OPERATOR'S GUIDE

DIAG++

Haldex

www.haldex.com

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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Contents

Installation

EBS / ABS Operation

Introduction

With DIAG++ you can use a standard personal computer to read and delete diagnostic codes, program vehicle parameters and end of line test (EOLT) for Haldex EB+ 4.0 EBS (referred as EBS in the rest of the document) and Haldex ABS 4.0 (referred as ABS in the rest of the document). The USB PC Interface (dongle) allows communications between a standard PC and the ECU. Connections to the USB PC Interface (dongle) are made through a cable connecting to a USB port on the computer and another cable connecting the diagnostic interface to the ECU. The vehicle parameter data is stored inside the ECU. It will remain intact even after electrical power is removed from the ECU.

Installation

Minimum system specification

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

Processor - No particular requirement

RAM - 256 megabytes

Hard drive - 30 megabytes free

MS Window 10 or higher

In addition to the above, a USB port is required to connect to the USB PC Interface (dongle).

Downloading DIAG++

The latest DIAG++ version software can be downloaded from the Trailer Application Guide section of the Haldex website.

To download follow:

› Click here: Trailer Application Guide / Software

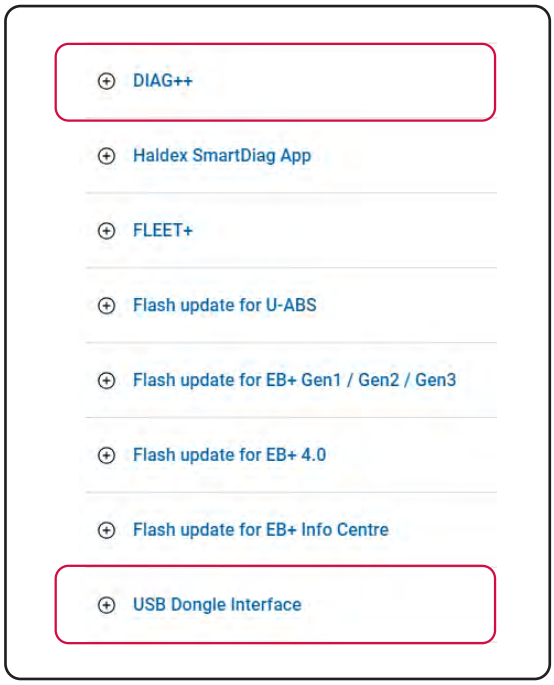
› Select DIAG++

› Download software

Follow installation procedure

Installing the software

The latest DIAG+++ installer, dongle driver and dongle software installer can all be downloaded from the Haldex Trailer Application Guide website.



The software must be installed before the connection of the USB PC interface (dongle).

› Download installer (.zip file) from Haldex Trailer Guide website

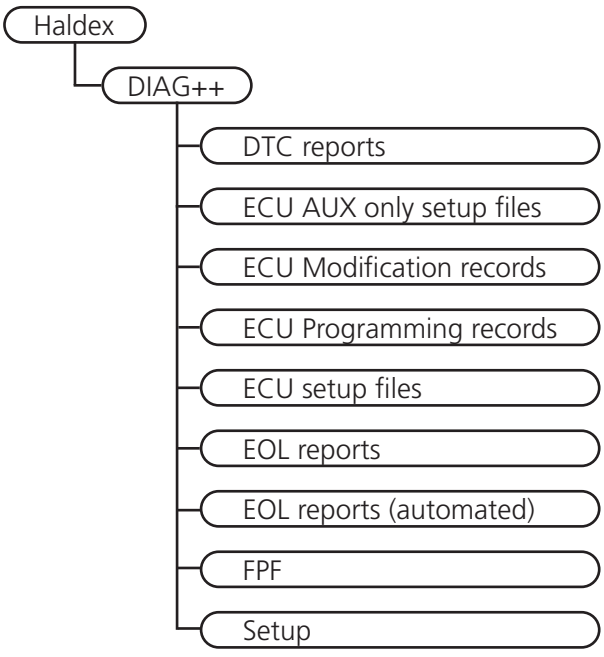
› Unzip installer and then run it (.exe file)

› The installer will place a shortcut to the DIAG++ program on the users desktop

Refer to 'Updating the USB PC Interface (dongle) software' section if the dongle driver needs to be installed.

In addition to the application folders, the following folder structure is added to your computer when DIAG++ first runs.

On Windows 10 the Haldex folder will be located in C:\Users\Public\Public Documents.



Installing the hardware

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

950 800 912 Diagnostic cable kit	
Part number	**Description**
814 036 001	ECU / PC Interface cable (6.5 m)
844 511 065	EB+ 4.0 CAN to PC Interface cable (6.5m)
815 018 001	EB+ ISO diagnostic cable
814 011 001	EB+ SOV / PC Interface cable (6.5 m)
042 623 719	Transit case

950 800 909 Interface kit	
Part number	**Description**
815 023 001	USB PC Interface (DIAG++)
042 707 309	USB cable

PC interface LED

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

- Yellow (solid): Indicates connection to USB port
- Red (solid): Indicates connection to USB port and ECU with CAN communication established
- Red / Green (flashing): Indicates a DIAGN connection is active with data being transmitted

The following behaviour shows a fault condition:

- Yellow (flashing): Indicates connection to USB port and power received from ECU but CAN communication not established

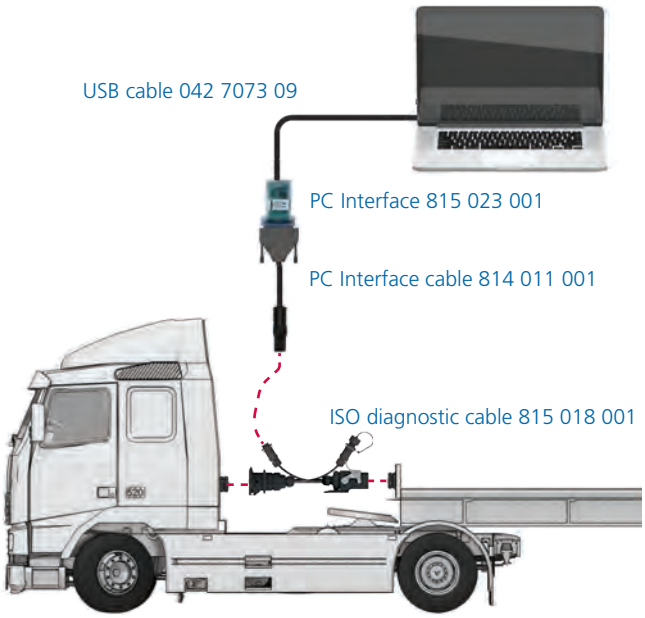
Connecting to EBS & ABS via ISO 7638

The ECU can be accessed by using the EB+ ISO diagnostic cable (815018001).

Disconnect the ISO 7638 truck to trailer cable and connect the EB+ ISO diagnostic cable (815018001) between the truck and trailer.

Connect the PC Interface to the ISO diagnostic cable using the PC interface cable (814011001).

Connect the PC Interface to the PC USB port using the USB cable (042707309).



Connecting a PC directly to EBS & ABS

To access the ECU directly, connect one end of the USB cable (042707309) into a USB port on the back of your PC or laptop and the other end into the PC Interface (815023001).Then connect the PC Interface to the H-CAN connector on the EB+ 4.0 using cable series 844 511 xxx.

The LED light on the PC Interface should now be 'on', coloured orange

Power the EB+ 4.0 EBS from an external 24 V dc supply (i.e. correctly rectified and smoothed) or a tractor unit.

The LED light on the PC Interface should now be 'on', coloured red.

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

Updating the USB PC Interface (dongle) software

The USB dongle software can be updated.

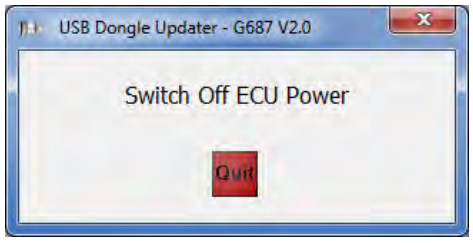
The latest software revision is available on the Haldex Trailer Application Guide website.

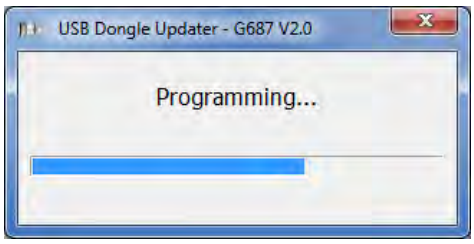
The required files that have been downloaded along with the DIAG++ software and can be found here:

C:\Program Files (x86)\Common Files\Haldex\USB

Example dongle software procedure is shown below:

- Run the dongle software flash updater USB_DONGLE_Flash_Updater_G687_V2_0.exe
- Follow the on screen instructions to install the program
- Switch "off" the power to the ECU
- Switch "on" the power to the ECU
- Software updating
- Software update now complete





Updating the USB PC Interface (dongle) driver

The USB dongle driver software can be updated.

The latest driver software revision is available on the Haldex Trailer Application Guide website.

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

C:\Program Files (x86)\Common Files\Haldex\USB

Example dongle driver procedure is shown below:

- Run the downloaded dongle driver setup file CDM212364_Setup.exe
- Follow the on screen instructions to install the program
- Accept the agreement, click on "next" to proceed
- Software updating
- Software update now complete
- Click on "finish" to proceed
- Restart your computer to apply these changes

Configuration Lock Function

DIAG++ version 2.10 and later support a Configuration Lock Function. When this is active (Locked) only a restricted set of changes to the ECU configuration will be allowed.

EB+ 4.0 software must be A847 or later for this function to be supported.

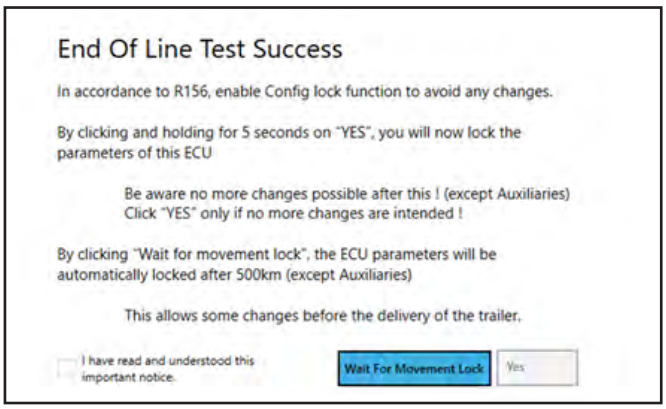
The option to lock the configuration will be presented to the customer after either a manual or auto EOLT has completed.

Note: The configuration will lock automatically once the odometer exceeds 500 Km.

The option to lock the configuration will be presented to the customer after either manual or auto EOLT has completed. This is the dialog that will be shown.

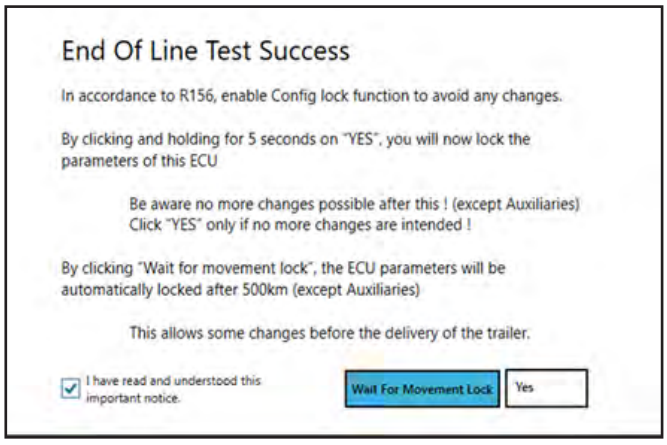
Note: This configuration lock option will be shown if any part of the EOLT has been completed successfully. It is not necessary to run a complete EOLT to get this option.

If the customer wants to wait for the Movement Lock (i.e. when odometer reaches 500km) they should click the "Wait For Movement Lock" button to exit the configuration lock procedure.



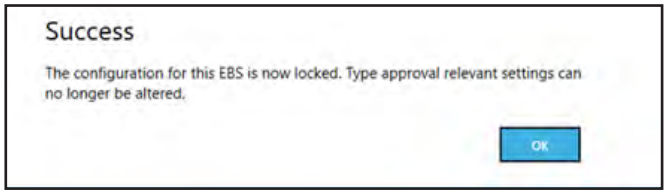
If the customer wants to lock the configuration at this point they must tick the "I have read and understand this important notice" tick-box to indicate they have read the instructions written in this dialog.

Once this tick-box is ticked, the "Yes" button will be enabled. The customer should then click and hold "Yes" button for 5 seconds to proceed with locking the configuration.

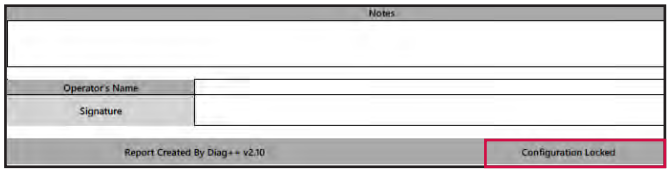


When the configuration has been locked this dialog will be shown to indicate that the lock has been successful.

Press "OK" button to proceed.



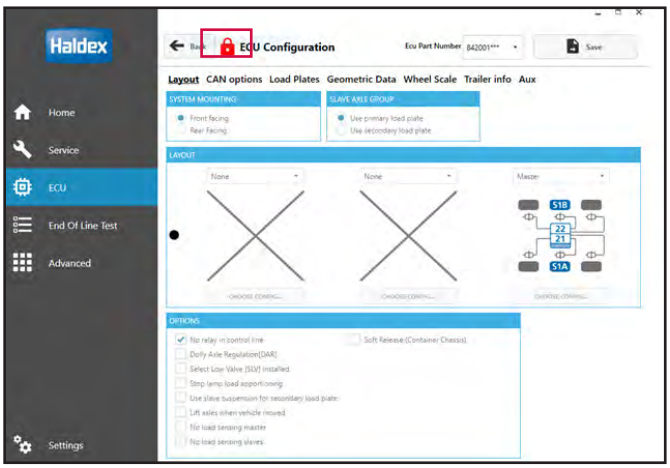
If the configuration is locked, this will be shown on the EOLT report.



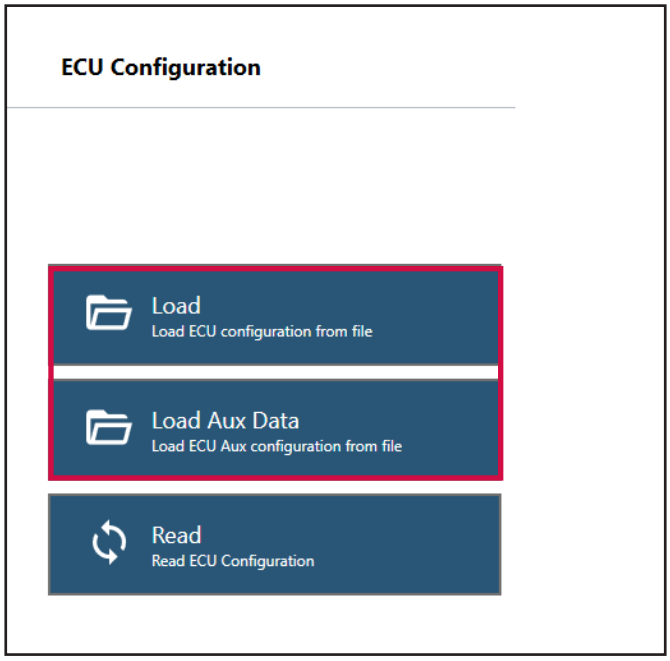
If the configuration is locked then a warning dialog is displayed when the user enters the 'Edit Configuration' dialog.

And when the 'Edit Configuration' dialog is displayed a warning 'locked padlock' icon is shown to indicate that the configuration is locked.

Any settings that now cannot be changed are disabled (greyed out).

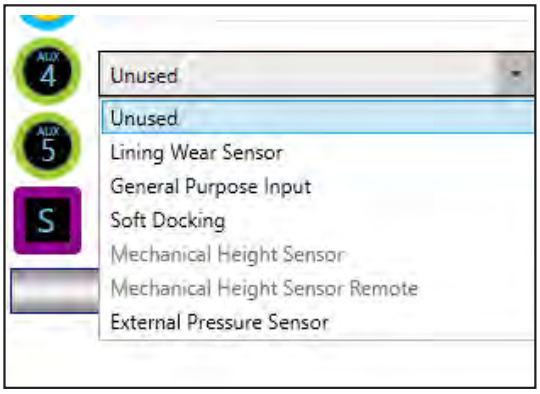


A configuration file (.dppf file type) can be programmed into the ECU when its configuration is locked but there is a very limited number of settings that can be changed once locking is active.

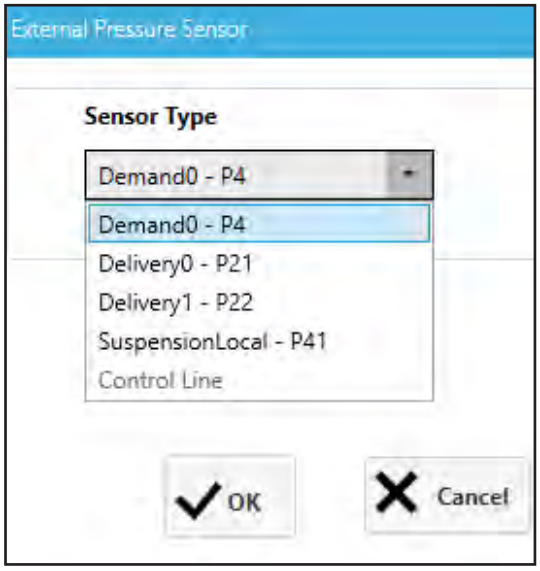


When the configuration is locked AUXs can still be reconfigured but with some limitations on AUX 4 and AUX 5.

1. Mechanical Height Sensors cannot be configured



2. An 'External Pressure Sensor' can be configured but not as a 'Control Line' variant.



Starting DIAG++

Connect the USB PC interface to the PC.

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

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

- Yellow (solid): Indicates connection to USB port
- Red (solid): Indicates connection to USB port and ECU with CAN communication established
- Red / Green (flashing): Indicates a DIAGN connection is active with data being transmitted

PC interface LED

The following behaviour shows a fault condition:

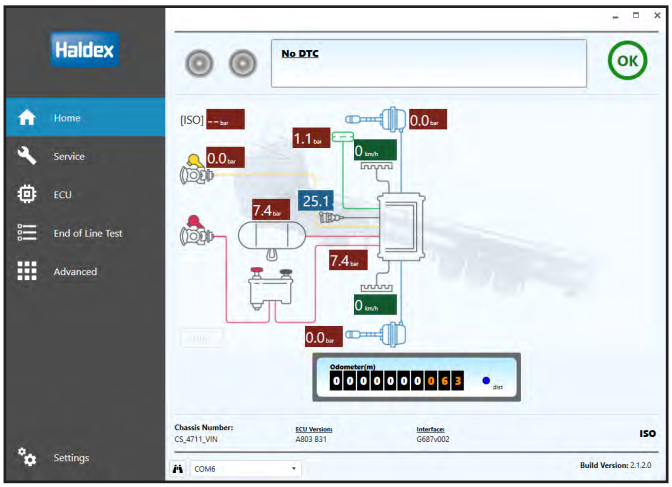
- Yellow (flashing): Indicates connection to USB port and power received from ECU but CAN communication not established

Power up the ECU.
During the self check procedure the system displays the following functions:

The trailer EBS / ABS warning light comes 'on' and stays 'on'. One audible cycle is produced by the EPRV's (EBS / ABS valves).

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

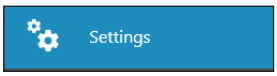
The EBS / ABS layout schematic should now be showing in the browser window.



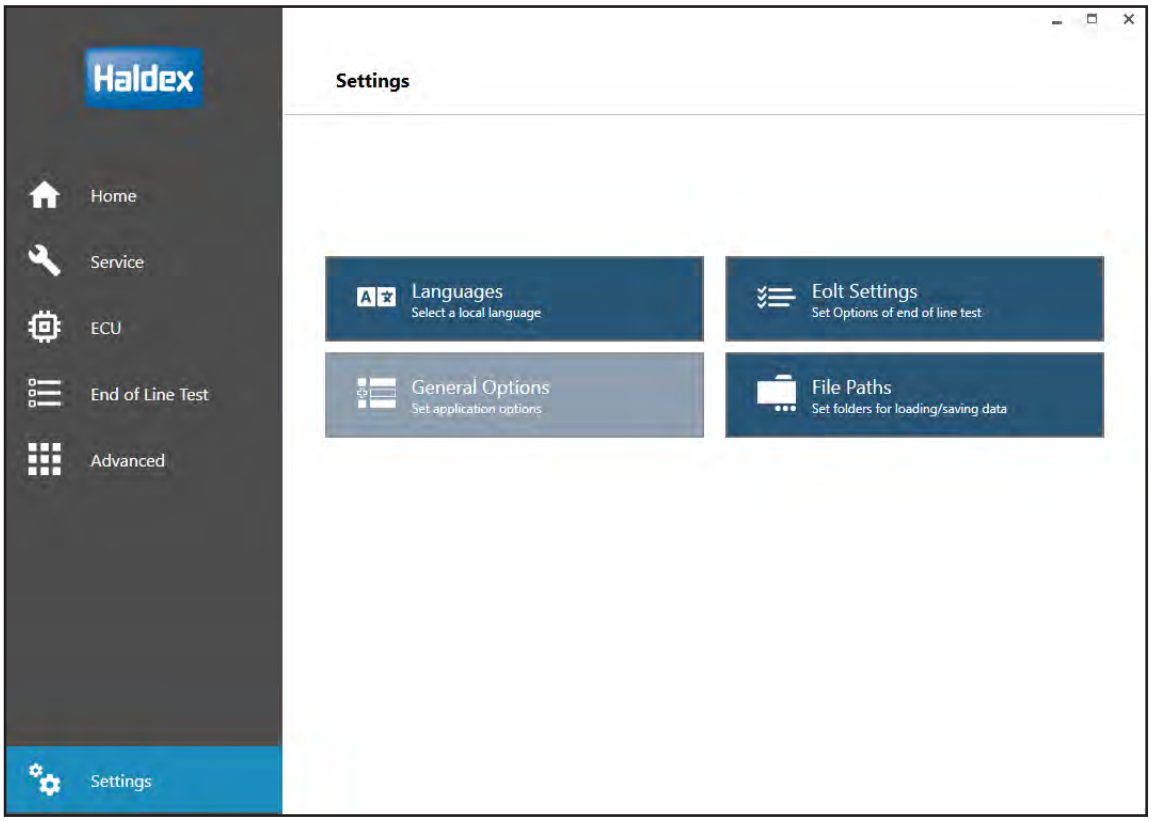
If no layout is shown, click on the binoculars to auto search for the correct PC connection port.

Settings

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



DIAG++ supports EB+ 4.0 EBS and ABS 4.0

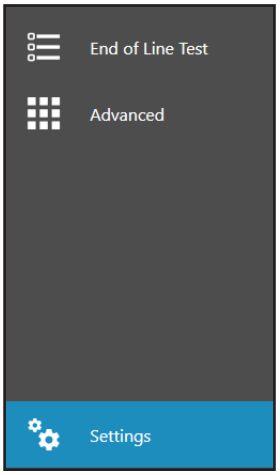


The DIAG++ software can be configured by the user, using the available icons.

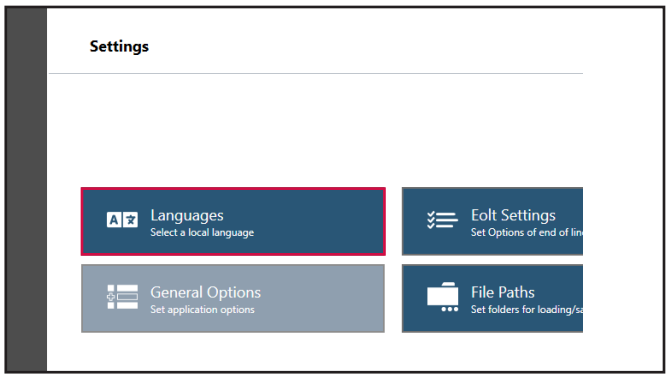
- Languages
- General options - not active at the moment
- EOLT settings
- File paths

Language selection

The DIAG++ operation language can be selected by clicking on the 'Settings' tab.



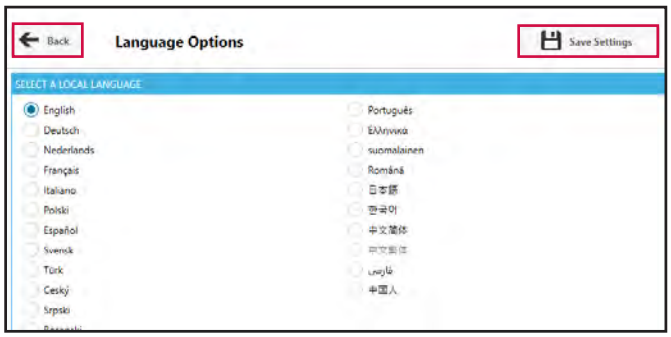
Click on 'Languages' button.



Select required language radio button to update language setting.

To keep selected change click 'Save Settings' button.

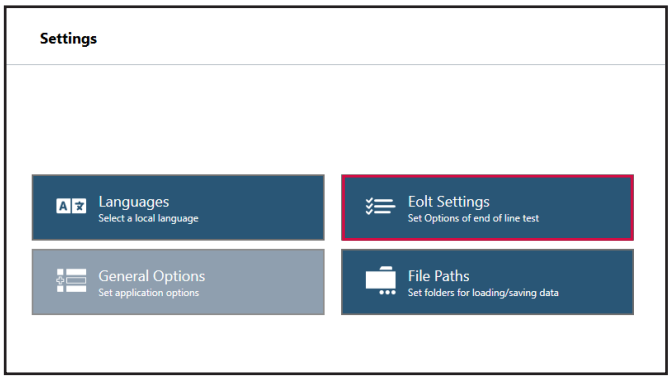
Note: for any (as yet) unsupported languages - their radio button will be inactive.



Click on 'Back' button to return to 'Settings' screen.

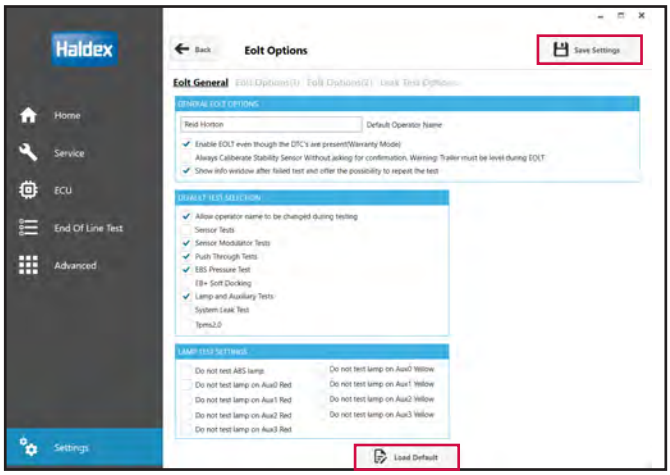
EOLT settings

Click on 'EOLT settings' button.



If a setting is changed in any tab, the 'Save Settings' button should be clicked if the user wishes to save that change.

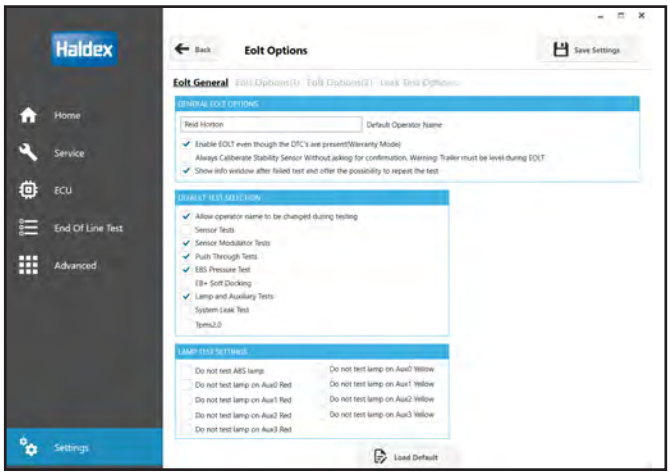
If the user wishes to reload the default EOLT Settings, the 'Load Default' button should be clicked to do this.



EOLT General tab

This tab allows the user to modify the following:

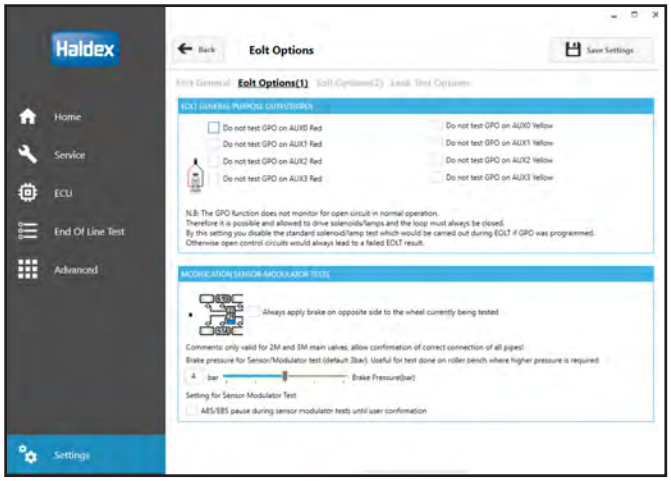
- General EOLT options
- Default test selection
- Lamp test settings



EOLT Options (1) tab

This tab allows the user to modify the following:

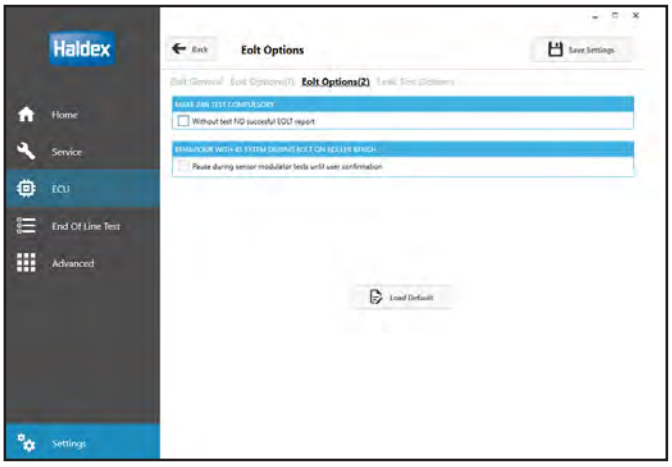
› EOLT General purpose outputs
› Modification sensor-modulator tests



EOLT Options (2) tab

This tab allows the user to modify the following:

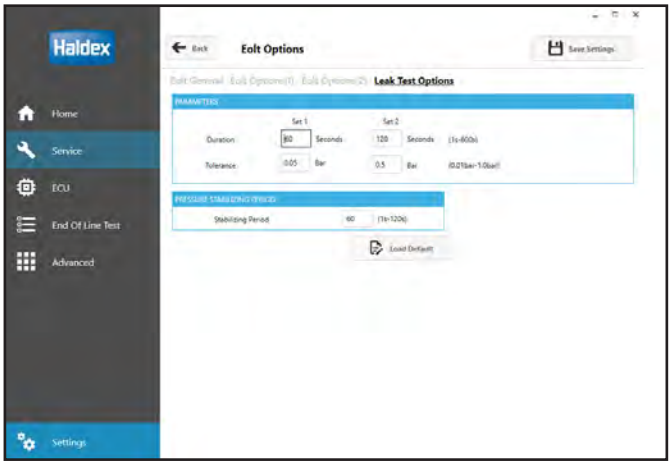
› Make 24N test compulsory
› Behaviour with 4S system during EOLT on roller bench



Leak Test Options tab

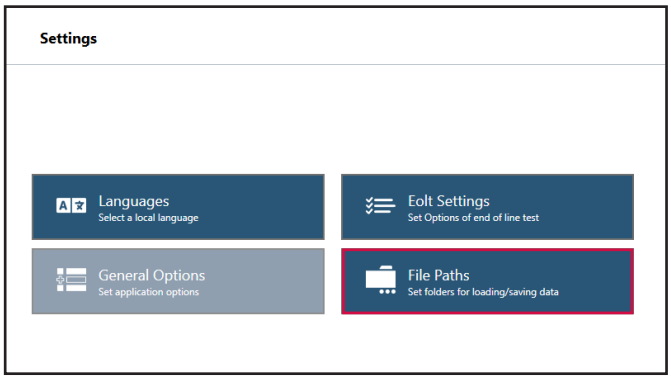
This tab allows the user to modify the following:

› Leak test parameters
› Leak test pressure stabilising period



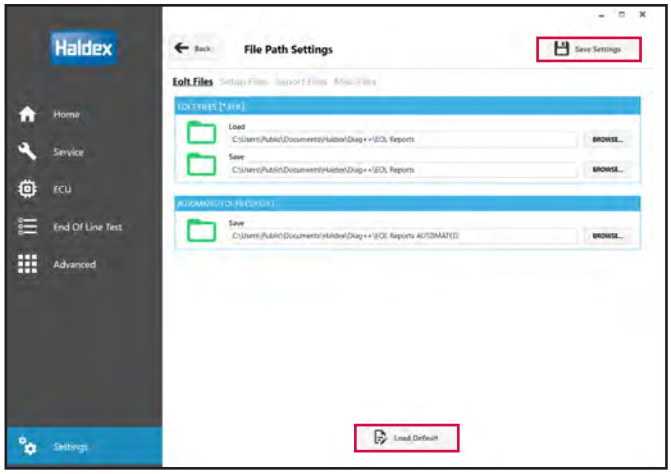
File Paths

Click on 'File Paths' button.



If a setting is changed in any tab, the 'Save Settings' button should be clicked if the user wishes to save that change.

If the user wishes to reload the default File Path Settings, the 'Load Default' button should be clicked to do this.

