

OPERATOR'S GUIDE



DIAG+

**TRANSPORT
EQUIPMENT
AUSTRALIA**

Haldex

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
- › Due to continuous development the right is reserved to alter the specification without notice
- › No legal rights can be derived from the contents of the manual
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DIAG+ installation

Seperate Booklet

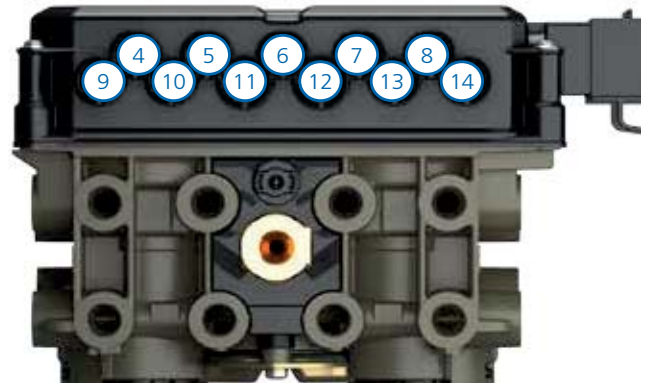
EBS

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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

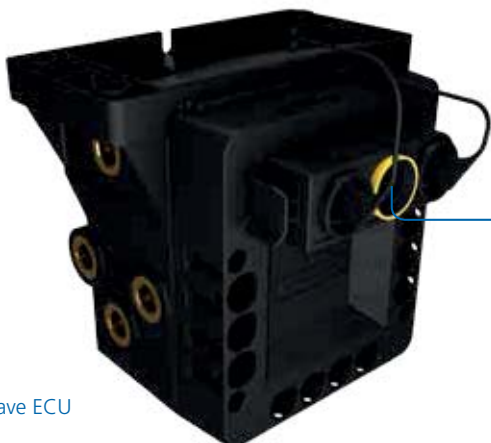
Position	Port
8	AUX 5
9	Sensor S2B
10	Sensor S1B
11	DIAGN
12	DIAGN
13	Sensor S1A
14	Sensor S2A

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.

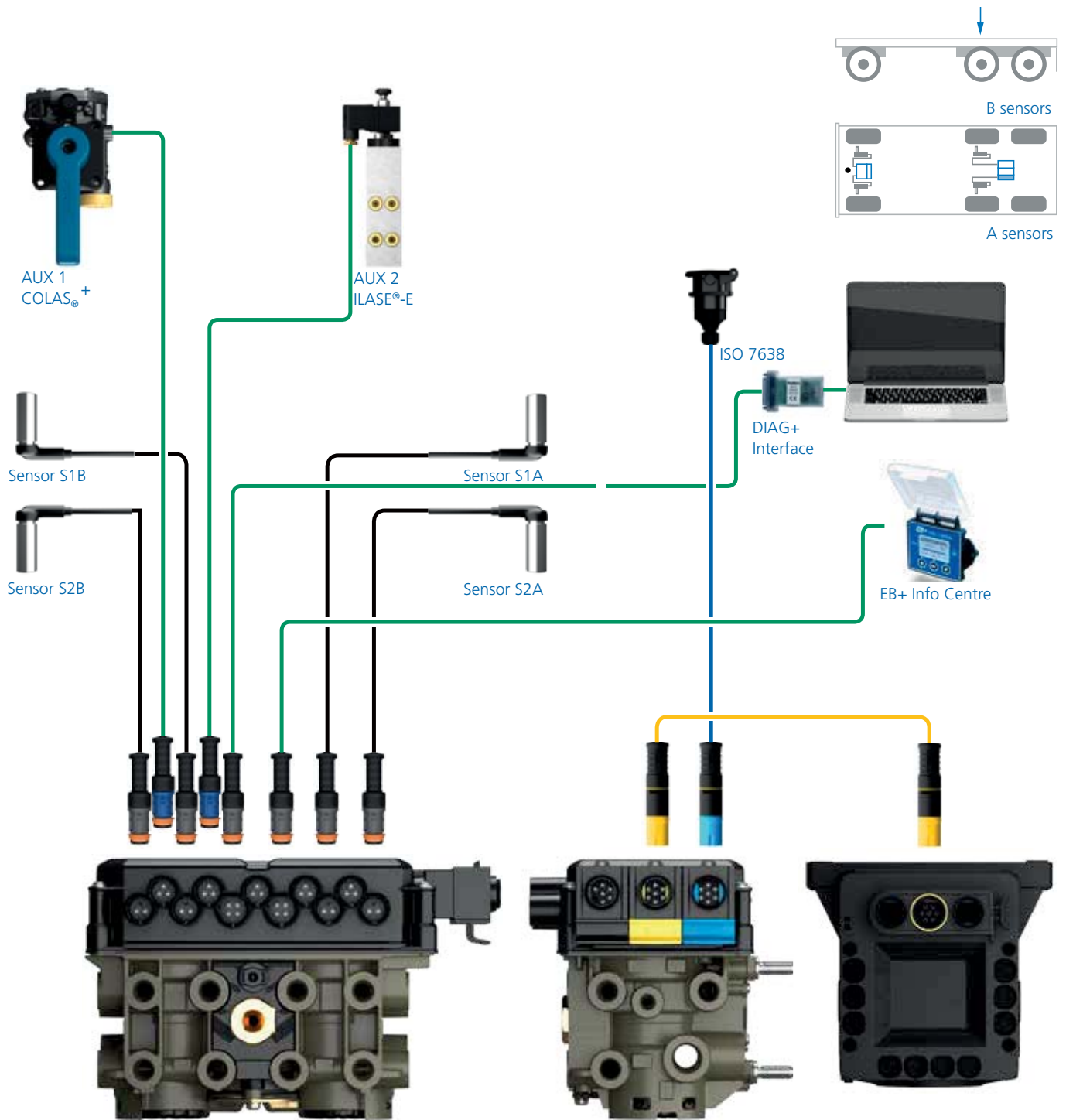


Interconnecting cable

Slave ECU



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

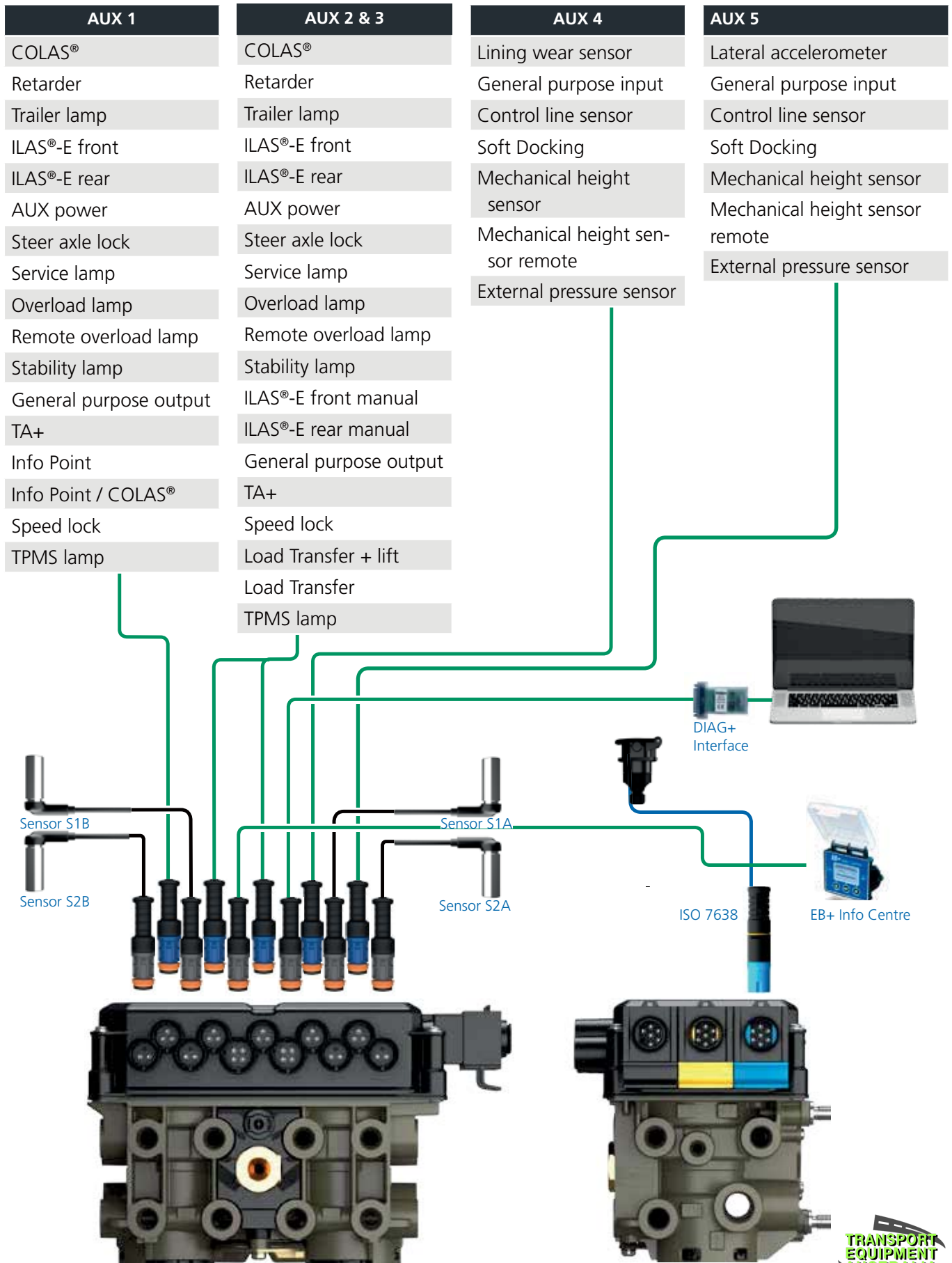


Connections shown:

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	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

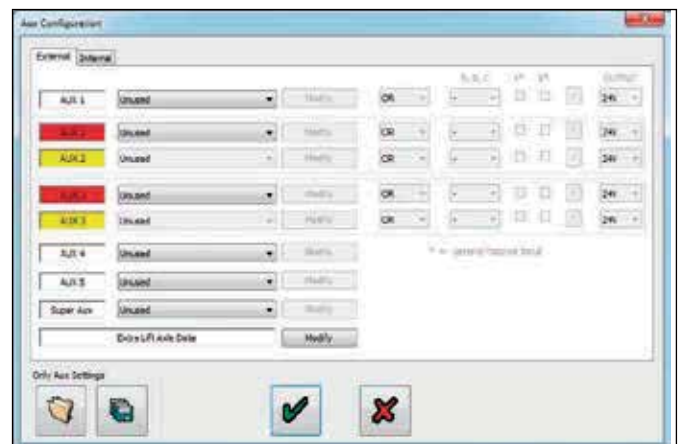
Programming Standard AUX using DIAG+ V6

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



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.

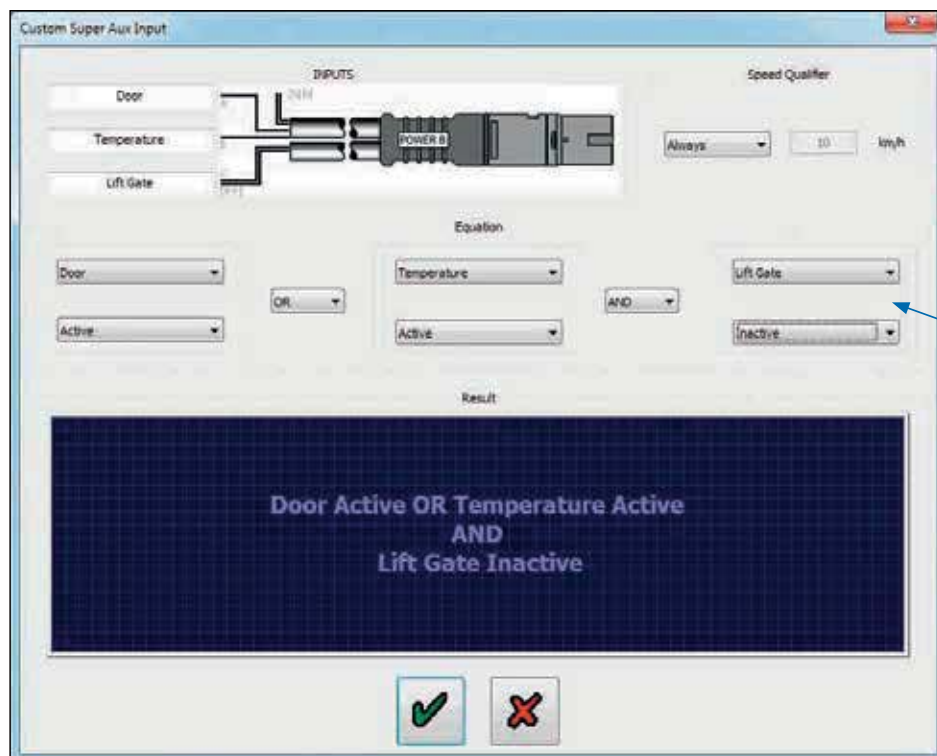
Speed qualifier

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



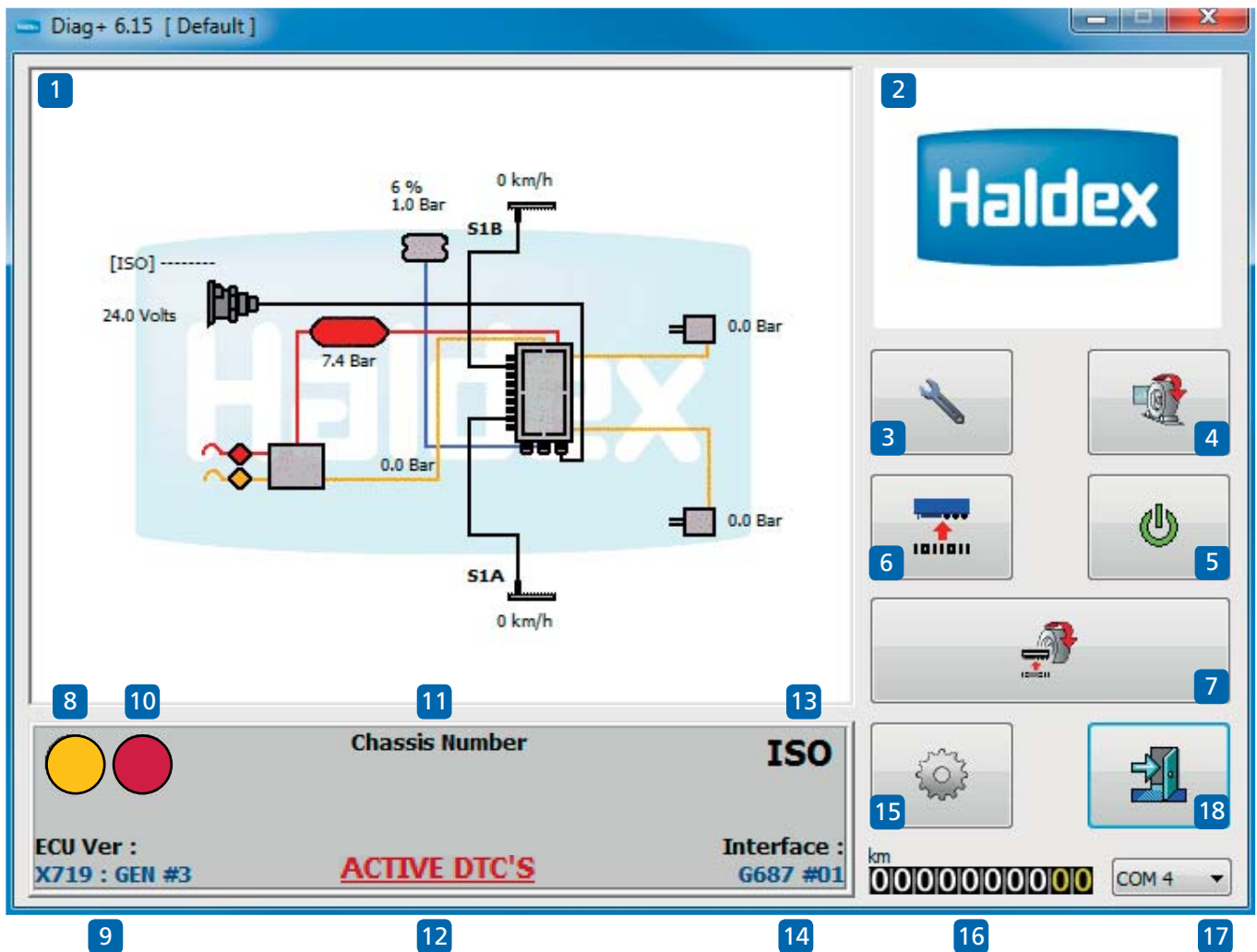
814 039 001

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.

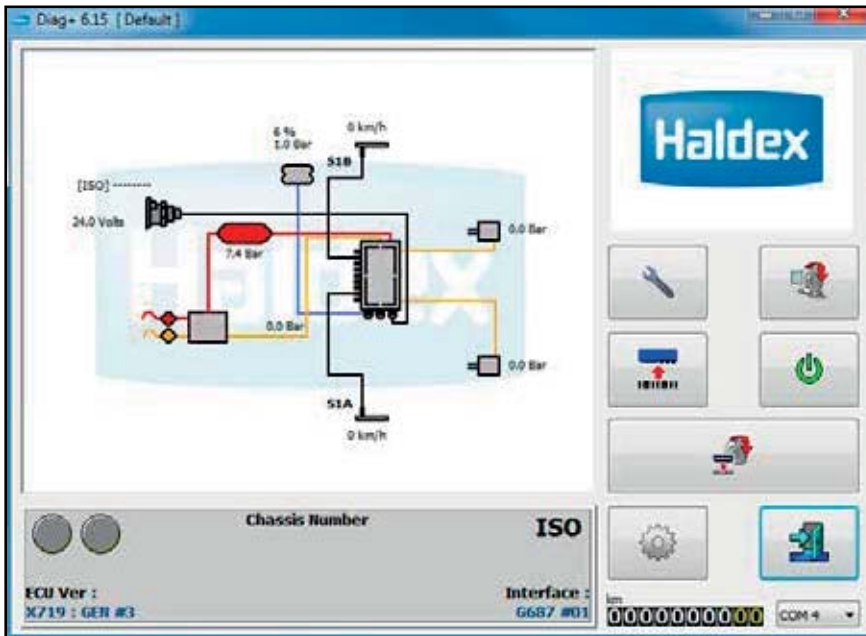
Understanding the home screen display

- | | | | |
|----|--|----|--|
| 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)
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 |



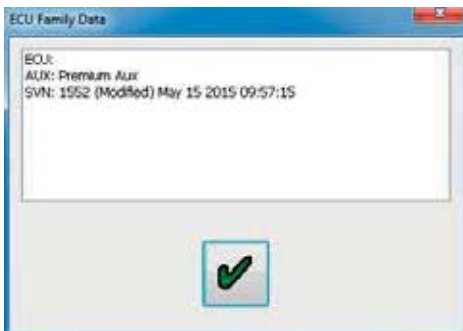
Connected ECU and dongle information

- › 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

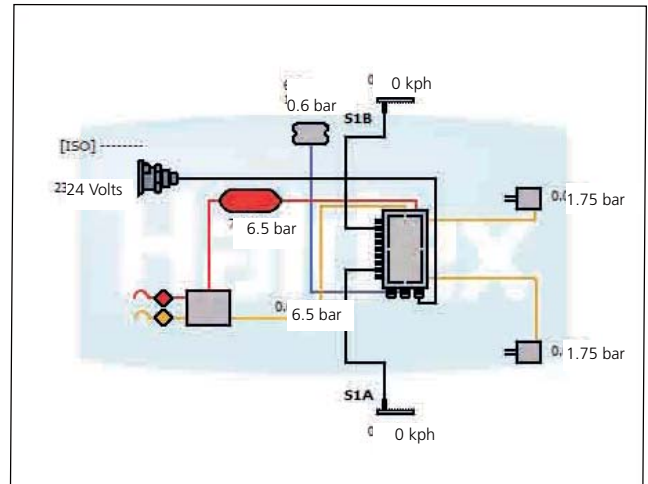
Connect emergency and service pressure lines.

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

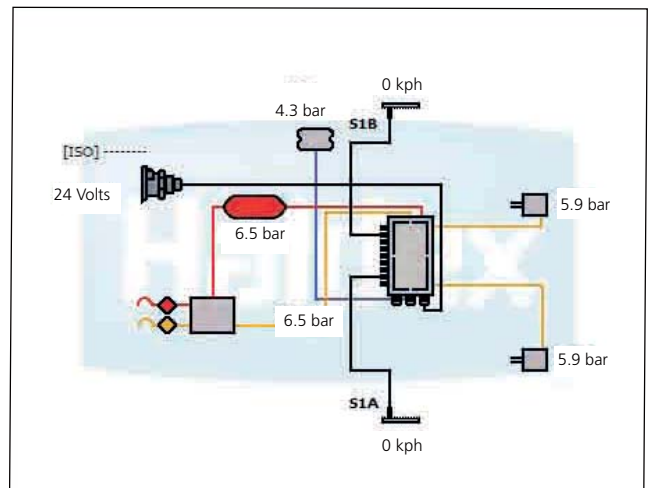
Example:

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



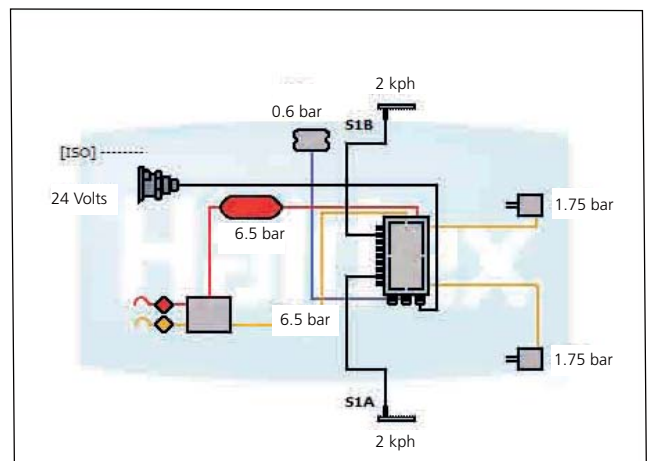
- › Pressure values are from the load plate data for a laden trailer



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

Example:

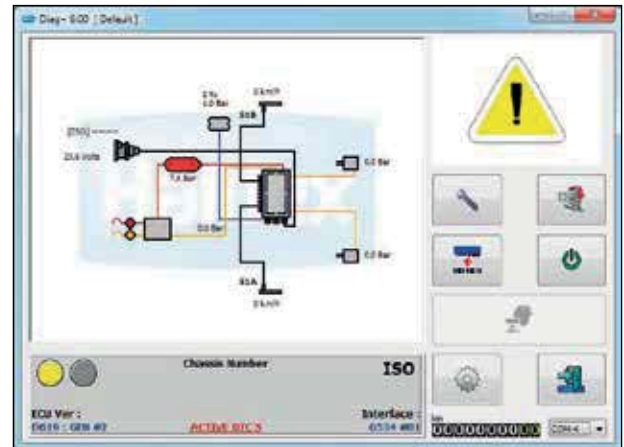
- 1 rev / 2 sec (30 rpm) ~ 4 kph for 80 tooth
- 5 kph for 90 tooth
- 6 kph for 100 tooth



Secondary main screen display

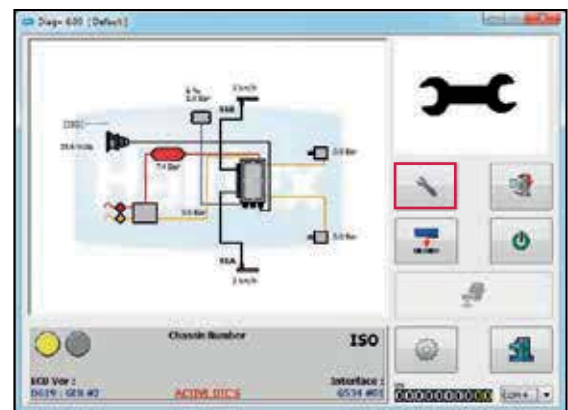
A flashing 'warning' symbol indicates a system warning.

This alternates with the following symbols:



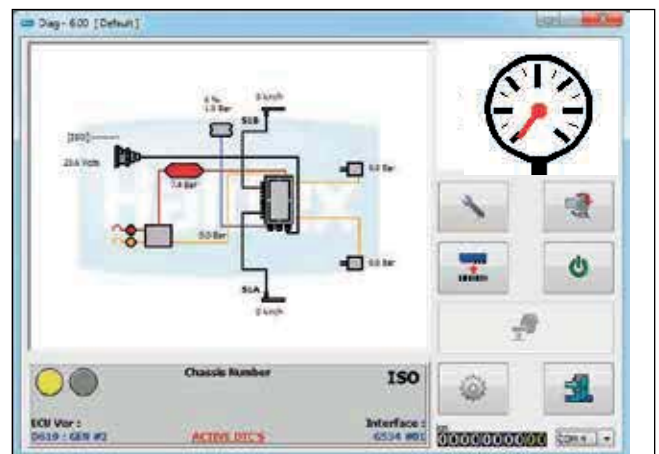
A flashing 'spanner' symbol. This indicates presence of an 'active' diagnostic trouble code

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.

