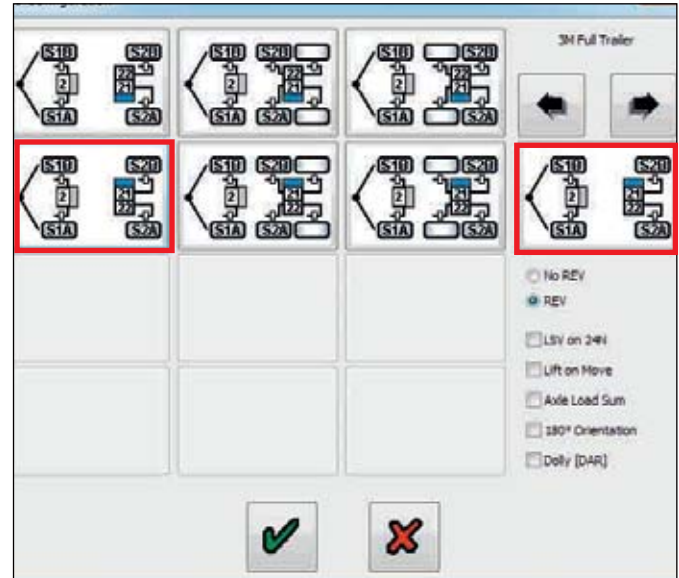
2M axle by axle configuration screen.



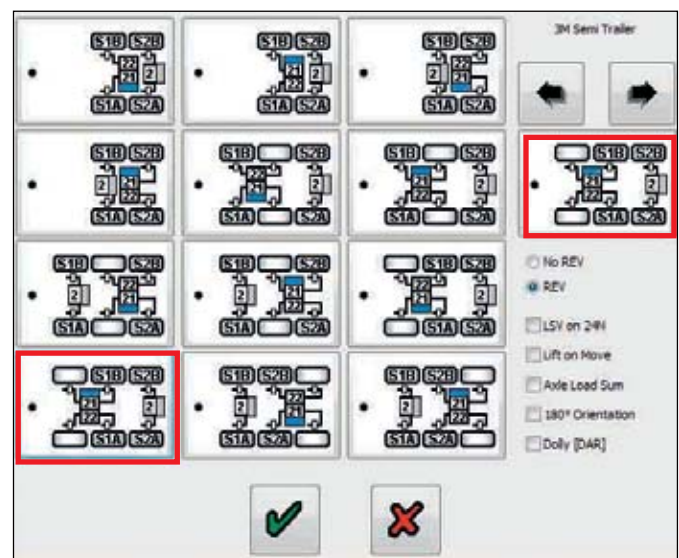
2M Non integrated configuration screen. EB+ Gen1 systems only.




3M full trailer configuration screen.



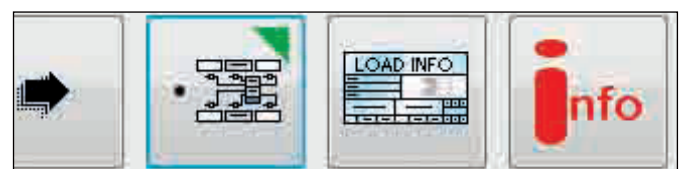
3M semi trailer configuration screen.



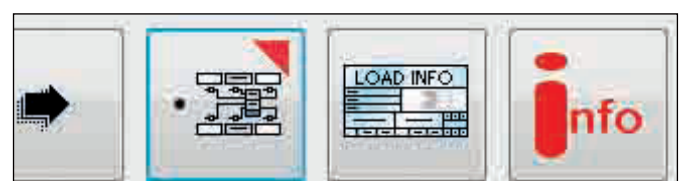
Click on the  button to accept and return to the ECU setup menu.

The 'setup ECU configuration and layout' icon will now have a green triangle in the top right hand corner, indicating that data in that section has changed.

or
The 'setup ECU configuration and layout' icon will now have a red triangle in the top right hand corner, indicating that data in that section has not changed.



Green triangle



Red triangle

Load plate data entry

Click on the  button to setup load plate configuration.

For semi and centre axle trailers the following screen will appear.

The screen shows a set of default example values (1 to 5 and 10 to 12) which require to be entered in accordance to the vehicles brake calculation.

Highlighting the appropriate box enables you to edit the value or pressing the tab button on your PC will step through, one by one, the various boxes to be edited or selected.

The following example shows values entered from a Haldex brake calculation as shown below.

Note: If values 6, 7, 8, and 9 are required (see brake calculation example below).

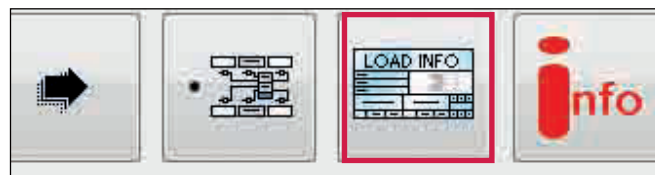
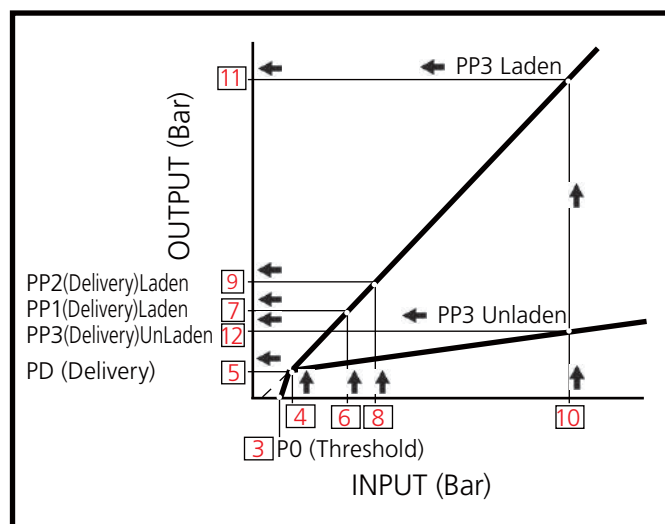
To enter the values click on ☐ Use boxes.

6	<input checked="" type="checkbox"/> Use	PP1 (Control)	1.60	7	PP1 (Delivery) Laden	1.20
8	<input checked="" type="checkbox"/> Use	PP2 (Control)	3.00	9	PP2 (Delivery) Laden	2.60

If value 'P Limit' is required, this limits the pressure at the brake chambers to the value selected which must be ≥ 5.00 bar (Note: not derived from brake calculation).

To enter the values click on ☐ Use P Lim box (default value is 8.50 bar).

Click on the  button to accept.

Example:

The graph shows the brake demand pressure (INPUT) values are in relation to the brake delivery pressure (OUTPUT) values.

Haldex brake calculation example

Input data for the EBS-Modulator EB+:							3	4	6	8	10	
	control pr.	pm	6.50 bar	control pr.	pm		P0	PD				
Axle	Axle load unladen (Kg)	Bag press. unladen (bar)	Brake press. unladen (bar)	Axle load laden (Kg)	Bag press. laden (bar)	Brake press. laden (bar)	0.30	0.70	1.60	3.00	6.50	bar
		1	12		2			5	7	9	11	
1	1150	0.60	1.75	8000	4.30	0.00	0.30	1.20	2.60	5.90	bar	
2	1150	0.60	1.75	8000	4.30	0.00	0.30	1.20	2.60	5.90	bar	
3	1150	0.60	1.75	8000	4.30	0.00	0.30	1.20	2.60	5.90	bar	

For full trailers the following screen will appear.

The following example shows values entered from a Haldex brake calculation as shown below.

The screenshot shows the 'Master' tab of the Haldex EBS configuration interface. It features two main sections: 'INPUTS' and 'OUTPUTS'. The 'INPUTS' section includes fields for 'Unladen Suspension' (0.55), 'Laden Suspension' (3.50), 'PD (Threshold)' (0.40), 'PD (Control)' (0.70), 'PP1 (Control)' (0.00), 'PP2 (Control)' (0.00), and 'PP3 (Control)' (6.50). The 'OUTPUTS' section includes fields for 'PD (Delivery)' (0.40), 'PP1 (Delivery) Laden' (0.00), 'PP2 (Delivery) Laden' (0.00), 'PP3 (Delivery) Laden' (6.85), and 'PP3 (Delivery) Unladen' (3.10). A 'Use P Lim' checkbox is also present. A small graph in the top right corner shows a line graph with 'Laden' and 'Unladen' curves. At the bottom, there are two buttons: a green checkmark button and a red X button.

Click on the button to accept

Brake calculation example - Master ECU (RAG)

Input data for the EBS-Modulator EB+:						
			3		4	10
			PO		PD	P3
RAG	control pr.	pm	6.50 bar	control pr.	pm	0.40 0.70 6.50 bar
Axle	Axle load	Bag press.	Brake press.	Axle load	Bag press.	Brake press.
	unladen	unladen	unladen	laden	laden	laden
	(Kg)	(bar)	(bar)	(Kg)	(bar)	(bar)
		1	12		2	5 11
1	1700	0.55	2.10	9000	3.50	0.00 0.40 6.85 bar

Click on the remote tab to change to the 'remote' load plate settings page.

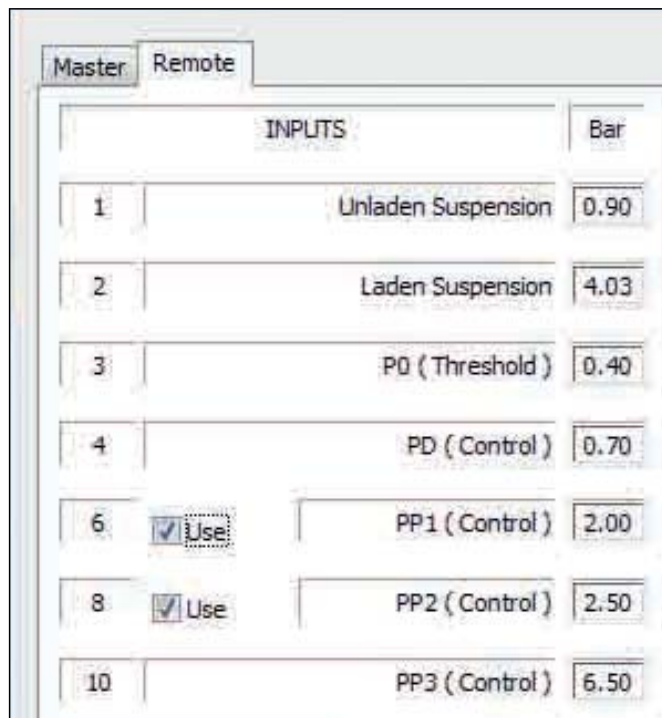
The screenshot shows the 'Load Plate' settings page with the 'Remote' tab selected. It displays two input fields: 'Unladen Suspension' with a value of 0.90 and 'Laden Suspension' with a value of 4.03. The 'Master' tab is also visible but not selected.

Remote tab

Remote load plate settings

The following example shows values entered from a Haldex brake calculation as shown below.

Click on the  button to accept



Master	Remote
INPUTS	
1	Unladen Suspension 0.90
2	Laden Suspension 4.03
3	PD (Threshold) 0.40
4	PD (Control) 0.70
6	<input checked="" type="checkbox"/> Use PP1 (Control) 2.00
8	<input checked="" type="checkbox"/> Use PP2 (Control) 2.50
10	PP3 (Control) 6.50

Brake calculation example - Remote ECU FAG)

Input data for the EBS-Modulator EB+:						
FAG	control pr.	pm	6.50 bar	control pr.	pm	
Axle	Axle load unladen (Kg)	Bag press. unladen (bar)	Brake press. unladen (bar)	Axle load laden (Kg)	Bag press. laden (bar)	Brake press. laden (bar)
		1	12		2	3 4 6 8 10 P0 PD P1 P2 P3
1	2350	0.90	2.10	10000	4.03	0.40 0.70 2.00 2.50 6.50 bar
						5 7 9 11
						0.00 0.40 1.40 2.50 6.85 bar

3M semi trailers

3M semi trailer information is entered into DIAG+ in the same way as 2M semi trailer information.

Setting auxiliaries

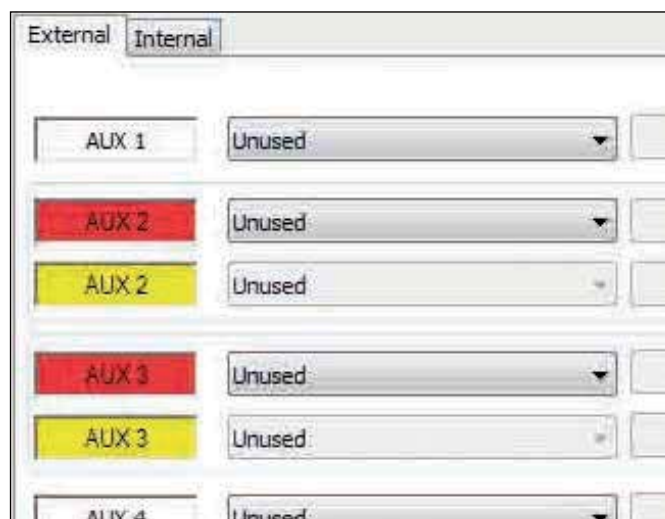
Click on the  button to setup auxiliary configuration.



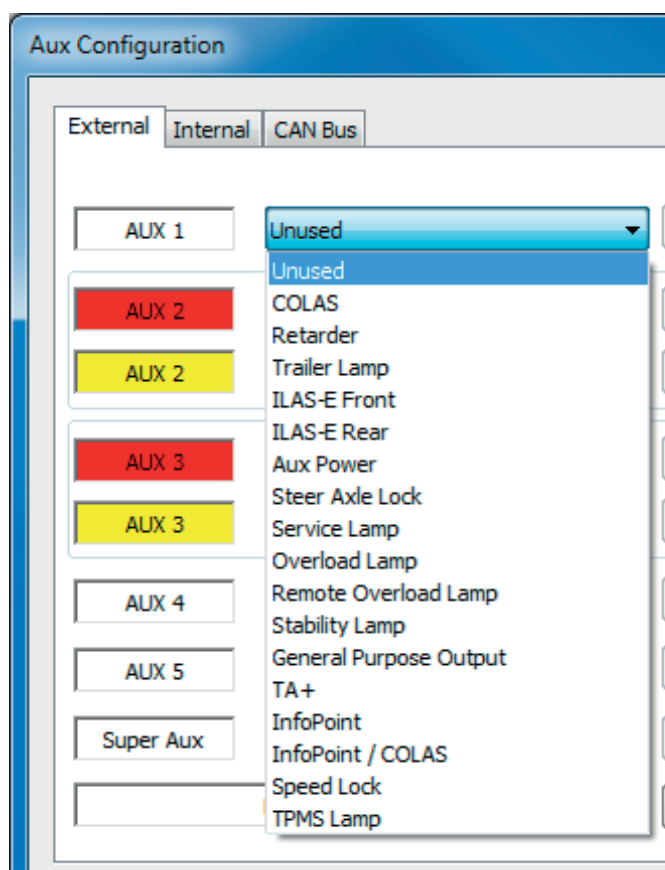
The following screen will appear.

The screen shows the various auxiliary connections that can be used (i.e. AUX 1 to 3, 4 and 5).

Clicking on the down arrow displays a listing of options that can be selected.



Example: AUX 1 options expanded ready for selection.



Auxiliary functions are dependant on the installed EBS product.

Gen3	STD	S AUX	P AUX
823 008 xxx	✓	✓	
823 034 xxx	✓	✓	✓



Standard AUX (STD)

Connections: 3 outputs + 2 inputs. EB+ includes by default 5 auxiliary ports for various surrounding functions. 3 of these auxiliaries are digital, 2 are analogue inputs. These amount of inputs and outputs are sufficient for most commonly used standard trailer applications. For example ILAS®-E (= lift axle control) and COLAS® (= return to ride height) digital AUX are required, whereas for LWI (= lining wear indicator) and EB+ Soft Docking (= ramp approach system) analogue inputs are needed. In case of malfunction (short circuit / open circuit) the EB+ system generates a DTC code and the service lamp will be triggered after start up.

The Standard AUX has 5 x AUX connectors that can be configured using DIAG+.

AUX 1 - B+ voltage switched output

AUX 2 - B+ voltage switched output and monitor input

AUX 3 - B+ voltage switched output and monitor input

AUX 4 - analogue input

AUX 5 - analogue input

Programming Standard AUX using DIAG+ V6

The AUX configuration screen shows the various auxiliary connections that can be used.

AUX 1

AUX 2 red only

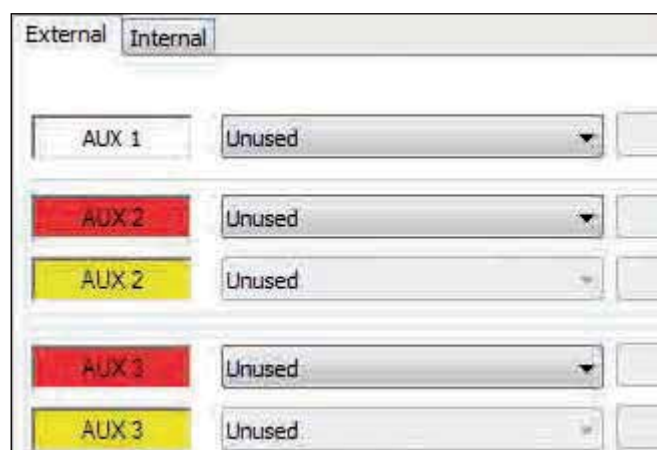
AUX 3 red only

AUX 4

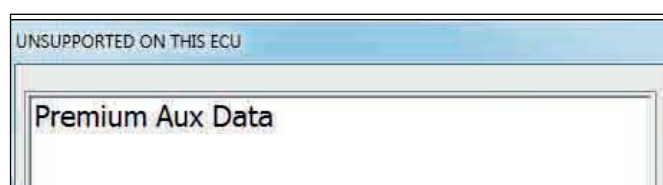
AUX 5

Clicking on the drop down arrow displays a list of options that can be selected on that auxiliary.

Error message: An error message will be displayed if an auxiliary configuration is created and sent to an ECU that does not support that function.



Note colour



Super AUX (S AUX)

The Super AUX connection was developed as there are a number of applications where trigger signals from the truck and trailer are required.

Connections via Power B (black connector)

1 x 24N power supply (2 pins)

3 x inputs (i.e. A, B and C) and 24 V signal (4 pins)



Already with EB+ Gen1 Haldex introduced a 'Power B' socket for backup power supply by stop light ISO 12098 / ISO1185 (24N). This link to the lighting system has been extended by the introduction of the 'Super AUX'. The connector includes an additional three digital inputs and 24 V signal supply (only use the 24 V signal supply for the Super AUX control switches). The control inputs can be linked to any auxiliary feature and this allows very sophisticated applications to be realised in a very simple manner. Some examples for controllable auxiliary features are 'traction support' and / or 'steer axle lock' and / or 'EBD' (=Electric Brake Demand). Backup power is always available by default.

Auxiliary connection cables: to use the full auxiliary functionality of "Super AUX", the following cable can be used.



814 002 3xx series

Programming Super AUX using DIAG+ V6

The "AUX configuration" screen shows the various auxiliary connections that can be used.

AUX 1

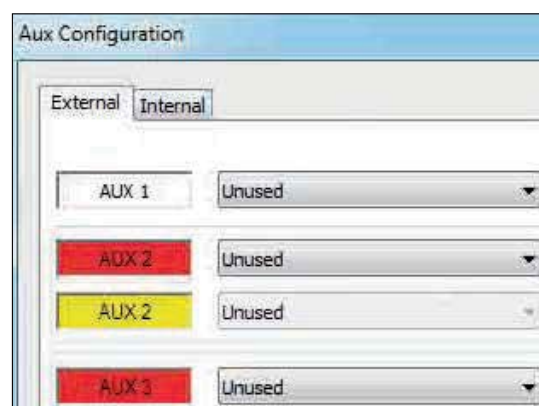
AUX 2 Red only

AUX 3 Red only

AUX 4

AUX 5

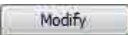
Super AUX

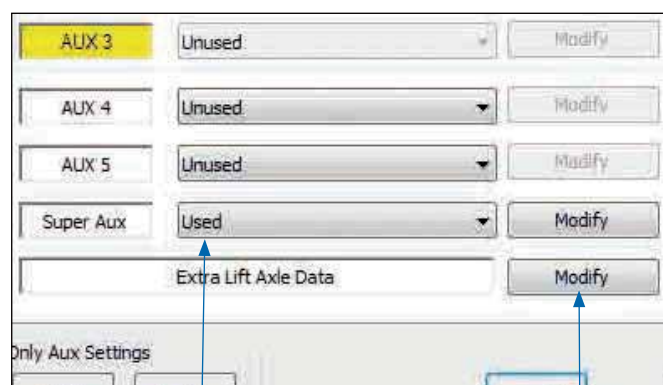


Note colour

Clicking on the drop down arrow displays a list of options that can be selected on that auxiliary.

Configuring Super AUX

Click on the  button to configure the Super AUX inputs.

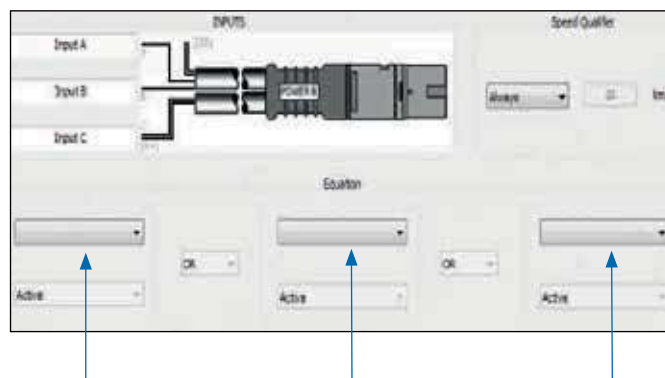


Super AUX option is selected

Super AUX modify button

Custom Super AUX input screen

Inputs A, B and C can now be configured using the drop down boxes.



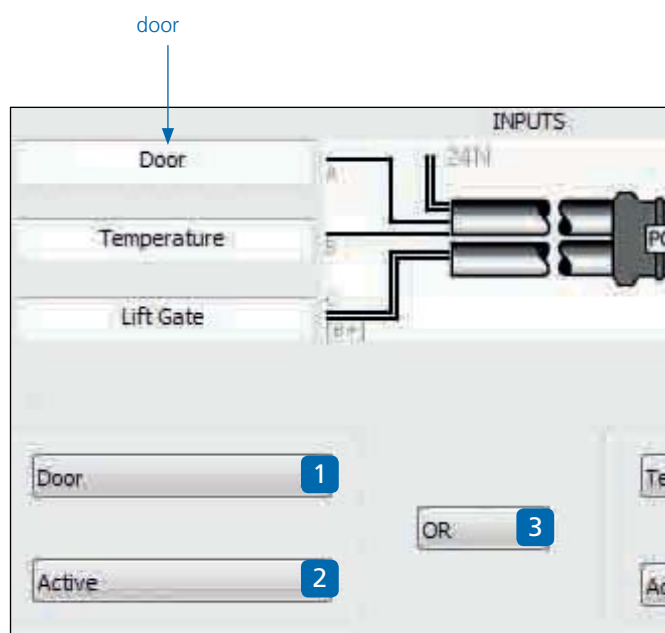
Drop down boxes used to configure the input signals.

Inputs A, B and C can also be renamed to their intended activation input (e.g. door).

The required input combination can be achieved by using the drop down boxes for:

- 1 The input signal (e.g. door)
- 2 The activation level (i.e. high or low)
- 3 The action (i.e. OR & AND).

A combined summary input statement is shown in the window at the bottom of the screen.




Speed qualifier


A speed signal can also be added to the final 'input statement' by using the 'speed qualifier' drop down box options.

Always No speed signal referenced

<= Less than and equal to selected km / h

> Greater than selected km / h

Click on the  button to cancel with no modifications.

Click on the  button to exit and keep the modifications.



Summary statement

Premium AUX (P AUX)

Premium AUX allows the user to program two totally independent outputs on both AUX 2 and AUX 3. It is only available with the Premium ECU (as shown).



The Premium system provides five instead of three outputs (AUX 2 and 3 are capable to operate two separate functions). An example for an extended application could be ILAS®-E front including TA+ on AUX 2, steer axle lock on AUX 3 and COLAS® RtR on AUX 1. The twin outputs of AUX 2 and AUX 3 are colour coded red and yellow within the DIAG+ software. These colours then match the twin identifiers of the cables below.

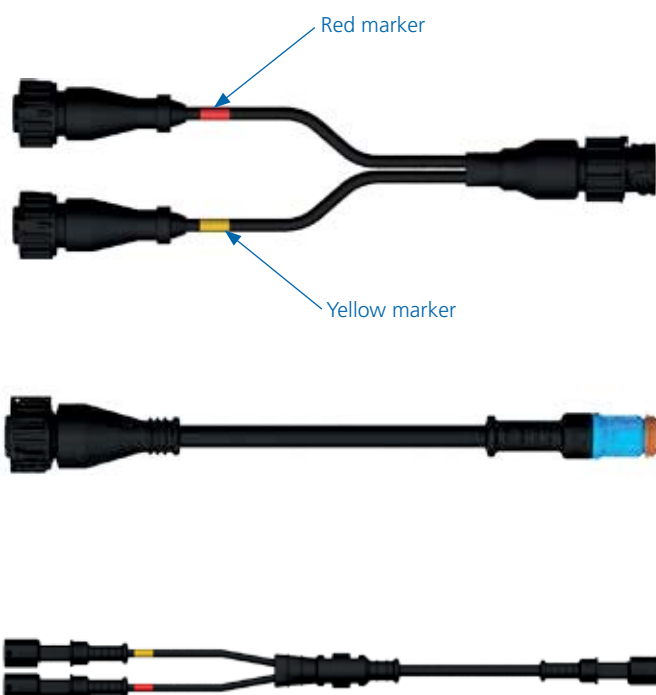
Auxiliary connection cables

To use the full auxiliary twin functionality of the "Premium AUX" product, the following cables can be used.

814 028 xxx series

814 012 2xx series

814 039 001



Programming Premium AUX using DIAG+ V6

Programming of AUX 2 and AUX 3 on Premium AUX is only possible using DIAG+ V6 or later.

The 'AUX configuration' screen shows the various auxiliary connections that can be used.

AUX 1

AUX 2 Red

AUX 2 Yellow

AUX 3 Red

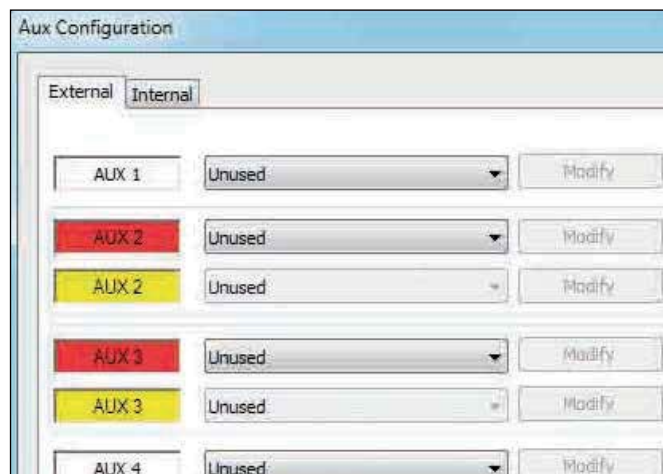
AUX 3 Yellow

AUX 4

AUX 5

Super AUX

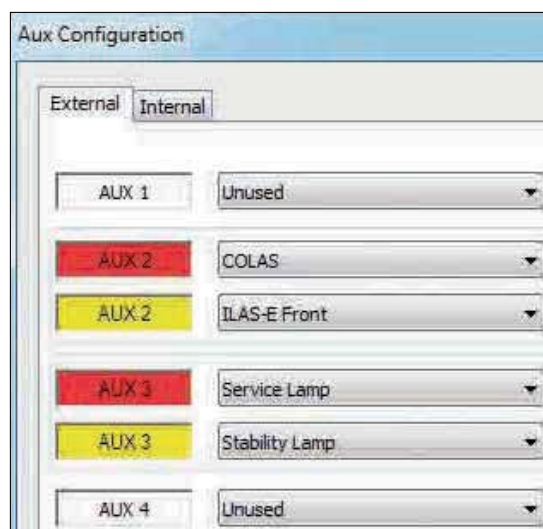
Clicking on the drop down arrow displays a list of options that can be selected on that auxiliary.



Note colour

Premium AUX example

AUX 2 (red AUX)	COLAS®
AUX 2 (yellow AUX)	ILAS®-E front
AUX 3 (red AUX)	Service lamp
AUX 3 (yellow AUX)	Stability lamp



COLAS settings information

General:

Activation (on) speed must be higher than de-activation (off) speed. (default for use with COLAS RTR: duration: 5 s, on: 15 kph, off: 0 kph)

Different settings for special applications:

- › 1. Permanent output
If the duration is set to '0', then the solenoid will switch 'on' after crossing the 'on speed' threshold, without a time limitation. It will only switch 'off' when the 'off speed' is crossed. You can use this setting e.g. to drive an external device that needs power and a speed signal, that is always supplied on the yellow wire of the 3 core AUX cable of AUX 1. (e.g.: 0 s, 15 kph, 10 kph)
- › 2. Movement detection with time limitation.
If the activation speed is set to '0', then the solenoid will switch 'on' after 1/4 turn any wheel, irrespective of speed. When the wheel pulses from the sensor stop, the solenoid will switch 'off', also if the duration is exceeded. (e.g.: 10 s, 0 kph, 0 kph)
- › 3. Movement detection without time limitation.
Like possibility 2. but 'duration' must be set to '0'. output is continuously switched 'on' during moving. (0 s, 0 kph, 0 kph)

COLAS input functions

COLAS function can be controlled / extended by several inputs.

OR

AUX output will change status, if COLAS function OR any of the related inputs is active.

AND

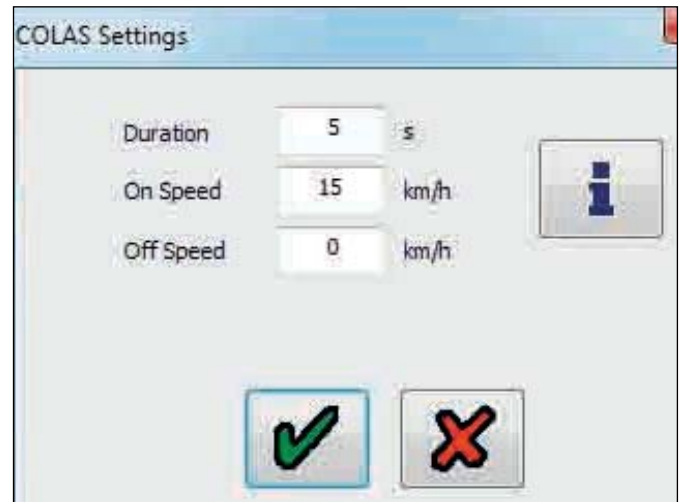
AUX output will change status, if COLAS function AND all related inputs are active.

24 V

Standard output: COLAS function AND / OR logic HIGH -> 24 V to solenoid, otherwise 0 V

0 V

Inverted output: COLAS function AND / OR logic HIGH -> 0 V to solenoid, otherwise 24 V



Application examples:

1. Traction help signal can be used to reset the suspension to ride height at the same time.
2. Automatic reset to ride height can be switched 'off' if needed.
3. Reset to ride height can be started by a remote switch.
4. Customer specific, speed related functions can be controlled by the input.

* The output level can be adjusted independently of input use!

* Possible inputs: Super AUX A / B / C / Custom, general purpose input (GPI) AUX 4 / 5.

Retarder and trailer lamp settings information

Function can be controlled/extended by several inputs.

OR

AUX output will change status if the function OR ANY of the related inputs are active.

AND

AUX output will change status if the function AND ALL related inputs are active.

24V

Standard output: Function AND/OR logic HIGH -> 24V to solenoid, otherwise 0V.

0V

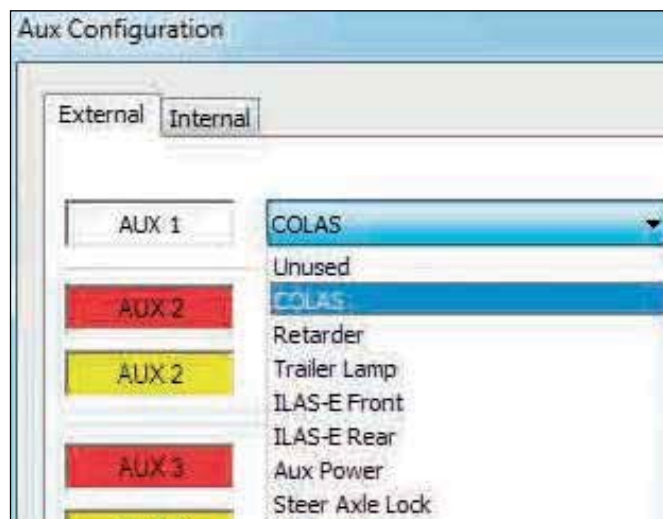
Inverted output: Function AND/OR logic HIGH-> 0V to solenoid, otherwise 24V.

*The output level can be adjusted independently of input use!



*Possible Inputs: Super AUX A/B/C Custom, General Purpose Input (GPI) AUX 4/5

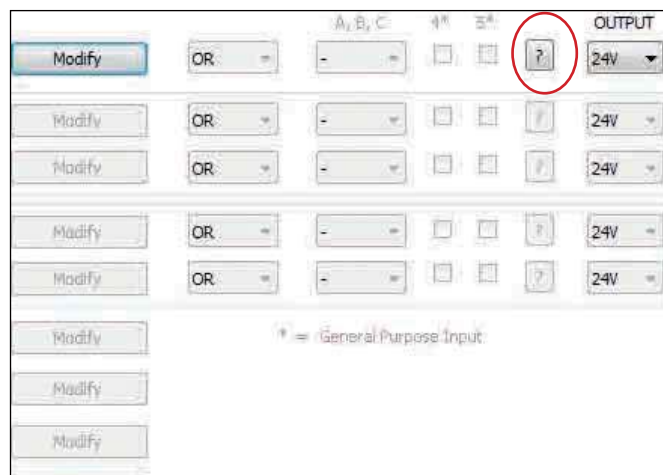
COLAS (on AUX 1)

Highlight option and click to select it. The required parameters for that option are automatically set.



To view and set the parameters click on the 'modify' and 'output' buttons.

Depending on the active window, further information can be obtained by clicking the  or  button.



Info button

Modify

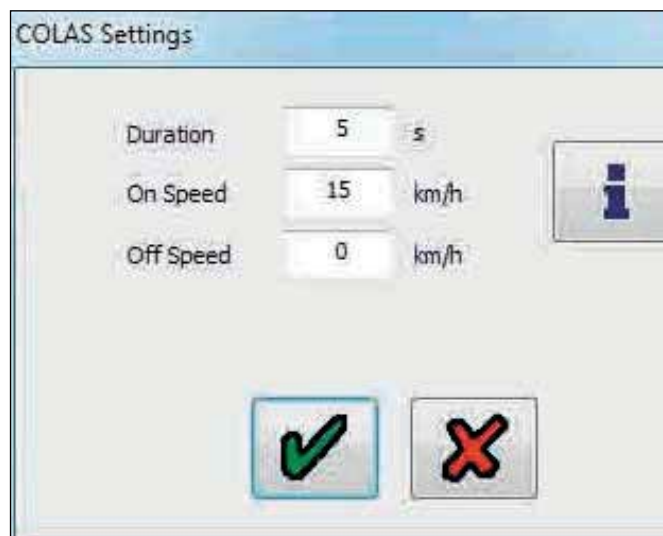
COLAS (AUX 1,2 & 3) example

The following screen will appear, modify the values as required.

Duration : Time COLAS solenoid is energised (default 5s)

On speed : The output to the COLAS will be switched 'on' (default 15 Kph)

Off speed : The output will be switched 'off' either when the vehicle decelerates below the 'off speed' or when 'duration' has been exceeded, whichever happens first. (default 0 kph)



Note: By setting the 'duration' to 0 sec. This now becomes a speed signal and a 'on and off speed' has to be set.

Click on the  button to accept.

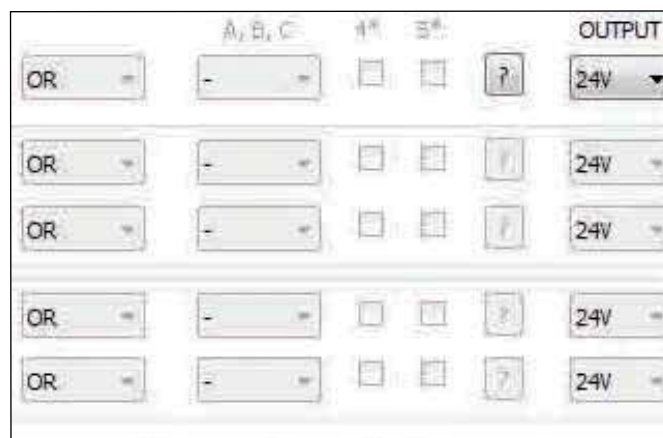
Output

24 V

Standard output: COLAS function AND/OR logic HIGH
-> 24 V to solenoid, otherwise 0 V

0 V

Inverted output: COLAS function AND/OR logic HIGH
-> 0 V to solenoid, otherwise 24 V



Example ILAS-E (AUX 1,2 & 3) front & rear

Auto raise / auto lower.

The following screen will appear, modify the values as required.

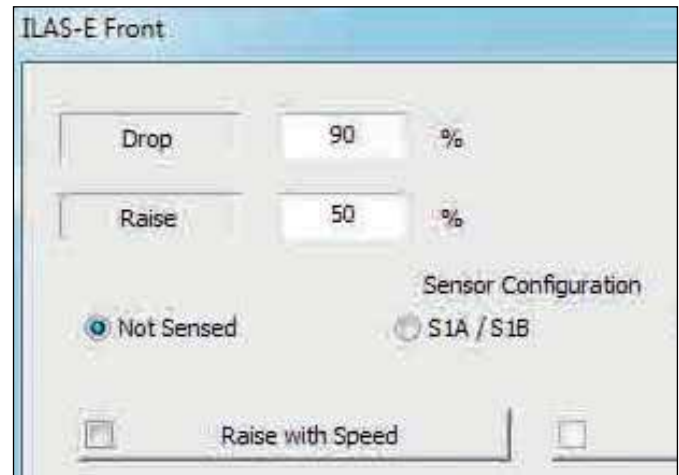
Drop: The load where the ILAS solenoid is de-energised resulting the axle to drop.
(default - 90 %)

Raise: The load where the ILAS solenoid is energised resulting for the axle to raise.
(default - 50 %)

Sensor configuration:

Disables the wheel speed signal when a sensed axle is raised. (default - not sensed)

Raise with speed, drop with speed are further options that can be selected when the drop and raise loads are reached.



Note: For installations with ILAS-E use:

Front lift axle only = ILAS-E front

Middle lift axle only = If lifting it weights the king pin then ILAS-E front

Rear lift axle only = ILAS-E rear

Example ILAS-E manual (AUX 2 & 3)

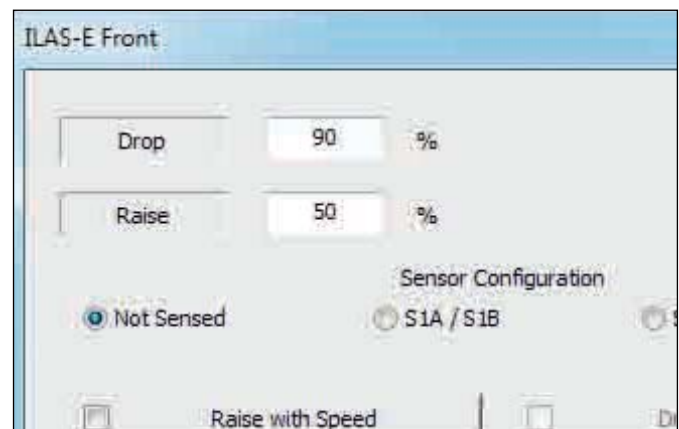
Manual = Manual raise / auto lower. Requires a 24 V signal / switch on the yellow wire of the 3 core AUX cable. The following screen will appear, modify the values as required.

Drop: The load where the ILAS solenoid is de-energised resulting the axle to drop.
(default - 90 %)

Raise: The load where the ILAS solenoid is energised resulting for the axle to raise.
(default - 50 %)

Sensor Configuration:

Disables the wheel speed signal when a sensed axle is raised.
(default - not sensed)



Raise with speed, drop with speed options are not valid.

Raise 'ILAS-E front' & raise 'ILAS-E rear'

Happens fully automatically below the raise threshold.

In the case of two lift axles the one with the higher raise threshold raises first!

Raise 'ILAS-E front manual'

Happens only after a demand signal on the AUX port (yellow wire) or related control inputs (momentary or permanent signal).

The first activation is always carried out using the traction assist thresholds. If after exceeding the traction speed limit the lift axle drop threshold is not exceeded the axle remains up, otherwise it is dropped. It will be raised again after dropping below the traction speed limit if you have used a permanent latching switch.

Raise 'ILAS-E rear manual'

Happens only after a demand signal on the AUX port (yellow wire) or related control inputs (momentary or permanent signal).

Lower

Happens in both cases automatically after exceeding the drop threshold.

In the case of two lift axles the one with the lower drop threshold drops first!

Raise with speed

2 possibilities, the higher value will be used.

1. In the ECU setup screen select 'lift on move' then all lift axles will not raise until vehicle has first exceeded 7 kph after ignition 'on'.

2. AND / OR here in this screen select 'raise with speed' (option 'drop with speed' becomes available and can be selected if necessary). Corresponding speeds must be set in the 'extra lift axle data' screen (default: 50 km/h, 1 km/h)

Sensor configuration - ILAS-E rear

If sensors are fitted to the lift axle you have to specify, if not a DTC may be generated when moving!

Traction help / disable lift axles - ILAS-E front

Activated by demand signal on AUX port (yellow wire) or related inputs.

Corresponding thresholds must be set in the 'extra lift axle data' screen (default: 130 %, 30 kph)

Traction help / disable lift axle - ILAS-E rear

Works only if no ILAS-E front is programmed.

Activated by a demand signal on the AUX port (yellow wire) or related inputs.

Corresponding thresholds must be set in the 'extra lift axle data' screen (default: 130 %, 30 kph)

Lift axle info

Lift axle functions can be controlled / extended by several inputs. These inputs don't control the output directly as in other cases. In this case inputs are logically connected to the yellow wire of the AUX port.

With the yellow wire you can control manual lift axles and traction support and you get the same result if you use one or more of the Super AUX or GPI inputs.

If you use automatic lift axles, only the input for ILAS E front is used.

OR

AUX traction support is started if the yellow wire (AUX 2 / 3) OR any of the inputs are active.

AND

Note: Yellow wire must only be used on AUX 2 / 3.

AUX traction support is started if the yellow wire AND all of the inputs are active.

24 V

Standard Output: Function AND/OR Logic High -> 24 V to solenoid, otherwise 0 V.