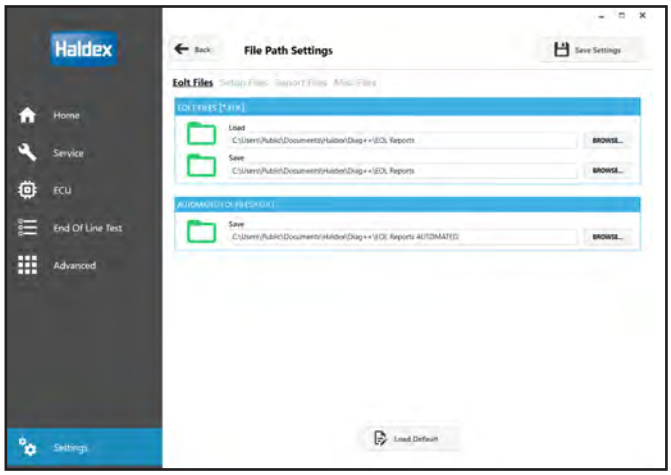


EOLT Files tab

This tab allows the user to modify the following:

› EOLT Files (*.EOL)

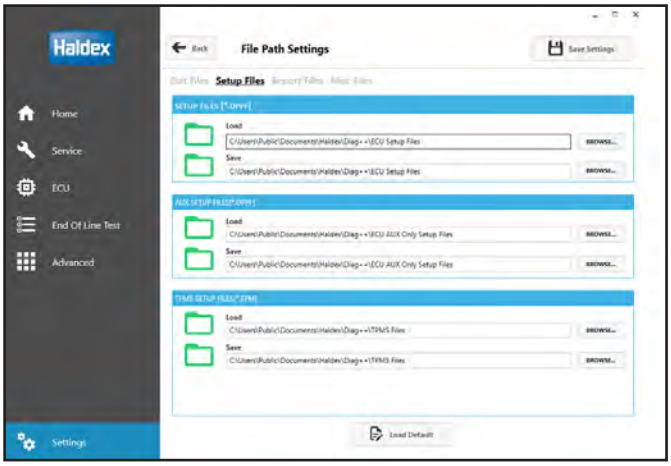
› Automated EOL Files (*.EOL)



Setup Files tab

This tab allows the user to modify the following:

- Setup files (*.DPPF)
- Aux setup files (*.DPPF)
- TPMS setup files (*.TPM)



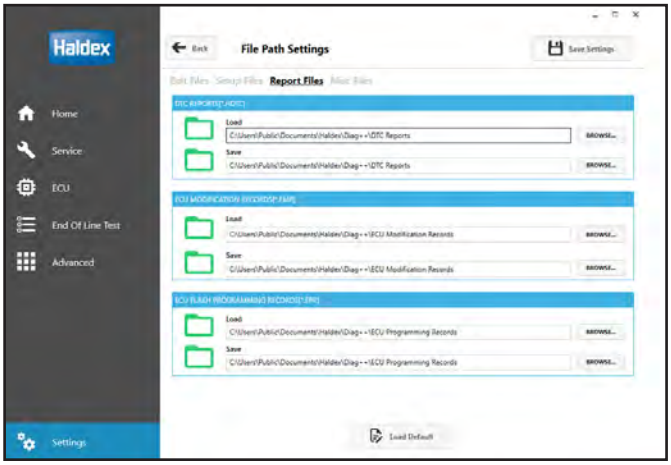
Report Files tab

This tab allows the user to modify the following:

DTC Reports (*.HDTC)

ECU Modification records (*.EMR)

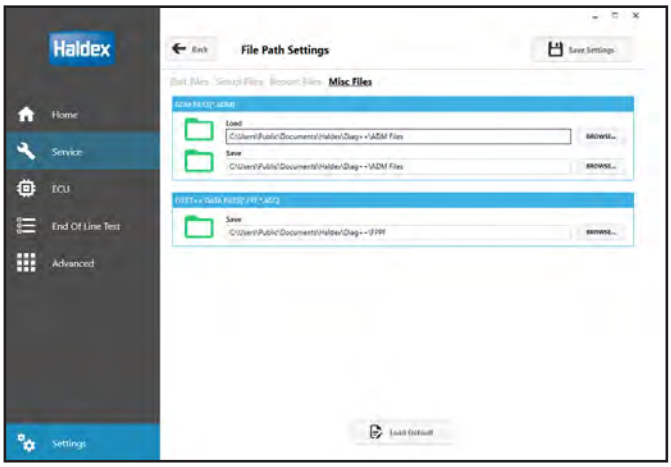
ECU Flash programming records (*.EPR)



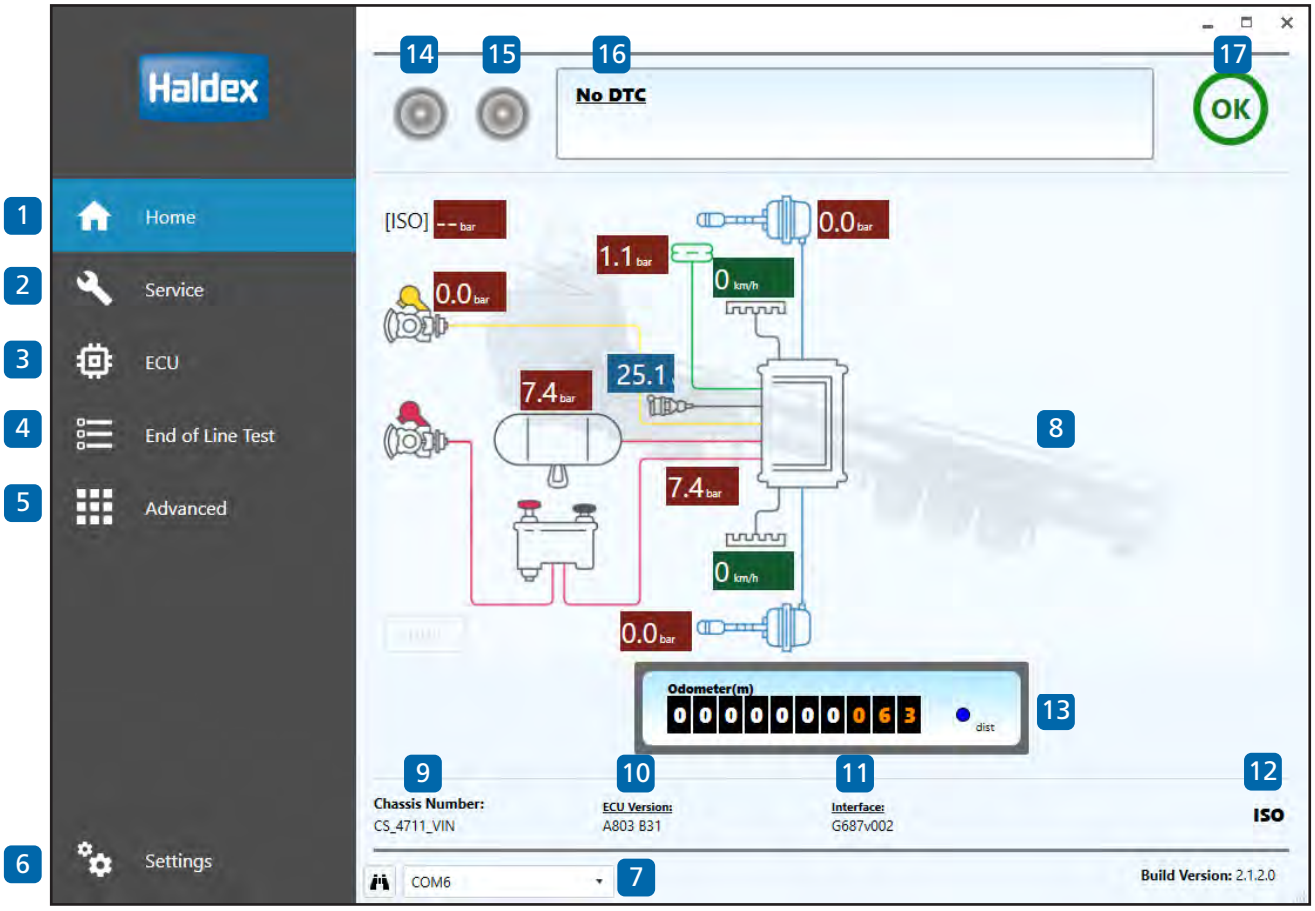
Misc Files tab

This tab allows the user to modify the following:

- ADM Files (*.ADM)
- Fleet++ Data files (*.FPF, *.ASC)



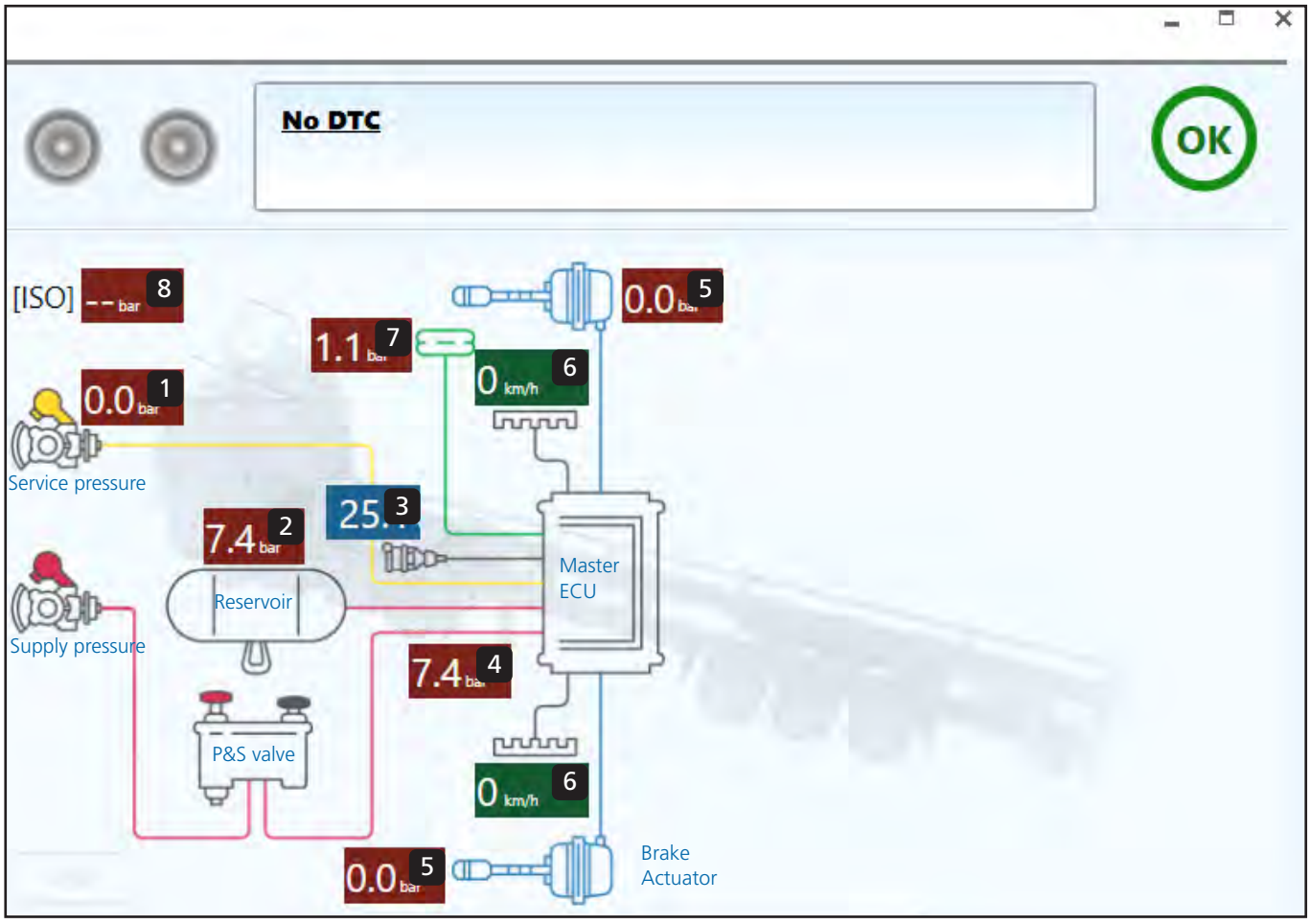
Home screen



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

Understanding the home screen display

01	Home window	12	Power source indicator
02	Service options	13	Odometer reading - total distance
03	ECU options	14	Red warning lamp
04	'End of line Test' (EOLT) procedure	15	Amber warning lamp
05	Advanced options	16	Shows active Diagnostic Trouble Codes (DTC)
06	Settings	17	Fault information (animation display)
07	PC connection port indication		
08	EBS connection graphic		
09	Chassis number		
10	ECU software version number		
11	PC Interface version number		



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

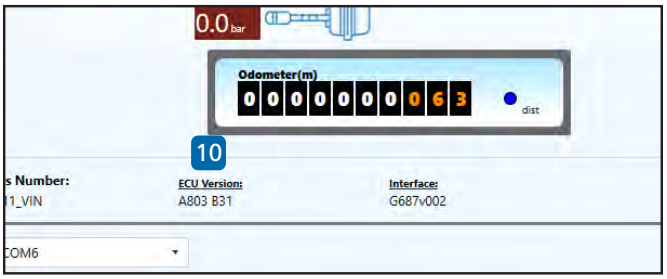
Understanding the home screen display

01	Service pressure (bar)
02	Reservoir pressure (bar)
03	System supply voltage (volts)
04	Supply pressure (bar)
05	Master ECU - brake actuator pressure (bar)
06	Master ECU - wheel speed (km/h)
07	Master ECU - air suspension pressure (bar)
08	ISO pressure (only available when connected via H-CAN or T-CAN)

Connected ECU and PC Interface (dongle) information

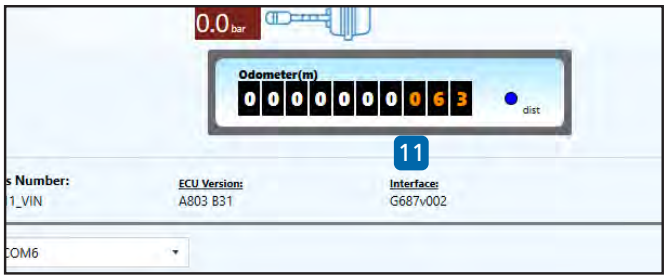
Click on the 'ECU version' (no. 10) hyperlink to display the following information:

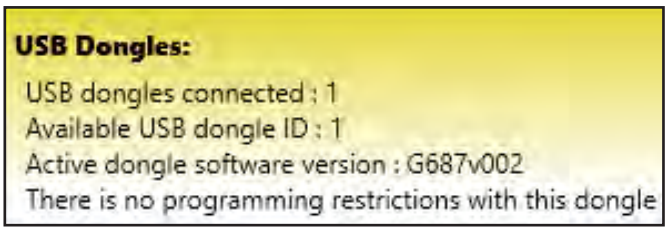
- ECU variant
- Available AUX connections
- Software revision
- Software type (Standard or specific)
- Build date and time



Click on the 'interface' (No. 11) hyperlink to display the connected dongle information:

- Number of dongles connected
- Dongle ID
- Dongle software version
- Any programming restrictions



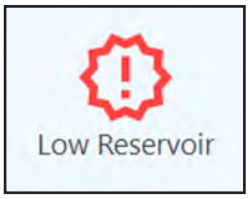


Animation display

The following animations are supported:

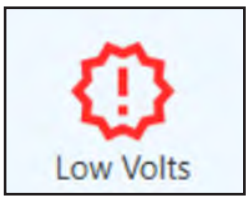
All OK.

Low reservoir.



Active DTC.

Low voltage.



Service menu (Basic diagnostics)

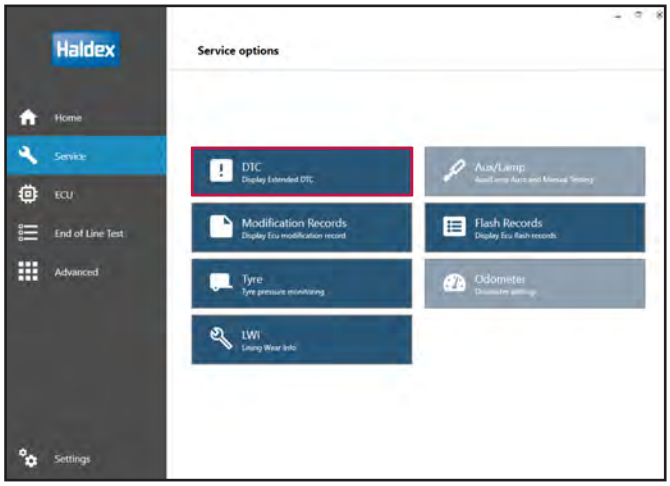
Trailer warning lamp 'on'

Observe the trailer warning lamp.

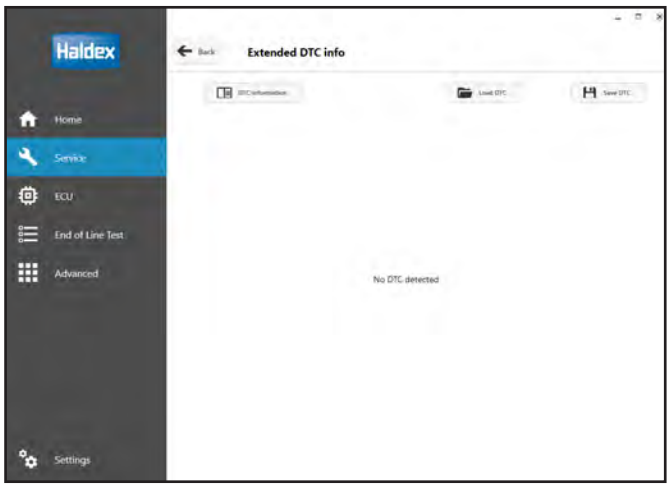
Note: If the trailer warning lamp comes 'on' and stays 'on' there are diagnostic trouble codes (DTC) present which need to be cleared or the system air pressure is below 4.5 bar.

Click on the 'Service' button on the main screen then

Click on the 'DTC' button to show any active or stored DTC's.



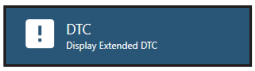
If there are no DTC's detected the following screen will appear.



Reading DTC's

Click on the 'Service' button on the main screen.

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

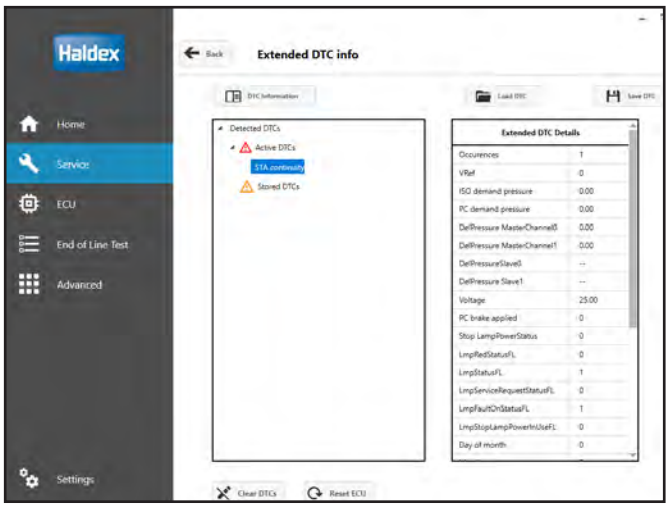


Any active DTC will be displayed in the 'Active DTCs' section.

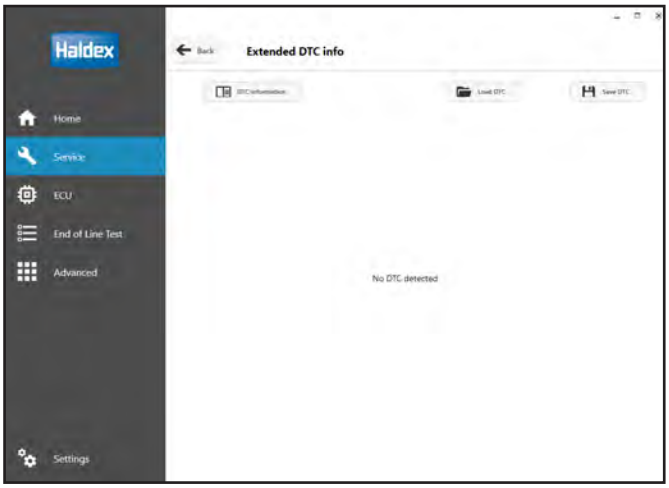
Repair the active DTC and reset the ECU by pressing the 'Reset ECU' button or switch 'off' then 'on' the power to the ECU.

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

Any stored DTC will be displayed in the 'Stored DTCs' section.

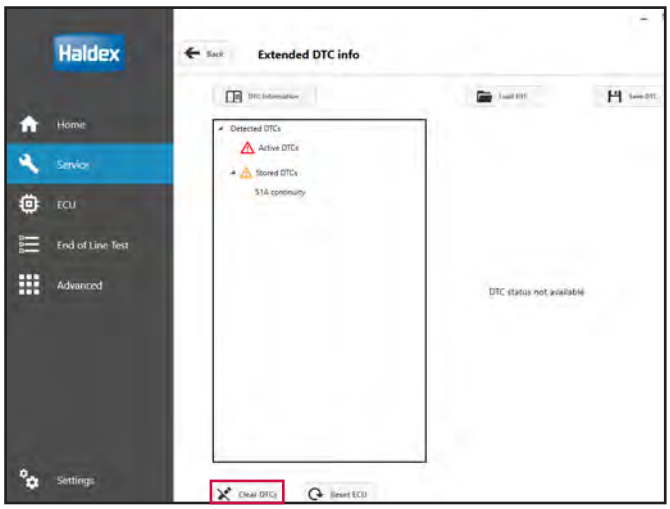


If there is no active DTC, it will display 'no active DTC's'



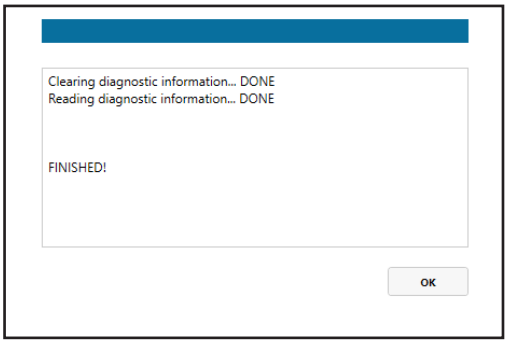
Clear stored DTC's

All stored DTC's can be deleted.



Click on the 'Clear DTCs' button to delete the stored DTC.

An information dialog is thrown up to indicate the progress.



ECU clearing the stored DTC.

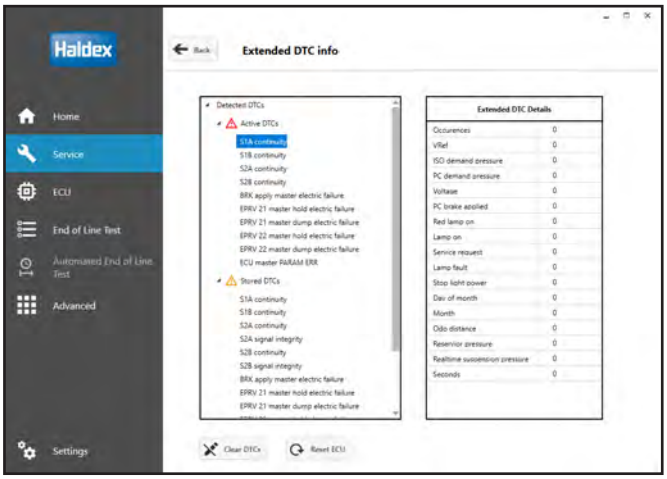
When the stored DTC's have cleared click 'ok' button.

Click on the 'Back' button to return to the service options.
Or
Click on any of the left hand side button links to move to that dialog.

Reading extended diagnostic codes

On active and stored DTC's, double click on any DTC

Extended DTC screen display:

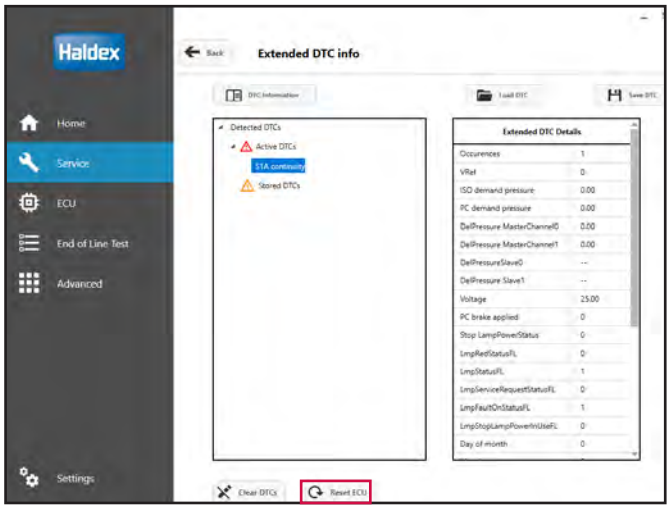


1. The number of times the DTC occurred (max 254 events). The event is logged every time the ECU is powered. The following data relates to the last time the DTC occurred
2. Speed (VRef) at which the DTC occurred (example shows vehicle stationary)
3. Electric control line pressure CAN lines pins 6,7 on ISO 7638 (example shows a 5 pin ISO 7638 installed)
4. Pressure reading on the service (yellow) line while braking.
5. Delivery pressure Master 0 (modulator 21)
6. Delivery pressure Master 1 (modulator 22)
7. Delivery pressure Slave 0 (Slave 1)
8. Delivery pressure Slave 1 (Slave 2)
9. Volts reading when fault first occurred.
10. PC brake applied status.
11. Stop light power available (yes / no) when fault first occurred.
12. Red lamp status (on / off) when fault first occurred
13. Amber Lamp status (on / off) when fault first occurred.
14. Service request status (active / inactive) when fault first occurred.
15. Lamp fault status (on / off) for this fault
16. Stop light power in use (yes / no) when fault first occured
17. Day of month (when available) where fault first occurred
18. Month (when available) where fault first occurred
19. Odometer reading when fault first occurred
20. Reservoir pressure
21. Suspension bag pressure Master
22. Suspension bag pressure SLV0 (Slave 1 if fitted)
23. Suspension bag pressure SLV1 (Slave 2 if fitted)
24. Total time, from ECU power up
25. Total time, from ECU power up
26. PCB temperature reading when fault first occurred

	Extended DTC Details	
1	Occurences	1
2	VRef	0
3	ISO demand pressure	0.00
4	PC demand pressure	0.00
5	DelPressure MasterChannel0	0.00
6	DelPressure MasterChannel1	0.00
7	DelPressureSlave0	--
8	DelPressure Slave1	--
9	Voltage	24.20
10	PC brake applied	0
11	Stop LampPowerStatus	0
12	LmpRedStatusFL	0
13	LmpStatusFL	1
14	LmpServiceRequestStatusFL	0
15	LmpFaultOnStatusFL	1
16	LmpStopLampPowerInUseFL	0
17	Day of month	0
18	Month	0
19	Odo distance(m)	15573
20	Reservior pressure	7.40
21	Suspension Pressure Master	1.05
22	Suspension PressureSLV0	--
23	Suspension PressureSLV1	--
24	Seconds	33
25	Minutes	49
26	Pcbtemperature	45

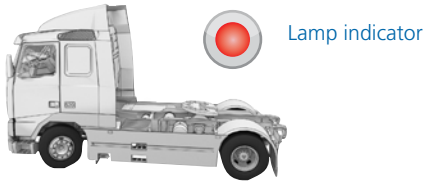
Clear Active DTC's

Clear the cause of the active DTC's then reset the ECU by clicking on the 'Reset ECU' button or switch 'off' then 'on' the power to the ECU.

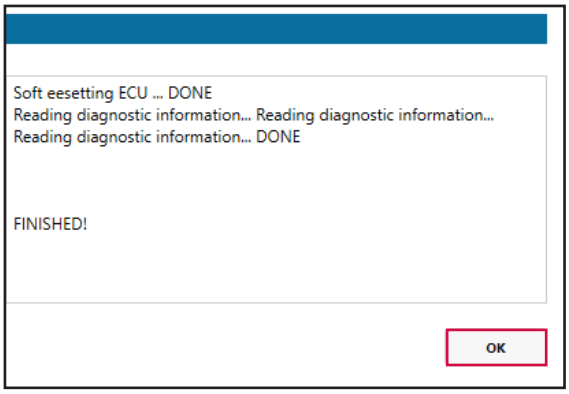


Observe the trailer warning lamp. The warning lamp should display what has been set in the 'lamp setting' section of the ECU Setup.

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



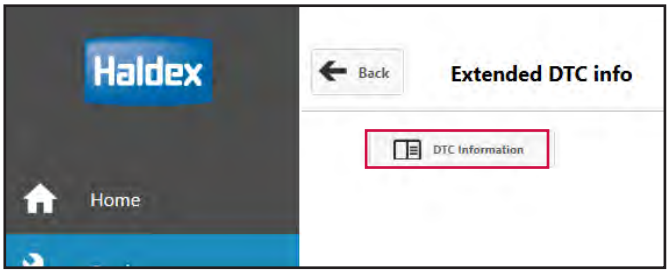
When the active DTC's have cleared (to stored) click 'ok' button.



Click on the 'Back' button to return to the service options.
Or
Click on any of the left hand side button links to move to that dialog.

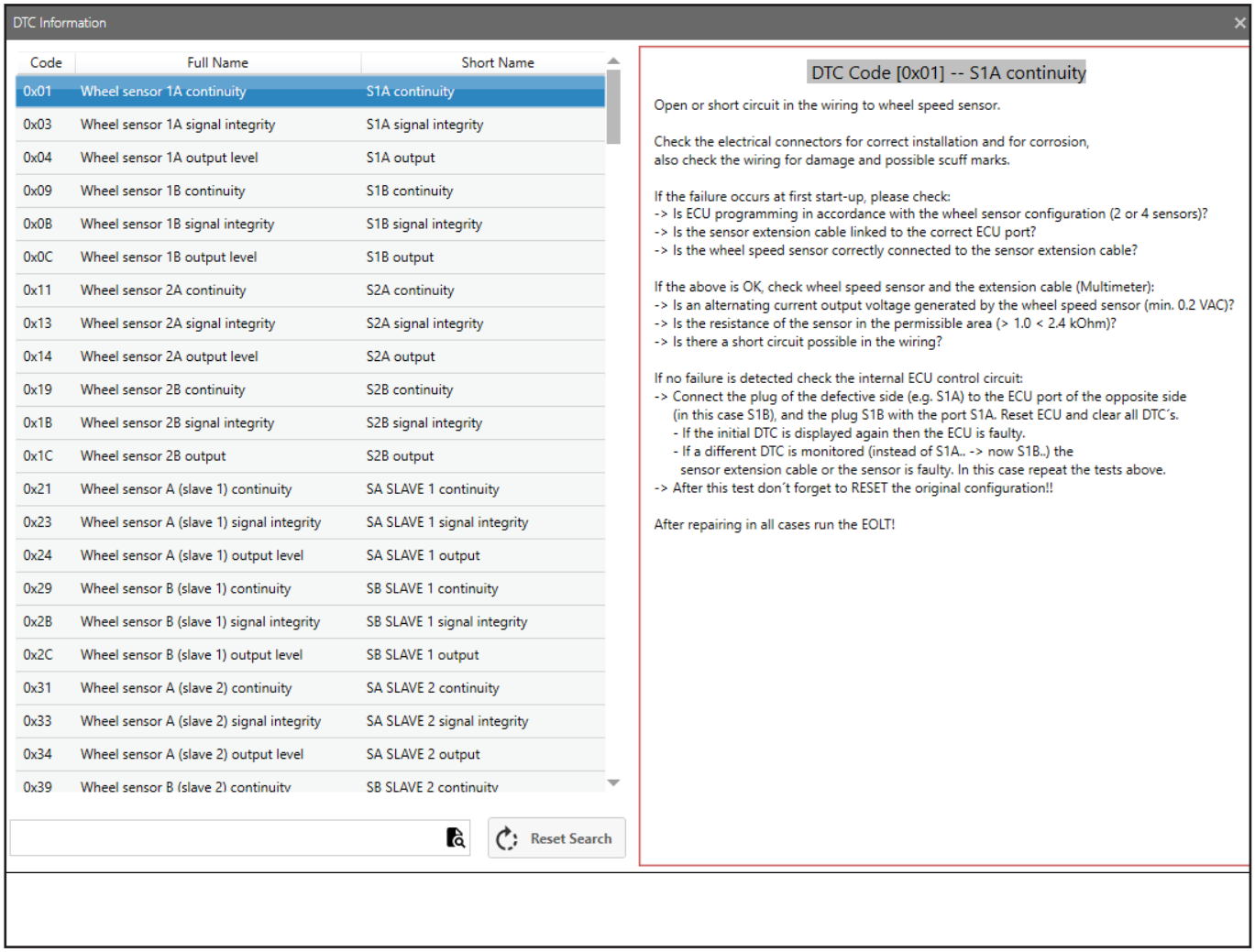
Viewing DTC information

Click 'DTC information' icon to display the DTC information.



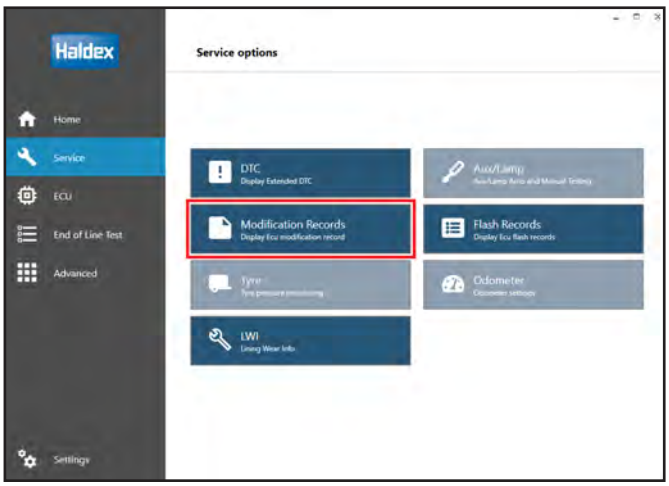
Click on the required DTC for possible causes.

For example "wheel sensor 1A continuity"



ECU modification record

Click on the 'Modification Records' button on the service menu.



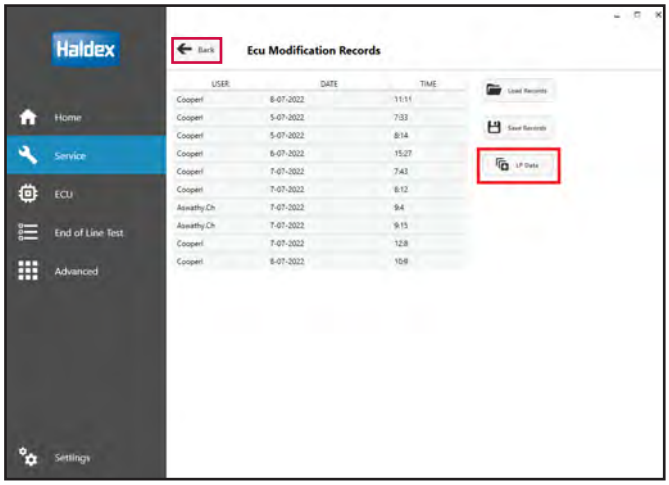
The following screen appears.

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

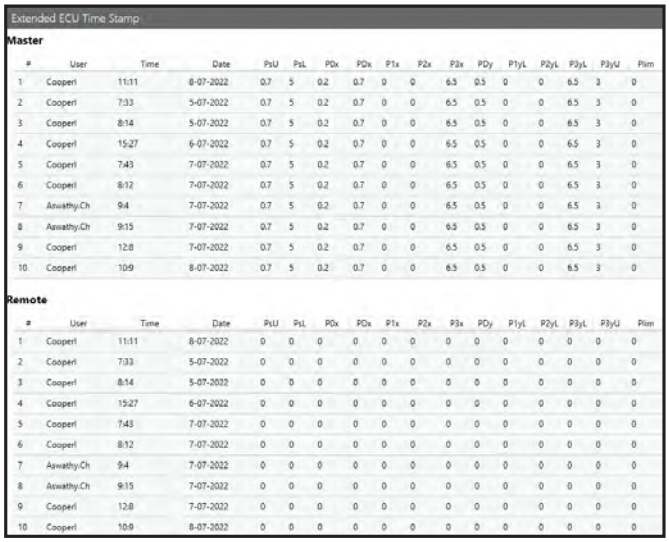
The user can be the computers name or log on name or 'Info C' representing Info Centre. The display shows up to ten recent users.

Click on the 'Back' button to exit.

Note: Load / Save buttons don't work yet



Shows Load PLate (LP) values when modifications are completed.



Tyre Pressure Monitoring System 1.0 (TPMS)

TPMS 1.0 components

Receiver control unit (RCU)

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

TPMS 1.0 RCU
(Note: now obsolete)

Wheel unit sensor (WUS)

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

WUS

Haldex TPMS trigger and TPMS Tool

Used to force the WUS to transmit its identification code (ID) to the RCU.

Haldex TPMS Trigger
(Note: now obsolete)

Haldex TPMS Tool

TPMS 1.0 Software requirements

DIAG++: version 2.1 or later

Dongle: version G687 or later

Dongle driver: version 2.12.36.4 or as advised by Haldex

EB+ 4.0: version A806 or later

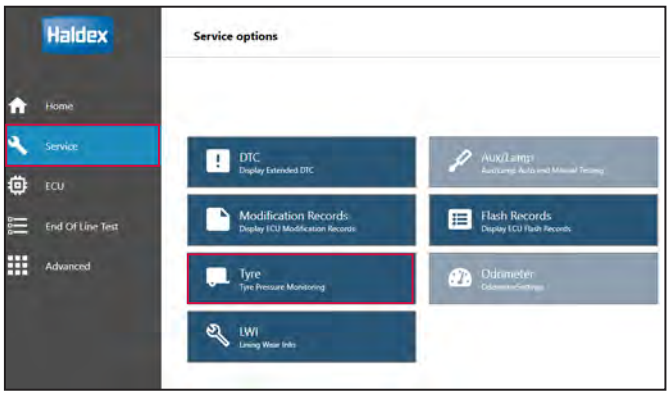
TPMS 1.0 Initial setup

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

Open TPMS 1.0

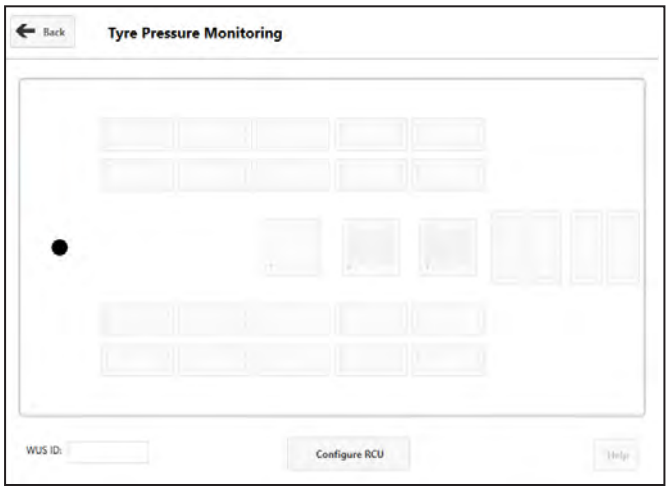
Click on the 'Service' tab on the DIAG++ main menu.

Click on the 'Tyre' button to enter TPMS dialogs.

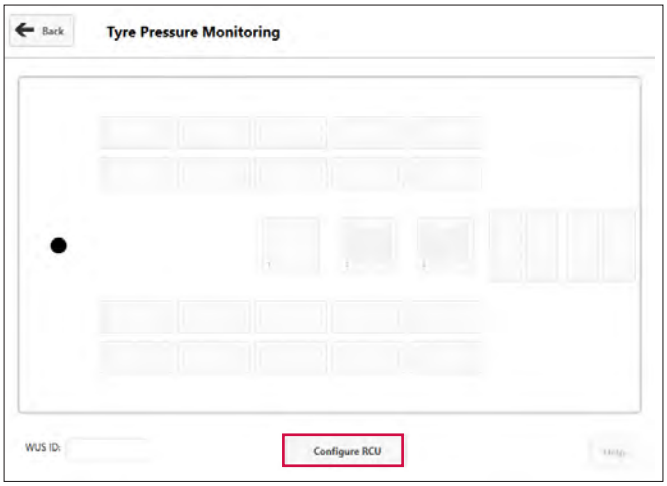


TPMS 1.0 setup dialogue screen

When the overview screen opens DIAG++ reads the configuration information (If setup).

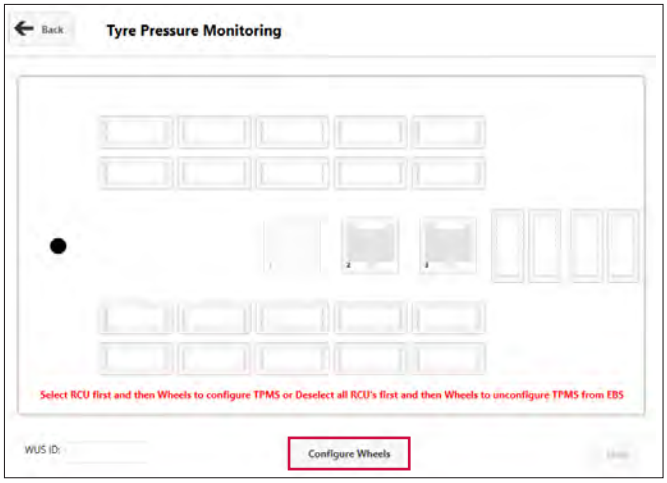


Initial screen shown for unconfigured TPMS 1.0 system.

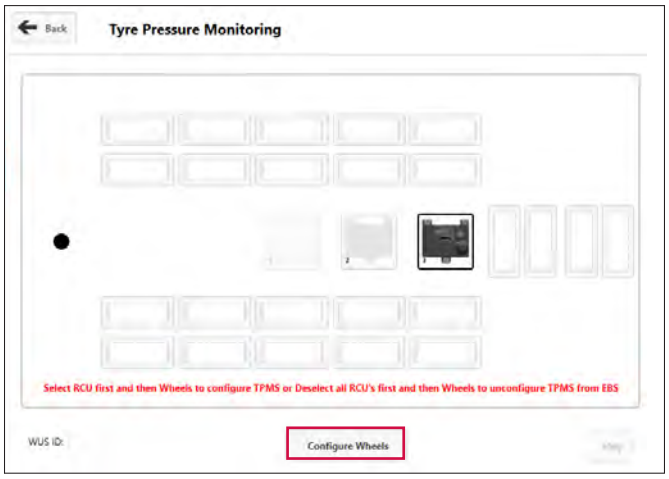


Click on the 'Configure RCU' button to start configuration.

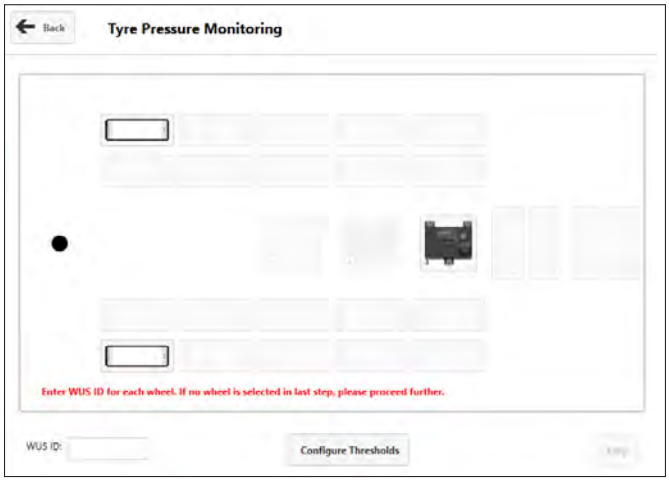
Select RCU first and then wheels to configure TPMS 1.0 or deselect all RCUs first and then wheels to unconfigure TPMS 1.0 from EB+ EBS.



Then, click on 'Configure Wheels' button to proceed



Once the RCU and wheels are chosen, click on 'Configure Wheels' button to proceed.