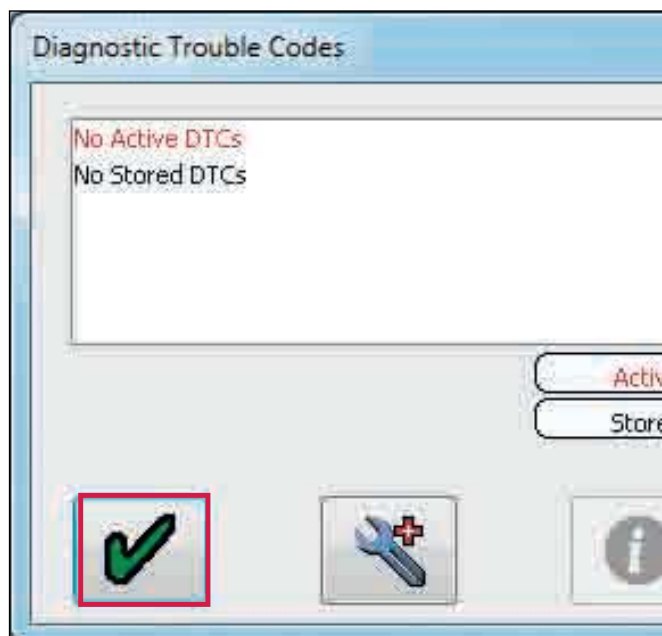
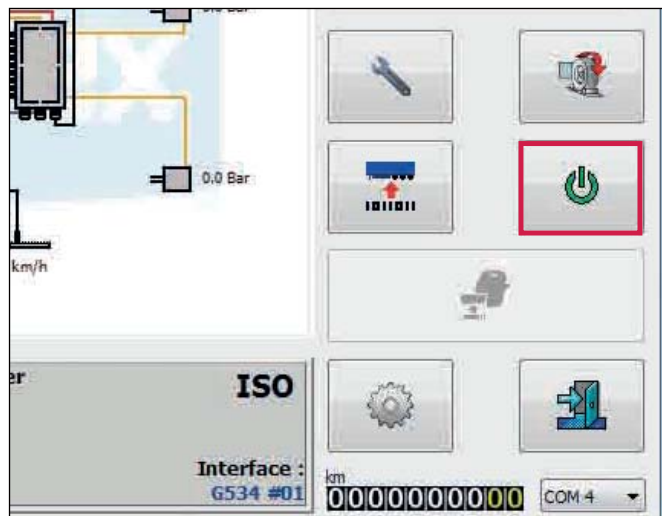
Note: If the trailer warning lamp comes 'on' and stays 'on' there are diagnostic trouble codes (DTC) present which need to be cleared or the system air pressure is below 4.5 bar.

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.

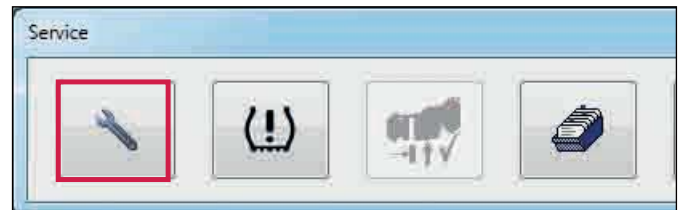
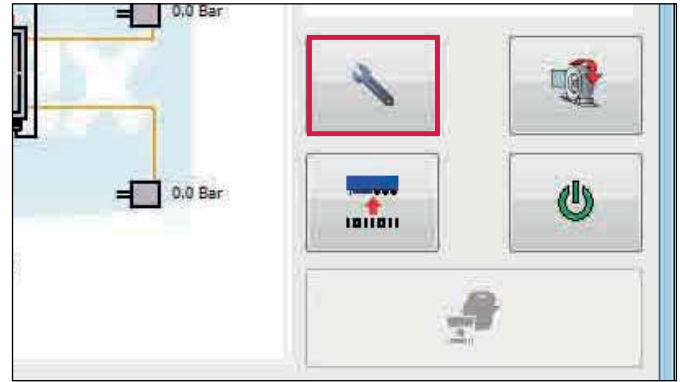
Click on the  button to accept and exit.




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.



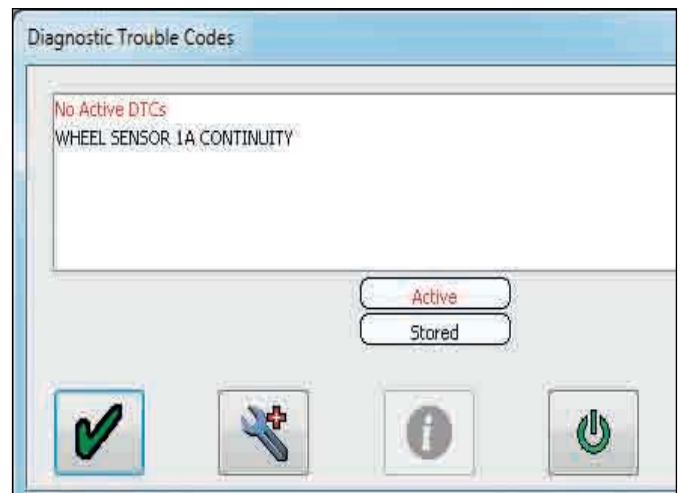
Any active DTC will be displayed in red (e.g. Wheel Sensor 1A Continuity).

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).



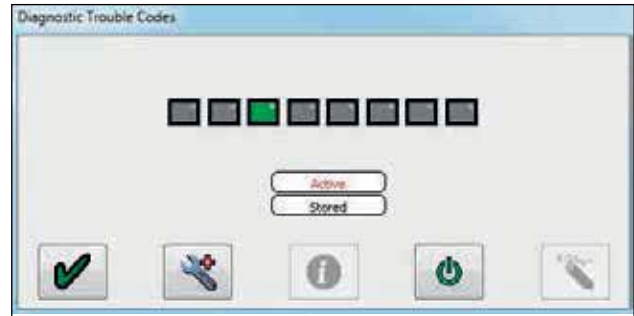
Deleting stored DTC's

All stored DTC's can be deleted.

Click on the  button to delete the stored DTC.




ECU deleting the stored DTC.

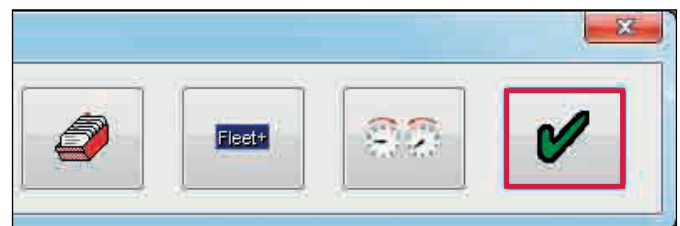


No active & no stored DTC's present.


Click on the  button to exit.



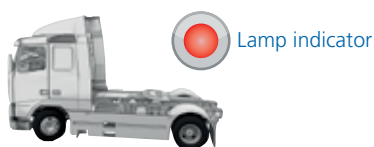
Click on the  button to exit to the main menu.



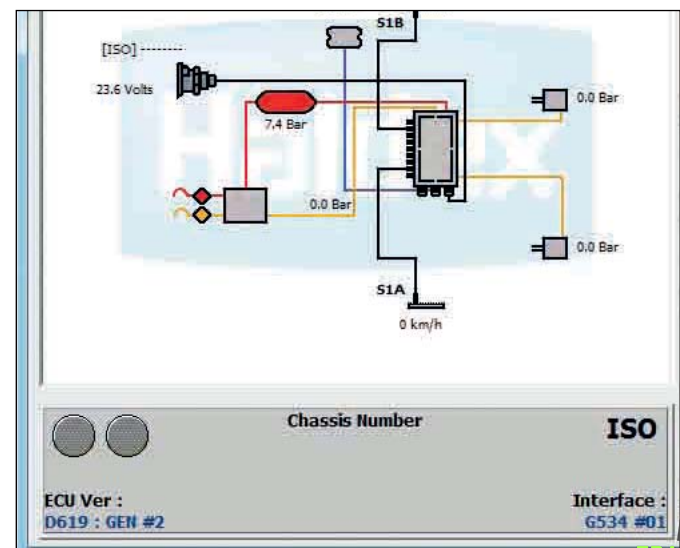
The DIAG+ main screen will appear.

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.





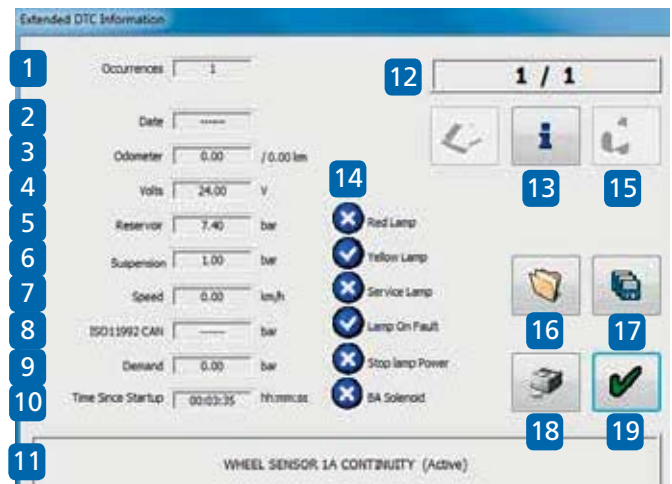
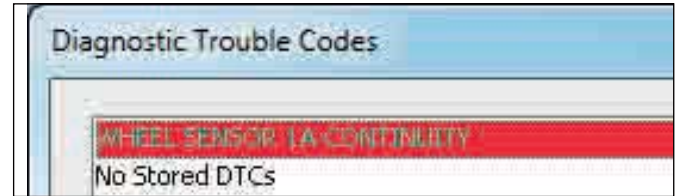
Reading extended diagnostic codes


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

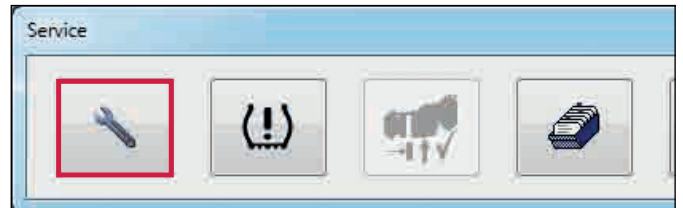


Note: Click on the  button for further detail on each diagnostic trouble code for example "Wheel speed sensor continuity".

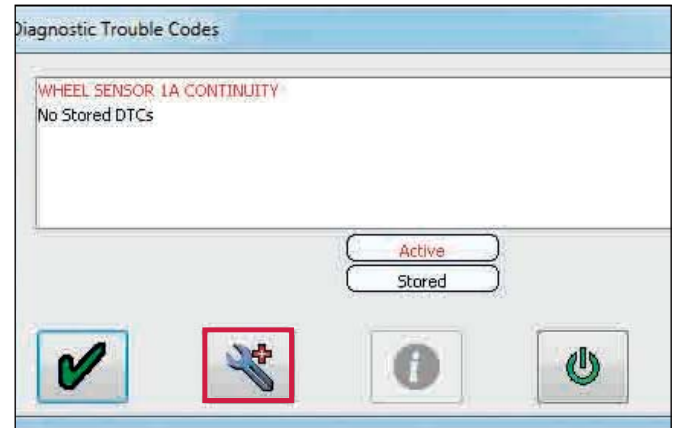
Diagnostic trouble codes (DTC)

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

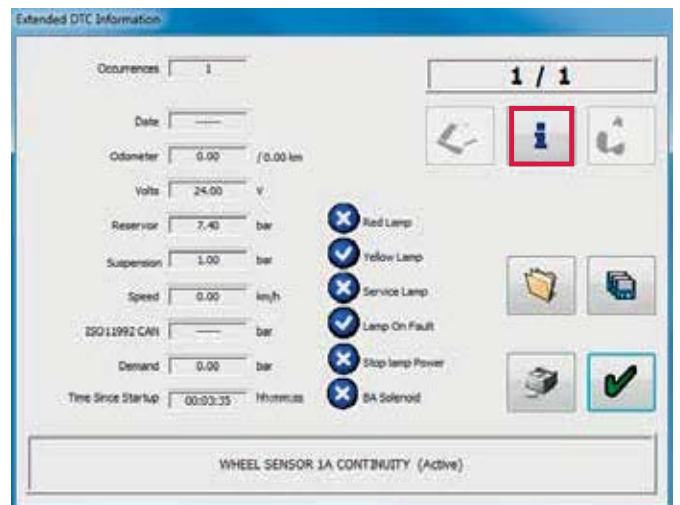
To access the list click on the  button on the service menu.



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 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 kOhm)?
- > 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!

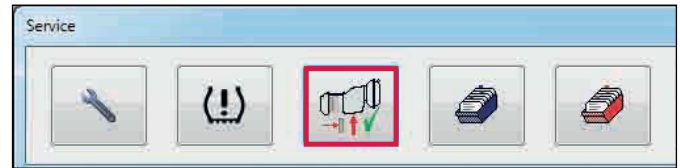
Position of the wheel speed sensor in the driving direction:
For all configurations (ECU right/left) and systems (1M/2M/3M)

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

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

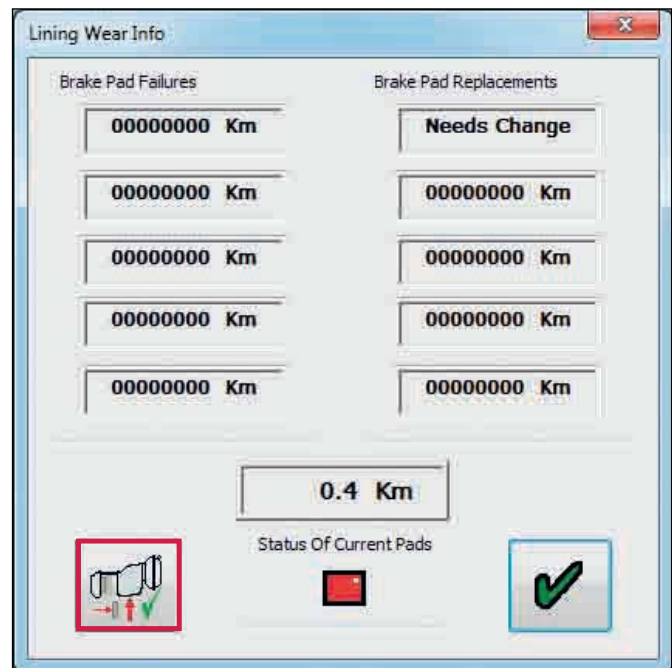
The following screen will appear which lists the history of the changes of linings (last five recorded).

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:

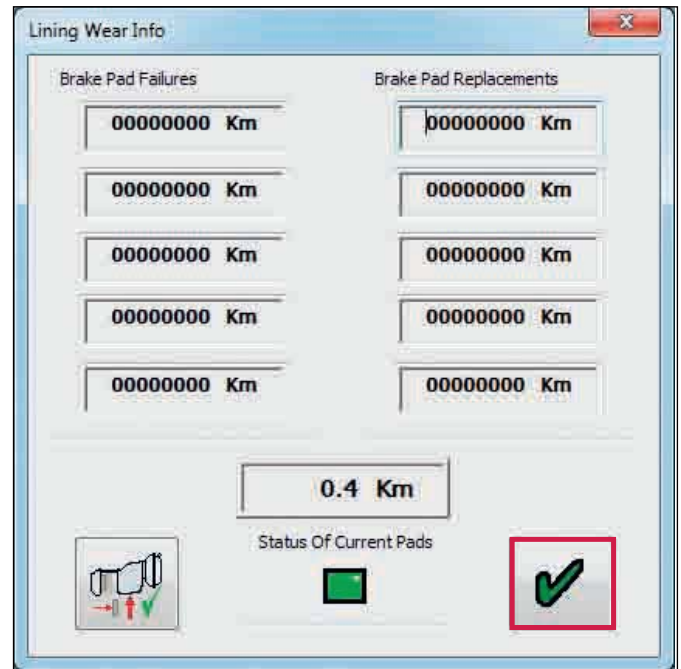
- a) In the 'brake pad replacements' column, the 'needs change' is replaced by a figure in km.
- b) The 'status of current pads' indicator changes from red to green.

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



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

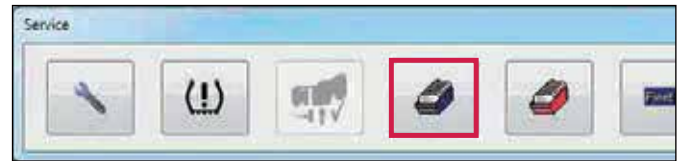
General

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.

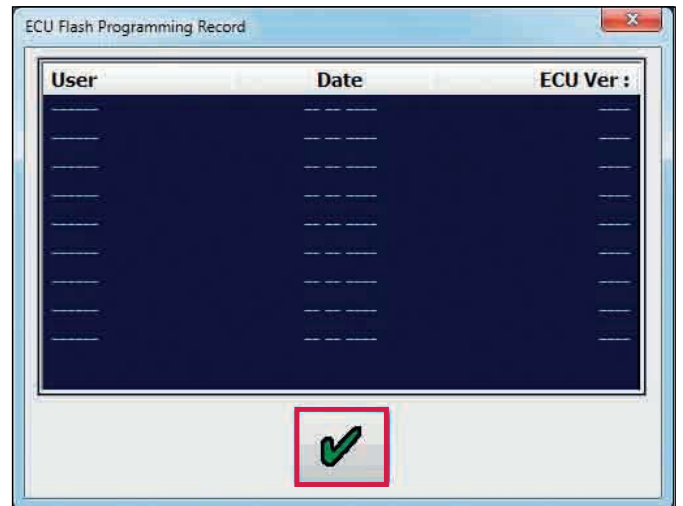


The following screen appears.

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.

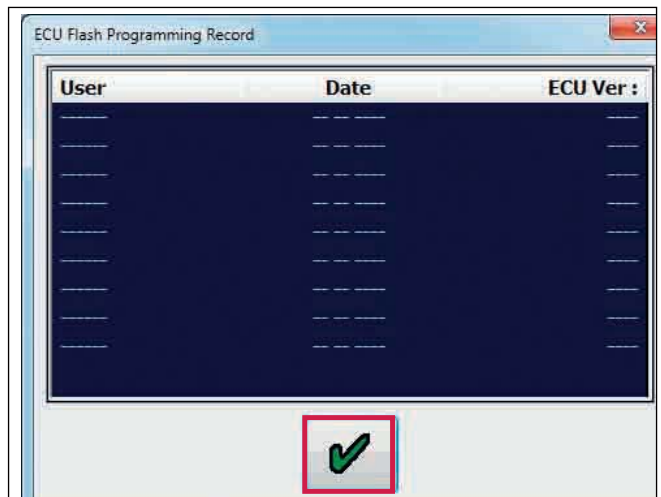


The following screen appears.


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).

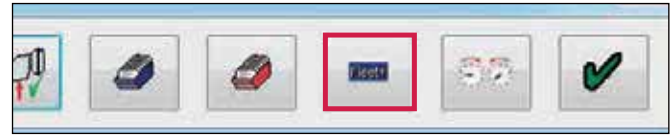
Note: Records from older ECU versions will display a message of 'no data available !'.

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.

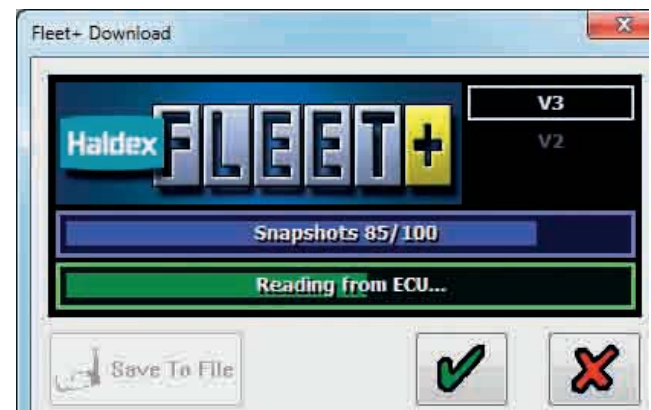
Downloading Fleet+ data

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.

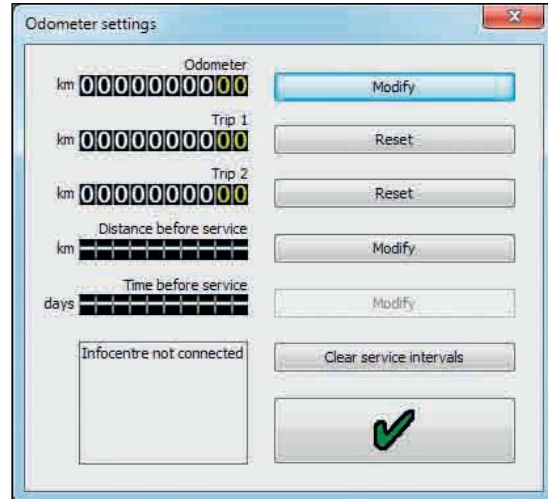


Odometer settings

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



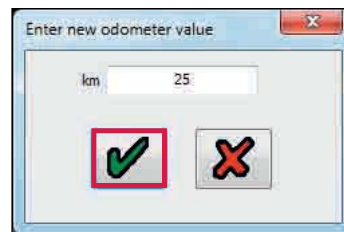
The trailer odometer

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.

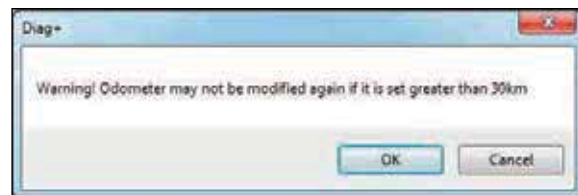


Warning:

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

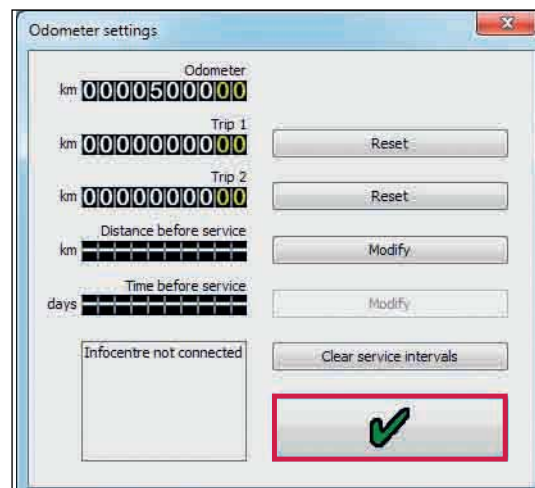
Click on the 'ok' button to accept or the 'cancel' button to return to the menu without altering the mileage.

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.



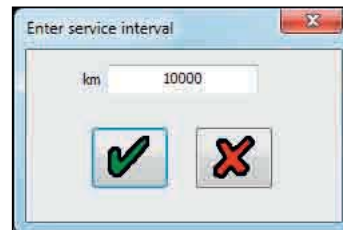
Service intervals

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

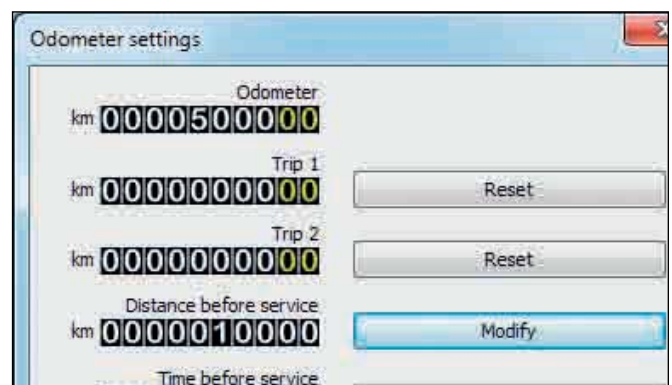
Enter the required mileage.

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.

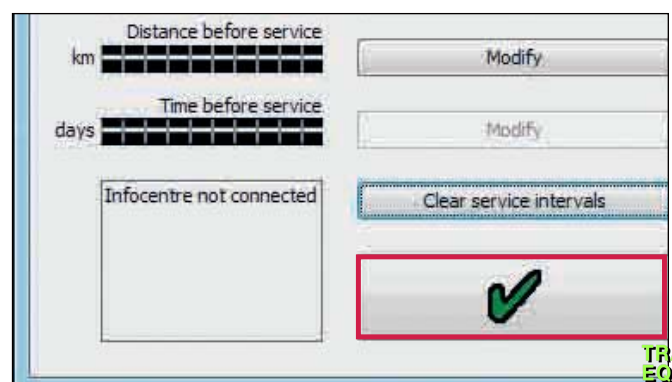


Clear service intervals


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

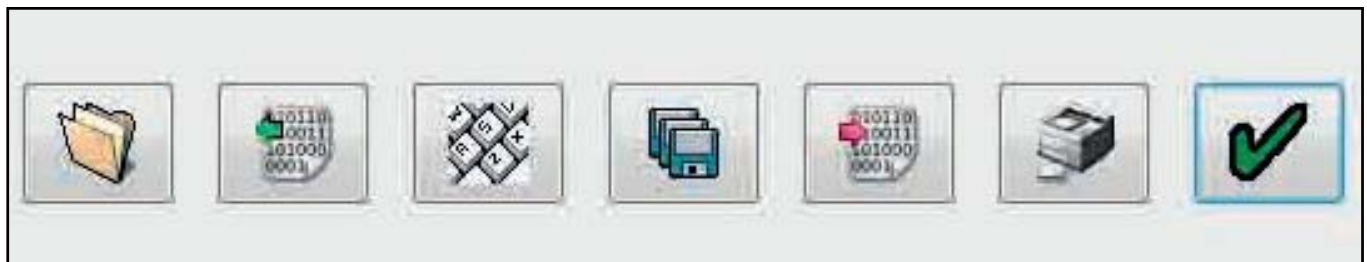
Distance before service has now been reset.

Click on the button to accept this value



Setting parameters (configure menu)

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




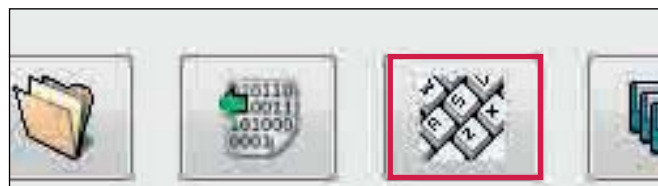
- 1
- 2
- 3
- 4
- 5
- 6
- 7

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.



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.