0 V

Inverted output: Function AND / OR logic HIGH -> 0 V to solenoid, otherwise 24 V.

AUX power settings information

AUX power function can be controlled / extended by several inputs. By default this function is high.

OR <<Please do not use>>

AUX output status will never change. This setting has no effect.

AND

AUX output will change status, if all related inputs are active.

24 V

Standard output: AND logic high -> 24 V to solenoid, otherwise 0 V.

0 V

Inverted output: AND logic high > 0 V to solenoid, otherwise 24 V.

Application examples:

1. Switchable power supply for customer applications.

Example steer axle lock (AUX 1,2 & 3)

The following screen will appear, modify the values as required.

Lock above: Speed at which the steer axle locks (default 25 Kph)

Unlock: Speed at which the steer axle unlocks (default 20 Kph)

Lift axle dependence:
The steer axle is set to lock and unlocks when the front axle is lifted in order to maintain turning circle.

Invert steer axle lock

This function will reverse the values as stated above in the steer axle lock.

By default this function provides 24 V to lock a steer axle, 0 V otherwise.

You can invert the output to get 0 V to lock, 24 V otherwise.

Which output type you need depends on the locking device / pneumatic installation.

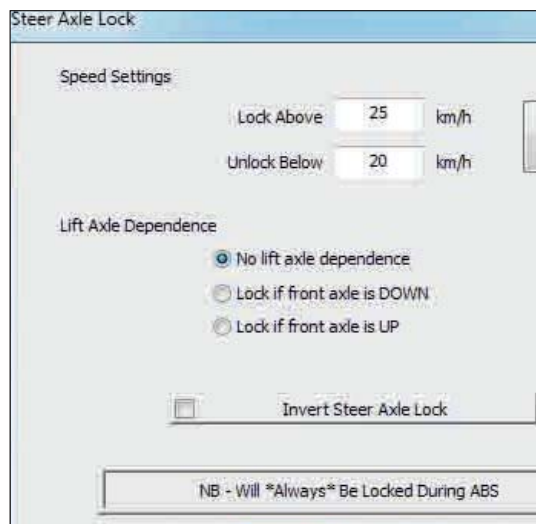
This 'Inverting' of the output can be selected in two places:

- › 1. Here in this screen -> is usable with all ECU software versions, but inverts only the output of this function. If you don't want to use further control inputs (or cannot because not available) you should use this option.
- › 2. In the main AUX screen -> only usable with ECU software version B407 upwards. This option offers the advantage that related control inputs also create an inverted AUX output. Example: automatic steer axle lock function 'high' or reversing 'high' (e.g. Super AUX B). Result: In both cases you get 0 V output to lock.

Important: Only use one of the 'inversion' options! Otherwise you may get unexpected results!

Special case for speed setting:

If you set both speeds to '0' the function only locks depending on the lift axle position or related control inputs. Speed no longer has an influence!



Steer axle lock settings information

Steer axle lock function can be controlled / extended by several inputs.

It is possible to lock the steer axle for example on the following events:

- Reversing
- Demand signal(s) from a switch mounted in the cab or on the trailer panel
- Depending on the front lift axle position
- Depending on the speed thresholds

Note: AUX is always active during ABS events

OR

AUX output will change status if steer lock function OR any of the related inputs are active.

AND

AUX output will change status, if all related inputs are active.

24 V

Standard output: Function AND / OR logic HIGH -> 24 V to solenoid, otherwise 0 V.

0 V <<Don't use this option if you intend to use the invert option in the steer lock function>>

Inverted output: Function AND/OR logic HIGH-> 0 V to solenoid, otherwise 24 V.

*The output level can be adjusted independently of input use!

*Possible inputs: Super AUX A / B / C custom, general purpose input (GPI) AUX 4 / 5

Service lamp settings information

Function can be controlled / extended by several inputs.

OR

AUX output will change status if function OR any of the related inputs are active.

AND

AUX output will change status, if the function AND all related inputs are active.

24 V

Standard output: Function AND / OR logic HIGH -> 24 V to solenoid, otherwise 0 V.

0 V

Inverted output: Function AND / OR logic HIGH-> 0 V to solenoid, otherwise 24 V.

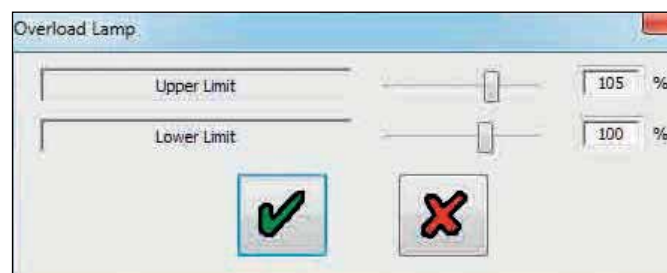
*The output level can be adjusted independently of input use!

*Possible inputs: Super AUX A / B / C custom, general purpose input (GPI) AUX 4 / 5

Overload lamp (AUX 1, 2 & 3) for semi / centre axle trailers

This gives a 24 V output when the trailer load goes above the set limits. The following screen will appear modify the values as required.

Note: Overload lamp works with only the main (Master ECU) valve suspension input.



Overload lamp settings information

Function can be controlled / extended by several inputs.

OR

AUX output will change status if function OR any of the related inputs are active.

AND

AUX output will change status, if the function AND all related inputs are active.

24 V

Standard output: Function AND / OR logic HIGH -> 24 V to solenoid, otherwise 0 V.

0 V

Inverted output: Function AND / OR logic HIGH-> 0 V to solenoid, otherwise 24 V.

*The output level can be adjusted independently of input use!

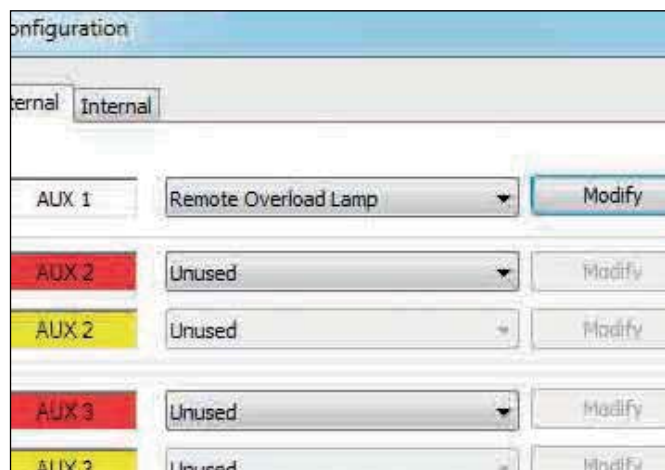
*Possible inputs: Super AUX A / B / C custom, general purpose input (GPI) AUX 4 / 5

Remote overload lamp

Select remote overload lamp on AUX 1 / 2 / 3 and click on 'modify' button.

This gives a 24 V output when the trailer load goes above the set limits. The following screen will appear to modify the values required.

Note: Remote overload lamp works with only the Slave ECU valve suspension unit in 3M full trailer systems.



Settings information

Function can be controlled / extended by several inputs.

OR

AUX output will change status if function OR any of the related inputs are active.

AND

AUX output will change status, if the function AND all related inputs are active.



24 V

Standard output: Function AND / OR logic HIGH -> 24 V to solenoid, otherwise 0 V.

0 V

Inverted output: Function AND / OR logic HIGH-> 0 V to solenoid, otherwise 24 V.

*The output level can be adjusted independently of input use!

*Possible inputs: Super AUX A / B / C custom, general purpose input (GPI) AUX 4 / 5

Stability lamp settings information

Function can be controlled / extended by several inputs.

OR

AUX output will change status if function OR any of the related inputs are active.

AND

AUX output will change status, if the function AND all related inputs are active.

24 V

Standard output: Function AND / OR logic HIGH -> 24 V to solenoid, otherwise 0 V.

0 V

Inverted output: Function AND / OR logic HIGH-> 0 V to solenoid, otherwise 24 V.

*The output level can be adjusted independently of input use!

*Possible inputs: Super AUX A / B / C custom, general purpose input (GPI) AUX 4 / 5

General purpose output (GPO) settings information

External devices can be controlled by the neutral general purpose output (GPO). By default the function is low.

OR

AUX output will change status if function OR any of the related inputs are active.

AND << Please don't use>>

AUX output will change status, if the function and all related inputs are active.

24 V

Standard output: Function AND / OR logic HIGH -> 24 V to solenoid, otherwise 0 V.

0 V

Inverted output: Function AND / OR logic HIGH-> 0 V to solenoid, otherwise 24 V.

*The output level can be adjusted independently of input use!

*Possible inputs: Super AUX A / B / C custom, general purpose input (GPI) AUX 4 / 5

Traction assist (TA+) settings information

Function can be controlled / extended by several inputs.

OR

AUX output will change status if function OR any of the related inputs are active.

AND

AUX output will change status, if the function AND all related inputs are active.

24 V

Standard output: Function AND / OR logic HIGH -> 24 V to solenoid, otherwise 0 V.

0 V

Inverted output: Function AND / OR logic HIGH-> 0 V to solenoid, otherwise 24 V.

*The output level can be adjusted independently of input use!

*Possible inputs: Super AUX A / B / C custom, general purpose input (GPI) AUX 4 / 5

Info Point

Info Point is used to show different events / system faults by a red point. In the DIAG+ 'Info Point status' screen you can see what causes the indication.

Here you can set the following options:

Enable

Red point is only active as long as the event is active.

Store

Red point is active until the Info Point has been reset (vehicle service)

This can be done by clearing the system DTC's with DIAG+ or Info Centre or by cycling the ignition 'on' for 4 seconds, 'off', 'on' for 4 seconds, 'off', then 'on' (the same sequence can be used to clear lining wear indicators)

DTC

All detected DTC's cause an Info Point indication.

Service indicator

Anything that causes the service indicator will cause an Info Point indication (e.g. linings worn or service due)

- The service indicator is normally shown by 2 flashes of the yellow warning lamp.

Overload

Up to 150 %, default is 130 % when no value is shown. During 'traction help' monitoring is switched off.

Over speed

Up to 150 km/h, default is 100 km/h when no value is shown.

Over pressure

Up to 12 bar, default is 9.75 bar (DTC trigger level) when no value is shown.

Legislation allows max 8.5 bar reservoir pressure.

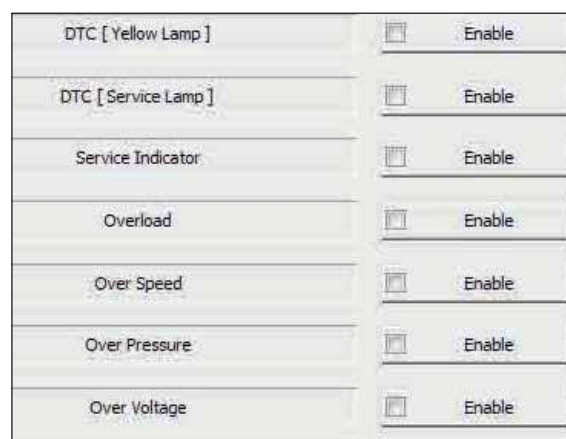
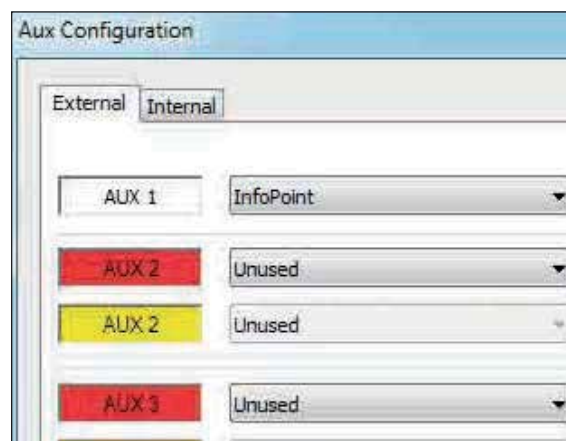
Higher pressure reduces the life time of all pneumatic components.

Over voltage

Up to 32 V, default is 32 V (DTC trigger level) when no value is shown.

TPMS

Click modify and select any combination from the options to activate the Info Point from the TPMS setting box.



Attention:

With the combined function 'Info Point / COLAS' the refresh of the Info Point is only started if the speed is higher than 15 km/h, because simultaneously the ride height is reset.

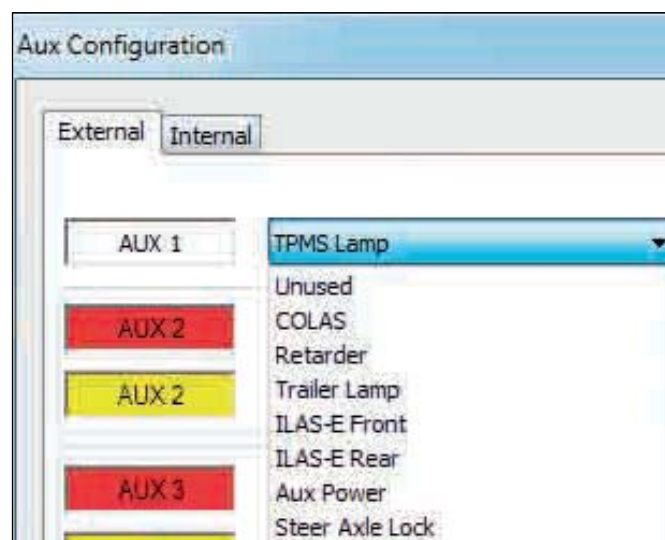
TPMS lamp (AUX 1, 2 & 3)

Select the TPMS lamp on AUX 1 / 2 / 3 from the drop down box and then click on the 'modify' button. This gives a 24 V output to the lamp when the TPMS selected threshold set limits have been exceeded.

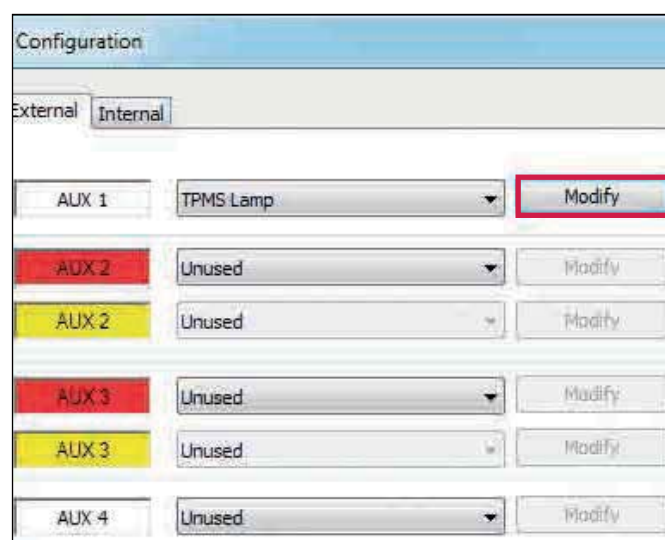
Example:

Setting the TPMS lamp to operate on AUX 1.

Select the TPMS lamp option from the drop down box on AUX 1.




Click on the 'modify' button.




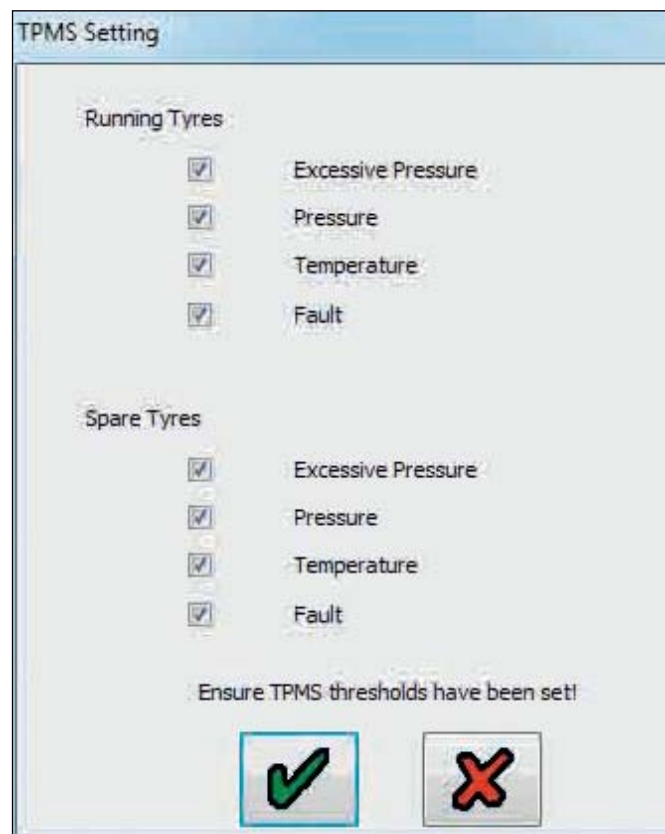
Now select any of the available options in any combinations from the 'TPMS setting' dialogue.

TPMS lamp settings:

Excessive pressure	Extreme over and under pressure alerts.
Pressure	Over and under pressure (i.e. not extreme) alerts.
Temperature	Over and under temperature alerts.
Fault	Any wheel unit sensor faults (e.g. loss of comms, low battery etc).

Click on the  button to exit without saving the selected options.

Click on the  button to exit and save the selected options.



The image shows a 'TPMS Setting' dialog box. It has two sections: 'Running Tyres' and 'Spare Tyres'. Each section has four checkboxes: 'Excessive Pressure', 'Pressure', 'Temperature', and 'Fault'. All checkboxes are currently checked. At the bottom, there is a message 'Ensure TPMS thresholds have been set!' followed by two buttons: a green checkmark button and a red X button.

Note: To complete the TPMS lamp AUX setting configuration, you must then program the ECU with these settings before they become active (see 'saving ECU parameters').

Load Transfer (AUX 2 & 3)

This feature uses two solenoid valves to exhaust and hold the pressure in the rear axle suspension bellows of a semi-trailer. This effectively reduces the dynamic wheelbase of the trailer, which in turn increases the share of the load carried by the remaining trailer axles thereby minimising risk of drive axle overloading.

Note: A 3M system configuration is required, with the 1M remote modulator measuring the rear axle suspension pressure and controlling the rear axle brakes independently.

Options:

- › Load Transfer & lift
- › Load Transfer

Settings:

Transfer Above - this is the overall percentage load above which automatic Load Transfer is allowed.

Load Target - this is the target percentage load on the front/centre axles after transfer has taken place, +/- the 'Load Target Tolerance'

Tag Axle Minimum Pressure - Load transfer may stop before the 'Load Target is reached in order to protect the 'Tag Axle Minimum Pressure'. This ensures that a minimum load is always carried by the rear axle.

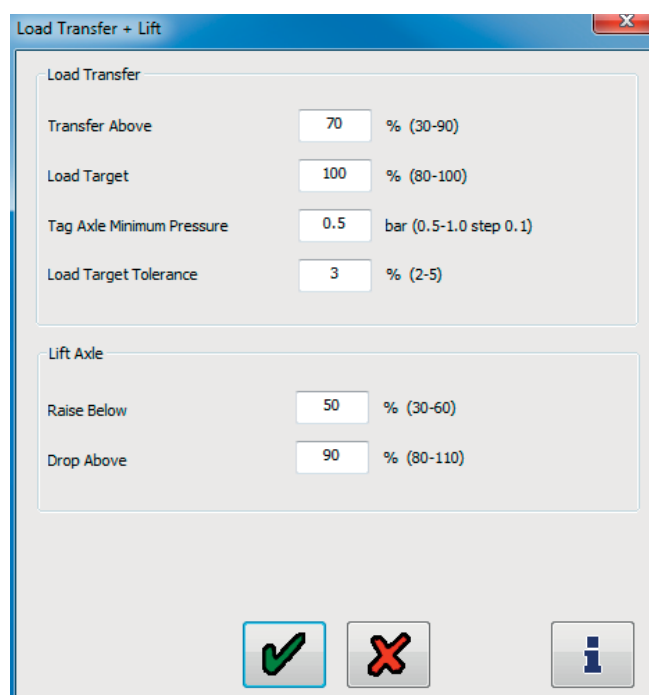
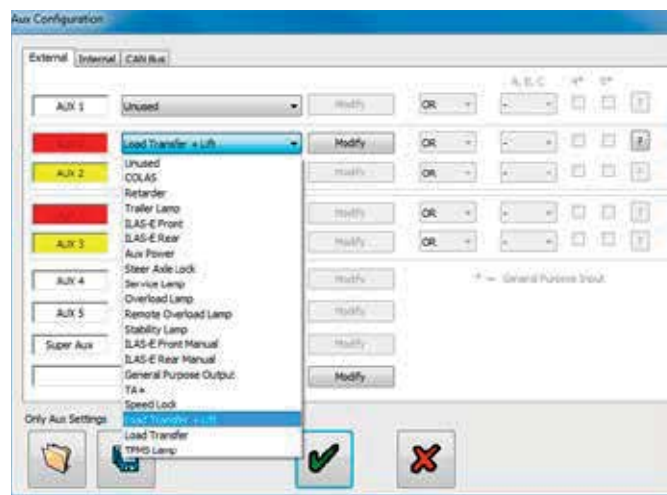
Lift Axle - Optionally the suspension exhaust solenoid valve can be an ILAS-E lift axle valve. This means that it is also possible to completely lift rear axles. 'Raise Below' and 'Drop Above' overall load percentages work in the same way as a conventional lift axle.

Load Transfer Control

An associated GPI or / and Super AUX can be connected to a button or a switch or both.

A short activation (< 5 seconds) is a manoeuvring request and will use the available Load Transfer hardware to temporary minimize the wheelbase. 'Load Target' is changed to the 'Traction Overload Limit' (Extra Lift Axle Data). Manoeuvring is cancelled when 'Traction Speed Limit' (Extra Lift Axle Data) is reached or by a further short activation of the switch.

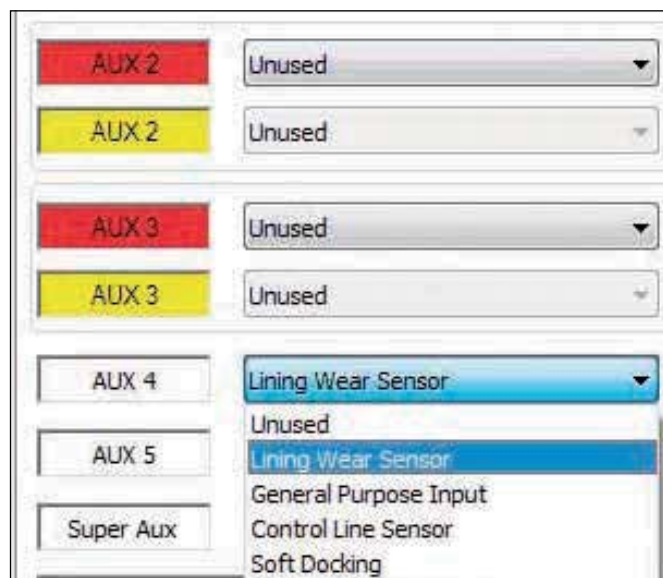
Note: Load Transfer is effectively the opposite to traction assist.



Lining wear sensor (AUX 4 or 5)

Select lining wear sensor from the drop down menu on AUX 4 or AUX 5.

Then select modify to enter specific parameters.



The following screen appears. 'Lining wear indicator'.

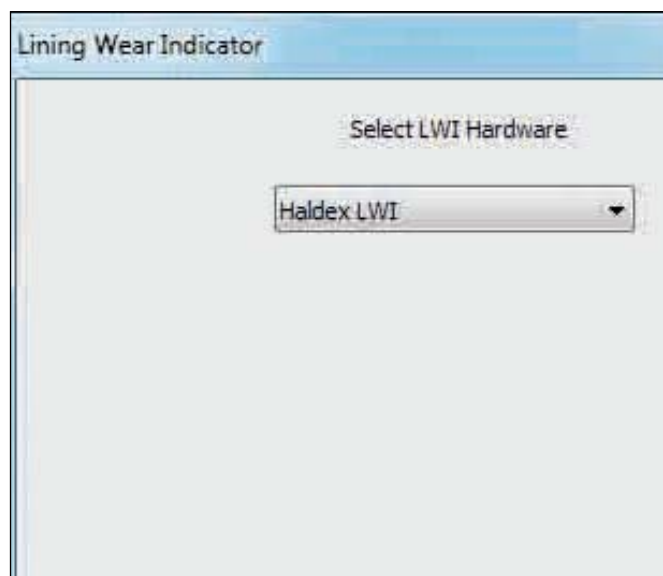
From the menu select one of the following:

Haldex LWI

BPW / brake monitor (customer specific only)

Custom

Haldex LWI' and 'BPW brake monitor' are preprogrammed options and no other data is required. 'Custom' allows entry of user settings (see Custom screen below).



Custom screen

The 'service lamp flash' is set as default. A sequence of three lamp flashes on ECU power up.

'Continuous flash' causes the flashing to continue until the vehicle is first driven away from rest.

The custom screen allows the user to enter custom voltage settings as to an alternative manufacturer lining wear system used.

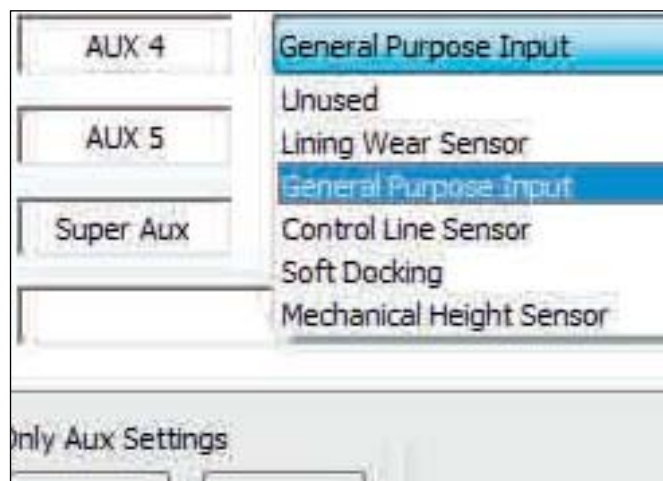
Note: As the pads wear the input voltage can rise or drop. If the lining wear sensor is tampered (i.e. short circuit) the input voltage rises.



General purpose input (AUX 4 or 5)

Select 'general purpose input' from the drop down menu on AUX 4 or AUX 5.

Then select 'modify' to enter specific parameters.



The following screen appears. 'general purpose input: [AUX 4].

The actions from this screen are processed if the conditions are active.

The yellow warning lamp can be 'permanent' or only 'on' whilst the conditions are 'active'.

You can connect simple switches or any type of 5 V sensor (pressure sensor 0 - 8 bar, M16 x 1.5 is available from Haldex).

AUX cable colours and function:

Red; Output 5 V supply

Black; B-

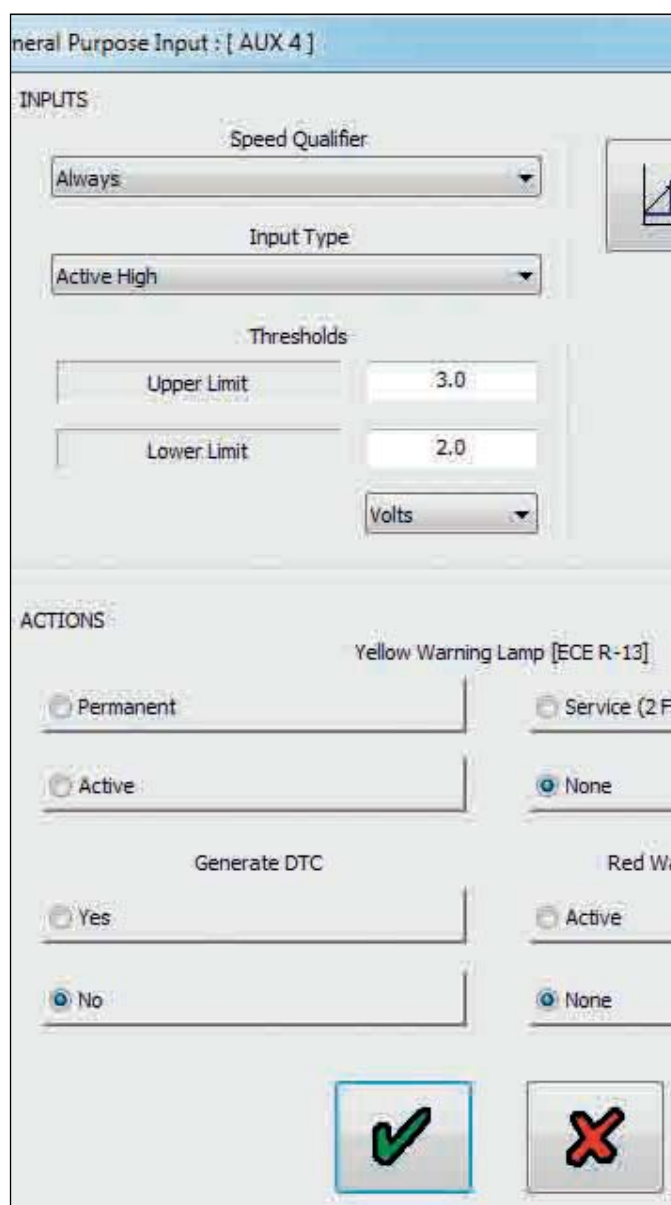
Yellow; Input signal, analog (0-24 V)

You can use the 'output' (high, low) to control other auxiliaries.

Application examples:

1. Traction help for lift axle by switch mounted on the trailer and / or in the cab.
2. Monitoring spring brake pressure, warning lamp if lower limit is exceeded.
3. Allow additional functions perhaps only if spring brake is 0 bar (i.e. brake applied)

Note: The lamp usage is controlled by ECE-R13



Control line sensor

The control line sensor functionality was added to EB+ ECU software B399 (Gen1 1M / 2M) and B400 (Gen1 3M). It is available in Gen2 software B397 onwards.

The control line sensor is configured in AUX 4 or AUX 5.

Mechanical height sensor

The mechanical height sensor is for use on mechanical suspension trailers. It will allow the EB+ to measure load and therefore adjust braking force according to the load plate data.

To configure the mechanical height sensor the user must first enter the trailer deflection. This is given by the trailer manufacturer and we allow 10 mm to 65 mm.

Once the deflection is entered, the user must set the lever length to between the allowed lever length range. The allowed lever length range varies depending upon the deflection.

Examples:

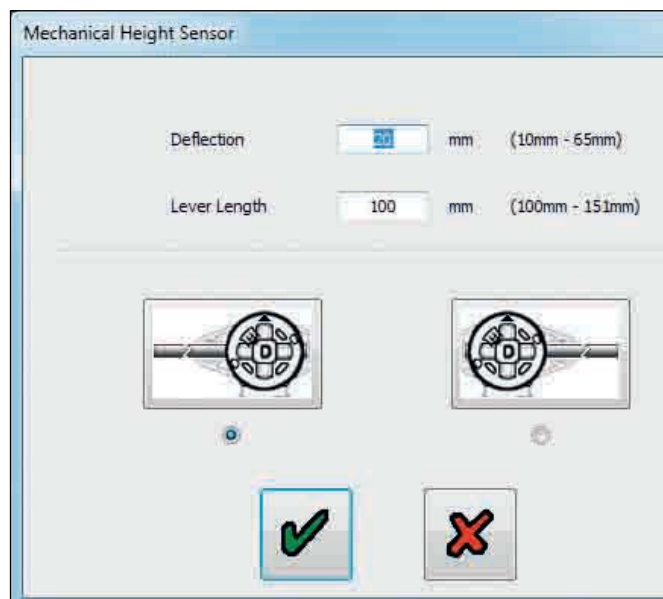
A deflection of 20 mm will allow a lever length range of 100 to 151 mm (as seen in the picture).

A deflection of 55 mm will allow a lever length range of 276 to 320 mm.

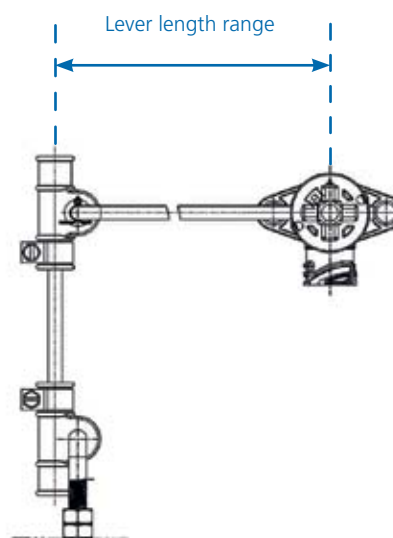
Once the lever length is set, the user then enters the actual lever length.

The user now selects a left or right installation.

The mechanical height sensor also needs calibrating, which is performed during EOLT. To perform the calibration the trailer must be on flat level ground, unladen and at the normal running king pin height.



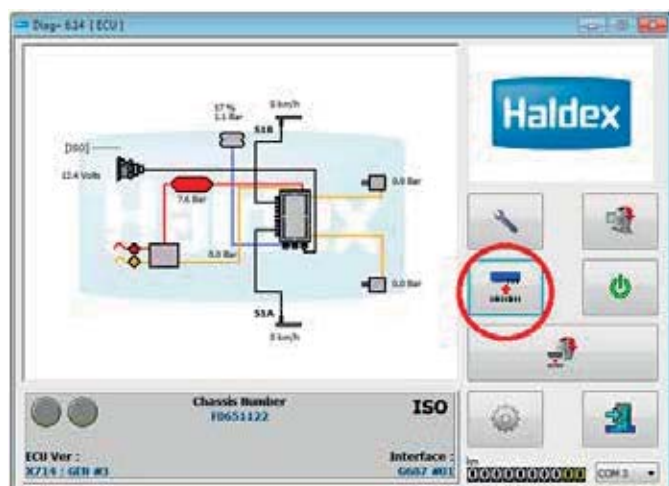
Highlight (check) to select left or right installation



How to check if EB+ Soft Docking is installed

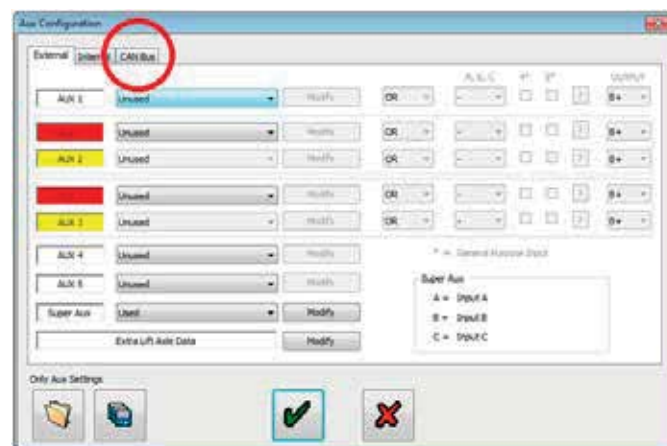
Step 1:

Turn 'on' the power to the EB+ Gen3.
Open DIAG+, select configuration.



Step 4:

Select CAN BUS tab.



Observe the EB+ Soft Docking tick box.

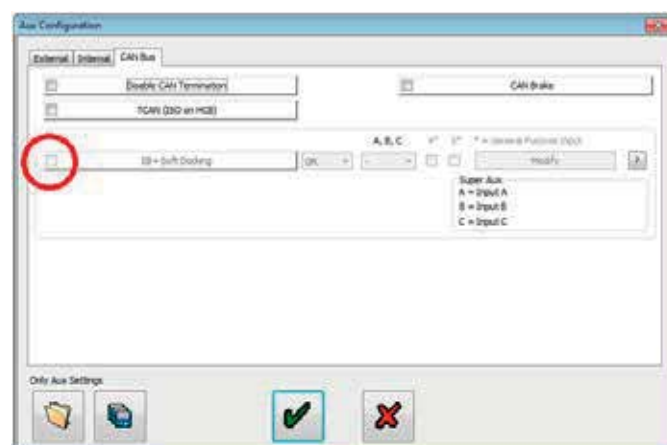
Step 2:

Select ECU parameters / configuration.

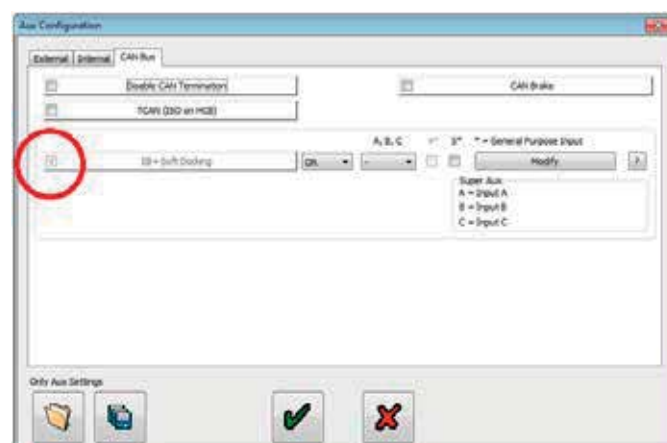


Step 3:

Select setup auxiliary configuration.



No tick = EB+ Soft Docking not installed

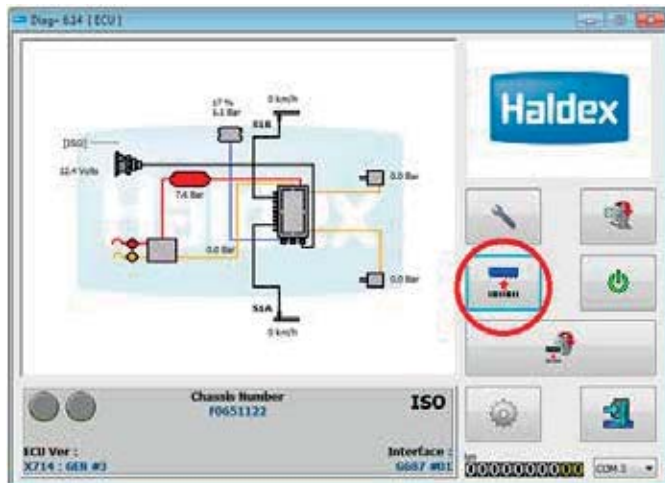


Tick = EB+ Soft Docking installed

How to remove EB+ Soft Docking from EB+ Gen3

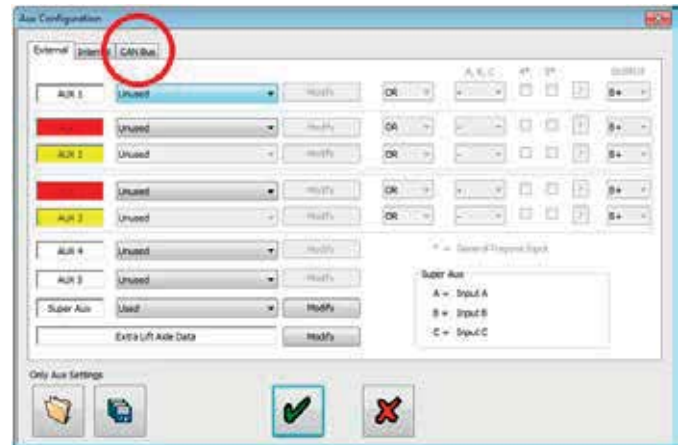
Step 1:

Turn 'on' the power to the EB+ Gen3.
Open DIAG+, select configuration.



Step 4:

Select CAN BUS tab.



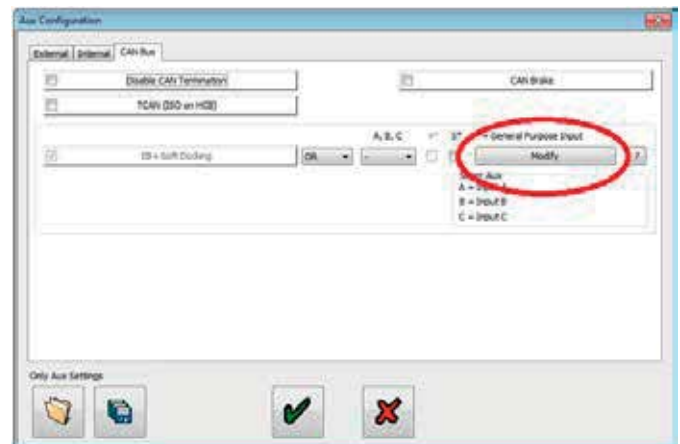
Step 2:

Select ECU parameters / configuration.



Step 5:

Select "Modify" button.

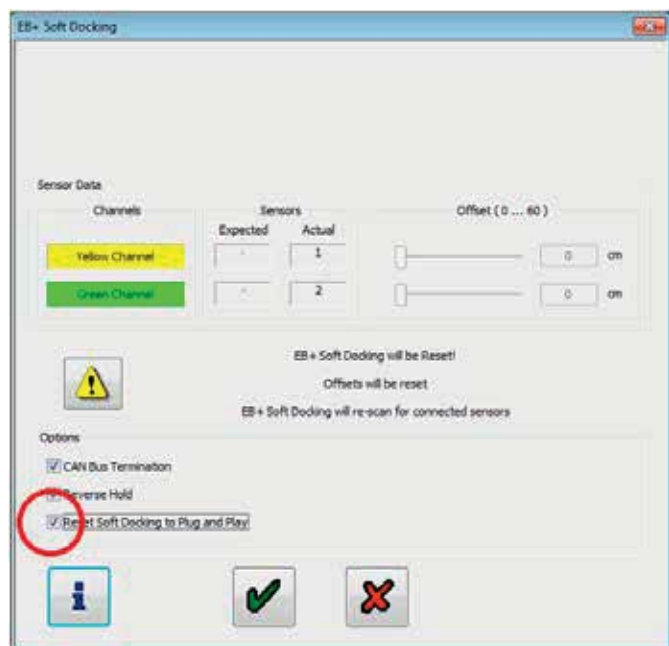


Step 3:

Select setup auxiliary configuration.

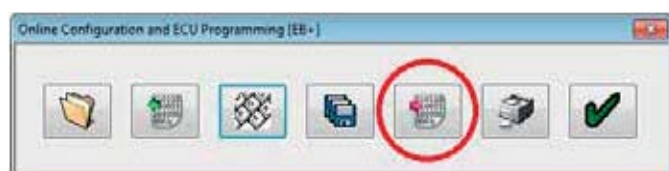


Step 6:
Select 'Reset Soft Docking to Plug and Play' box.



Step 7:
Click on 'green' ticks until you reach 'Online Configuration and ECU Programming' window.

Step 8:
Select 'Send data to ECU'.

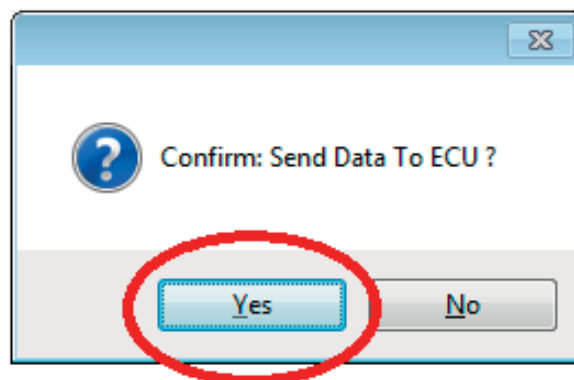


Step 9:
Remove EB+ Soft Docking CAN BUS cable from EB+ Gen3 ECU.