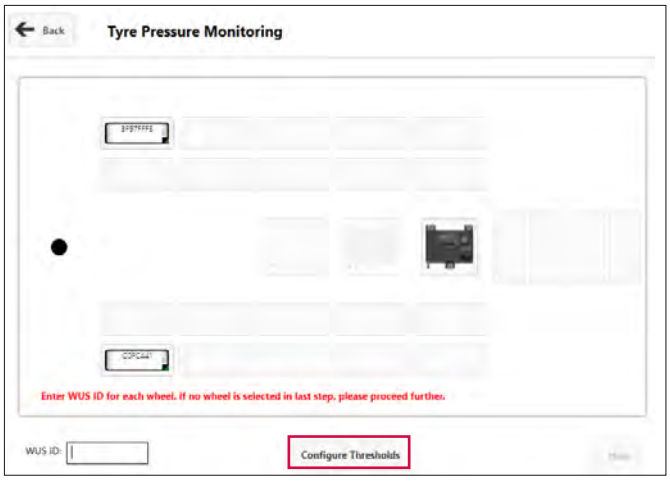
For each wheel sensor (WUS):

› Select wheel

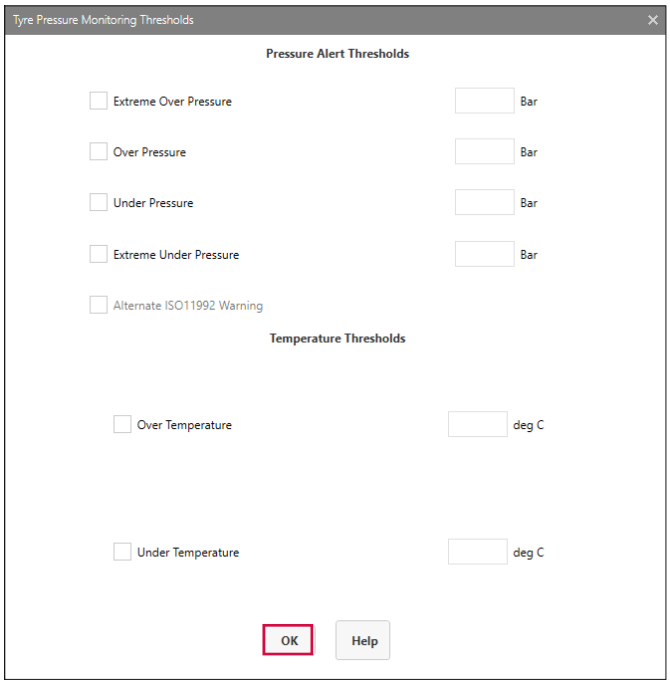
› Manually type in WUS ID in text box

› press return

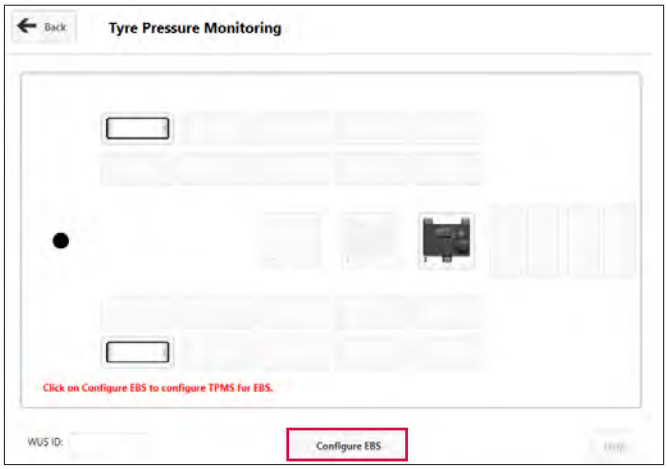
When all WUS IDs have been entered, click on 'Configure Thresholds' button to proceed.



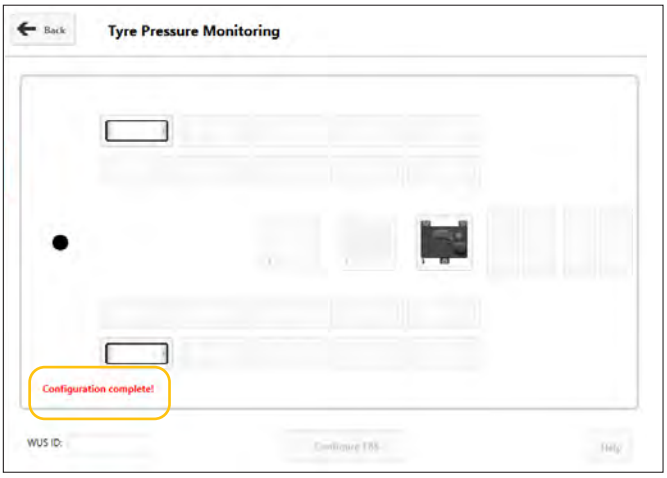
When all thresholds have been configured, click on the 'OK' button to proceed.



Click on 'Configure EBS' button to program TPMS 1.0 configuration into EB+ and TPMS RCU ECUs.

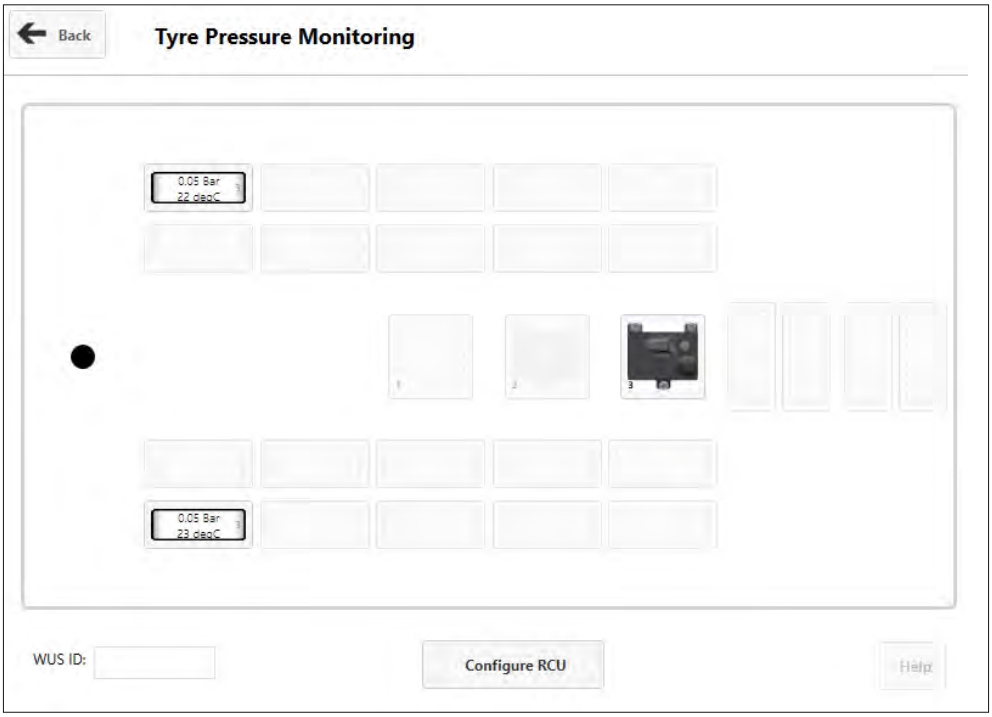


Click 'OK' button when active.



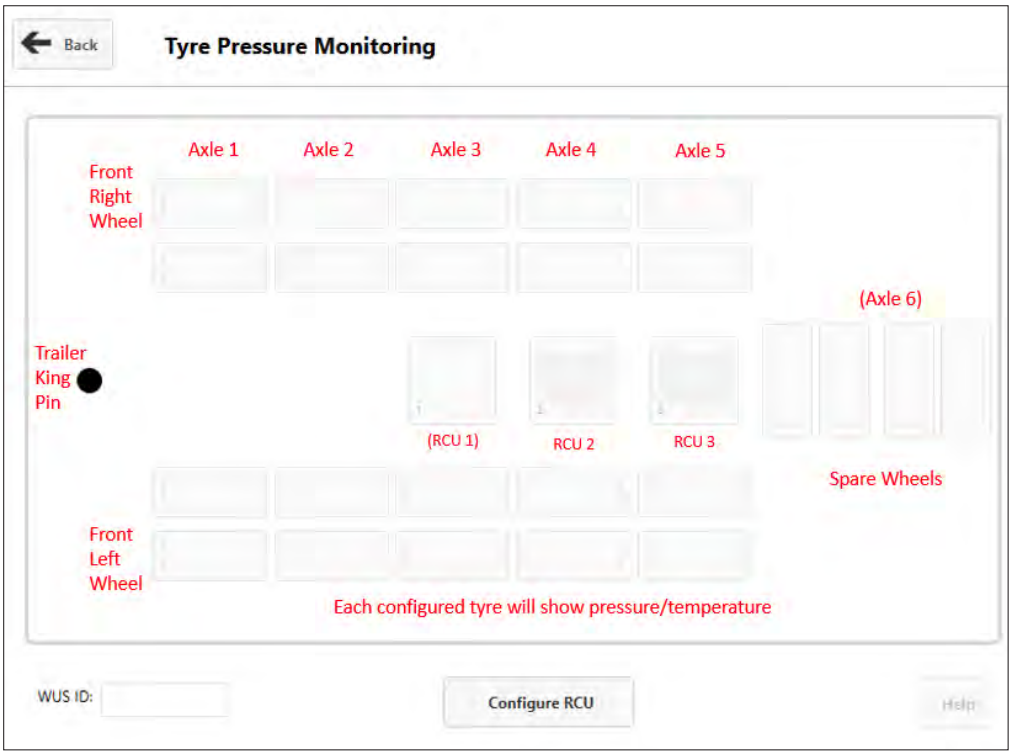
Successful configuration.

Successfully configured TPMS 1.0 system showing pressures and temperatures for the configured tyres.



TPMS 1.0 dialog

The dialog diagram allows the user to see all possible tyre locations.



› Configured tyres are shown with a bold outline

› TPMS axles to be configured from the front (i.e. nearest to the king pin) to the rear of the trailer, with no gaps

› Spare tyres to be configured from the front (i.e. nearest to the king pin) to the rear of the trailer, with no gaps

The RCUs are shown in the centre of the screen.

› RCUs that are connected are shown as pictures

› The current EB+ 4.0 TPMS1.0 function currently only supports RCU2 and RCU3

Note:
DIAG++ TPMS 1.0 function is a simplified version of that delivered in DIAG+ leading to the following:

› No offline TPMS 1.0 setup

› No save / load of TPMS 1.0 configuration to / from a file

› Only common thresholds supported

› No "drag and drop" tyre swapping supported

› Active threshold indication is via use of "External TPMS" DTC

› WUS IDs can only be manually entered (Auto / semi-auto operations not supported)

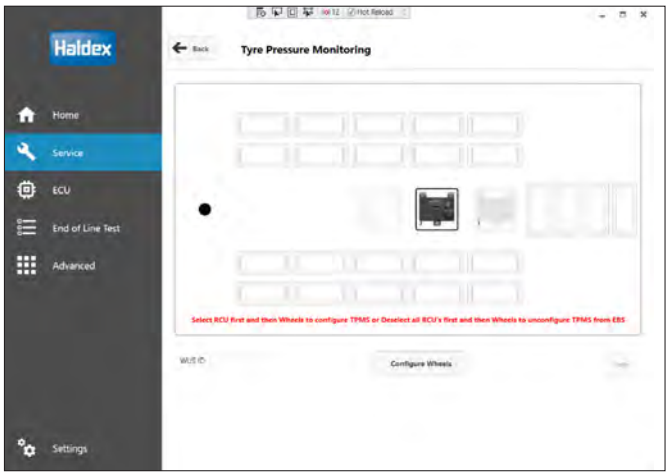
TPMS 1.0 RCU / tyre configuration

Step 1 – Select RCU (2 or 3):

Click on required RCU (RCU2 shown as selected).

Note:
1. Single click to select RCU and double click to deselect RCU.

2. To remove any already configured RCU, double click on that RCU and proceed further. If no RCU is selected, then TPMS configuration will be completely removed from the EBS System.



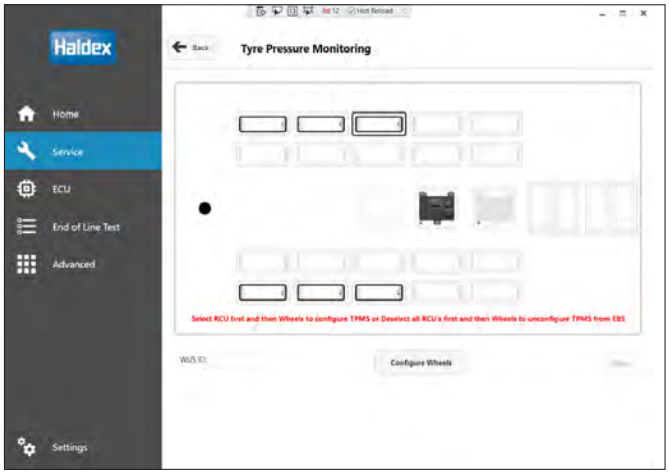
Step 2 – Select Wheels:

Click on required wheels (axle 1,2,3 outer wheels shown as selected).

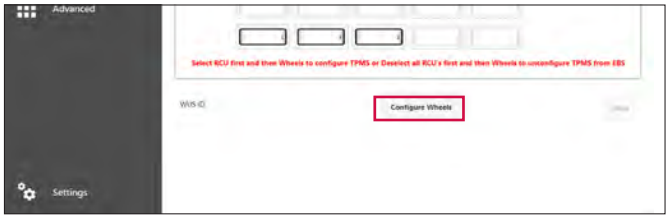
Note:
1. Single Click to select wheel and double click to deselect wheel.

2. If more than one RCU is configured and the user wants to configure one wheel on RCU 3 and another one on RCU 2 (for example), then single click on the respective wheel till the desired RCU number is displayed on the wheel. The RCU number is displayed on the right-hand side of the wheel.

3. To remove any already configured wheel, double click on that wheel and proceed further.

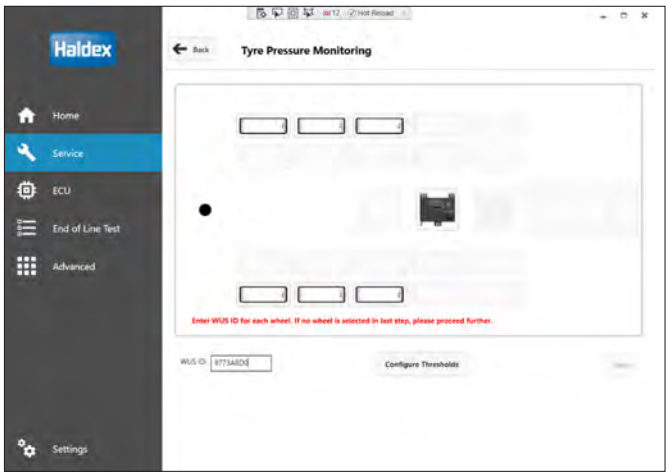


Step 3 – Click 'Configure Wheels' button to proceed further.



Step 4 – Wheel configuration:

Single click on each wheel and enter the WUS ID in the text box. Once the ID is entered, hit ENTER and a green indicator at the right-hand bottom corner will appear along with WUS ID on the respective wheel, indicating that WUS ID for the selected wheel is now available.



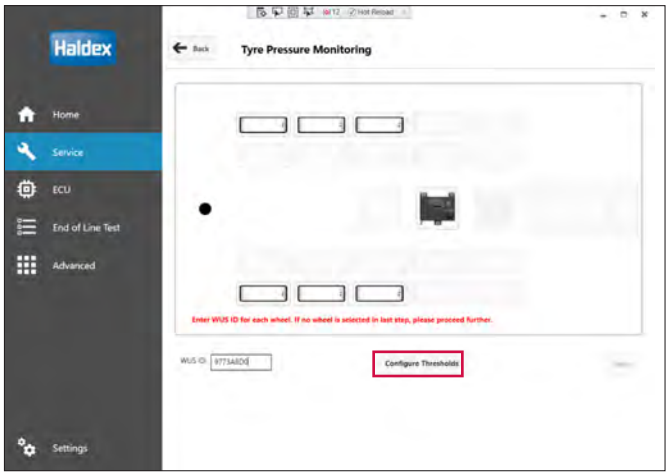
Repeat this procedure by selecting one wheel at a time and entering WUS ID for each wheel in turn.

Note:
1. WUS IDs are hex numbers, so enter the number without "0x" i.e., if WUS ID is "0x9773A8D0" only "9773A8D0" is entered.

2. For DIAG++ / EB+ 4.0 TPMS 1.0 operation WUS IDs can only be entered manually (so no Auto / Semi-auto method is supported).

Once all WUS IDs have been entered proceed to step 5

Step 5 – Click 'Configure Thresholds' button to proceed further.

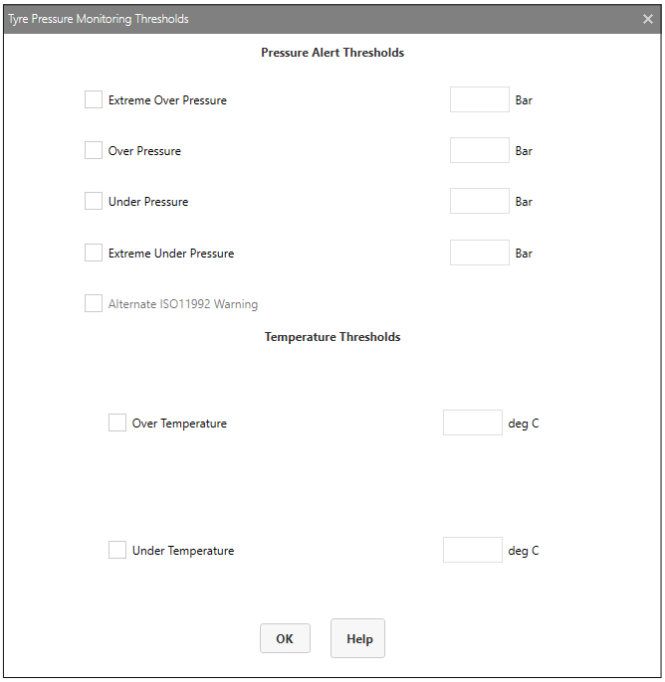


Step 6 – Set Tyre Thresholds:

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

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

When any threshold values are not selected, these thresholds will be deactivated in the TPMS 1.0 system i.e., TPMS system will not report any Over Pressure and / or Under Pressure warnings / dtc.

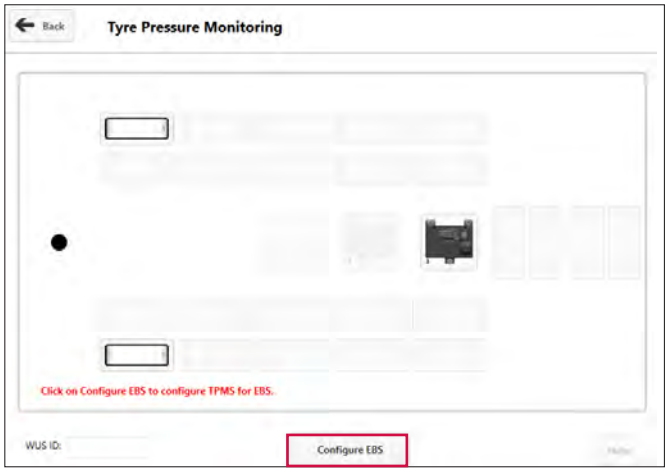


Alternate ISO11992 warning:

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

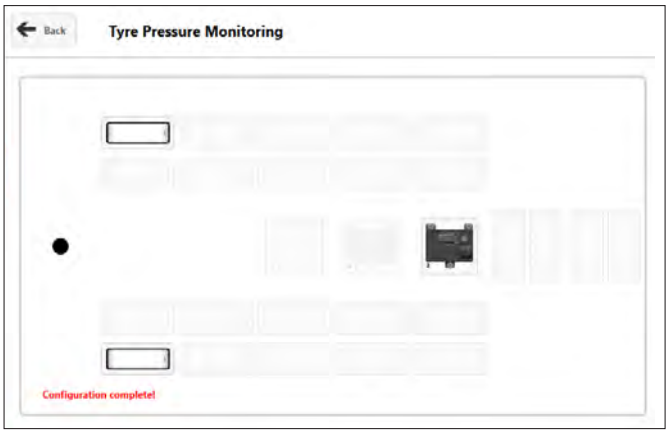
Once the thresholds are set to the desired values, click 'OK' button to proceed further.

Step 7 – Click 'Configure EBS' button to configure TPMS 1.0 on the EBS.



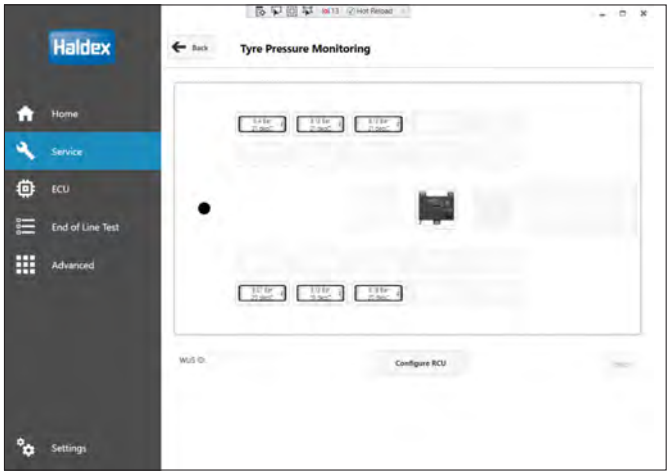
A "Configuration complete!" message is displayed when configuration has completed.

Click 'OK' button to proceed further.



After a few minutes, once the TPMS 1.0 RCU and WUSs are ready to transmit data, the tyre pressure and temperature for each wheel will be displayed.

Note: It can take some time for TPMS 1.0 RCU to transmit wheel data, especially when a new WUS is configured.

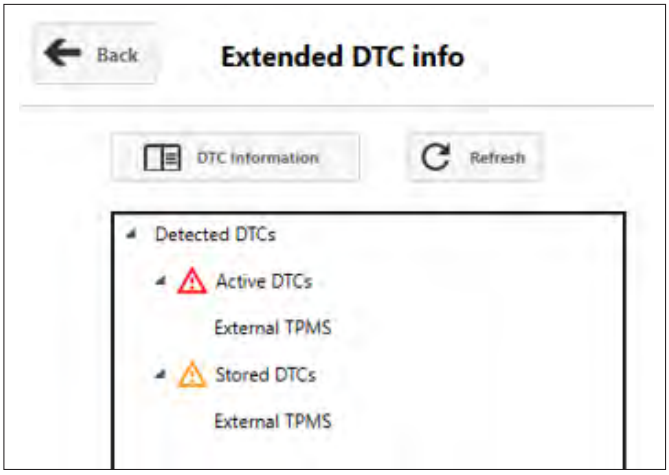


Troubleshooting

TPMS1.0 not available / not configured

RCU missing (External TPMS DTC is reported)

Active Threshold alert



Tyre Pressure Monitoring System 2.0 (TPMS)

TPMS 2.0 components

Receiver control unit (RCU)

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

TPMS 2.0 RCU

Wheel unit sensor (WUS)

The TPMS 2.0 wheel unit sensor (WUS) is a pressure sensor which is clamped inside the tyre using a velcro belt. It measures the pressure and temperature inside the tyre and transmits all the measurements by radio frequency (RF) to the RCU.

WUS

TPMS 2.0 Software requirements

DIAG++: version 2.13 or later

Dongle: version G859v002 or later

Dongle driver: version 2.12.36.4 or as advised by Haldex

EB+ 4.0: version A858 or later

Enable TPMS 2.0 using DIAG++

When EB+ 4.0 EBS is fitted to the trailer, the 'TPMS Gateway' must be enabled using DIAG++ before configuring the TPMS.

The 'TPMS Gateway' enable option in DIAG++ is available in ECU -> EDIT -> CAN Options

Procedure:

a. Select CAN options tab

b. Select 'TPMS Gateway' tick box

c. Click 'Save Configuration' button, to save the changes made.

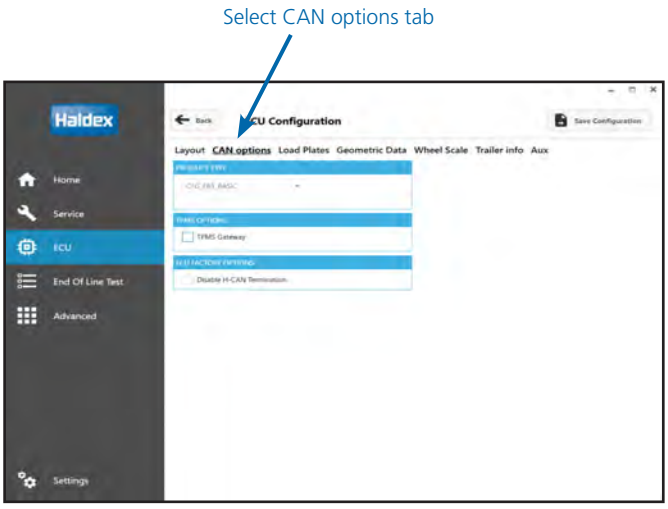
d. Click 'Back' button

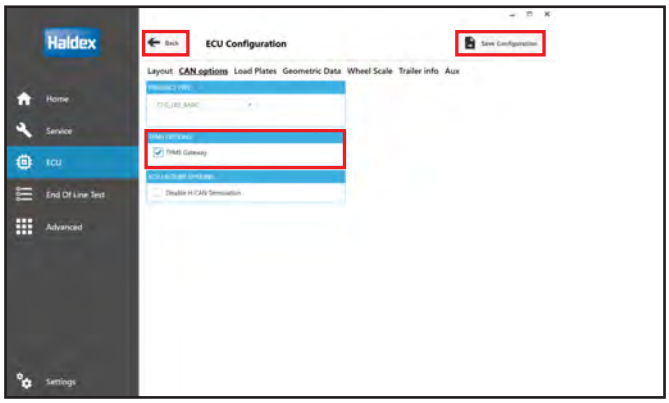
e. Click 'ECU' button

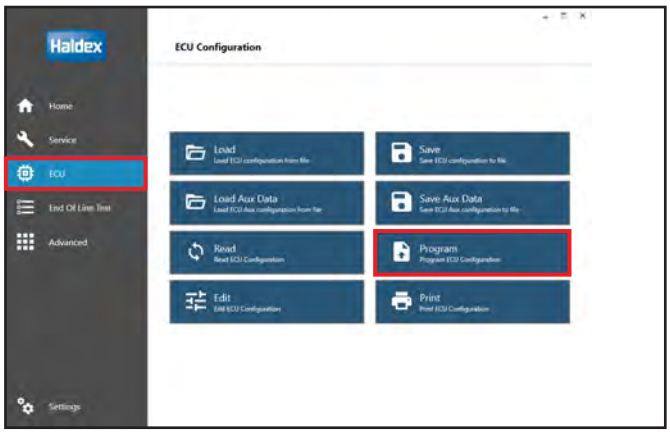
f. Click 'Program' to program the updated ECU configuration to the EB+ 4.0 EBS

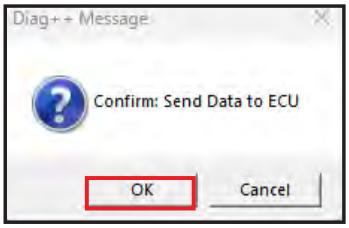
g. Click 'OK' to finish

Note:
If the 'config lock' is enabled the TPMS gateway is also locked and cannot be selected (it's not greyed out, but it is locked).









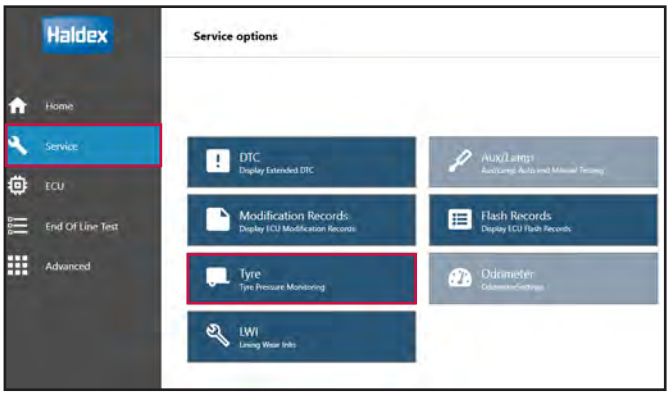
TPMS 2.0 Initial setup

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

Open TPMS 2.0

Click on the 'Service' tab on the DIAG++ main menu.

Click on the 'Tyre' button to enter TPMS dialogs.

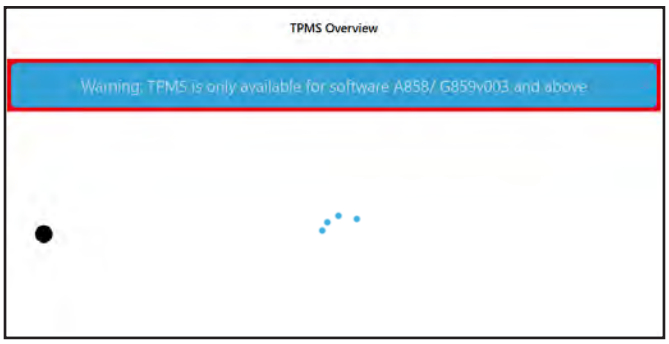


Warnings

If the EB+ 4.0 software does not support TPMS 2.0 then a warning dialogue is shown to the user.

EB+ 4.0 software: A858 or later

Note:
The EB+ 4.0 EBS software must be updated before proceeding.

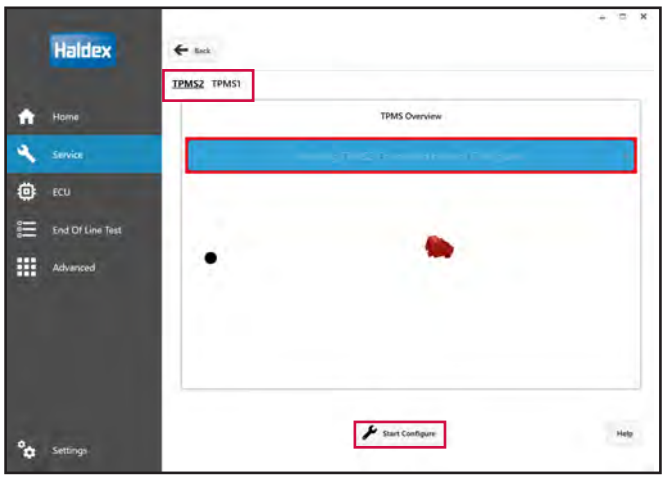


When the overview screen opens, DIAG++ reads the configuration information (If setup).

Click on the 'TPMS2' tab

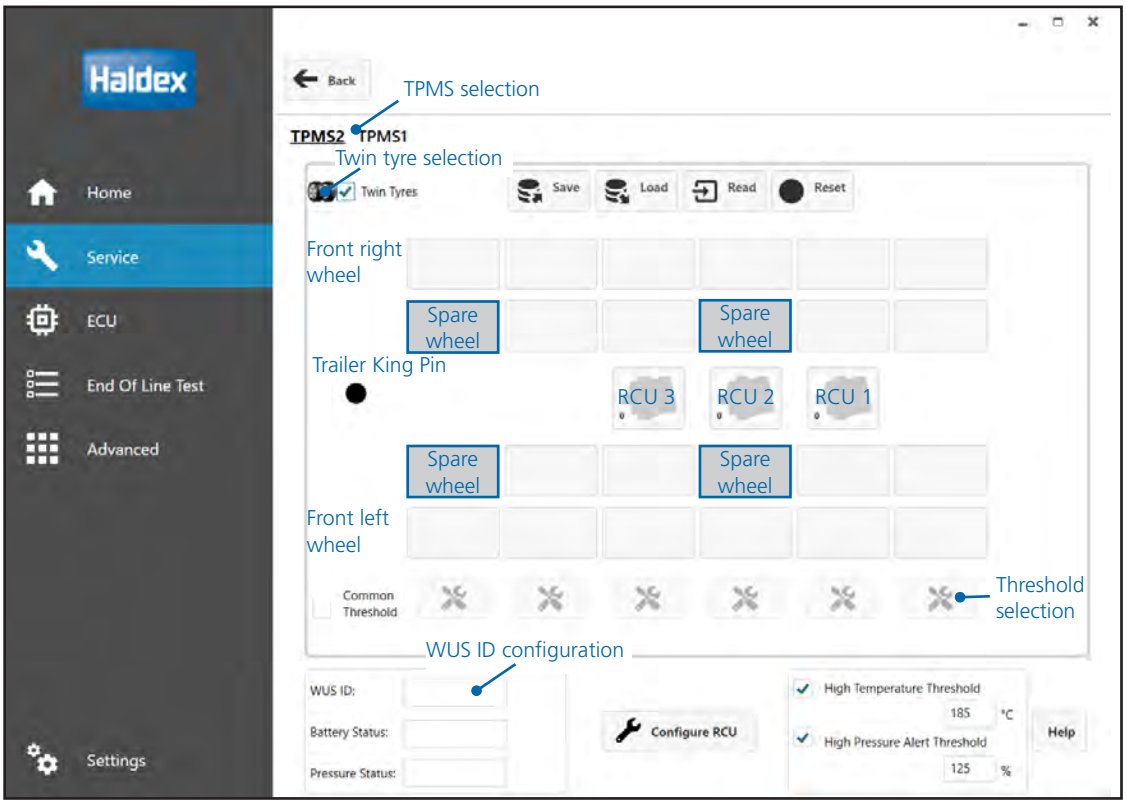
The following screen is displayed if the TPMS 2.0 is connected but not yet configured.

Click on the 'Start Configure' button to start the TPMS 2.0 configuration



TPMS 2.0 dialog overview

The TPMS 2.0 dialog diagram allows the user to see all possible options (i.e. RCUs / axles / tyres / action boxs etc)



› Selected tyres are shown with a bold outline

› Spare Wheel(s) can be allocated on two axles (see above picture)

› TPMS axles must be configured from the rear of the trailer (i.e. furthest from the king pin) to the front of the trailer, with no gaps

The RCUs are shown in the centre of the screen.

› RCUs must be configured starting with 'RCU 1'

TPMS 2.0 RCU / tyre configuration

Available TPMS 2.0 configurations are shown in the below table.

Config No.	No. of axles	Number of wheels per axle					Total no. of sensors	No. of RCUs required	No. of supported spares
		Axle 1 (front)	Axle 2	Axle 3	Axle 4	Axle 5			
1	1	2					2	1	2
2	1	4					4	1	2
3	2	2	2				4	1	2
4	2	2	4				6	1	2
5	2	4	2				6	1	2
6	2	4	4				8	1	2
7	3	2	2	2			6	1	2
8	3	2	2	4			8	1	2
9	3	2	4	2			8	1	2
10	3	2	4	4			10	1	2
11	3	4	2	2			8	2	4
12	3	4	2	4			10	2	4
13	3	4	4	2			10	2	4
14	3	4	4	4			12	2	4
15	4	2	2	2	2		8	2	4
16	4	2	2	2	4		10	2	4
17	4	2	2	4	2		10	2	4
18	4	2	2	4	4		12	2	4
19	4	2	4	2	2		10	2	4
20	4	2	4	2	4		12	2	4
21	4	2	4	4	2		12	2	4
22	4	2	4	4	4		14	2	4
23	4	4	2	2	2		10	2	4
24	4	4	2	2	4		12	2	4
25	4	4	2	4	2		12	2	4
26	4	4	2	4	4		14	2	4
27	4	4	4	2	2		12	2	4
28	4	4	4	2	4		14	2	4
29	4	4	4	4	2		14	2	4
30	4	4	4	4	4		16	2	4
31	5	2	2	2	2	2	10	2	4
32	5	2	2	2	2	4	12	2	4
33	5	2	2	2	4	2	12	2	4
34	5	2	2	2	4	4	14	2	4
35	5	2	2	4	2	2	12	2	4
36	5	2	2	4	2	4	14	2	4
37	5	2	2	4	4	2	14	2	4
38	5	2	2	4	4	4	16	2	4

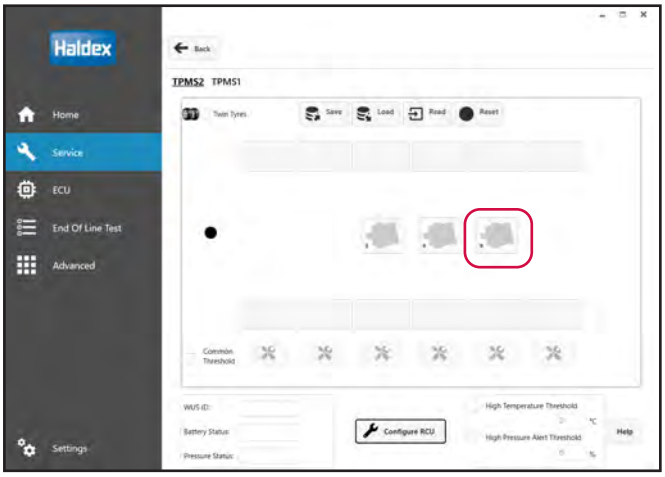
Step 1 – Select RCU(s):

Double click on required RCU starting from the rear of the trailer .

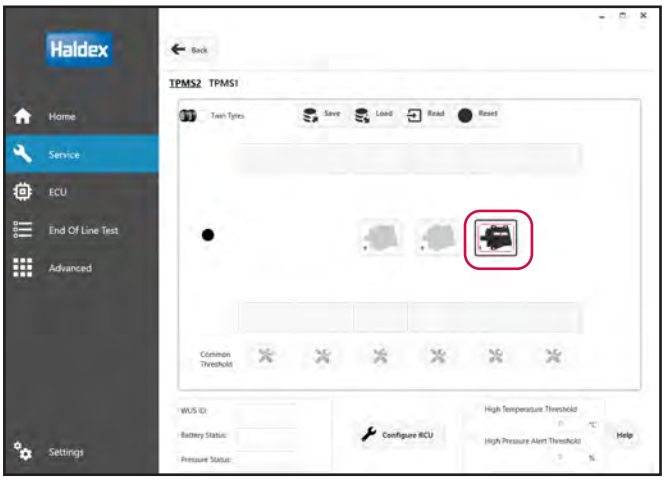
Note:
1. Double click to select RCU and double click to deselect RCU.

2. To remove any already configured RCU, double click on that RCU and then click on the 'Configure RCU'.

If no RCU is selected, then TPMS configuration will be completely removed from the EBS System.



RCU 1 now selected

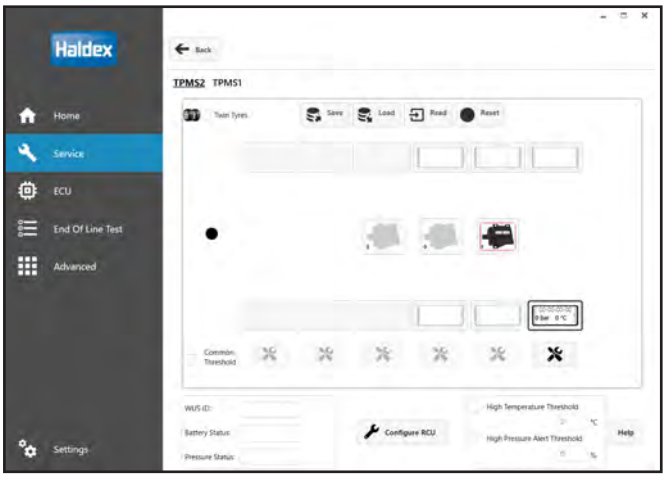


Step 2 – Select Wheels:

Click on required wheels

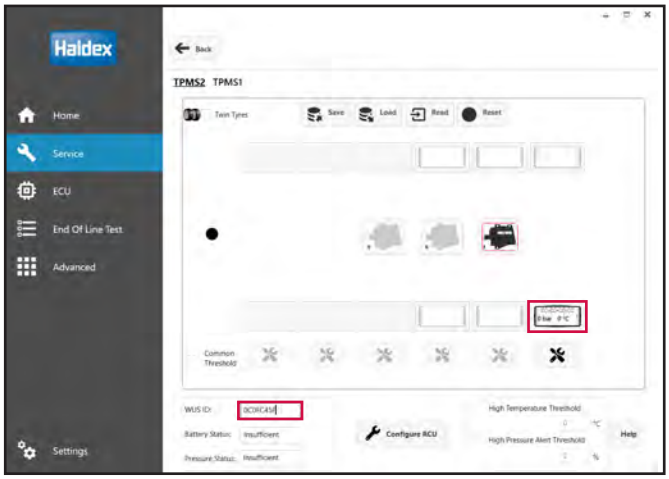
Note:
1. Double click to select wheel and double click to deselect wheel.