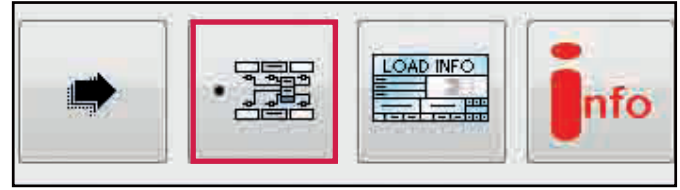
Note: The following sections have default settings as shown below:

- 5 Auxiliaries - not used (unused).
- 6 Wheel scaling - 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.

- a) 2M side by side
- b) 1M (EB+ Gen1 only)
- c) 2M axle by axle
- d) 2M non-integrated (EB+ Gen1 only)
- e) 3M full trailer
- f) 3M semi trailer

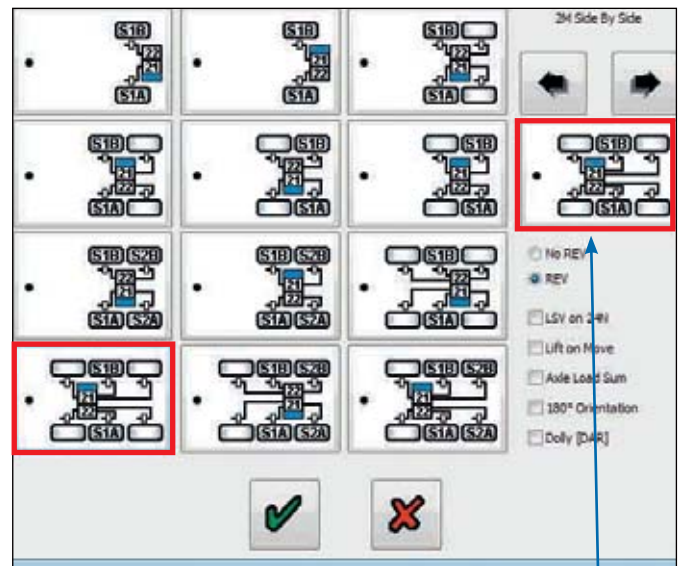
The configuration group title is shown at the top right of the screen in which below are left and right arrow boxes to enable to toggle between the configuration screens.

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).

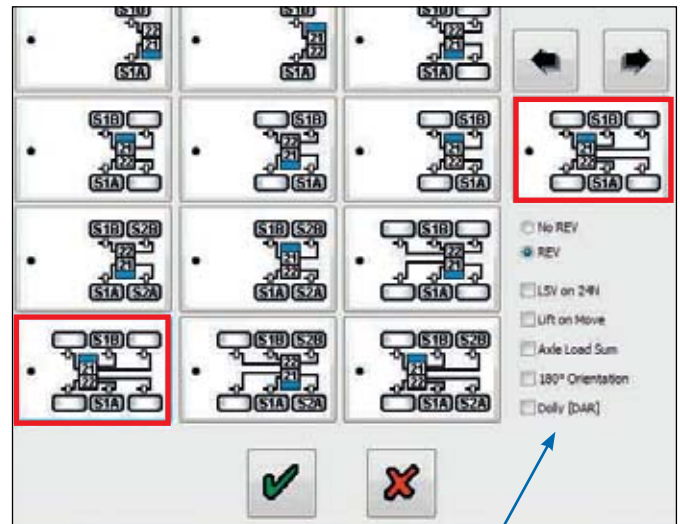
If box 5 is selected this allows the weight of the trailer to be indicated in the cab if the truck supports this function.

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

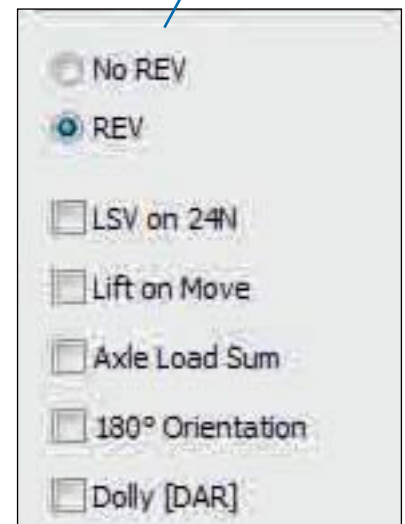
3


4

5

6

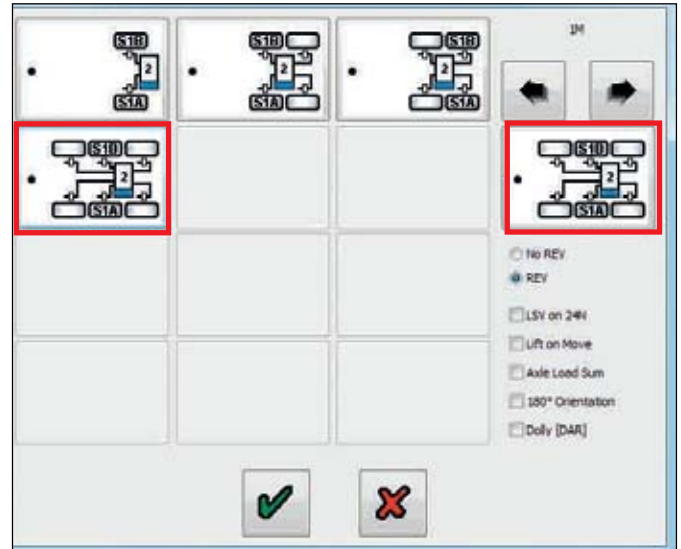
7



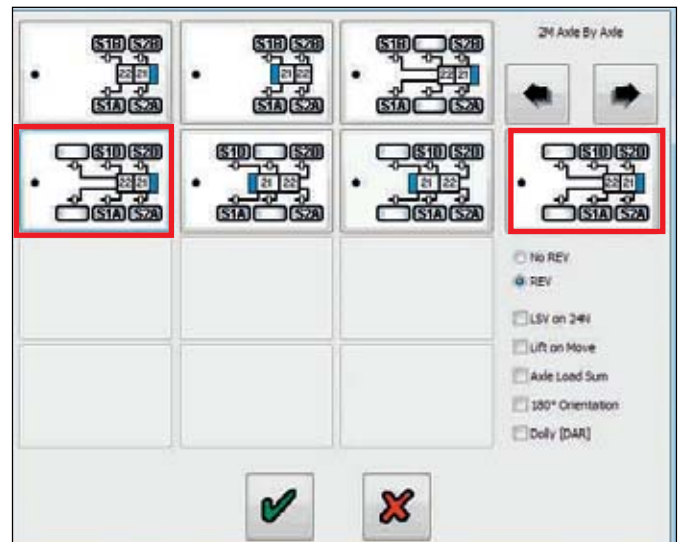
Click on the  button to accept.

1M configuration screen. EB+ Gen1 systems only.

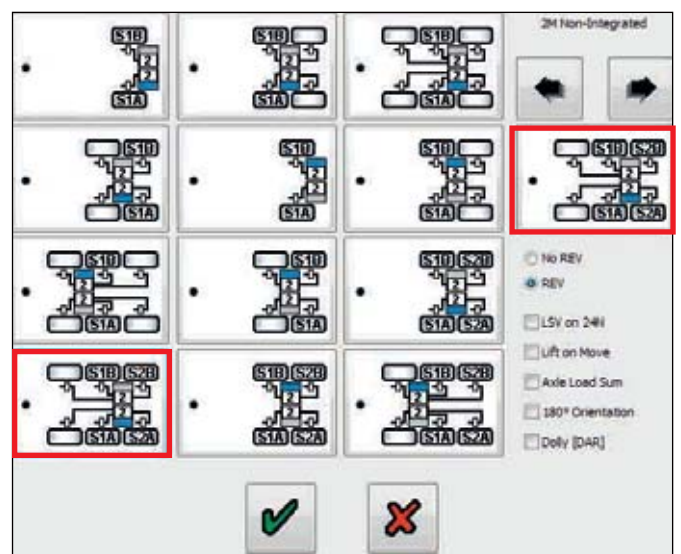
Note: Position of ECU can be left, right, front or rear.



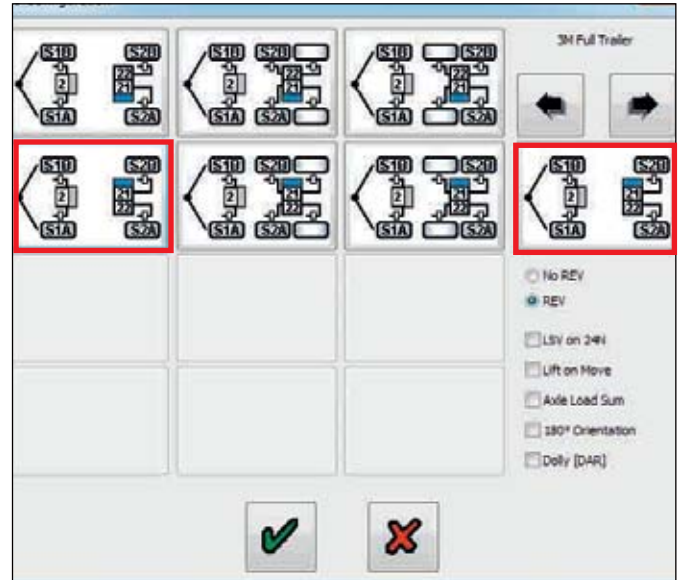
2M axle by axle configuration screen.



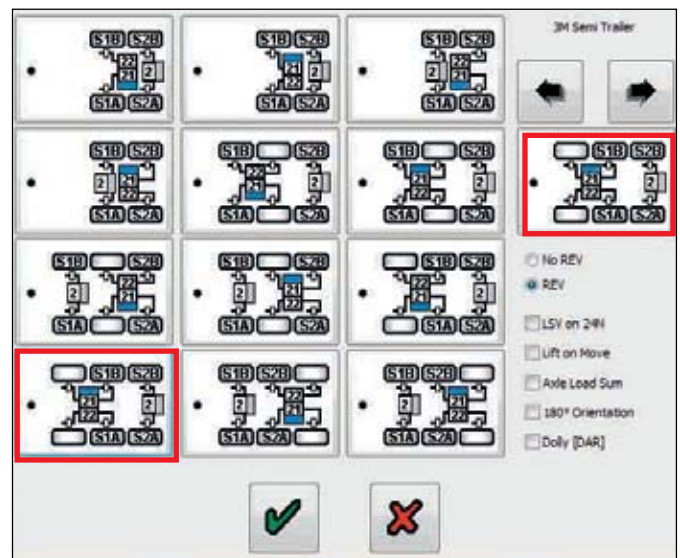
2M Non integrated configuration screen. EB+ Gen1 systems only.




3M full trailer configuration screen.



3M semi trailer configuration screen.

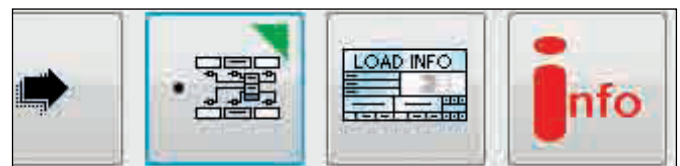


Click on the  button to accept and return to the ECU setup menu.

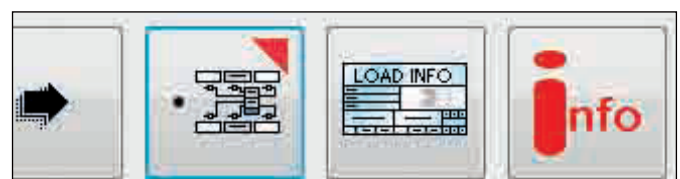
The 'setup ECU configuration and layout' icon will now have a green triangle in the top right hand corner, indicating that data in that section has changed.

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).

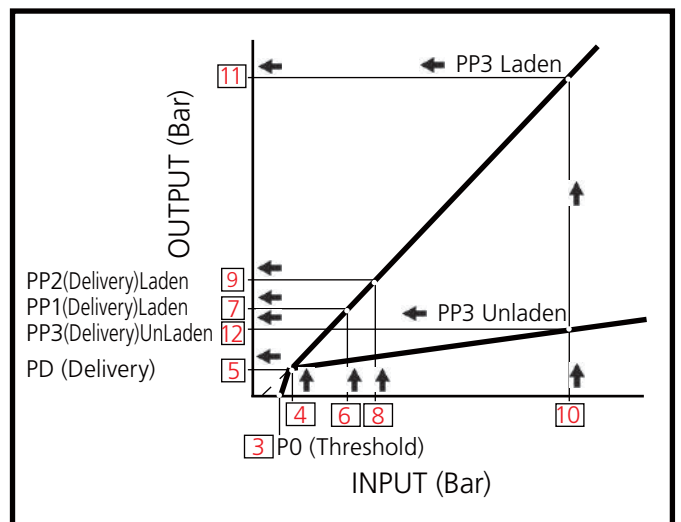
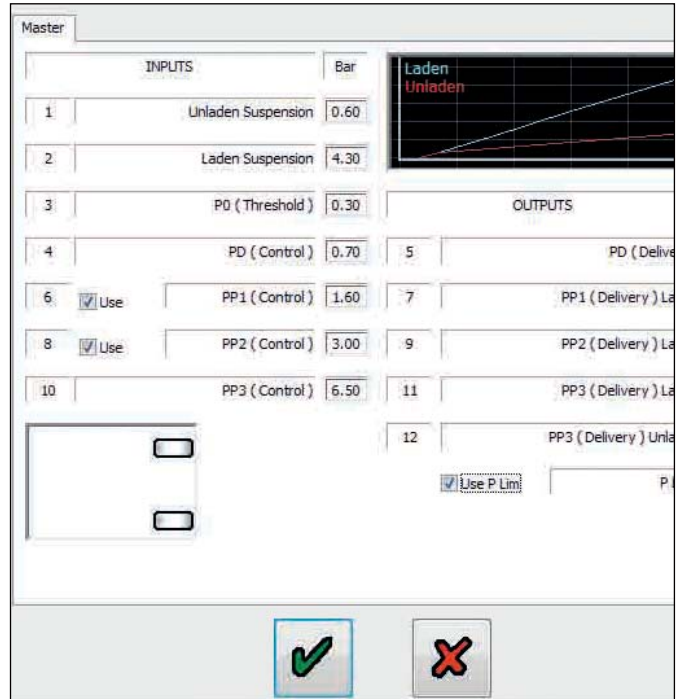
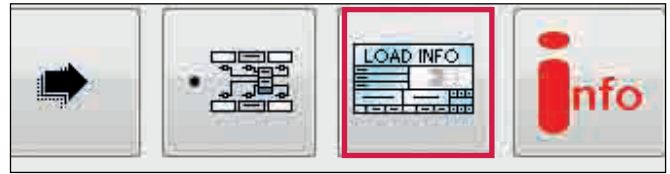
To enter the values click on Use boxes.

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.



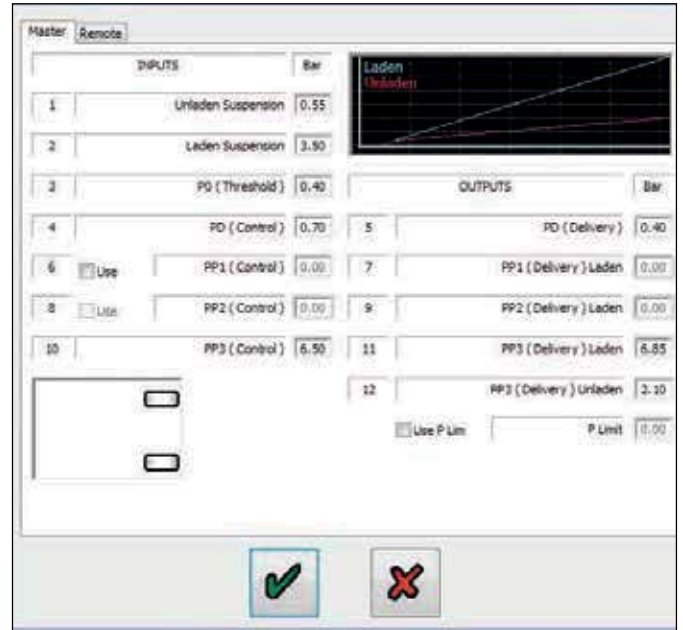
Haldex brake calculation example

Input data for the EBS-Modulator EB+:

Axle	control pr.	pm	6.50 bar	control pr.	pm	3 P0	4 PD	6	8	10	bar
	Axle load unladen (Kg)	Bag press. unladen (bar)	Brake press. unladen (bar)	Axle load laden (Kg)	Bag press. laden (bar)	0.30	0.70	1.60	3.00	6.50	
1	1150	1 0.60	12 1.75	8000	2 4.30	0.00	5 0.30	7 1.20	9 2.60	11 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.



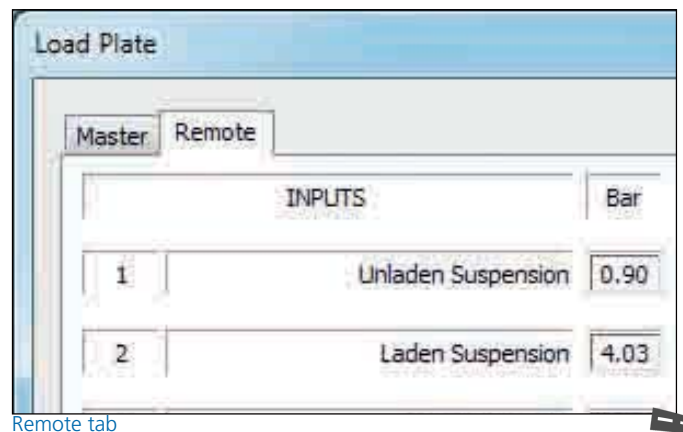
Click on the button to accept

Brake calculation example - Master ECU (RAG)

Input data for the EBS-Modulator EB+:

RAG	control pr.	pm	6.50 bar	control pr.	pm	3	4	10	
Axle	Axle load	Bag press.	Brake press.	Axle load	Bag press.	PO	PD	P3	
	unladen	unladen	unladen	laden	laden				
	(Kg)	(bar)	(bar)	(Kg)	(bar)				
		1	12		2	0.40	0.70	6.50	bar
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.



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


Brake calculation example - Remote ECU FAG)

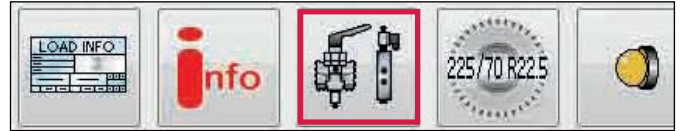
Input data for the EBS-Modulator EB+:						3	4	6	8	10	
						P0	PD	P1	P2	P3	
FAG	control pr.	pm	6.50 bar	control pr.	pm	0.40	0.70	2.00	2.50	6.50	bar
Axle	Axle load unladen (Kg)	Bag press. unladen (bar)	Brake press. unladen (bar)	Axle load laden (Kg)	Bag press. laden (bar)	Brake press. laden (bar)			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

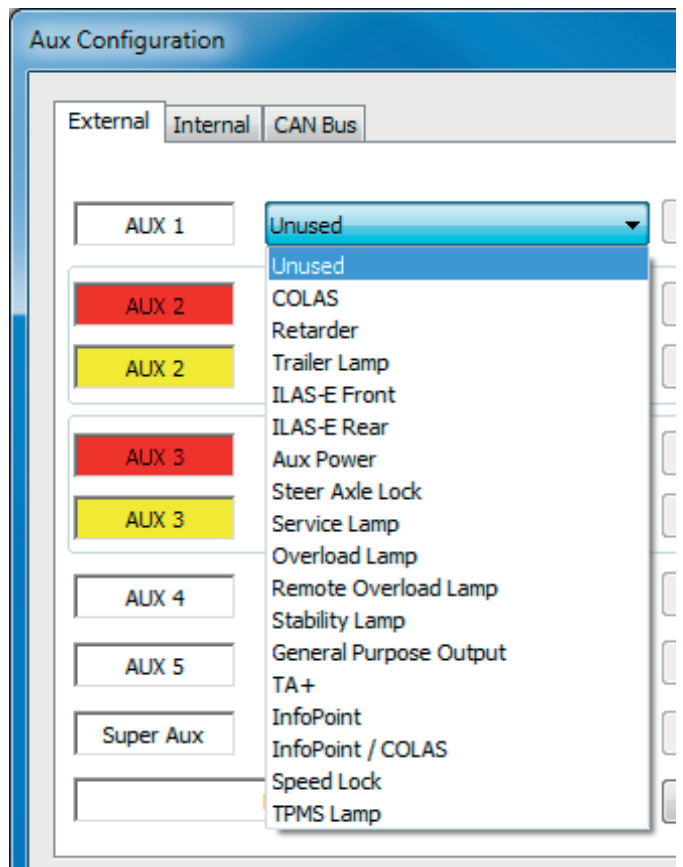


The following screen will appear.
The screen shows the various auxiliary connections that can be used (i.e. AUX 1 to 3, 4 and 5).

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

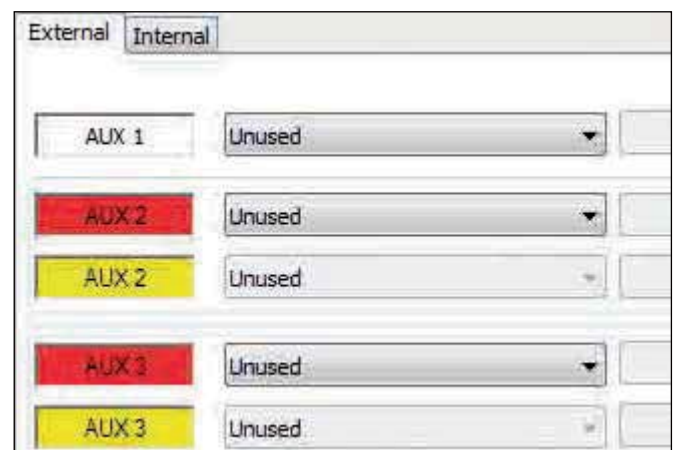
Programming Standard AUX using DIAG+ V6

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

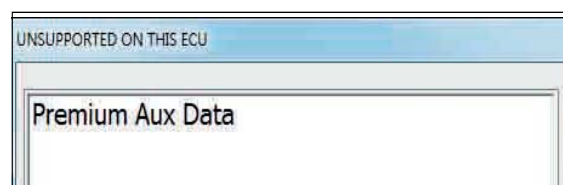
- AUX 1
- AUX 2 red only
- AUX 3 red only
- AUX 4
- AUX 5

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.

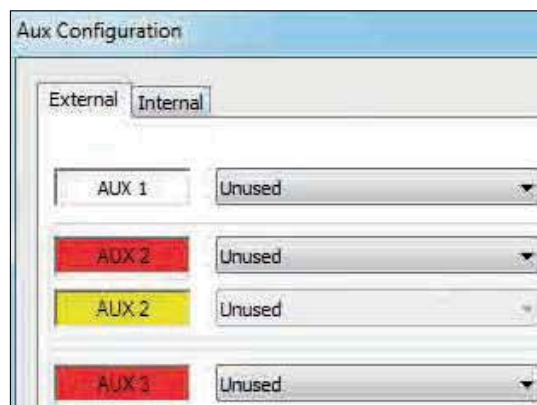


814 002 3xx series

Programming Super AUX using DIAG+ V6

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

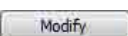
- AUX 1
- AUX 2 Red only
- AUX 3 Red only
- AUX 4
- AUX 5
- Super AUX

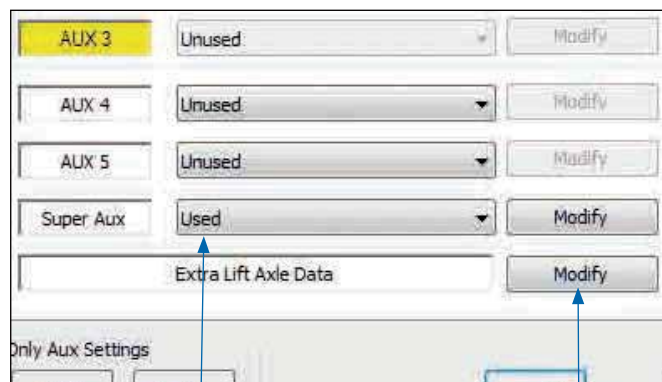


Note colour

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.



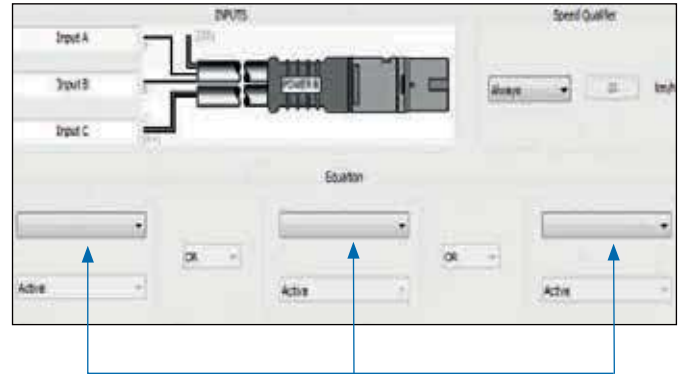
Super AUX option is selected



Super AUX modify button

Custom Super AUX input screen

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



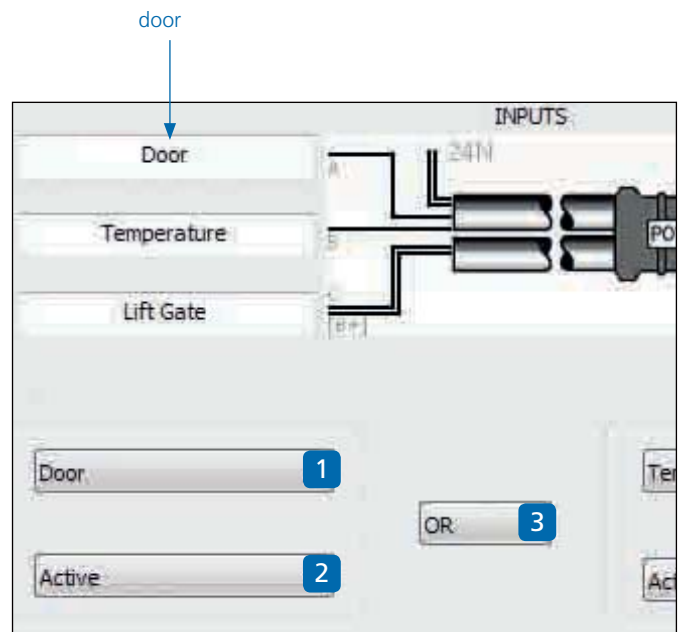
Drop down boxes used to configure the input signals.