EB+ CAN BUS cable



Step 10:
Select 'Yes' to send data to ECU.



Step 11:
Sending data screen.



Step 12:
Select 'green' tick to complete the operation.



Step 13:
Check using DIAG+ that the EB+ Soft Docking has now been removed.

How to install a 3 sensor (1 x yellow & 2 x green) EB+ Soft Docking system using DIAG+

Step 1:

Turn 'off' the power to EB+ Gen3.

Step 2:

Connect EB+ Soft Docking to the EB+ CAN BUS connector.

Step 3:

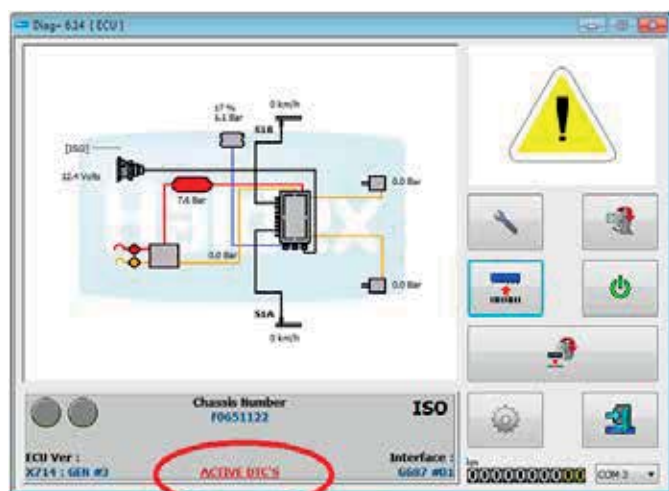
Turn 'on' the power to EB+ Gen3.

Step 4:

Check installation using DIAG+

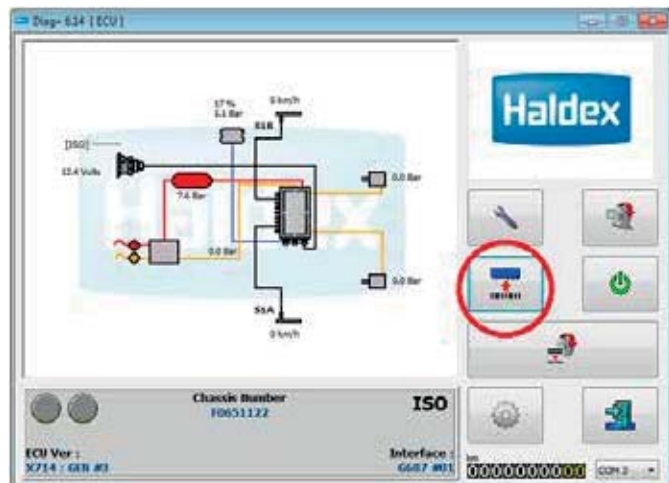
Step 5:

Open DIAG+, check that no DTC's are shown.



Step 6:

If no DTC's are present select configuration.



Step 7:

Read data from ECU.



Step 8:

Select ECU parameters / configuration.



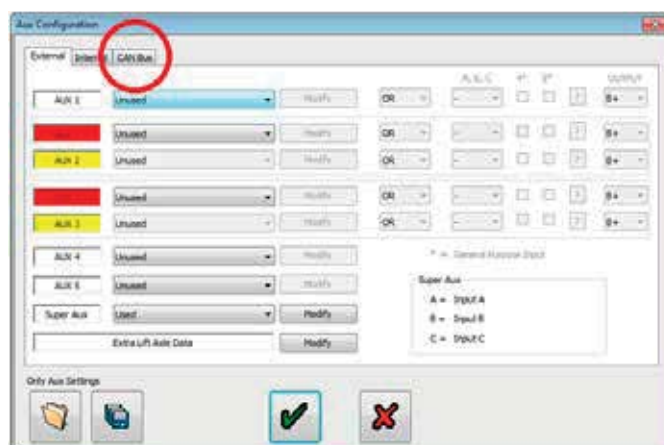
Step 9:

Select set up auxiliary configuration.

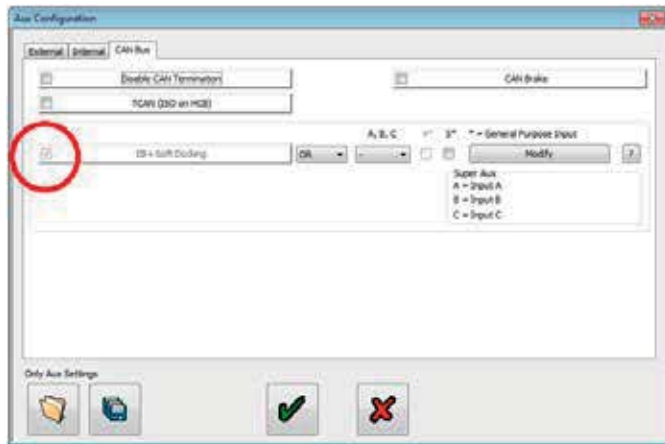


Step 10:

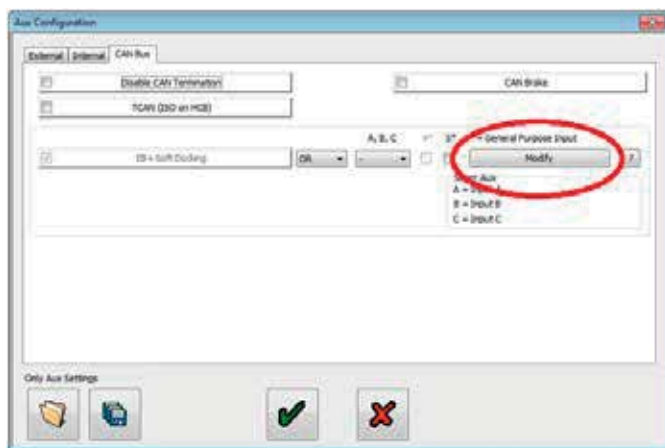
Select CAN BUS tab.



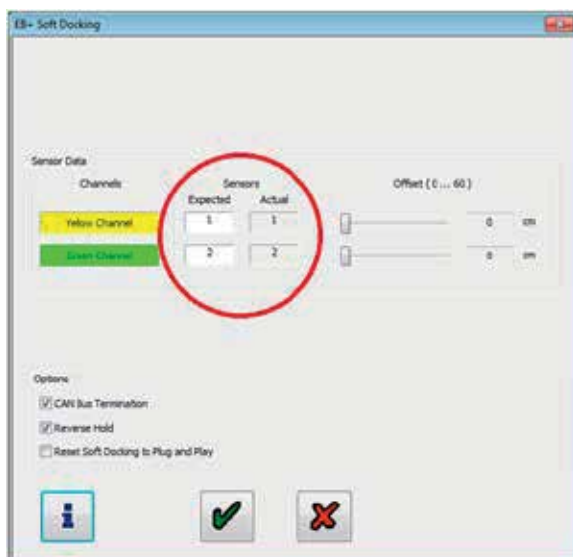
Step 11:
Observe the EB+ Soft Docking tick box.



Step 12:
Select 'Modify' button.



Step 13:
Check that the number of sensors is correct.



Step 14:
Ensure that the 'CAN Bus Termination' box is selected.

Note: the 'CAN Bus termination' shall always be selected unless otherwise advised by Haldex.



Step 15:
Select 'i' button for additional information.



Step 16:

If no sensor channel offsets are required, go to step 17.

If sensor channel offsets are required, go to step 18.

Step 17:

Proceed to EOLT.

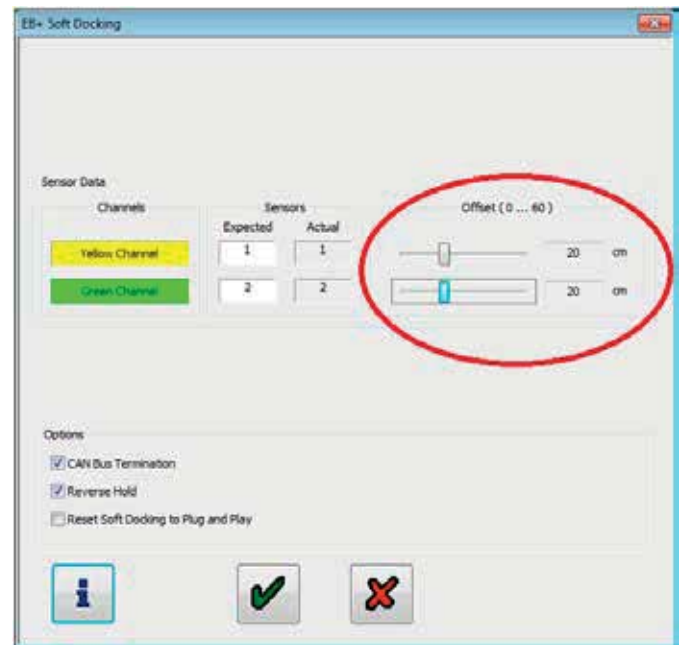
Click on 'green' ticks until you reach 'DIAG+ home page'

Step 18:

Adjust channel values to sensor installation offset.

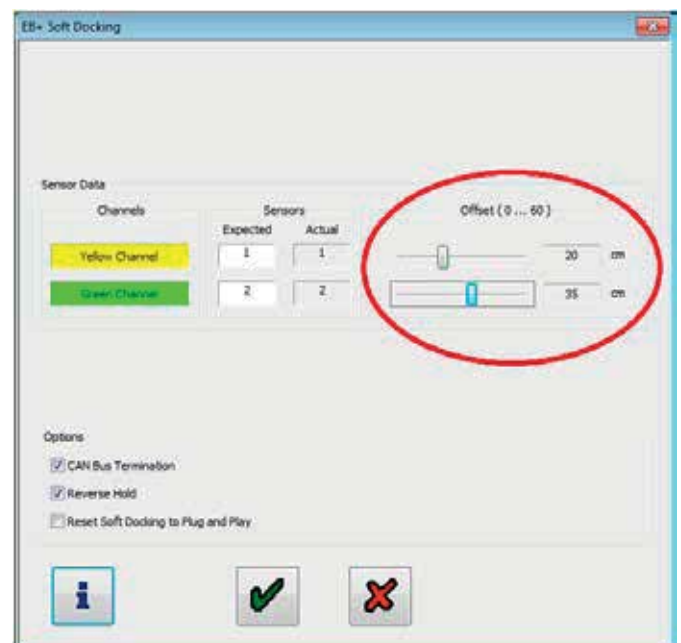
Offset example:

Both channels the same value.



Offset example:

Both channels are different values.

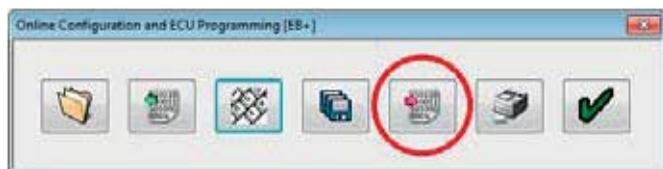


Step 19:

Click on 'green' ticks until you reach 'Online Configuration and ECU Programming' window.

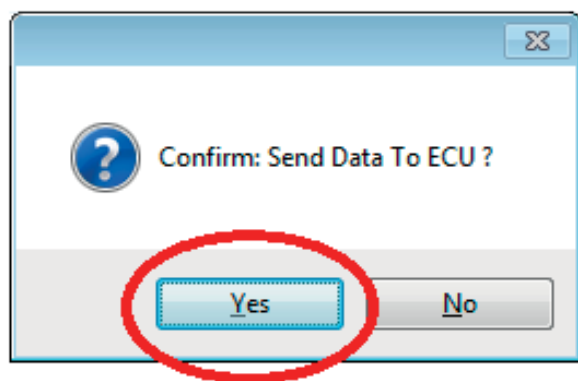
Step 20:

Select 'Send data to ECU'.



Step 21:

Select 'Yes' to send data to ECU.



Step 22:

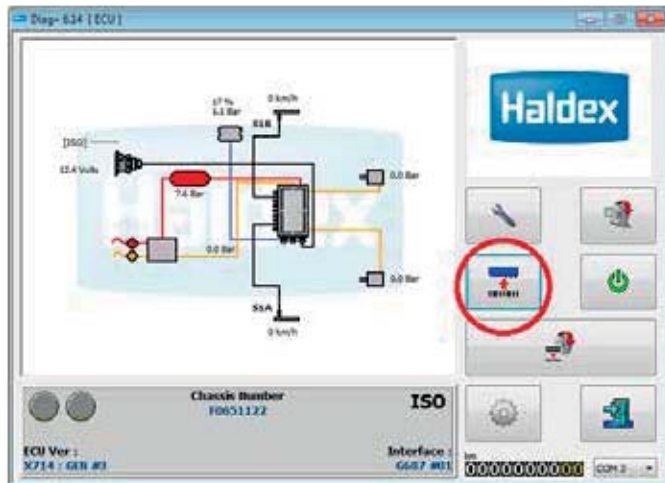
Click green tick to return to DIAG+ home page.



How to configure a sensor channel offset

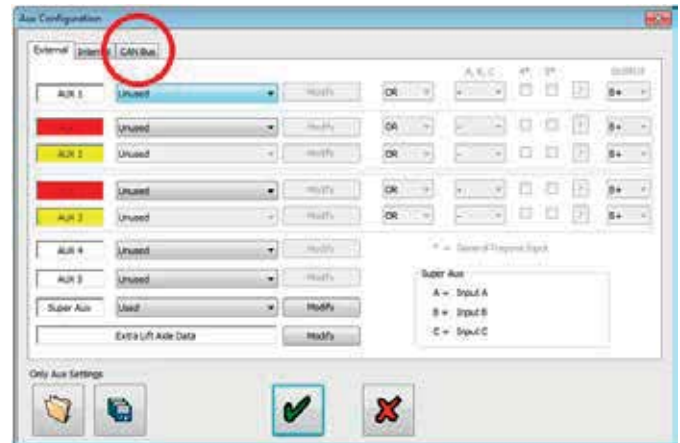
Step 1:

Turn 'on' the power to the EB+ Gen3.
Open DIAG+, select configuration.



Step 4:

Select CAN BUS tab.



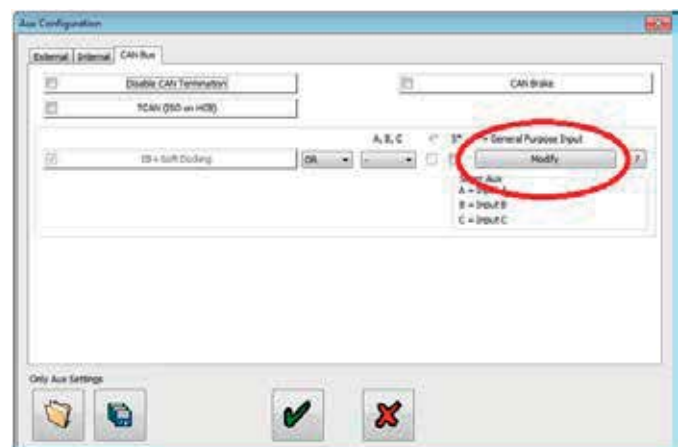
Step 2:

Select ECU parameters / configuration.



Step 5:

Select "Modify" button.

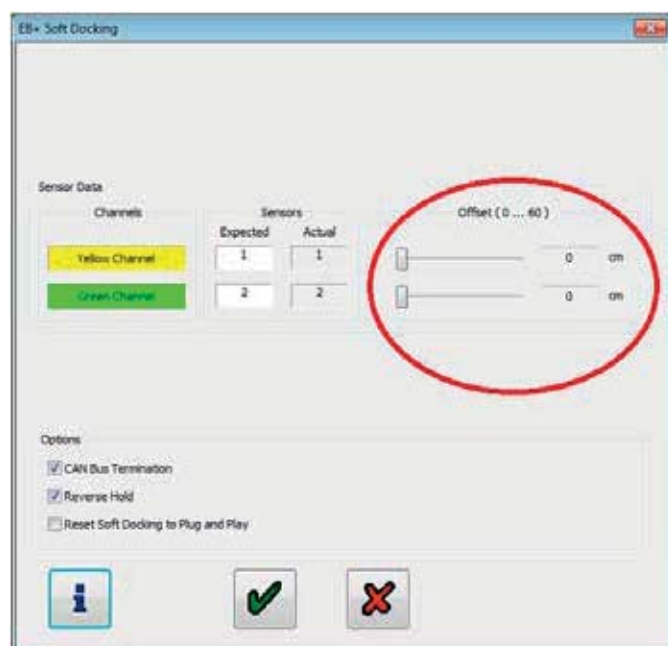


Step 3:

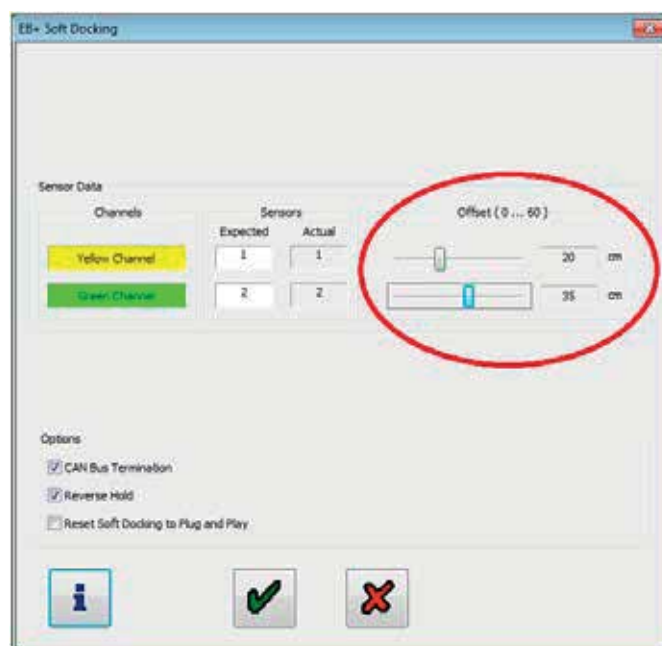
Select setup auxiliary configuration.



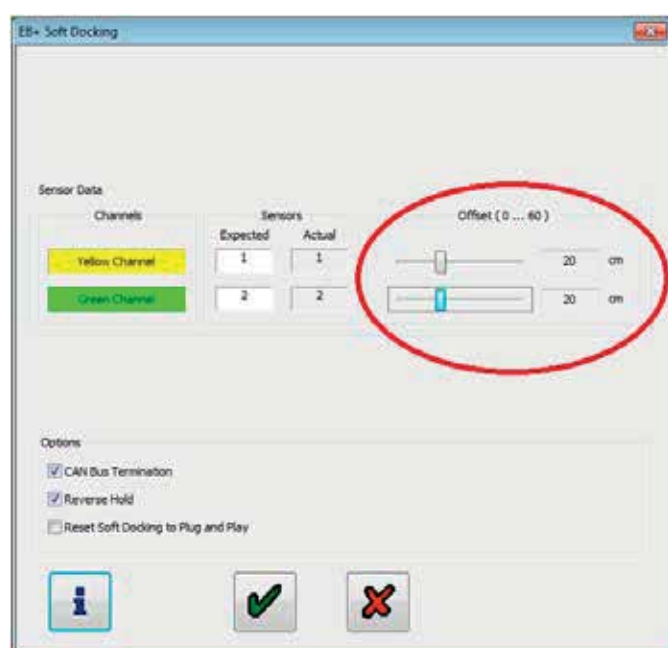
Step 6:
Adjust channel values to sensor installation offset.



Offset example:
Both channels are different values.



Offset example:
Both channels the same value.



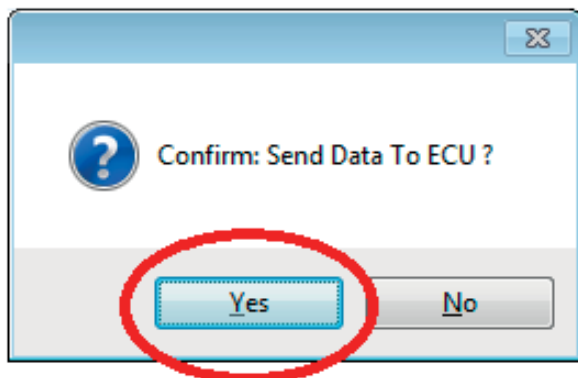
Step 7:
Click on 'green' ticks until you reach 'Online Configuration and ECU Programming' window.

Step 8:
Select 'Send data to ECU'.



Step 9:

Select 'Yes' to send data to ECU.



Step 10:

Click green tick to return to DIAG+ home page.



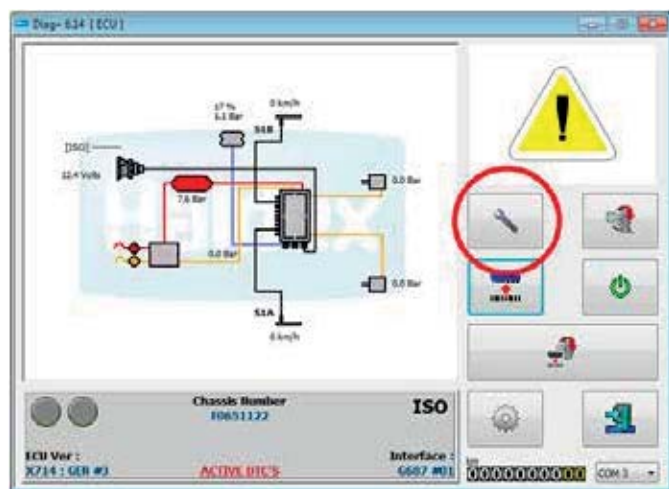
How to check for a faulty installation using DIAG+

Step 1:

Turn 'on' the power to EB+ Gen3.

Step 2:

Open DIAG+, select service.



Step 3:

Select DTC's.



Step 4:

Check 'Diagnostic Trouble Code' window for any active DTC's.

DTC error:

Sensor error - damaged or faulty sensor detected.



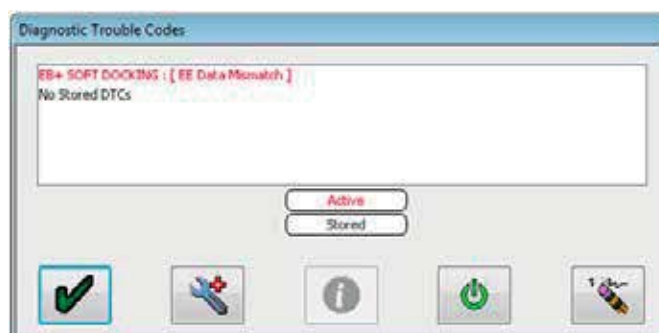
DTC error:

Incorrect number of sensors - either the yellow or green channel has no working sensors connected.



DTC error:

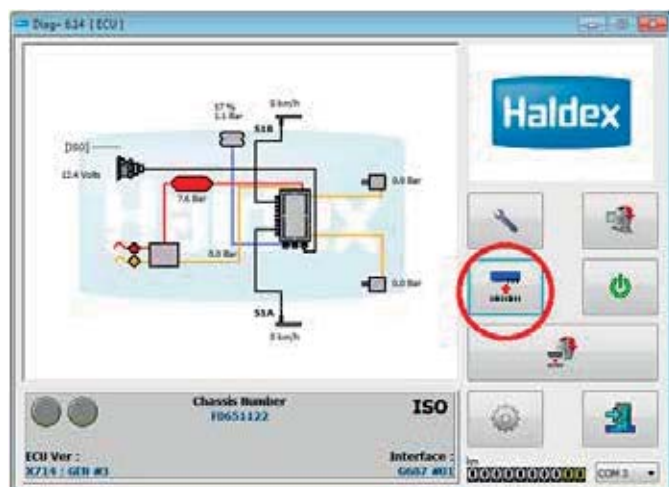
EE data mismatch - sensor mismatch between EB+ Gen3 stored data and EB+ Soft Docking stored data. Reset EB+ Gen3 to remove this error.



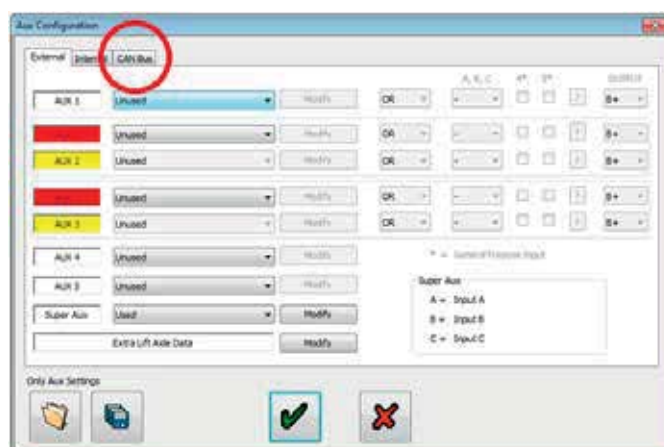
Step 5:

Click on 'green' ticks until you reach the DIAG+ home window.

Step 6:
Select configuration.



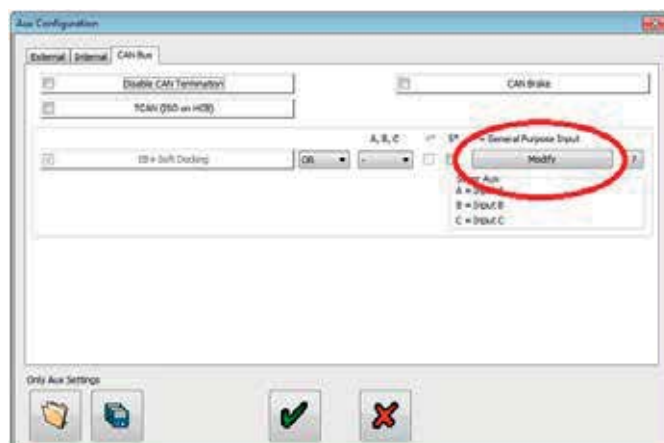
Step 9:
Select CAN BUS tab.



Step 7:
Select ECU parameters / configuration.



Step 10:
Select "Modify" button.

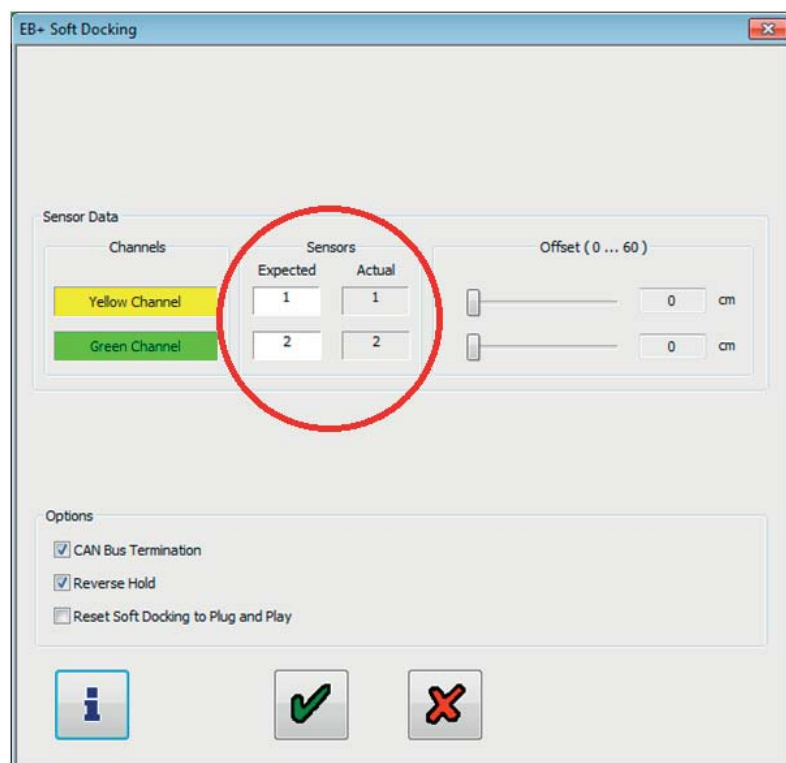


Step 8:
Select setup auxiliary configuration.



Step 11:

Check displayed sensors for errors.



Step 12:

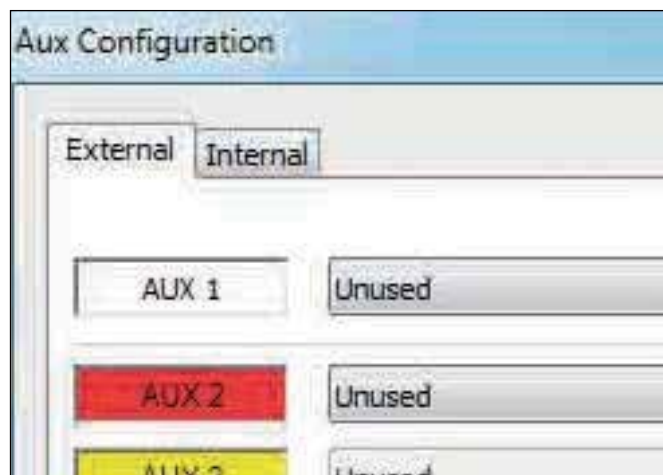
Rectification of faulty sensors

- Turn 'off' power to the EB+ Gen3.
- Based on the information obtained, replace a sensor with a new sensor.
- Turn 'on' the power to the EB+ Gen3.
- Use DIAG+ to check for any active DTC's.
- Repeat steps (a) to (d) until no active EB+ Soft Docking sensor DTC's are shown.

Lateral accelerometer (EB+ Stability) for 2M systems only

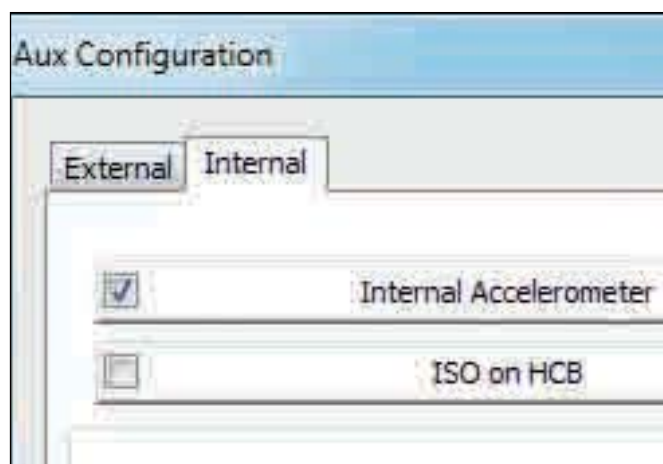
Internal accelerometer

To set the parameters click on button marked 'internal'



The following screen will appear.

Click on box 'internal accelerometer' to select installation.



Note: An additional auxiliary test runs specifically for the internal accelerometer.

The internal accelerometer calibration is completed during the EOLT procedure.

External accelerometer

To set the parameters click on button marked 'external'

Then select 'lateral accelerometer' from the AUX 5 menu

Note: The external accelerometer calibration is completed during the EOLT procedure.

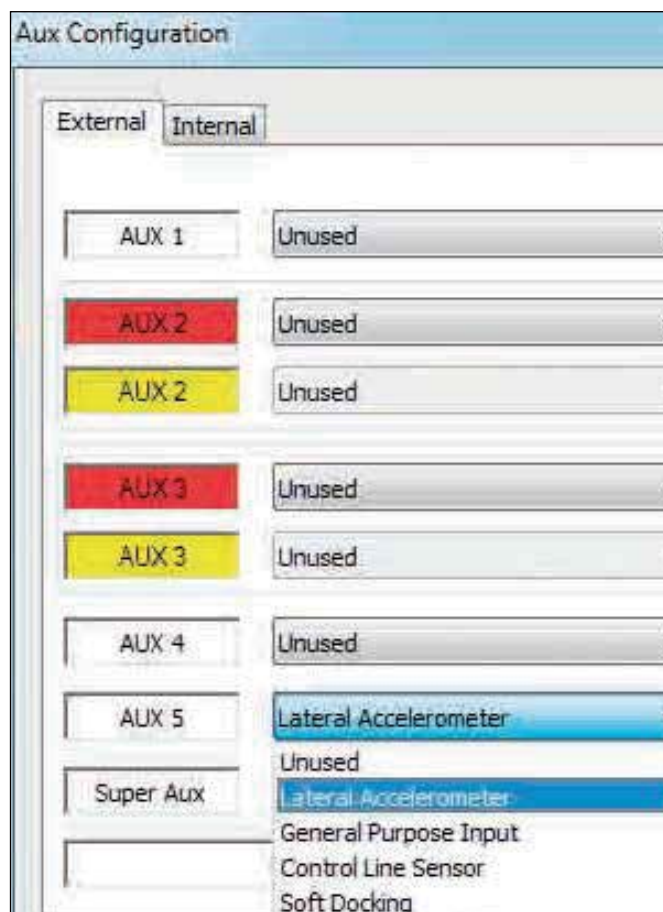
Reaction to various configuration possibilities:

Make sure the correct AUX configuration is chosen i.e. external mounted on AUX 5 or Internal (within the ECU).

Errors that will occur are as follows:

Accelerometer will not work.

A stability sensor DTC will be recorded.



Electric brake demand (EBD)

Electric brake demand is an internal feature that allows application of the brakes under certain conditions by electrical inputs. No ISO CAN or pneumatic demand required. This feature is very flexible and can be used for a lot of applications.

To set the parameters click on button marked 'internal'

The following screen will appear.

Click on box 'electric brake demand' to select installation.

Select default settings

Load the default settings for these three known applications. Modifications are allowed, but then it is no longer a DIAG+ default setup.

Street laying machine

Bogie / inter lock

Extendable drawbar / trailer

Cab warning Lamp (ECE R-13)

Driver can be informed by ABS warning lamp if EBD active.

None

Yellow lamp

Red lamp + buzzer (CAN ISO 7638) (Only on bogie/inter lock option)

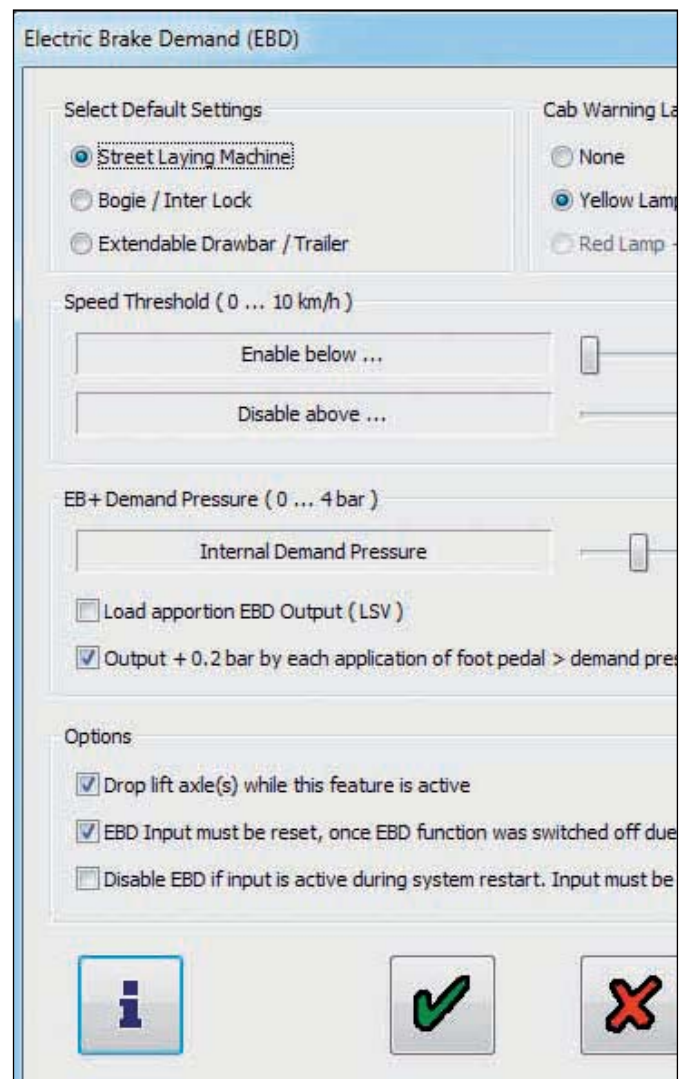
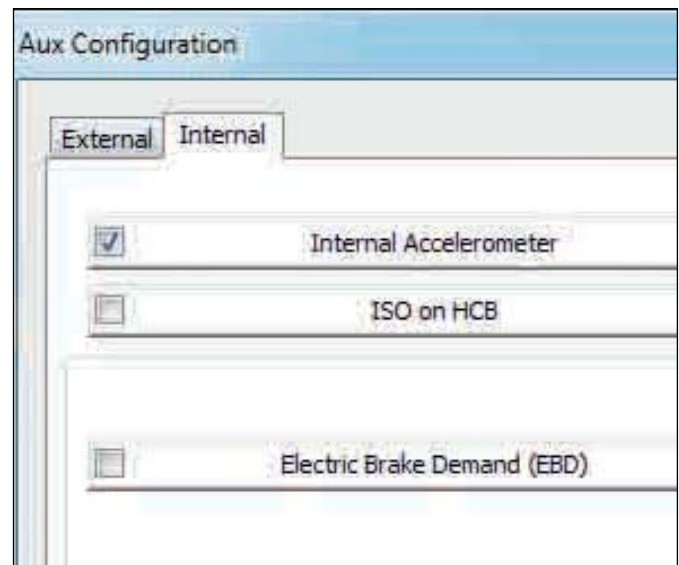
Speed threshold (0...10 km/h)

Enable below - below this speed, it's possible to switch EBD feature 'on'.

Disable above - above this speed, EBD will be switched 'off' automatically.

Internal demand pressure (0.. 4 bar)

This pressure will be delivered 1:1 to the actuators, if the following option ('load apportion..') is not selected. If this option is selected you'll get load dependant output, (LSV active) corresponding to the demand pressure. Option 'output + 0.2 bar...' generates a higher output, if the current setting is not high enough under special conditions (big gradient during street building..). To achieve this, the pneumatic demand pressure must be higher than the current EBD demand pressure for a short period of time.



Electric brake demand options

Keeps lift axles down as long as this feature is active, this avoids height changes of trailer chassis.

If the 'disable speed' was crossed during operation and therefore the EBD feature is switched 'off', the control input must be reset once to switch 'on' the feature again.

If the control input is already active during ignition 'on', it must be reset once to switch 'on' the feature again.

The last two options avoid unexpected activation of the feature.

Electric brake demand information

By default the EBD feature is inactive and must be controlled by external input / switch!

The following inputs can be used:

Available with all Gen1, Gen2 and Gen3 EB+ (ECU C440 upwards):

GPI4 = AUX 4 connected to a switch, yellow core as signal input.

GPI5 = AUX 5 connected to a switch, yellow core as signal input.

Additional, if you use Super AUX EB+ variant:

Input A, B, C available on power B connector.

Several of these inputs (A and / or B, A and / or C, B and / or C), or customer specific combination of these inputs (modify screen).

If you select more than one input, they are used

corresponding to the selected logic:

((Input A active) AND / OR (Input B active)) -> Action

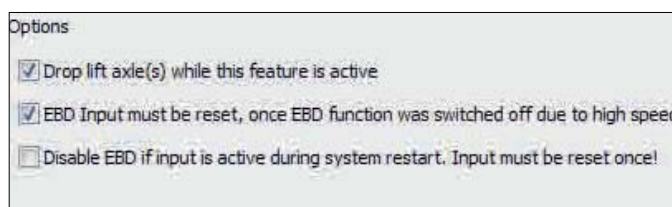
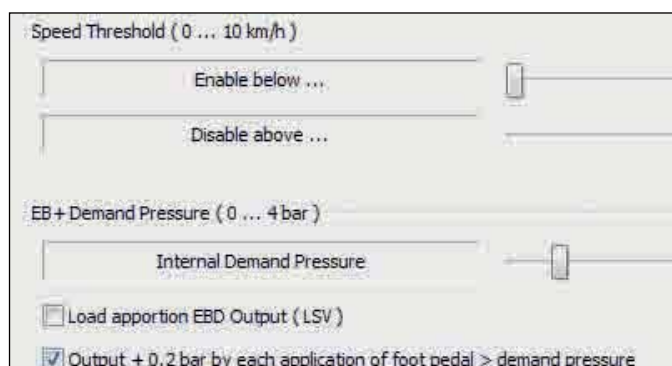
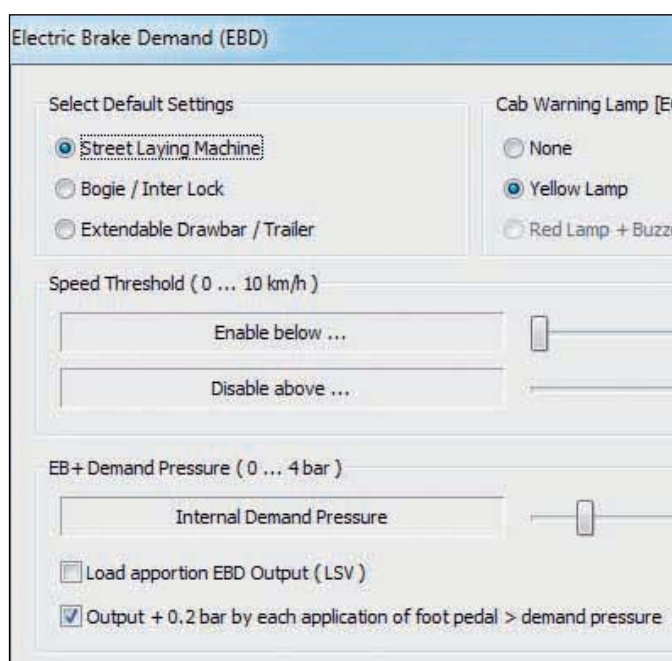
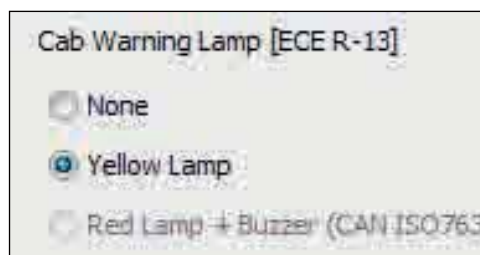
The brake will be applied if the current speed is below EBD 'enable speed' threshold AND the logic is also valid.

OR

Brake will be applied if one of the inputs is active.

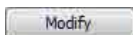
AND <<only useful with more than one selected input>>

Brake will be applied if all related inputs are active.



Extra lift axle data menu

To view a set of parameters click on the



The following screen will appear.

Raise speed

If the option 'raise with speed' is set for any lift axle, then the axle will not lift before the set speed (the default is 50 km/h).

Example is for manoeuvring before getting on to the highway.

Drop speed

If the option 'drop with speed' is set for any lift axle, then the axle will drop automatically the vehicle speed falls below the set speed (the default is 1 km/h).

Traction overload limit

The traction assist axle will drop once the suspension reaches this value, based on % of laden setting. An information icon is displayed above 130% to ask the user to check the design weights for the remaining axle (s) as the legal limit is 130% of design weight. (the default is 130%).