2. To remove any already configured wheel, double click on that wheel.



Step 3 – Wheel configuration:

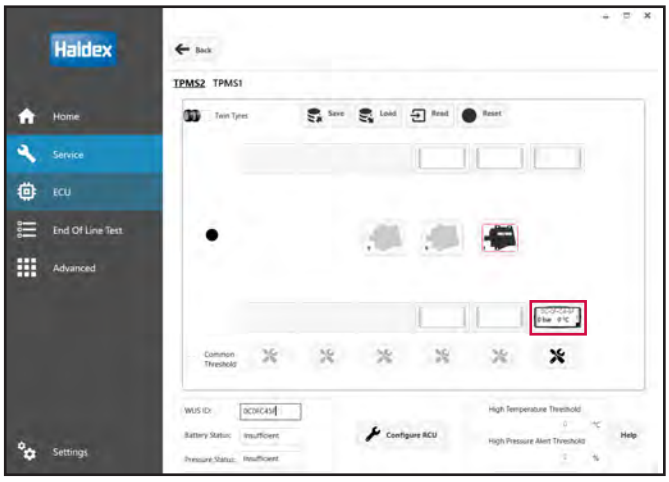
Single click on each wheel and enter the WUS ID in the text box. Once the ID is entered, hit ENTER and a green indicator at the right-hand bottom corner will appear along with WUS ID on the respective wheel, indicating that WUS ID for the selected wheel is now available.



Repeat this procedure by selecting one wheel at a time and entering WUS ID for each wheel in turn.

Note:
1. WUS IDs are 8-digits long (e.g. 9773A8D0)

2. For DIAG++ / EB+ 4.0 TPMS 2.0 operation WUS IDs can only be entered manually (so no Auto / Semi-auto method is supported).

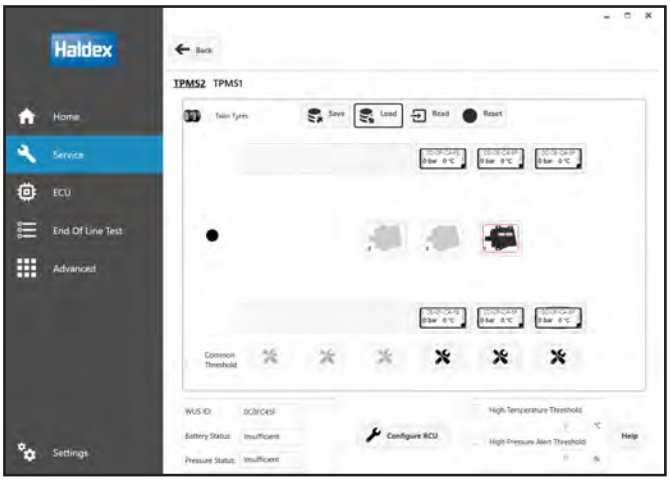


Once all WUS IDs have been entered proceed to step 4

Configuration example:

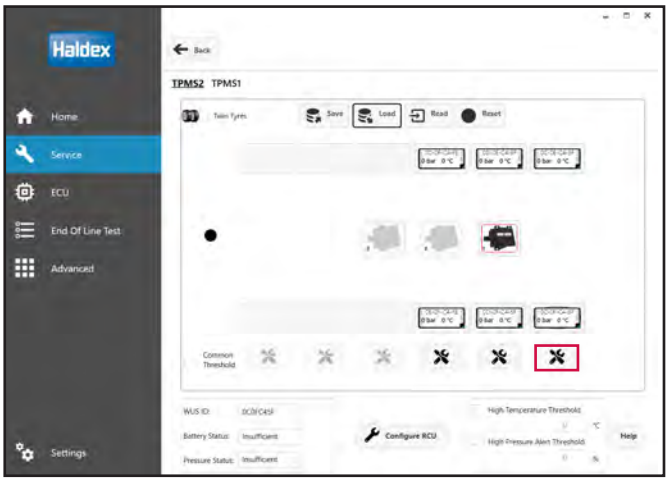
RCU 1 selected

6-off wheels shown as selected (two wheels on each axle)



Step 4 – Configure Tyre Thresholds

Click on the 'Configure Tyre Thresholds' button (located below each axle)



Step 5 – Set Tyre Thresholds:

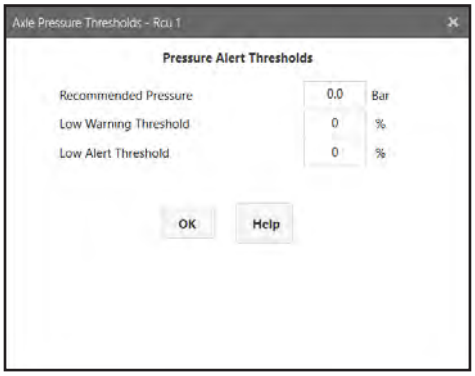
If a temperature threshold is entered and is out of range or a pressure threshold is entered above range then on moving away from that edit box the relevant limit replaces the user-entered value. For example if the extreme over pressure value is set to 15 bar; on moving to another editable box this will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

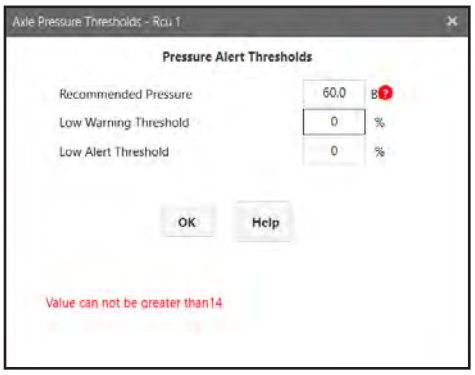
When any threshold values are not selected, these thresholds will be deactivated in the TPMS 2.0 system i.e., TPMS system will not report any Over Pressure and / or Under Pressure warnings / DTC.

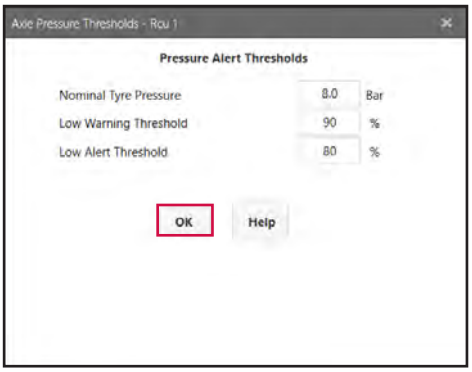
Click on the 'Help' button for further information.

Pressure alert default values:

Nominal tyre pressure: 8 Bar
Low warning threshold: 90%
Low alert threshold: 80%



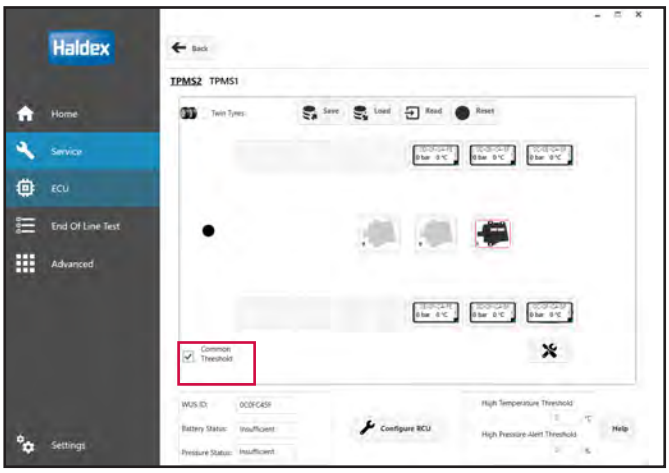




Once the thresholds are set to the desired values, click 'OK' button to accept the values and exit.

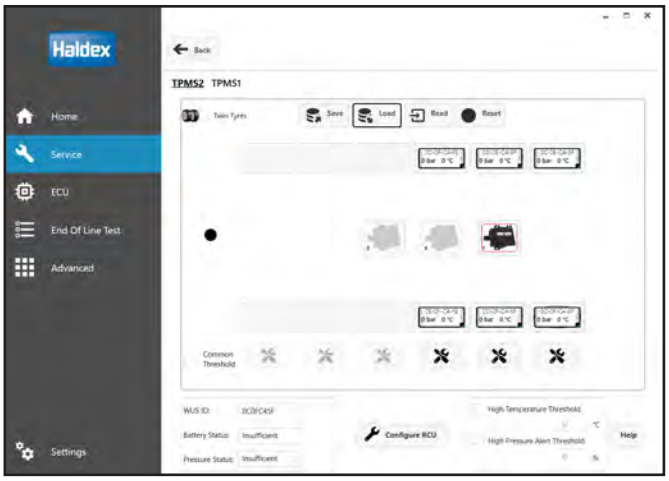
Common Thresholds

All selected tyres can be configured at the same time by clicking the 'Common threshold' box



Step 6: Configuring High and Pressure Thresholds

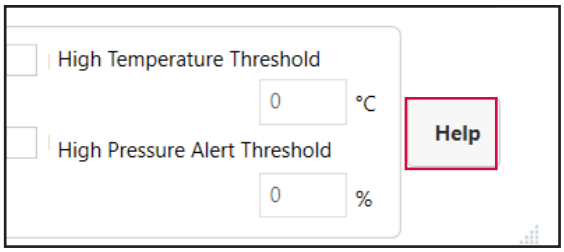
Enter the required settings in the appropriate box and press return.



High Temperature Threshold range: 80 - 120 °C

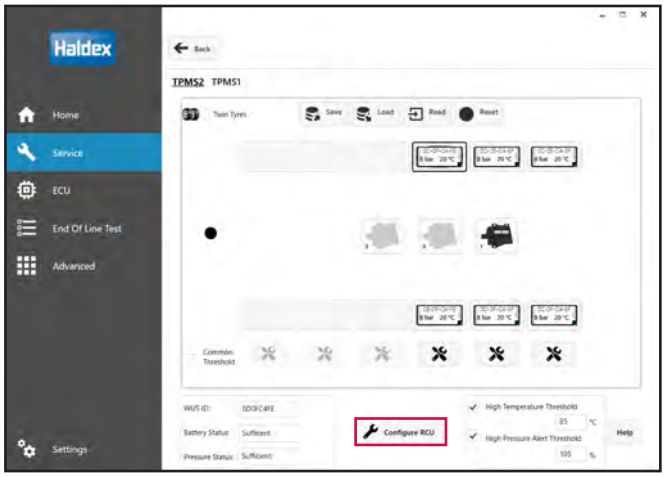
High Pressure Threshold range: 105 - 170%

Click on the 'Help' button for further information.



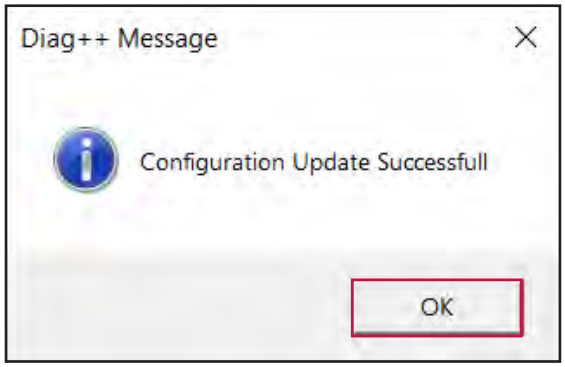
Step 7: Configure RCU

Click on the 'Configure RCU' button when all of the TPMS RCU configuration is completed to send / store this information in the EBS.



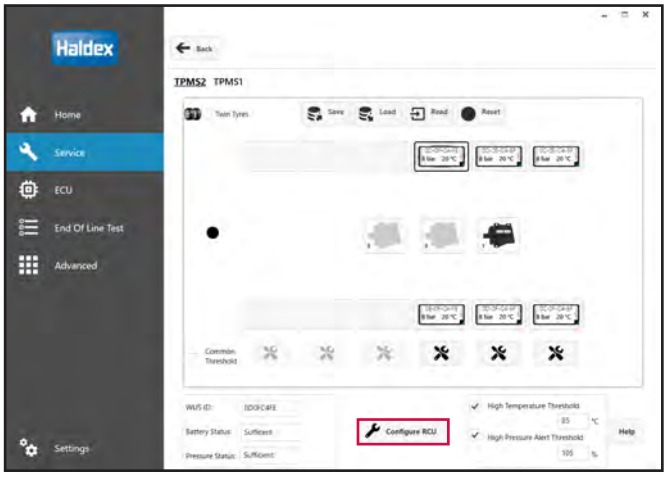
TPMS configuration completed successfully

Click on the 'OK' button to continue

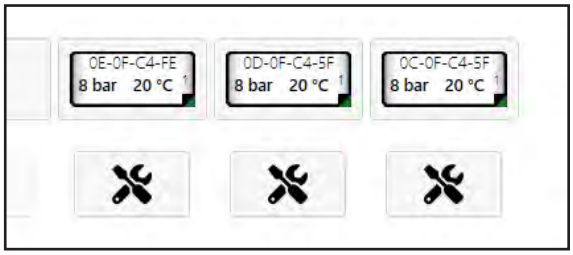


After a few minutes, click on the 'Read' button, when the TPMS 2.0 RCU and WUS(s) are ready to transmit data, the tyre pressure and temperature for each wheel will be displayed.

Note: It can take some time for TPMS 2.0 RCU to transmit wheel data, especially when a new WUS is configured.

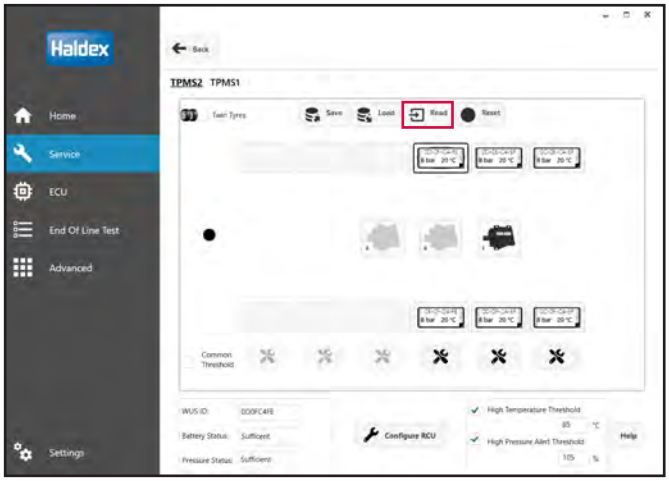


Example: Wheel parameters now displayed for each wheel.



Step 8: TPMS dialog refresh

The 'Read' button must be clicked to refresh / update the information displayed on the TPMS dialog screen.



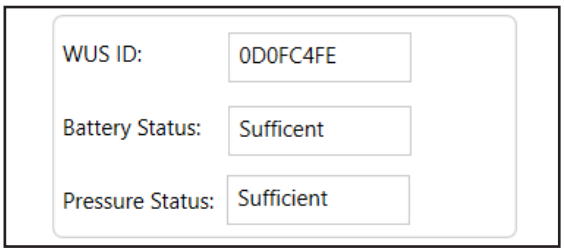
Wheel WUS Information

Click on any configured wheel.

WUS information for that wheel is displayed as shown (editable).

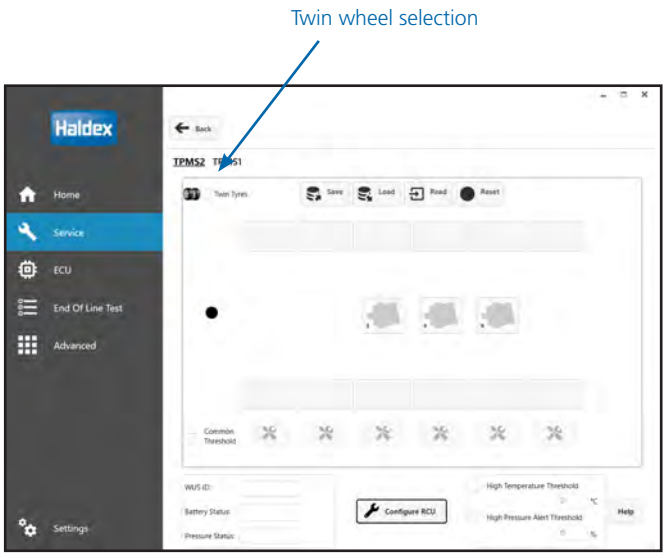
Battery status: Sufficient (not editable)

Battery status: Sufficient (not editable)



Twin wheel selection

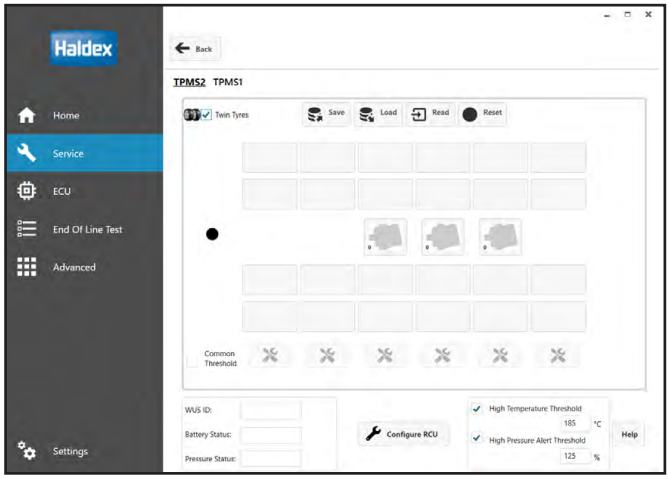
Click on the 'Twin Tyres' check box to display the TPMS twin wheel axle dialog window.



Twin wheel axles now displayed.

Double click to select and add a wheel to the configuration window.

Double click the selected wheel to remove from the configuration window.

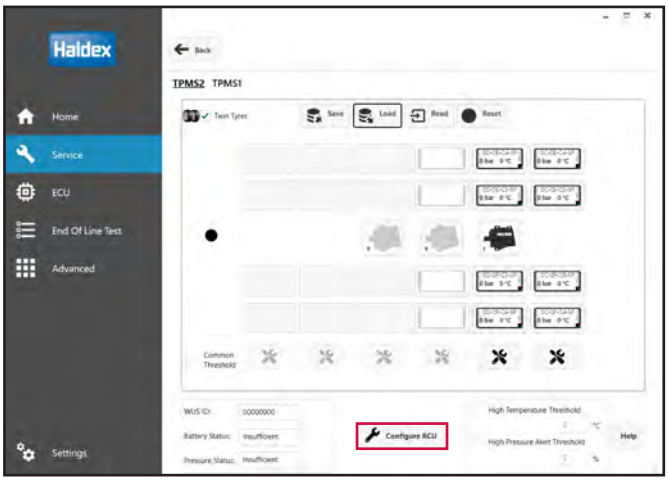


Example shown:

4 x wheels selected on first axle

4 x wheels selected on second axle

No spare wheels selected



Click on the 'Configure RCU' to send this selection to the EBS.

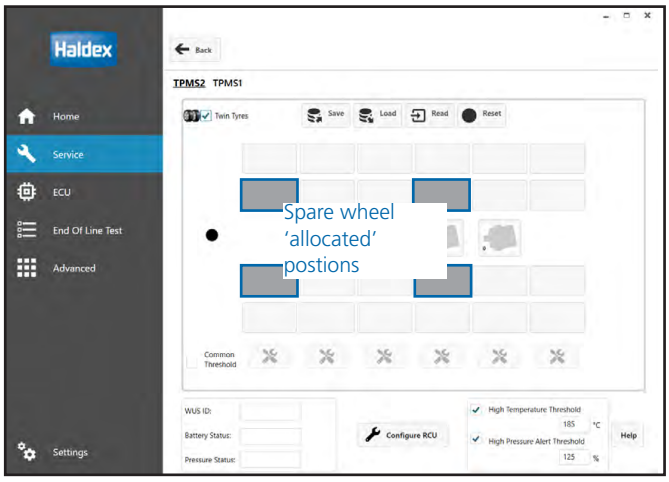
Spare wheel selection location

Only the system 'allocated' wheels , as displayed, can be configured as 'Spare Wheels'

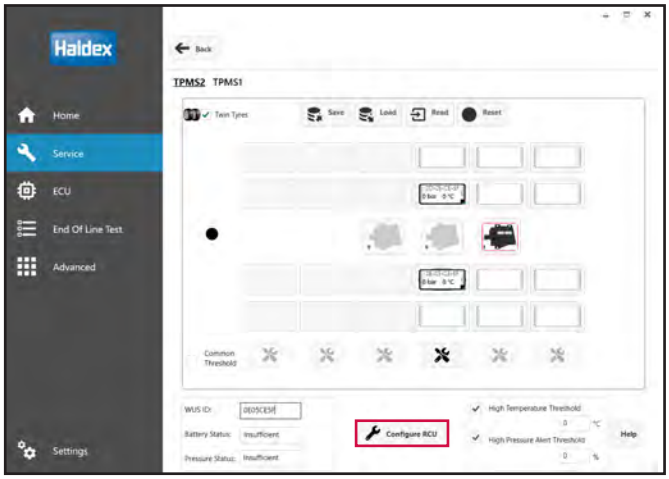
Refer to the TPMS 2.0 configuration table for available RCU configurations.

Double click to select and add a spare wheel to the configuration window.

Double click the selected spare wheel to remove from the configuration window.



Click on the 'Configure RCU' to send this selection to the EBS.

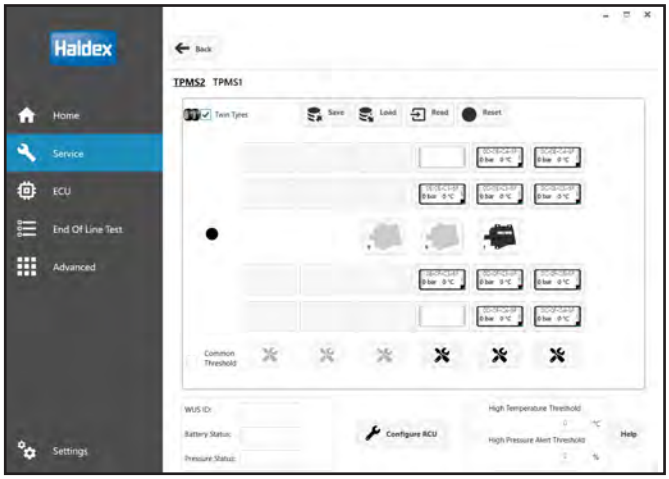


Example shown:

4 x wheels selected on first axle

4 x wheels selected on second axle

2 x spare wheels selected on third axle



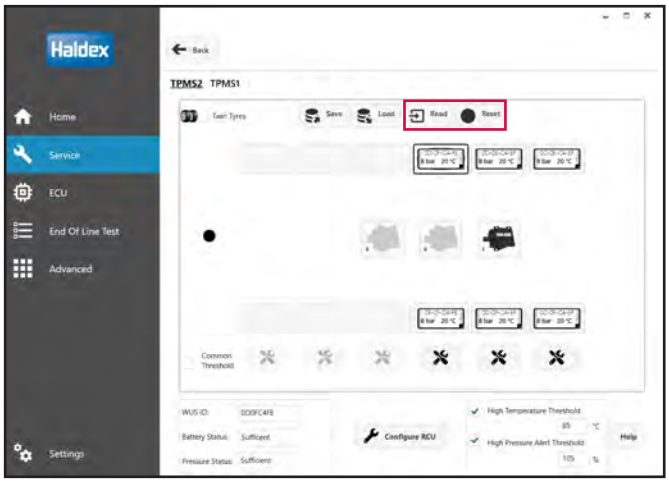
TPMS Configuration reset

If required, all of the TPMS 2.0 configuration data can be deleted.

Click on the 'Reset' button

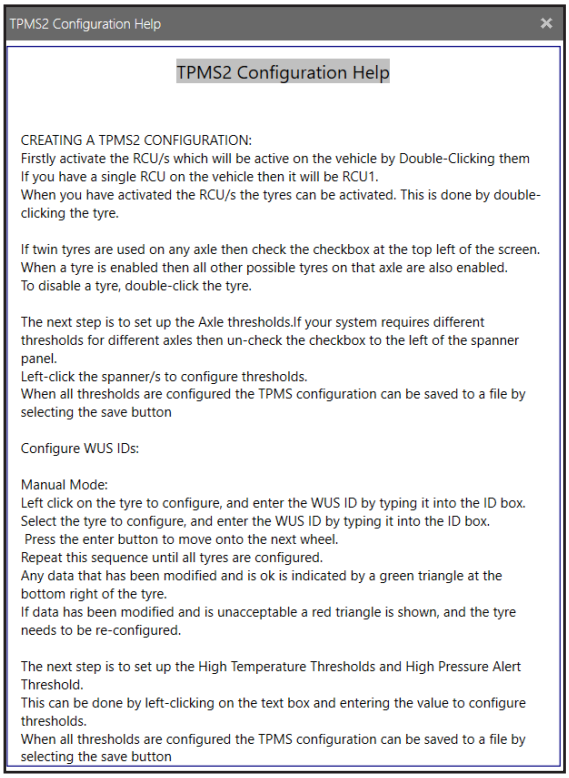
Click on the 'Read' button to update the TPMS dialog screen.

All of the TPMS 2.0 configuration data has now been deleted.



TPMS Configuration help

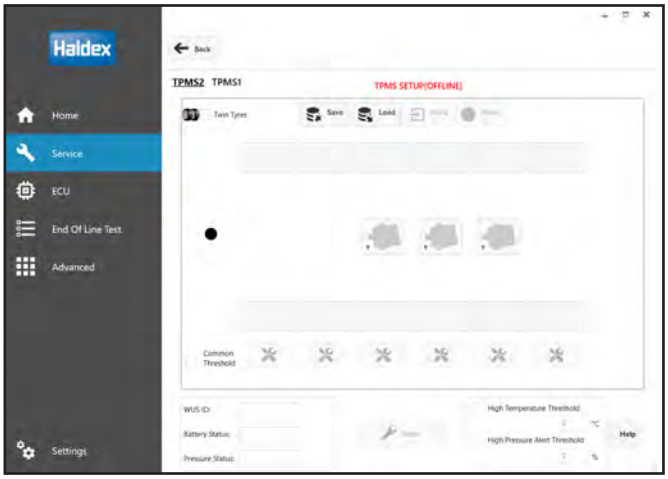
A TPMS help menu can be displayed by pressing the 'Help' button on the dialog diagram.



TPMS setup (offline)

Creating a TPMS configuration

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

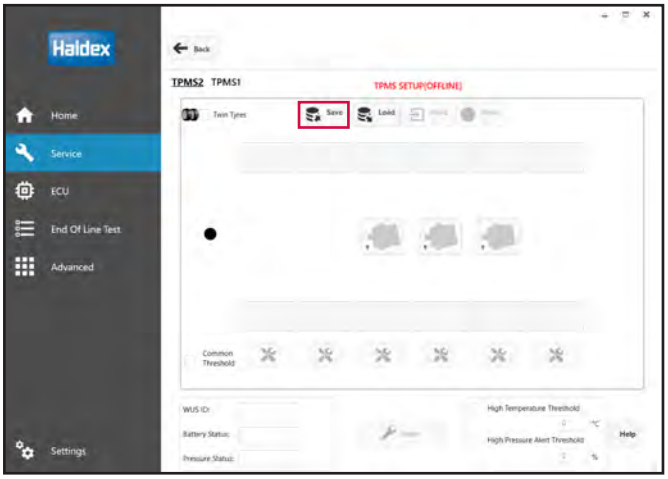


It is possible to save the configuration on your computer as a TPMS file type (*.tppm).

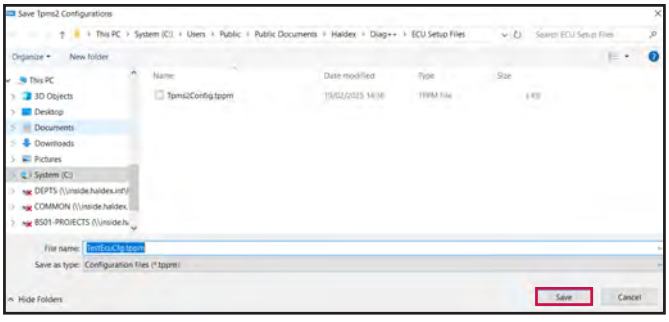
This can be retrieved later when online (i.e. connected to EB+).

Saving the TPMS configuration file (Online & Offline)

On completing the TPMS configuration click on the 'Save' button to save the current configuration.



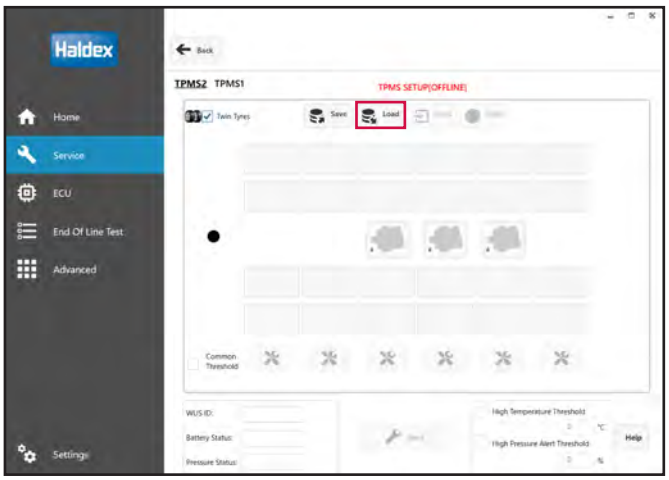
Enter a name for the configuration file and press the 'Save' button.



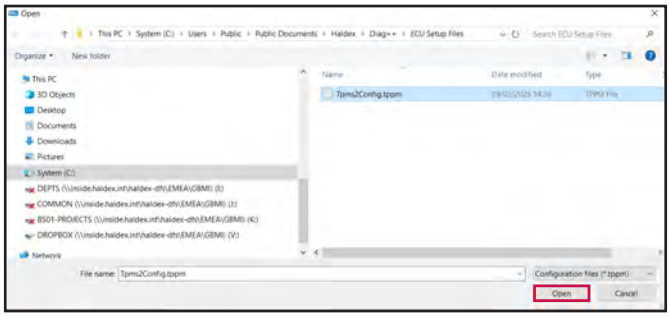
Note: WUS IDs can be assigned in offline mode.

Opening a TPMS configuration file (Online & Offline)

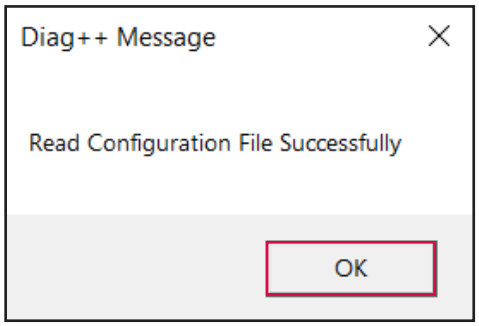
Click on the 'Load' button to read a TPMS configuration file from disk.



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

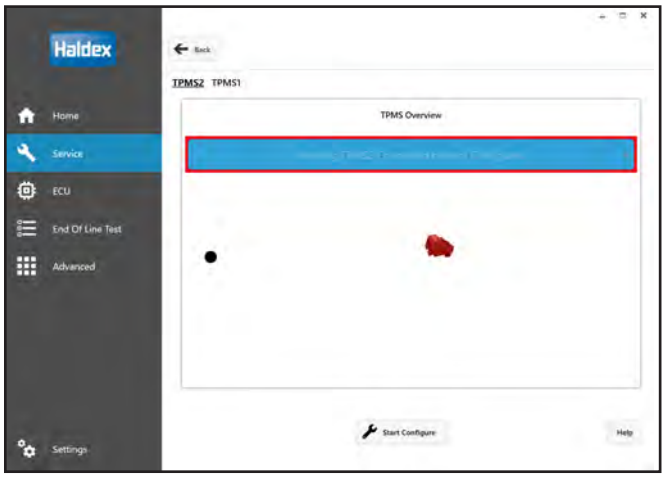


Click 'OK' button to open file in the TPMS setup dialog screen.



Troubleshooting

Error screen:TPMS 2.0 connected but not yet configured

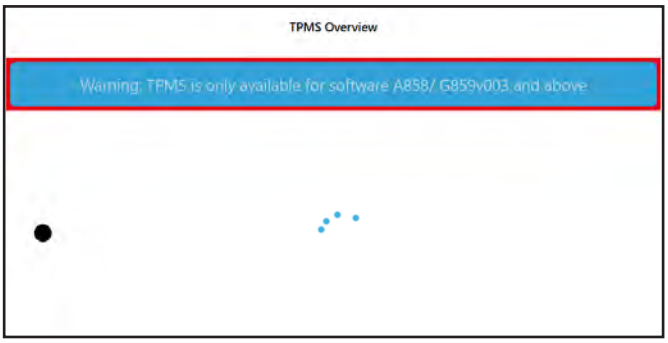


Warnings

If the EB+ 4.0 software does not support TPMS 2.0 then a warning dialogue is shown to the user.

EB+ 4.0 software: A858 or later

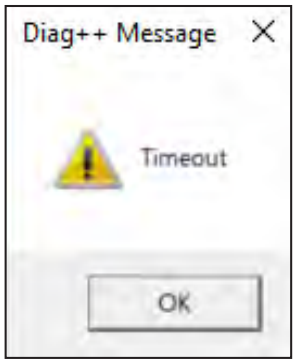
Note:
The EB+ 4.0 EBS software must be updated before proceeding.



Error screen: DIAG++ Error Timeout

Will be shown upon clicking the 'Configure RCU' button if there is:

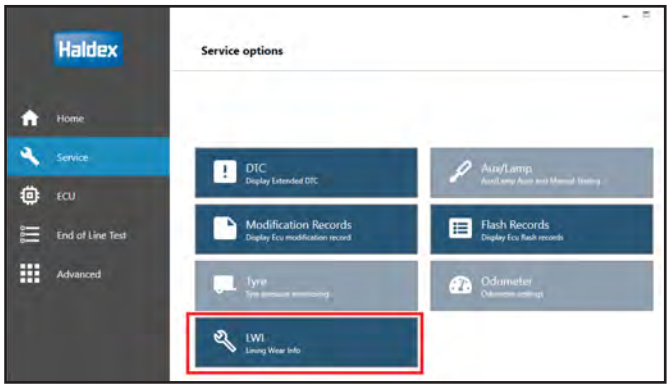
- No power / power interuption
- Loss of communication



Lining wear sensor (LWS)

This feature must be set in the AUX 4 configuration.

Click on the 'LWI' button (red box) to enter the lining wear info screen.



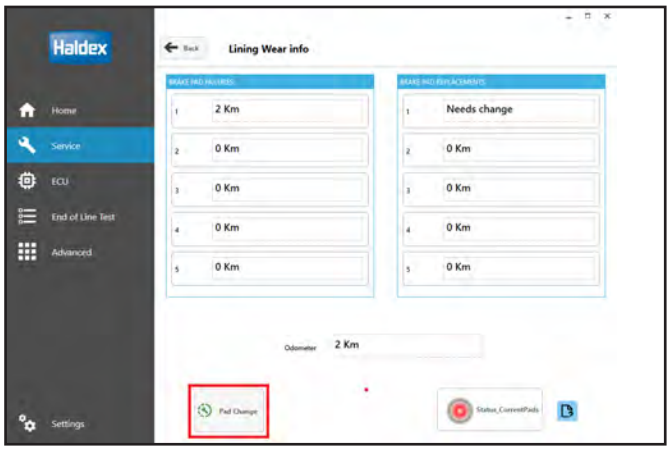
There are two types of faults which can be detected by the LWS:

1. Pad failure
2. Tamper fault

Pad failure

An AUX 4 OC [open circuit] DTC is reported if this condition is active.

The Lining Wear info screen lists the history of the changes of linings (last five recorded).

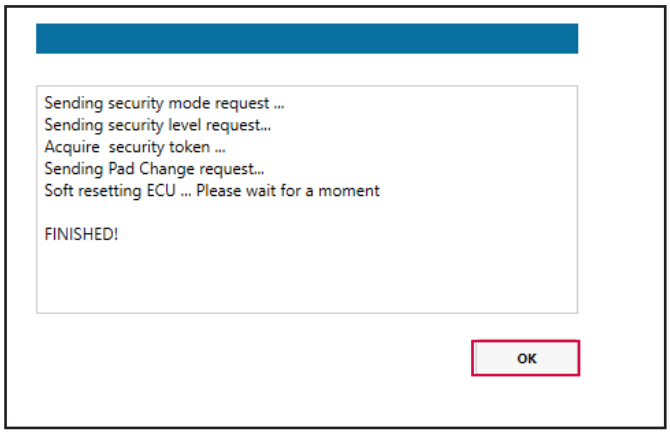


The left hand column records when the brake pads (lining wear sensor) has worn. The right hand column records or indicates when the brake pads have been replaced or require replacing.

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 Pad Change button (this will be active) to reset the LWS.



The following screen appears.

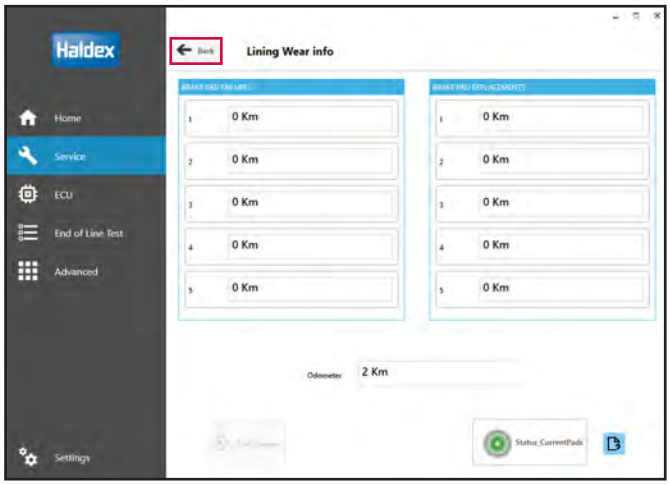
Click on the 'OK' button when finished.

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.

c. Pad change button should be inactive



On 'lining wear info' screen click on the ‘Back’ button to exit to the ‘Service Options’ screen.

Note: Diagnostic code 'AUX 4 OC [open circuit]' is deleted automatically.

General

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

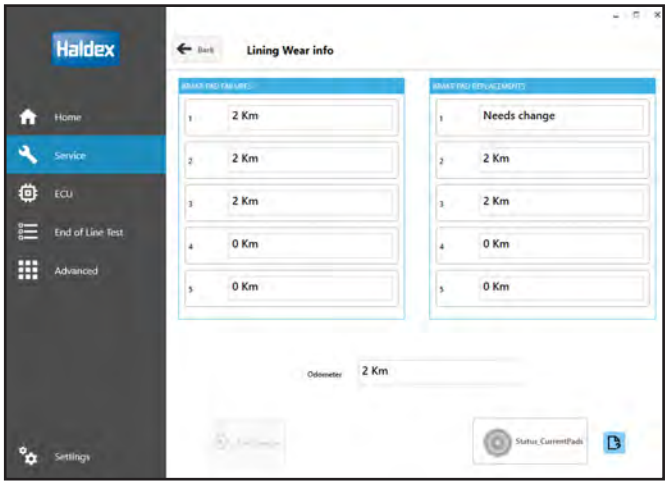
The following screen will be displayed.

The 'status of current pads' indication is coloured green.

Record any necessary details for future reference.