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).

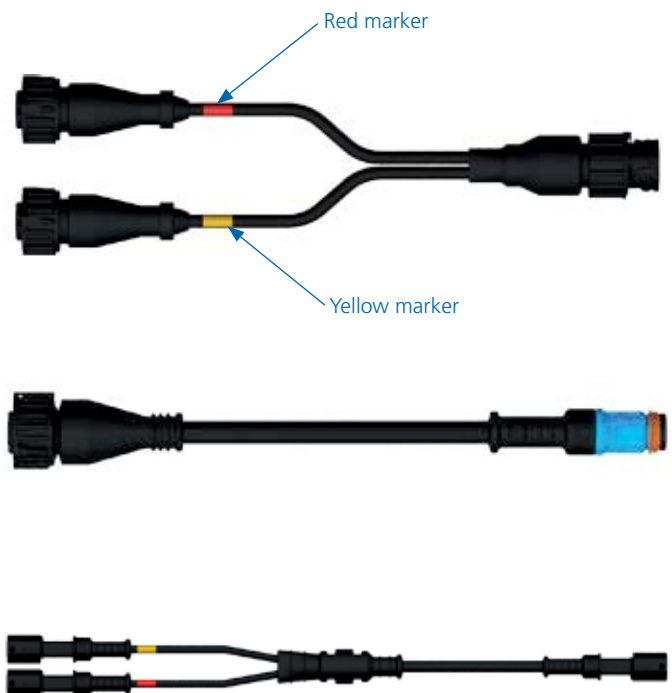


The Premium system provides five instead of three outputs (AUX 2 and 3 are capable to operate two separate functions). An example for an extended application could be ILAS®-E front including TA+ on AUX 2, steer axle lock on AUX 3 and COLAS® RtR on AUX 1. The twin outputs of AUX 2 and AUX 3 are colour 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

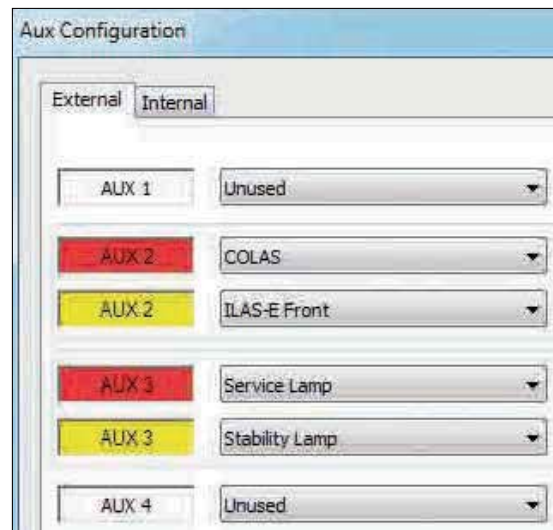
Clicking on the drop down arrow displays a list of options that can be selected on that auxiliary.



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

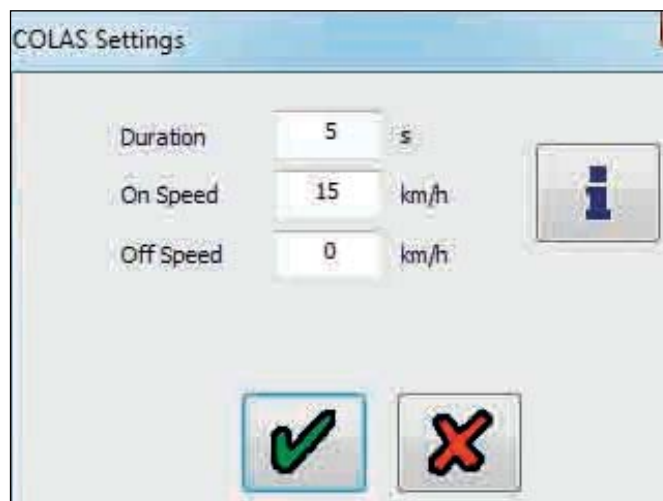
AUX output will change status, if COLAS function AND all related inputs are active.

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

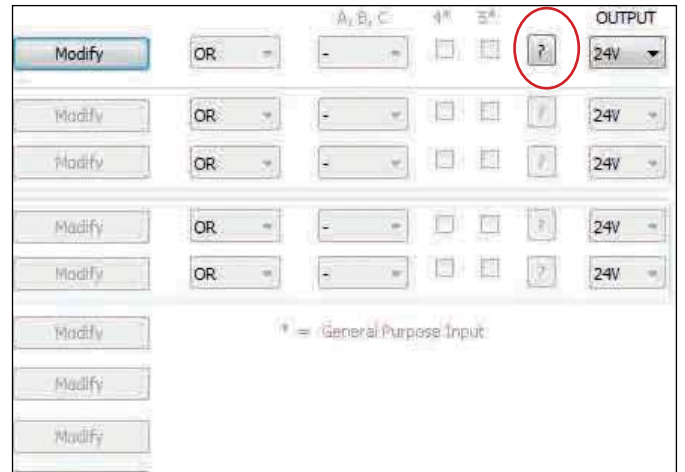
COLAS (on AUX 1)

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

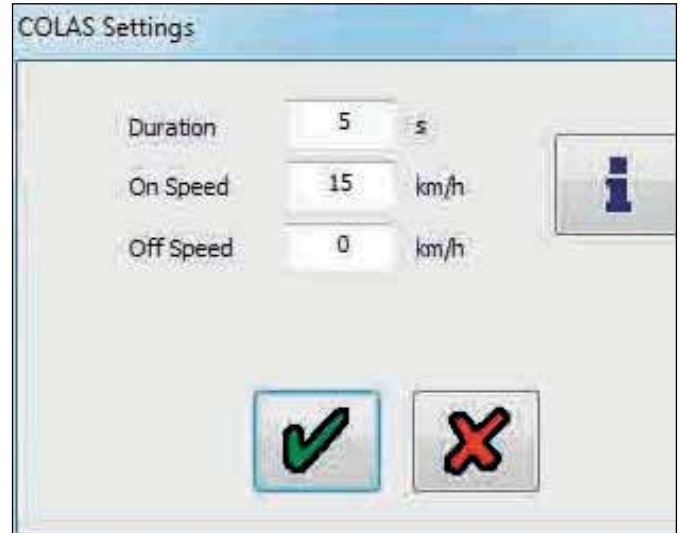
COLAS (AUX 1,2 & 3) example

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.

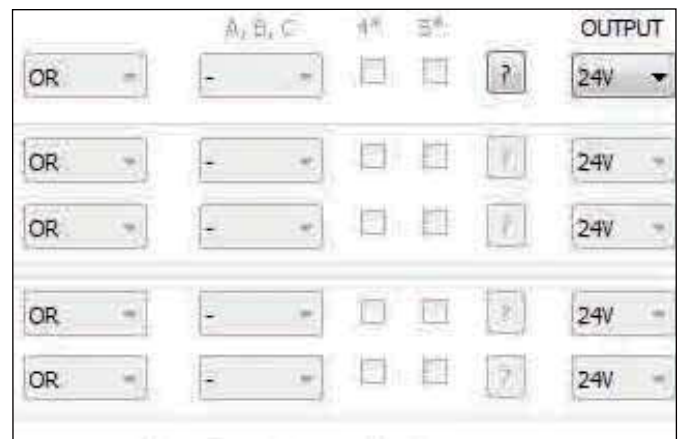
Output

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.

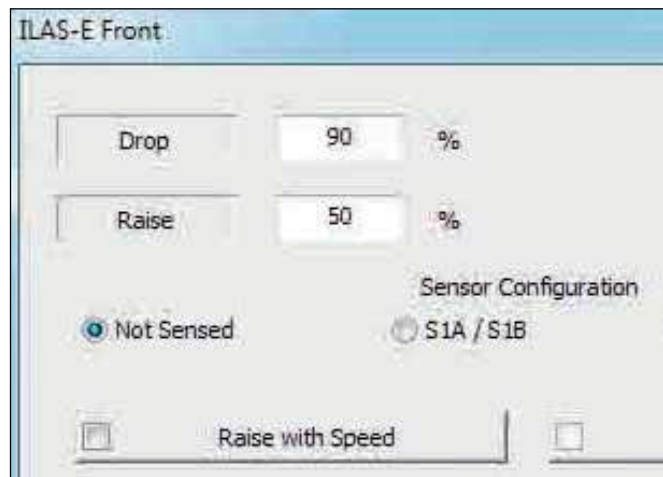
The following screen will appear, modify the values as required.

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

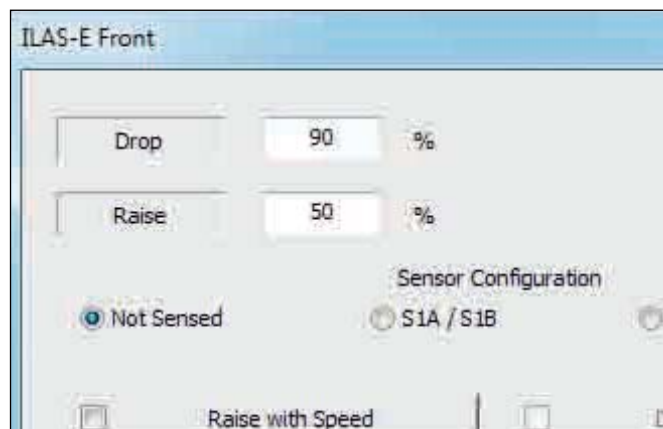
Example ILAS-E manual (AUX 2 & 3)

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.

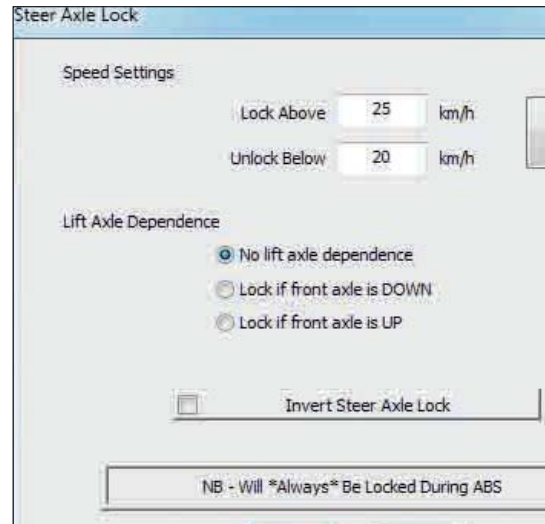
This 'Inverting' of the output can be selected in two places:

- › 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.

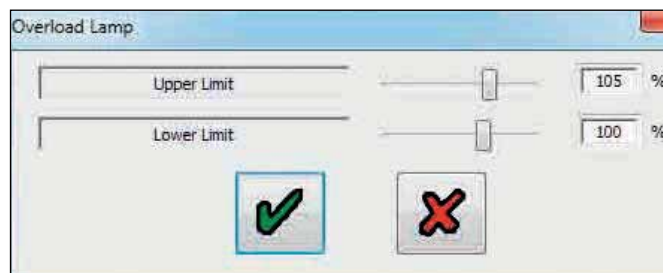
0 V
Inverted output: Function AND / OR logic HIGH-> 0 V to solenoid, otherwise 24 V.

*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

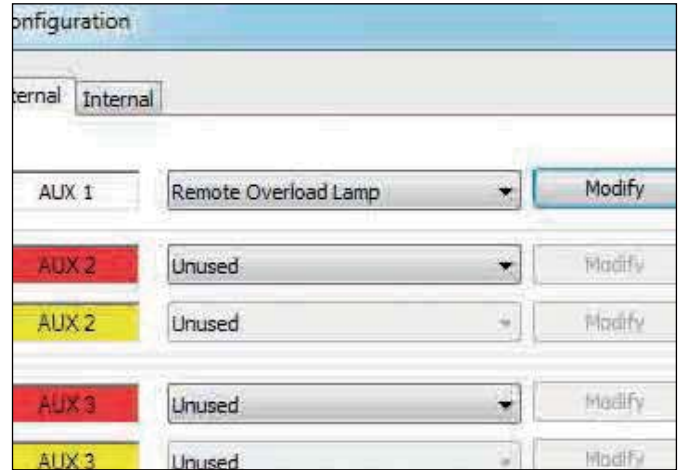


Remote overload lamp

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

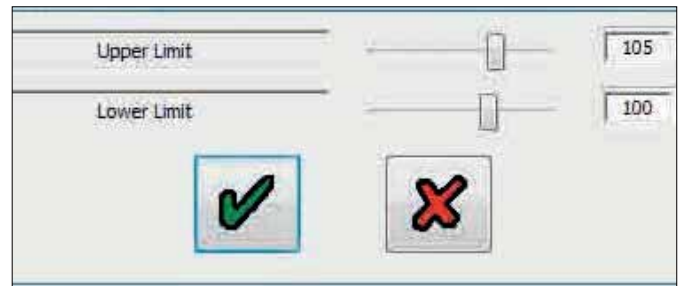
Standard output: Function AND / OR logic HIGH -> 24 V to solenoid, otherwise 0 V.

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

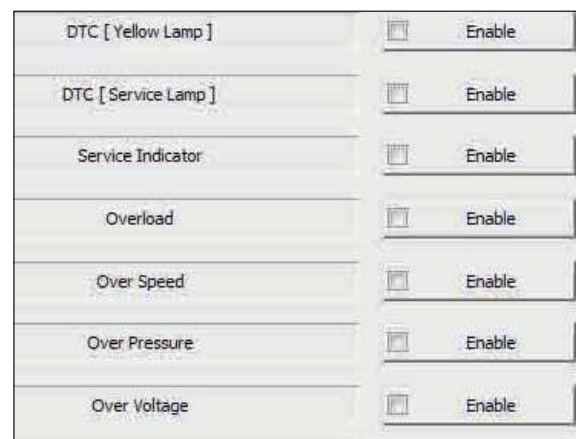
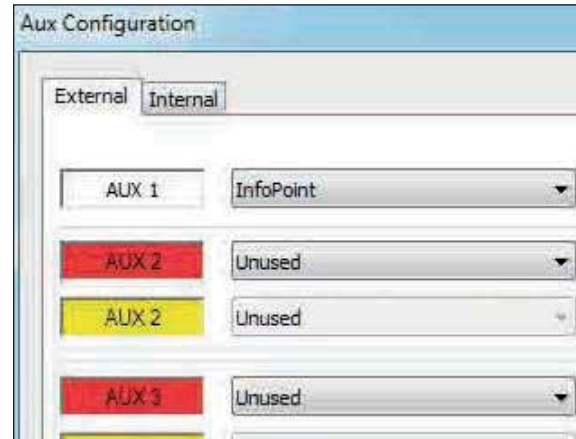
Up to 12 bar, default is 9.75 bar (DTC trigger level) when no value is shown.
Legislation allows max 8.5 bar reservoir pressure.
Higher pressure reduces the life time of all pneumatic components.

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.



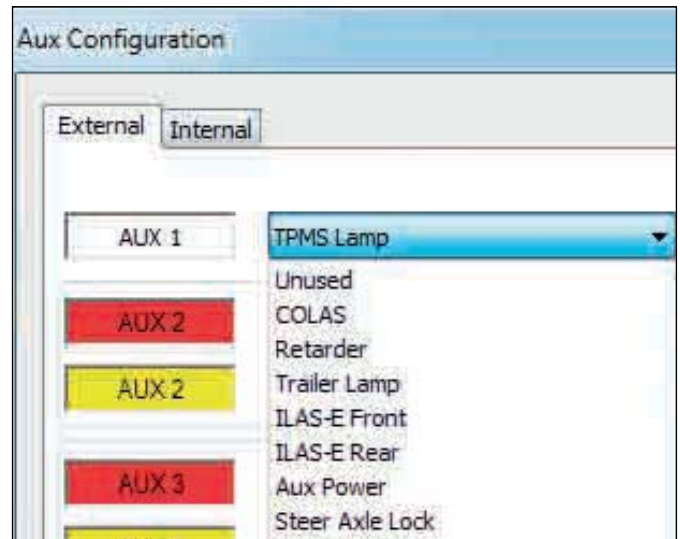
TPMS lamp (AUX 1, 2 & 3)

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.

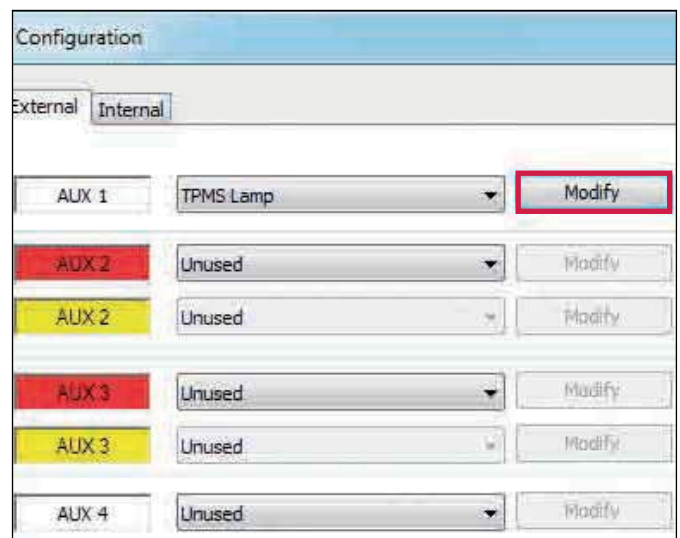
Example:

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.




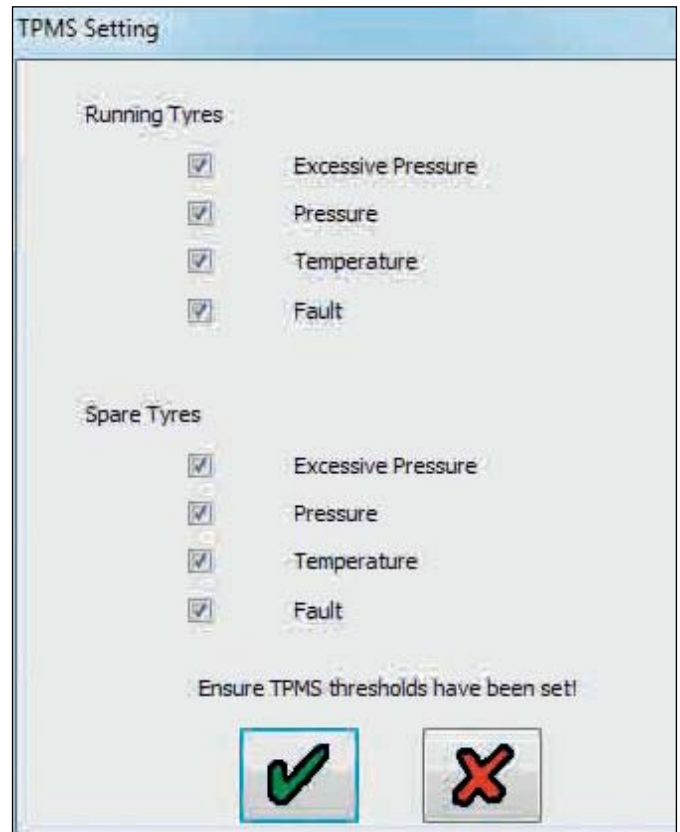
Now select any of the available options in any combinations from the 'TPMS setting' dialogue.

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.



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

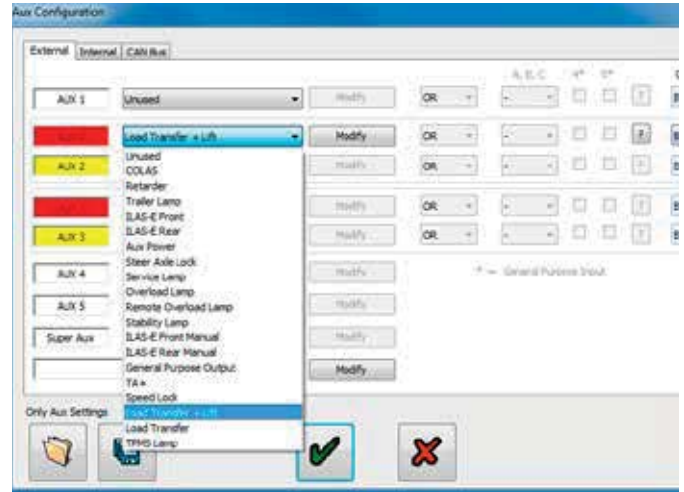
Settings:

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.

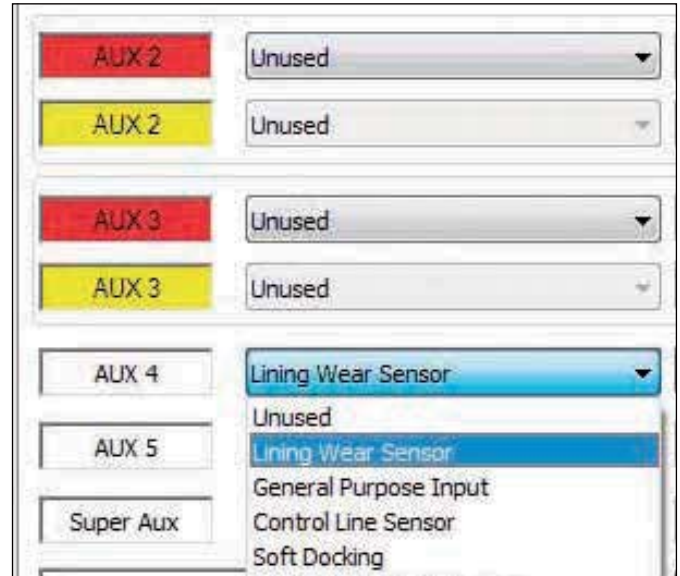
A short activation (< 5 seconds) is a manoeuvring request and will use the available Load Transfer hardware to temporarily minimize the wheelbase. 'Load Target' is changed to the 'Traction Overload Limit' (Extra Lift Axle Data). Manoeuvring is cancelled when 'Traction Speed Limit' (Extra Lift Axle Data)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

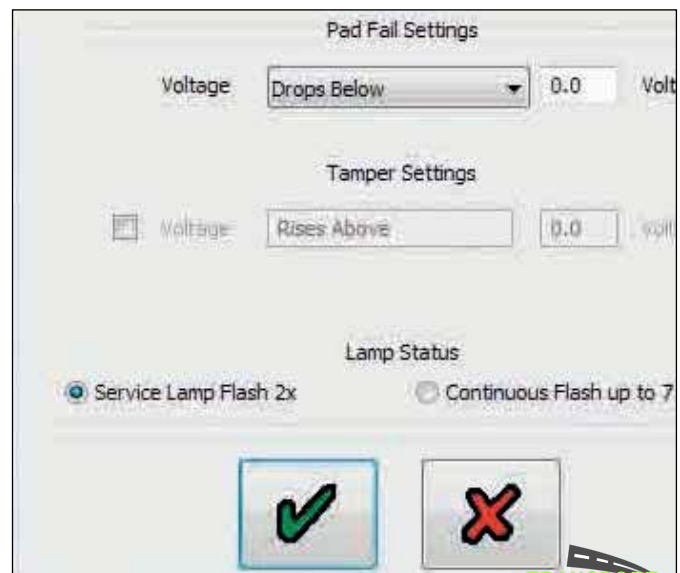


Custom screen

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.

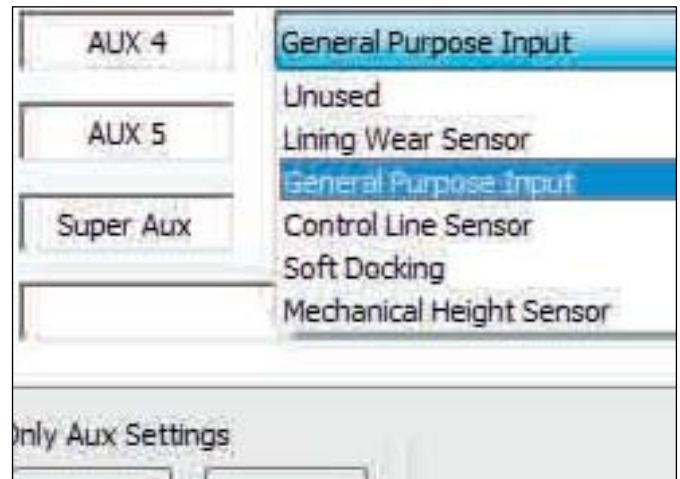
The custom screen allows the user to enter custom voltage settings as to an alternative manufacturer lining wear system used.