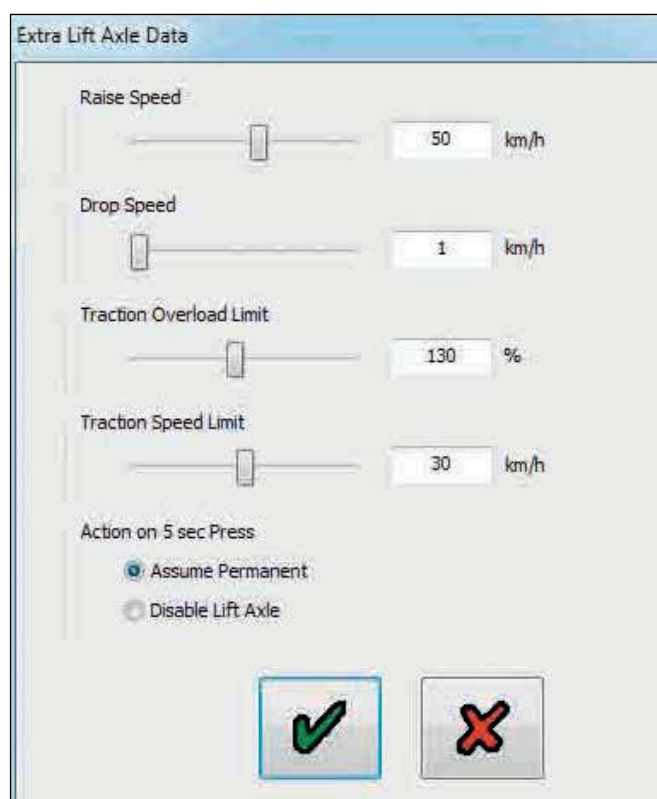
Traction speed limit

The traction assist axle will drop once the vehicle speed increases above the value (the default is 25 km/h). A warning icon is displayed above 30 km/h to indicate that this is above the legal limit.

Action on 5 sec press

Normally, when the lift axle switch has been pressed for 5 sec, the system assumes that the switch is a permanent type, not a momentary type.

If the "disable lift axle" option is selected then the system will always assume that the switch is momentary and will disable (lower) all lift axles until the system is next re-powered (ignition 'off').



Setting wheel scaling

Click on the  button

The following screen will appear.

The screen shows the default value of a tire size of 306 revs/km, 520 Rdyn (dynamic rolling radius - mm) with a 100 tooth exciter installed. This value covers tire sizes from 19.5" to 22.5" and sets the correct ABS function and odometer of the system.

Note: If the tooth number is not 100 the wheel scale factor on the Info Centre will read a different value.

Click on the  button to accept.



Test for number of teeth

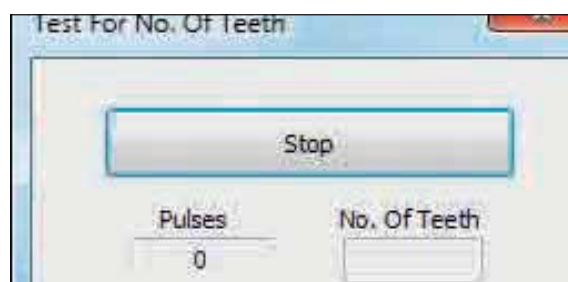
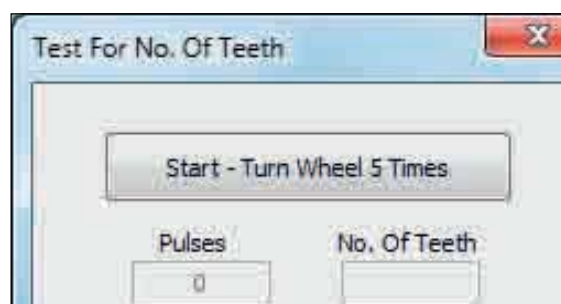
Click on the  button

Click on button marked 'start - turn wheel 5 times'. Rotate the selected sensed wheel 1 rev / 2 sec, five times.

The pulses box automatically records during the wheel rotation procedure. After 5 turns, click on button marked 'stop'. The 'No. of teeth' box indicates the value. Click on button marked 'use calculated value' if required to use in wheel scaling above or note the value for information purposes.

Click on 'abort' to exit.

Repeat for any other selected sensor.



Lamp Settings

Click on the  button



The following screen will appear.

The screen shows the two options of flash sequence for the trailer EBS warning lamp.

The on/off sequence is set as a default.

Click on button marked  to accept.



Note: The on/off lamp sequence change will only be visible if system air pressure is above 4.5 bar.

Info - trailer information

Click on the  button

The following screen will appear.

Enter details of :

Trailer manufacturer (19 characters)


Brake calculation number (16 characters)

Chassis number (17 characters)

Type (12 characters)

Axle information - load of axle/s installed on the trailer.
(default values are: Unladen = 3000 Kg,
Laden = 9000 Kg)

This information is stored in the ECU and can be printed out on the end-of-line test report and load plate.


Click on the  button to open a new screen titled 'Geometric data'. From here the user can enter detailed vehicle data.

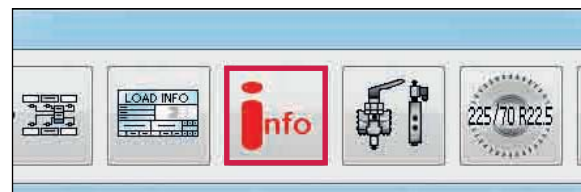
- › Configuration
- › Lift axle position
- › Wheel base

From software version C463 / C464 / C465 onwards, the EB+ transmits 'Geometric data' to the truck via the ISO 11922 CAN link.

Click on the  button to accept.

'ECU setup' is complete (ECU parameters settings not sent to ECU - see next step).

Click on the  button to accept.



Unladen		Laden	
Axle 1	3000 kg	Axle 1	9000 kg
Axle 2	3000 kg	Axle 2	9000 kg
Axle 3	3000 kg	Axle 3	9000 kg



Saving the ECU parameters

Option 1:

Saving the ECU parameters file to disc.

Click on the  button.

The following screen will appear.

A file name (e.g. Example 01 saved as type .DPF) can be entered in position 'file name' and stored in the C:\Program Files\Haldex\Diag+ECU setup files folder. Click on button 'save' to store the file.

Note: The saved EB+ ECU parameter file can be used for future programming of ECU's (which require the same parameters) by recalling the file from the 'Open EB+ ECU File' button.

Option 2:

Programming the ECU.

Click on the  button.

This activates the sending of the edited parameters file to the ECU.

Note: At 90% progress all the DTC's are deleted and the ECU is reset.


The status of this process is shown in the following ways:

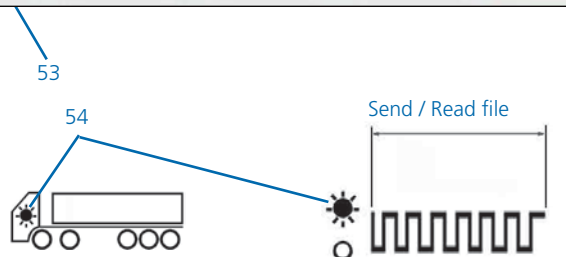
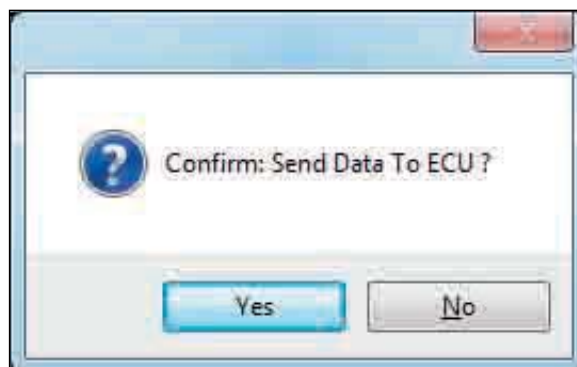
- 53 A bar indicator fills the progress box on the 'Program ECU' screen.
- 54 The trailers EBS warning lamp function is
 - a) 'on' - ECU not programmed
 - b) Flashing - programmed ECU (with an 'ECU setup' installed)

Note: The trailers EBS warning lamp is 'on'


This completes the programming of the ECU.

The following screen will appear.

Click on the  button to view or print a label with the current ECU configuration information (load plate label).



Load plate label printing

Click on the  button to print the load plate label.

Click on 'Print' to show options.

› Click 'Print' to print the EOLT report.

Print label using Haldex blank label 028 5301 09.

Use laser printer only and refer to manufacturers information on printing a A5 size paper. After installation spray on a clear lacquer (or a hard varnish) to protect the printed surface.


› Click 'page fine tune offset' to position the EOLT report on the page.

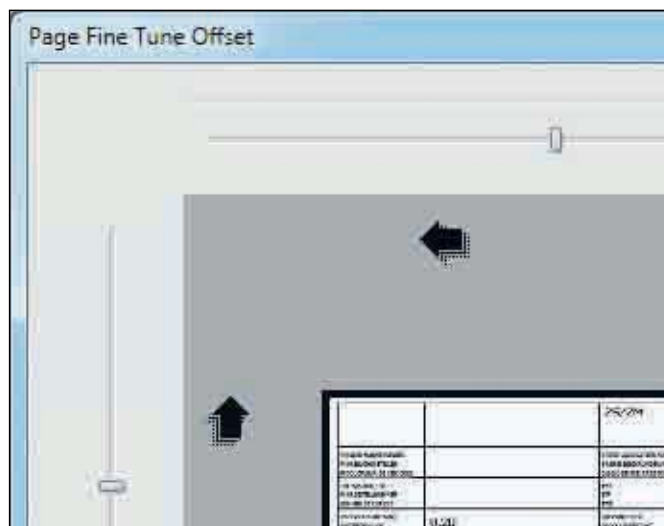


Page fine tune offset

Either click and drag the EOLT report or use the horizontal and vertical side bars to move the report around the page.

Click on the  button to accept.

Click on the  button to exit without changing page position.



Example label for a semi or centre axle trailer.

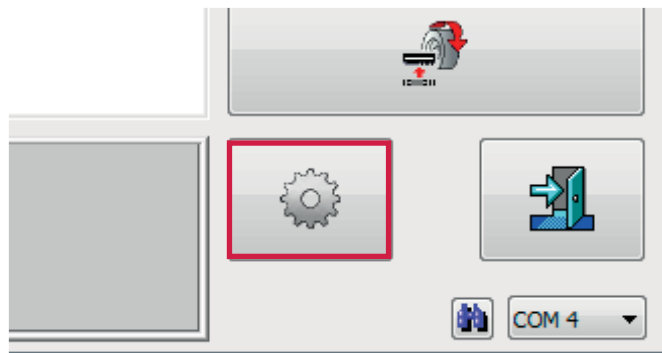
Haldex		EB+ ADR TŮ.EGG.094-04		2S/2L Stabil
TRAILER MANUFACTURER FAHRZEUGHERSTELLER CONSTRUCTEUR		M & G Trailers		BRAKE CALCUL BREMSBERECHNUNG CALCUL DE FREINAGE
CHASSIS NUMBER FAHRGESTELLNUMMER NUMERO DE CHASSIS		31293		TYPE TYP TYPE
THRESHOLD PRESSURE ANSPRECHDRUCK PRESSION D'APPROCHE [bar]		0.20		PRESSURE LIMITE DRUCKGEGRENZE LIMITE DE PRESSION
[1.00 bar = 100 kPa]		UNLADEN / LEER / A VIDE		LADE
		INPUT PRESSURE EINGANGSDRUCK PRESSION D'ENTRÉE [bar]		6.50
		AXLE LOAD ACHSLAST CHARGE ESSEU [kg]	SUSPENSION PRESSURE BALGDROCK PRESSION DE SUSPENSION [bar]	OUTPUT PRESSURE AUSGANGSDRUCK PRESSION DE SORTIE [bar]
		AXLE LOAD ACHSLAST CHARGE ESSEU [kg]	AXLE LOAD ACHSLAST CHARGE ESSEU [kg]	
1 AXLE				

End of line test (EOLT)

Before commencing EOLT:

Clear all active or stored diagnostic trouble codes

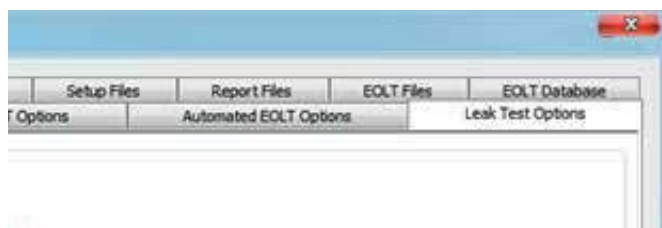
Set the leak test parameters in the options menu



Setting leak test parameters

Click on the  button

Click on the leak test options tab



Input the required parameters for:

Parameters

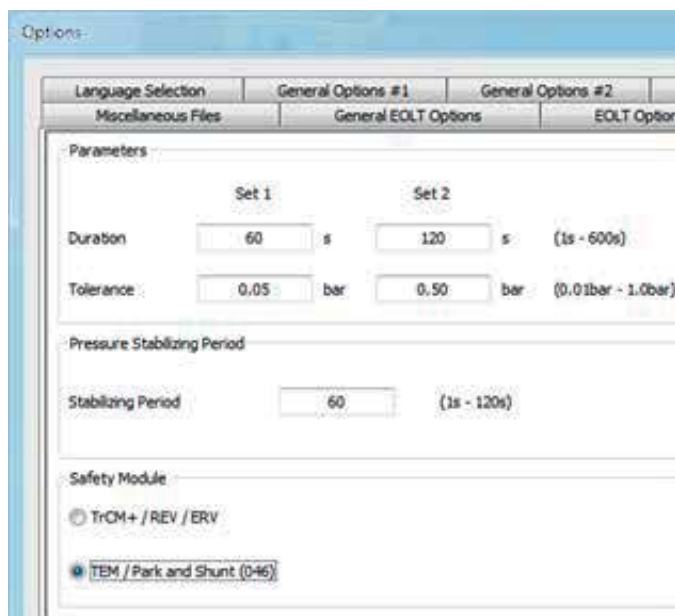
Set 1 - duration and tolerance


Set 2 - duration and tolerance


Pressure stabilizing period

Stabilizing period

Select either TrCM+ or TEM installation



Click on the  button to save and exit back to the EBS home screen.

Click on the  button to exit without saving the changes.





Starting EOLT


Click on the  button on the main screen.


› EOLT options

This screen will appear if there are no hardware or software compatibility issues.

The 'View / print'  and 'Save to file'  buttons are initially disabled. They are enabled under the following conditions:

- Completion of an EOLT
- An existing EOLT file is opened (.eol) ('View / print' only).

Click on the  button to start the EOLT test procedure.


Or click on the  button to return to the main menu.

› Error

This screen will appear if there is a stored DTC present in the ECU. Click ok and exit the EOLT menu, then clear the stored fault and try again.

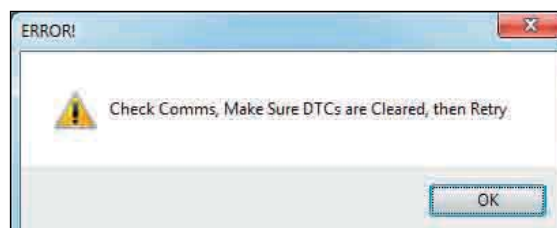
› Software versions

This screen will appear if the interface dongle or ECU are not compatible (i.e. wrong software or hardware).

Click on the  button to quit the EOLT procedure and update the hardware accordingly.

› Warning screen

This screen will appear if there is no pressure measured at Port 41, check installation piping.




EOLT initialisation

A list of EOLT tests are shown. These tests can be selected or de-selected as required by ticking the corresponding box.

If the 'Operators name' option is selected, it will enable a name to be entered in the area below. This will be recorded on the EOLT report.

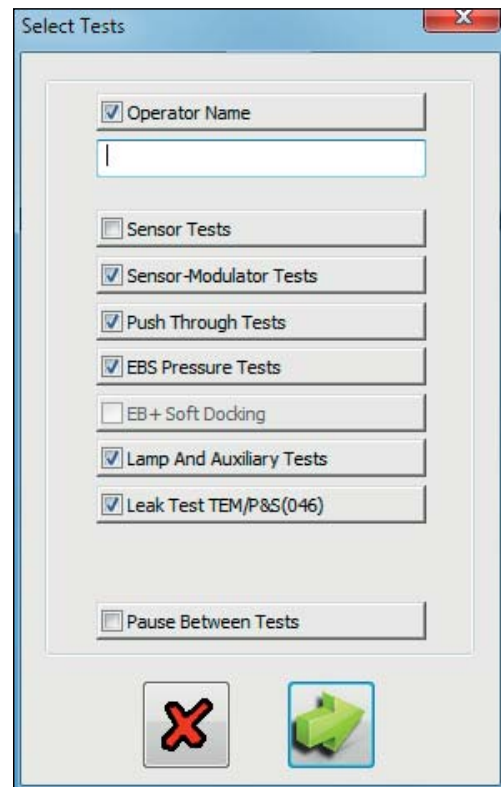
If the 'Pause between tests' option is not selected, the selected tests screen will run automatically after each test has been carried out.

Click on the  button to return to the main menu.

Click on the  button to start the EOLT.

Note: During the EOLT procedure the cab / trailer warning lamp will flash to indicate the EOLT is in progress.

The screen display as shown is relevant to a 2S / 2M system. The sensor-modulator tests is a combination of the sensor output to the correct modulator.




Sensor tests

This full sensor test is optional, and the sensors will be tested during the 'Sensor modulator tests' (i.e. tick box is not selected when entering the 'Select tests' menu). Procedure:

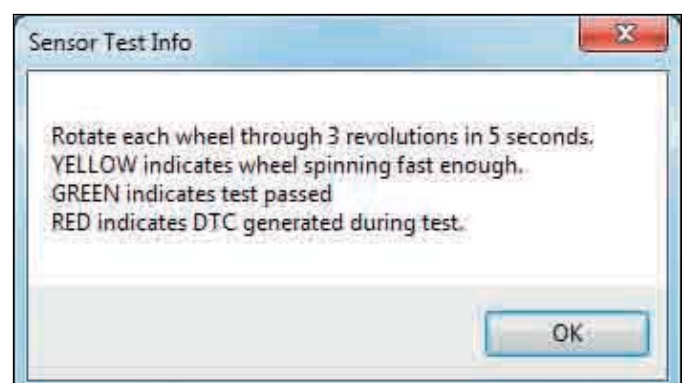
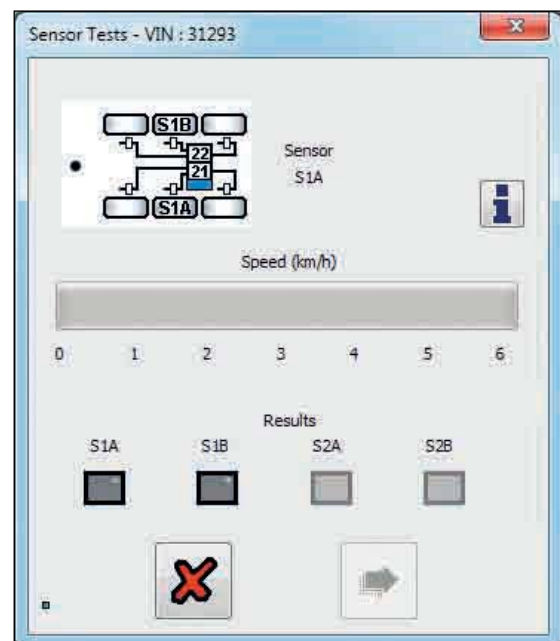
- › Rotate each wheel through 3 revolutions in 5 secs
- › The test sequence is S1A, S1B, S2A, S2B etc

Result section:

Yellow indicates wheel spinning fast enough.
Green indicates test passed.
Red indicates DTC generated during test.

Click on the  button to access the individual test procedure.

If previously entered, the vehicle ident number (VIN) will be displayed in the title bar of each test (e.g. VIN: 31293)



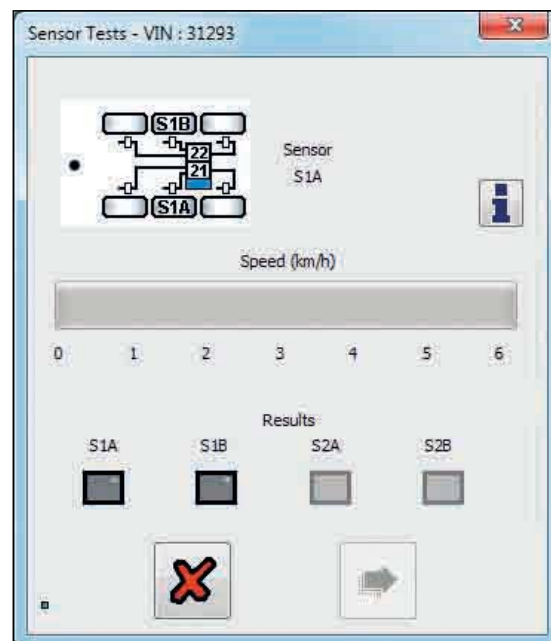
Sensor tests

The screen display as shown is relevant to a 2S / 2M system.

This full sensor test is optional, and the sensors will be tested during the 'Sensor modulator tests' (i.e. tick box is not selected when entering the 'Select tests' menu).

Procedure:

- › Rotate each wheel through 3 revolutions in 5 secs
- › The test sequence is S1A, S1B, S2A, S2B etc




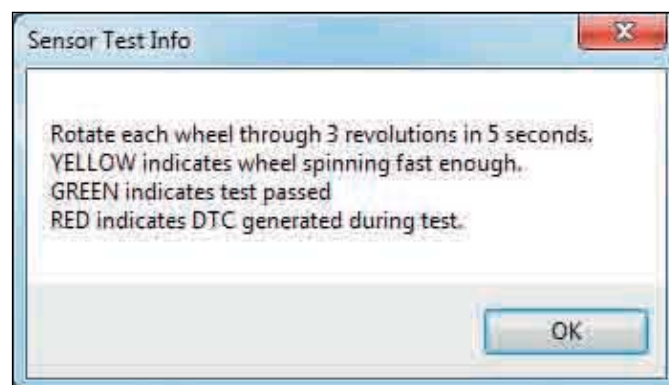
Result section:

Yellow indicates wheel spinning fast enough.

Green indicates test passed.

Red indicates DTC generated during test.

Click on the  button to access the individual test procedure.



Note: If previously entered, the vehicle ident number (VIN) will be displayed in the title bar of each test (e.g. VIN: 31293)

Sensor modulator tests

The screen display as shown is relevant to a 2S / 2M system. The sensor-modulator tests is a combination of the sensor output to the correct modulator.

Procedure:

Rotate each wheel through 1 revolution in 2 seconds.
The system should brake the spinning wheel.


› The test sequence is S1A, S1B, S2A, S2B etc

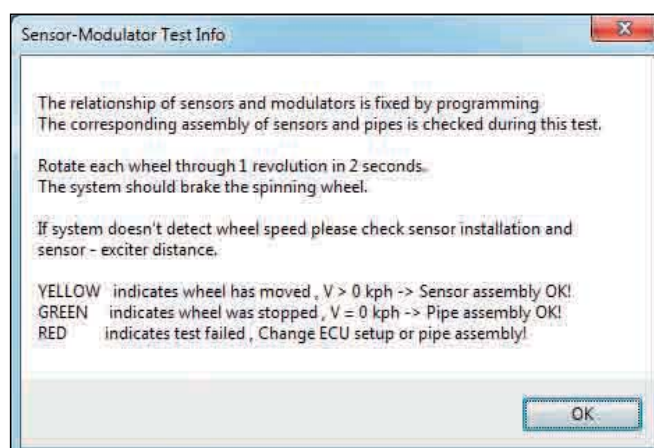
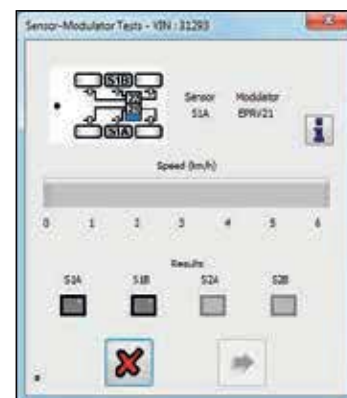
Result section:

Yellow indicates wheel has moved.

Green indicates test passed.

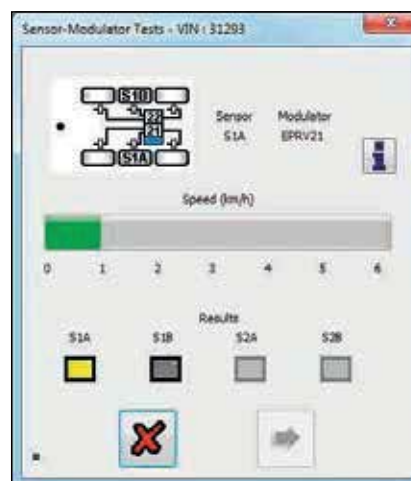
Red indicates test failed.

Click on the  button to access the individual test procedure.



S1A test started

Manually rotate wheel S1A at 1 revolution in 2 seconds.

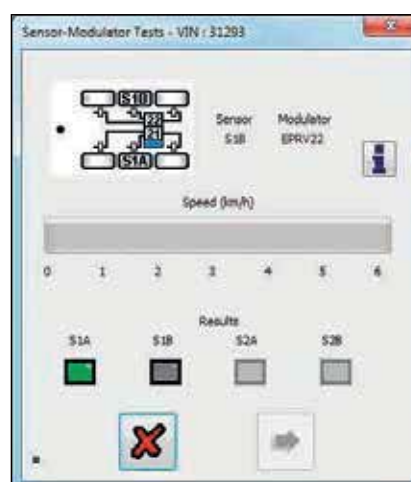


Wheel speed detected
(moving green bar)

Moving wheel
(yellow indication)

S1A test passed

If the moving wheel is successfully braked, the S1A test will pass and move onto the S1B wheel.

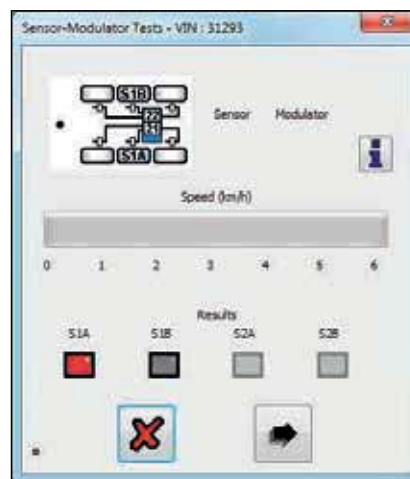


Correct wheel braked
(green indication)

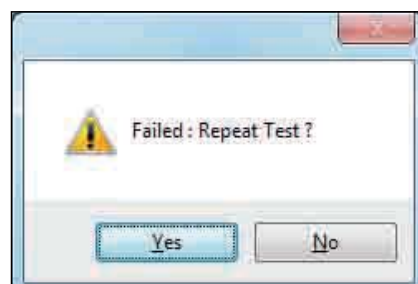
Failed test

If any of the 'Sensor modulator test' fails check the following:

- › Correct sequence - S1A, S1B, S2A, S2B etc
- › Rotating the wrong wheel
- › Incorrect wiring
- › Incorrect piping

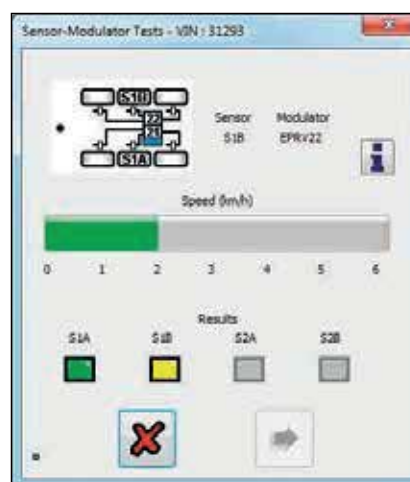


S1A wheel failed
(red indication)



S1B test started

Manually rotate wheel S1B at 1 revolution in 2 seconds.



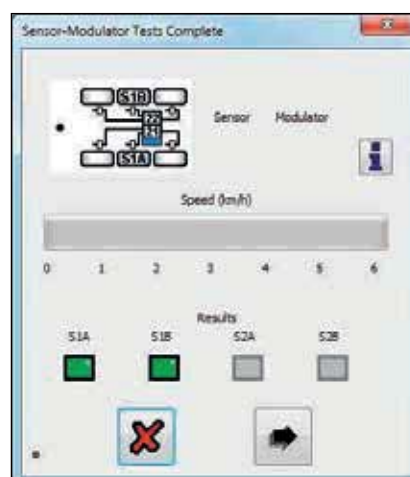
Wheel speed detected
(moving green bar)

Moving wheel
(yellow indication)

S1B test passed

If the moving wheel is successfully braked, the S1B test will pass and move onto the next configured sensor in the sequence.

Repeat the 'Sensor modular test' for all the programmed ECU sensors.




Correct wheel braked
(green indication)

Push through tests

1 Apply brake

The system should be forced into push-through condition (approx. 1:1) and the delivery pressures will be measured.

Click on the  button to access the individual test procedure.

2 Release brake

The target pressure is a calculated value.

The 'main valve port 1' and 2 boxes displays the actual pressure that is measured at the EPRV.

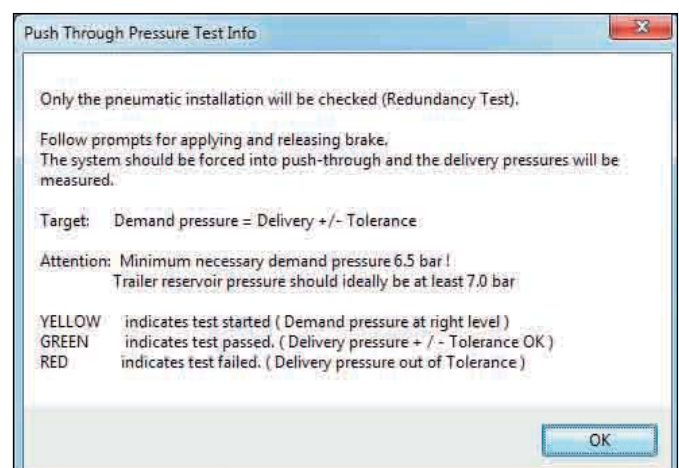
For 3M systems the actual pressure is displayed in the 'remote valve' box.

Result section:

Yellow indicates test started.

Green indicates test passed.

Red indicates test failed.



EBS Pressure function tests

The system will be forced to simulate various load conditions and control pressures. The delivery pressures will be measured and compared with the target pressures.

Result section:

Yellow indicates test started.

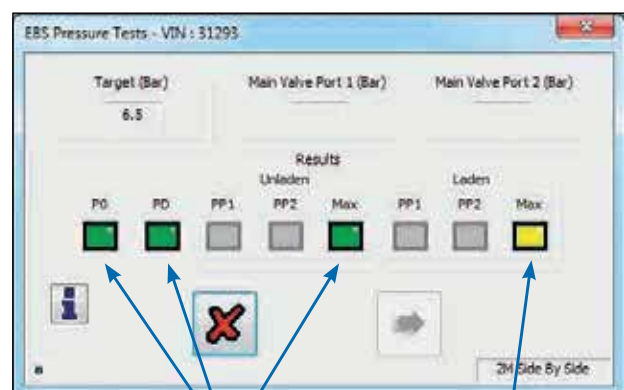
Green indicates test passed.

Red indicates test failed.

Note: The example shows the screen as for a 2M side by side installation.

For 3M two screens appear '3M master 'and '3M remote'.

Note: Before this test a warning screen may appear. Make sure that there is the required air pressure in the reservoir to carry out the test. Failure results may occur on the output values (P3) if the value measured (-0.3 bar min.) is below the target value.



Test passed
(green indication)

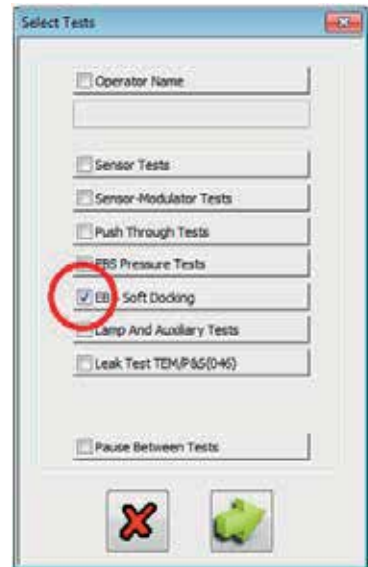
Test in progress
(yellow indication)

EB+ Soft Docking

How to complete EB+ Soft Docking EOLT using DIAG+ for a 3 sensor

(1 x yellow & 2 x green) system

Tick the EB+ Soft Docking box.



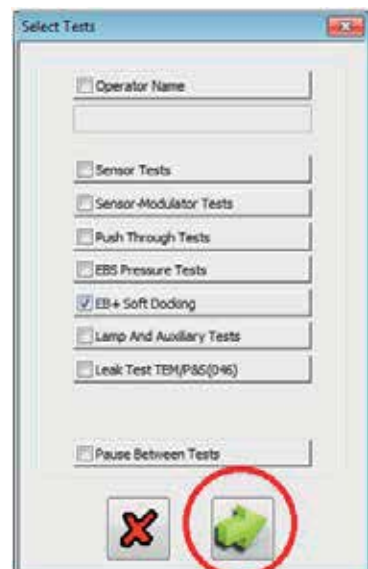
EOLT option:

If required, tick the 'Pause Between Tests' box.

When ticked the EOLT waits for a prompt from the operator before proceeding to the next test.

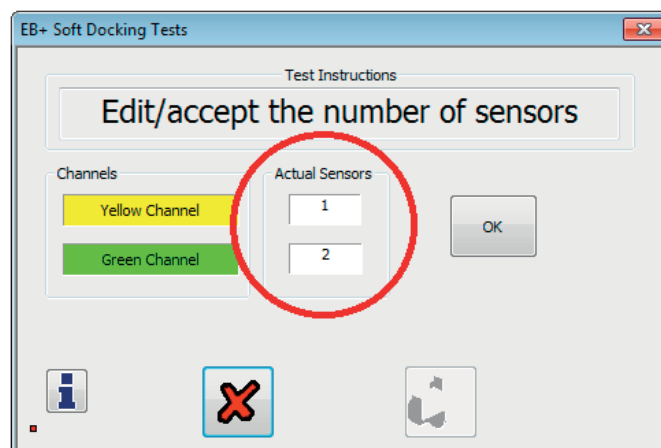


Select 'arrow' to start the EOLT.

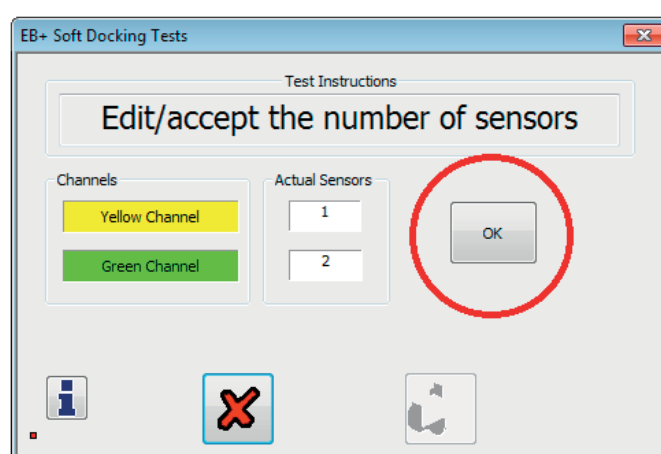


Check 'Actual Sensors' displayed value is correct.

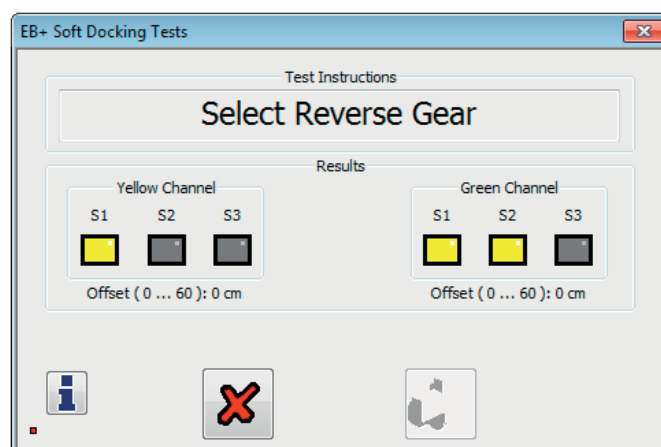
Note: Manually edit the sensor boxes for the correct values before proceeding with the EOLT.



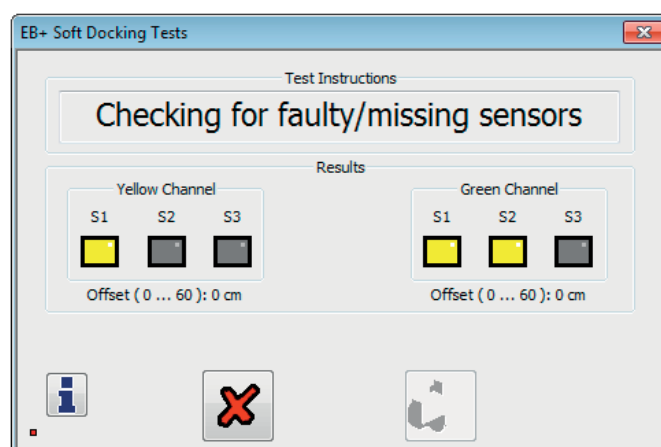
Select 'OK' button.



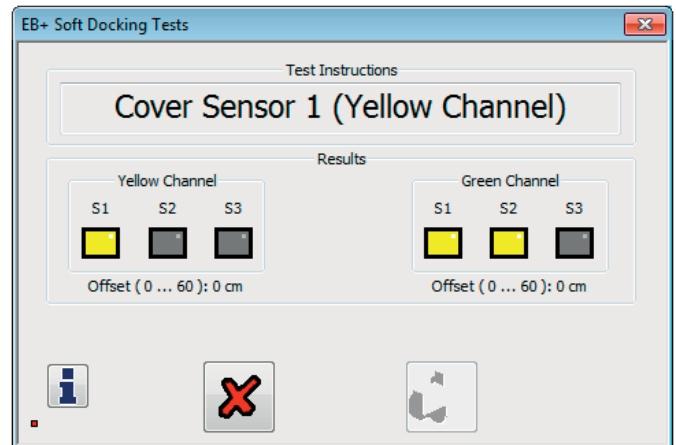
Select vehicle reverse gear.



Check all installed sensors are displayed.



Activate the sensor on the yellow channel.



Sensor activation sequence:

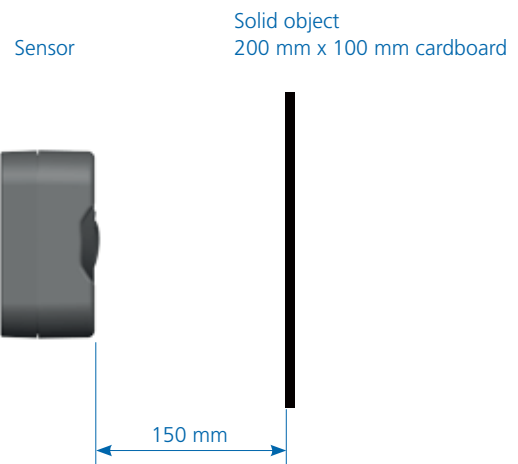
The sensor is activated / detected using a solid object (see example) placed at 150 mm in front of the sensor.

Note: Do not place the solid object onto the sensor face, a 150 mm gap must be maintained for correct activation.

Solid object examples:

Rigid cardboard (200 mm x 100 mm)

Rigid metal sheet (200 mm x 100 mm)



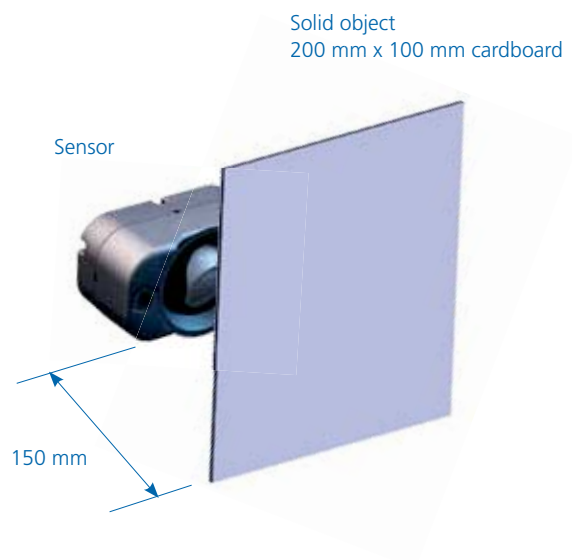
Test sequence:

Marker lights flashing.

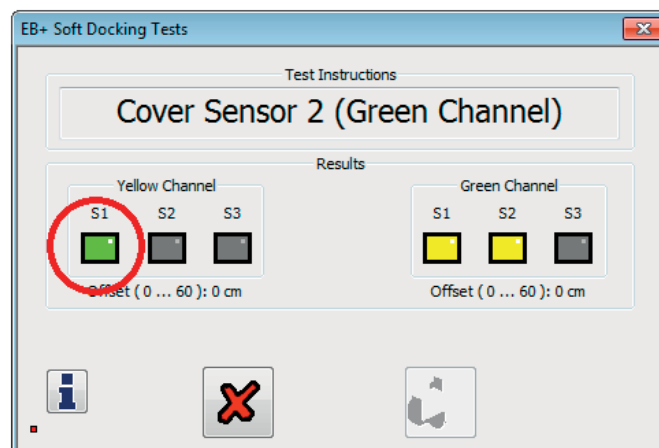
Place a solid object 150 mm away from the sensor face.

Marker lights stop flashing (remain 'on') and bleeper sounds, when the sensor has been detected.

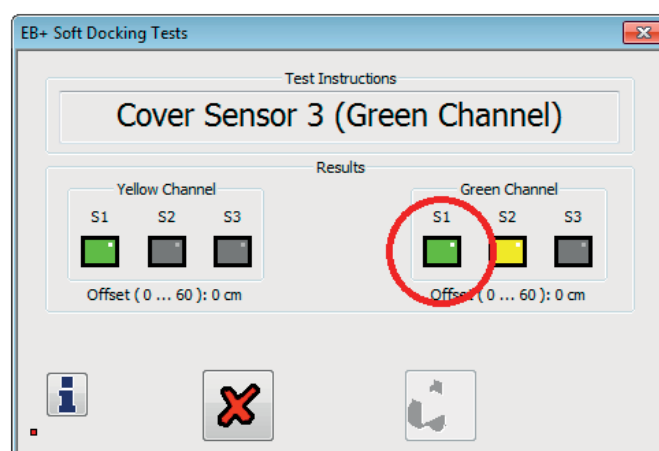
DIAG+ screen shows that the sensor has been detected using a green box (S1, S2 or S3)



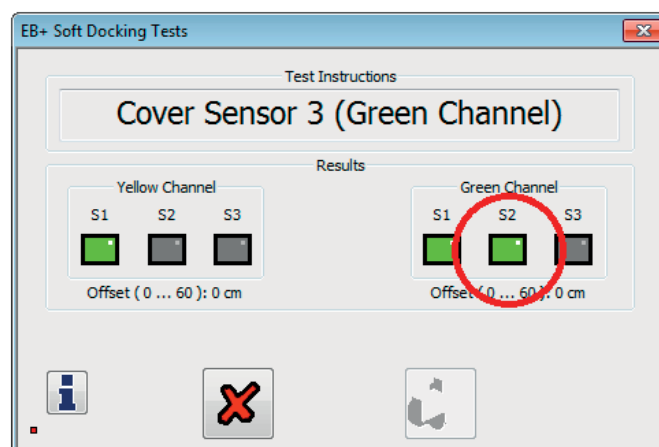
Sensor on the yellow channel has been detected (S1 box green).
Activate any sensor on the green channel.