Tamper fault

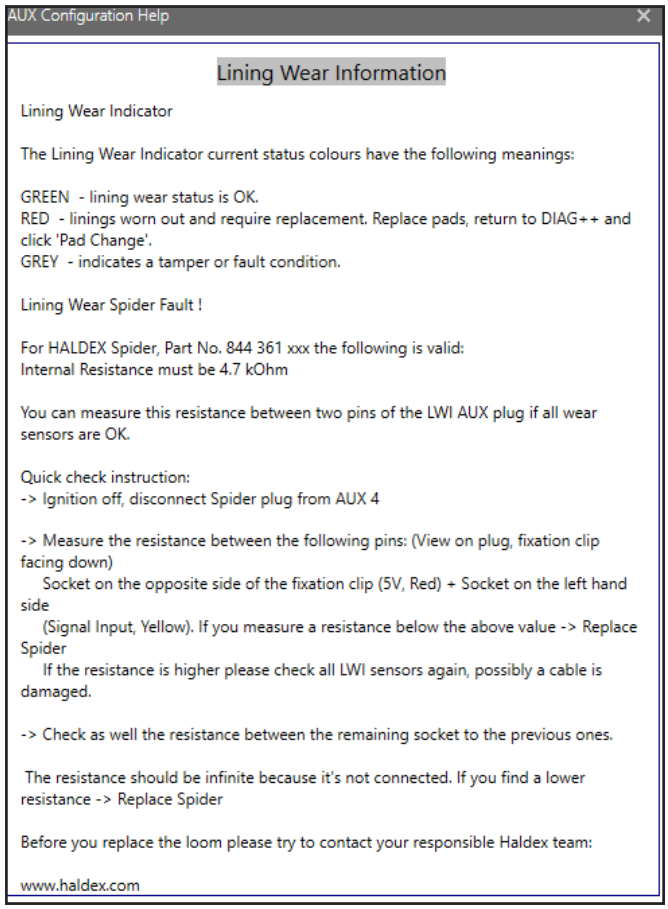
An AUX 4 SC [short circuit] DTC is reported if this condition is active.



Navigate to Lining Wear Information screen and see that the "Status_CurrentPads" indication is coloured grey.

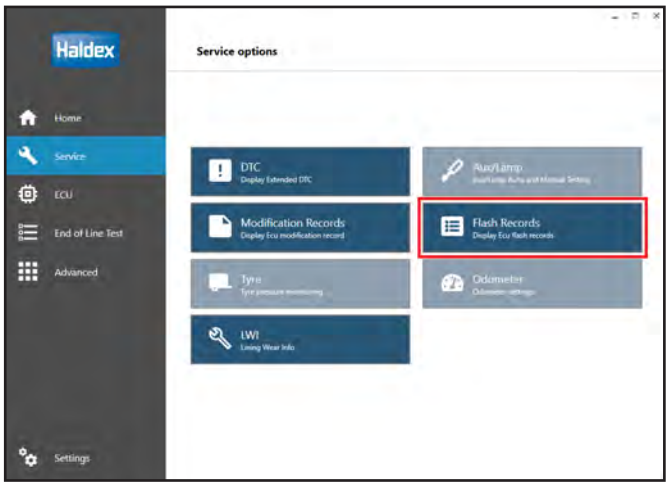
To clear this DTC (to stored) fix the tamper fault and power-cycle the ECU. The DTC should clear (to stored) and the "Status_CurrentPads" indication should now be coloured green.

Help info

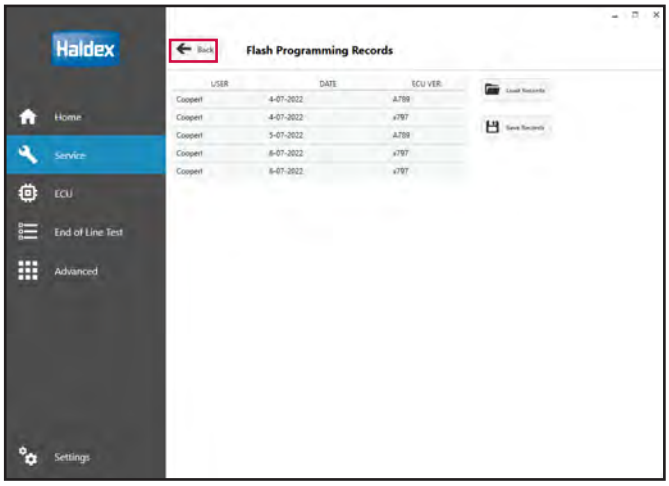


ECU flash programming record

Click on the 'Flash Records' 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, a record is made in the ECU memory (containing details of the computer used, the date and the ECU version).

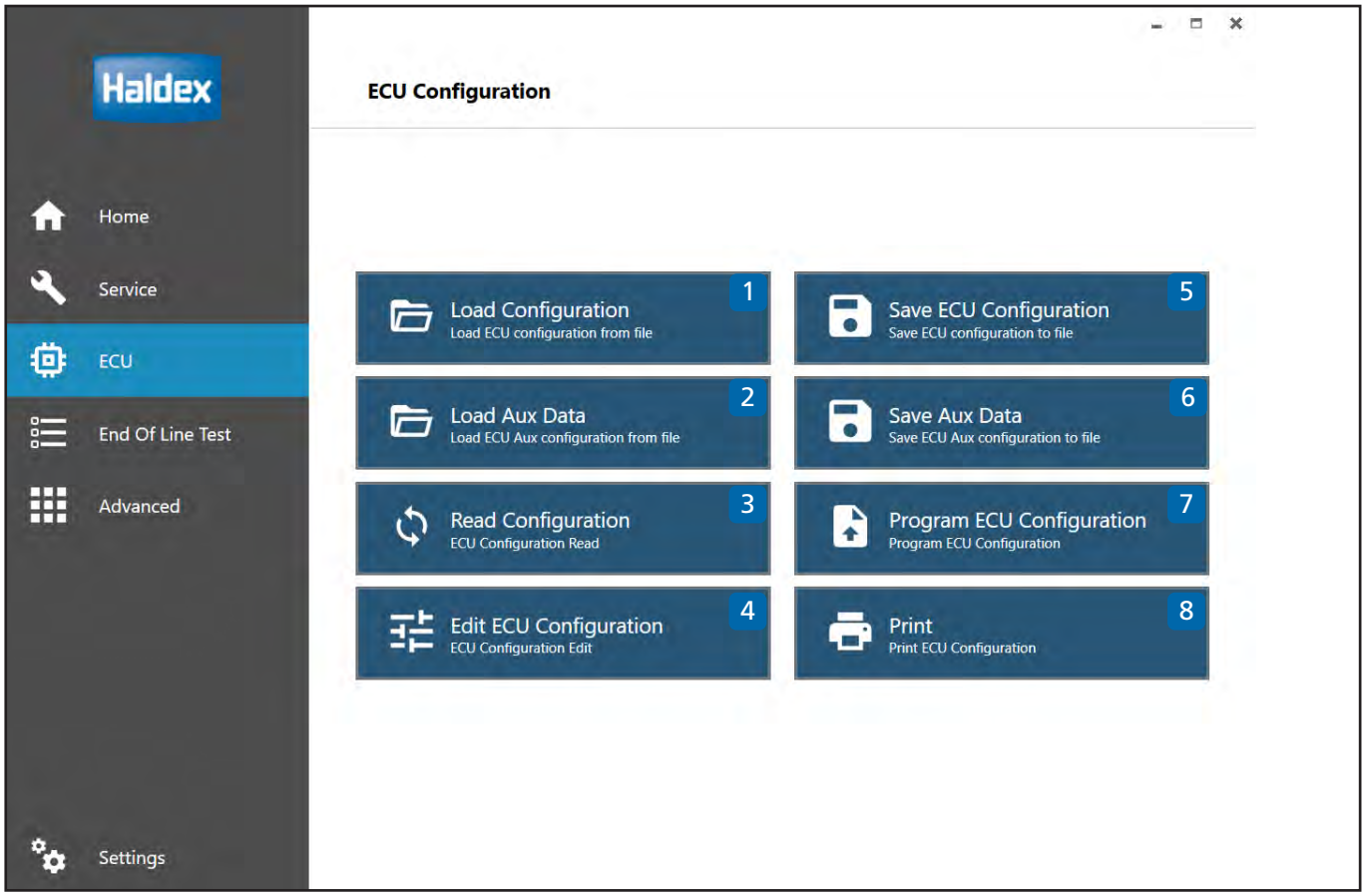
Note: Records from older ECU versions will display a message of 'no data available !'.

Click on the 'Back' button to exit.

Note: Load / Save buttons don't work yet

ECU configuration (Setting parameters)

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

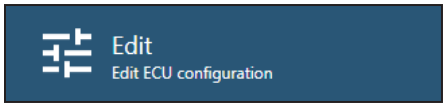


ECU Menu

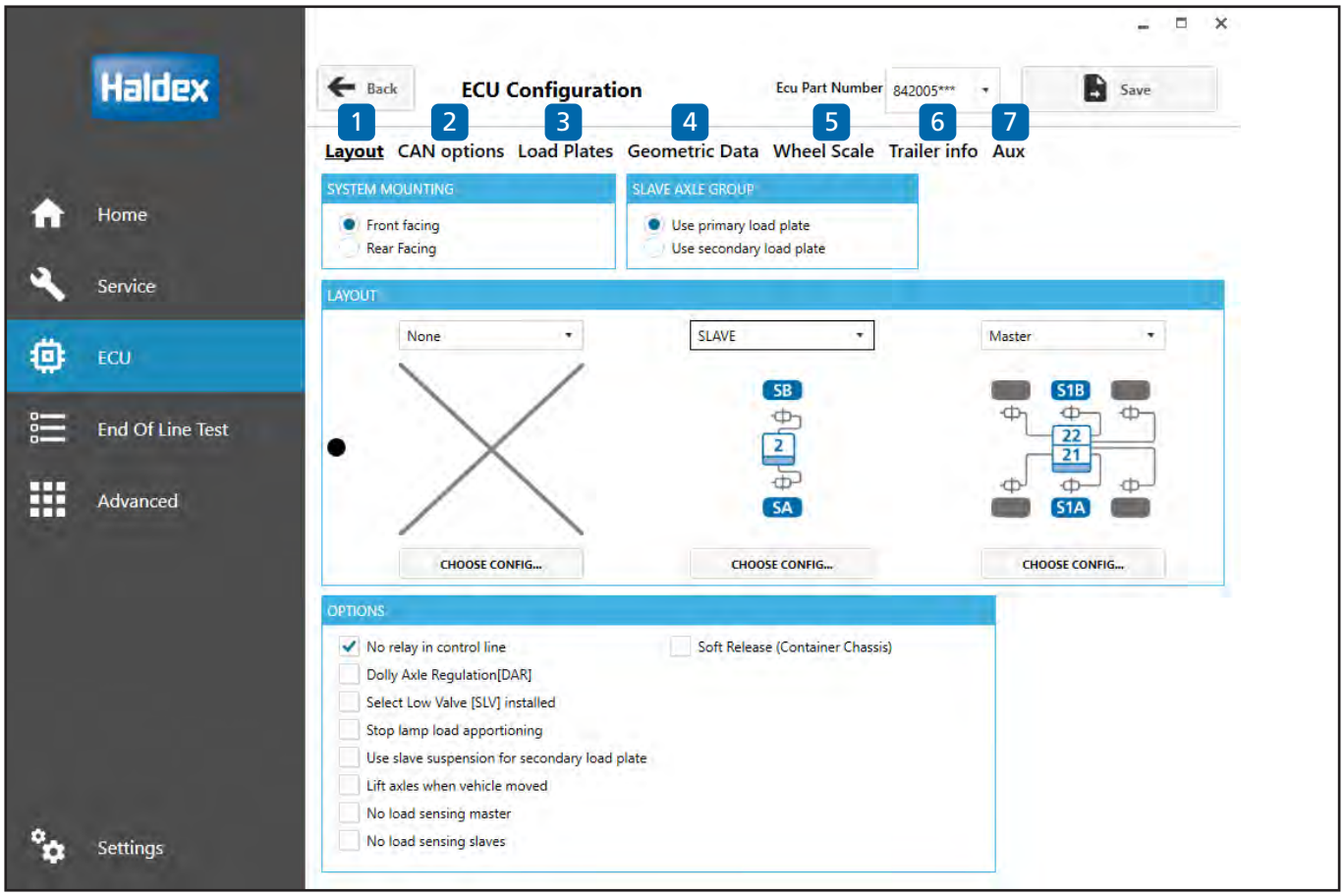
01	Load - Load ECU configuration from file.
02	Load AUX Data -Load ECU AUX configuration from file
03	Read - Read ECU configuration.
04	Edit - Edit ECU configuration.
05	Save - Save ECU configuration to file.
06	Save AUX Data - Save ECU AUX configuration to file.
07	Program - Program ECU configuration.
08	Print - Print ECU configuration (Chassis load plate)

Edit ECU configuration

Click on the 'Edit' button to edit the ECU configuration.



If a Read (configuration) has not been done prior to entering the Edit (configuration) dialogs then DIAG++ will do a Read first to load up the current EBS or ABS data.



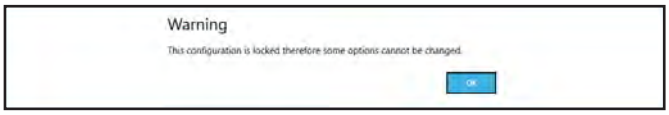
Edit ECU setup menu

01	Layout.	05	Wheel scale.
02	CAN options.	06	Trailer information.
03	Load plate.	07	Auxiliary information.
04	Geometric data.		

Note: The following defaults are set as shown below:

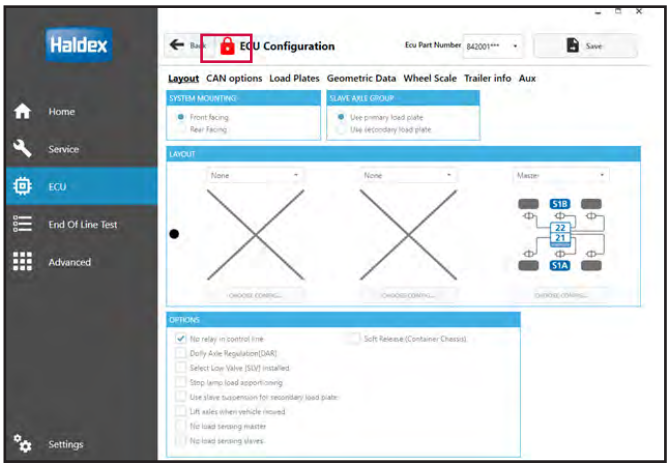
- Auxiliaries - not used (unused).
- Wheel scaling - 306 rev/km, 520 Rdyn (mm) and 100 no. of teeth exciter.
- Lamp sequence - on / off.

If the configuration is locked then a warning dialog is displayed when the user enters the 'Edit Configuration' dialog.



And when the 'Edit Configuration' dialog is displayed a warning 'locked padlock' icon is shown to indicate that the configuration is locked.

Any settings that now cannot be changed are disabled (greyed out).



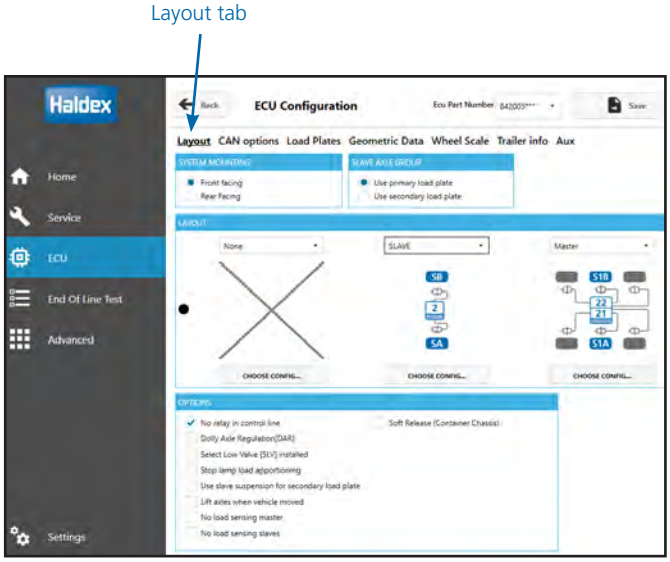
ECU Layout

Only the layouts as defined in the system schematics documentation are supported.

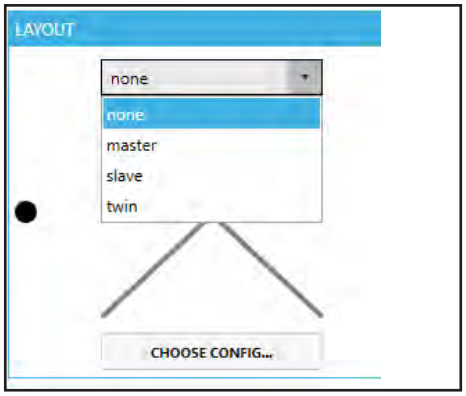
EB+ 4.0 System Schematic - 006300053
ABS 4.0 System Schematic - 006300057

Please check with Haldex (before trailer configuration) if any other layout is required – because this may not be supported.

Click on 'ECU' button then choose 'Layout' tab:



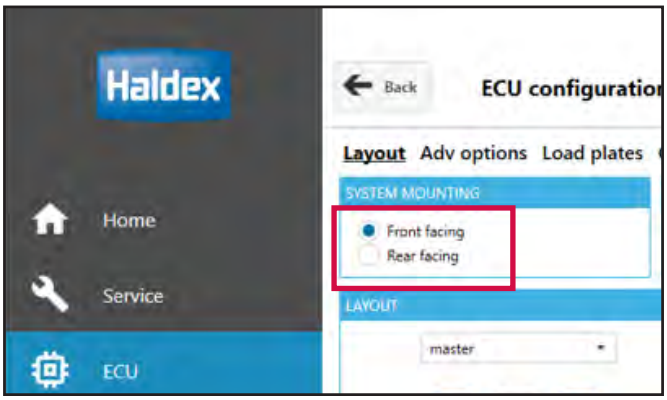
Choose ECU type – Master / Slave / Twin – to be configured from layout drop-down:



Note: Users should try to mimic the physical layout of the ECUs / Axles when defining the logical layout. For example, if a 8S/4M system on a 4-axle trailer is required with slaves on axle 1 and 2 and the master on axle 3/4 then the logical layout should look like this:

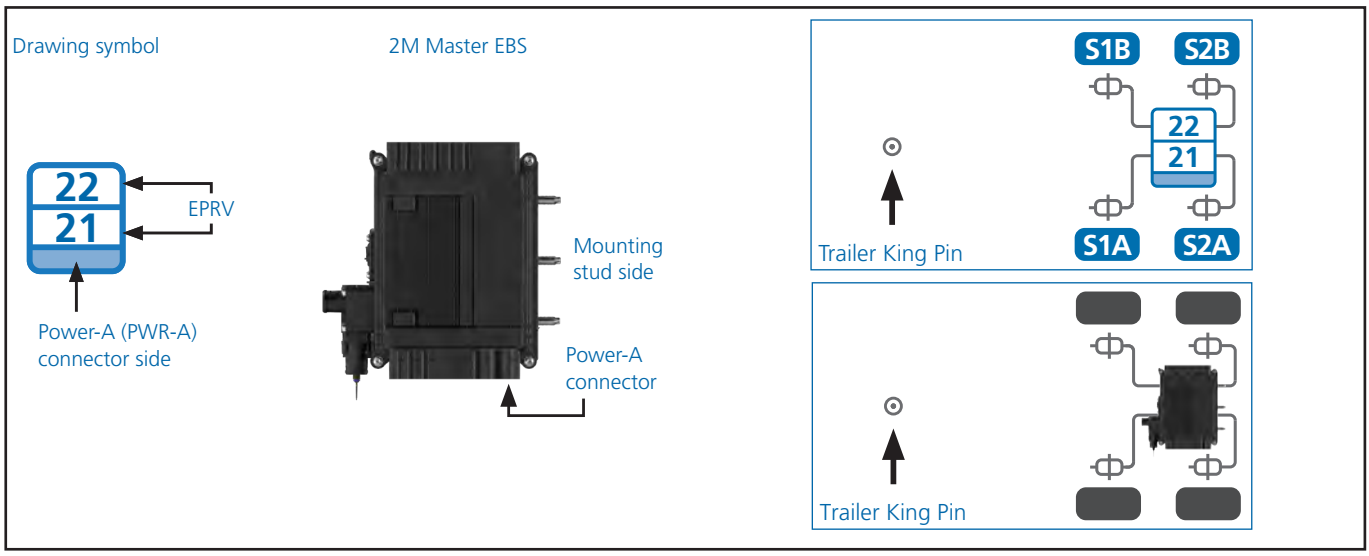
Note: all Master / Slave / Twin layouts are shown as front facing – if rear facing configuration is needed choose most relevant front facing layout then invert with system mounting orientation buttons.

See orientation examples:



Front facing EBS

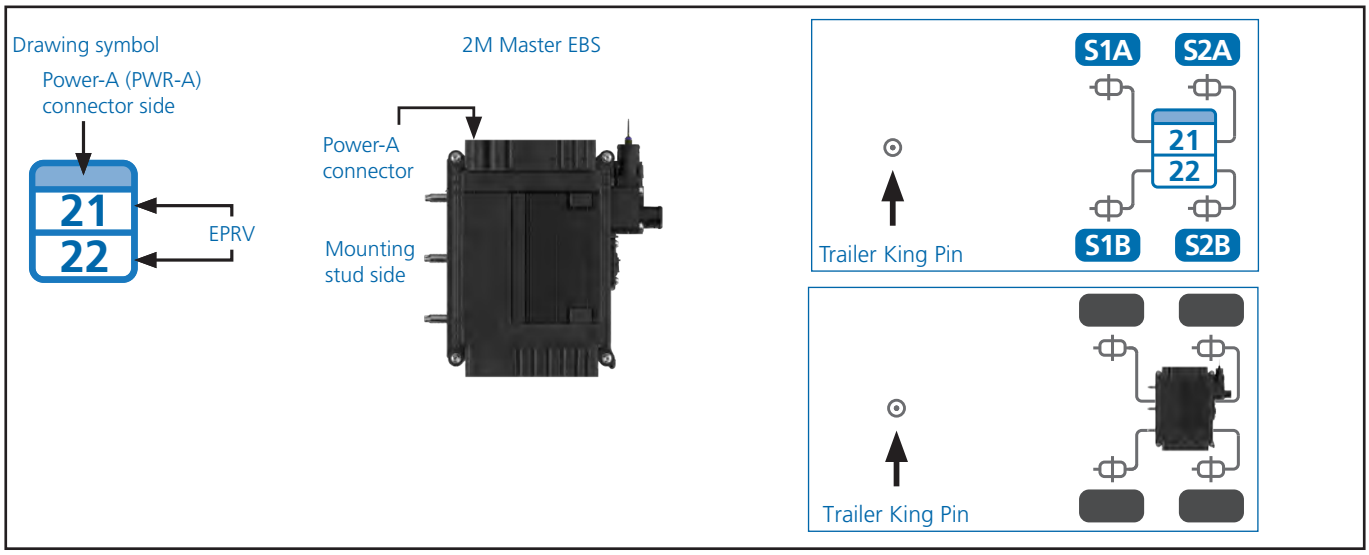
EBS is mounted in front of the cross beam, facing to the front of the trailer



Premium 2M Master EBS front facing

Rear facing EBS

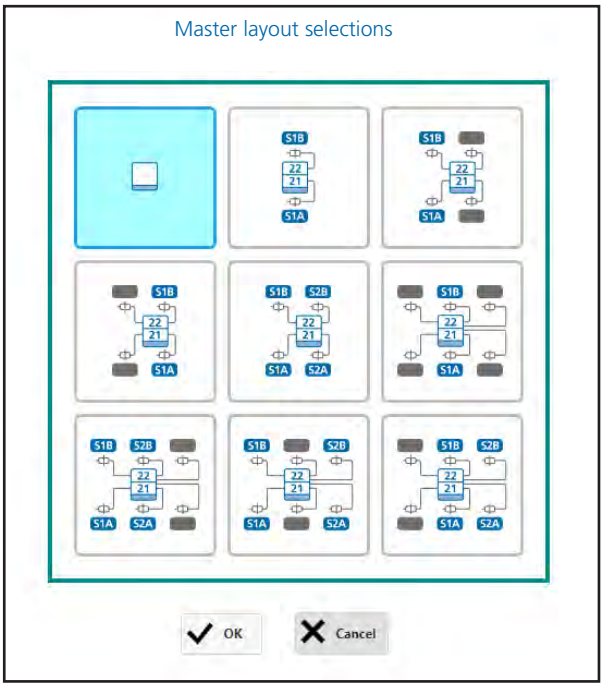
EBS is mounted on the back of the cross beam, facing to the rear of the trailer



Premium 2M Master EBS rear facing

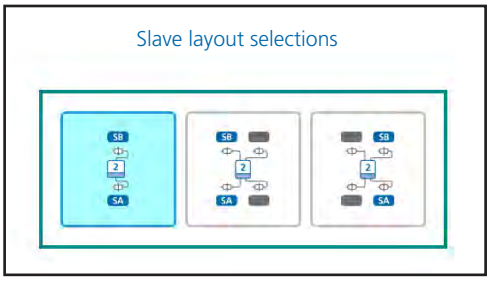
Choose correct Master Layout :

Note: a Master ECU is always needed and can optionally be linked to either additional Slave(s) or a Twin.



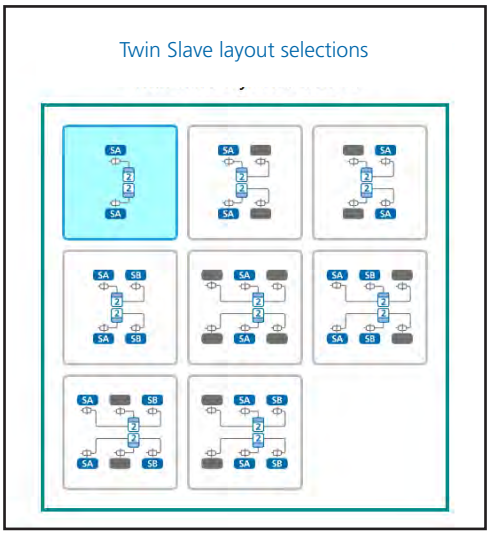
If configured, choose correct Slave(s) layout:

Note: if Slave(s) selected then any additional Twin selection is invalid.

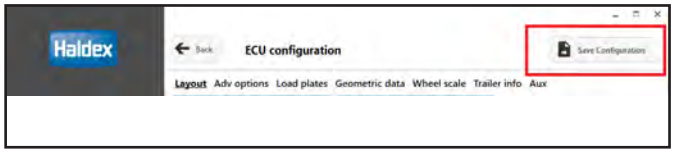


If configured, choose correct Twin Layout:

Note: if Twin selected then any additional Slave(s) selection is invalid.



Click on the 'Save configuration' button to save the updated settings.



Slave valve configuration consideration

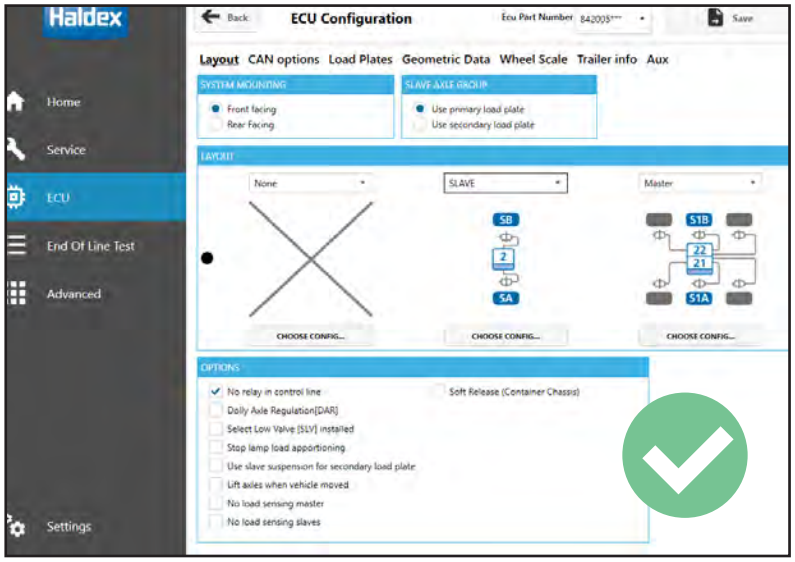
With DIAG++ it is possible to configure braking systems that do not meet the European UN R13 legislation.

For most trailers, you cannot have more than 50% of the axles with select low ABS control logic.

That means you cannot have any slave valves present controlling more axles than the Master valve - because the ABS performance would be downgraded from the required Category A performance braking system (which meets the UN R13 split friction performance requirement) to a Category B system (which does not, and which therefore is not allowed for most trailers).

So, when configuring an EB+ 4.0 and ABS 4.0 installation please ensure that if any slaves are to be used, the master is controlling 50% or more of the trailer axles.

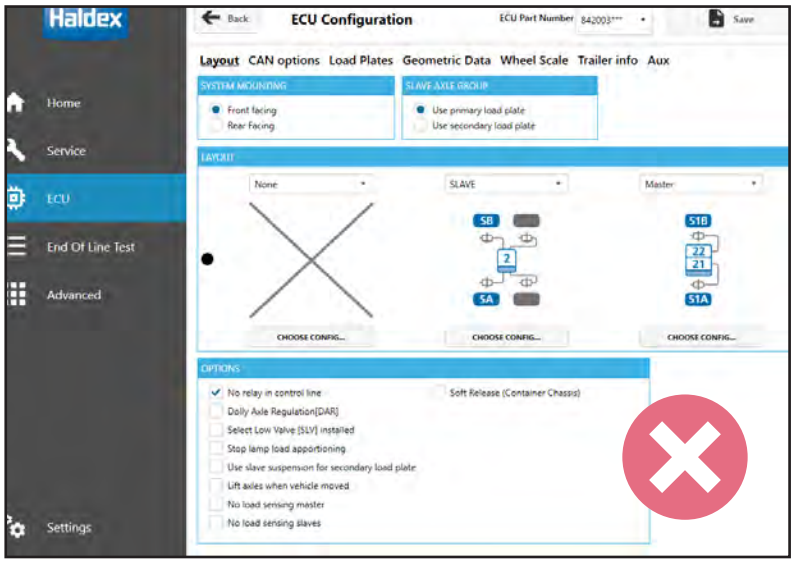
See example illustrations below:



Category A system configuration

The master valve ECU controls the same or more axles than the slave valve ECU

Example shown:
Master valve - 2 x axles selected / controlled
Slave valve -1 x axle selected / controlled



Category B system configuration

The slave valve ECU controls more axles than the master valve ECU

Example shown:
Master valve - 1 x axle selected / controlled
Slave valve - 2 x axles selected / controlled

If box 1 is selected this adjusts the working parameters when No Relay Valve is installed.

If box 2 is selected this modifies the left and right pressure control for dollies to prevent unwanted torque steer.

Select box 3 if a steer axle is configured and operated via ports 21 / 22.

If box 4 is selected (as shown) load sensing function is available together with ABS on backup powering ISO 1185 (24N).

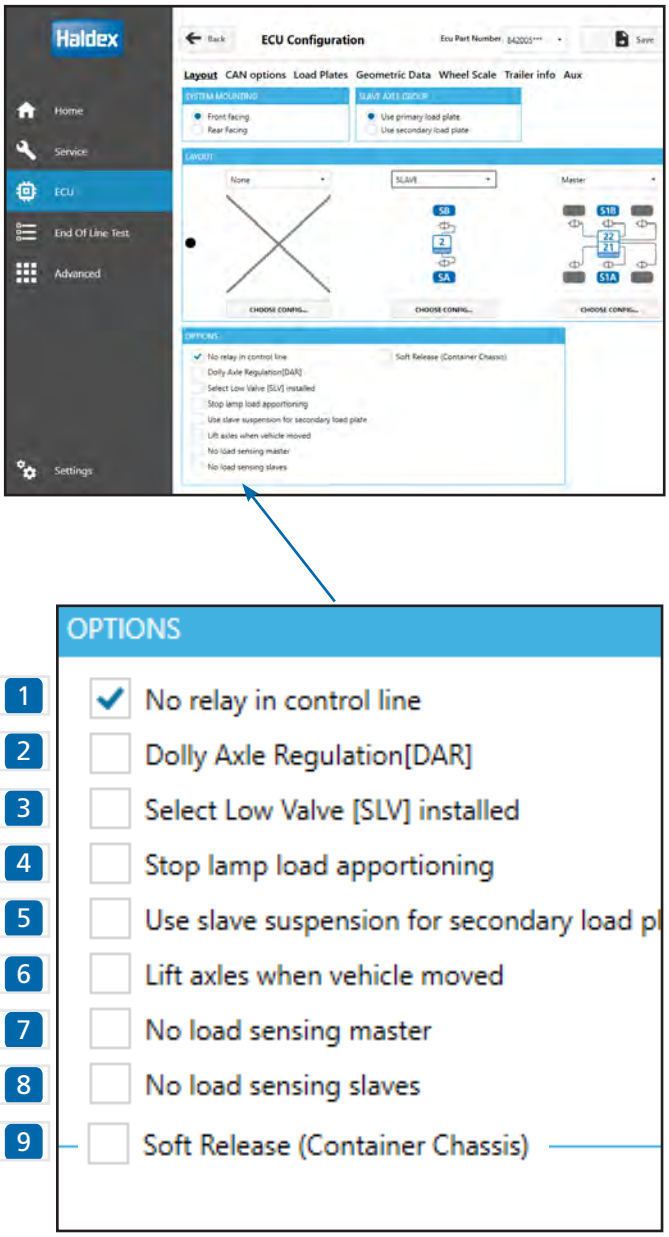
If box 5 is selected this allows the Slave valve suspension port to be used for the secondary load plate.

If box 6 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 7 is selected Master valve on trailer will always brake as fully laden (Used for example for fixed load trailers).

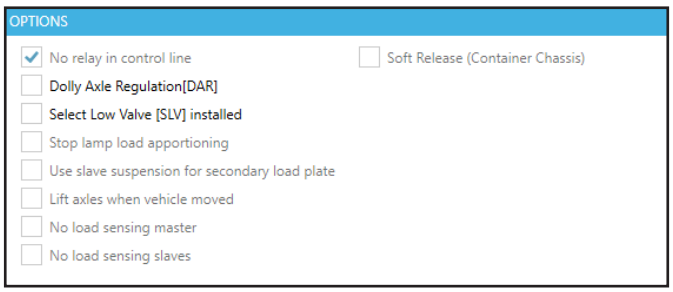
If box 8 is selected Slave (s) valves on trailer will always brake as fully laden

If box 9 is selected (usually for container chassis trailers) this enables a "double braking sequence" when the foot brake is pressed if trailer brake is active (Park on Air) so trailer suspension adjustment is controlled if the container has been removed.

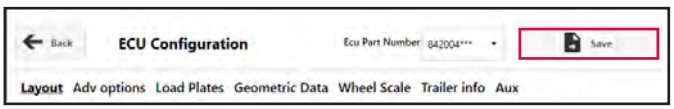


Note: For ABS units, only boxes 2 and 3 will be active i.e:

- Dolly Axle Regulation (DAR)
- Select Low Valve (SLV) installed

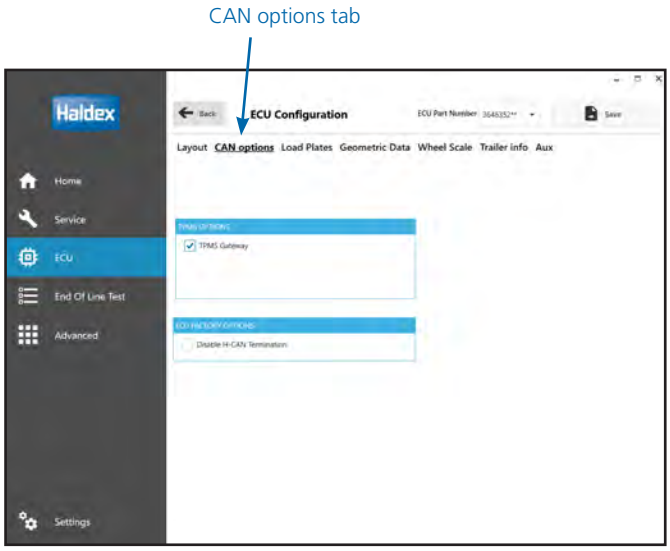


Click on the 'Save' button to save the updated settings.



CAN options

Click on the 'ECU' button then choose the 'CAN options' tab to setup CAN configuration.



A tick box is provided to enable or disable (default) R141 TPMS Gateway support as required for the EB+ 4.0 installation.

A tick box is provided to enable (default) or disable the H-CAN termination as required for the EB+ 4.0 installation.

Please check with Haldex personnel before changing this tick box value!

If the status of either tick box is changed the EB+ 4.0 must be re-programmed with the changed configuration.

Load plates

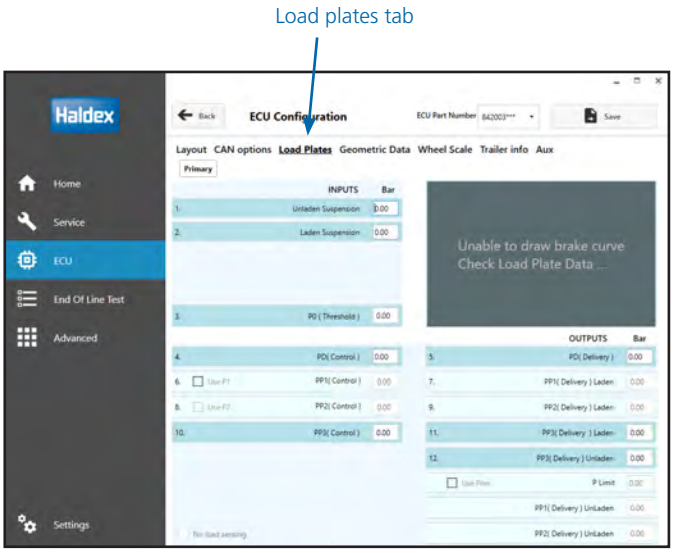
Click on the 'ECU' button then choose the 'Load plates' tab to setup load plate configuration.

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

The highlighted boxes (1 to 5 and 10 to 12) require data 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.



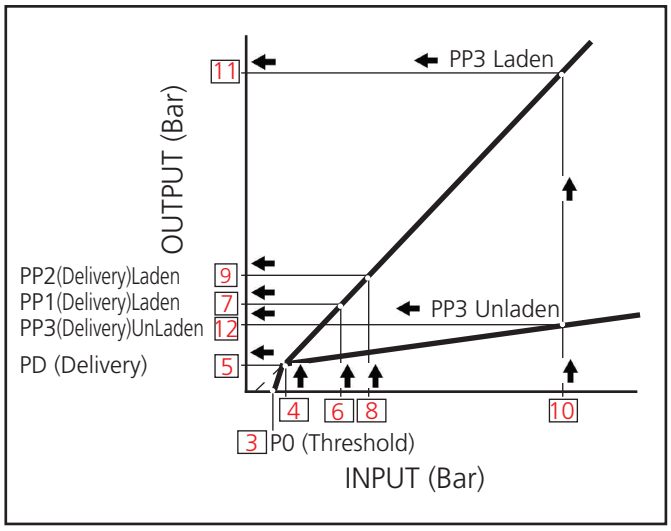
Note: If values 6, 7, 8, and 9 are required (see brake calculation example below).

To enter the values click on ☐ Use boxes.

6	☑ Use	PP1 (Control)	1.60	7	PP1 (Delivery) Laden	1.20
8	☑ 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).