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-

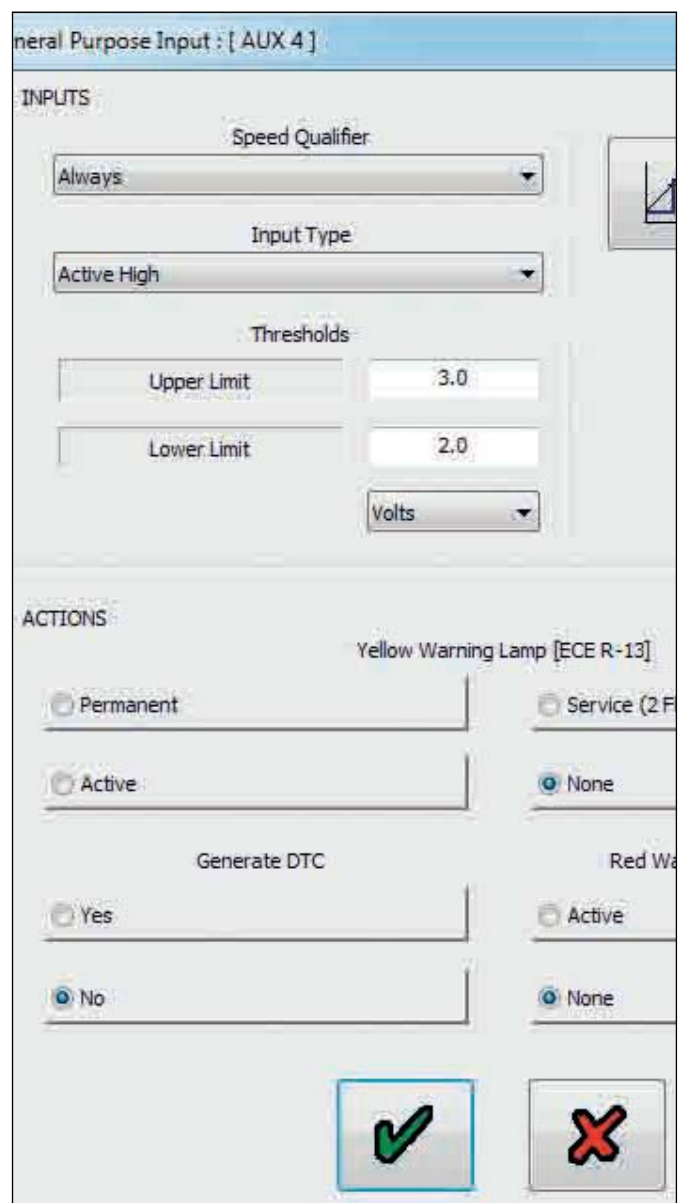
Yellow; Input signal, analog (0-24 V)

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:

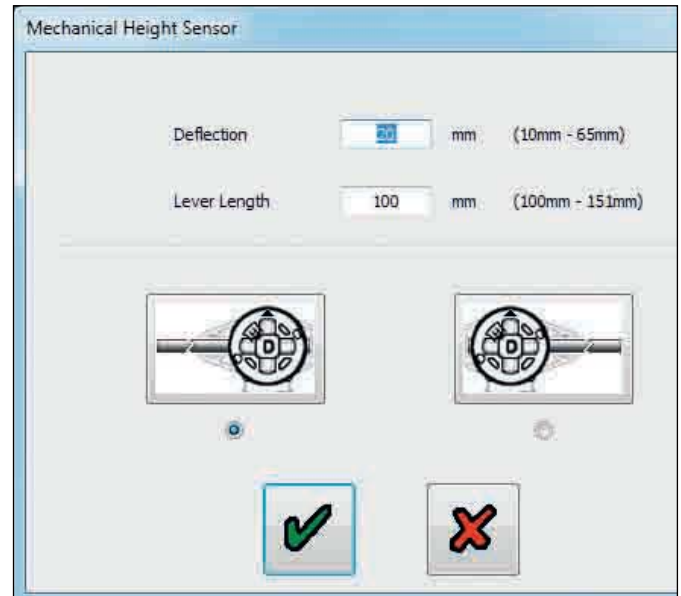
A deflection of 20 mm will allow a lever length range of 100 to 151 mm (as seen in the picture).

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

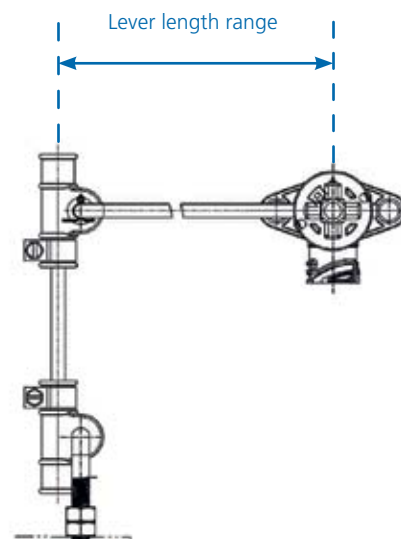
Once the lever length is set, the user then enters the actual lever length.

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.



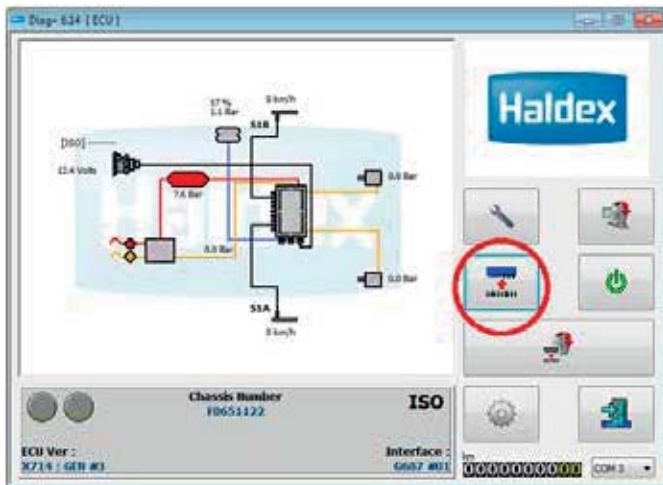
Highlight (check) to select left or right installation



How to check if EB+ Soft Docking is installed

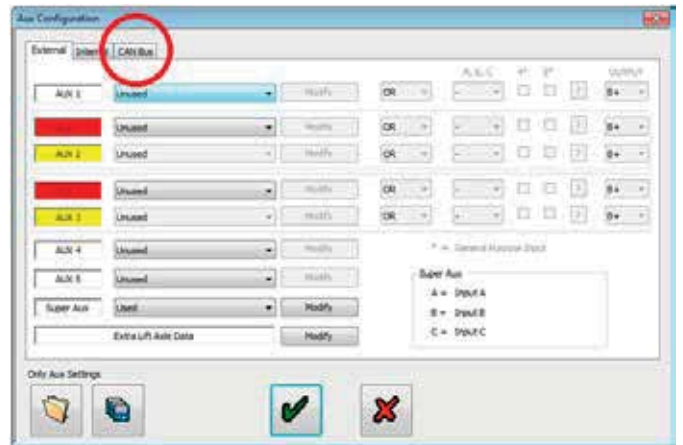
Step 1:

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



Step 4:

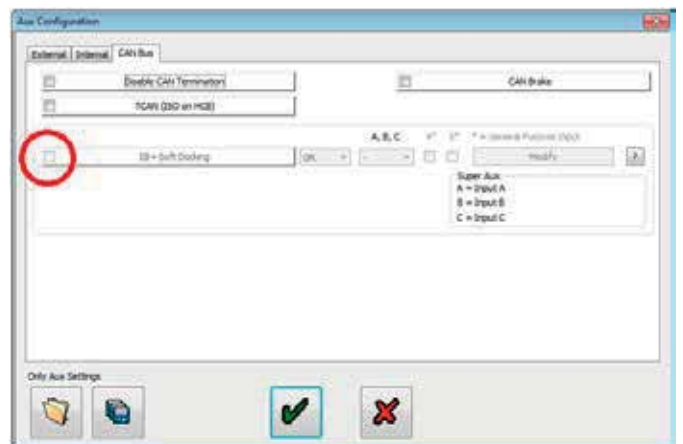
Select CAN BUS tab.



Observe the EB+ Soft Docking tick box.

Step 2:

Select ECU parameters / configuration.

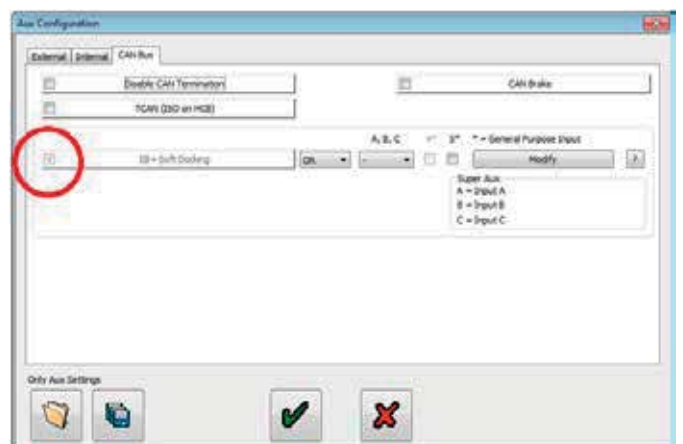


Step 3:

Select setup auxiliary configuration.



No tick = EB+ Soft Docking not installed

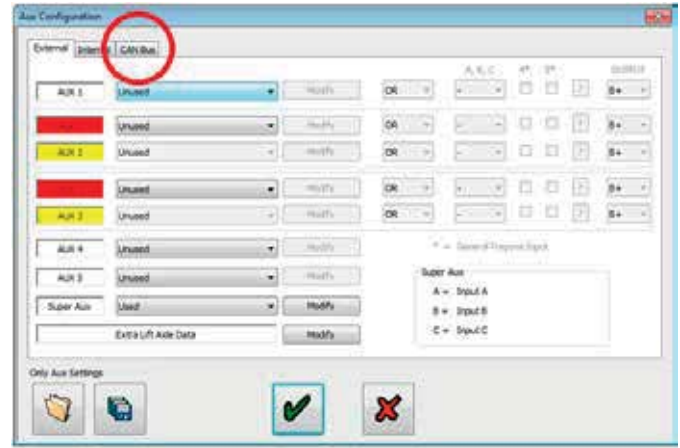
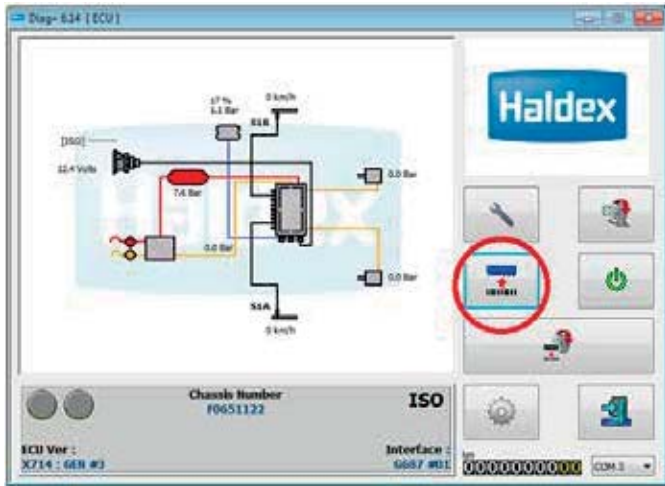


Tick = EB+ Soft Docking installed

How to remove EB+ Soft Docking from EB+ Gen3

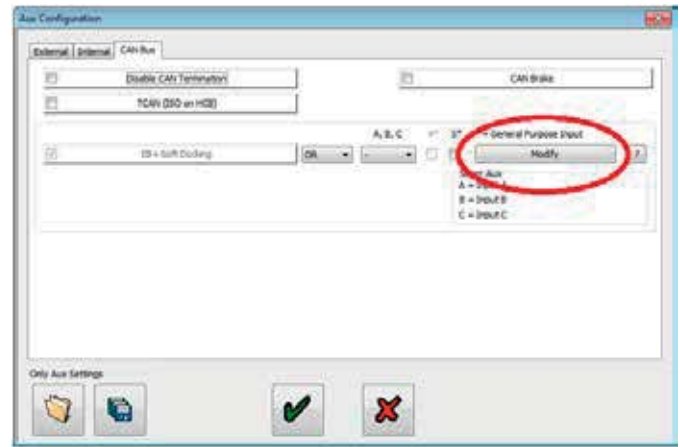
Step 1:
Turn 'on' the power to the EB+ Gen3.
Open DIAG+, select configuration.

Step 4:
Select CAN BUS tab.



Step 2:
Select ECU parameters / configuration.

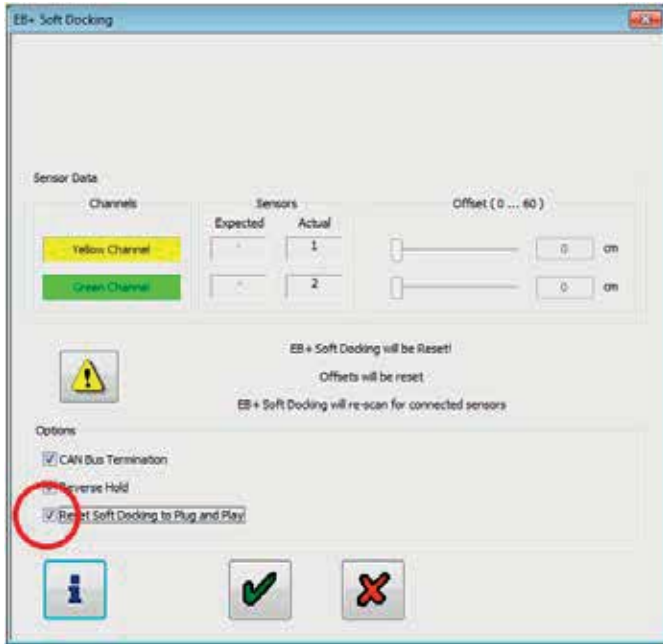
Step 5:
Select "Modify" button.



Step 3:
Select setup auxiliary configuration.

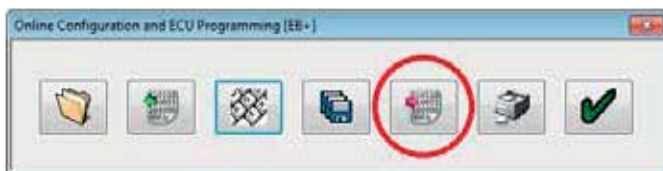


Step 6:
Select 'Reset Soft Docking to Plug and Play' box.



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

Step 8:
Select 'Send data to ECU'.

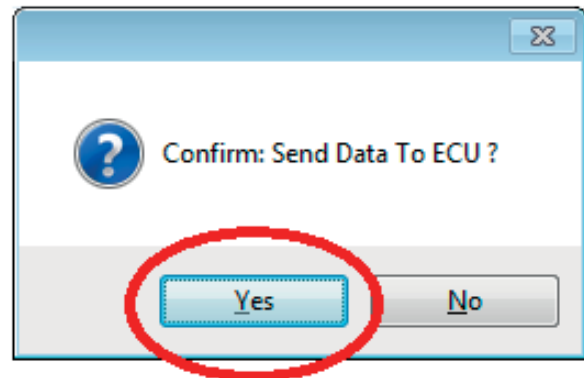


Step 9:
Remove EB+ Soft Docking CAN BUS cable from EB+ Gen3 ECU.

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+

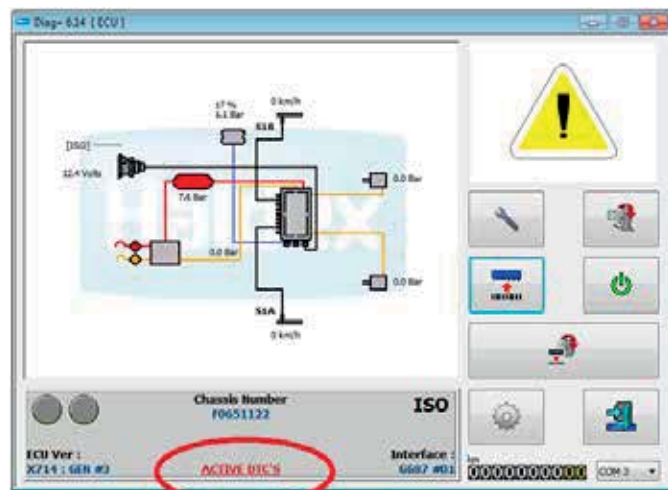
Step 1:
Turn 'off' the power to EB+ Gen3.

Step 2:
Connect EB+ Soft Docking to the EB+ CAN BUS connector.

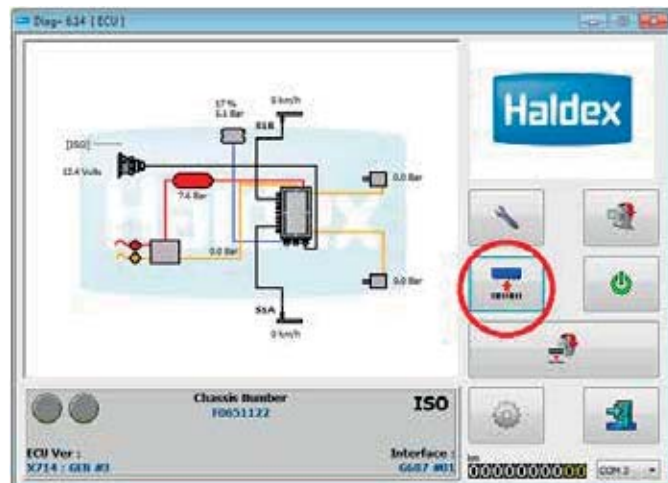
Step 3:
Turn 'on' the power to EB+ Gen3.

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.



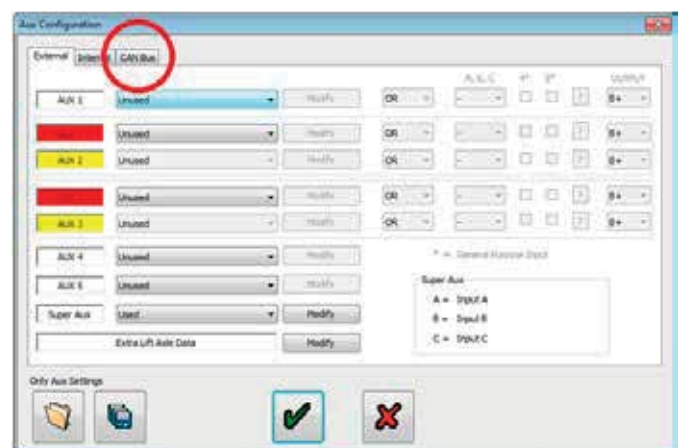
Step 8:
Select ECU parameters / configuration.



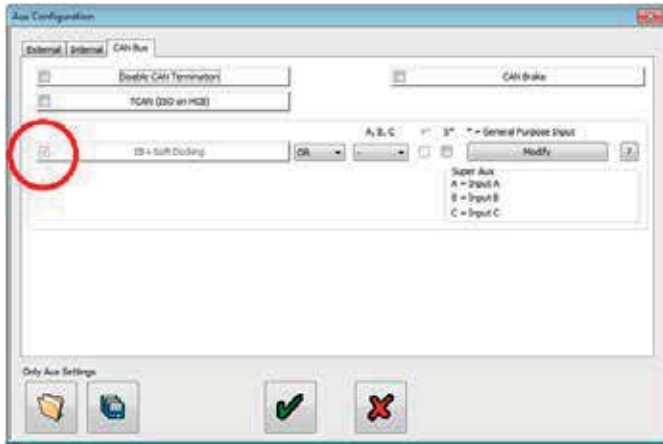
Step 9:
Select set up auxiliary configuration.



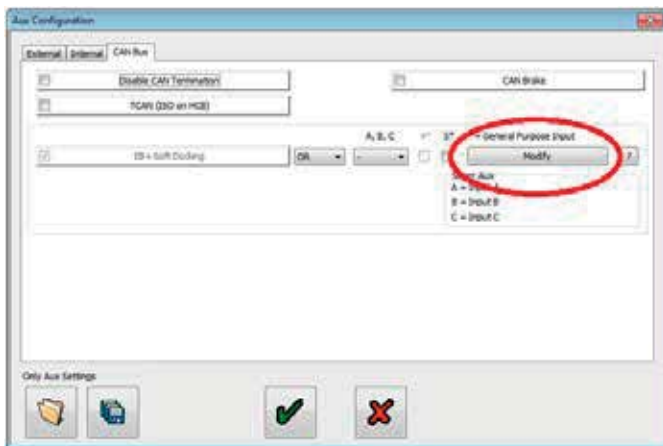
Step 10:
Select CAN BUS tab.



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.



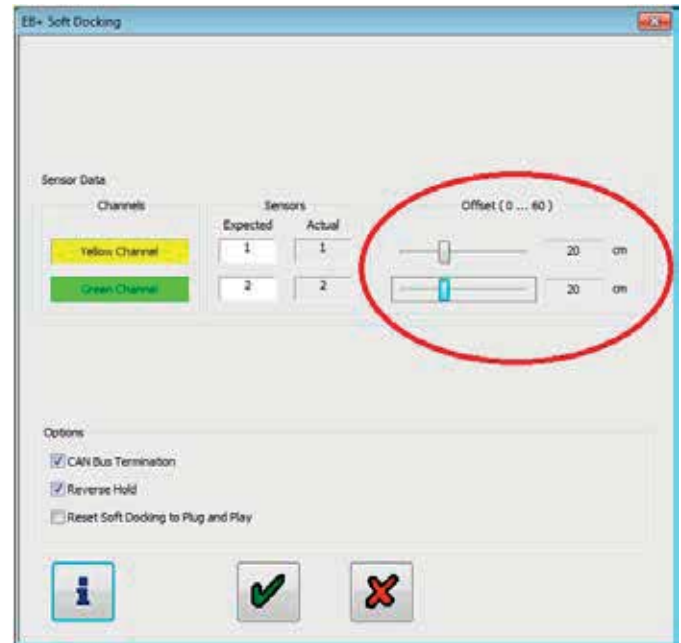
Step 16:
 If no sensor channel offsets are required, go to step 17.
 If sensor channel offsets are required, go to step 18.

Step 17:
 Proceed to EOLT.

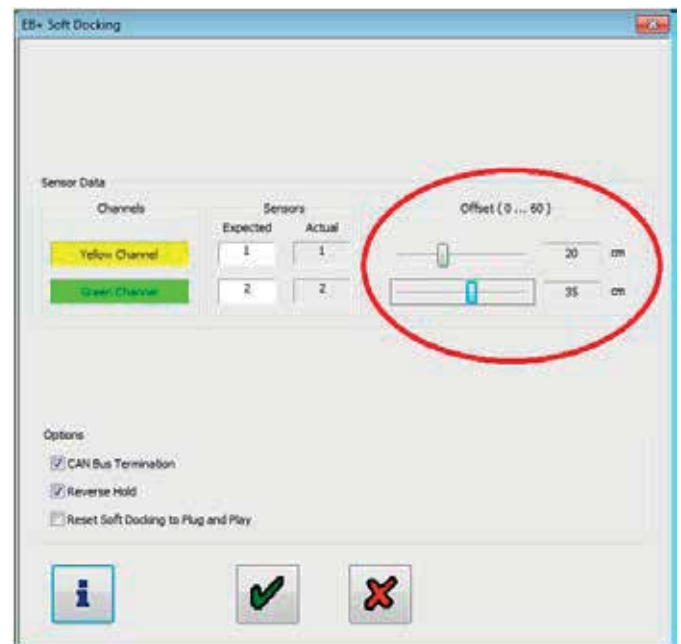
Click on 'green' ticks until you reach 'DIAG+ home page'

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.

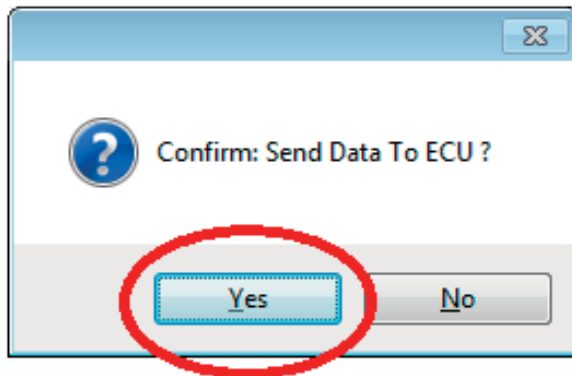
Step 20:

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.



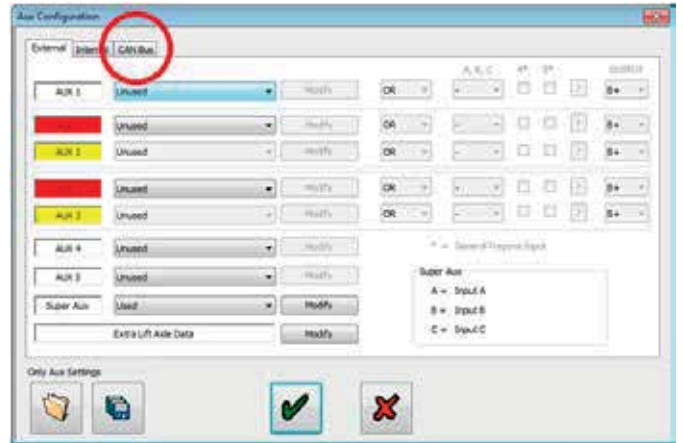
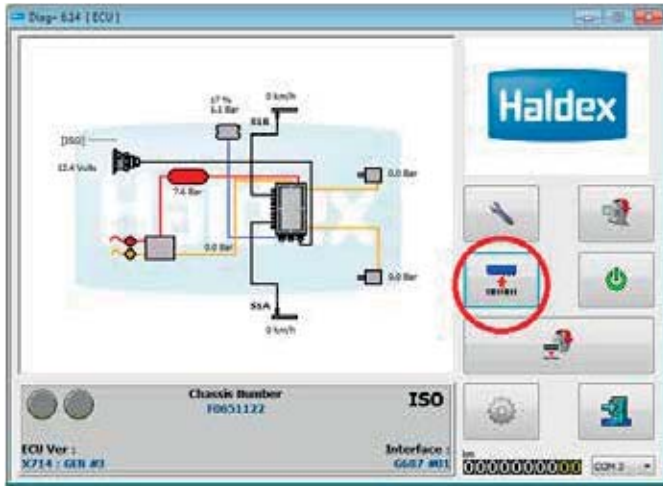
How to configure a sensor channel offset

Step 1:

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

Step 4:

Select CAN BUS tab.

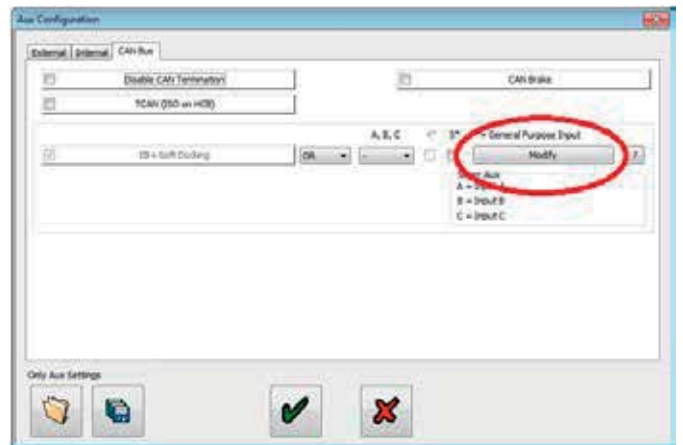


Step 2:

Select ECU parameters / configuration.