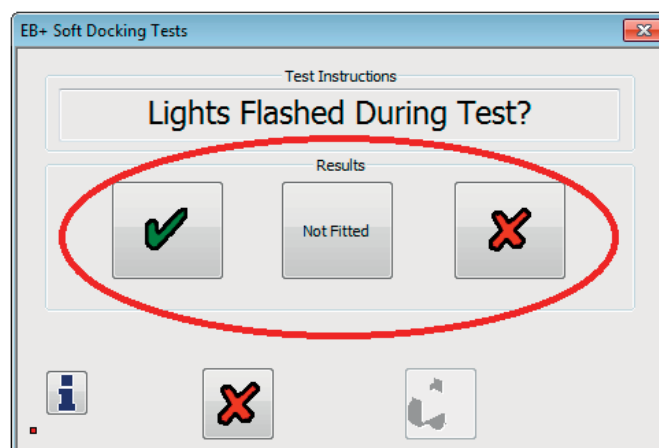
Sensor on green channel has been detected (S1 box green).
Activate the next sensor on the green channel.



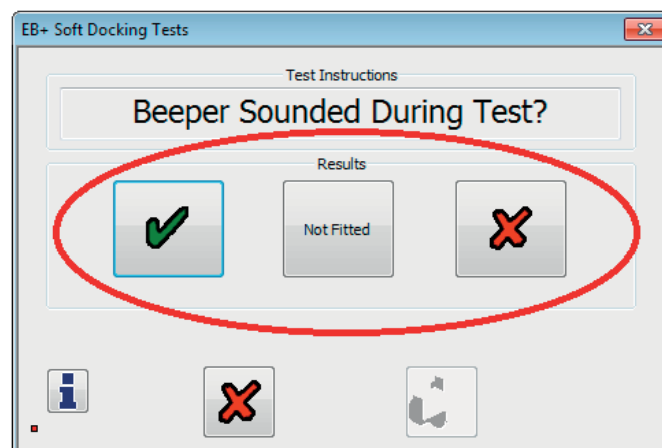
Sensor on green channel has been detected (S2 box green).



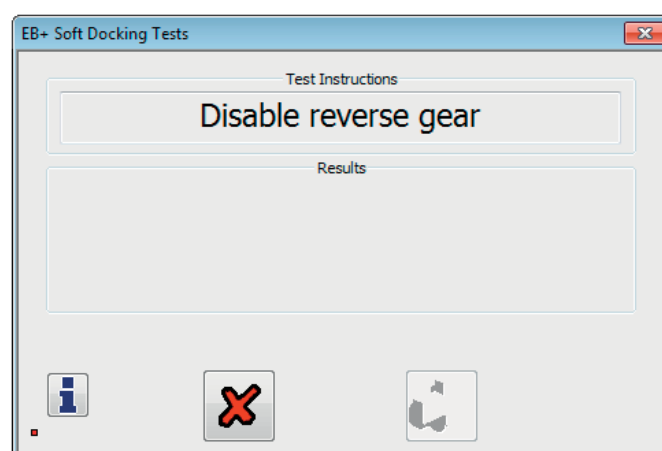
Select / click the correct button.



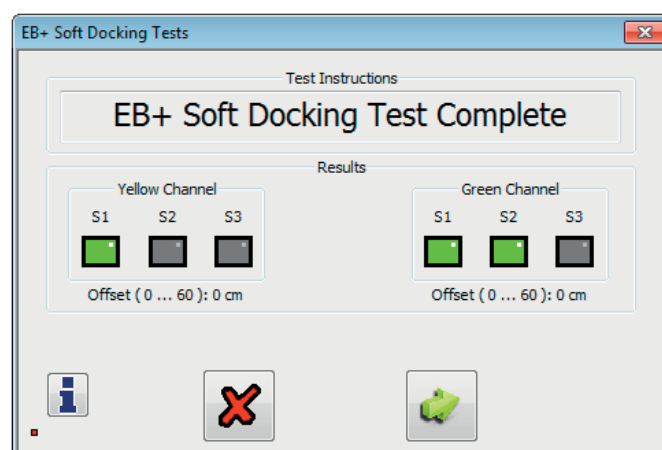
Select / click correct button.



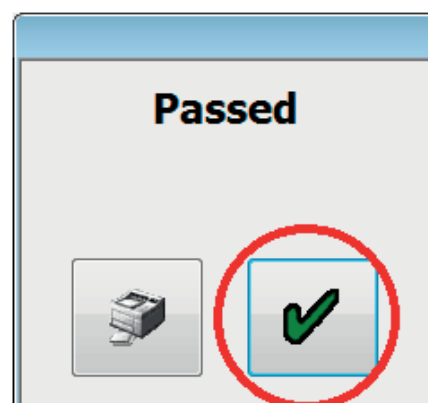
Disable vehicle reverse gear.



EOLT completed.



EOLT passed, select 'green' tick to continue.



Lamp and auxiliary tests

The cab lamp and any auxiliaries will be forced 'on' then 'off', and monitored to determine the correct response. Once correctly tested, the lamp or auxiliary can be switched manually without affecting test results. To switch to manual testing click on the 'on' button the 'off' and 'norm' buttons are highlighted, toggle between the 'on' and 'off'. The 'norm' resets to automatic mode.

Result section:

Yellow indicates test started.

Green indicates test passed.


Red indicates test failed.

Lateral accelerometer


Note: Ensure that the trailer is on flat level ground before calibrating any of the lateral accelerometers.


AUX 5 tests the (external) lateral accelerometer (EB+ stability) if selected in the AUX configuration option.

If the test fails refer to EB+ stability installation Instructions 000 700 287 and check chassis installation. Or

The 'Lat Acc Internal' button  tests the internal lateral accelerometer (EB+ stability) if selected in the AUX configuration option 'internal'.

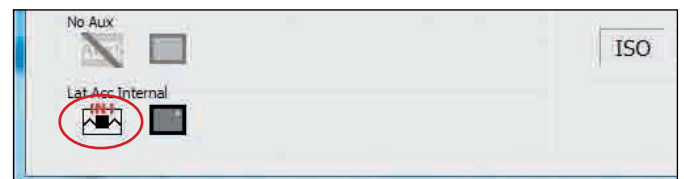
If the test fails refer to EB+ Installation Instructions 006 300 018 and check chassis installation.

Click on the  button to calibrate the accelerometer.

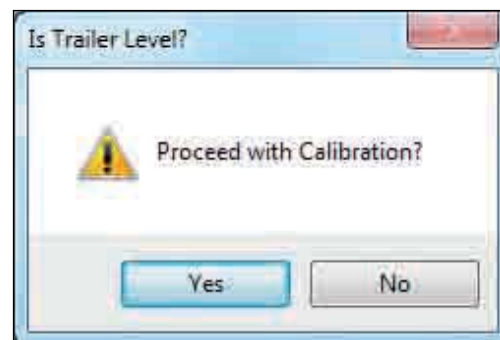
Click on the  button to exit without calibrating the accelerometer.

Checking 24N electrical supply (stop light power)

The 24N (stop light power) can be checked by pressing the tractor brake pedal. The ECU will then register that stop light power has been received, and this is shown on the 'lamp and auxiliary test' menu.



Internal lateral accelerometer



Internal lateral accelerometer now calibrated

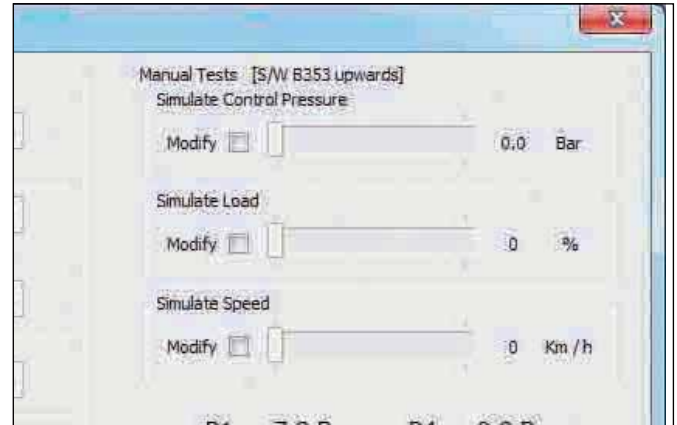
24N power received ok

Additional auxiliary simulation tests

Additional confirmation that any of the programmed auxiliary options are working correctly, can be simulated by using the manual tests section in the 'lamp and auxiliary test' menu. Where EBS parameters can be adjusted to activate the auxiliary options.

The following parameters can be adjusted:

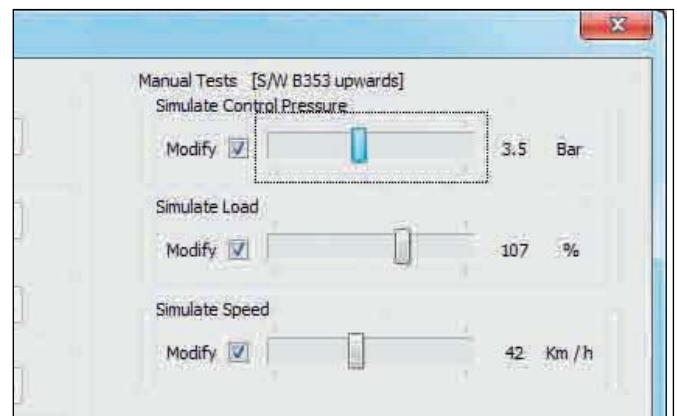
- › Control pressure
- › Load
- › Speed



Manual simulation controls

Click on the modify box adjacent to the required parameter.

Now use the bar to increase or decrease the selected parameter.



Slide the bar to increase or decrease the value

On completion of the EOLT click on the  button to exit

Click on the  button to exit.

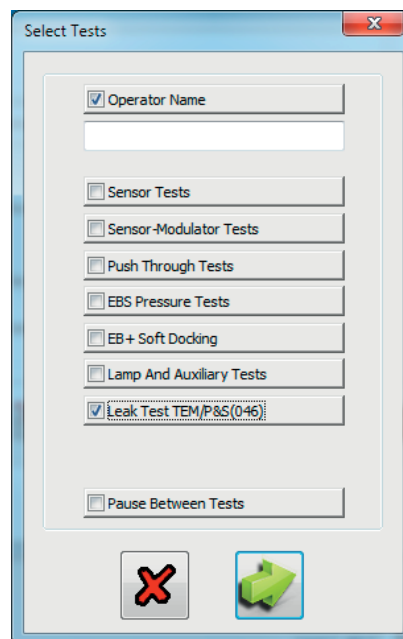
Leak test TrCM & TEM

Before commencing ensure that the correct valve (i.e. TRCM+ or TEM) has been selected in the leak test options page.

Procedure for Leak test TEM/ P & S (046)

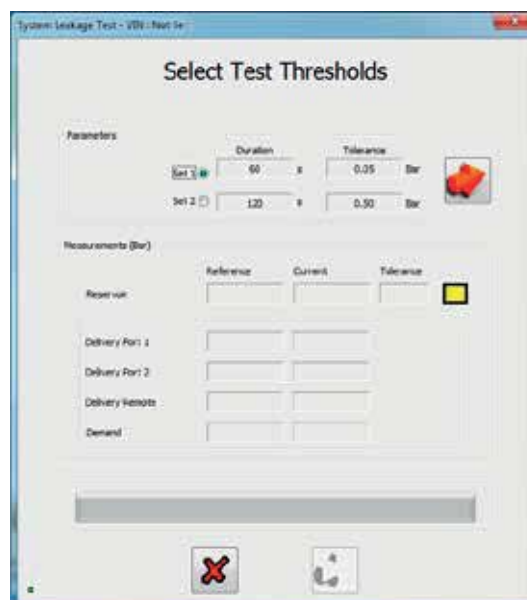
Select leak test box

Click on the  button to start the test.




Select either set 1 or set 2 (as read from the leak test option page)

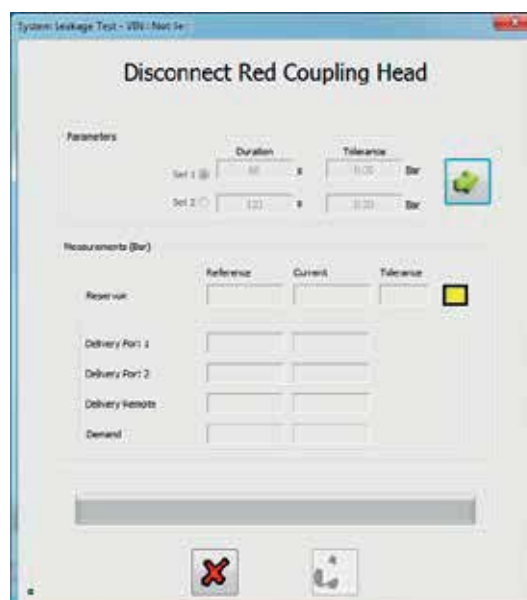
Click on the  button to proceed



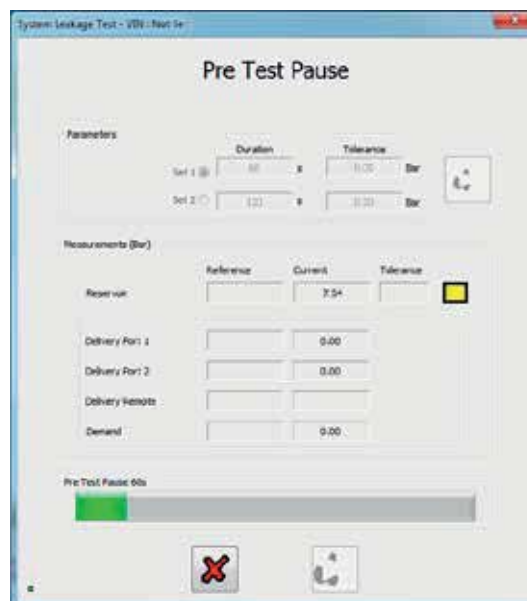
Disconnect the red coupling head (emergency red line) from the trailer.

Click on the  button to proceed (TEM valve only)

Note: If TrCM+ has been selected, the test will start automatically once pressure has been measured at port 4



The software will now wait for the time stated in the stabilizing period (as read from the leak test options page)



The reservoir pressure is now read (reference) and the leak test started.

The length of the test is dependant on the value set in set 1 or set 2 (duration)


The actual pressure during the test is displayed in the current box.

Note: All other values displayed, delivery port 1, delivery port 2, delivery remote and demand are for reference only, and do not affect the test.




At the end of the duration period, the reference and current values are compared, and if the difference is within the tolerance the test will pass.


Click on the  button to proceed

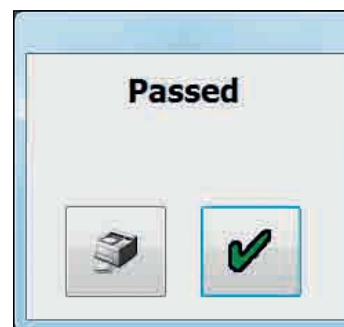
Click on the  button to exit test




On the successful completion of the EOLT the passed menu will be displayed.

Click on the  button to return to the EOLT options menu.

Click on the  button to print out the EOLT report.



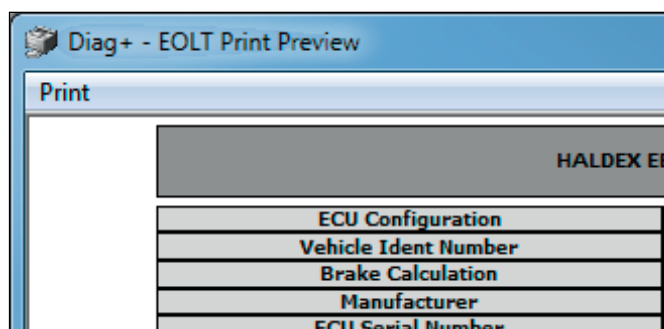
EOLT report printing

The end of line test report can be viewed by selecting the  button.

If required the report can then be printed.



Click 'Print' to print the EOLT report.



Click on print

Example - End of line test report.

HALDEX EB+ END OF LINE TEST REPORT

Halbe

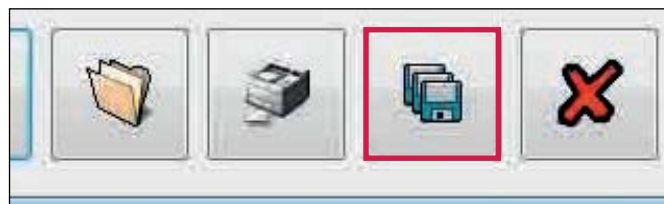
ECU Configuration		49 : 3M ECU Left			
Vehicle Ident Number		31233			
Brake Calculation		B.C No. 2031.131			
Manufacturer		M.B.G Trailers			
ECU Serial Number		000000_47			
Software		B558			
Ordercode (Int)		9			
Date (dd/mm/YY)		11/20/11			
Time		18:57			
Wheel Size		Rdyn (mm)	No. Of Teeth		
S1A/S1B		S20	100		
S2A/S2B		S20	100		
Sensor Tests		Not Applicable			
S1A	S1B	S2A	S2B		
-	-	-	-		
Sensor Modulator Tests		Passed			
S1A	S1B	S2A	S2B		
Passed	Passed	Passed	Passed		
Push Through Tests		Passed			
P21	P22	P23			
6.4	6.4				
EBS Pressure Tests		Passed			
		INPUTS		OUTPUTS	
		MASTER	REMOTE	MASTER	REMOTE
Unladen Suspension		0.7			
Laden Suspension		5.0			
P0		0.3			
P0		0.7	0.5	0.8	0.6
PP1 [U]		-	-	-	-
PP1 [L]		-	-	-	-
PP2 [U]		-	-	-	-
PP2 [L]		-	-	-	-
PP3 [U]		6.3	3.0	3.9	3.9
PP3 [L]		6.3	6.3	6.3	6.3
P Load		-	-	-	-
Options					
REV					
Auxiliary Tests		Passed			
Lamp		On / Off			
Aux 1		No, 15km/h, 6km/h			
Aux 2 Red		No Aux			
Aux 2 Yel		No Aux			
Aux 3 Red		No Aux			
Aux 3 Yel		No Aux			
Aux 4		No Aux			
Aux 5		No Aux			
Lat Acc Interfial		Not Fitted			
Jen					
Notes					
Operator's Name					
Signature					

Saving an EOLT report

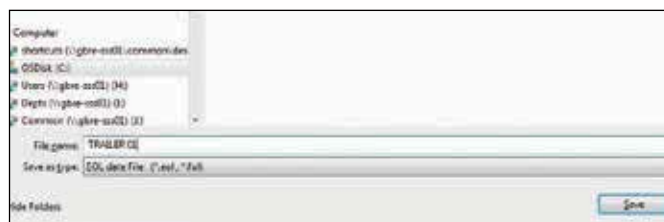
By selecting the  button a report file can be saved.

A file name relevant to the vehicle tested (e.g. TRAILER01 saved as type .eol) can be entered in position 'File name' and stored in the C:\Program Files\Haldex\Diag+\EOLT Reports folder.

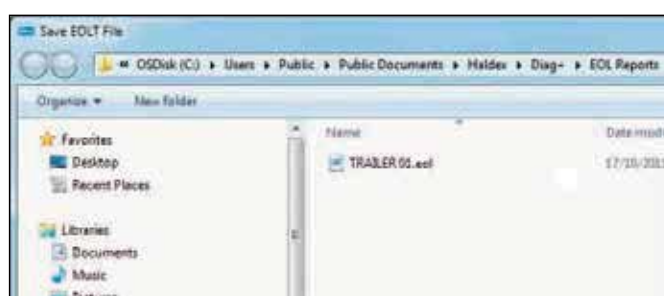
Note: The EOLT report can only be viewed within DIAG+ program in the EOLT section.



Enter the file name and select the 'Save' button.




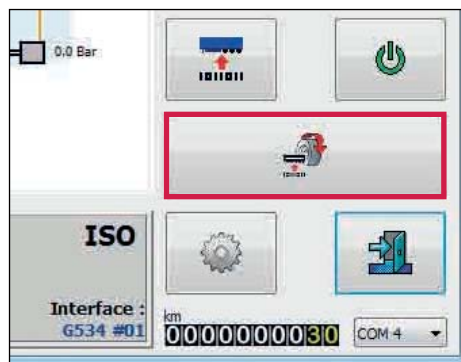
File name 'TRAILER 01.eol' has now been saved



Automated end of line test (OEM recommended only)

The auto end of line test enables a parameter file to be opened for a trailer, program the ECU, check for faults, fix any faults, perform end of line test and save and print in sequence from one base window.

From the start screen, select the icon  to commence the auto end of line test.

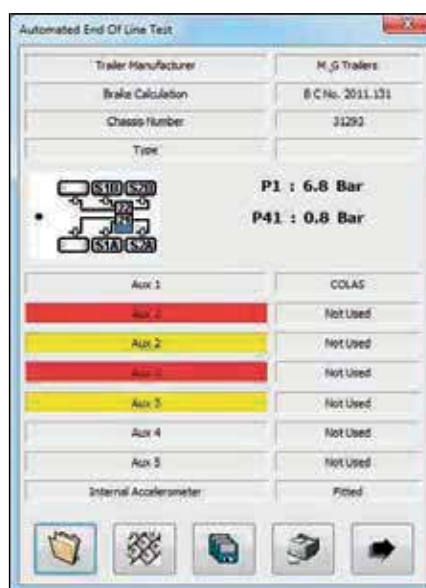


The screen automated end of line test will appear.

It will display live pressure information.

Note: P41_2 also appears in case of 3M systems.

It is possible to check or edit the data (perhaps to change the VIN or auxiliary function) and save to a new file.



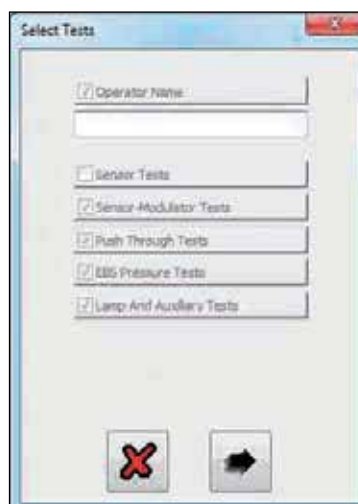
The print icon will allow you to print the load plate data.

The forward button will proceed with the end of line test for the trailer.

The operator name can be preset in the INI file, and can be locked out if required.

It is not possible to change the tests selected in the INI file, as they are greyed out.

The end of line test will then proceed once the ticked icon is selected.



Once the automated end of line test is complete and no faults identified, you should see this screen.

The option is given to print out the report.



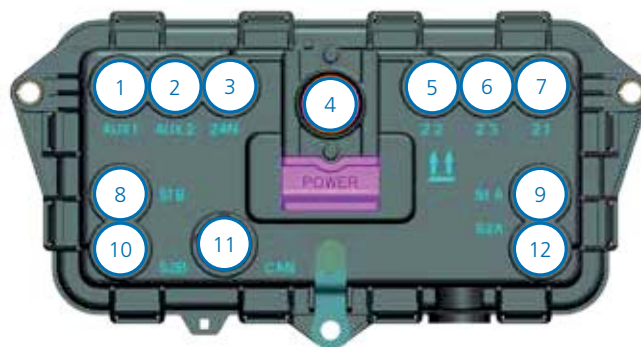
U-ABS

ECU connections	158
Home screen	160
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Setting parameters	168
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Automated end of line test	189

ECU connections

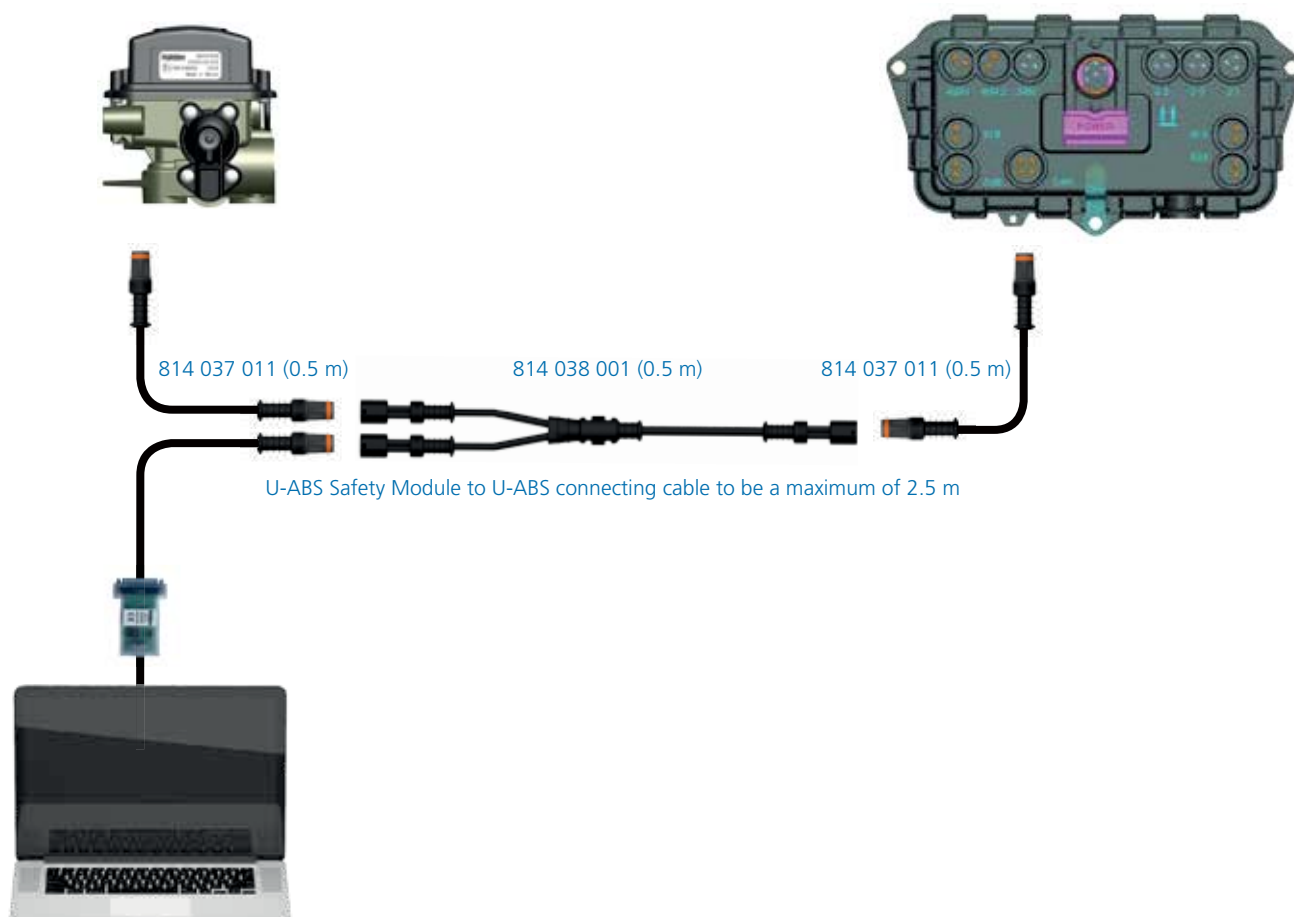
U-ABS Premium

Ref	Description
1	AUX 1
2	AUX 2
3	ISO 12098 / ISO 1185 (24N)
4	ISO 7638
5	Solenoid 22
6	AUX 3 / solenoid 23
7	Solenoid 21
8	Sensor S1B
9	Sensor S1A
10	Sensor S2B
11	CAN / DIAGN
12	Sensor S2A

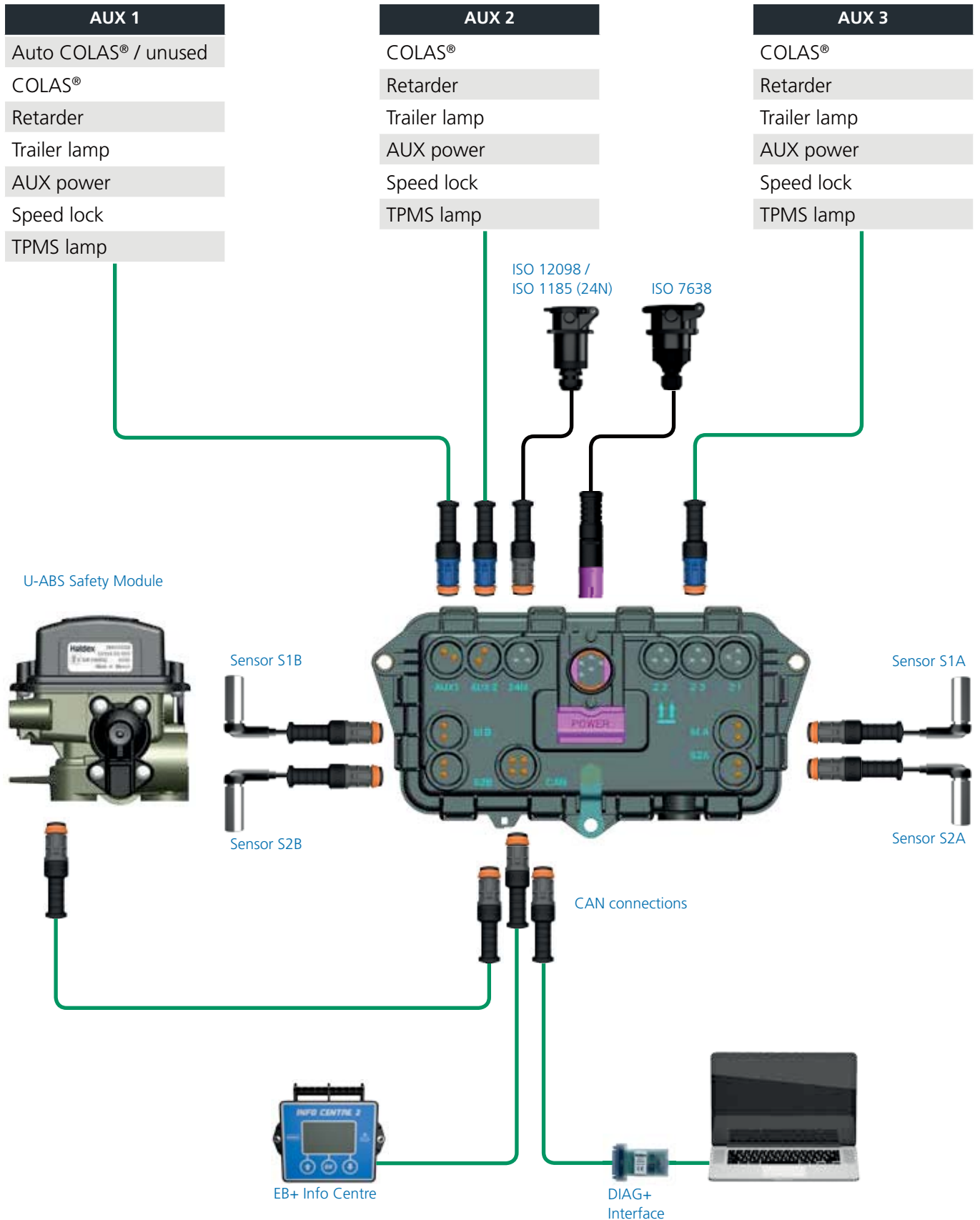


Connecting U-ABS to DIAG+ and U-ABS Safety Module

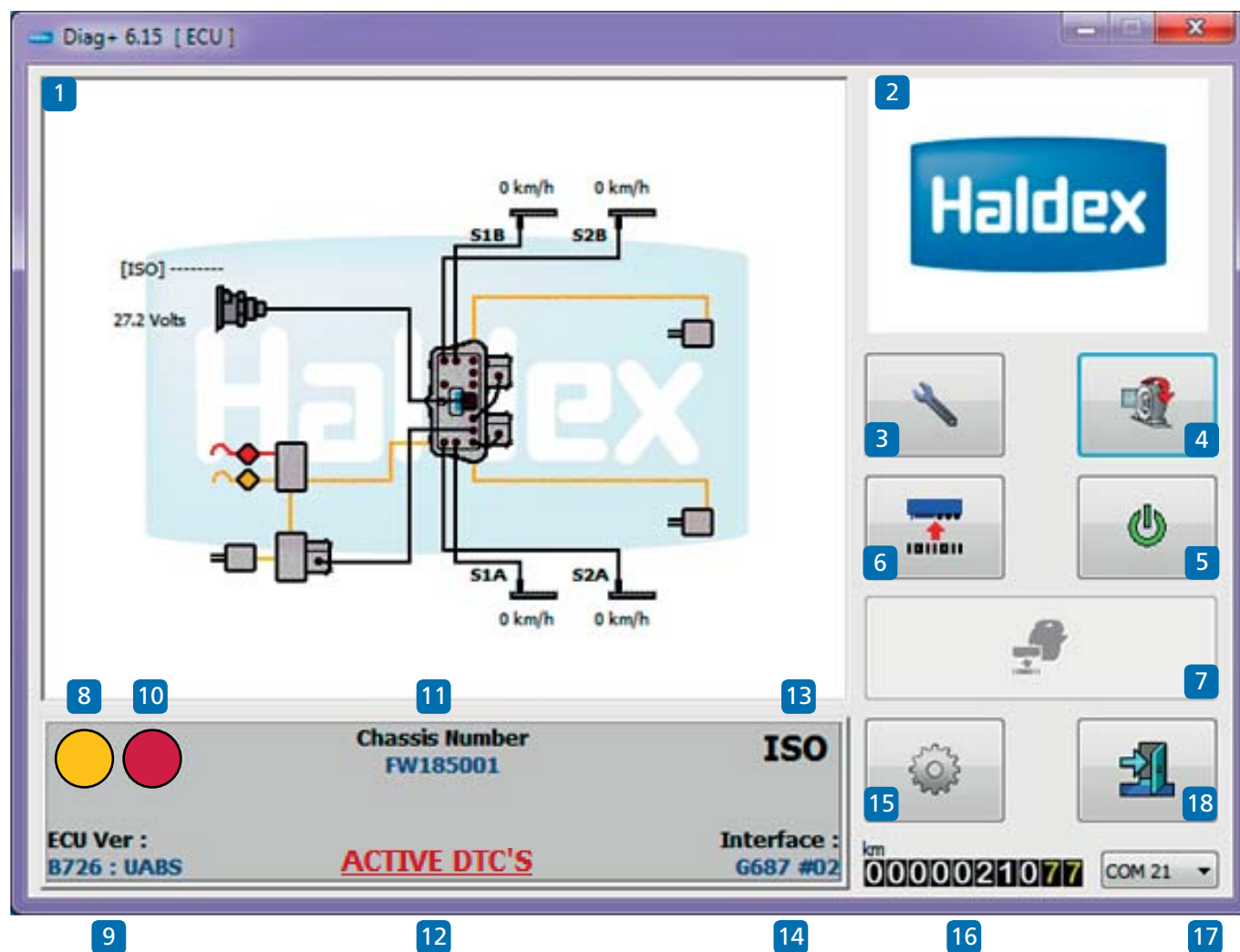
A Y-splitter and extension cables are required when connecting U-ABS (when connected to U-ABS Safety Module) to the DIAG+ software.



U-ABS ECU connection identification



Home screen



Enter into the DIAG+ program by the short-cut icon created on your desktop.

Understanding the home screen display

01	Browser window (e.g. U-ABS layout)	11	Chassis number
02	Video screen	12	Shows active diagnostic trouble codes
03	Service	13	Power source indicator
04	'End of line test' (EOLT) procedure	14	Interface version number
05	Reset the ECU	15	Options
06	Read, setup and program the ECU	16	Odometer reading (total distance)
07	Automated EOLT (option)	17	Trip 1 odometer & trip 2 odometer
08	System information lamp	18	PC connection port indication
09	ECU software version number	19	Exit the DIAG+ program
10	System warning lamp		

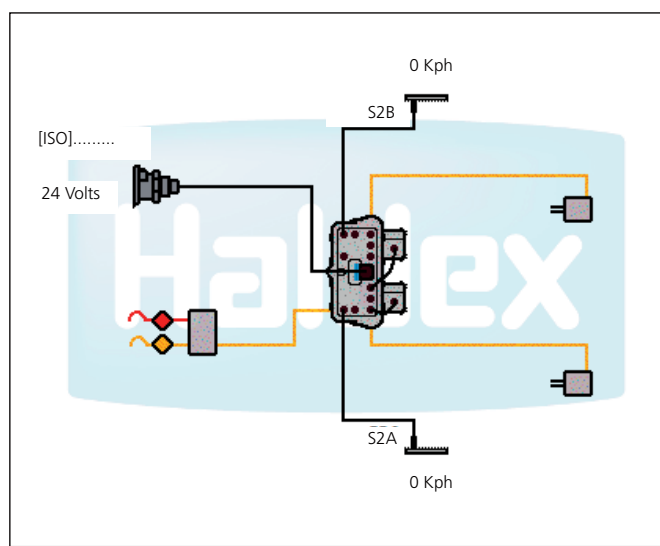
Reading U-ABS voltage and speeds

DIAG+ can display supply voltage and wheel speeds when connected to a U-ABS.

Example:

The following should be displayed.

- 1) ISO voltage will be displayed.

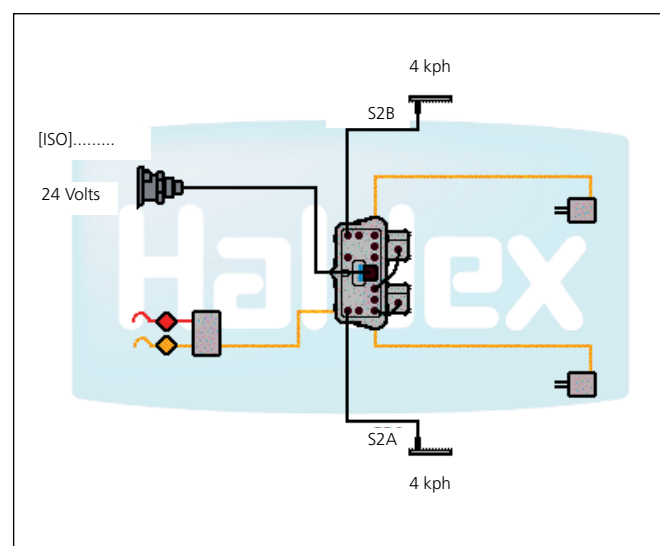


- 2) Wheel speeds will be displayed.

On rotation of the sensed wheels the speed value will be displayed.


Example:

1 rev / 2 sec (30 rpm) ~ 4 kph	for 80 tooth
5 kph	for 90 tooth
6 kph	for 100 tooth



Basic diagnostics (service menu)


Trailer warning lamp “on”


Click on the  button to reset the ECU and wait 10 seconds before proceeding.

Observe the trailer warning lamp.

The warning lamp should display what has been set in the 'lamp setting' section of the ECU Setup.

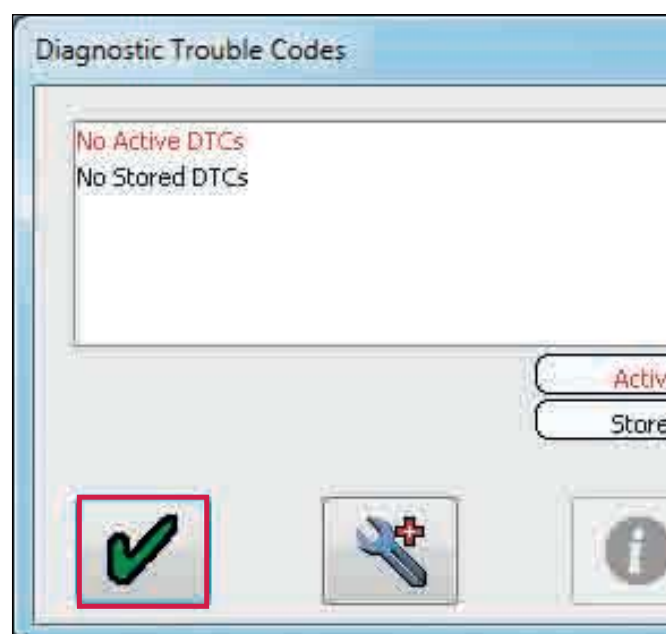
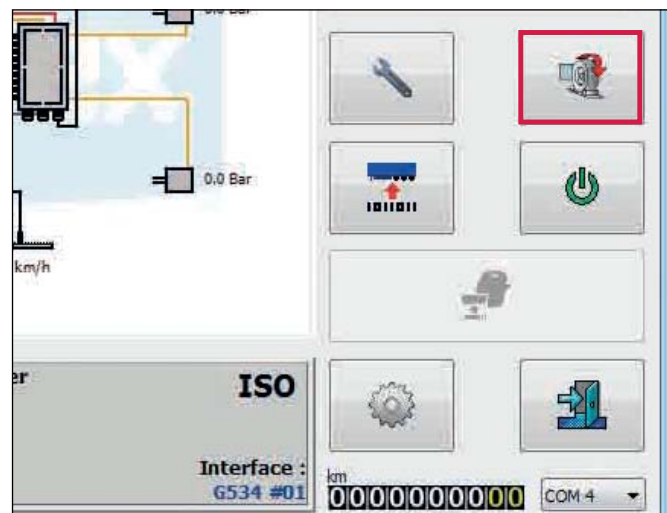
Note: If the trailer warning lamp comes 'on' and stays 'on' there are diagnostic trouble codes (DTC) present which need to be cleared.

Click on the  button on the main screen then

Click on the  button on the service menu to show any stored DTC's.

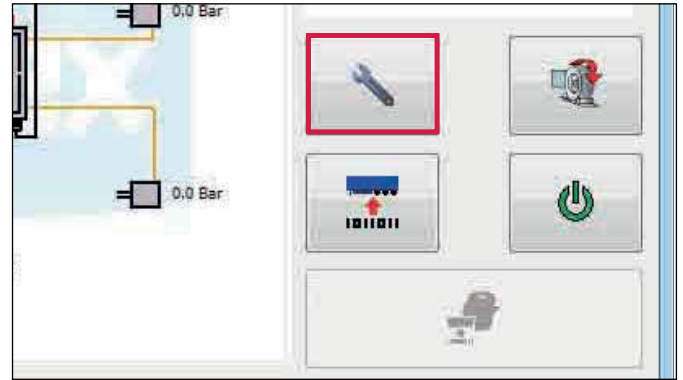
If there are no DTC's detected the following screen will appear.


Click on the  button to accept and exit.



Reading DTC's


Click on the  button on the main screen.



Click on the  button on the service menu to show any stored DTC's.



Any active DTC will be displayed in red (e.g. wheel sensor 1A continuity).