Example:

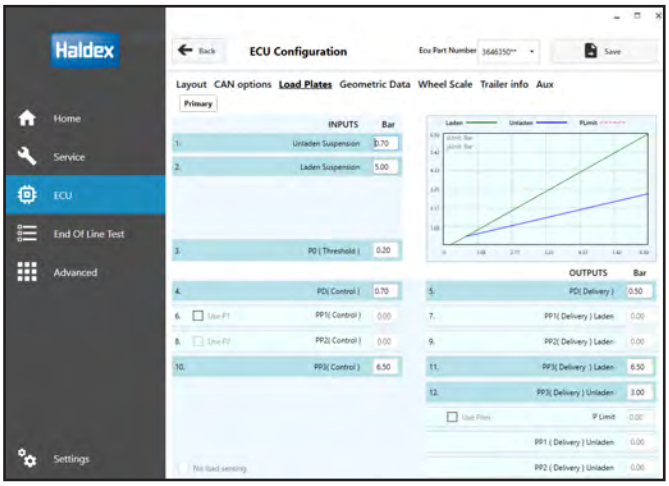
The graph shows the brake demand pressure (INPUT) values are in relation to the brake delivery pressure (OUTPUT) values.

Haldex brake calculation example

Input data for the EBS-Modulator EB+:

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

For full trailers the following screen will appear.



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

Brake calculation example - Master ECU (RAG)

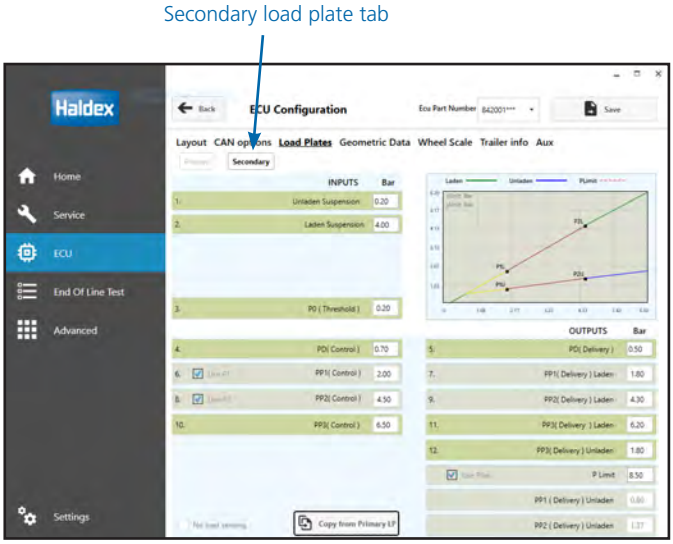
Input data for the EBS-Modulator EB+:

						3 P0	4 PD	10 P3	
RAG	control pr.	pm	6.50 bar	control pr.	pm	0.40	0.70	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	11	
1	1700	0.55	2.10	9000	3.50	0.00	0.40	6.85	bar

Secondary load plate settings

Click on 'Secondary' icon (if available) to display this load plate.

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

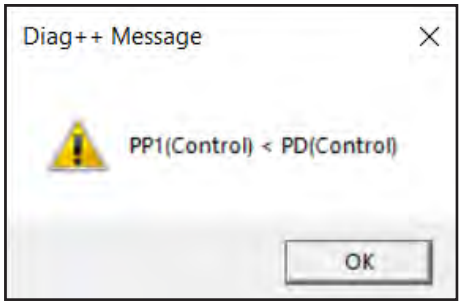


Brake calculation example - Remote ECU FAG)

Input data for the EBS-Modulator EB+:

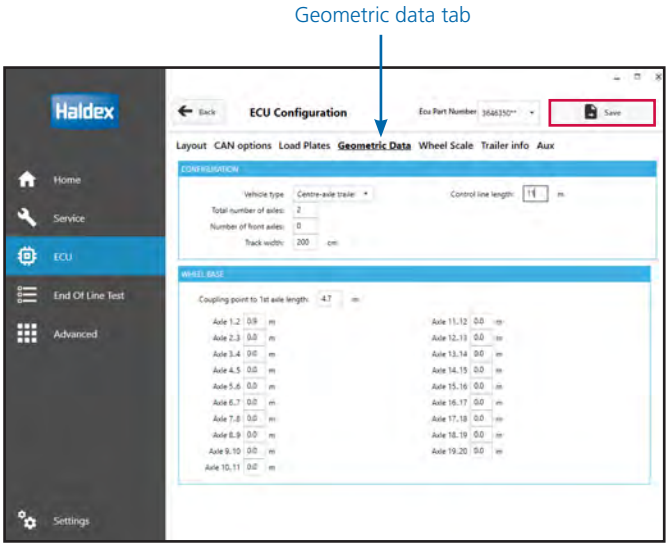
						3	4	6	8	10	
						P0	PD	P1	P2	P3	
FAG	control pr.	pm	6.50 bar	control pr.	pm	0.20	0.70	2.00	2.50	6.50	bar
Axle	Axle load unladen (Kg)	Bag press. unladen (bar)	Brake press. unladen (bar)	Axle load laden (Kg)	Bag press. laden (bar)	Brake press. laden (bar)					
		1	12		2		5	7	9	11	
1	2350	0.70	2.10	10000	5.00	0.00	0.50	1.40	2.50	6.85	bar

Note: if the user sets any Load Plate setting to an invalid value with respect to any other Load Plate setting, when the settings are saved, a warning dialog is displayed and the save disallowed.



Geometric data

The Geometric data specifies detailed vehicle data. With some fields being mandatory as shown below.



Click on the 'ECU' button then click on the 'Geometric data' tab to open the Geometric options.

From here the user can enter the following vehicle data, including:

a. Vehicle type

b. Total number of axles (Mandatory)

c. Track width

d. Control line length (Mandatory)
Control line length data must be input. Normally the length would correspond to the installed control line length piping, unless the trailer manufacturer has established an optimised setting for their range of trailers. Then that value will be input.

Both EB+ 4.0 and ABS 4.0 transmit 'Geometric data' to the truck via the ISO 11992 CAN link.

Click on the 'Save' button to accept.

Setting wheel scaling

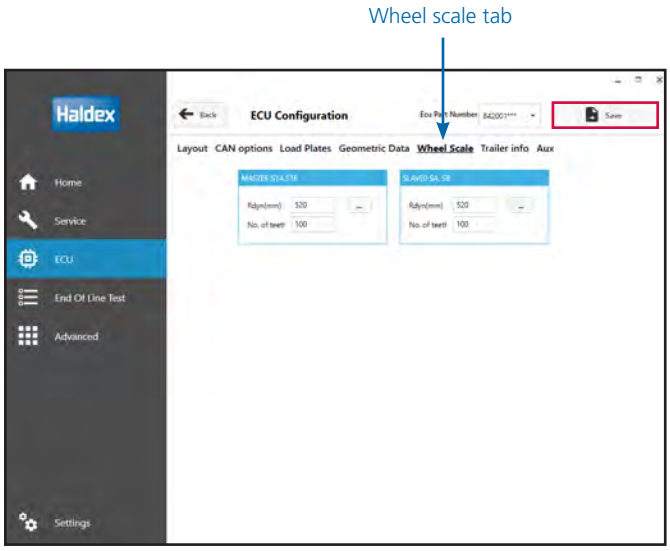
Click on the 'ECU' button then click on the 'Wheel scale' tab

The following screen will appear.

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

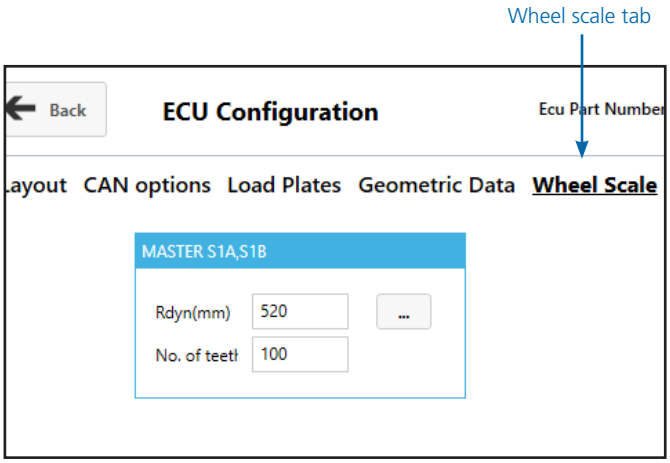
Note: If the tooth number is not 100 the wheel scale factor on the Info Centre will read a different value.

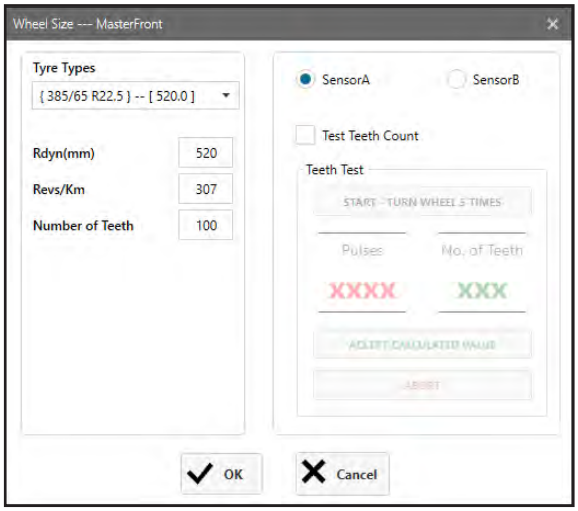
Click on the 'Save' button to accept.



Test for number of teeth

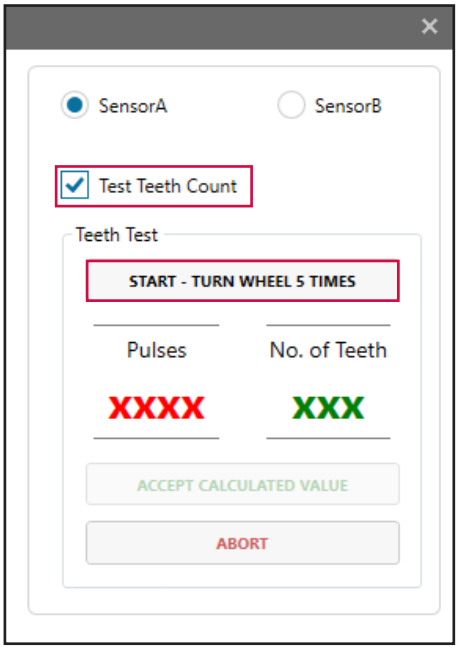
Click on the 'Wheel scale' tab to throw up the number of teeth test dialog.



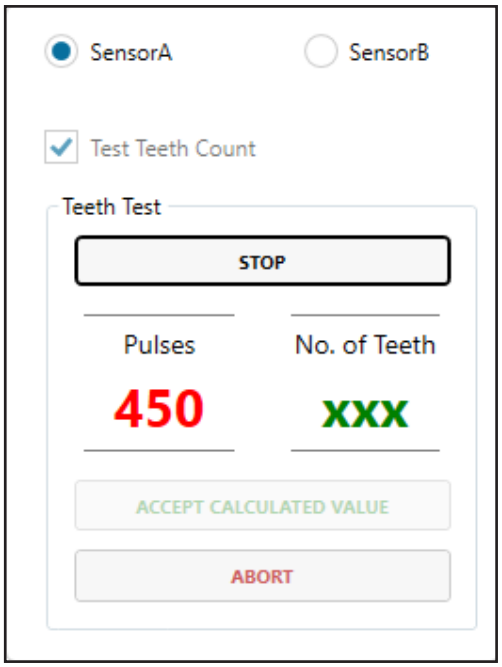


Enable 'Test Teeth Count' tick box.

Click on the "START – TURN WHEEL 5 TIMES" button to start test.



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 'STOP' button.

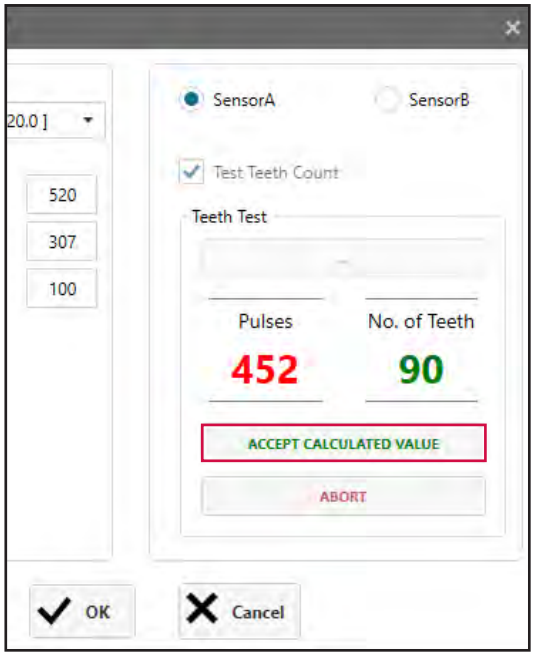
The "No of Teeth" box indicates the value.

Click on 'ACCEPT CALCULATED VALUE' button if this value is to be used for the wheel scaling data (or note value for information purposes).

Click 'ABORT' button to abort current test.

Repeat for any other selected sensor.

Click 'OK' or 'Cancel' button to exit test dialog.



Trailer information

Click on the 'ECU' button then click on the 'Trailer info' tab.

The following screen will appear.

Enter details of :

a. Trailer manufacturer (20 characters)

b. Brake calculation number (20 characters)

c. Chassis number (17 characters)

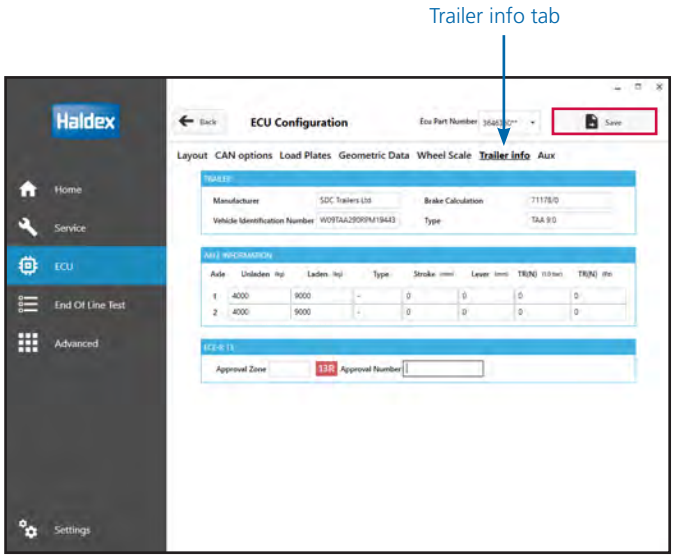
d. Type (20 characters)

e. Axle information - load of axle/s installed on the trailer.

(default values are: Unladen = 3000 Kg, Laden = 9000 Kg)

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

Click on the 'Save' button to accept.



Auxiliary operation

EB+ 4.0 Auxiliary information

Auxiliary operations are dependant on the installed EBS product.

EB+ 4.0 has up to 4 usable Premium auxiliary connectors (AUX 0-3), 2 usable Standard auxiliary connectors (AUX 4 & 5) and a Super AUX, which can be configured using the DIAG++ software.

This amount of inputs and outputs are sufficient for most used standard trailer applications. In the case of malfunction (short circuit / open circuit) the EB+ 4.0 system generates a DTC code and the service lamp will be triggered after start up.

EBS variant	AUX 0	AUX 1	AUX 2	AUX 3	AUX 4	AUX 5	Super AUX
Basic EBS (without emergency override)	✗	✓	✗	✗	✓	✓	✓
Basic EBS	✓	✓	✗	✗	✓	✓	✓
Premium EBS	✓	✓	✓	✓	✓	✓	✓

AUX function assignment

Wire colour	AUX 0	AUX 1	AUX 2	AUX 3	AUX 4	AUX 5
Red	O/P DIG I/P	O/P DIG I/P	O/P DIG I/P	O/P DIG I/P	5 Volt	5 Volt
Black	B-	B-	B-	B-	B-	B-
Yellow	O/P DIG I/P	O/P ANA I/P	O/P ANA I/P	O/P ANA I/P	ANA I/P	ANA I/P

Key:

O/P (AUX 0-3) – Switched supply voltage outputs on red channel (pin 1) and yellow channel (pin3) with 1.2A maximum supply current for each channel.

Dig I/ P (AUX 0) - Digital monitor input. Both red channel (pin 1) and yellow channel (pin 3) can be used to monitor a state of change input (B+ or B-)

Dig I/P (AUX 0-3) – Digital monitor input. Red channel (pin 1) can be used to monitor a state change input (B+ or B-)

Ana I/P (AUX 1-3) – Analogue input on yellow channel (pin 3) can be used to measure voltage input.

Ana I/P (AUX 4 & 5) – Analogue input. Analogue input (pin 3) between 0 and 5V.

5 volt (AUX 4 & 5) – 5 volt switched output on pin1. Combined supply current from AUX 4 and AUX 5 (pins 1) must not exceed 50mA

B- – System ground connection (pin 4)

Premium EB+ 4.0 Auxiliary operation

AUX 4 / AUX 5
Lining wear sensor
General purpose input
Soft Docking
Mechanical height sensor
Mechanical height sensor remote
External pressure sensor

AUX 1 - 3
COLAS®+
Retarder
Trailer lamp
ILAS®-E+ front
ILAS®-E+ rear
12 / 24V AUX power
Steer axle lock
Service lamp
Overload lamp
Remote overload lamp
Stability lamp
ILAS®-E+ front manual
ILAS®-E+ rear manual
General purpose output
TA+
Speed lock
Load Transfer + Lift
Load Transfer
TPMS lamp

AUX 0
COLAS®+
Retarder
Trailer lamp
ILAS®-E+ front
ILAS®-E+ rear
12 / 24V AUX power
Steer axle lock
Service lamp
Overload lamp
Remote overload lamp
Stability lamp
General purpose output
TA+
Speed lock
TPMS lamp

Premium EB+ 4.0 CAN operation

T-CAN
Telematics (Customer)

H-CAN
TPMS
EB+ Soft Docking
EB+ Info Centre
PC interface

S-CAN
1M Slave

Standard AUX

Programming of AUX 4 and AUX 5 on EB+ 4.0 is only possible using DIAG++ software.

Standard AUX allows the user to program two totally independent inputs. One on AUX 4 and one on AUX 5.

Each AUX has three wires that can be used as follows:

Red wire – 5 volt supply

Yellow wire – Analogue input

Black wire – System ground

AUX 4 and AUX 5

Programming Standard AUX using DIAG++

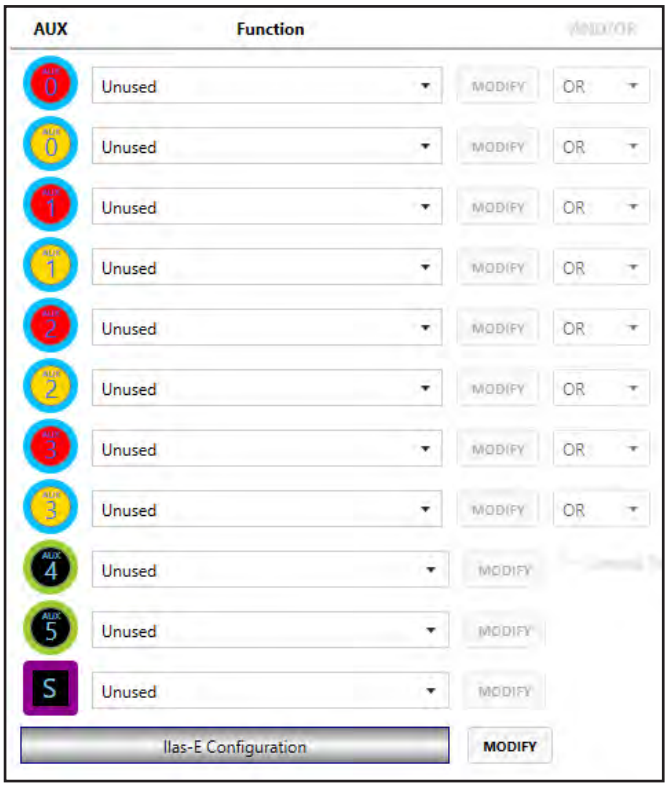
Programming of AUX 4 and AUX 5 on EB+ 4.0 is only possible using DIAG++ software.

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

AUX 4 Analogue input

AUX 5 Analogue input

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



Premium AUX

Programming of AUX 0 to AUX 3 on EB+ 4.0 is only possible using DIAG++ software.

Premium AUX allows the user to program two totally independent inputs or outputs on AUX 0 to AUX 3.

Each AUX has two wires that can be configured as an input or output.

The twin inputs or outputs of AUX 0 to AUX 3 are colour coded red and yellow within the DIAG++ software. These colours then match the twin colour identifiers on the cables.

AUX 0 to AUX 3

Premium auxiliary connection cables

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

844 301 XXX

Bare ended cable for customers to fit their own connectors.

Gen3 Equivalent: 814 001 3XX

844 331 XXX

Auxiliary extension cable (for use with Y-Splitter)

Gen3 Equivalent: 814 032 XXX

844 341 001

F/F/F Splitter. Premium Aux, meaning each cable can be programmed individually in the EB+ 4.0 software

Gen3 Equivalent: 814 039 001

844 342 001

M/F/F Splitter. Premium Aux, meaning each cable can be programmed individually in the EB+ 4.0 software

Gen3 Equivalent: N/A

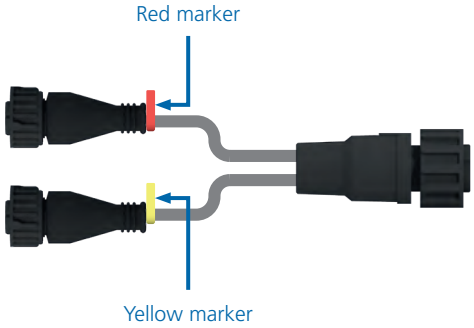
844 321 XXX

DIN 72585 Socket connection for ILAS®, COLAS® etc

Gen3 Equivalent: 814 012 2XX

814 027 001

Male to female to female (2x2x2 way)



Programming Premium AUX using DIAG++

Programming of AUX 0 to AUX 3 on EB+ 4.0 is only possible using DIAG++ software.

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

AUX 0 Red & yellow

AUX 1 Red & yellow

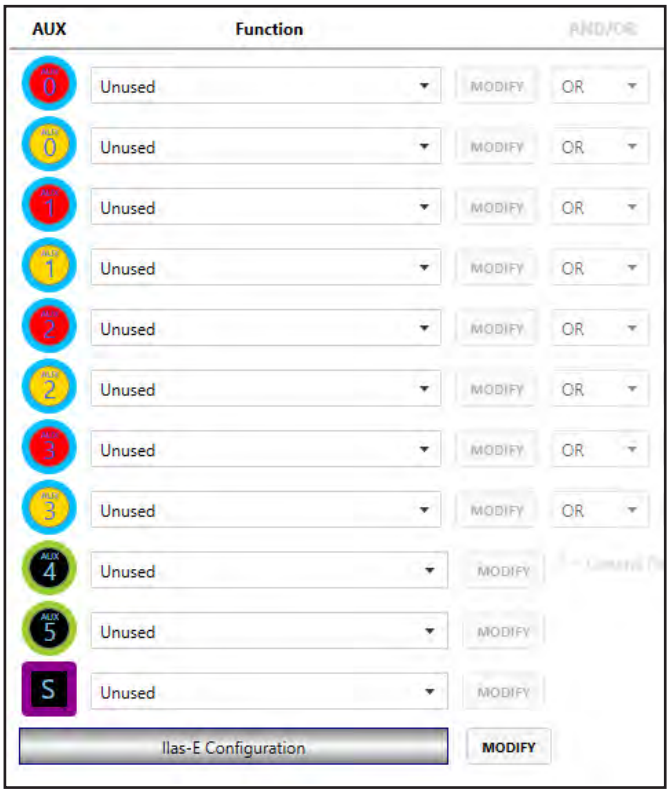
AUX 2 Red & yellow

AUX 3 Red & yellow

AUX 4

AUX 5

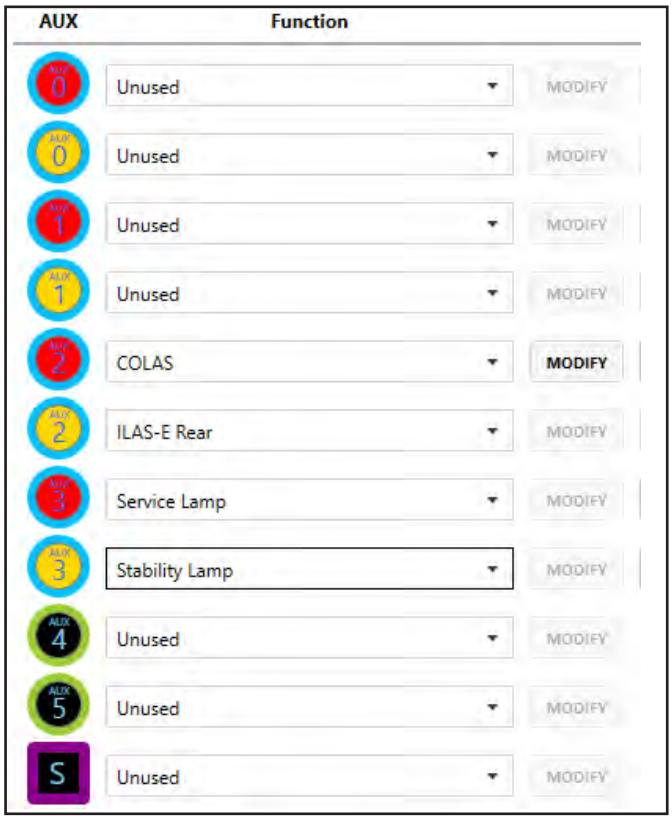
Super AUX



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

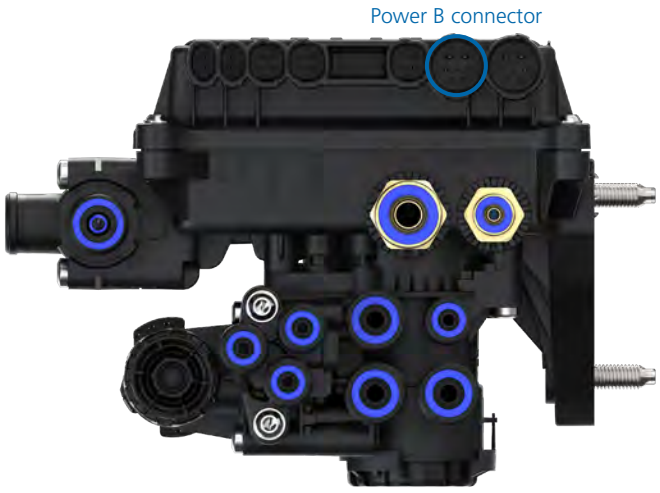
Premium AUX example

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



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 are via the Power B connector

1 x 24N power supply (2 pins) -

Protected vehicle battery voltage level supply, maximum current allowed is 50mA

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

3 x signal level inputs, LO state must be less than 10.5V and HI state greater than 13.5V for a 24V supply.

The Power B (Super AUX) 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.

Super AUX connection cables: For full auxiliary functionality of "Super AUX", the following cables can be used:

844 221 XXX

Bare ended Super Aux cable (to ISO 12098)

EB+ Gen3 Equivalent: 814 002 3XX

844 231 XXX

4 core Super Aux to DIN 72585 Plug (to ISO 12098)

EB+ Gen3 Equivalent: 814 004 3XX

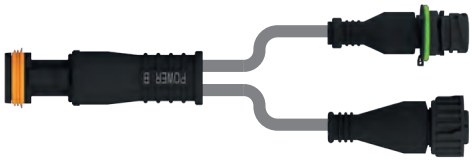
844 211 XXX

2 core Super Aux to DIN 72585 Plug (to ISO 12098

844 242 XXX

6 core Super Aux to 4 core DIN 72585 Plug (to ISO 12098) and 2 core DIN 72585 Socket (to Trailer Lift Axle Switch)

EB+ Gen3 Equivalent: 814 029 2XX



24N Cables:

844 201 XXX

Bare ended 24N cable (to ISO 12098)

EB+ Gen3 Equivalent: 814 002 2XX

Programming Super AUX using DIAG++

Programming of Super AUX on EB+ 4.0 is only possible using DIAG++ software.

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

AUX 0 Red & yellow

AUX 1 Red & yellow

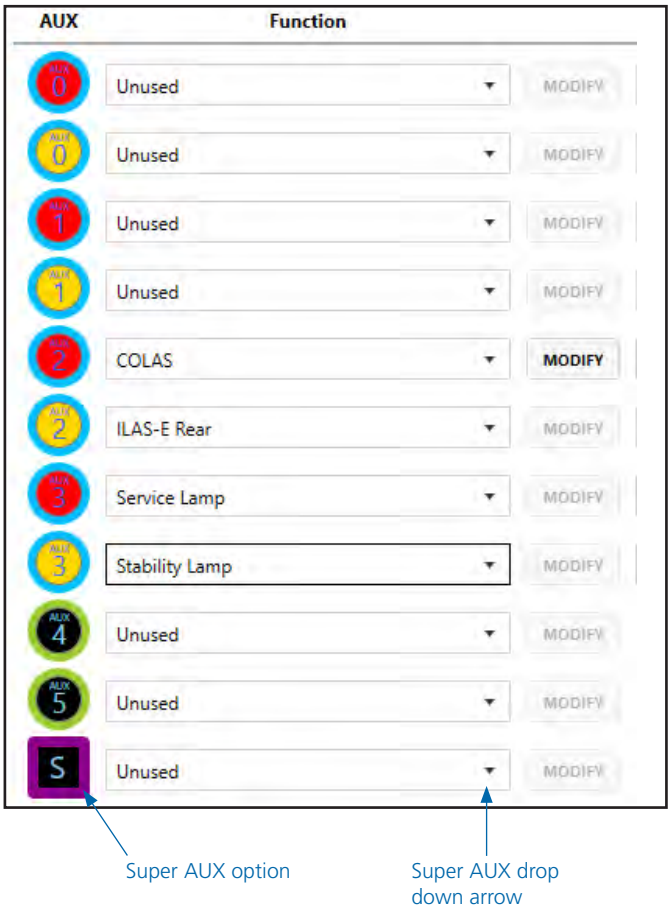
AUX 2 Red & yellow

AUX 3 Red & yellow

AUX 4

AUX 5

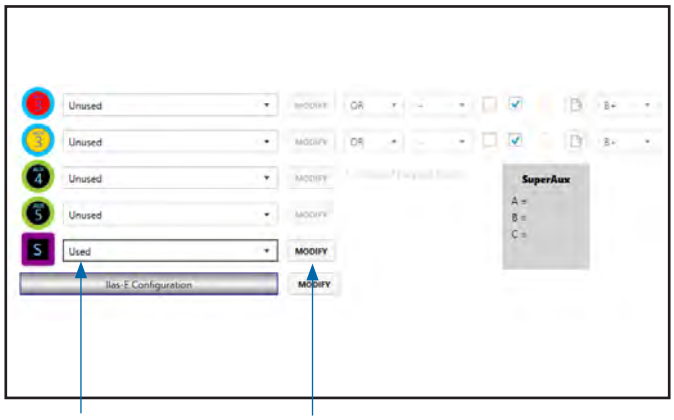
Super AUX



Clicking on the drop down arrow activates the Super AUX option

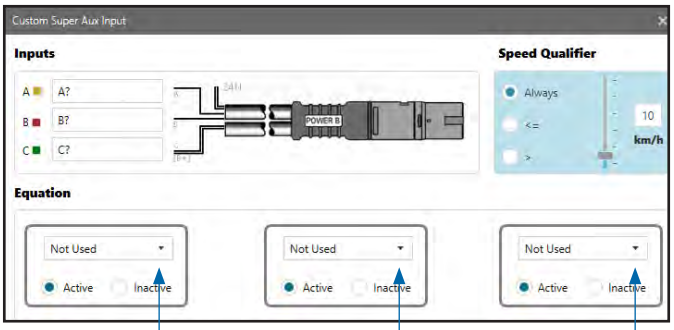
Configuring Super AUX

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



Custom Super AUX input screen

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



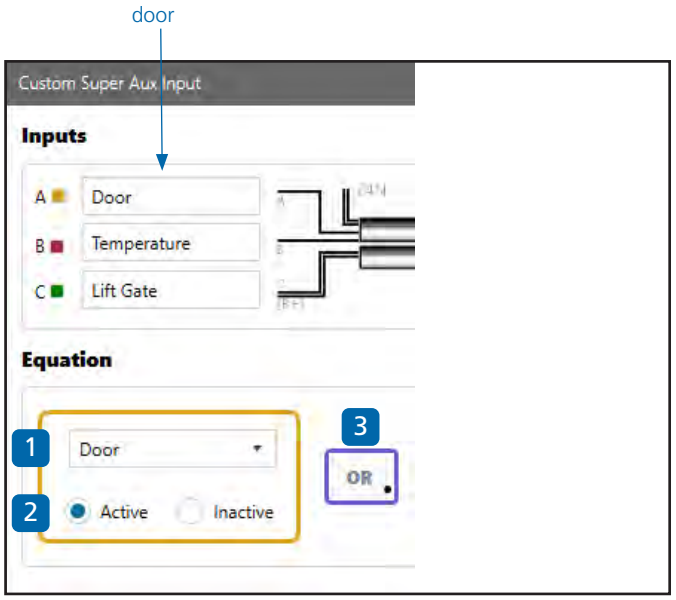
Drop down boxes used to configure the input signals.

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 'Cancel' button to cancel with no modifications.

Click on the 'OK' button to exit and keep the modifications.

Summary statement

ABS 4.0 Auxiliary information

Auxiliary operations are dependant on the installed ABS product.

ABS 4.0 has up to 3 usable auxiliary connectors (AUX 1-3), which can be configured using the DIAG++ software.

This amount of inputs and outputs are sufficient for most used standard trailer applications. In the case of malfunction (short circuit / open circuit) the ABS 4.0 system generates a DTC code and the service lamp will be triggered after start up.

ABS variant	AUX 1	AUX 2	AUX 3
Basic	✓	✗	✗
Premium	✓	✓	✓
Premium (roll-over control)	✓	✓	✓

Wire colour	AUX 1	AUX 2	AUX 3
Red	O/P DIG I/P	O/P DIG I/P	O/P DIG I/P
Black	B-	B-	B-
Yellow	O/P ANA I/P	O/P ANA I/P	O/P ANA I/P

Key:

O/P (AUX 1-3) – Switched supply voltage outputs on red channel (pin 1) and yellow channel with 1.2A maximum supply current for each channel.

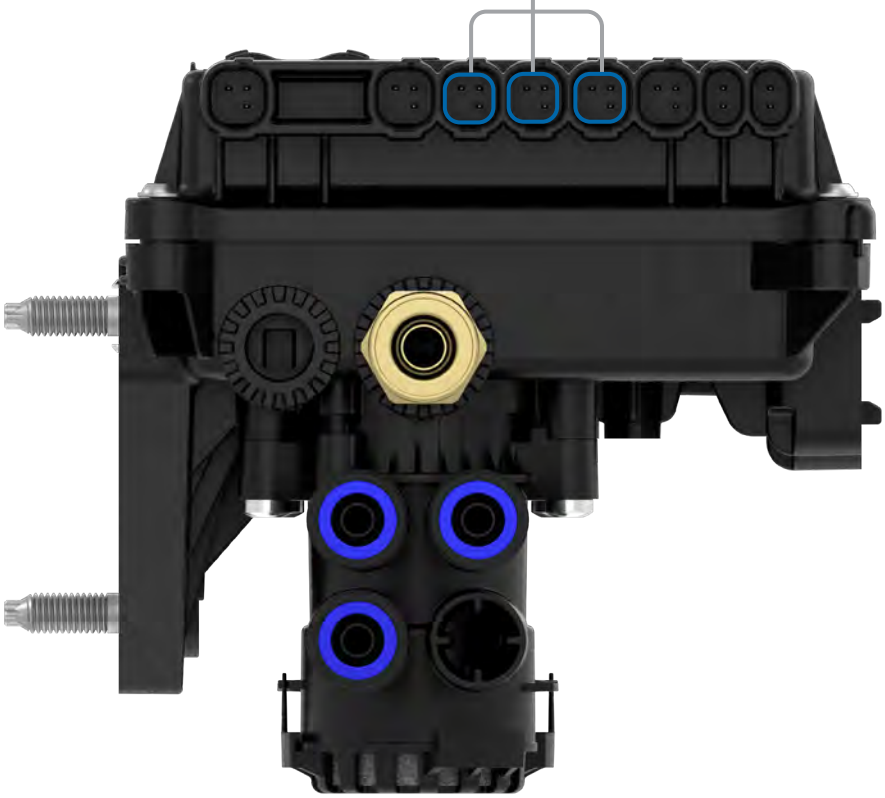
Dig I/P (AUX 1-3) – Digital monitor input. Red channel can be used to monitor a state change input (B+ or B-)

Ana I/P (AUX 1-3) – Analogue input on yellow channel can be used to measure voltage input.