Step 5:

Select "Modify" button.



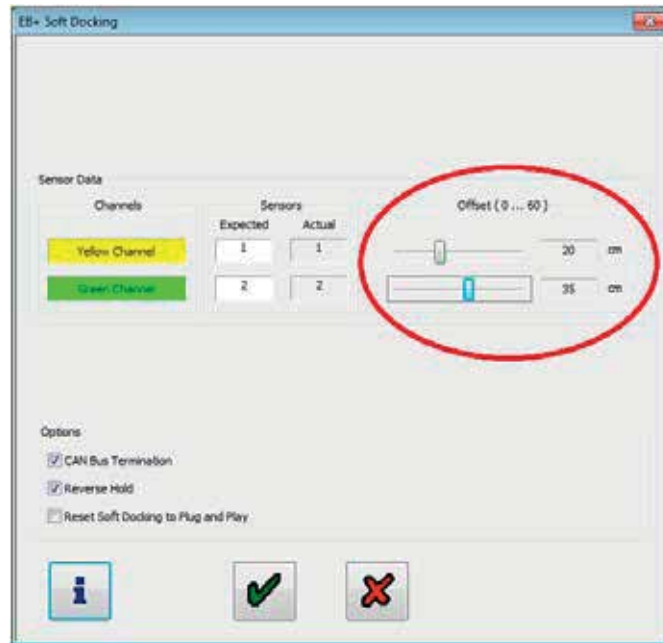
Step 3:

Select setup auxiliary configuration.



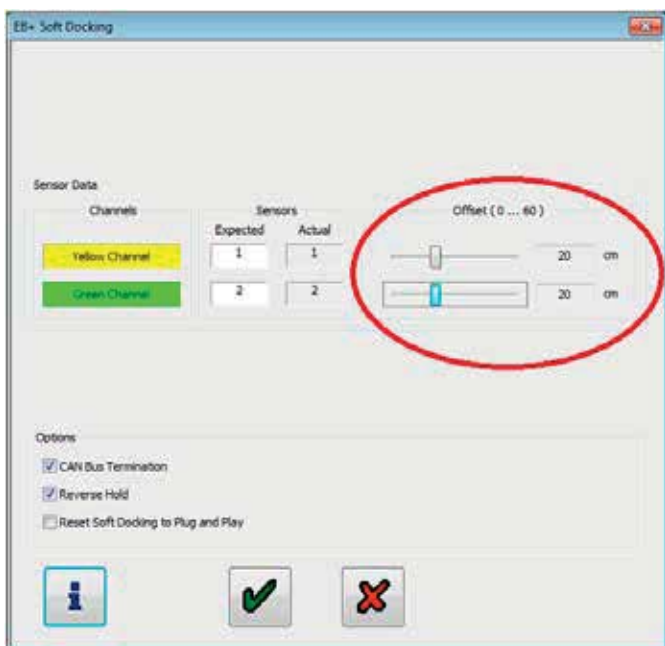
Step 6:
Adjust channel values to sensor installation offset.

Offset example:
Both channels are different values.

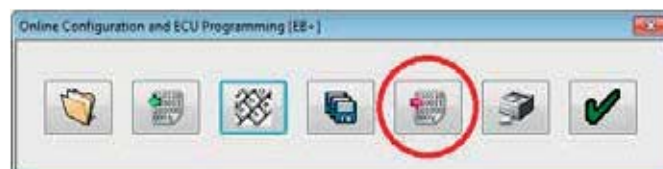


Offset example:
Both channels the same value.

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

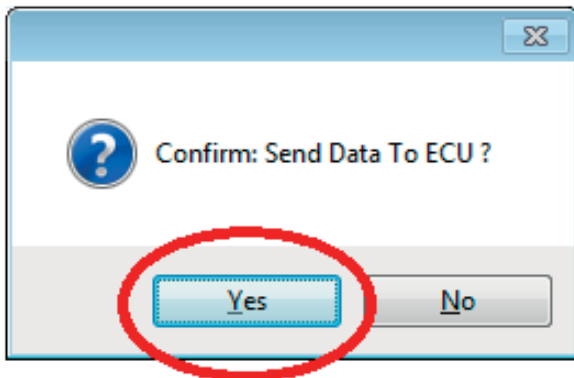


Step 8:
Select 'Send data to ECU'.



Step 9:

Select 'Yes' to send data to ECU.



Step 10:

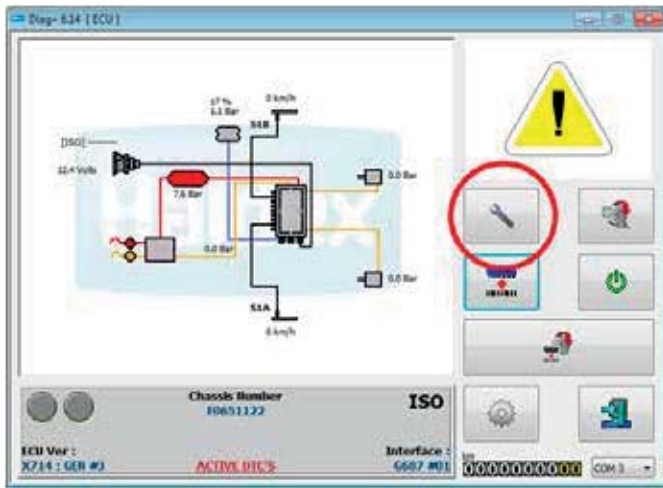
Click green tick to return to DIAG+ home page.



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.

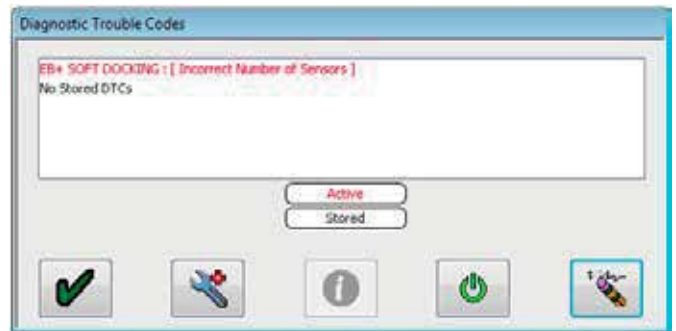


Step 4:
Check 'Diagnostic Trouble Code' window for any active DTC's.

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.

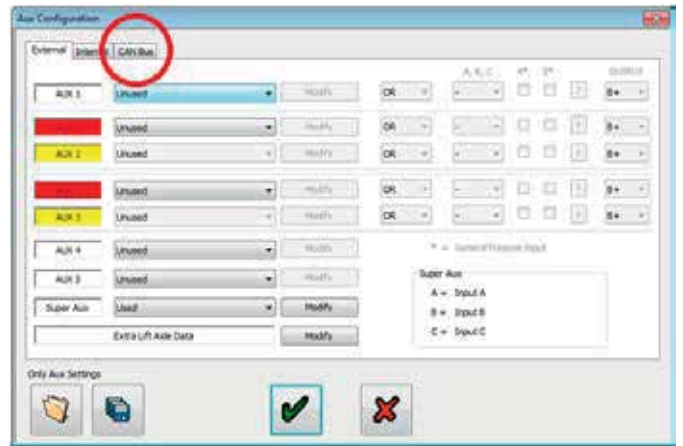
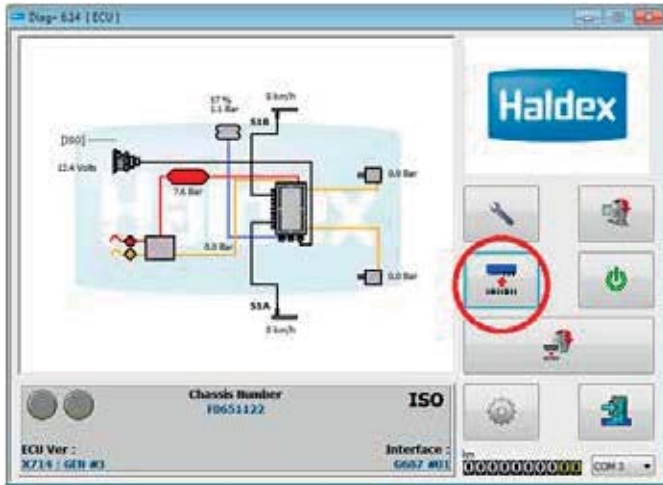


Step 5:
Click on 'green' ticks until you reach the DIAG+ home window.



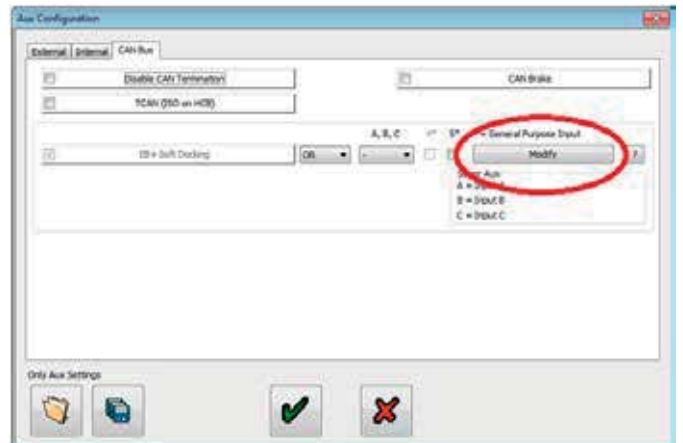
Step 6:
Select configuration.

Step 9:
Select CAN BUS tab.



Step 7:
Select ECU parameters / configuration.

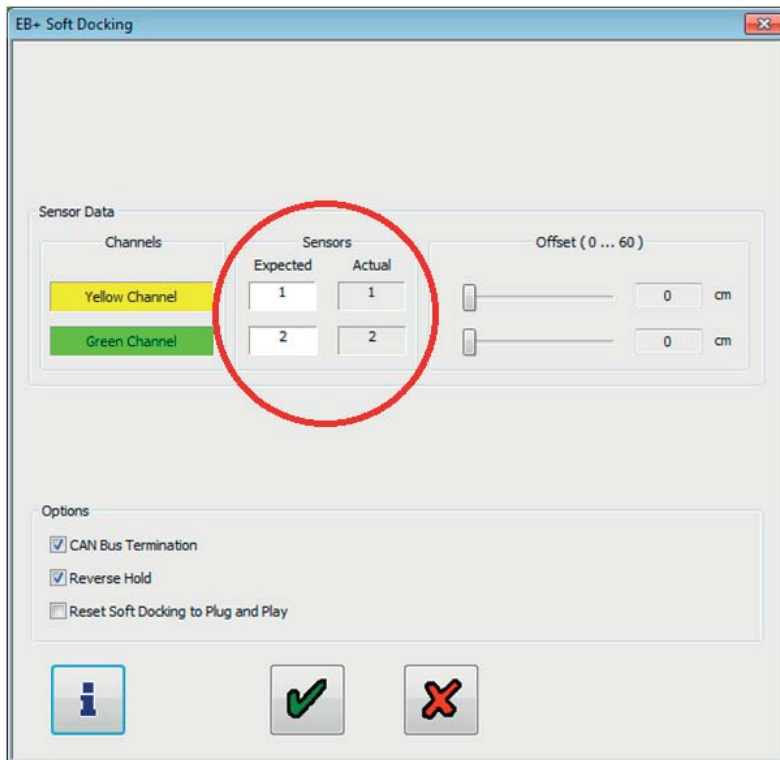
Step 10:
Select "Modify" button.



Step 8:
Select setup auxiliary configuration.



Step 11:
Check displayed sensors for errors.



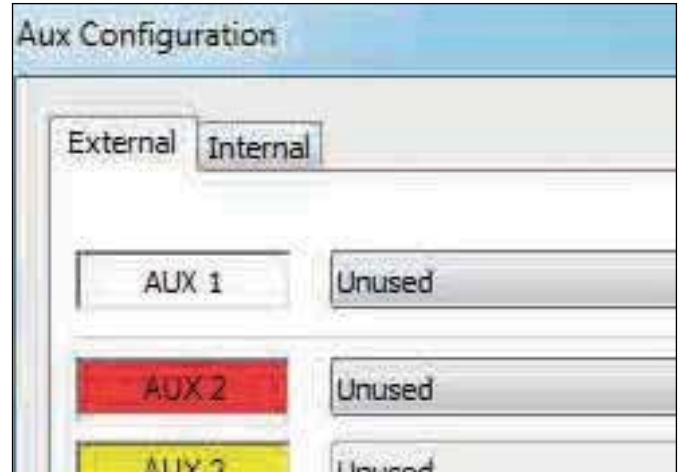
Step 12:
Rectification of faulty sensors

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

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

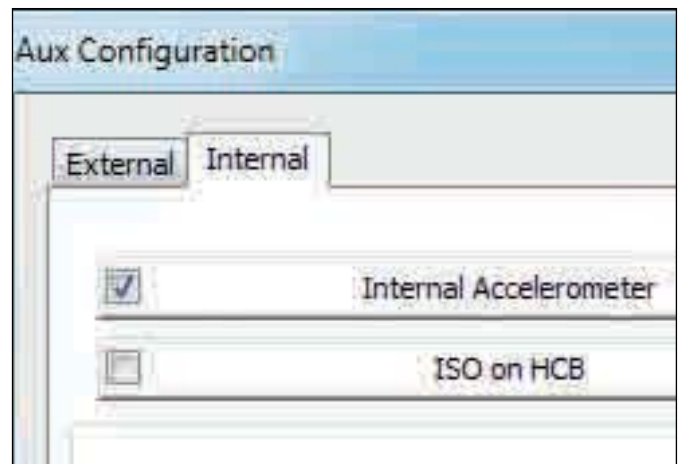
Internal accelerometer

To set the parameters click on button marked 'internal'



The following screen will appear.

Click on box 'internal accelerometer' to select installation.



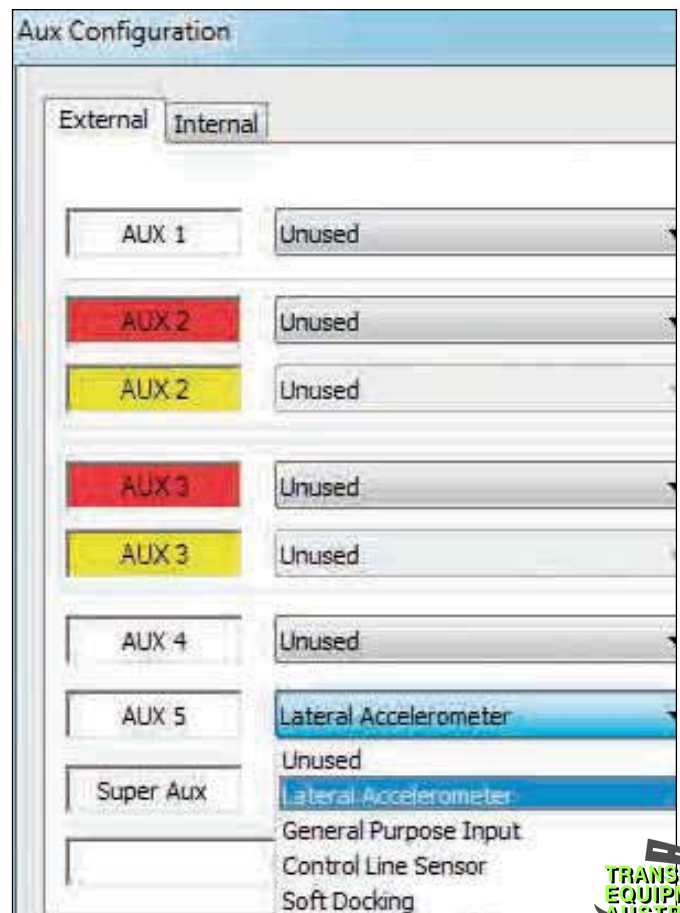
Note: An additional auxiliary test runs specifically for the internal accelerometer.

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.



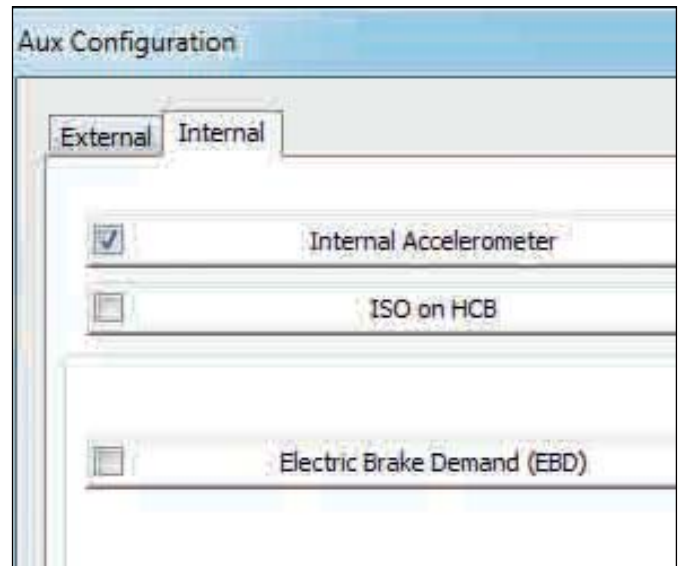
Electric brake demand (EBD)

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

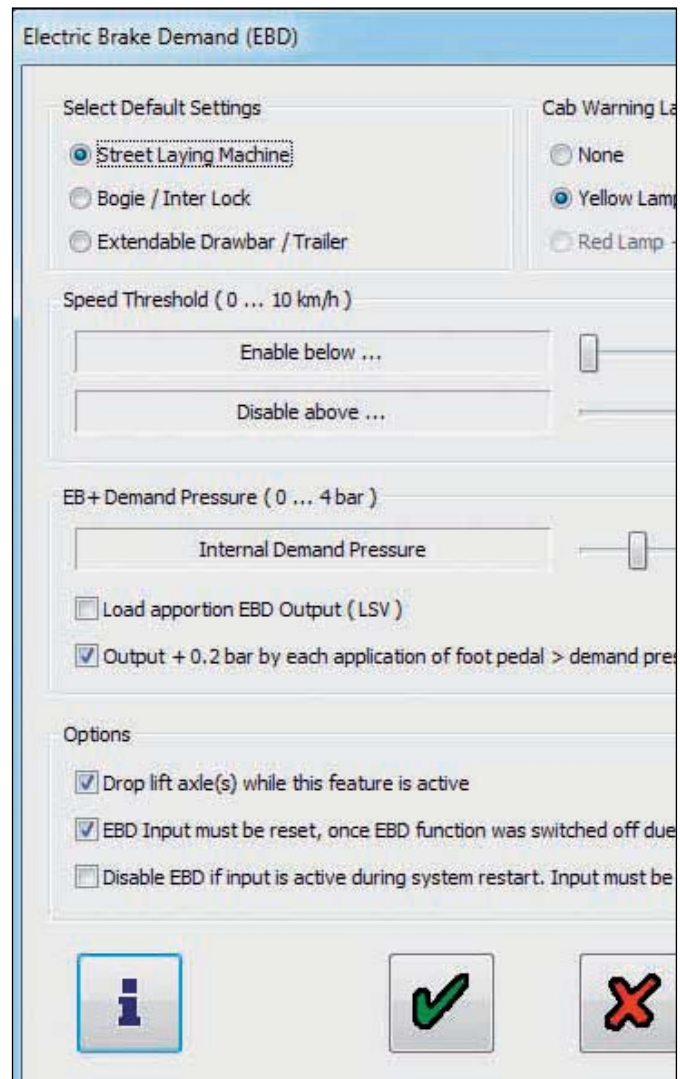
Yellow lamp

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.

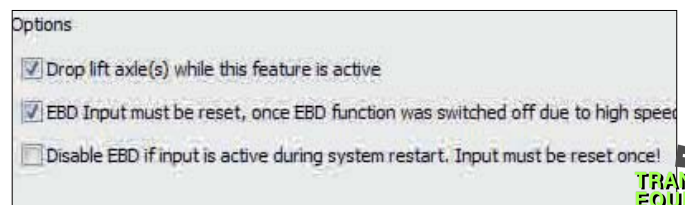
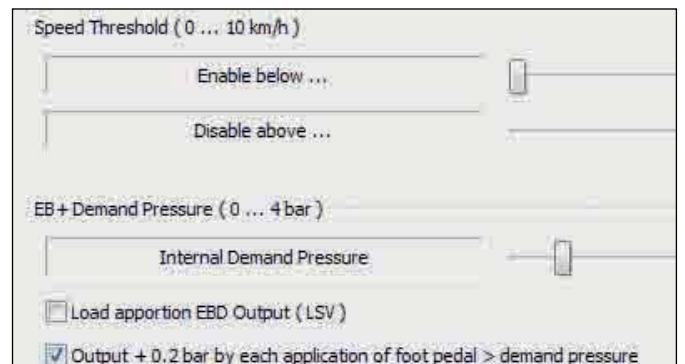
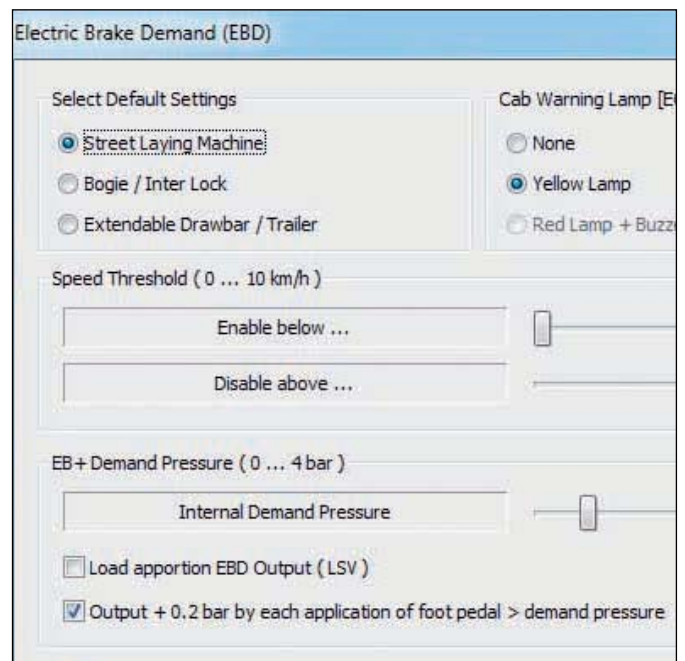
Additional, if you use Super AUX EB+ variant:
 Input A, B, C available on power B connector.
 Several of these inputs (A and / or B, A and / or C, B and / or C), or customer specific combination of these inputs (modify screen).

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  button.

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%).

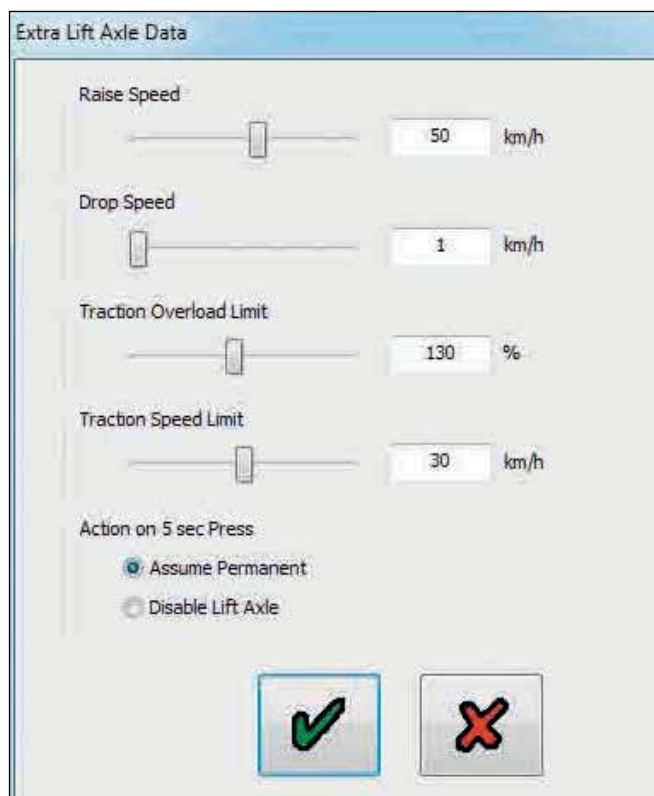
Traction speed limit

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.

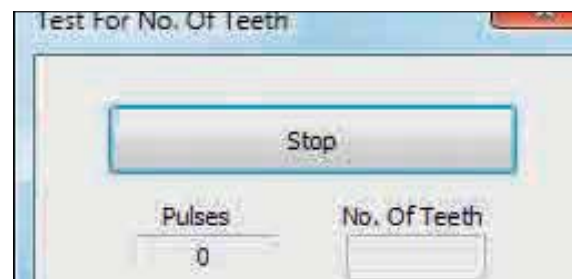
Test for number of teeth

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.



tails

Trailer Manufacturer	Brake Calculation
Chassis Number	Type

Axle Information

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

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

Geometric Data

Configuration | Lift Axle Position | Wheel Base

Type Of Towed Vehicle Select Ty

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.