Repair the active DTC and reset the ECU by pressing the  button or switch 'off' then 'on' the power to the ECU.




If there is no active DTC, it will display 'no active DTC's' in red.

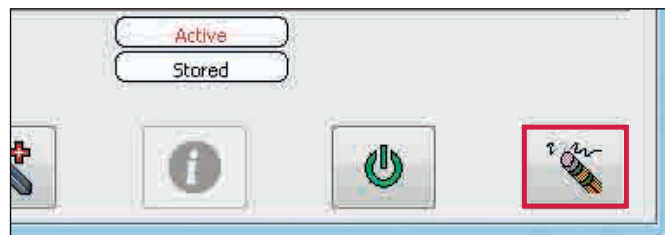
Any repaired DTC will transfer into the ECU memory (i.e. stored DTC).



Deleting stored DTC's

All stored DTC's can be deleted.

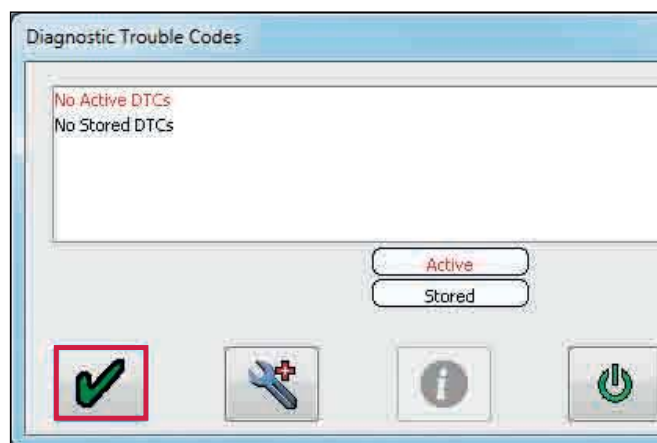
Click on the  button to delete the stored DTC.




ECU deleting the stored DTC.



No active & no stored DTC's present.




Click on the  button to exit.

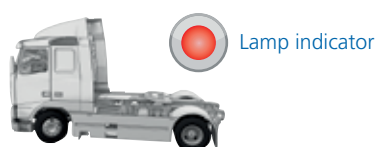
Click on the  button to exit to the main menu.



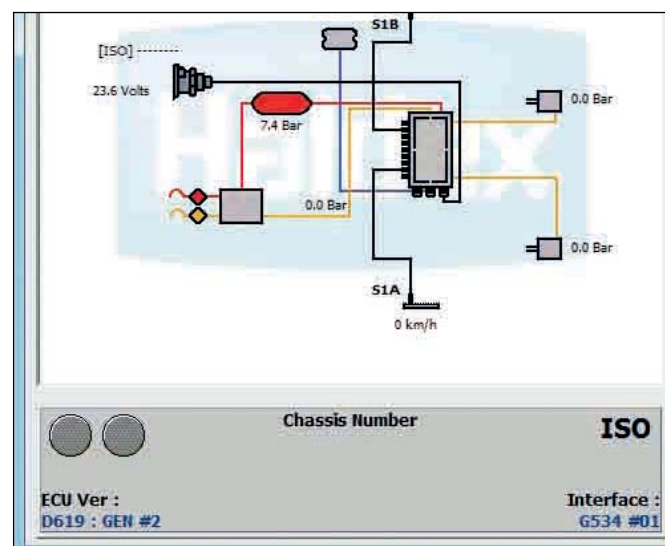
The DIAG+ main screen will appear.

Reset the ECU by clicking on the  button or switch 'off' then 'on' the power to the ECU, but do not exit the DIAG+ program.


Observe the trailer warning lamp. The warning lamp should display what has been set in the 'lamp setting' section of the ECU Setup.

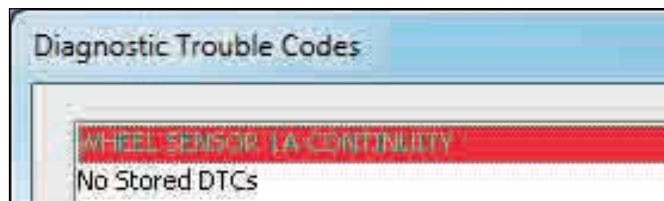


Note: If the trailer warning lamp comes 'on' and stays 'on' there are DTC's present which need to be cleared as above or the system air pressure is below 4.5 bar.



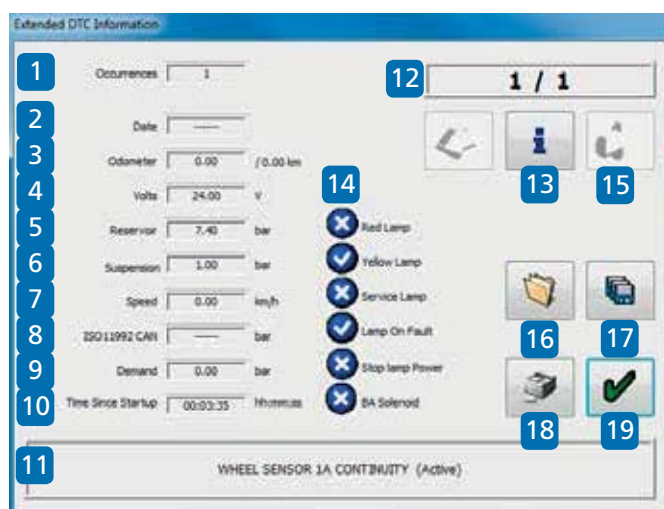
Reading extended diagnostic codes


On active and stored DTC's, double click on any DTC or click on the  button to display the extended DTC information.



Extended DTC screen display:

1. The number of times the DTC occurred (max 254 events). The event is logged every time the ECU is powered. The following data relates to the 1st time the DTC occurred.
2. Date reading - not used.
3. Odometer reading when fault first occurred / total distance.
4. Volts reading.
5. Reservoir pressure - external pressure sensor required.
6. Suspension bag pressure - external pressure sensor required.
7. Speed at which the DTC occurred (example shows vehicle stationary).
8. Electric control line pressure - not used.
9. Pressure reading on the service (yellow) line while braking - external pressure sensor required.
10. Total time, from ECU power up, when DTC occurred
11. Description of DTC.
12. Order and quantity of DTC.
13. Additional DTC information.
14. Status flags of signal requests and system. Refer to Haldex for further interpretation.
15. Flashing icons:



Note: Click on the  button for further detail on each diagnostic trouble code for example "Wheel speed sensor continuity".



DTC from ECU



DTC from file


16. Read extended DTC file from disc.

Note: To read this file you must enter the 'extended DTC information' screen.


17. Save extended DTC file to disc.
18. Print extended DTC.
19. Exit.

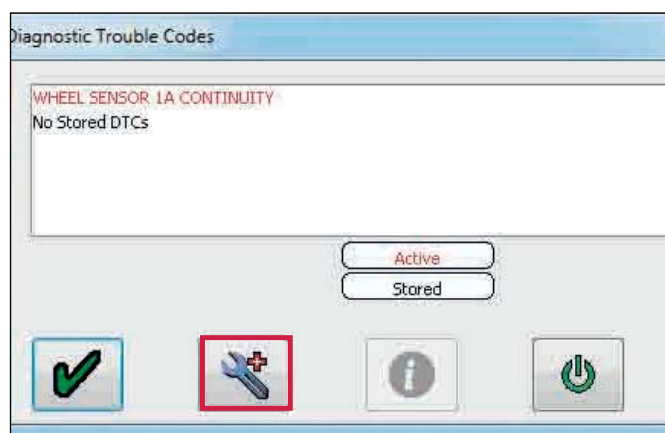
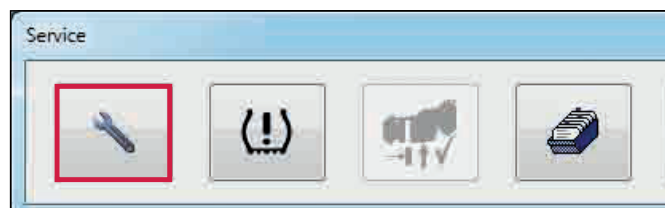
Diagnostic trouble codes (DTC)

A full list of DTC's is available from the DIAG+ software.

To access the list click on the  button on the service menu.

Click on the  button (i.e. ECU connected).

Click on the  button.



Click on the required DTC for possible causes.

For example "wheel sensor 1A continuity"

DTC Info

DTC Code	Full name	Short name
0x01	WHEEL SENSOR 1A CONTINUITY	S1A CONT
0x03	WHEEL SENSOR 1A SIGNAL INTEGRITY	S1A SIGNAL
0x04	WHEEL SENSOR 1A OUTPUT LEVEL	S1A OUTPUT
0x09	WHEEL SENSOR 1B CONTINUITY	S1B CONT
0x0B	WHEEL SENSOR 1B SIGNAL INTEGRITY	S1B SIGNAL
0x0C	WHEEL SENSOR 1B OUTPUT LEVEL	S1B OUTPUT
0x11	WHEEL SENSOR 2A CONTINUITY	S2A CONT
0x13	WHEEL SENSOR 2A SIGNAL INTEGRITY	S2A SIGNAL
0x14	WHEEL SENSOR 2A OUTPUT LEVEL	S2A OUTPUT
0x19	WHEEL SENSOR 2B CONTINUITY	S2B CONT
0x1B	WHEEL SENSOR 2B SIGNAL INTEGRITY	S2B SIGNAL
0x1C	WHEEL SENSOR 2B OUTPUT LEVEL	S2B OUTPUT
0x21	REMOTE VALVE SENSOR	REMOTE VALVE SENSOR
0x22	REMOTE VALVE MODULATOR	REMOTE VALVE MODUL
0x23	REMOTE VALVE CABLE	REMOTE VALVE CABLE
0x24	REMOTE VALVE SLOW RECOVERY	REMOTE VALVE SLOW R
0x29	AUX 1	AUX 1
0x2A	AUX 1	AUX 1
0x2B	AUX 1	AUX 1
0x2C	AUX 1	AUX 1

Open or short circuit in the wiring to wheel speed sensor.

Check the electrical connectors for correct installation and for corrosion, also check the wiring for damage and possible scuff marks.

If the failure occurs at first start-up, please check:

- > Is ECU programming in accordance with the wheel sensor configuration (2 or 4 sens
- > Is the sensor extension cable linked to the correct ECU port?
- > Is the wheel speed sensor correctly connected to the sensor extension cable?

If the above is OK, check wheel speed sensor and the extension cable (Multimeter):

- > Is an alternating current output voltage generated by the wheel speed sensor (mir
- > Is the resistance of the sensor in the permissible area ($> 1.0 < 2.4 \text{ k}\Omega$)?
- > Is there a short circuit possible in the wiring?

If no failure is detected check the internal ECU control circuit:


- > Connect the plug of the defective side (e.g. S1A) to the ECU port of the opposite s (in this case S1B), and the plug S1B with the port S1A. Reset ECU and clear all DTC
- If the initial DTC is displayed again then the ECU is faulty.
- If a different DTC is monitored (instead of S1A.. -> now S1B..) the sensor extension cable or the sensor is faulty. In this case repeat the tests above
- > After this test don't forget to RESET the original configuration!!

After repairing in all cases run the EOLT!

Position of the wheel speed sensor in the driving direction:
For all configurations (ECU right/left) and systems (1M/2M/3M)

1st sensed axle:
S1A = left / S1B = right

Setting parameters (configure menu)


Click on the  button to 'configure, read, setup and program the ECU'.



Program ECU Menu

- 1 Read ECU configuration from a previously saved file.
- 2 Read configuration info from the ECU.
- 3 Edit ECU parameters and configuration.
- 4 Save ECU configuration to a file.
- 5 Program ECU with current configuration info.
- 6 Print current ECU configuration information - load plate.
- 7 Ok - exit the 'program ECU' menu.

ECU parameters

Click on the  button to edit the ECU parameters and configuration.



Edit ECU setup menu


- 1 Walk through button.
- 2 Setup the ECU configuration and layout.
- 3 Setup load plate configuration.
- 4 Display trailer information.
- 5 Setup AUX configuration data.
- 6 Setup wheel scale configuration.
- 7 Setup lamp flash configuration.
- 8 Ok - exit the ECU setup.

Note: The following sections have default settings as shown below:

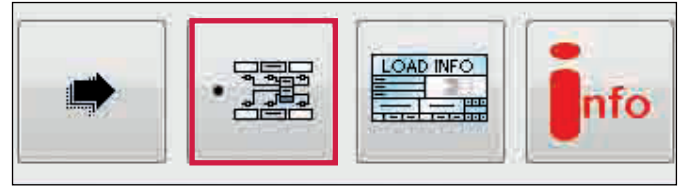
- 5 Auxiliaries - not used (unused).
- 6 Wheel scaling - 306 rev/km, 520 Rdyn (mm) and 100 no. of teeth exciter.
- 7 Lamp sequence - on / off.

If these are correct go to trailer information.

ECU configuration

Click on the  button on the ECU setup screen.

The U-ABS will automatically determine the system configuration installed onto the trailer. This will then be read back into DIAG+.



If box 1 is selected, this adjusts the working parameters in the presence of no REV.

If box 2 is selected, this adjusts the working parameters in the presence of a REV.

If box 3 is selected, load sensing function is available together with ABS on backup powering ISO 1185 (24N).

If box 4 is selected, any automatic lift axles will not raise until move away (when the lamp goes out). It is to enable roller testing of all axles even when unladen.

(Note: Use for the UK vehicle test authority).

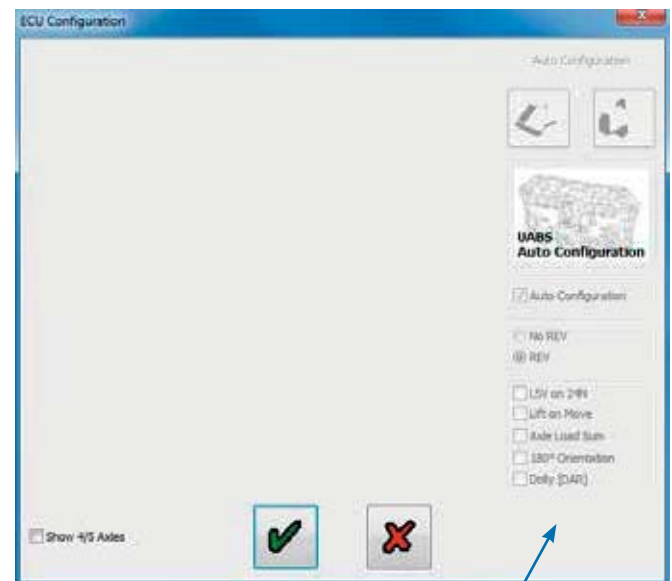
If box 5 is selected, this allows the weight of the trailer to be indicated in the cab if the truck supports this function.

If box 6 is selected, this eliminates crossing of the sensor cables.

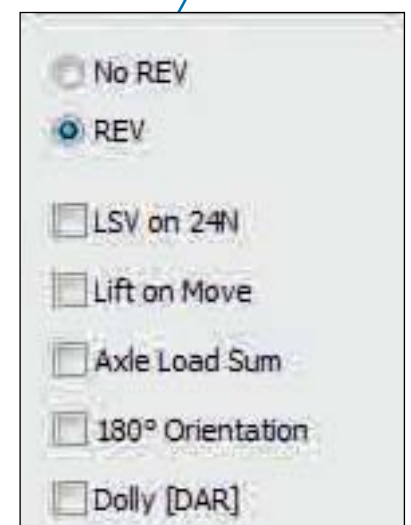
If box 7 is selected, this modifies the left and right pressure control for dollies to prevent unwanted torque steer.

Note: Boxes 1-2 you can select one or the other
Boxes 3-7 you can select from none to all.

Click on the  button to accept.

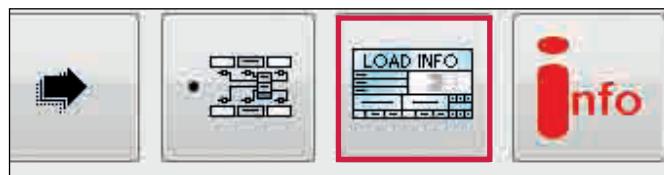


- 1
- 2
- 3
- 4
- 5
- 6
- 7



Load plate data entry

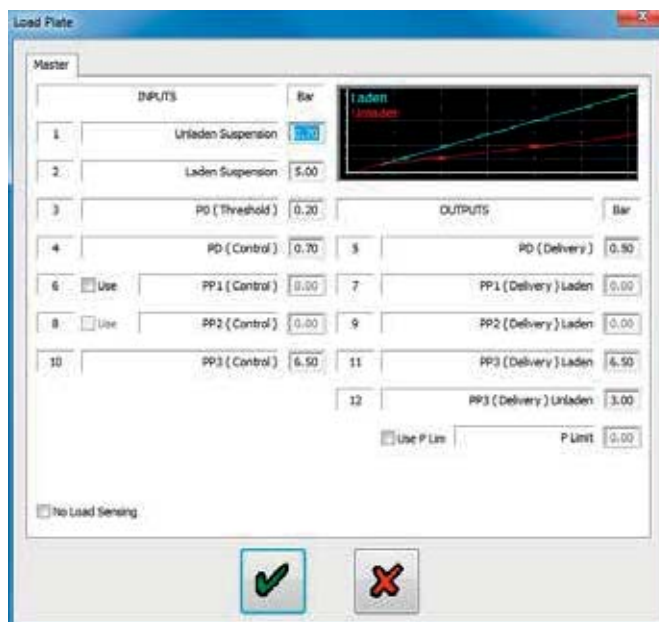
Click on the  button to setup load plate configuration.




For semi and centre axle trailers the following screen will appear.

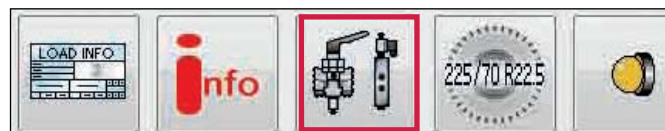
The screen shows a set of default example values (1 to 5 and 10 to 12) which require to be entered in accordance to the vehicles brake calculation.

Highlighting the appropriate box enables you to edit the value or pressing the tab button on your PC will step through, one by one, the various boxes to be edited or selected.



Setting auxiliaries

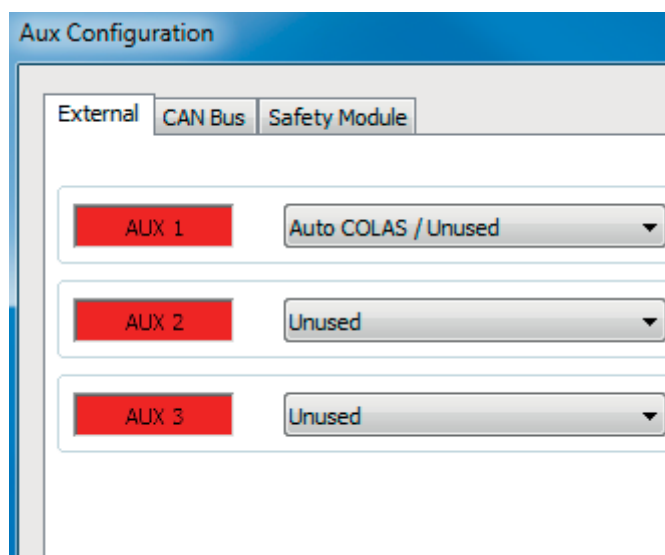
Click on the  button to setup auxiliary configuration.



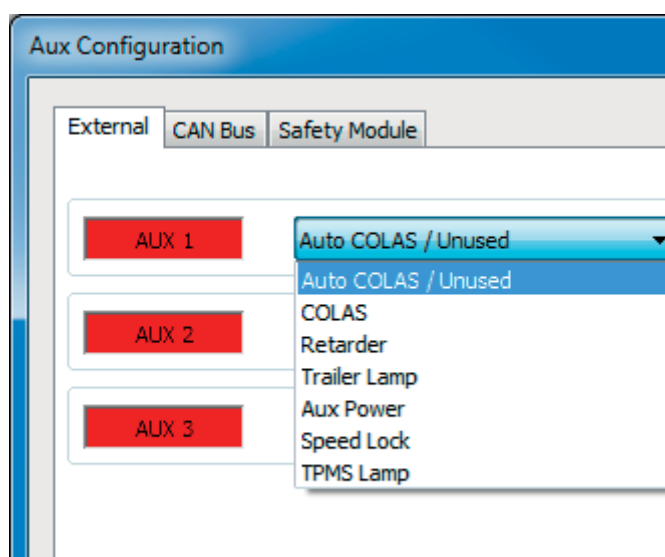
External tab

Depending on the version of the U-ABS connected the 'Aux configuration' screen shows the various auxiliary connections that can be used (i.e. AUX 1 to 3 for a Premium U-ABS).

Clicking on the down arrow displays a listing of options that can be selected.



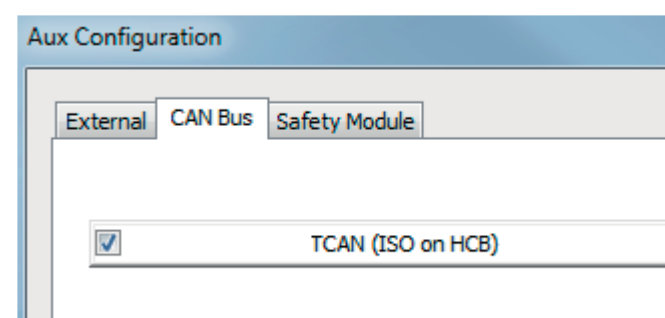
Example: AUX 1 options expanded ready for selection.



CAN BUS tab

The trailer CAN (TCAN) protocol specifies the data exchange between braking and auxiliary data collection systems, e.g. telematics.

Note: This box will be automatically ticked when an U-ABS / U-ABS Safety Module is detected (and the ECU setup has been read back into DIAG+).



Safety Module tab

- › CAN bus termination enabled in Safety Module

This box must be ticked when there is only an U-ABS Safety Module connected. You must contact sales and / or Engineering for advise when there is more than one device connected to the Haldex CAN bus.

Note: This box will be automatically ticked when a U-ABS Safety Module is detected by the U-ABS (and the ECU setup has been read back into DIAG+).

- › Safety Module should always be present

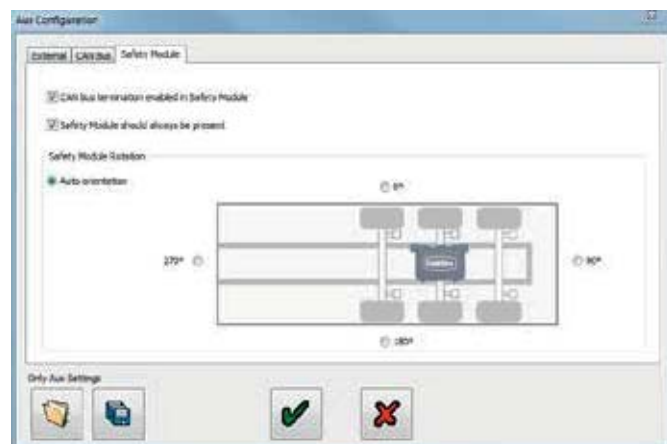
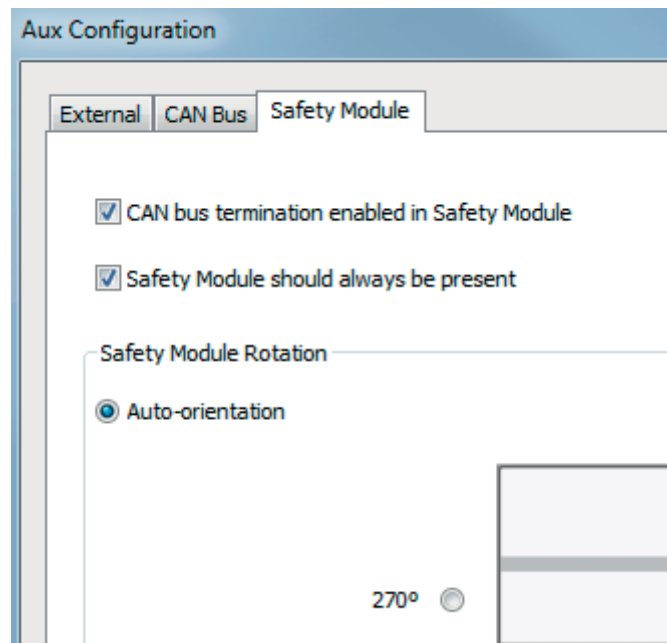
This box will be automatically ticked when a U-ABS Safety Module is detected by U-ABS (and the ECU setup has been read back into DIAG+)

Un-tick this box if removing the U-ABS Safety Module. If left ticked, and the U-ABS Safety Module is removed will cause a DTC to be generated

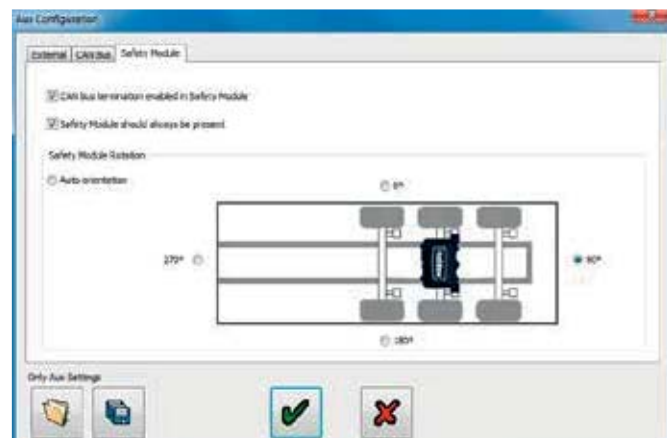
- › Auto

During the installation, U-ABS / DIAG+ will automatically determine the orientation of the fitted U-ABS Safety Module.

If required, this orientation can be changed via DIAG+ by selecting one of the rotation options, and sending the data to U-ABS.



Example: orientation of U-ABS Safety Module modified by the user via DIAG+.



Setting wheel scaling

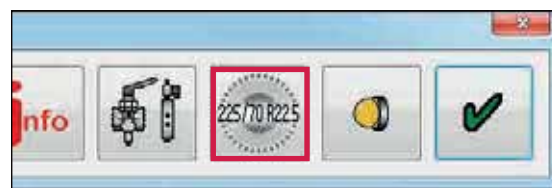
Click on the  button

The following screen will appear.

The screen shows the default value of a tire size of 306 revs/km, 520 Rdyn (dynamic rolling radius - mm) with a 100 tooth exciter installed. This value covers tire sizes from 19.5" to 22.5" and sets the correct ABS function and odometer of the system.

Note: If the tooth number is not 100 the wheel scale factor on the Info Centre will read a different value.

Click on the  button to accept.



Test for number of teeth

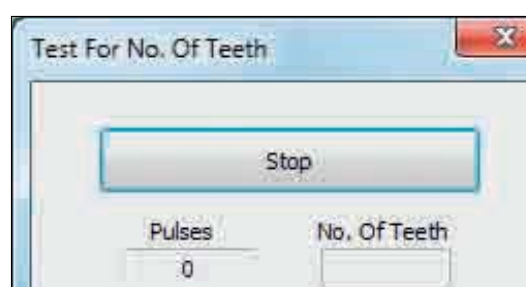
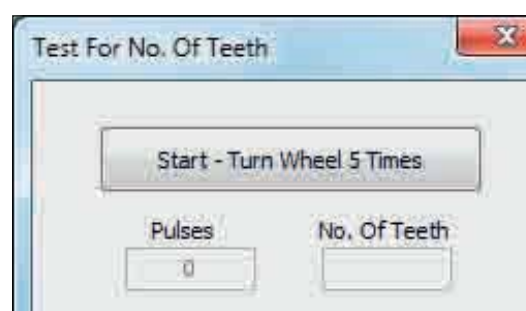
Click on the  button

Click on button marked 'start - turn wheel 5 times' Rotate the selected sensed wheel 1 rev / 2 sec, five times.

The pulses box automatically records during the wheel rotation procedure. After 5 turns, click on button marked 'stop'. The 'No. of teeth' box indicates the value. Click on button marked 'use calculated value' if required to use in wheel scaling above or note the value for information purposes.

Click on 'abort' to exit.

Repeat for any other selected sensor.



Lamp Settings

Click on the  button

The following screen will appear.

The screen shows the two options of flash sequence for the trailer EBS warning lamp.

The on / off sequence is set as a default.

Click on button marked  to accept.

Note: The on / off lamp sequence change will only be visible if system air pressure is above 4.5 bar.



Info - trailer information

Click on the  button




The following screen will appear.

Enter details of :

- › Trailer manufacturer (19 characters)
- › Brake calculation number (16 characters)
- › Chassis number (17 characters)
- › Type (12 characters)
- › Axle information - load of axle/s installed on the trailer. (default values are: Unladen = 3000 Kg, Laden = 9000 Kg)

This information is stored in the ECU and can be printed out on the end-of-line test report and load plate.

Click on the  button to open a new screen titled 'Geometric data'. From here the user can enter detailed vehicle data.




- › Configuration
- › Lift axle position
- › Wheel base

U-ABS transmits 'Geometric data' to the truck via the ISO 11898 CAN link.

Click on the  button to accept.



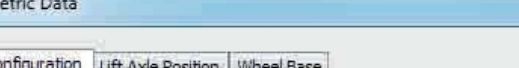
'ECU setup' is complete (ECU parameters settings not sent to ECU - see next step).

Click on the  button to accept.



Trailer Manufacturer		Brake Calculation	
<input type="text"/>		<input type="text"/>	
Chassis Number		Type	
<input type="text"/>		<input type="text"/>	

Axle Information			
Unladen		Laden	
Axle 1	<input type="text" value="3000"/> kg	Axle 1	<input type="text" value="9000"/> kg
Axle 2	<input type="text" value="3000"/> kg	Axle 2	<input type="text" value="9000"/> kg
Axle 3	<input type="text" value="3000"/> kg	Axle 3	<input type="text" value="9000"/> kg



Geometric Data

Configuration

Lift Axle Position

Wheel Base

Type Of Towed Vehicle

Select Type

Select Type

[illegible]

Saving the ECU parameters

Option 1:

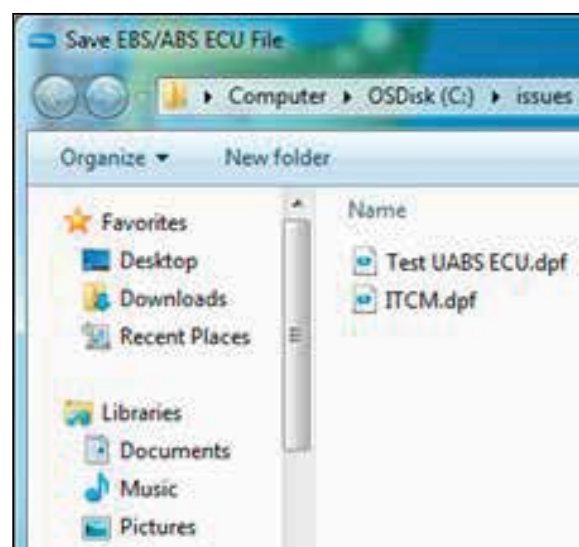
Saving the ECU parameters file to disc.

Click on the  button.

The following screen will appear.

A file name (e.g. Example 01 saved as type .DPF) can be entered in position 'file name' and stored in the C:\Program Files\Haldex\Diag+VECU setup files folder. Click on button 'save' to store the file.


The saved U-ABS ECU parameter file can be used for future programming of ECU's (which require the same parameters) by recalling the file from the 'Open U-ABS ECU File' button.



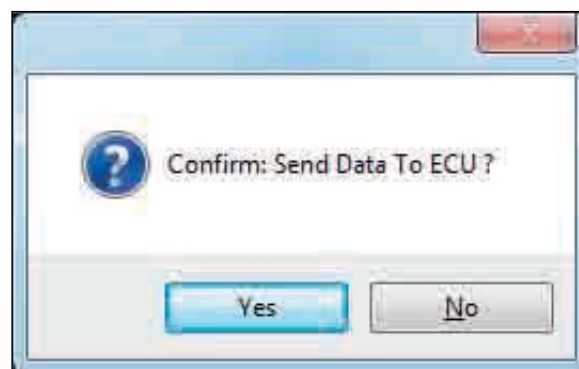
Option 2:

Programming the ECU.

Click on the  button.

This activates  sending of the edited parameters file to the ECU.

Note: At 90% progress all the DTC's are deleted and the ECU is reset.




The status of this process is shown in the following ways:

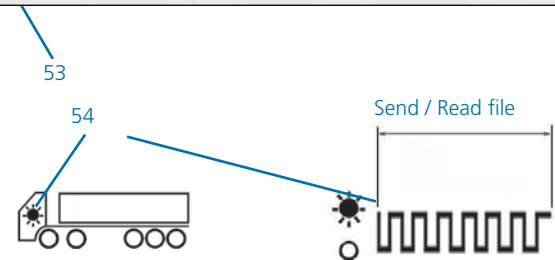
- 53 A bar indicator fills the progress box on the 'Program ECU' screen.
- 54 The trailers ABS warning lamp function is
- a) 'on' - ECU not programmed
 - b) Flashing - programmed ECU (with an 'ECU setup' installed)

Note: The trailers ABS warning lamp is 'on'


This completes the programming of the ECU.

The following screen will appear.

Click on the  button to view or print a label with the current ECU configuration information (load plate label).



Load plate label printing

Click on the  button to print the load plate label.

Click on 'Print' to show options.

› Click 'Print' to print the EOLT report

Print label using Haldex blank label 028 5301 09.


Use laser printer only and refer to manufacturers information on printing a A5 size paper. After installation spray on a clear lacquer (or a hard varnish) to protect the printed surface.

› Click 'page fine tune offset' to position the EOLT report on the page

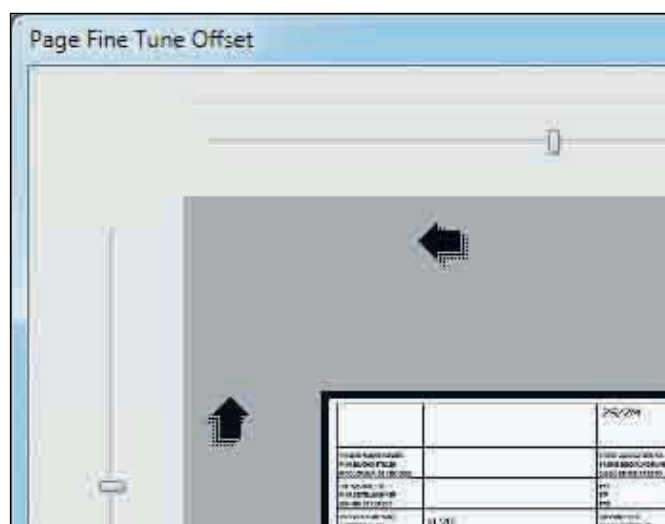
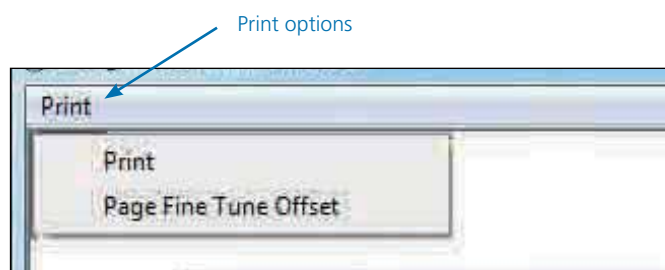
Page fine tune offset

Either click and drag the EOLT report or use the horizontal and vertical side bars to move the report around the page.

Click on the  button to accept.

Click on the  button to exit without changing page position.

Example label for a semi or centre axle trailer.



Haldex		EB+ ADR Tü.EGG.094-04	2S/2M Stabil
TRAILER MANUFACTURER FAHRZEUGHERSTELLER CONSTRUCTEUR	M & G Trailers		BRAKE CALCUL BREMSBERECH CALCUL DE FRE
CHASSIS NUMBER FAHRGESTELLNUMMER NUMERO DE CHASSIS	31293		TYPE TYP TYPE
THRESHOLD PRESSURE ANSPRECHDRUCK PRESSION D'APPROCHE [bar]	0.20		PRESSURE LIM DRUCKGEGREN LIMITE DE PRE
[1.00 bar = 100 kPa]	UNLADEN / LEER / A VIDE		LADE
	INPUT PRESSURE EINGANGSDRUCK PRESSION D'ENTREE [bar]		6.50
	AXLE LOAD ACHSLAST CHARGE ESSEU [kg]	SUSPENSION PRESSURE BALGDRUCK PRESSION DE SUSPENSION [bar]	OUTPUT PRESSURE AUSGANGSDRUCK PRESSION DE SORTIE [bar]
			AXLE LOAD ACHSLAST CHARGE ESSEU [kg]

End of line test (EOLT)

Clear all active or stored diagnostic trouble codes before proceeding with end of line test.



Note: When the ECU is initially programmed all DTC's are deleted.



Click on the  button on the main screen.

EOLT options

This screen will appear if there are no hardware or software compatibility issues.

The 'View / print'  and 'Save to file'  buttons are initially disabled. They are enabled under the following conditions:

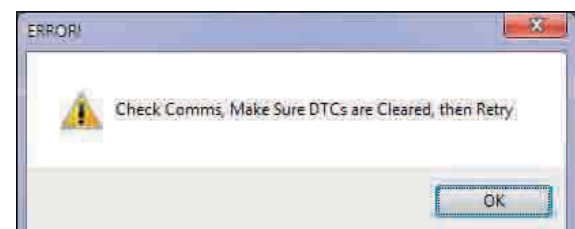
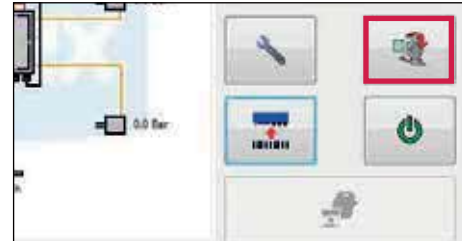
- a) Completion of an EOLT
- b) An existing EOLT file is opened (.eol) ('View / print' only).

Click on the  button to start the EOLT test procedure.

Or click on the  button to return to the main menu.

Error

This screen will appear if there is a stored DTC present in the ECU. Click OK and exit the EOLT menu, then clear the stored fault and try again.




EOLT initialisation

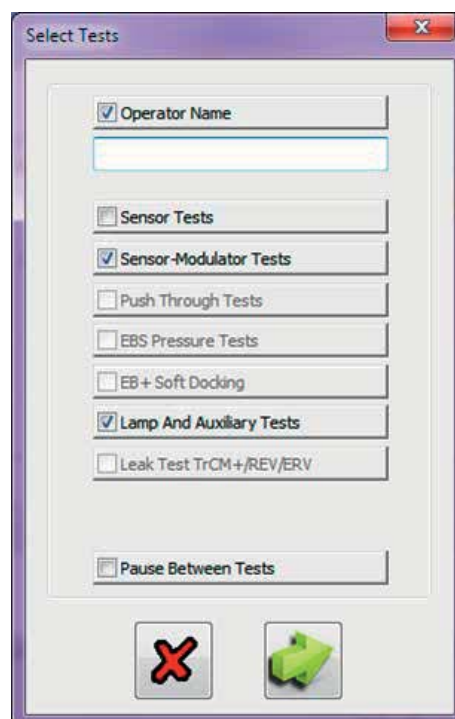
A list of EOLT tests are shown. These tests can be selected or de-selected as required by ticking the corresponding box.

If the 'Operators name' option is selected, it will enable a name to be entered in the area below. This will be recorded on the EOLT report.

If the 'Pause between tests' option is not selected, the selected tests screen will run automatically after each test has been carried out.

Click on the  button to return to the main menu.

Click on the  button to start the EOLT.



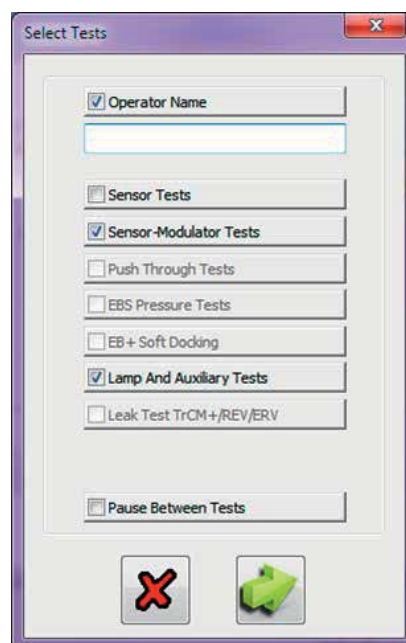
Note: During the EOLT procedure the cab / trailer warning lamp will flash to indicate the EOLT is in progress.

Sensor tests

This full sensor test is optional, and the sensors will be tested during the 'Sensor modulator tests' (i.e. tick box is not selected when entering the 'Select tests' menu).

Procedure:

- › Foot brake "off" (no pressure in the service line)
- › Rotate each wheel through 3 revolutions in 5 secs
- › The test sequence is S1A, S1B, S2A, S2B etc

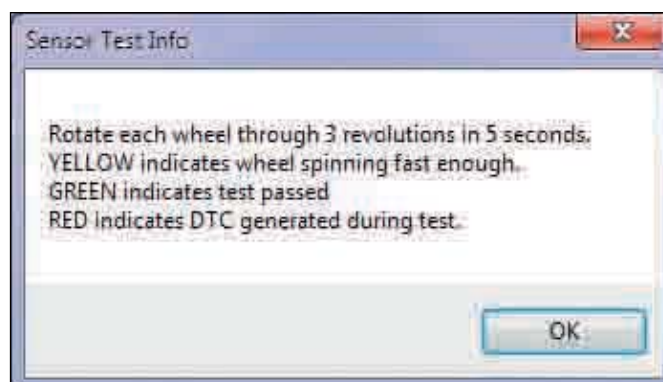


Result section:

Yellow indicates wheel spinning fast enough.

Green indicates test passed.

Red indicates DTC generated during test.



Sensor modulator test

Procedure:

- › Apply foot brake continuously (pressure in the service line)
- › Rotate each wheel through 1 revolution in 2 seconds
- › The test sequence is S1A, S1B, S2A, S2B etc

The EOLT will release the wheel to be rotated. Rotate each wheel through 1 revolution in 2 seconds. The system will brake the spinning wheel.


- › The test sequence is S1A, S1B, S2A, S2B etc

Result section:

Yellow indicates wheel has moved.

Green indicates test passed.

Red indicates test failed.

Click on the  button to access the individual test procedure.

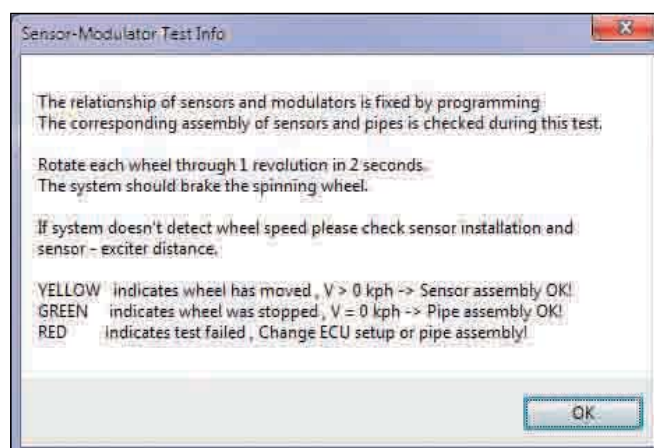
Note: If previously entered, the vehicle ident number (VIN) will be displayed in the title bar of each test (e.g. VIN: FW185001).