B- – System ground connection

Premium ABS 4.0 Auxiliary operation

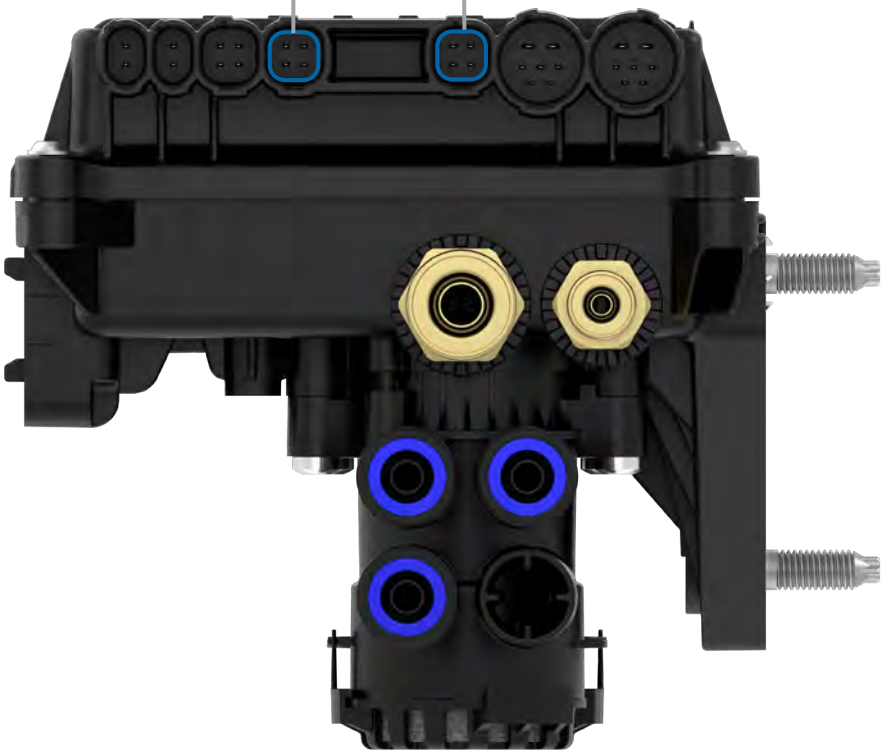
AUX 1 - 3
COLAS®+
Retarder
Trailer lamp
AUX power
Steer axle lock
Service lamp
Stability lamp
Speed lock
TPMS lamp



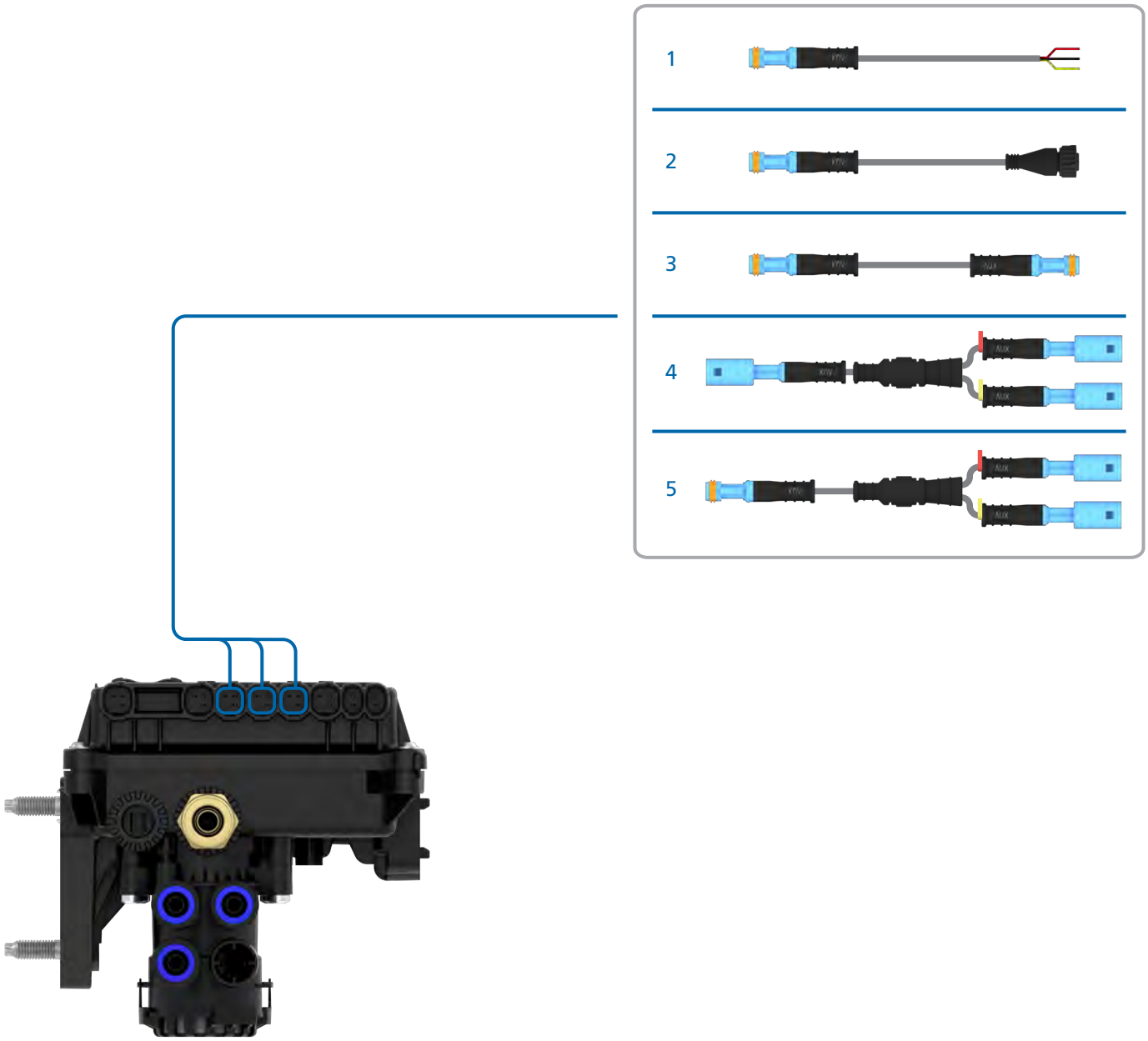
Premium ABS 4.0 CAN operation

H-CAN
TPMS
EB+ Soft Docking
EB+ Info Centre
PC interface

S-CAN
1M Slave



Auxiliary cables (AUX 1-3)



Item	Description	Part numbers
1	Auxiliary to bare wires	844 301 xxx
2	Auxiliary DIN	844 321 xxx
3	Auxiliary to Y-Splitter	844 331 xxx
4	Auxiliary Y-Splitter 3x2x2 way (F/F/F)	844 341 xxx
5	Auxiliary Y-Splitter 3x2x2 way (M/F/F)	844 342 xxx

Programming AUX using DIAG++

Programming of AUX 1 to AUX 3 on ABS 4.0 is only possible using DIAG++ software.

The user can program two totally independent inputs or outputs on AUX 1 to AUX 3.

Each AUX has two wires that can be configured as an input or output.

The twin inputs or outputs of AUX 1 to AUX 3 are colour coded red and yellow within the DIAG++ software. These colours then match the twin colour identifiers on the cables.

AUX 1 to AUX 3

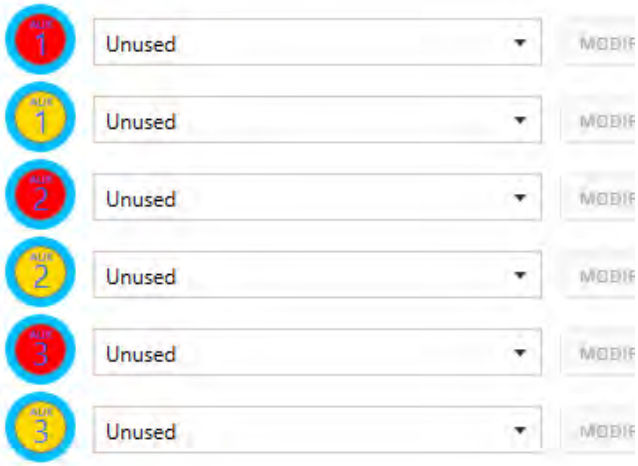
The 'AUX configuration' screen shows the various auxiliary connections that can be used.

AUX 1 Red & yellow

AUX 2 Red & yellow

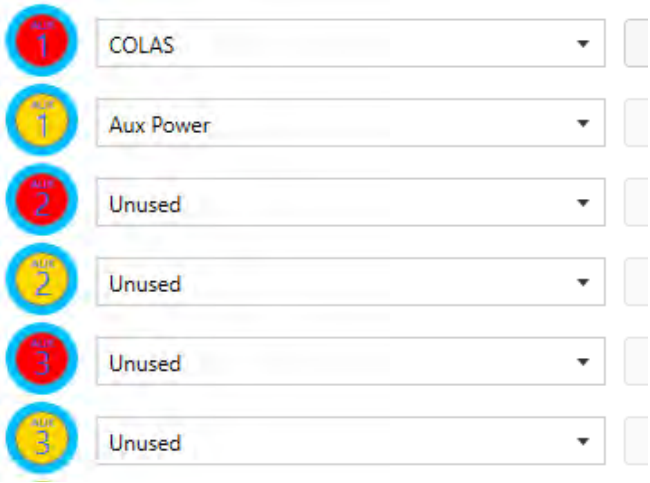
AUX 3 Red & yellow

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



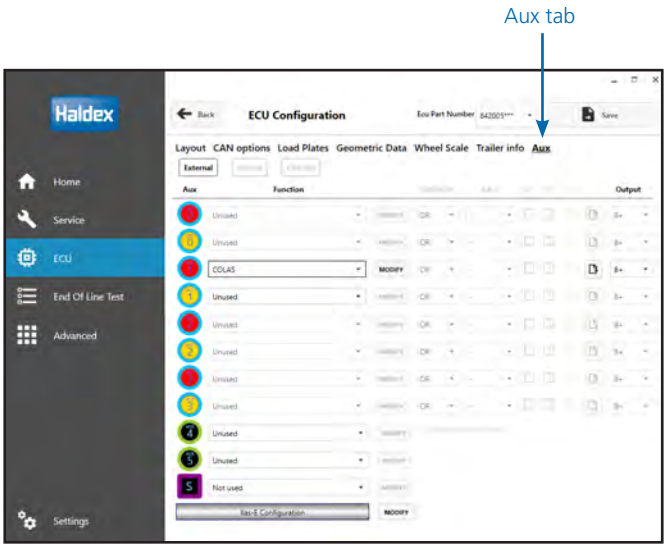
AUX configuration example

AUX 1 (Red AUX)	COLAS®
AUX 1 (Yellow AUX)	Aux Power
AUX 2 (Red AUX)	Unused
AUX 2 (Yellow AUX)	Unused
AUX 3 (Red AUX)	Unused
AUX 3 (Yellow AUX)	Unused



AUX Configuration

Click on the 'ECU' button, then click the 'Edit' button, then click the 'Aux' tab to setup the auxiliary configuration.

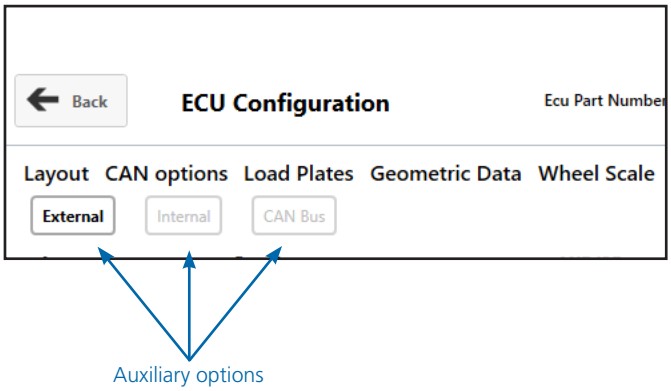


The following screen will appear.

Three auxiliary options are available:

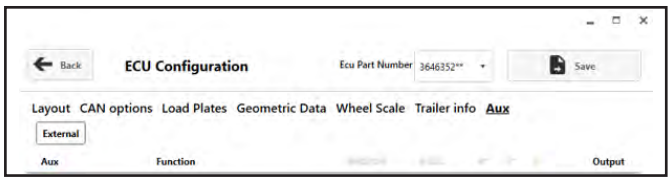
1. External
2. Internal
3. CAN Bus

Click on the required tab to select the options



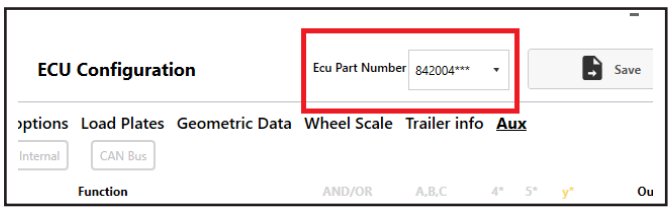
Note: For ABS units, the 'Internal' button is not shown.

top of the dialog will be active in this dialog



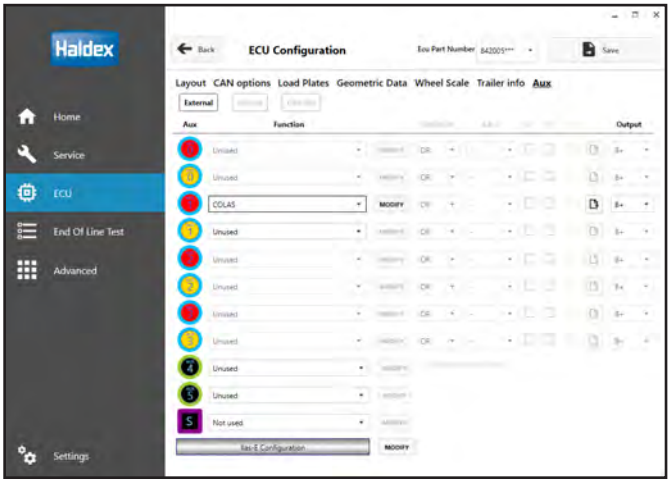
The 'ECU Part Number' will show the variant part number of the EB+ 4.0 being diagnosed.

The AUXs available are defined by the ECU part number shown in the 'ECU Part Number' box.



1. External AUX Configuration

Click on the 'ECU' button, then click the 'Edit' button, click on the 'Aux' tab to setup the external auxiliary configuration.

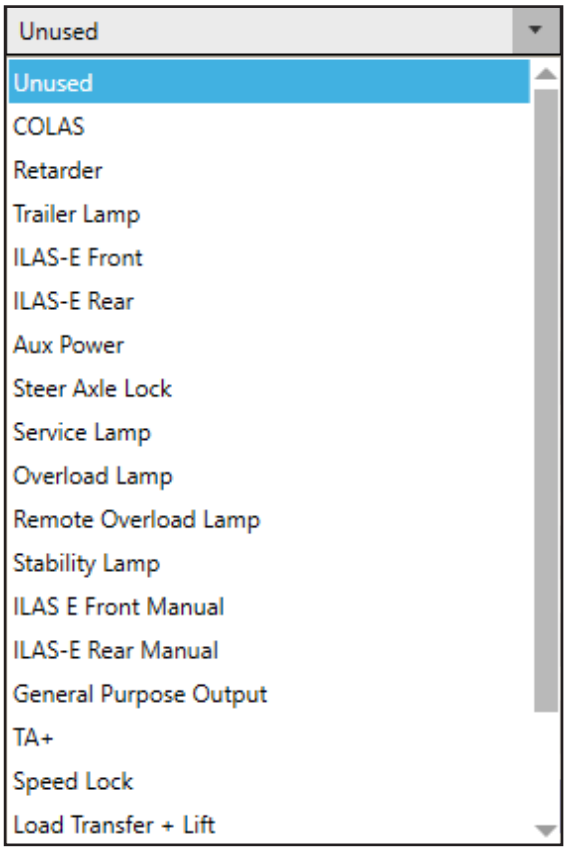


The following screen will appear.

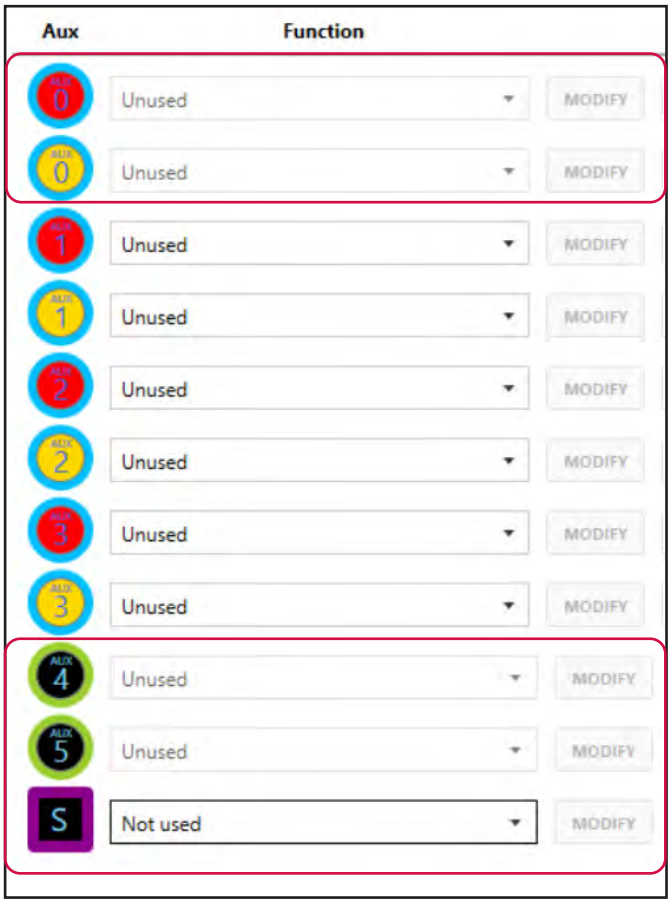
The screen shows the various auxiliary connections that can be used (i.e. AUX 0 to 3, 4 and 5).

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

Example: AUX 1 options expanded ready for selection.

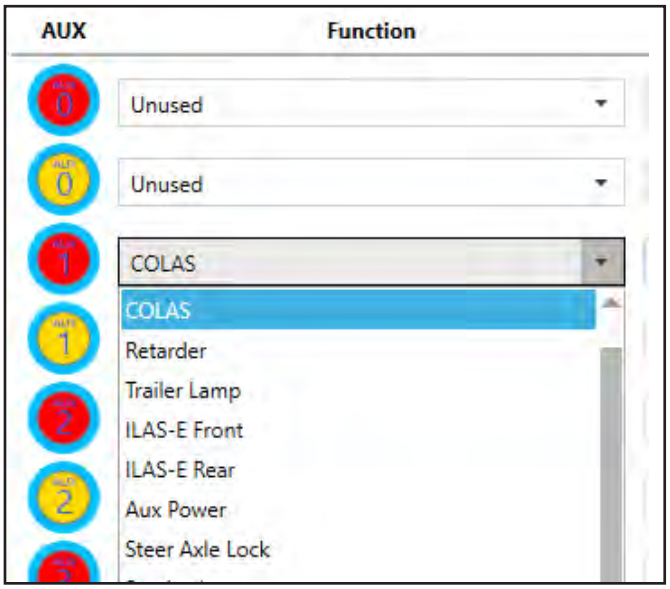


Note: For ABS 4.0 units, AUXs 0, 4, 5 and Super Aux are not supported.



COLAS® (AUX 0,1,2,3 – AUX 1 configuration shown)

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



To view and set the parameters click on the 'modify' button.

Modify

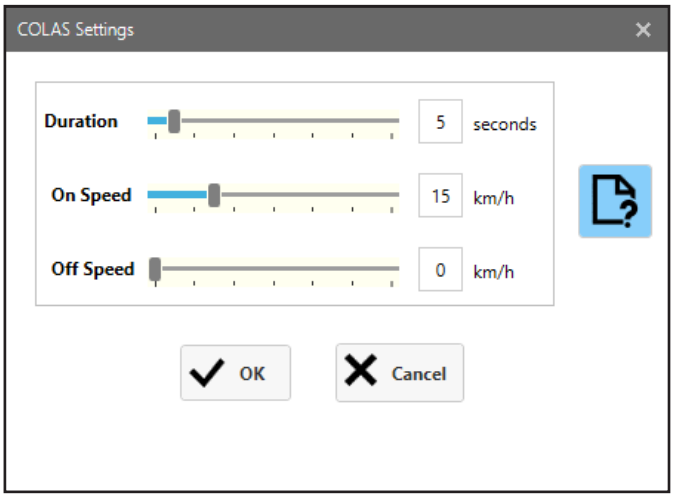
COLAS® (AUX 0,1,2, 3) example

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 0s this now becomes a speed signal and an 'on and off' speed has to be set.



Depending on the active window, further information can be obtained by clicking the 'Help' button where available.

COLAS® input functions

COLAS® function can be controlled/extended by several inputs.

Possible inputs are:

- Super AUX A / B / C / Custom
- General Purpose Input (GPI) AUX 4 / 5

OR
AUX output will change status if COLAS® function OR any related input is active.

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

COLAS® output functions

B+
Standard output: COLAS® function AND / OR logic HIGH-> 12 / 24 V to solenoid, otherwise 0 V.

0 V
Inverted output: COLAS® function AND / OR logic HIGH-> 0 V to solenoid, otherwise 12 / 24 V.

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.
   Note: You can also use this setting for an external device that needs power at a certain speed range (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. (e.g.:0 s, 0 kph, 0 kph)

Application examples:

a. Traction help signal can be used to reset the suspension to ride height at the same time.

b. Automatic reset to ride height can be switched 'off' if needed.

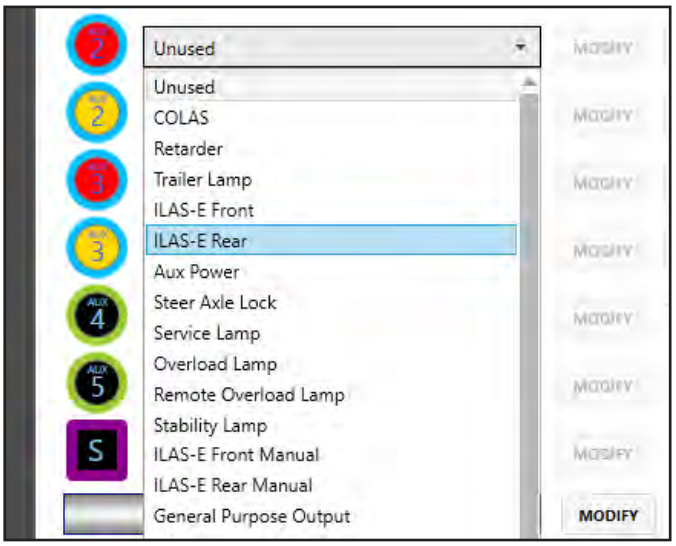
c. Reset to ride height can be started by a remote switch.

d. Customer specific, speed related functions can be controlled by the input.

ILAS®-E

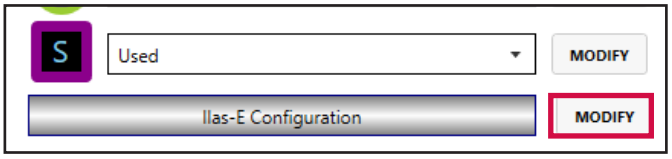
There are 2 types of ILAS®-E:

- ILAS®-E Auto (front / rear)
  Supported on AUX 0,1,2,3
- ILAS®-E Manual (front / rear)
  Supported on AUX 1,2,3



The required ILAS®-E type is selected from the desired AUX drop-down:

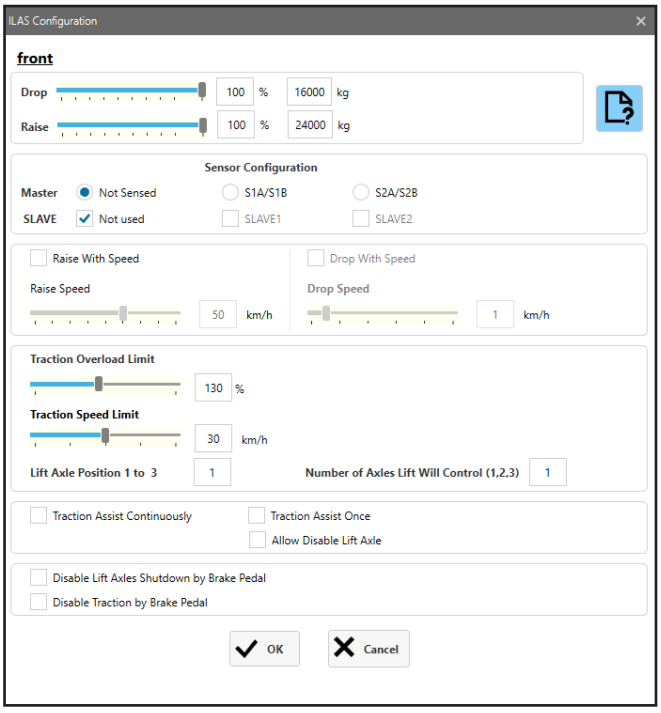
Further configuration of the ILAS®-E selected can be done by clicking the ILAS®-E configuration MODIFY button.



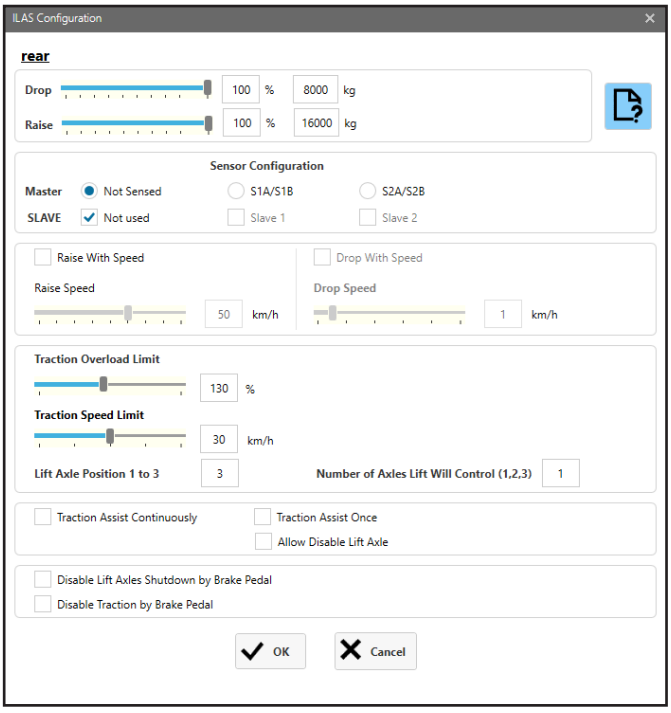
Then choose relevant tab for the ILAS®-E type configured – as shown below.

Please note there are differences in the configuration options for the different ILAS®-E types!

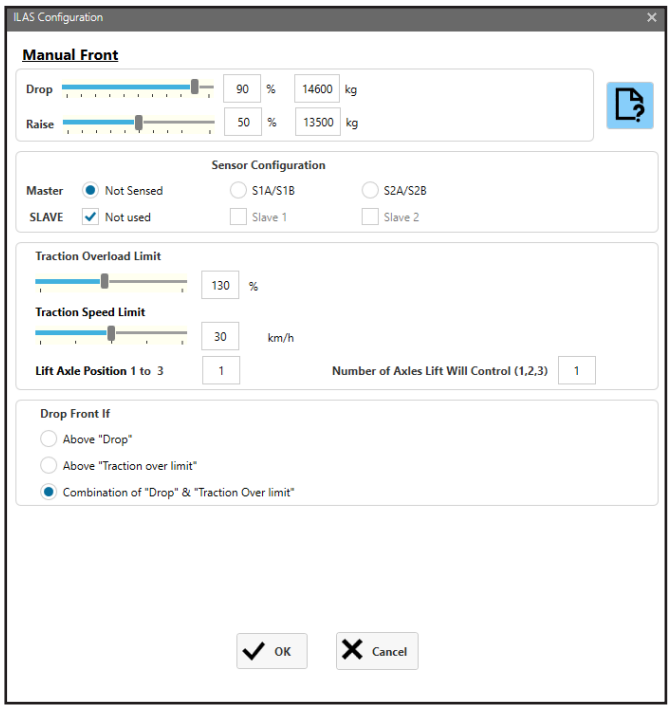
Front



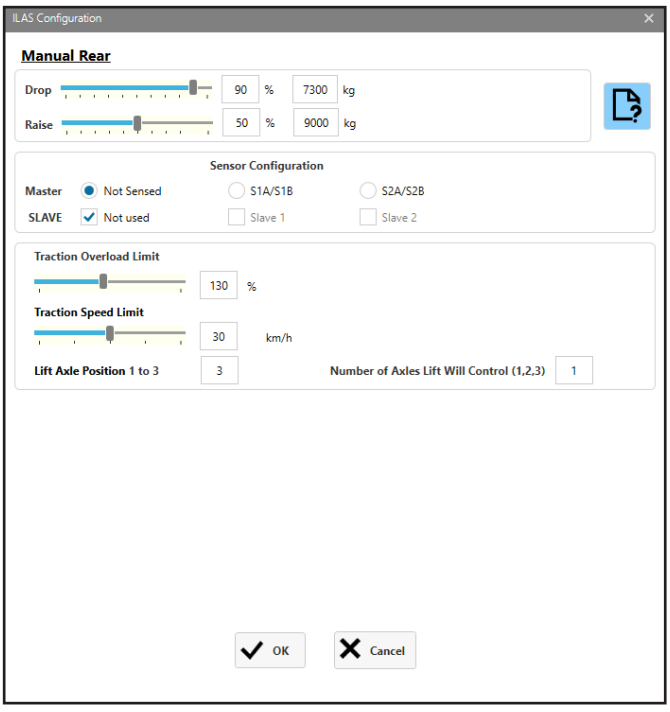
Rear



Manual Front



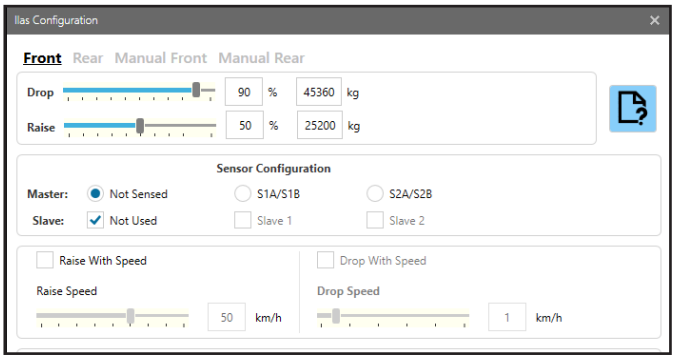
Manual Rear



ILAS®-E Auto front / rear settings:

Auto raise / Auto lower.

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



Raise:
The load where the ILAS® solenoid is energised causing the axle to raise. (default - below 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.

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).

Notes: for all ILAS®-E types:

a. Raising happens fully automatically below the raise threshold.

b. Dropping happens fully automatically above the drop threshold.

c. If front and rear lift axles are configured the one with the higher raise threshold raises first!

d. If front and rear lift axles are configured the one with the lower drop threshold drops first!

ILAS®-E Manual front / rear settings:

Manual raise / Manual lower.

A B+ signal / switch on the yellow wire of the 3 core AUX cable is required.

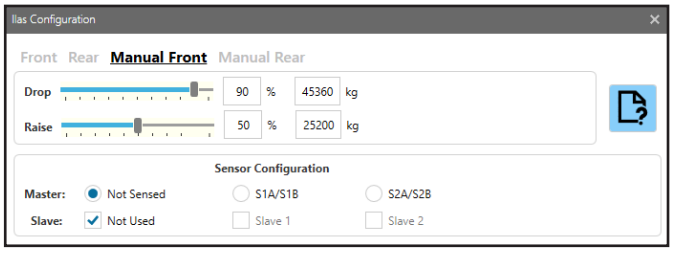
Auto raise / Auto lower.

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

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

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

Note: Raise with speed, drop with speed are not supported for Manual lift axles.



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').

Notes: for installations with ILAS®-E (all types) use:

a. Front lift axle only = use ILAS®-E front.

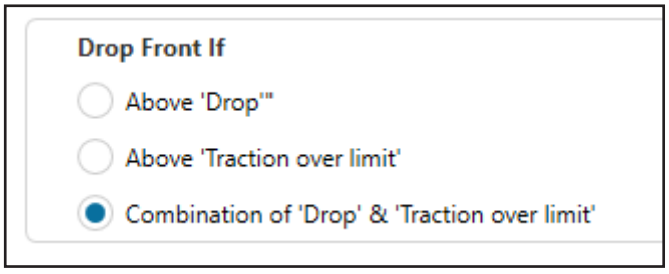
b. Middle lift axle only = if raising it puts weight on the king pin then use ILAS®-E front.

c. Rear lift axle only = use ILAS®-E rear.

d. Two axles lifted i.e. front and rear = ILAS®-E front + ILAS®-E rear.

For ILAS®-E Manual Front only a set of radio buttons are provided to further control axle dropping with options being:

- Above 'Drop' threshold' (only)
- Above 'Traction Overload limit' (only)
- Above both 'Drop' threshold' AND 'Traction Overload limit'



ILAS®-E Front Manual Raise:

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.

ILAS®-E Front Manual Lower:

Happens automatically after exceeding the drop threshold.

Raise with Speed:

There are two ways to set this (higher value will be used):

For all ILAS®-E types:

1. In the ECU Configuration dialog – Layout tab select 'lift axles when vehicle moved' then all lift axles will not raise until vehicle has first exceeded 7 kph after ignition 'on'.

Additionally (for ILAS®-E Auto Only):

1. AND / OR in ILAS®-E Configuration dialog select 'raise with speed' (option 'drop with speed' becomes available and can be selected if necessary). Corresponding speeds must then be set. (defaults: 50 km/h raise speed, 1 km/h drop speed).

ILAS®-E Rear Manual Raise:

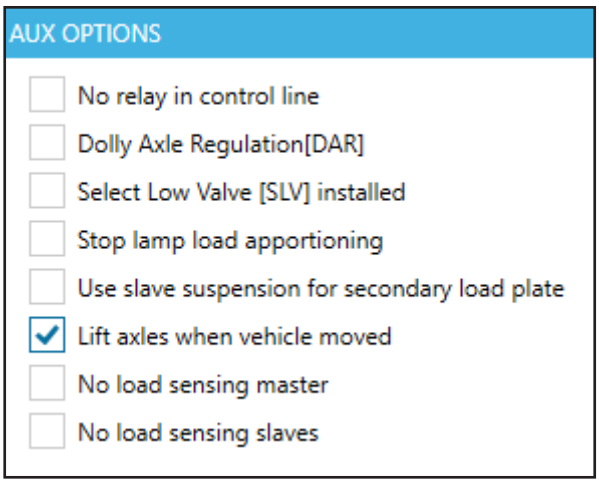
Happens only after a demand signal on the AUX port (yellow wire) or related control inputs (momentary or permanent signal).

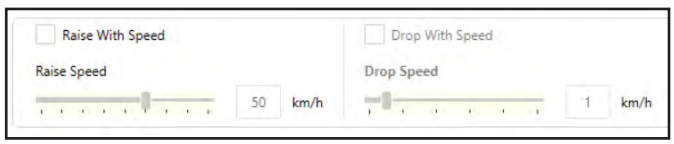
ILAS®-E Rear Manual Lower:

Happens automatically after exceeding the drop threshold.

ILAS®-E Rear with sensed Axle:

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

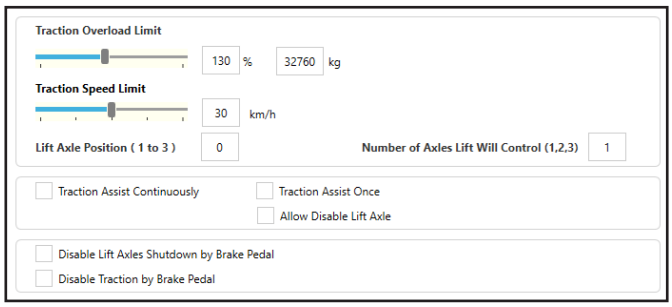




Traction help / disable lift axle - ILAS®-E front:

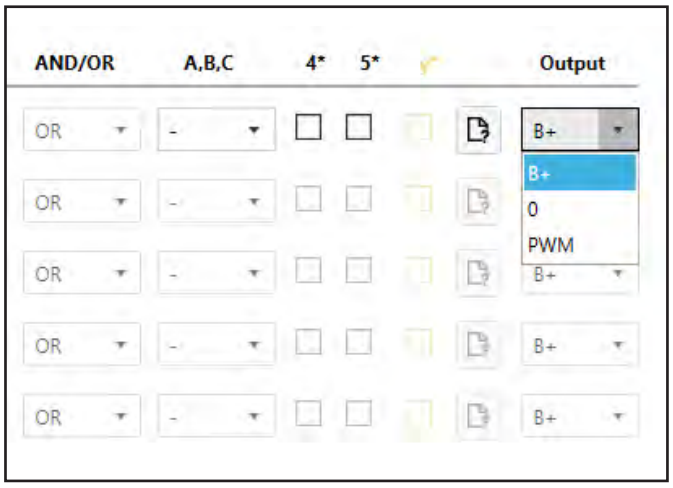
Activated by demand signal on AUX port (yellow wire) or related inputs.
Corresponding thresholds must be set in the 'Traction Overload Limit' part of the IlAS® Configuration dialog (default: 130 %, 30 kph)

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 'Traction Overload Limit' part of the IlAS® Configuration dialog (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 1 / 2 / 3) OR any of the inputs are active.

AND
Note: Yellow wire must only be used on AUX 1 / 2 / 3.
AUX traction support is started if the yellow wire AND all of the inputs are active.

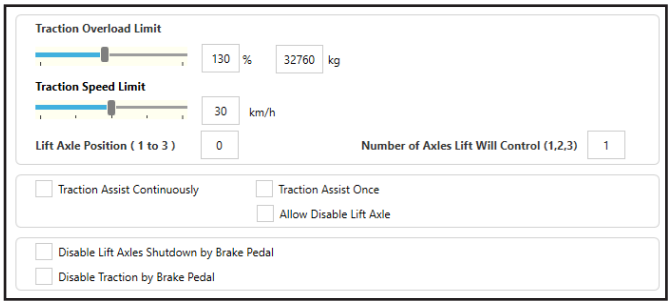
B+
Standard Output: Function AND/OR Logic High -> 12 / 24 V to solenoid, otherwise 0 V.

0 V
Inverted output: Function AND / OR logic High -> 0 V to solenoid, otherwise 12 / 24 V.

Extra Lift Axle / Traction Help Controls:

Traction Overload Limit:

The Traction Help axle will drop once the suspension reaches this value (default 130%), 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.



Traction Speed Limit:

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

Two counts are provided to optionally provide:

- 'Lift Axle Position'
- 'Number of Axles Lift will Control' for any Traction help action.

The following tick-boxes are provided for further Lift Axle / Traction Help control:

Traction Assist Continuously:
If ticked then system assumes any switch used for lift axle control is of "permanent" type.
With a "permanent" switch type, if the axle has subsequently dropped again because an overload or speed limit has been exceeded then the axle will re-raise automatically should that limit then be superseded.

Traction Assist Once:
If ticked then system assumes any switch used for lift axle control is of "momentary" type.
With a "momentary" switch , if the axle has subsequently dropped again because an overload or speed limit has been exceeded then the axle will not re-raise unless the switch is activated again.
Once a momentary switch activation has been accepted there is a 30 second "damping" delay on accepting any subsequent activation to avoid the lift axle dropping before it is fully raised.

Allow Disable Lift Axle:
If ticked then system always assumes switch is "momentary" and will disable (drop) all lift axles until the system is next re-powered (ignition 'off').

Disable Lift Axles Shutdown by Brake Pedal:
If ticked this disables the dropping of any raised lift axle(s) via a brake pedal signal (i.e. 3 presses (of between 3.0 to 6.5 bar pressure) in 8 seconds).

Disable Traction by Brake Pedal:
If ticked this disables Traction Help activation via a brake pedal signal (i.e. 3 presses (of between 3.0 to 6.5 bar pressure) in 8 seconds and vehicle is loaded).

Note:

1. Once a Traction Help Brake Pedal activation has been accepted there is a 30 second "damping" delay on recognising a subsequent activation to avoid the lift axle dropping before it is fully raised.

2. Brake Pedal activation can only enable Traction Help (so no disable of Traction Help via brake pedal).

Example steer axle lock (AUX 0-3)

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.

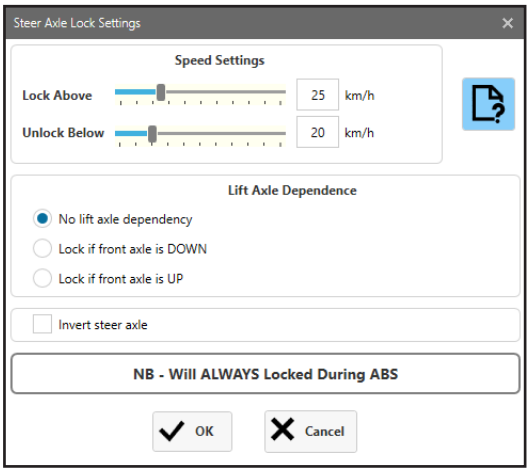
Which output type you need depends on the locking device / pneumatic installation.

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 -> 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.

B+
Standard output: Function AND / OR logic HIGH -> 12 / 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 12 / 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.

B+
Standard output: Function AND / OR logic HIGH -> 12 / 24 V to solenoid, otherwise 0 V.

0 V
Inverted output: Function AND / OR logic HIGH-> 0 V to solenoid, otherwise 12 / 24 V.

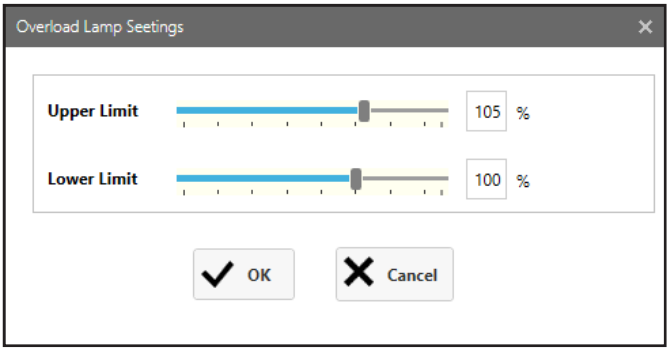
*The output level can be adjusted independently of input use!
*Possible inputs: Super AUX A / B / C custom, general purpose input (GPI) AUX 4 / 5

Overload lamp (AUX 0-3) for semi / centre axle trailers

This gives a 12 / 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.

B+
Standard output: Function AND / OR logic HIGH -> 12 / 24 V to solenoid, otherwise 0 V.