Geometric Data

Configuration: Lift Axle Position (Wheel Base)

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

Geometric Data

Configuration: Lift Axle Position (Wheel Base)

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+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:

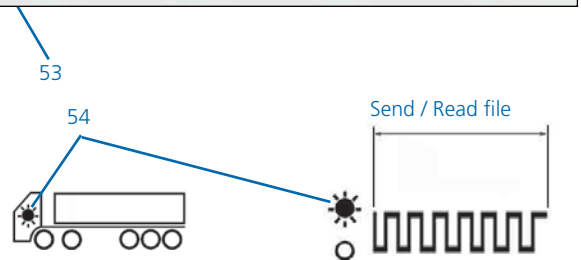
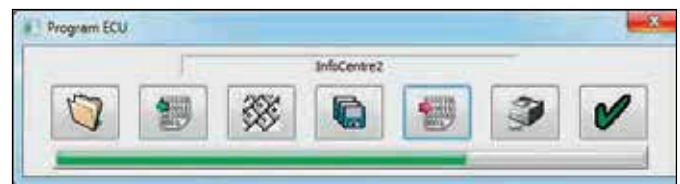
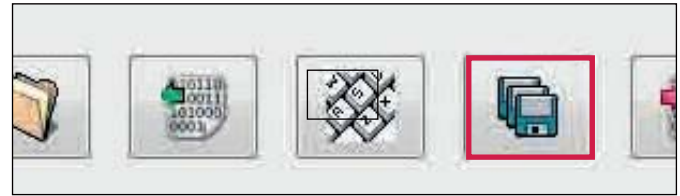
- 53 A bar indicator fills the progress box on the 'Program ECU' screen.
- 54 The trailers EBS warning lamp function is
 - a) 'on' - ECU not programmed
 - b) Flashing - programmed ECU (with an 'ECU setup' installed)

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.

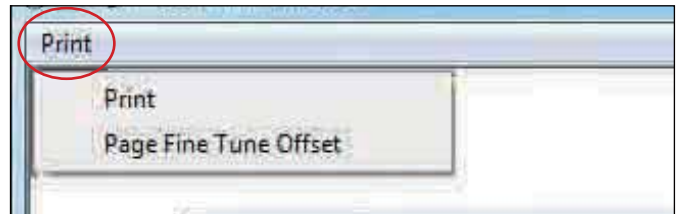
› Click 'Print' to print the EOLT report.



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.

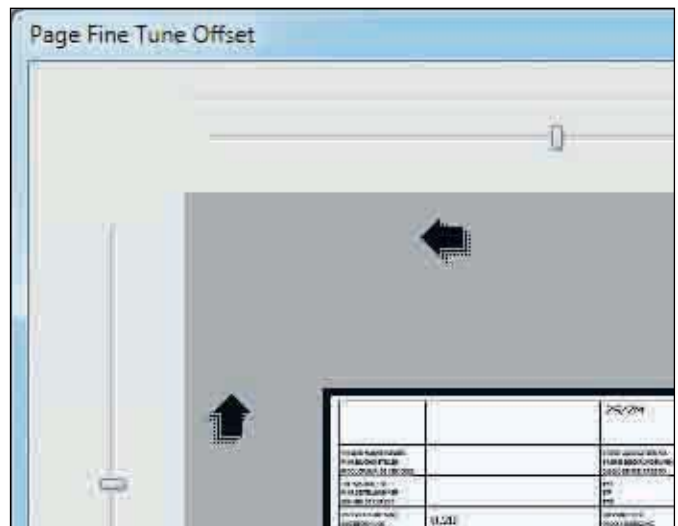


Page fine tune offset

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.

	EB+ ADR TŪ.EGG.094-04	2S/2I Stabi	
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 DRUCKBEGRENZ LIMITE DE PR	
	UNLADEN / LEER / A VIDE	LADE	
	INPUT PRESSURE EINGANGSDRUCK PRESSION D'ENTREE [bar]	6.50	INPUT PRESS EINGANGSDR PRESSION D'E
[1.00 bar = 100 kPa]	AXLE LOAD ACHSLAST CHARGE ESSTIEU [kg]	SUSPENSION PRESSURE BALGDROCK PRESSION DE SUSPENSION [bar]	OUTPUT PRESSURE AUSGANGSDRUCK PRESSION DE SORTIE [bar]
1 AXLE	2000	0.70	2000



End of line test (EOLT)

Before commencing EOLT:

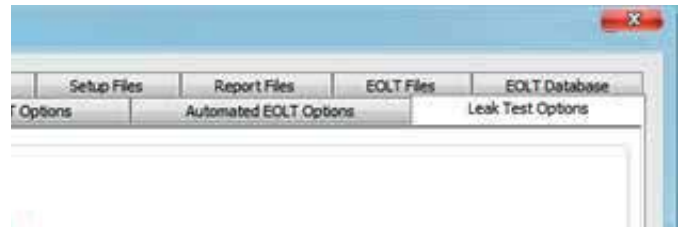
- Clear all active or stored diagnostic trouble codes
- Set the leak test parameters in the options menu



Setting leak test parameters

Click on the  button

Click on the leak test options tab



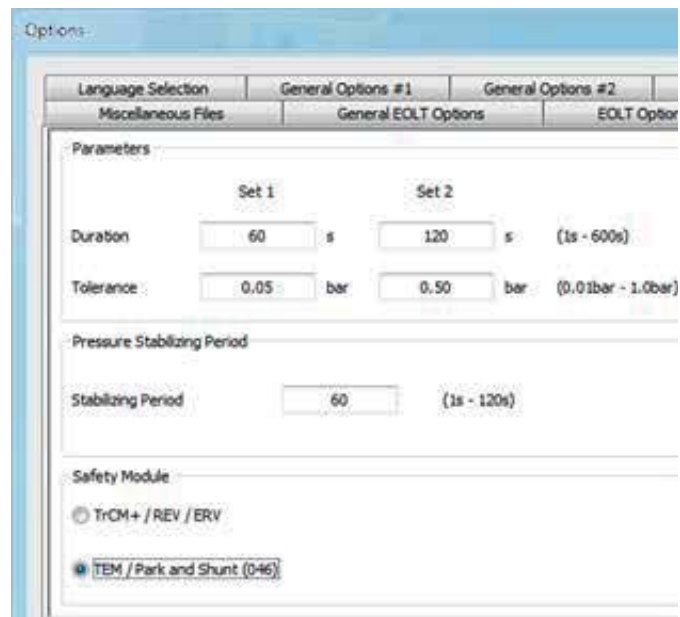
Input the required parameters for:


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:

- 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.

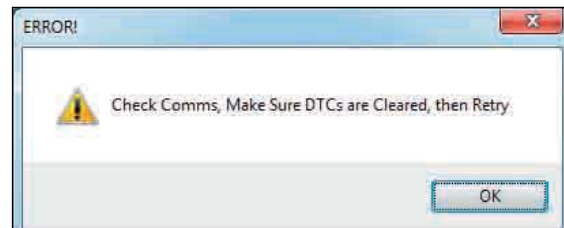
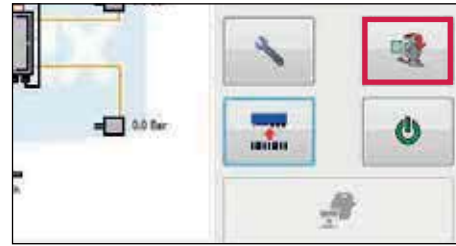
› Software versions

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.

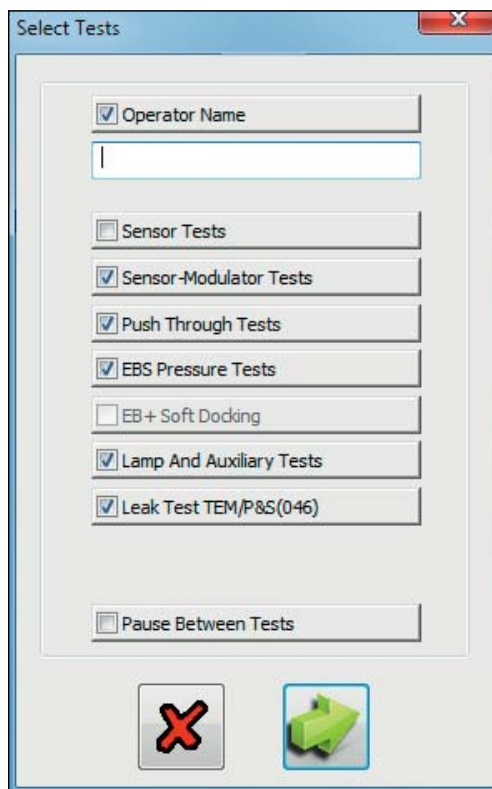
If the 'Operators name' option is selected, it will enable a name to be entered in the area below. This will be recorded on the EOLT report.

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:

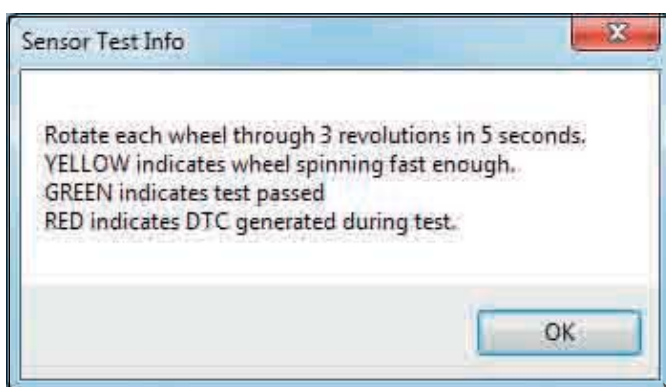
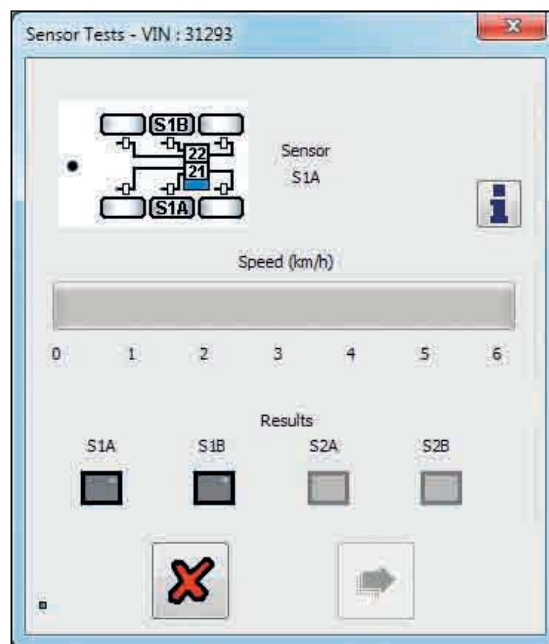
- > Rotate each wheel through 3 revolutions in 5 secs
- > The test sequence is S1A, S1B, S2A, S2B etc

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)



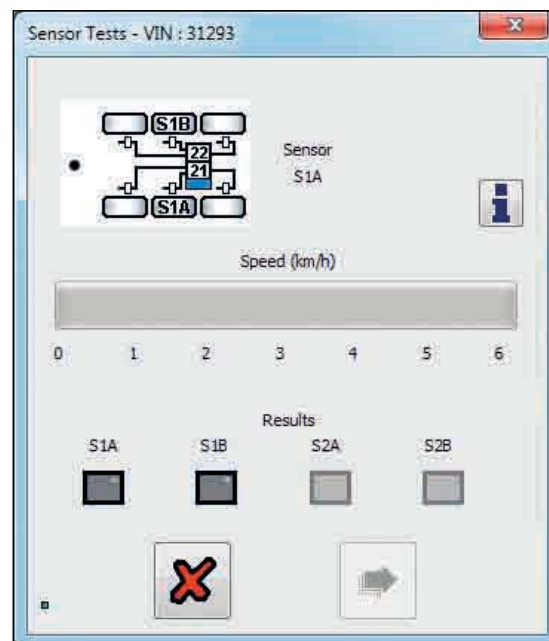
Sensor tests

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




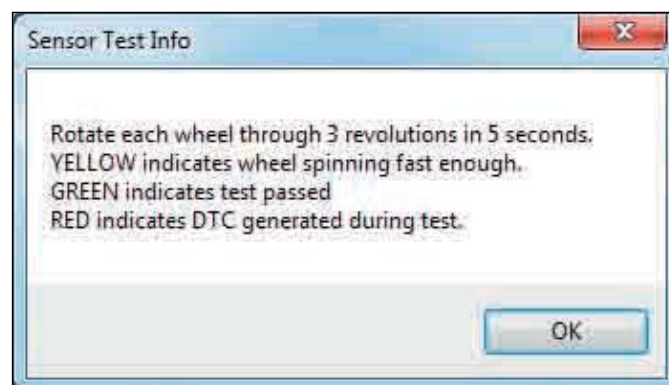
Result section:

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

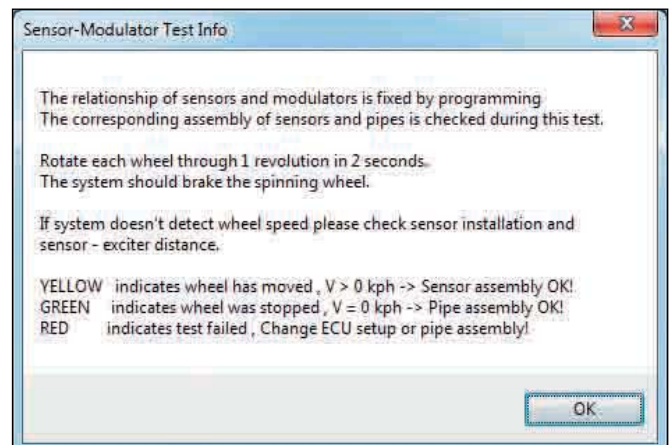
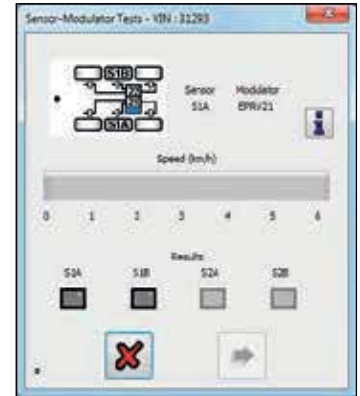
Result section:

Yellow indicates wheel has moved.

Green indicates test passed.

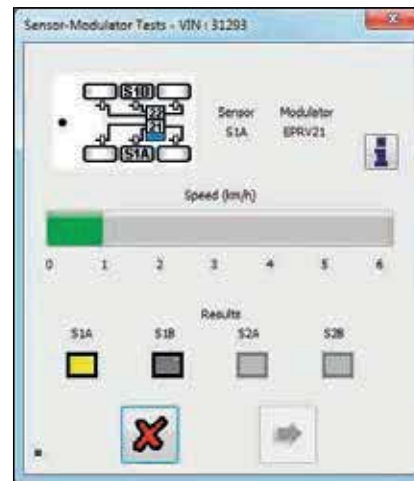
Red indicates test failed.

Click on the  button to access the individual test procedure.



S1A test started

Manually rotate wheel S1A at 1 revolution in 2 seconds.

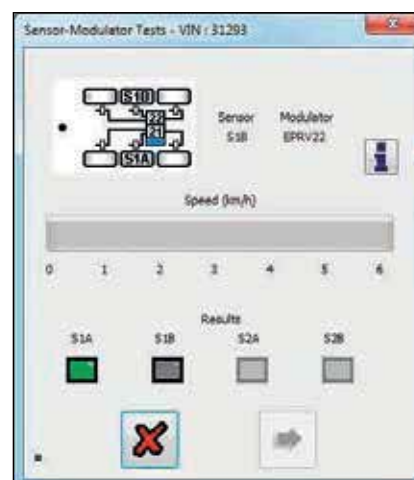


Wheel speed detected (moving green bar)

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.



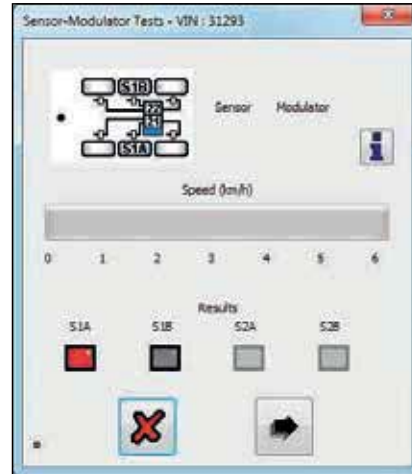
Correct wheel braked (green indication)



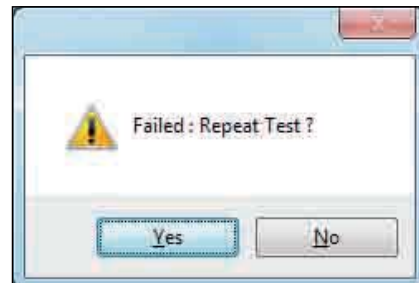
Failed test

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

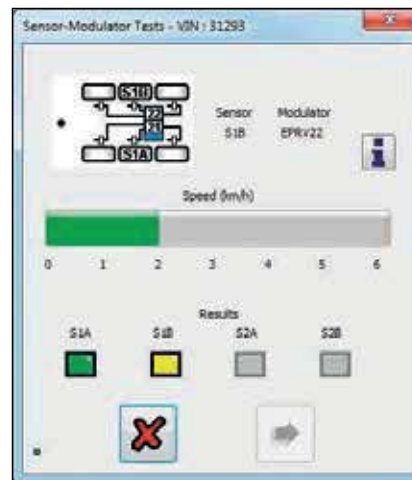


S1A wheel failed (red indication)



S1B test started

Manually rotate wheel S1B at 1 revolution in 2 seconds.



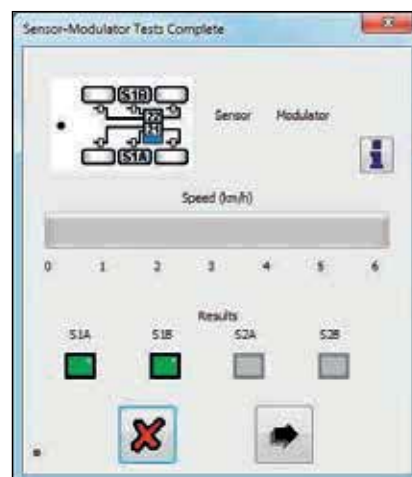
Wheel speed detected (moving green bar)

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.

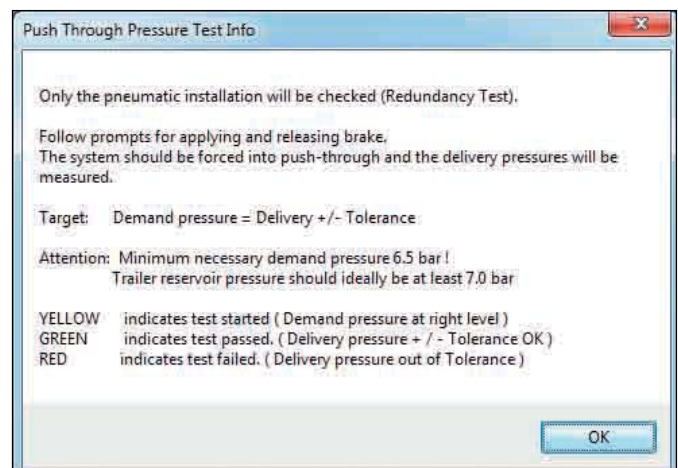
For 3M systems the actual pressure is displayed in the 'remote valve' box.

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.

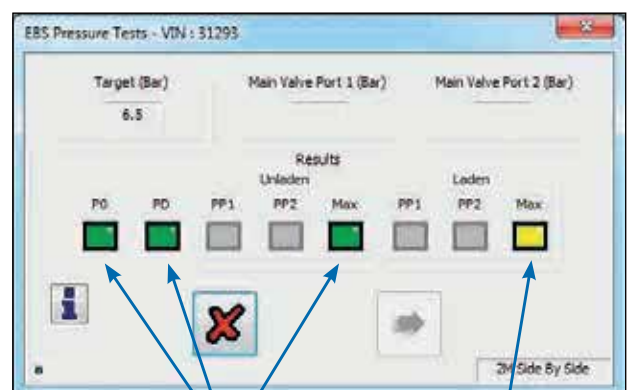
Green indicates test passed.

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.



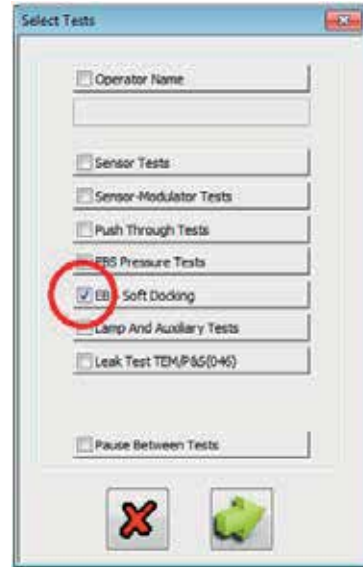
Test passed (green indication)

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

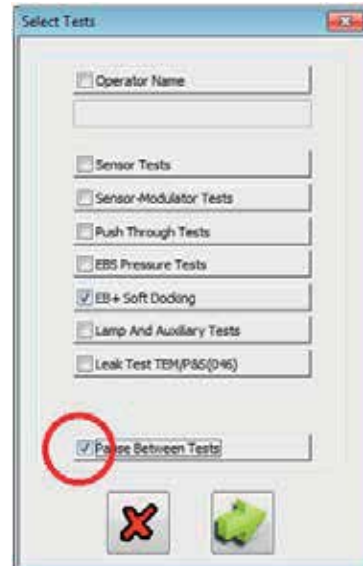
Tick the EB+ Soft Docking box.



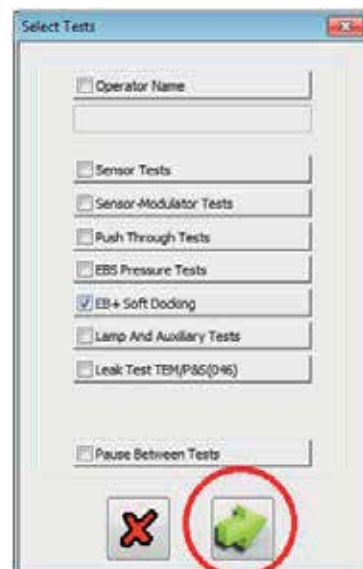
EOLT option:

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

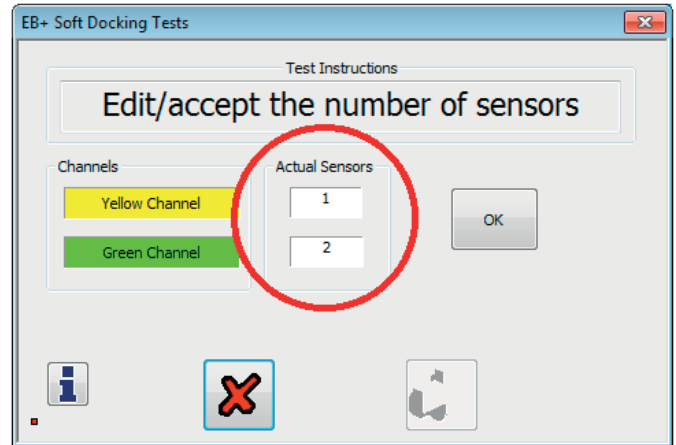
When ticked the EOLT waits for a prompt from the operator before proceeding to the next test.



Select 'arrow' to start the EOLT.

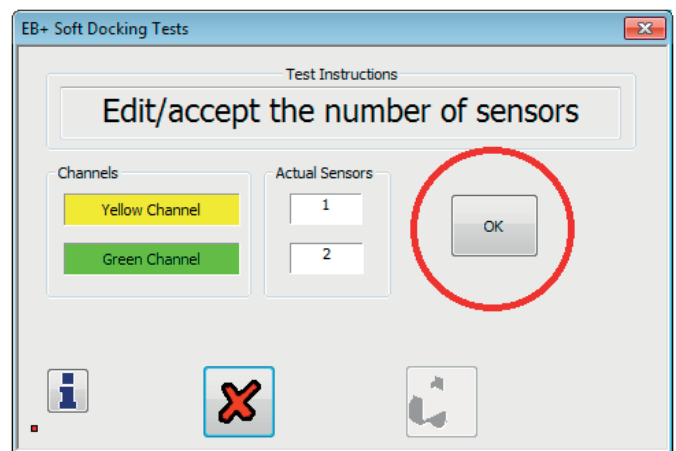


Check 'Actual Sensors' displayed value is correct.

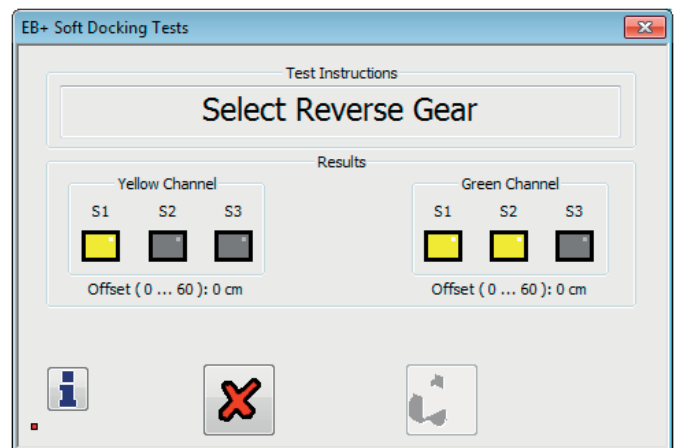


Note: Manually edit the sensor boxes for the correct values before proceeding with the EOLT.

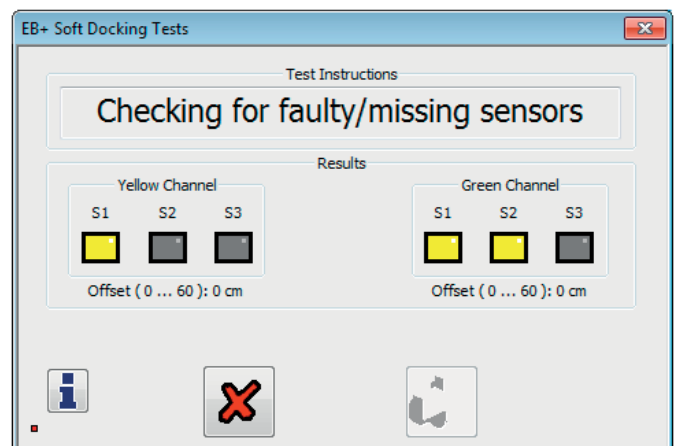
Select 'OK' button.