S1A test started

Manually rotate wheel S1A at 1 revolution in 2 seconds.

S1A test passed

If the moving wheel is successfully braked, the S1A test will pass and move onto the S1B wheel.



Wheel speed detected
(moving green bar)

Moving wheel
(yellow indication)



Correct wheel braked
(green indication)

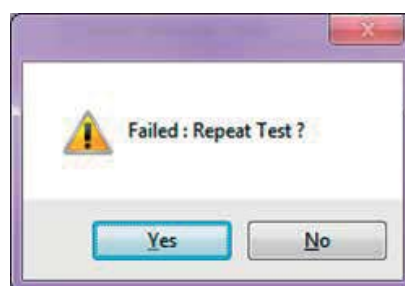
Failed test

If any of the 'Sensor modulator test' fails check the following:

- › Correct sequence - S1A, S1B, S2A, S2B etc
- › Incorrect wiring
- › Incorrect piping

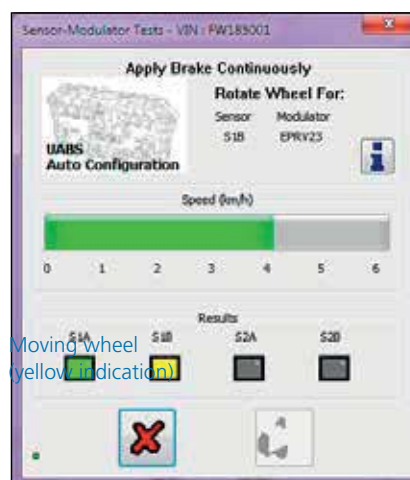


S1A wheel failed
(red indication)



S1B test started

Manually rotate wheel S1B at 1 revolution in 2 seconds.



Wheel speed detected
(moving green bar)

Moving wheel
(yellow indication)

S1B test passed

If the moving wheel is successfully braked, the S1B test will pass and move onto the next configured sensor in the sequence.

Repeat the 'Sensor modular test' for all the programmed ECU sensors.



Correct wheel braked
(green indication)

Lamp and auxiliaries test (automatic test)

The cab lamp and any auxiliaries will be forced 'on' then 'off', and monitored to determine the correct response. Once correctly tested, the lamp or auxiliary can be switched manually without affecting test results.

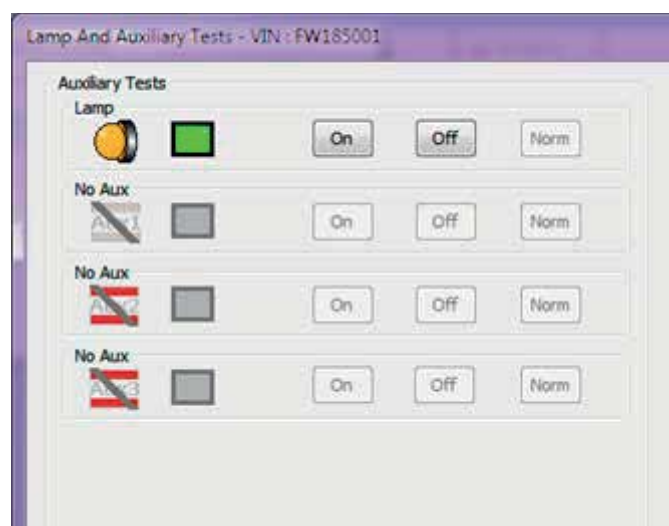
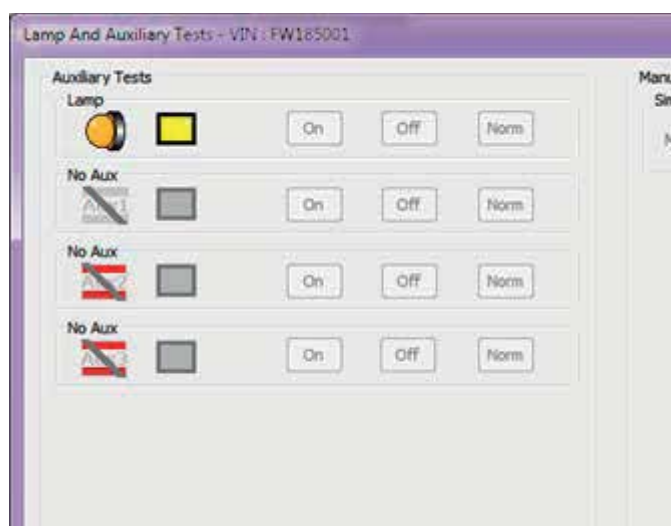
To switch to manual testing click on the 'on' button the 'off' and 'norm' buttons are highlighted, toggle between the 'on' and 'off'. The 'norm' resets to automatic mode.

Result section:

Yellow indicates test started.



Green indicates test passed.

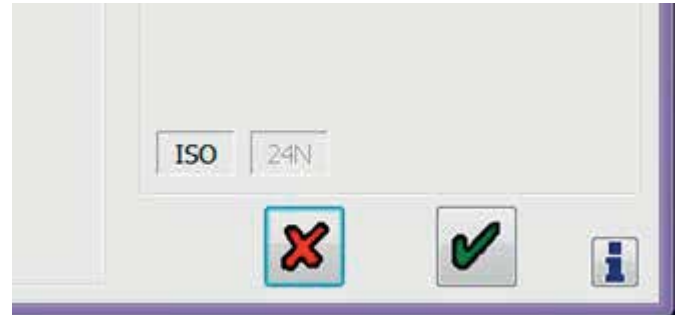
Red indicates test failed.



Checking 24N electrical supply (stop light power)

The 24N (stop light power) can be checked by pressing the tractor brake pedal. The ECU will then register that stop light power has been received, and this is shown on the 'lamp and auxiliary test' menu.

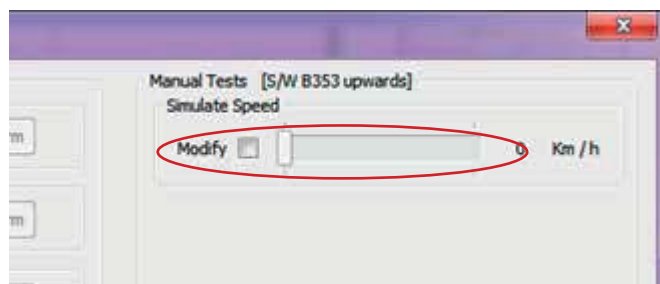
Click on the  button to proceed with the next step
Click on the  button to quit the EOLT procedure.



ISO or 24N power indication

Additional auxiliary simulation tests

Additional confirmation that any of the programmed auxiliary options are working correctly, can be simulated by using the manual tests section in the 'lamp and auxiliary test' menu. Where U-ABS parameters can be adjusted to activate the auxiliary options.



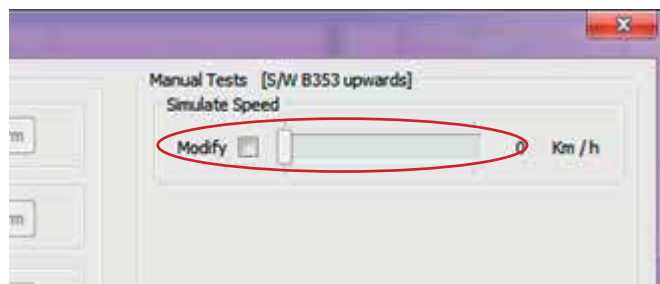
Manual simulation controls

The following parameters can be adjusted:

- › Speed

Click on the modify box adjacent to the required parameter.

Now use the bar to increase or decrease the selected parameter.





Slide the bar to increase or decrease the value

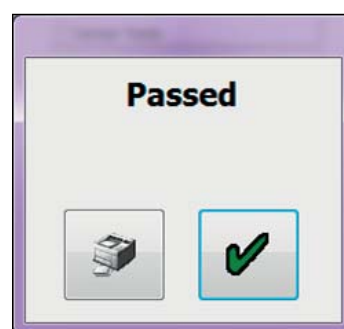
On completion of the EOLT click on the  button to exit

Click on the  button to exit.


On the successful completion of the EOLT the passed menu will be displayed.

Click on the  button to return to the EOLT options menu.

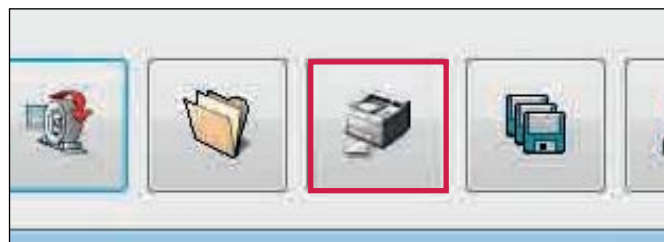
Click on the  button to print out the EOLT report.



EOLT report printing

The end of line test report can be viewed by selecting the  button.

If required the report can then be printed.



Click 'Print' to print the EOLT report.

Diag - EOLT Print Preview

Print

HALDEX EBS/ABS END OF LINE TEST REPORT		
ECU Configuration	UABS Auto Configu	
Vehicle Ident Number	FW1850	
Brake Calculation	201016	
Manufacturer	Freuhaut &	
ECU Serial Number	020013	
Software	8726	
Odometer (km)	210	
Date (DD/MM/YY)	24/03/	
Time	11:27	
Wheel Scale	Rdyn (mm)	No. Of T
S1A/S1B	520	100

Example - end of line test report

HALDEX EBS/ABS END OF LINE TEST REPORT

Haldex

ECU Configuration	UABS Auto Configuration 45 : 3H		
Vehicle Ident Number	FW185001		
Brake Calculation	2010162.1		
Manufacturer	Freuhaut &		
ECU Serial Number	020013 43		
Software	8726		
Odometer (km)	210		
Date (DD/MM/YY)	24/03/16		
Time	11:27		

Wheel Scale	Rdyn (mm)	No. Of Teeth
S1A/S1B	520	100
S2A/S2B	520	100

Sensor Tests			Not Applicable
S1A	S1B	S2A	S2B
-	-	-	-

Sensor Modulator Tests			Not Applicable
S1A	S1B	S2A	S2B
-	-	-	-

Options			
REV			

Auxiliary Tests			On / Off	Passed
Lamp				Passed
Aux 1	No Aux			-
Aux 2 Std	No Aux			-
Aux 3 Std	No Aux			-
24R				-

Notes				
-------	--	--	--	--

--	--	--	--	--

--	--	--	--	--

Operator's Name				
-----------------	--	--	--	--

Signature				
-----------	--	--	--	--

--	--	--	--	--

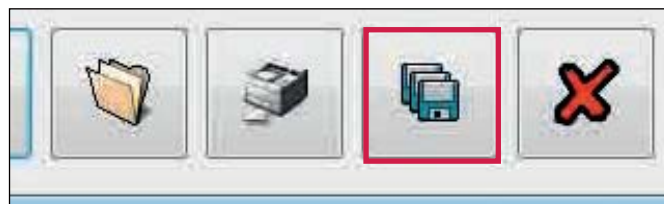
Report Created by Diag v6.13

Saving an EOLT report

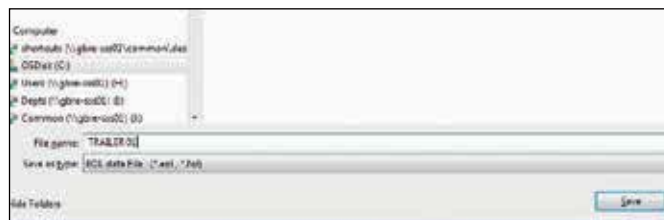
By selecting the  button a report file can be saved.

A file name relevant to the vehicle tested (e.g. TRAILER01 saved as type .eol) can be entered in position 'File name' and stored in the C:\Program Files\Haldex\Diag+\EOLT Reports folder.

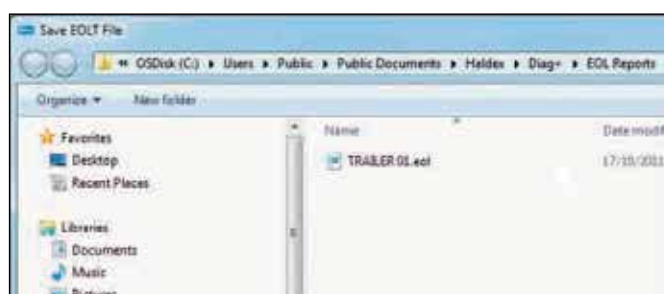
Note: The EOLT report can only be viewed within DIAG+ program in the EOLT section.



Enter the file name and select the 'Save' button.




File name 'TRAILER 01.eol' has now been saved



Automated end of line test (OEM recommended only)

The auto end of line test enables a parameter file to be opened for a trailer, program the ECU, check for faults, fix any faults, perform end of line test and save and print in sequence from one base window.

From the start screen, select the icon  to commence the auto end of line test.

The screen automated end of line test will appear. It will display live pressure information.

It is possible to check or edit the data (perhaps to change the VIN or auxiliary function) and save to a new file.

The print icon will allow you to print the load plate data.

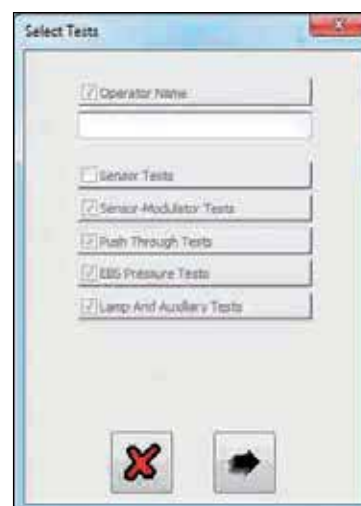
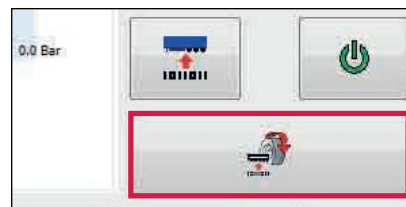
The forward button will proceed with the end of line test for the trailer.

The operator name can be preset in the INI file, and can be locked out if required.

It is not possible to change the tests selected in the INI file, as they are greyed out.

The end of line test will then proceed once the ticked icon is selected.

Once the automated end of line test is complete and no faults identified, you should see this screen. The option is given to print out the report.



ITCM

ECU connections	192
Home screen	195
Basic diagnostics	198
Setting parameters	204
End of line test (EOLT)	213
Automated end of line test	221

ECU connections



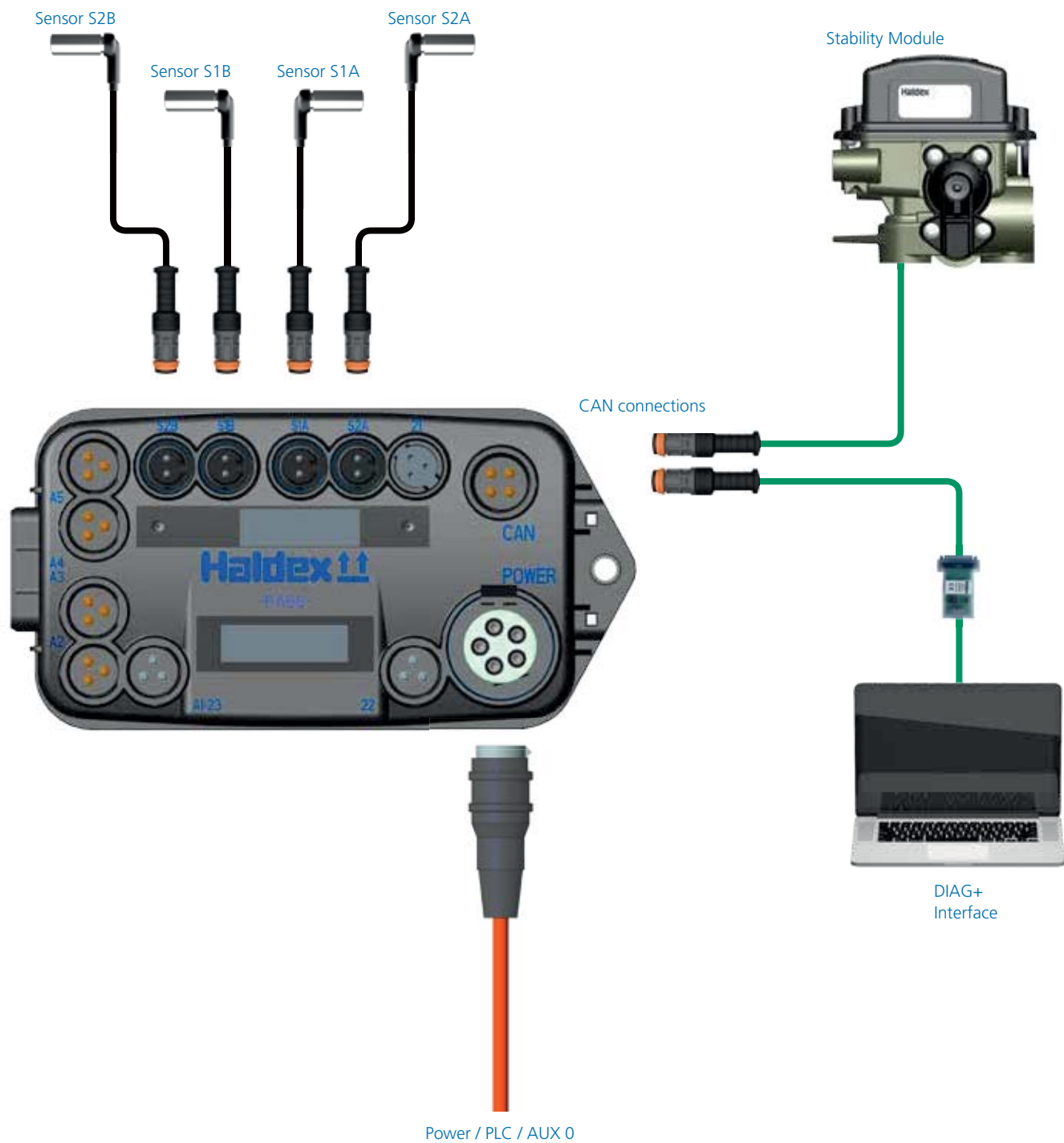
Ref	Description
1	AUX 1 / solenoid 23
2	AUX 2
3	AUX 3
4	AUX 4
5	AUX 5
6	Sensor S2B
7	Sensor S1B
8	Sensor S1A
9	Sensor S2A
10	Solenoid 21
11	CAN 11898 / DIAGN
12	Power / PLC / AUX 0
13	Solenoid 22

Connecting ITCM to DIAG+ and Stability Module

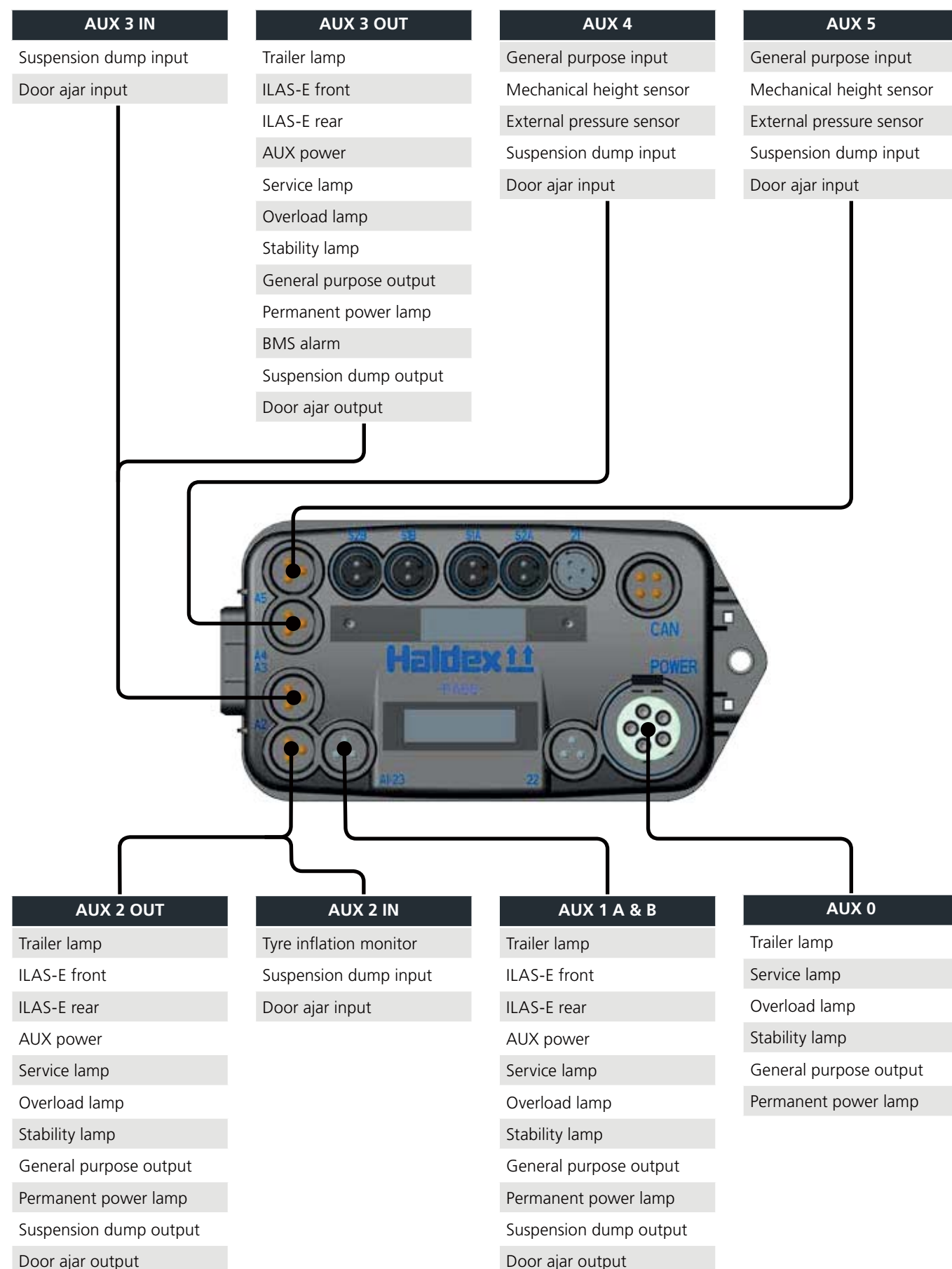
A Y-splitter and extension cables are required when connecting ITCM (when connected to Stability Module) to the DIAG+ software.



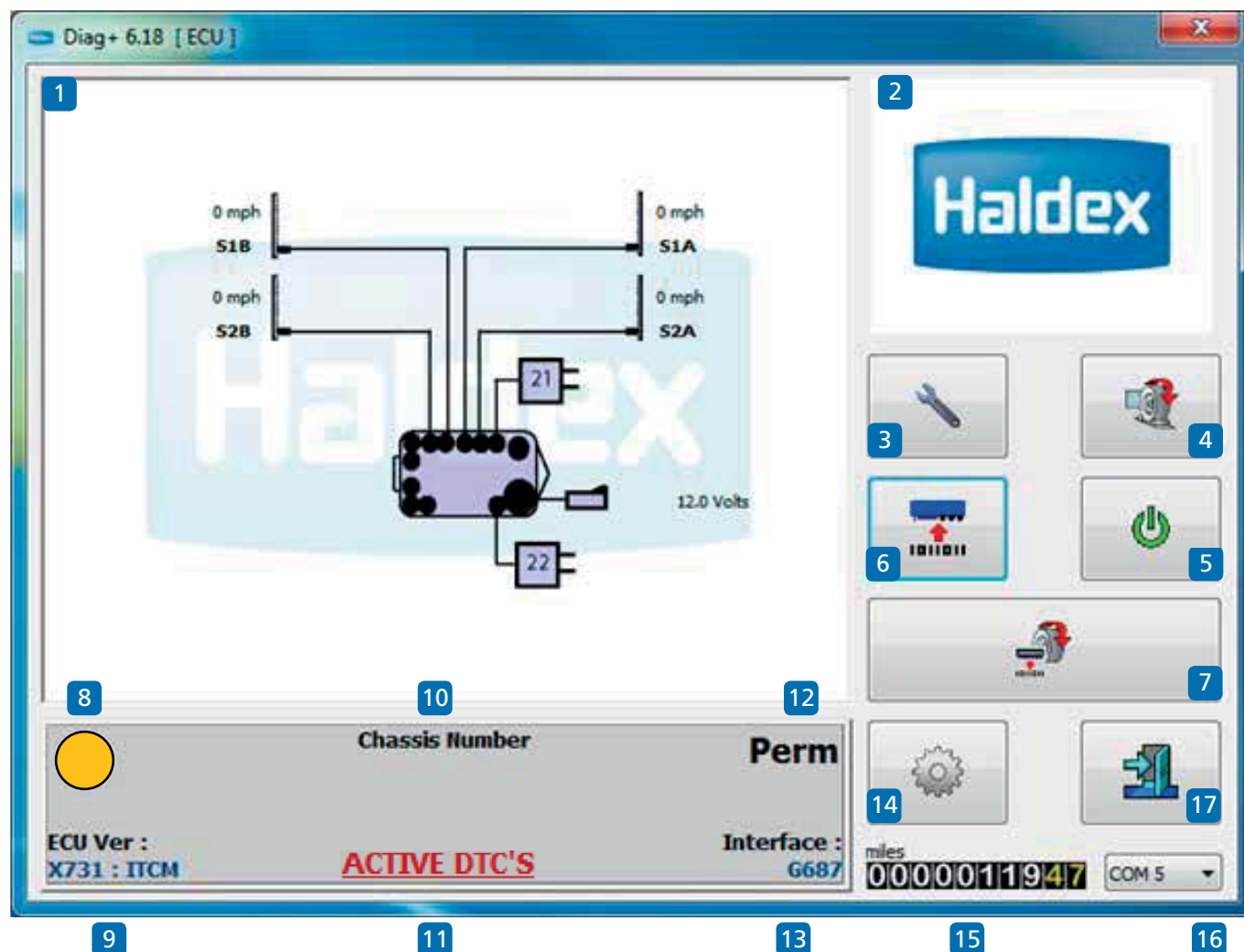
Power, sensor and CAN connections



Auxiliary identification



Home screen



Enter into the DIAG+ program by the short-cut icon created on your desktop.

Understanding the home screen display

01	Browser window (e.g. ITCM layout)	10	Chassis number
02	Video screen	11	Shows active diagnostic trouble codes
03	Service	12	Power source indicator
04	'End of line test' (EOLT) procedure	13	Interface version number
05	Reset the ECU	14	Options
06	Read, setup and program the ECU	15	Odometer reading (total distance)
07	Automated EOLT (option)	16	Trip 1 odometer & trip 2 odometer
08	System information lamp	17	PC connection port indication
09	ECU software version number	18	Exit the DIAG+ program

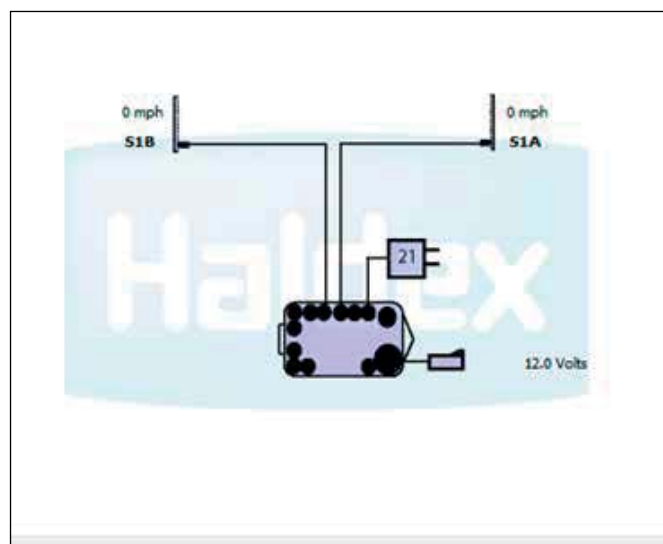
Reading ITCM voltage and speeds

DIAG+ can display supply voltage and wheel speeds when connected to an ITCM.

Example:

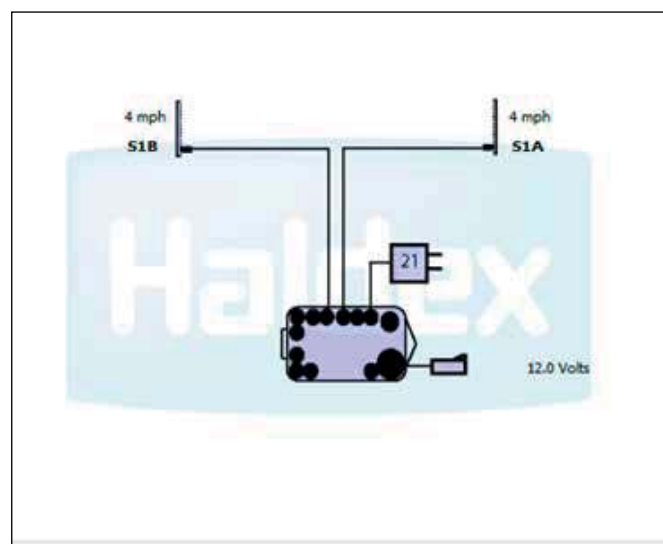
The following should be displayed.

- 1) ISO voltage will be displayed.



- 2) Wheel speeds will be displayed.

On rotation of the sensed wheels the speed value will be displayed (4 mph shown).

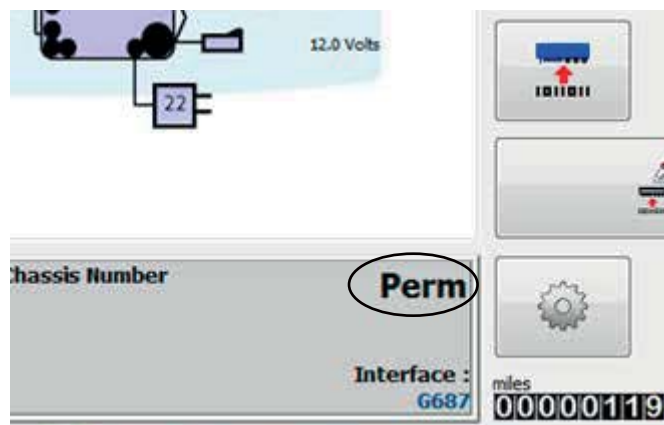


Checking electrical supply

The ITCM can be powered by either a permanent or stoplight supply.

The type of power supply is shown on the DIAG+ home page

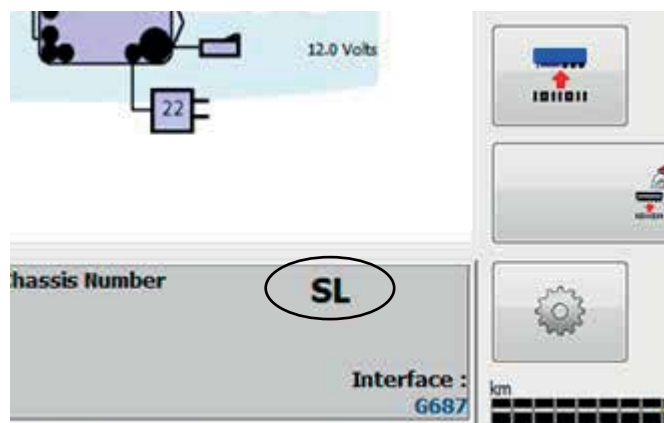
- › Permanent power (PERM)



Permanent power indication

- › Stoplight power (SL)


The SL (stop light power) can be checked by pressing the tractor brake pedal. The ECU will then register that stop light power has been received, and this is shown on the DIAG+ home page.



Stop light power indication

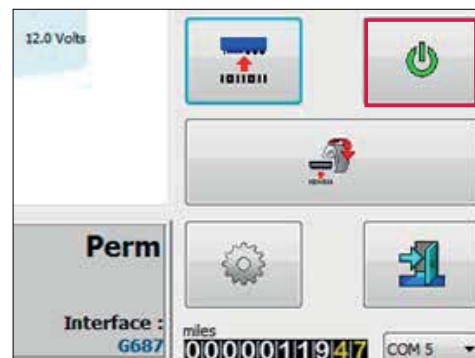
Basic diagnostics (service menu)

Trailer warning lamp 'on'

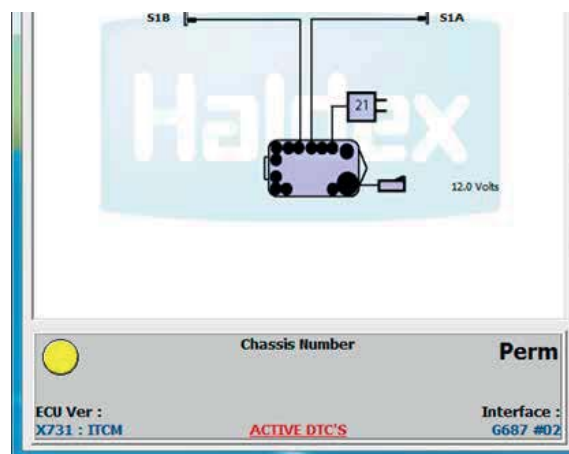
Click on the  button to reset the ECU and wait 10 seconds before proceeding.

Observe the trailer warning lamp.


The warning lamp should display what has been set in the 'lamp setting' section of the ECU Setup.

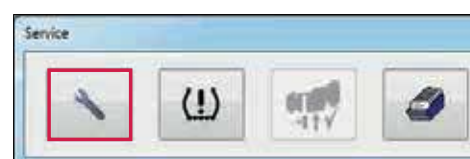


Note: If the trailer warning lamp comes 'on' and stays 'on' there are diagnostic trouble codes (DTC) present which need to be cleared.



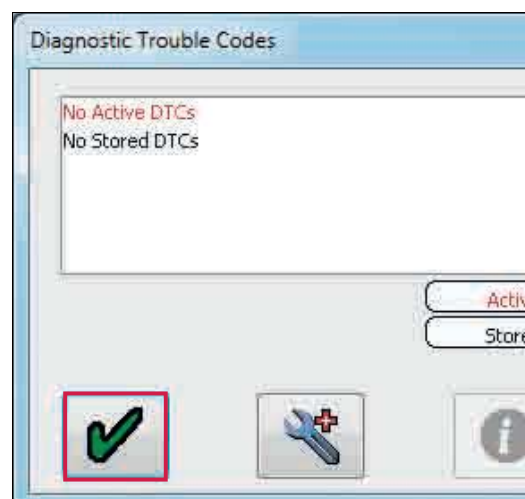
Click on the  button on the main screen then

click on the  button on the service menu to show any stored DTC's.



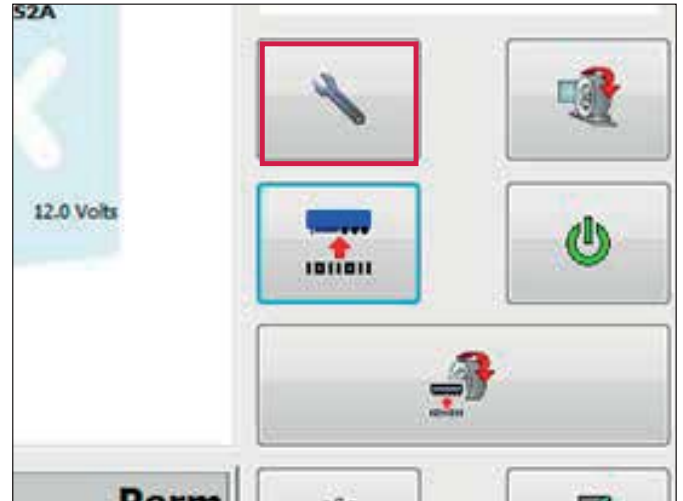
If there are no DTC's detected the following screen will appear.


Click on the  button to accept and exit.



Reading DTC's


Click on the  button on the main screen.



Click on the  button on the service menu to show any stored DTC's.



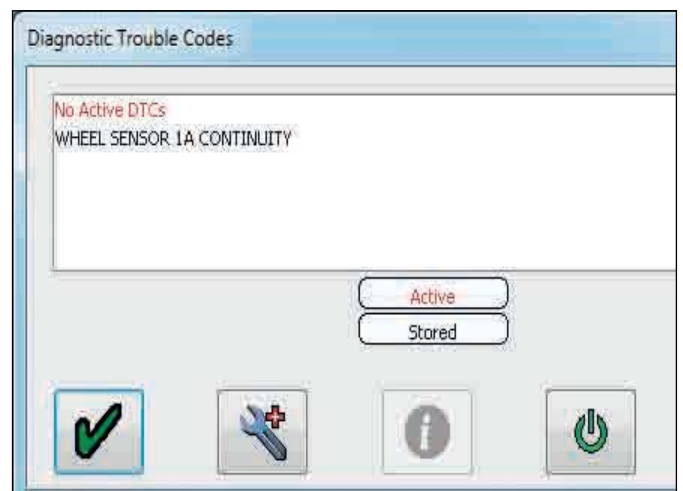
Any active DTC will be displayed in red (e.g. wheel sensor 1A continuity).

Repair the active DTC and reset the ECU by pressing the  button or switch 'off' then 'on' the power to the ECU.




If there is no active DTC, it will display 'no active DTC's' in red.

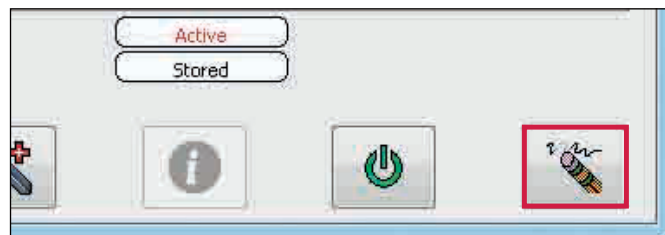
Any repaired DTC will transfer into the ECU memory (i.e. stored DTC).



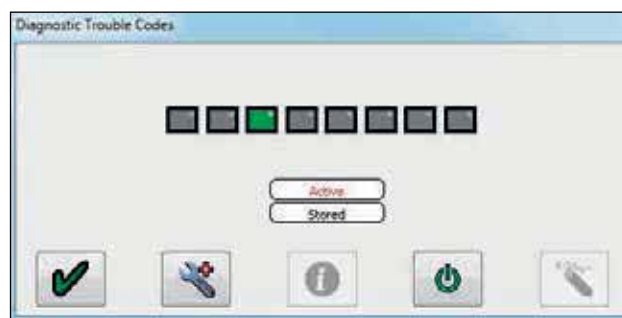
Deleting stored DTC's

All stored DTC's can be deleted.

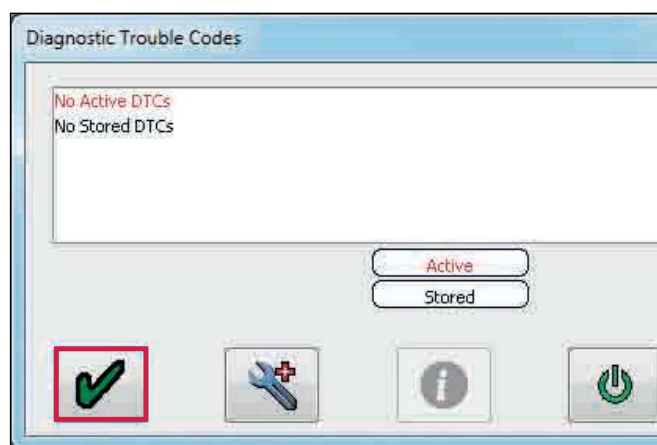
Click on the  button to delete the stored DTC.




ECU deleting the stored DTC.



No active & no stored DTC's present.




Click on the  button to exit.

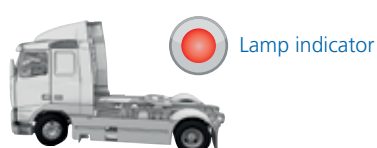
Click on the  button to exit to the main menu.

The DIAG+ main screen will appear.

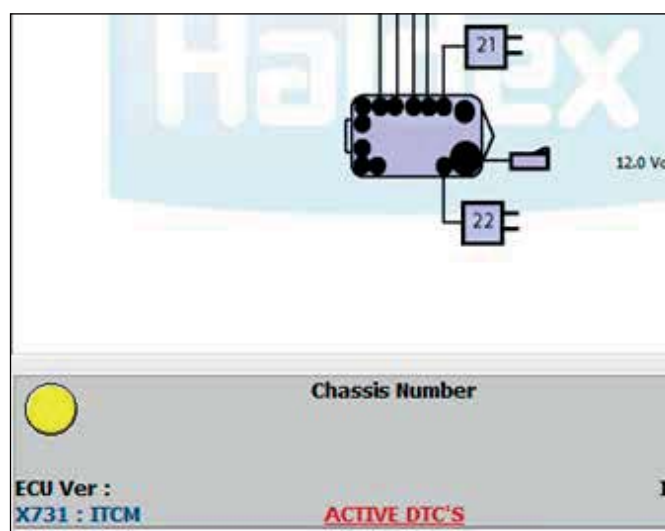


Reset the ECU by clicking on the  button or switch 'off' then 'on' the power to the ECU, but do not exit the DIAG+ program.


Observe the trailer warning lamp. The warning lamp should display what has been set in the 'lamp setting' section of the ECU Setup.

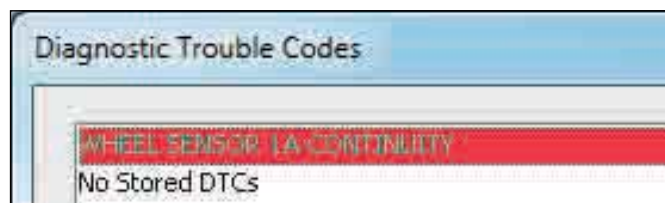


Note: If the trailer warning lamp comes 'on' and stays 'on' there are DTC's present which need to be cleared as above.



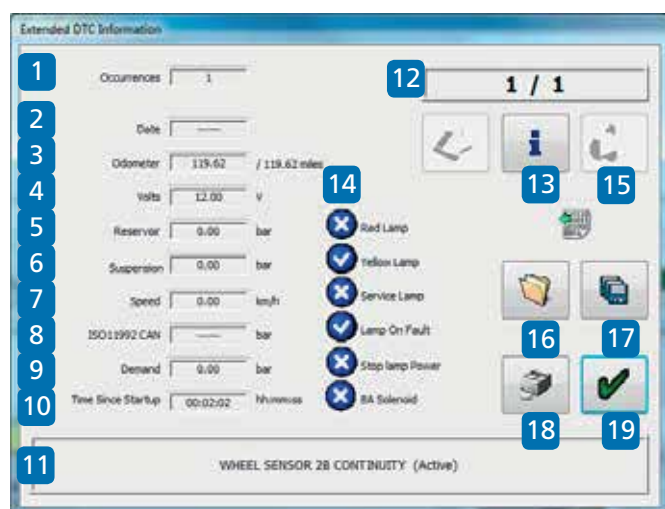
Reading extended diagnostic codes


On active and stored DTC's, double click on any DTC or click on the  button to display the extended DTC information.



Extended DTC screen display:

1. The number of times the DTC occurred (max 254 events). The event is logged every time the ECU is powered. The following data relates to the 1st time the DTC occurred.
2. Date reading - not used.
3. Odometer reading when fault first occurred / total distance.
4. Volts reading.
5. Reservoir pressure - external pressure sensor required.
6. Suspension bag pressure - external pressure sensor required.
7. Speed at which the DTC occurred (example shows vehicle stationary).
8. Electric control line pressure - not used.
9. Pressure reading on the service (yellow) line while braking - external pressure sensor required.
10. Total time, from ECU power up, when DTC occurred
11. Description of DTC.
12. Order and quantity of DTC.
13. Additional DTC information.
14. Status flags of signal requests and system. Refer to Haldex for further interpretation.
15. Flashing icons:



Note: Click on the  button for further detail on each diagnostic trouble code for example "Wheel speed sensor continuity".



DTC from ECU




DTC from file

16. Read extended DTC file from disc.
17. Save extended DTC file to disc.
18. Print extended DTC.
19. Exit.

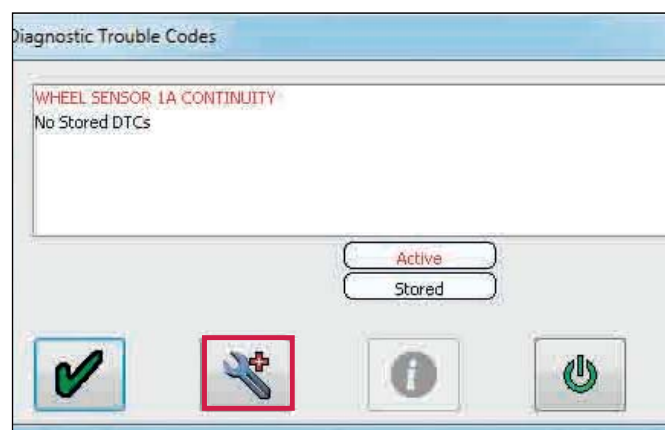
Diagnostic trouble codes (DTC)

A full list of DTC's is available from the DIAG+ software.

To access the list click on the  button on the service menu.



Click on the  button.



Click on the  button.



Click on the required DTC for possible causes.

For example "wheel sensor 1A continuity"

DTC Info

DTC Code	Full name	Short name
0x01	WHEEL SENSOR 1A CONTINUITY	S1A CONT
0x03	WHEEL SENSOR 1A SIGNAL INTEGRITY	S1A SIGNAL
0x04	WHEEL SENSOR 1A OUTPUT LEVEL	S1A OUTPUT
0x09	WHEEL SENSOR 1B CONTINUITY	S1B CONT
0x0B	WHEEL SENSOR 1B SIGNAL INTEGRITY	S1B SIGNAL
0x0C	WHEEL SENSOR 1B OUTPUT LEVEL	S1B OUTPUT
0x11	WHEEL SENSOR 2A CONTINUITY	S2A CONT
0x13	WHEEL SENSOR 2A SIGNAL INTEGRITY	S2A SIGNAL
0x14	WHEEL SENSOR 2A OUTPUT LEVEL	S2A OUTPUT
0x19	WHEEL SENSOR 2B CONTINUITY	S2B CONT
0x1B	WHEEL SENSOR 2B SIGNAL INTEGRITY	S2B SIGNAL
0x1C	WHEEL SENSOR 2B OUTPUT LEVEL	S2B OUTPUT
0x21	REMOTE VALVE SENSOR	REMOTE VALVE SENSOR
0x22	REMOTE VALVE MODULATOR	REMOTE VALVE MODUL
0x23	REMOTE VALVE CABLE	REMOTE VALVE CABLE
0x24	REMOTE VALVE SLOW RECOVERY	REMOTE VALVE SLOW R
0x29	AUX 1	AUX 1
0x2A	AUX 1	AUX 1
0x2B	AUX 1	AUX 1
0x2C	AUX 1	AUX 1

Open or short circuit in the wiring to wheel speed sensor.

Check the electrical connectors for correct installation and for corrosion, also check the wiring for damage and possible scuff marks.

If the failure occurs at first start-up, please check:

- > Is ECU programming in accordance with the wheel sensor configuration (2 or 4 sensors)?
- > Is the sensor extension cable linked to the correct ECU port?
- > Is the wheel speed sensor correctly connected to the sensor extension cable?

If the above is OK, check wheel speed sensor and the extension cable (Multimeter):

- > Is an alternating current output voltage generated by the wheel speed sensor (multimeter)?
- > Is the resistance of the sensor in the permissible area ($> 1.0 < 2.4 \text{ k}\Omega$)?
- > Is there a short circuit possible in the wiring?

If no failure is detected check the internal ECU control circuit:


- > Connect the plug of the defective side (e.g. S1A) to the ECU port of the opposite side (in this case S1B), and the plug S1B with the port S1A. Reset ECU and clear all DTCs.
- If the initial DTC is displayed again then the ECU is faulty.
- If a different DTC is monitored (instead of S1A.. -> now S1B..) the sensor extension cable or the sensor is faulty. In this case repeat the tests above.
- > After this test don't forget to RESET the original configuration!!

After repairing in all cases run the EOLT!

Position of the wheel speed sensor in the driving direction:
For all configurations (ECU right/left) and systems (1M/2M/3M)

1st sensed axle:
S1A = left / S1B = right

Setting parameters (configure menu)


Click on the  button to 'configure, read, setup and program the ECU'.



Program ECU Menu

- 1 Read ECU configuration from a previously saved file.
- 2 Read configuration info from the ECU.
- 3 Edit ECU parameters and configuration.
- 4 Save ECU configuration to a file.
- 5 Program ECU with current configuration info.
- 6 Not used on ITCM
- 7 Ok - exit the 'program ECU' menu.

ECU parameters

Click on the  button to edit the ECU parameters and configuration.



1

2

3

4

5

6

7

8

Edit ECU setup menu


- 1 Walk through button.
- 2 Setup the ECU configuration and layout.
- 3 Setup load plate configuration.
- 4 Display trailer information.
- 5 Setup AUX configuration data.
- 6 Setup wheel scale configuration.
- 7 Setup lamp flash configuration.
- 8 Ok - exit the ECU setup.

Note: The following sections have default settings as shown below:

- 5 Auxiliaries - not used (unused).
- 6 Wheel scaling - 508 Rdyn (mm) and 100 no. of teeth exciter.
- 7 Lamp sequence - on / off.

If these are correct go to trailer information.

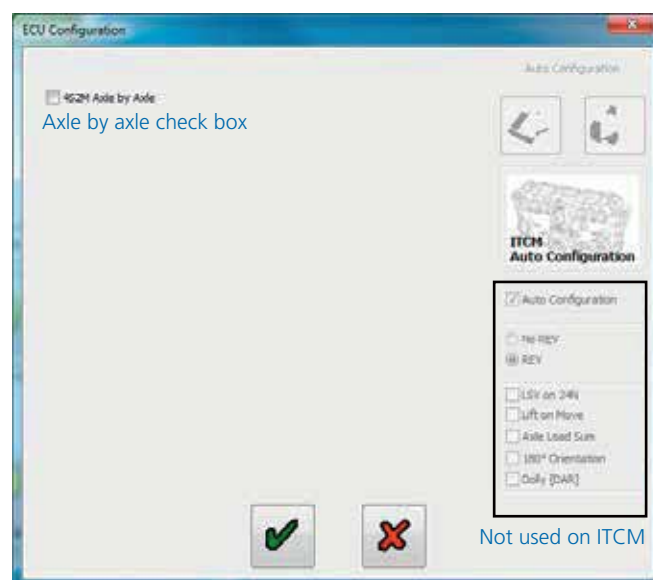
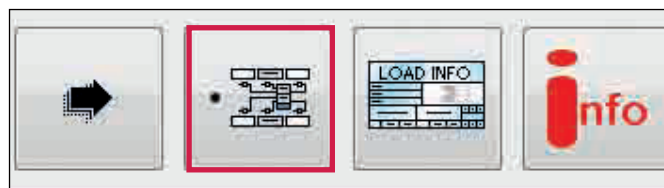
ECU configuration

Click on the  button on the ECU setup screen.


The ITCM will automatically determine the system configuration installed onto the trailer. This will then be read back into DIAG+.

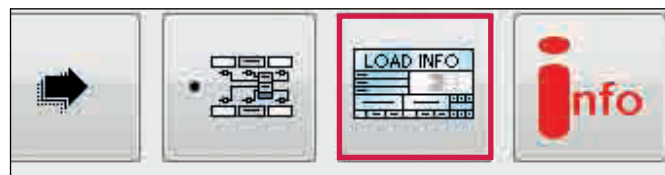
ITCM auto configuration can only change from side to side to axle by axle.

Click on the  button to accept.



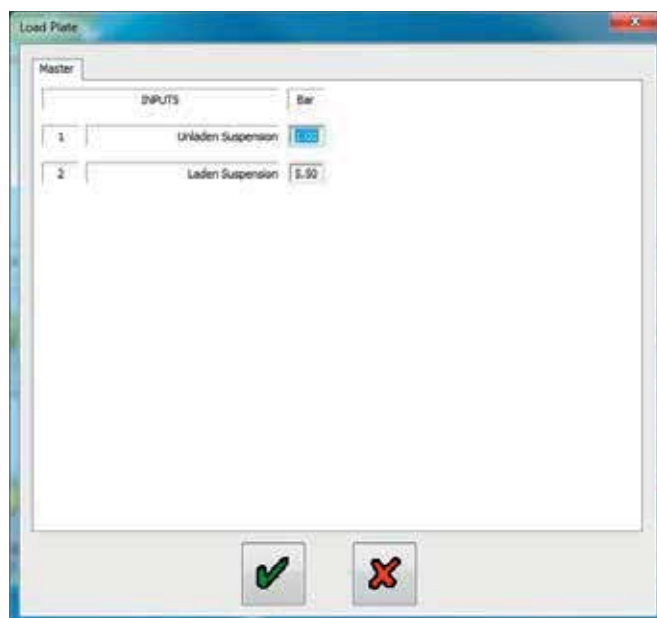
Load plate data entry

Click on the  button to setup load plate configuration.




› Unladen suspension

› Laden suspension



Setting auxiliaries

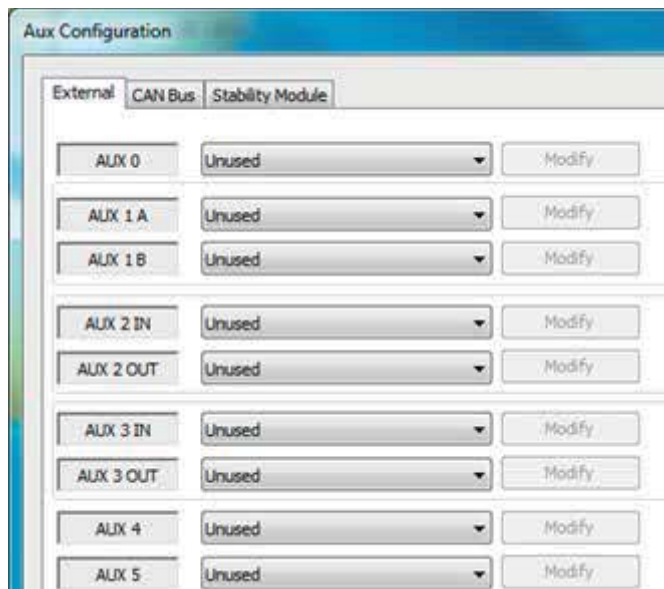
Click on the  button to setup auxiliary configuration.



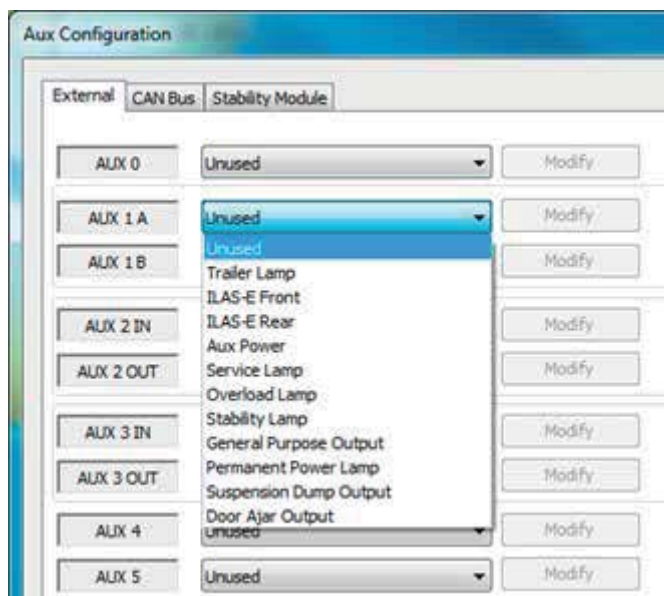
External tab

The 'Aux configuration' screen shows the various auxiliary connections that can be used (i.e. AUX 0 to 5 for a ITCM).

Clicking on the down arrow displays a listing of options that can be selected.



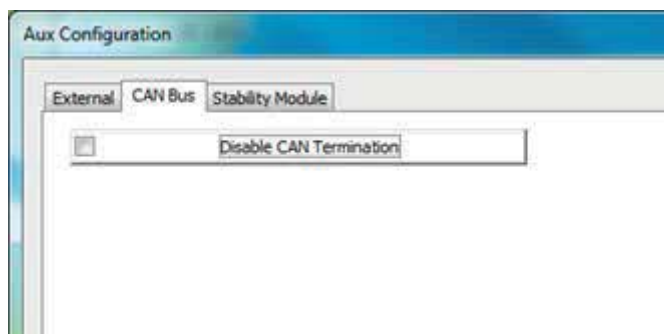
Example: AUX 1 options expanded ready for selection.



CAN BUS tab

The trailer CAN termination tick box is used to disable the CAN function.

Note: This box will be automatically ticked when an ITCM / Stability Module is detected (and the ECU setup has been read back into DIAG+).



Stability Module tab

- › CAN bus termination enabled in Stability Module

This box must be ticked when there is only a Stability Module connected. You must contact sales and / or Engineering for advise when there is more than one device connected to the Haldex CAN bus.

Note: This box will be automatically ticked when a Stability Module is detected by the ITCM (and the ECU setup has been read back into DIAG+).

- › Stability Module should always be present

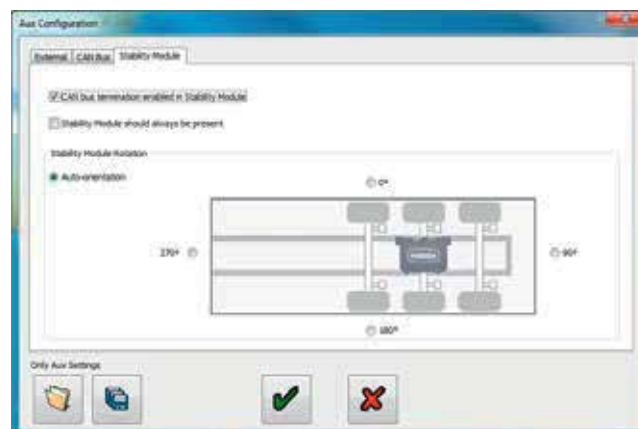
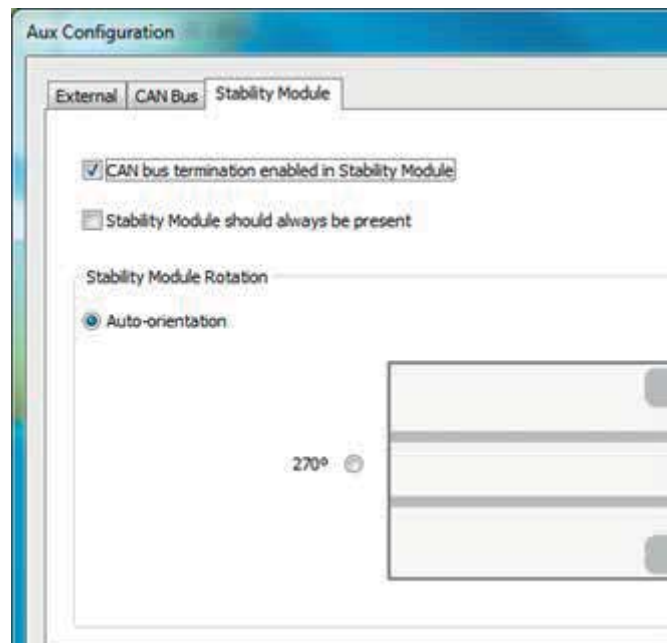
This box will be automatically ticked when a Stability Module is detected by ITCM (and the ECU setup has been read back into DIAG+)

Un-tick this box if removing the Stability Module.

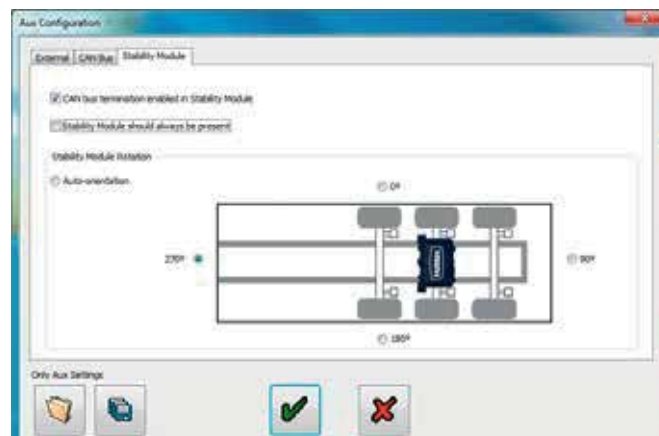
If left ticked, and the Stability Module is removed, this will cause a DTC to be generated

- › Auto

During the installation, ITCM / DIAG+ will automatically determine the orientation of the fitted Stability Module. If required, this orientation can be changed via DIAG+ by selecting one of the rotation options, and sending the data to the ECU.



Example: orientation of Stability Module modified by the user via DIAG+.



Setting wheel scaling

Click on the  button

The following screen will appear.

The screen shows the default value of a tire size of 306 revs/km, 520 Rdyn (dynamic rolling radius - mm) with a 100 tooth exciter installed. This value covers tire sizes from 19.5" to 22.5" and sets the correct ABS function and odometer of the system.

Note: If the tooth number is not 100 the wheel scale factor on the Info Centre will read a different value.

Click on the  button to accept.

Test for number of teeth

Click on the  button

Click on button marked 'start - turn wheel 5 times' Rotate the selected sensed wheel 1 rev / 2 sec, five times.

The pulses box automatically records during the wheel rotation procedure. After 5 turns, click on button marked 'stop'. The 'No. of teeth' box indicates the value. Click on button marked 'use calculated value' if required to use in wheel scaling above or note the value for information purposes.

Click on 'cancel' to exit.

Repeat for any other selected sensor.

Lamp Settings

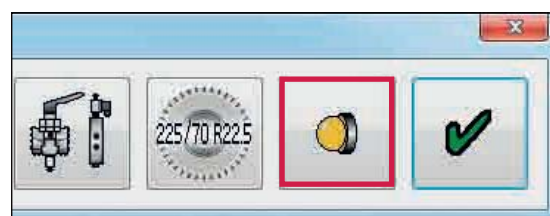
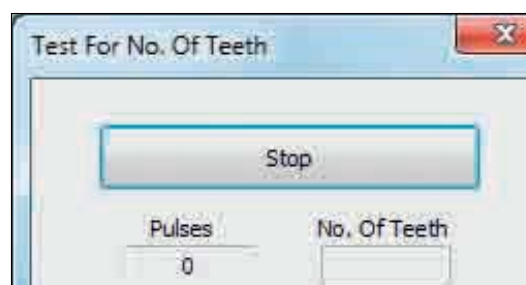
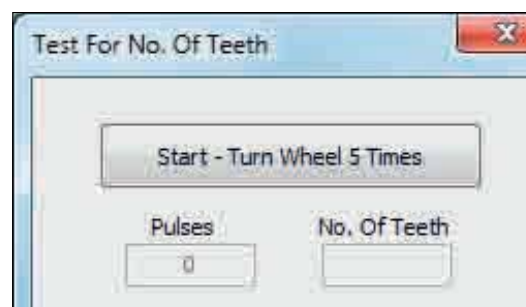
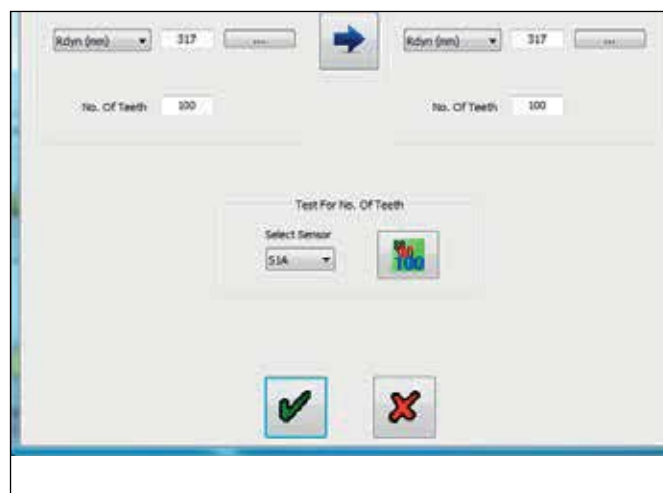
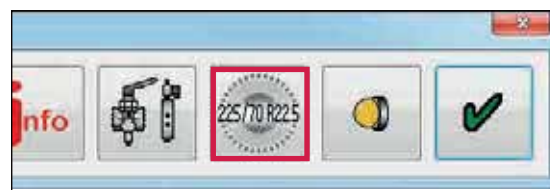
Click on the  button

The following screen will appear.

The screen shows the two options of flash sequence for the trailer ABS warning lamp.

The on / off sequence is set as a default.

Click on button marked  to accept.



Info - trailer information


Click on the  button

The following screen will appear.

Enter details of :

- › Trailer manufacturer (19 characters)
- › Brake calculation number (16 characters)
- › Chassis number (17 characters)
- › Type (12 characters)

This information is stored in the ECU and can be printed out on the end-of-line test report and load plate.

Click on the  button to open a new screen titled 'Geometric data'. From here the user can enter detailed vehicle data.

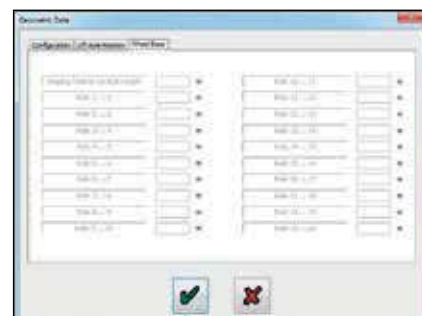
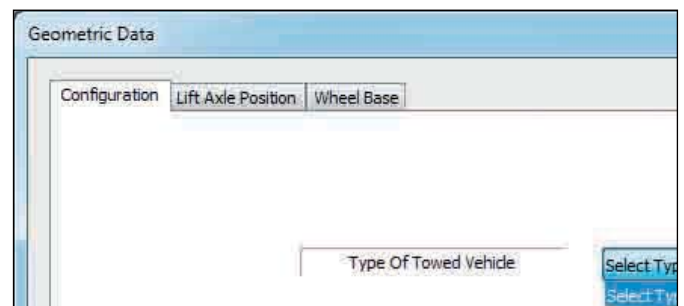
- › Configuration
- › Lift axle position
- › Wheel base

ITCM transmits 'Geometric data' to the truck via the ISO 11898 CAN link.

Click on the  button to accept.

'ECU setup' is complete (ECU parameters settings not sent to ECU - see next step).

Click on the  button to accept.



Saving the ECU parameters

Option 1:

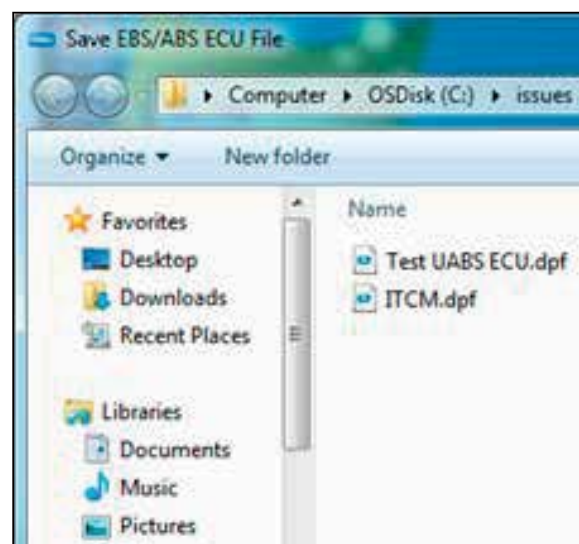
Saving the ECU parameters file to disc.

Click on the  button.

The following screen will appear.

A file name (e.g. Example 01 saved as type .DPF) can be entered in position 'file name' and stored in the C:\Program Files\Haldex\Diag+VECU setup files folder. Click on button 'save' to store the file.

The saved ITCM ECU parameter file can be used for future programming of ECU's (which require the same parameters) by recalling the file from the 'Open ITCM ECU File' button.



Option 2:

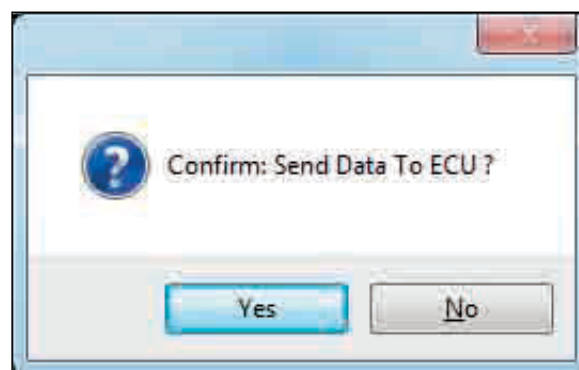
Programming the ECU.

Click on the  button.

This activates the sending of the edited parameters file to the ECU.

Note: At 90% progress all the DTC's are deleted and the ECU is reset.

The status of this process is shown by a bar indicator filling the progress box on the 'Program ECU' screen.



This completes the programming of the ECU.

End of line test (EOLT)

Clear all active or stored diagnostic trouble codes before proceeding with end of line test.



Note: When the ECU is initially programmed all DTC's are deleted.




Click on the  button on the main screen.

EOLT options

This screen will appear if there are no hardware or software compatibility issues.

The 'View / print'  and 'Save to file'  buttons are initially disabled. They are enabled under the following conditions:

- a) Completion of an EOLT
- b) An existing EOLT file is opened (.eol) ('View / print' only).

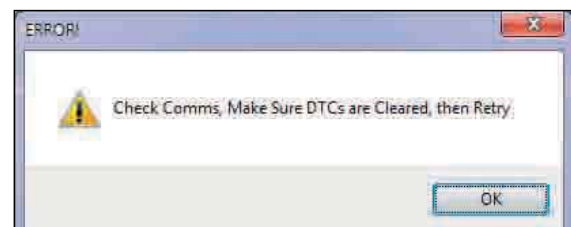
Click on the  button to start the EOLT test procedure.

Or click on the  button to return to the main menu.



Error

This screen will appear if there is a stored DTC present in the ECU. Click OK and exit the EOLT menu, then clear the stored fault and try again.




EOLT initialisation

A list of EOLT tests are shown. These tests can be selected or de-selected as required by ticking the corresponding box.

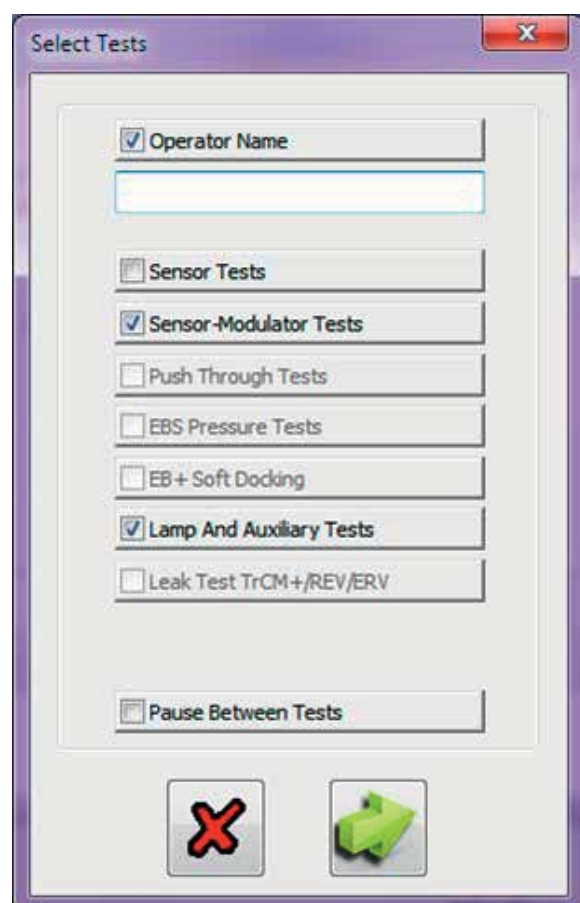
If the 'Operators name' option is selected, it will enable a name to be entered in the area below. This will be recorded on the EOLT report.

If the 'Pause between tests' option is not selected, the selected tests screen will run automatically after each test has been carried out.

Click on the  button to return to the main menu.

Click on the  button to start the EOLT.

Note: During the EOLT procedure the cab / trailer warning lamp will flash to indicate the EOLT is in progress.



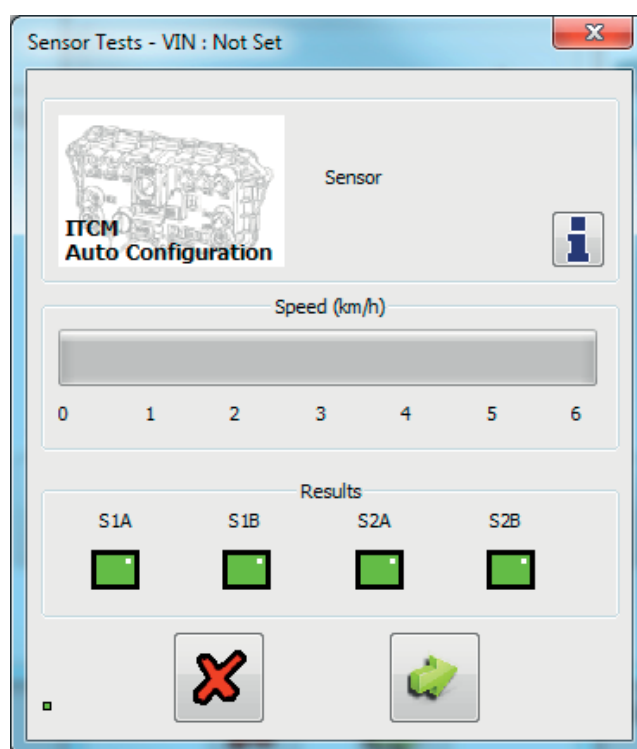
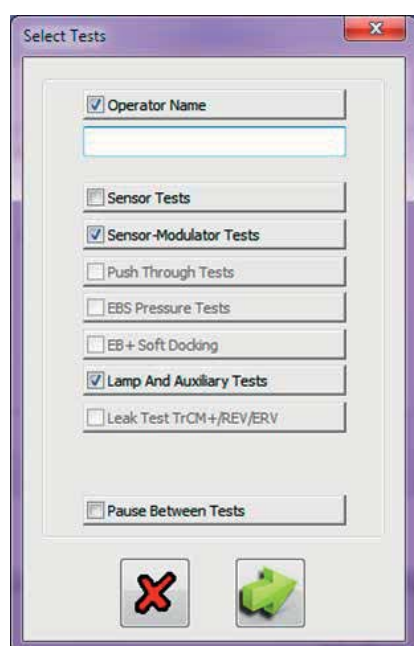
The sensor modulator test is not available for 2S / 1M configurations.

Sensor tests

This full sensor test is optional, and the sensors will be tested during the 'Sensor modulator tests' (i.e. tick box is not selected when entering the 'Select tests' menu).

Procedure:

- › Foot brake "off" (no pressure in the service line)
- › Rotate each wheel through 3 revolutions in 5 secs
- › The test sequence is S1A, S1B, S2A, S2B etc



Sensor modulator test

Procedure:

- › Apply foot brake continuously (pressure in the service line)
- › Rotate each wheel through 1 revolution in 2 seconds
- › The test sequence is S1A, S1B, S2A, S2B etc

The EOLT will release the wheel to be rotated. Rotate each wheel through 1 revolution in 2 seconds. The system will brake the spinning wheel.


- › The test sequence is S1A, S1B, S2A, S2B etc

Result section:

Yellow indicates wheel has moved.

Green indicates test passed.

Red indicates test failed.

Click on the  button to access the individual test procedure.

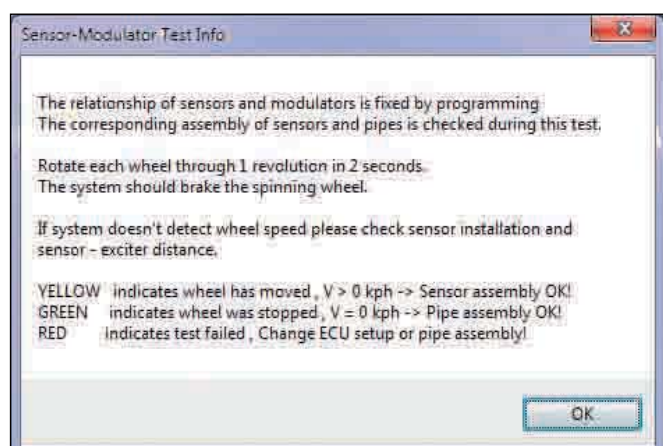
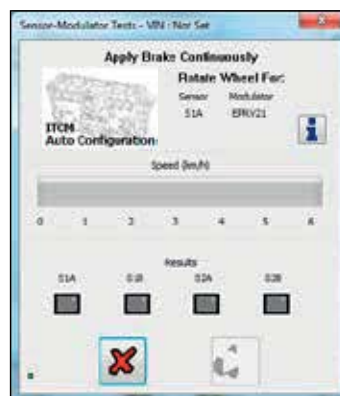
Note: If previously entered, the vehicle ident number (VIN) will be displayed in the title bar of each test (e.g. VIN: FW185001).

S1A test started

Manually rotate wheel S1A at 1 revolution in 2 seconds.

S1A test passed

If the moving wheel is successfully braked, the S1A test will pass and move onto the S1B wheel.



Wheel speed detected
(moving green bar)

Moving wheel
(yellow indication)



Correct wheel braked
(green indication)

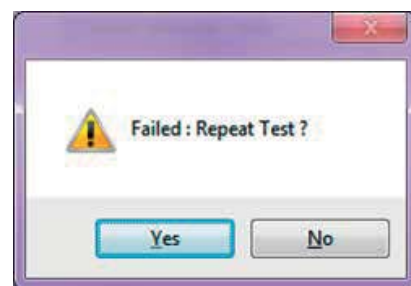
Failed test

If any of the 'Sensor modulator test' fails check the following:

- › Correct sequence - S1A, S1B, S2A, S2B etc
- › Incorrect wiring
- › Incorrect piping



S1A wheel failed
(red indication)



S1B test started

Manually rotate wheel S1B at 1 revolution in 2 seconds.



Wheel speed detected
(moving green bar)

Moving wheel
(yellow indication)

S1B test passed

If the moving wheel is successfully braked, the S1B test will pass and move onto the next configured sensor in the sequence.

Repeat the 'Sensor modular test' for all the programmed ECU sensors.



Correct wheel braked
(green indication)

Lamp and auxiliaries test (automatic test)

The cab lamp and any auxiliaries will be forced 'on' then 'off', and monitored to determine the correct response.

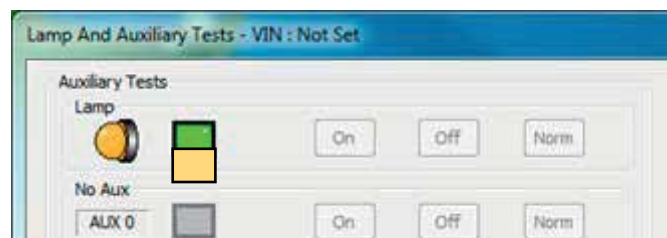
Once correctly tested, the lamp or auxiliary can be switched manually without affecting test results. To switch to manual testing click on the 'on' button the 'off' and 'norm' buttons are highlighted, toggle between the 'on' and 'off'. The 'norm' resets to automatic mode.

Result section:


Yellow indicates test started.


Green indicates test passed.

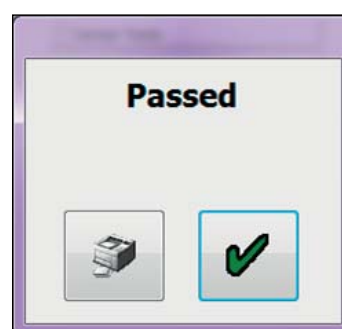
Red indicates test failed.




On the successful completion of the EOLT the passed menu will be displayed.

Click on the  button to return to the EOLT options menu.

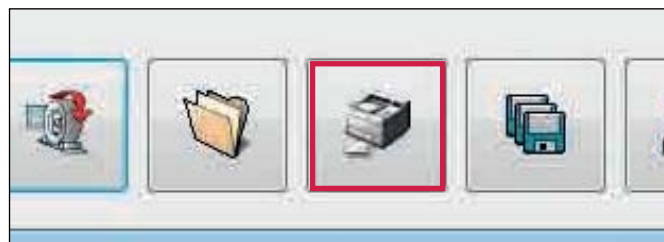
Click on the  button to print out the EOLT report.



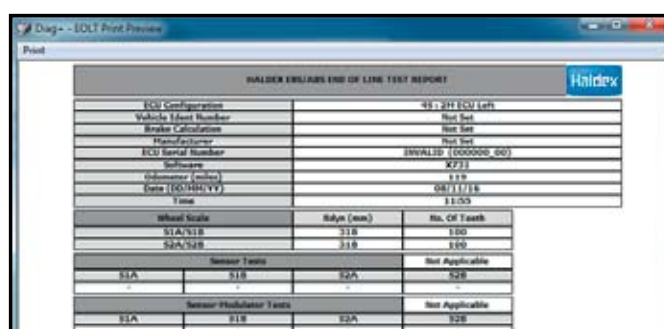
EOLT report printing

The end of line test report can be viewed by selecting the  button.

If required the report can then be printed.



Click 'Print' to print the EOLT report.



Example - end of line test report

HALDEX EBS/ABS END OF LINE TEST REPORT			
ECU Configuration	4S : 2M ECU Left		
Vehicle Ident Number	Not Set		
Brake Calculation	Not Set		
Manufacturer	Not Set		
ECU Serial Number	INVALID (000000_00)		
Software	X731		
Odometer (miles)	119		
Date (DD/MM/YY)	08/11/16		
Time	11:55		
Wheel Scale	Rdyn (mm)	No. Of Teeth	
S1A/S1B	318	100	
S2A/S2B	318	100	
Sensor Tests			Not Applicable
S1A	S1B	S2A	S2B
-	-	-	-
Sensor-Modulator Tests			Not Applicable
S1A	S1B	S2A	S2B
-	-	-	-
Options			
Auxiliary Tests			
Lamp	On / Off		
Aux 0	No Aux		
Aux 1A	No Aux		
Aux 1B	No Aux		
Aux 2 OUT	No Aux		
Aux 2 IN	No Aux		
Aux 3 OUT	No Aux		

Saving an EOLT report

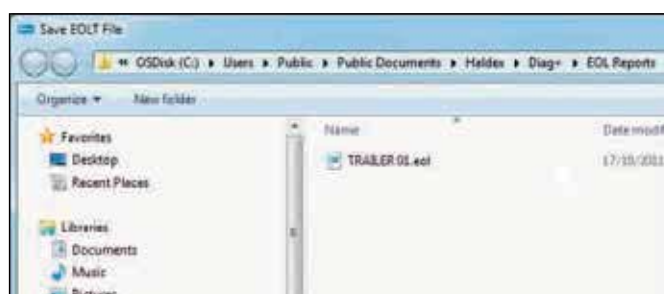
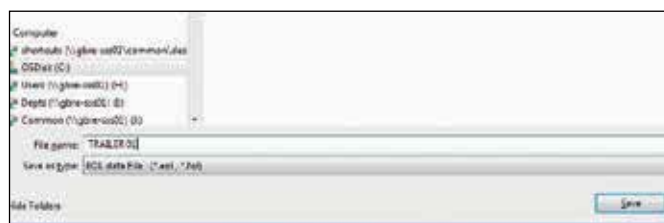
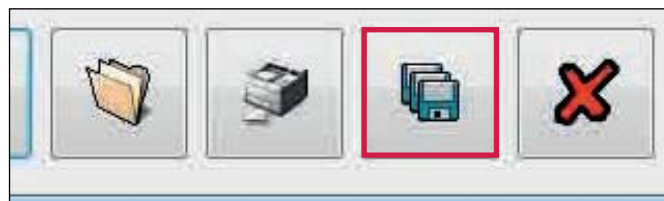
By selecting the  button a report file can be saved.

A file name relevant to the vehicle tested (e.g. TRAILER01 saved as type .eol) can be entered in position 'File name' and stored in the C:\Program Files\Haldex\Diag+\EOLT Reports folder.

Note: The EOLT report can only be viewed within DIAG+ program in the EOLT section.


Enter the file name and select the 'Save' button.

File name 'TRAILER 01.eol' has now been saved



Automated end of line test (OEM recommended only)

The auto end of line test enables a parameter file to be opened for a trailer, program the ECU, check for faults, fix any faults, perform end of line test and save and print in sequence from one base window.

From the start screen, select the icon  to commence the auto end of line test.

The screen automated end of line test will appear.

It will display live pressure information.

It is possible to check or edit the data (perhaps to change the VIN or auxiliary function) and save to a new file.

The print icon will allow you to print the load plate data.

The forward button will proceed with the end of line test for the trailer.

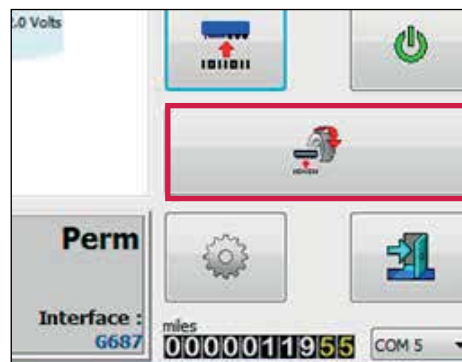
The operator name can be preset in the INI file, and can be locked out if required.

It is not possible to change the tests selected in the INI file, as they are greyed out.

The end of line test will then proceed once the ticked icon is selected.

Once the automated end of line test is complete and no faults identified, you should see this screen.

The option is given to print out the report.



Haldex develops and provides reliable and innovative solutions focused on brake and air suspension products to the global commercial vehicle industry.

In 2015, the company had net sales of approximately 4.8 billion SEK and employed a workforce of 2,140 people.



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