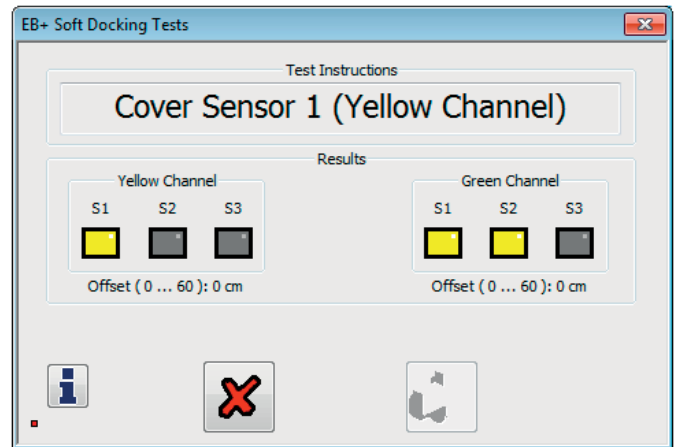
Select vehicle reverse gear.



Check all installed sensors are displayed.



Activate the sensor on the yellow channel.



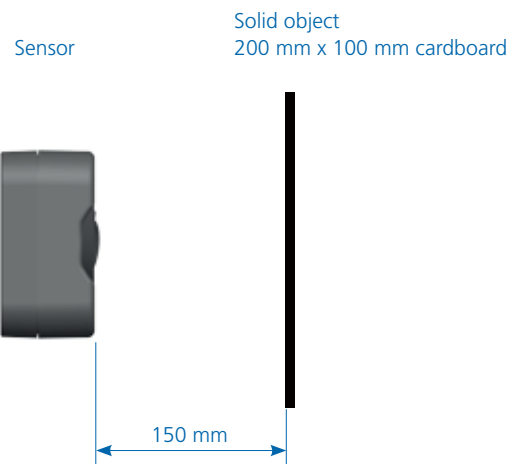
Sensor activation sequence:

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)



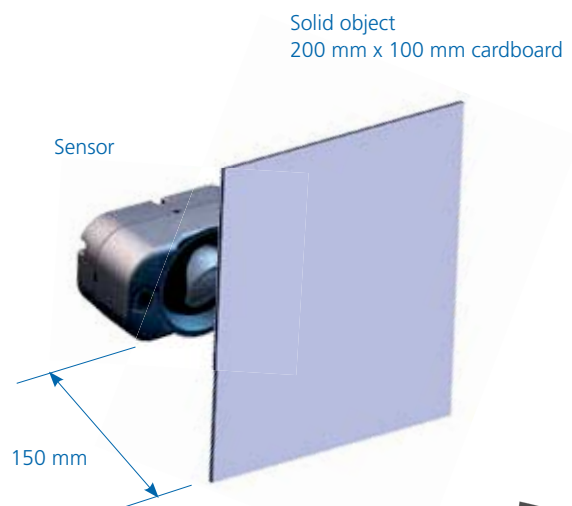
Test sequence:

Marker lights flashing.

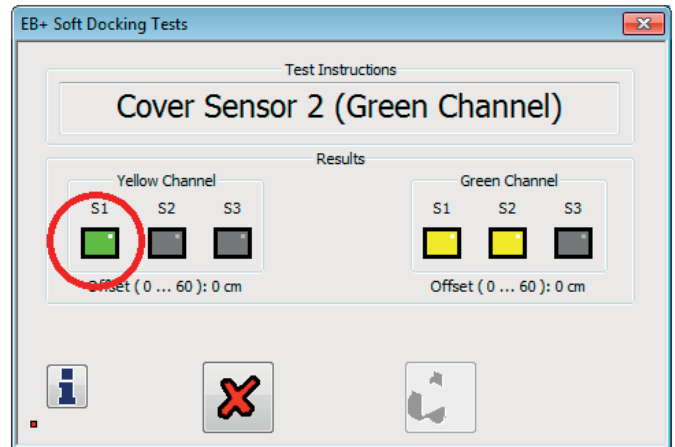
Place a solid object 150 mm away from the sensor face.

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

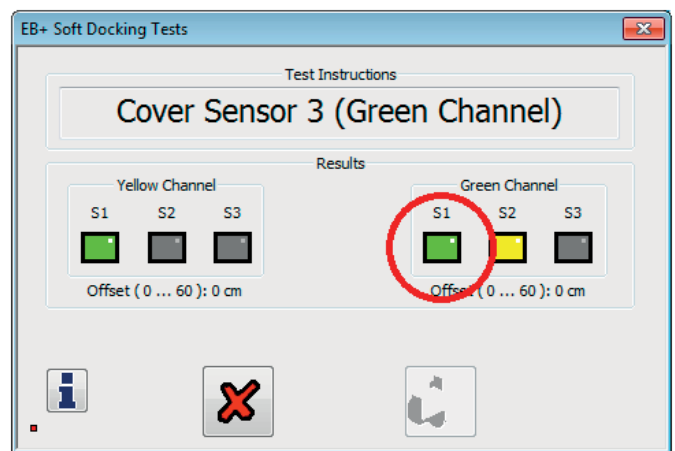
DIAG+ screen shows that the sensor has been detected using a green box (S1, S2 or S3)



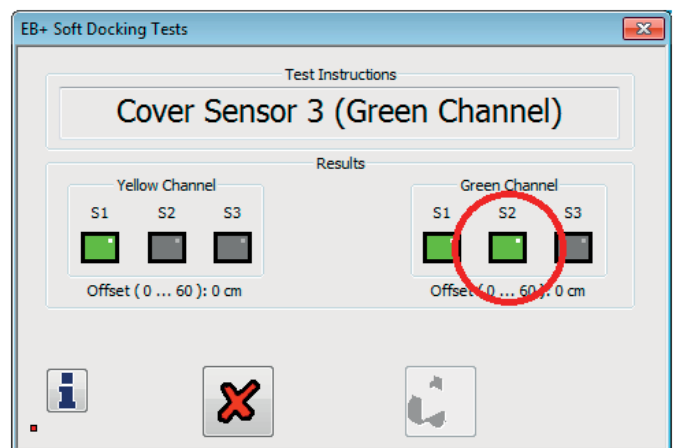
Sensor on the yellow channel has been detected (S1 box green).
 Activate any sensor on the green channel.



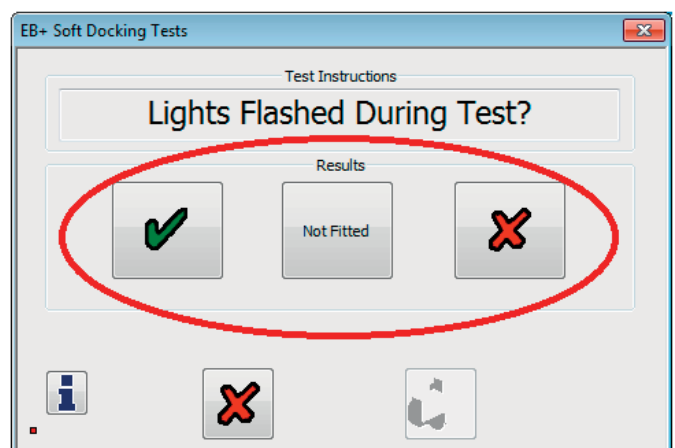
Sensor on green channel has been detected (S1 box green).
 Activate the next sensor on the green channel.



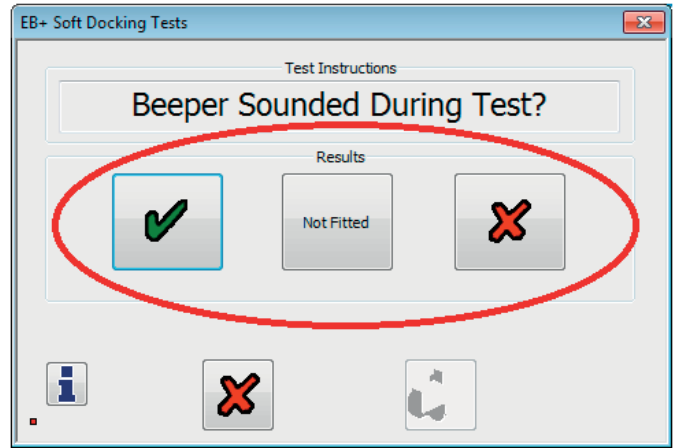
Sensor on green channel has been detected (S2 box green).



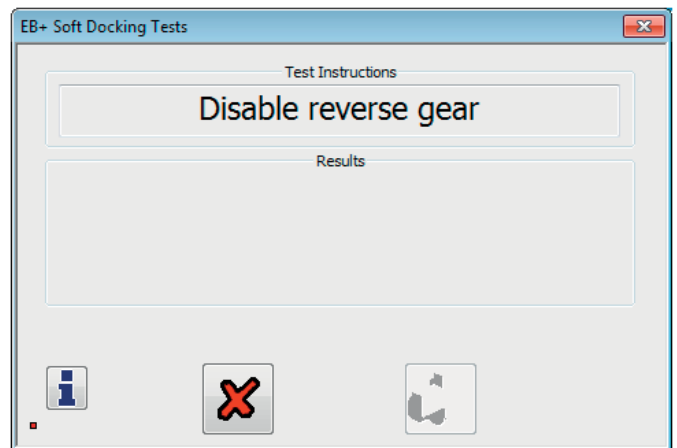
Select / click the correct button.



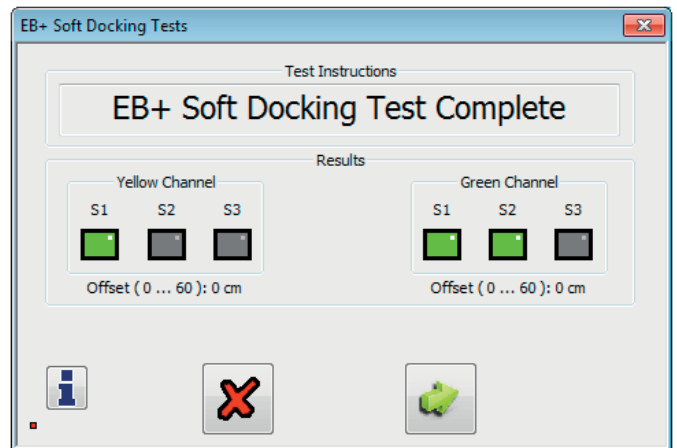
Select / click correct button.



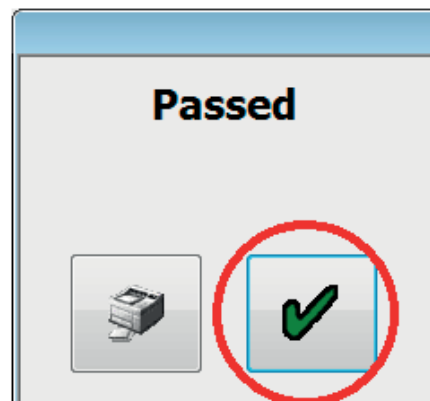
Disable vehicle reverse gear.



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'.

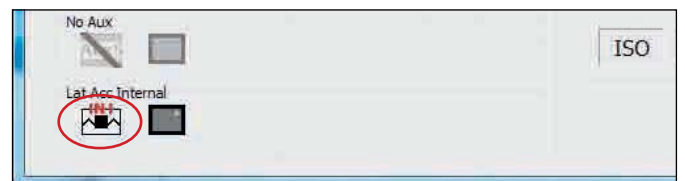
If the test fails refer to EB+ Installation Instructions 006 300 018 and check chassis installation.

Click on the  button to calibrate the accelerometer.

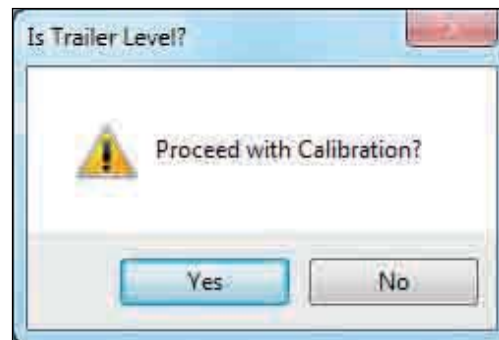
Click on the  button to exit without calibrating the accelerometer.

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

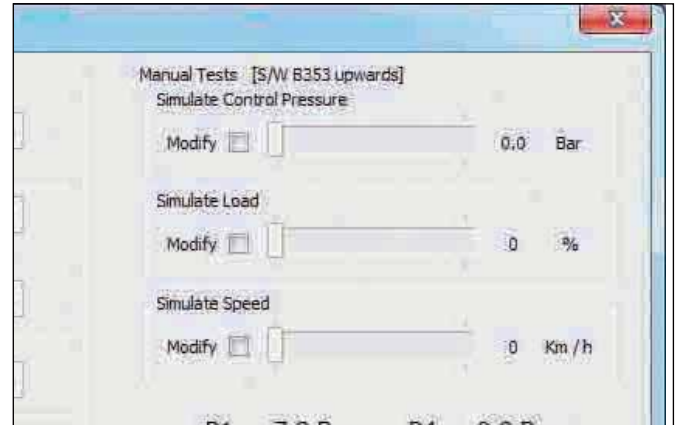
24N power received ok

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:

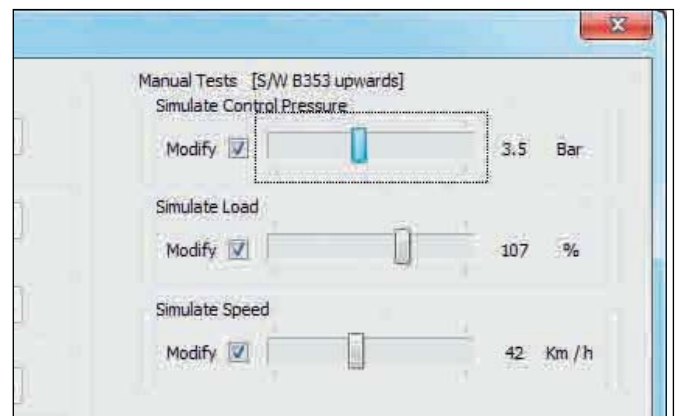
- › Control pressure
- › Load
- › Speed




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.

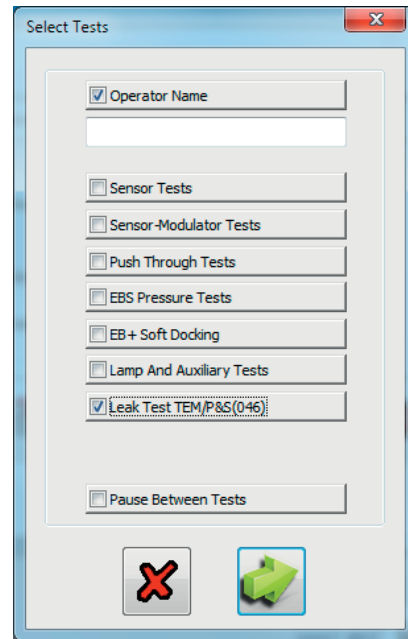
Leak test TrCM & TEM

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)

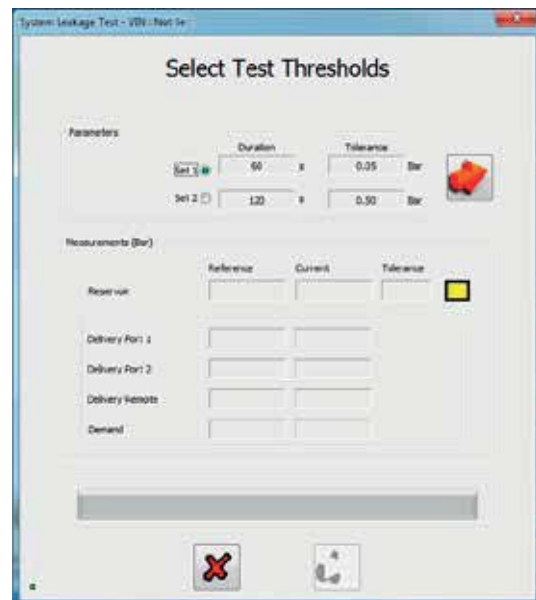
Select leak test box

Click on the  button to start the test.




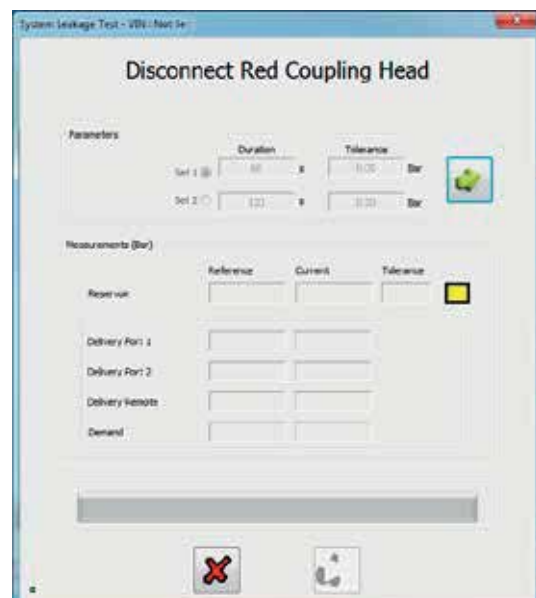
Select either set 1 or set 2 (as read from the leak test option page)

Click on the  button to proceed



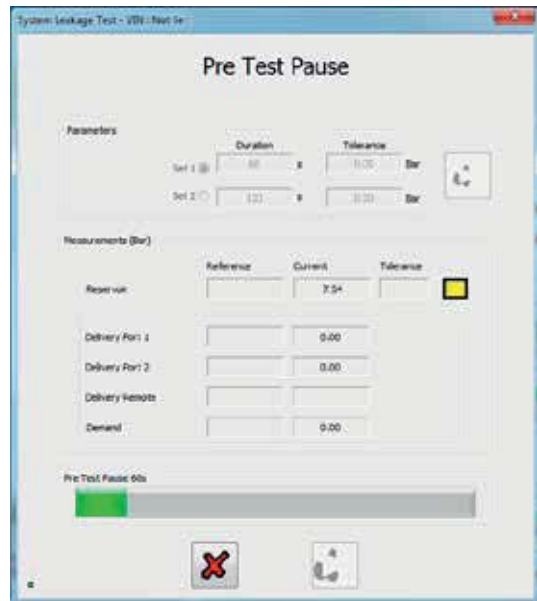
Disconnect the red coupling head (emergency red line) from the trailer.

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)

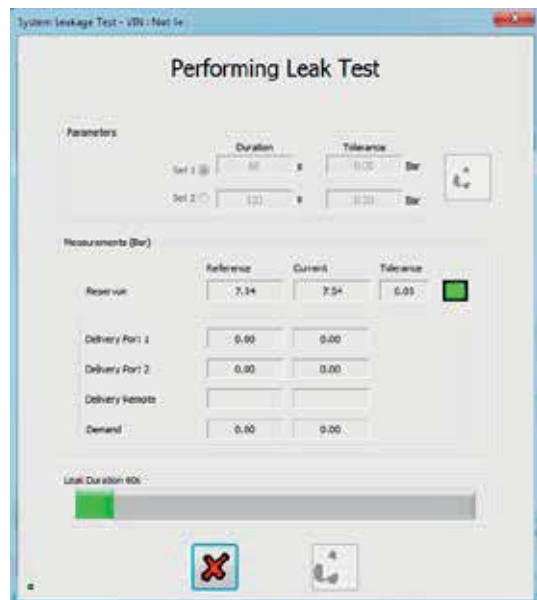


The reservoir pressure is now read (reference) and the leak test started.

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

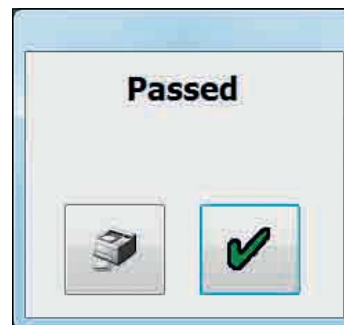
Click on the  button to exit test




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

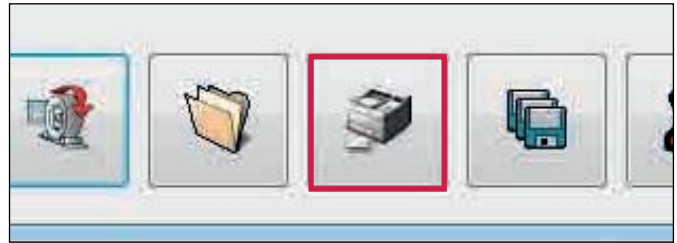
Click on the  button to return to the EOLT options menu.

Click on the  button to print out the EOLT report.

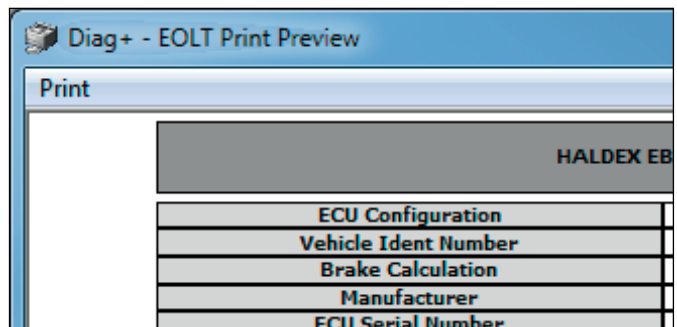


EOLT report printing

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							Haldex	
ECU Configuration		49 - 2M ECU Left						
Vehicle Ident Number		31293						
Brake Calculation		S E No. 2811.131						
Manufacturer		M & G Trailers						
ECU Serial Number		000000_47						
Software		B558						
Observer (km)		9						
Date (MM/DD/YY)		11/28/13						
Time		18:57						
Wheel Size		Rdyn (mm)		No. Of Teeth				
S1A/S1B		S28		100				
S2A/S2B		S28		100				
Sensor Tests				Not Applicable				
S1A	S1B	S2A	S2B					
-	-	-	-					
Sensor Manufacturer 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		Results		
		MASTER	SEMIOTE	MASTER	SEMIOTE	P21	P22	P23
Unladen Suspension		0.7				-	-	-
Laden Suspension		5.8				-	-	-
R0		0.3				-	-	-
P0		0.7		0.5		0.8	0.8	
PP1 (U)						-	-	-
PP1 (L)						-	-	-
PP2 (U)						-	-	-
PP2 (L)						-	-	-
PP3 (U)		0.8		3.0		3.0	3.0	
PP3 (L)		0.3		0.3		0.3	0.3	
P Load						-	-	-
Options								
REV								
		Auxiliary Tests		On / Off		Passed		
Lamp								
Aux 1		COLAS		On, 18km/h, 6km/h				Passed
Aux 2 Wheel		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 Interhal		Not Fitted						-
Jerk								-
Notes								
Operator's Name								
Signature								



Saving an EOLT report

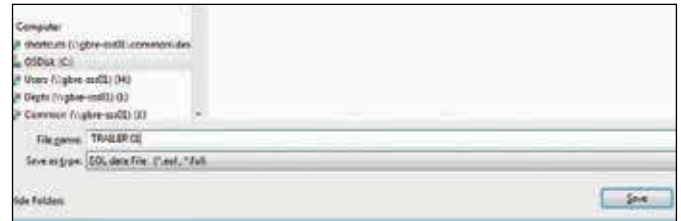
By selecting the  button a report file can be saved.

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.

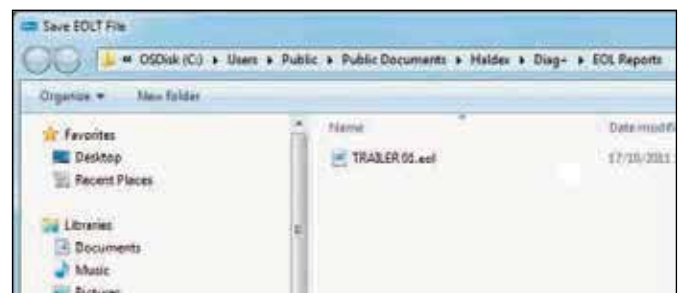
Note: The EOLT report can only be viewed within DIAG+ program in the EOLT section.



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




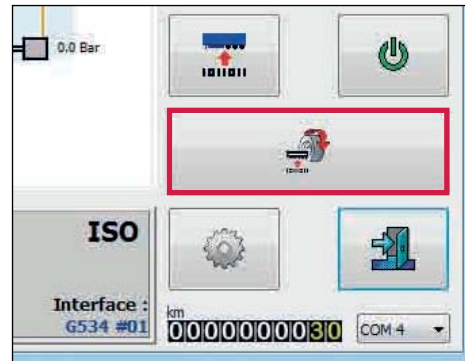
File name 'TRAILER 01.eol' has now been saved



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.

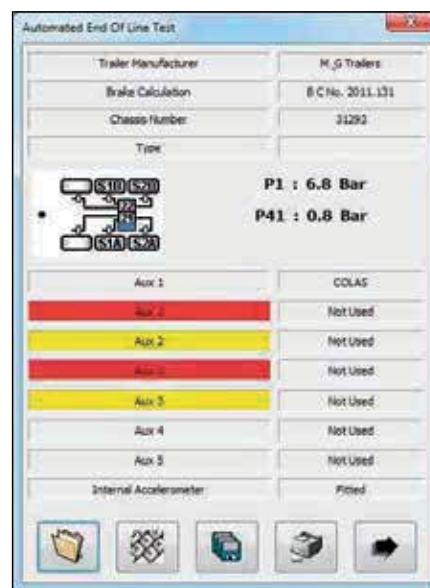


The screen automated end of line test will appear.

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.



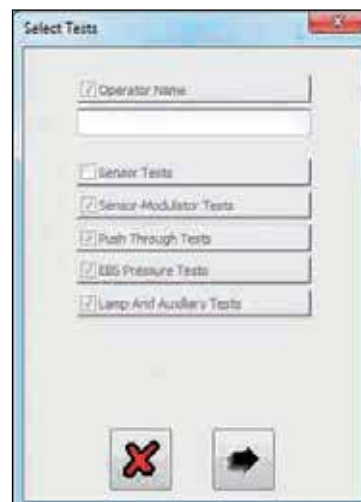
The print icon will allow you to print the load plate data.

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.



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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