0 V
Inverted output: Function AND / OR logic HIGH-> 0 V to solenoid, otherwise 12 / 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 12 / 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.

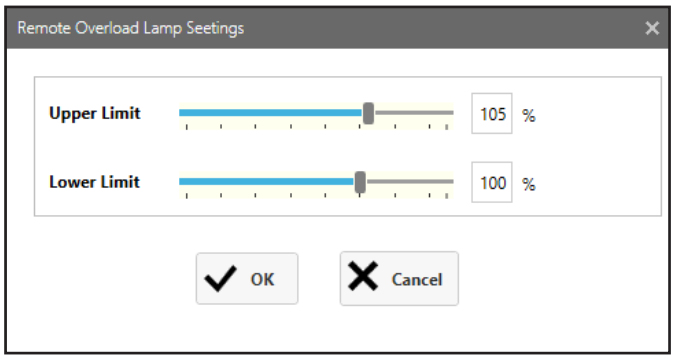
OR
AUX output will change status if function OR any of the related inputs are active.

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

B+
Standard output: Function AND / OR logic HIGH -> 12 / 24 V to solenoid, otherwise 0 V.

0 V
Inverted output: Function AND / OR logic HIGH-> 0 V to solenoid, otherwise 12 / 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.

B+
Standard output: Function AND / OR logic HIGH -> 12 / 24 V to solenoid, otherwise 0 V.

0 V
Inverted output: Function AND / OR logic HIGH-> 0 V to solenoid, otherwise 12 / 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.

B+
Standard output: Function AND / OR logic HIGH -> 12 / 24 V to solenoid, otherwise 0 V.

0 V
Inverted output: Function AND / OR logic HIGH-> 0 V to solenoid, otherwise 12 / 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 (AUX 0-3)

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.

B+
Standard output: Function AND / OR logic HIGH -> 12 / 24 V to solenoid, otherwise 0 V.

0 V
Inverted output: Function AND / OR logic HIGH-> 0 V to solenoid, otherwise 12 / 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

Load Transfer (AUX 1-3)

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
- Load Transfer & lift

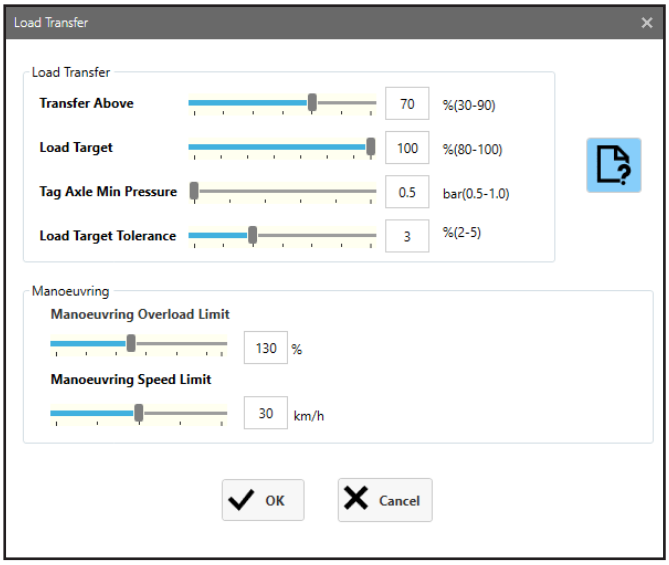
Settings:

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

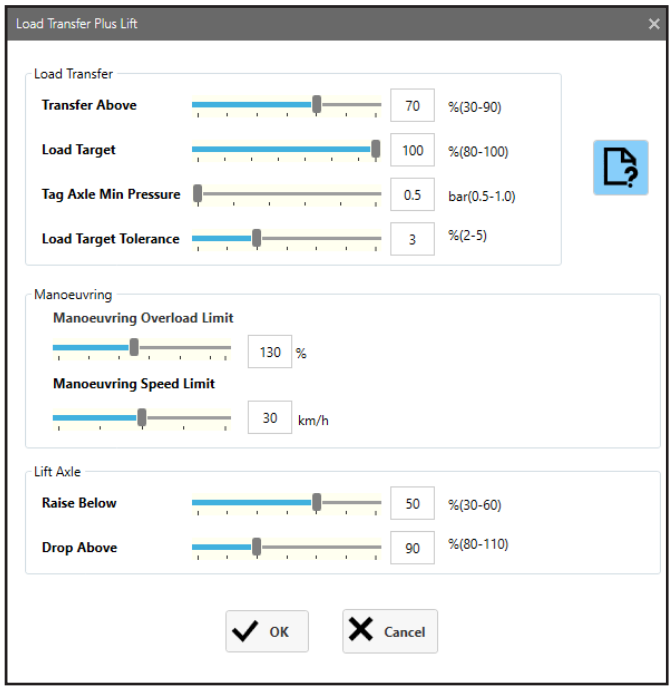
Load Target - this is the target percentage load on the front / centre axles after transfer has taken place, +/- the 'Load Target Tolerance'

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.

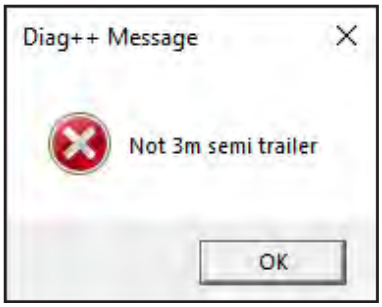
Load Target Tolerance - tolerance (between 2 - 5%).



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 axle. 'Raise Below' and 'Drop Above' overall load percentages work in the same way as a conventional lift axle.



Load Transfer / Load Transfer + Lift are only valid for 3M semi-trailer installations and a warning dialog will be shown if the user attempts to configure these on an installation that is NOT a 3M semi-trailer.



Load Transfer Control

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

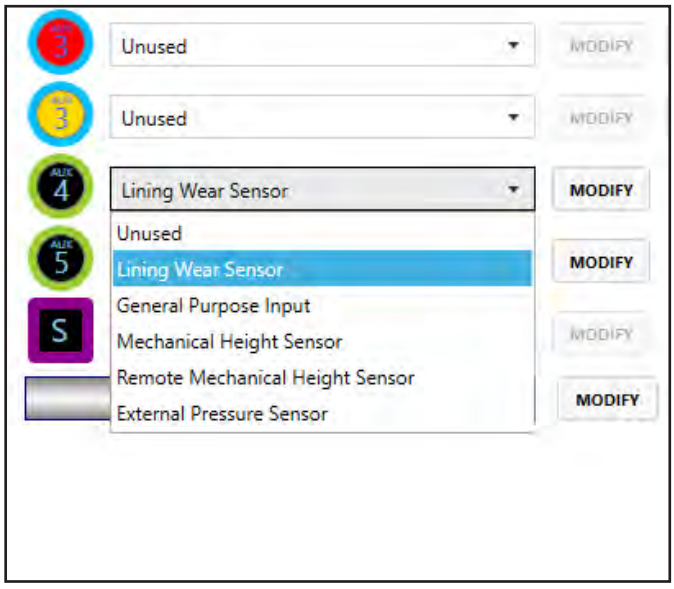
A short activation (< 5 seconds) is a manoeuvring request and will use the available Load Transfer hardware to temporary minimize the wheelbase. 'Load Target' is changed to the 'Traction Overload Limit' (Extra Lift Axle Data). Manoeuvring is cancelled when 'Traction Speed Limit' (Extra Lift Axle Data)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

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

Lining wear sensor (AUX 4)

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

Then select 'modify' to enter specific parameters.



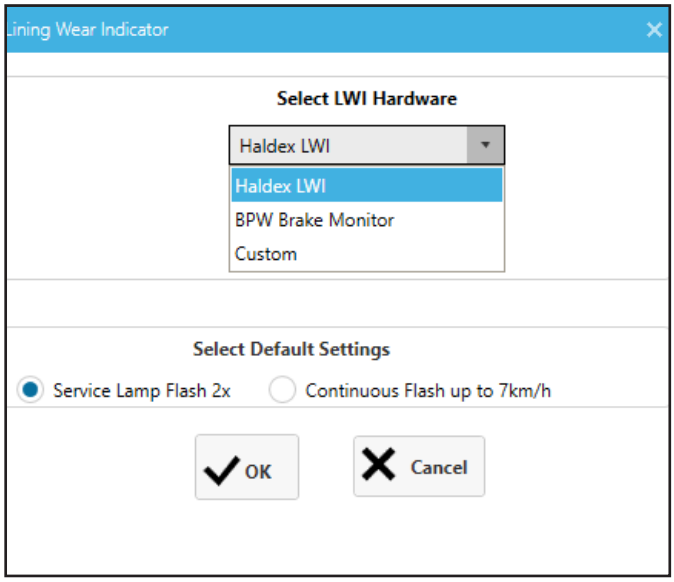
The following screen appears. 'Lining wear indicator'.

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).

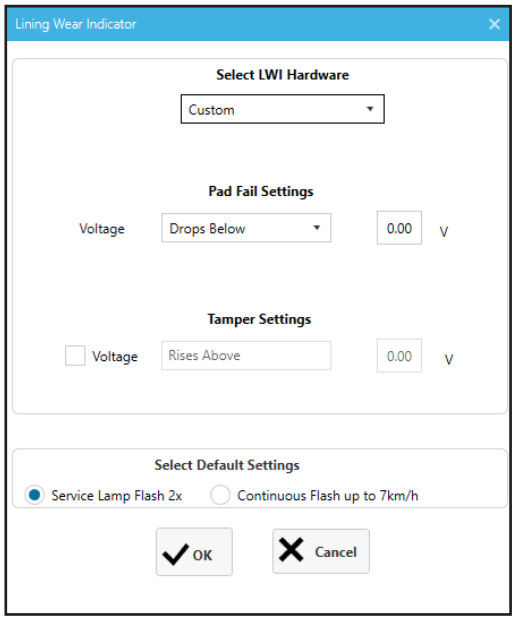
Custom screen

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.

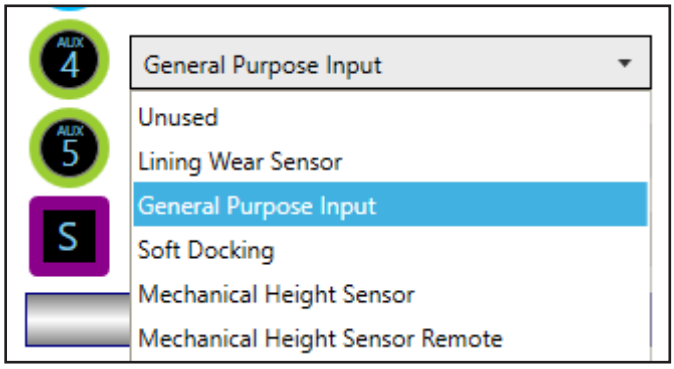
Note: As the pads wear the input voltage can rise or drop. If the lining wear sensor is tampered (i.e. short circuit) the input voltage rises.



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.

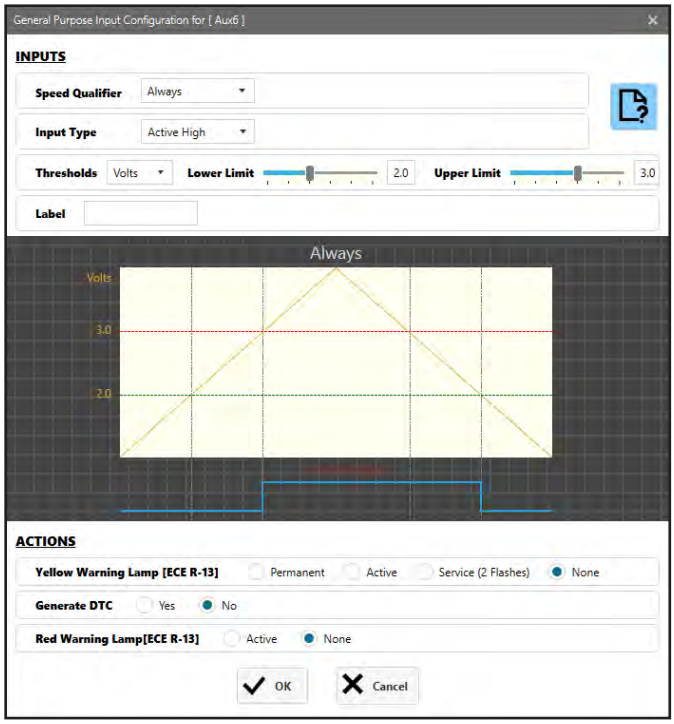
The actions from this screen are processed if the conditions are active.

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 (0-5 V), digital (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.

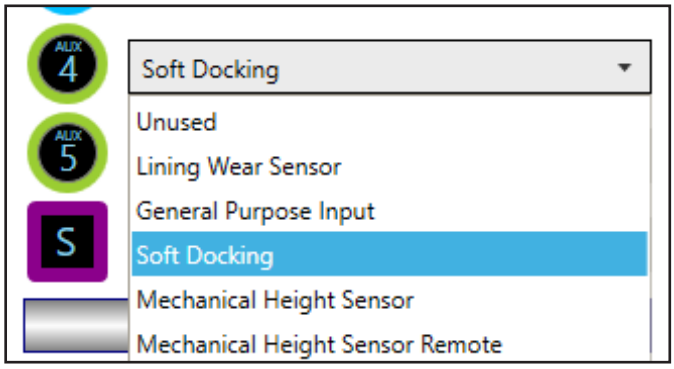
3. Allow additional functions perhaps only if spring brake is 0 bar (i.e. brake applied)

Note: The lamp usage is controlled by ECE-R13

Soft Docking input (AUX 4 or 5)

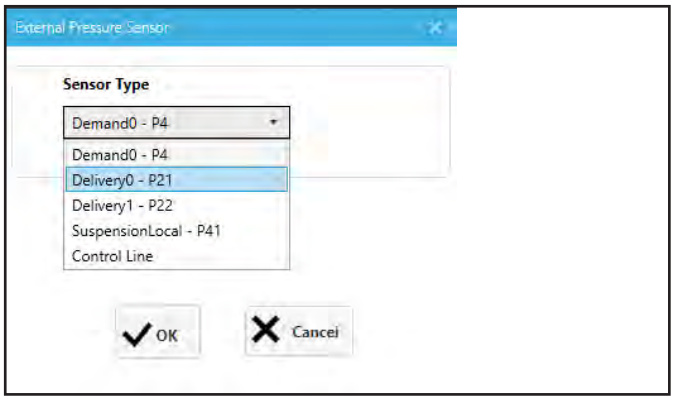
Select 'Soft Docking' from the drop down menu on AUX 4 or AUX 5.

Note: There are no additional parameters to be set.

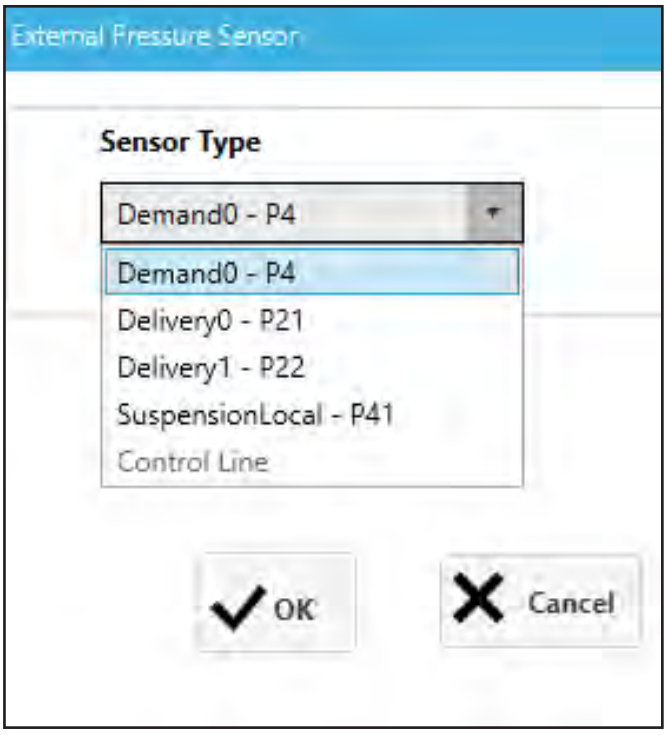


External pressure / control line sensor

Select sensor type from 'Modify' settings (AUX 4 and AUX 5 configuration only).



If the configuration is locked, an 'External Pressure Sensor' can be configured but not as a 'Control Line' variant.



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:

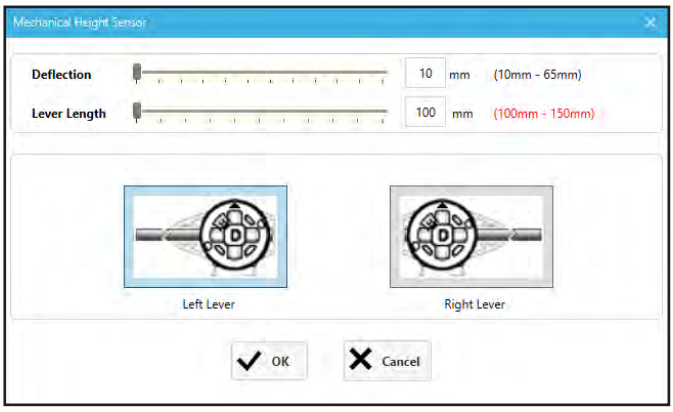
A deflection of 20 mm will allow a lever length range of 100 to 151 mm (as seen in the picture).

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

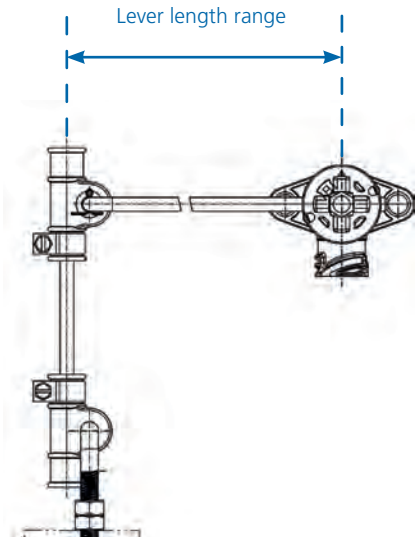
Once the lever length is set, the user then enters the actual lever length.

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



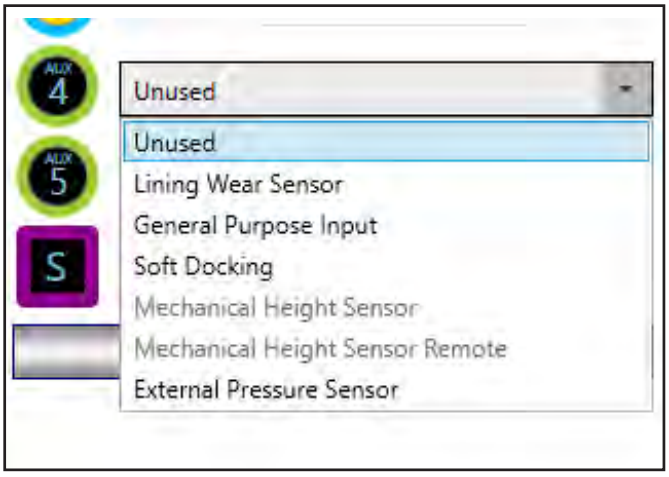
Note: When a Mechanical Height Sensor is configured the Load Plate suspension pressures will be blanked.

	INPUTS	Bar
1.	Unladen Suspension	-
2.	Laden Suspension	-

As will the suspension pressures on the EOLT report (if both pressure test and Lamp and Aux tests have been performed).

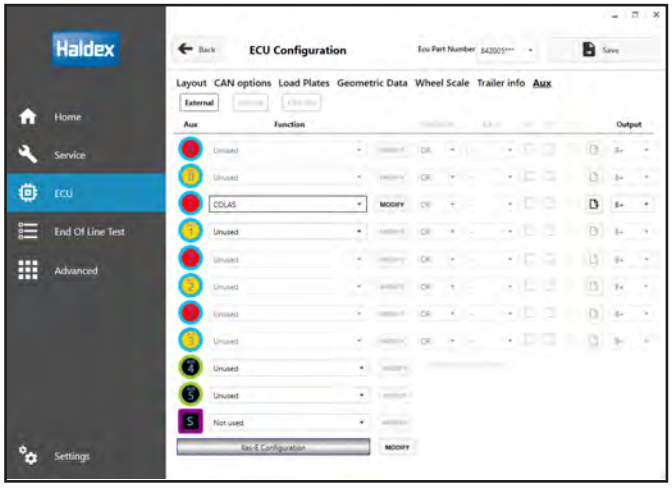
EBS Pressure Test										Passed
	INPUTS			OUTPUTS			Results			
	Master	SLAVE1	SLAVE2	Master	SLAVE1	SLAVE2	P21	P22	P2(1)	P2(2)
Unladen Suspension										
Laden Suspension										
P0	0.20									
PD	0.70			0.50			0.60	0.60		
PP1[U]	2.00			0.75			0.60	0.60		
PP1[L]	2.00			1.80			1.85	1.85		
PP2[U]	4.50			1.35			1.40	1.40		
PP2[L]	4.50			4.30			4.35	4.35		
PP3[U]	6.50			1.80			1.80	1.80		
PP3[L]	6.50			6.20			6.15	6.15		
P Limit										

When the configuration is locked Mechanical Height Sensors cannot be configured.



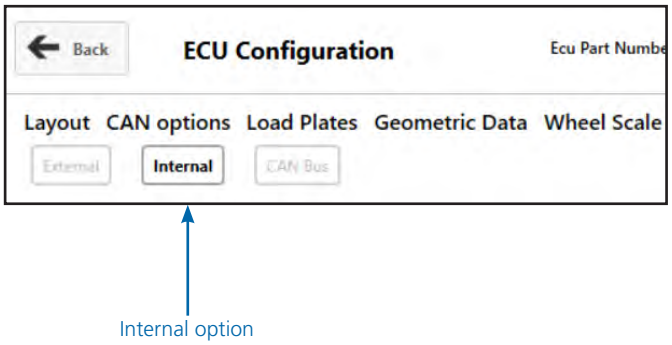
2. Internal AUX Configuration

Click on the 'ECU' button, then click the 'Edit' button, then click on the 'Aux' tab to setup the auxiliary configuration.



The following screen will appear.

Click on the 'Internal' box to select the internal aux options



Internal option

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 the 'Internal' button.

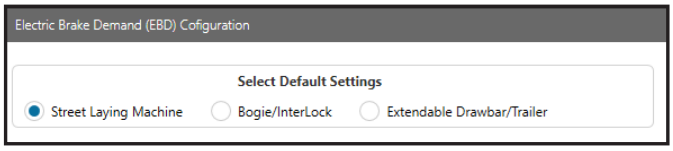
The following screen will appear.

Click on 'electric brake demand' box 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



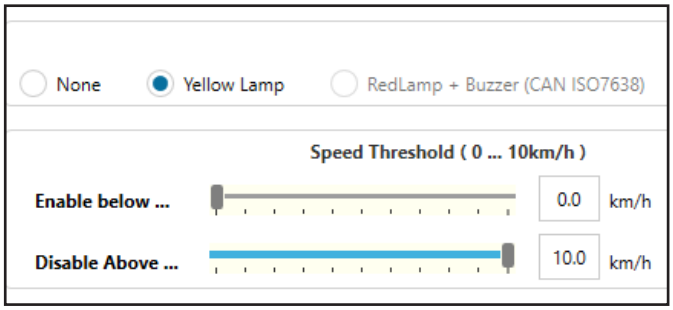
Cab warning Lamp (ECE R-13)

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)

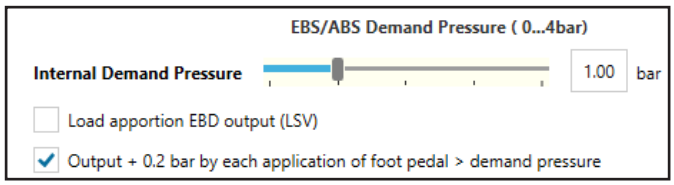
Enable below - below this speed, it's possible to switch EBD feature 'on'.

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.



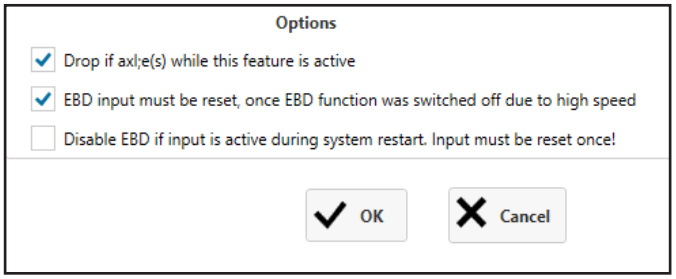
Electric brake demand options

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:

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.

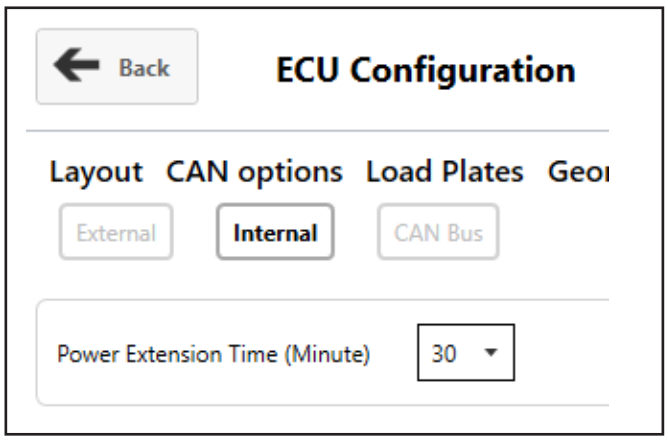
OR
Brake will be applied if one of the inputs is active.

AND <<only useful with more than one selected input>>
Brake will be applied if all related inputs are active.

Power extension time

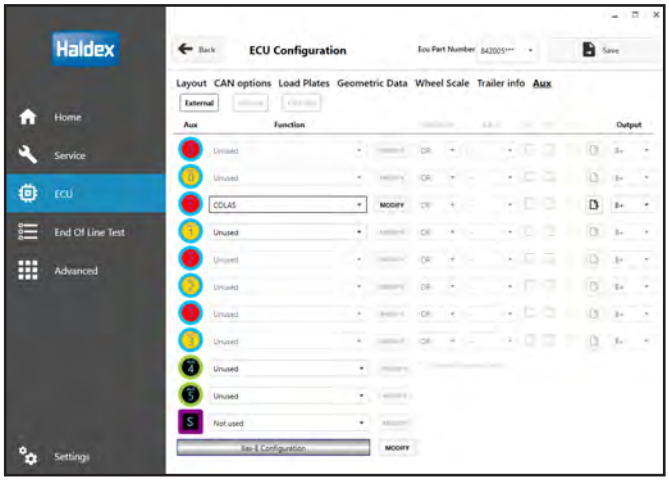
The Power Extension Time is enabled by choosing a time period from the dropdown, when the driver turns ignition off, EB+ will still be powered (including AUXs such as AUX power) for that time period.

Time period range: 0-60mins



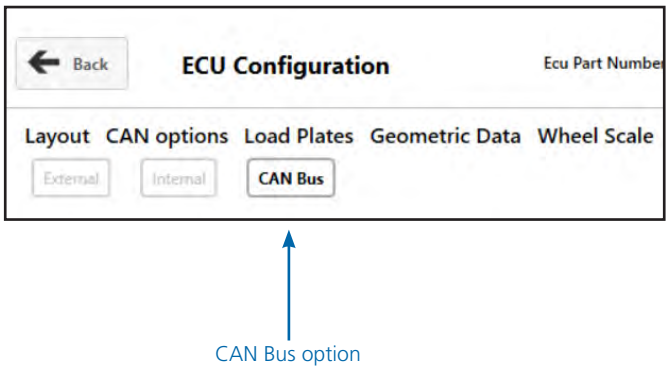
3. CAN Bus AUX Configuration

Click on the 'ECU' button, then click the 'Edit' button, then click on the 'Aux' tab to setup the auxiliary configuration.



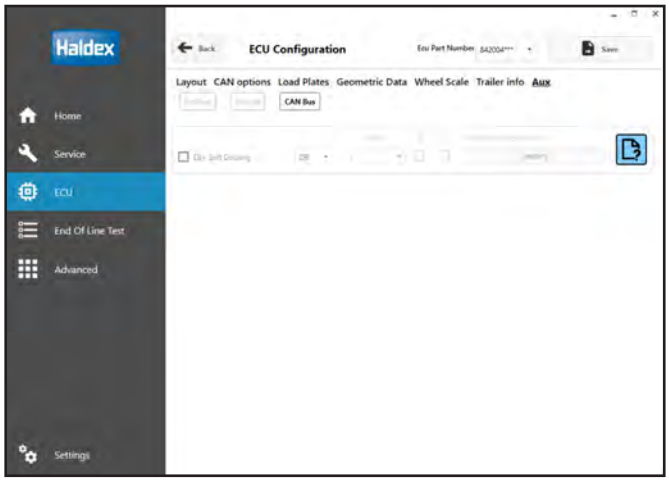
The following screen will appear.

Click on the 'CAN Bus' button to select the CAN Bus aux options



CAN Bus option

The following screen will appear.



No tick = EB+ Soft Docking not installed

Tick = EB+ Soft Docking installed

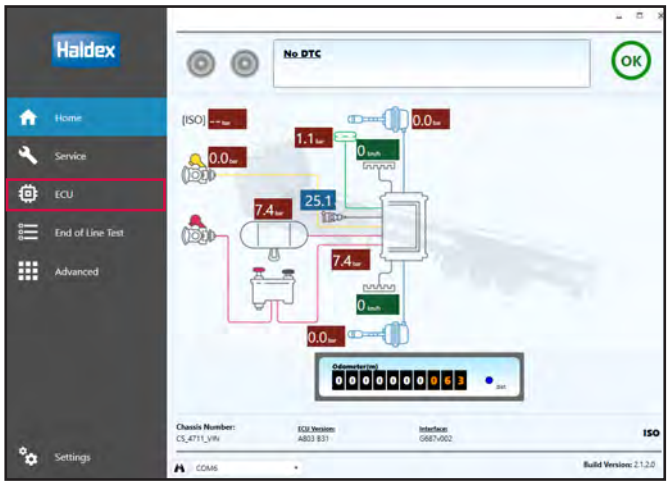
EB+ Soft Docking

How to check if EB+ Soft Docking is installed on EB+ 4.0 / ABS 4.0

Step 1:

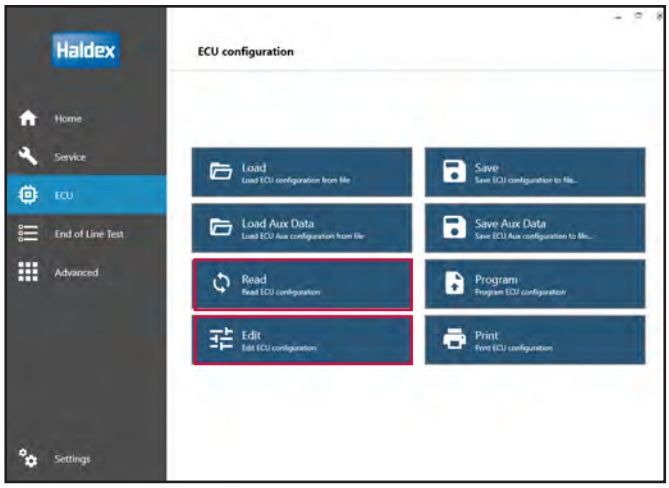
Turn 'on' the power to the EB+ 4.0 / ABS 4.0

Open DIAG++, select ECU (configuration).



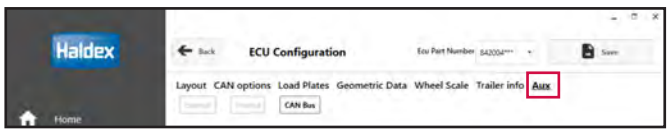
Step 2:

Read ECU configuration then select ECU Edit configuration.



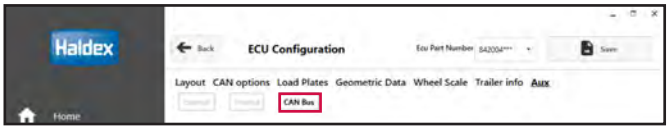
Step 3:

Select Aux tab.



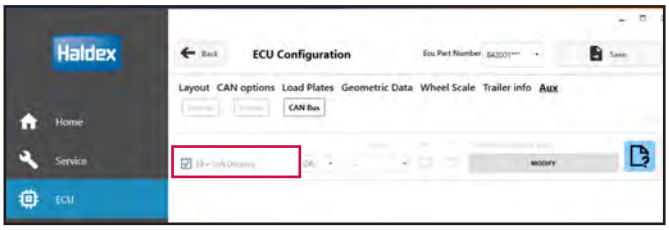
Step 4:

Select CAN Bus tab.



Step 5:

Observe the EB+ Soft Docking tick box.



No tick = EB+ Soft Docking not installed

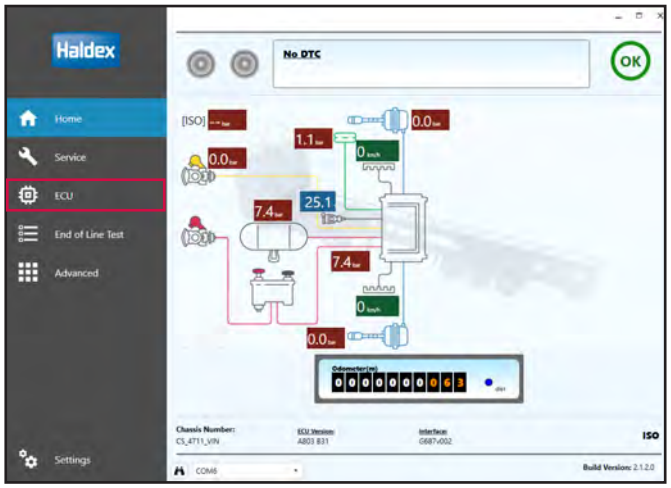
Tick = EB+ Soft Docking installed

How to remove EB+ Soft Docking from EB+ 4.0 / ABS 4.0

Step 1:

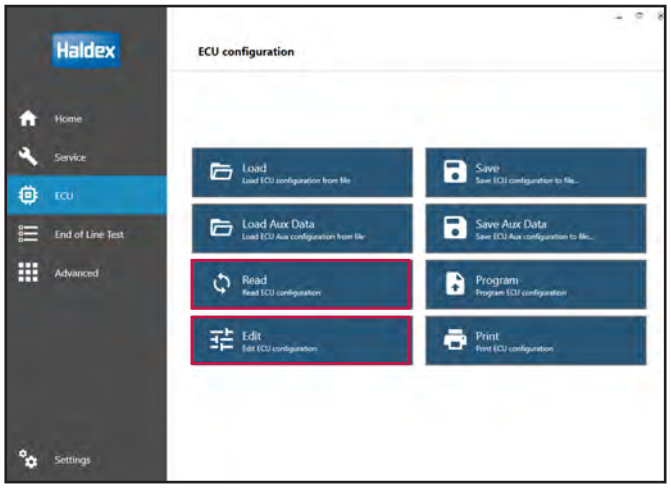
Turn 'on' the power to the EB+ 4.0 / ABS 4.0

Open DIAG++, select ECU (configuration).



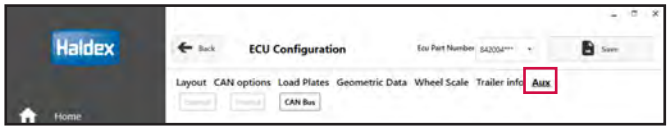
Step 2:

Read ECU configuration then select ECU Edit configuration.



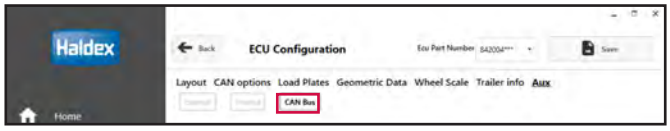
Step 3:

Select Aux tab.



Step 4:

Select CAN Bus tab.

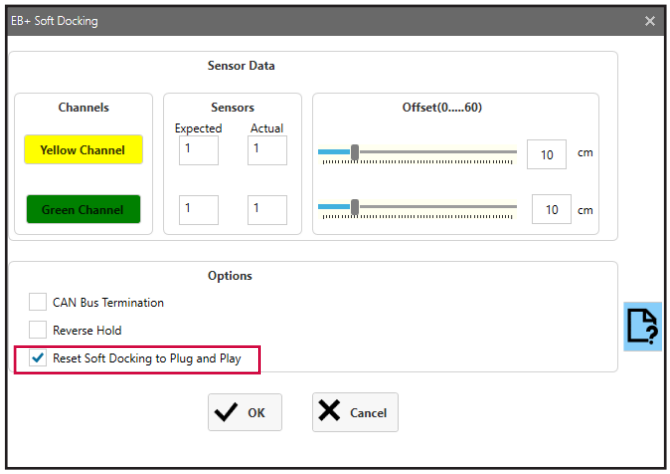


Step 5:

Select "Modify" button.

Step 6:

Select 'Reset EB+ Soft Docking to Plug and Play' box.

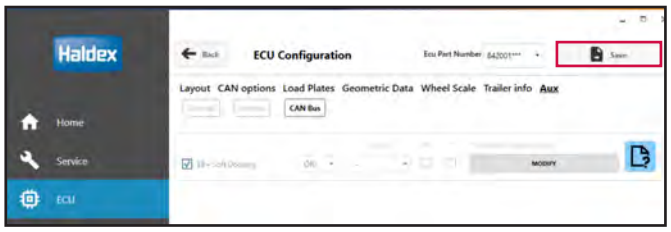


Step 7:

Click on 'OK' (tick) to save changes and exit this dialog

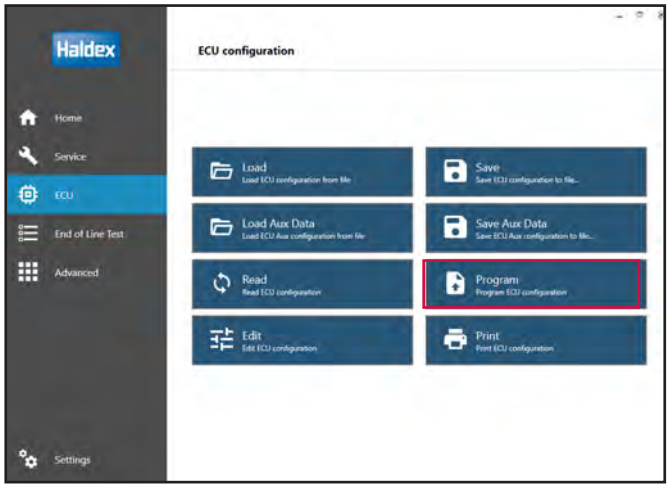
Step 8:

Important - Click 'Save' button, to save the changes made.



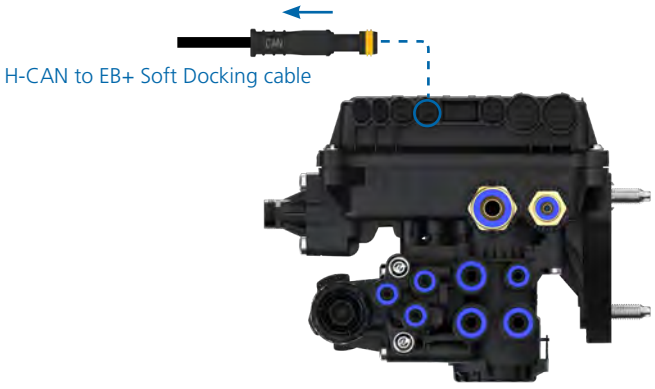
Step 9:

Programme the changed configuration into the EB+ 4.0 / ABS 4.0 ECU.



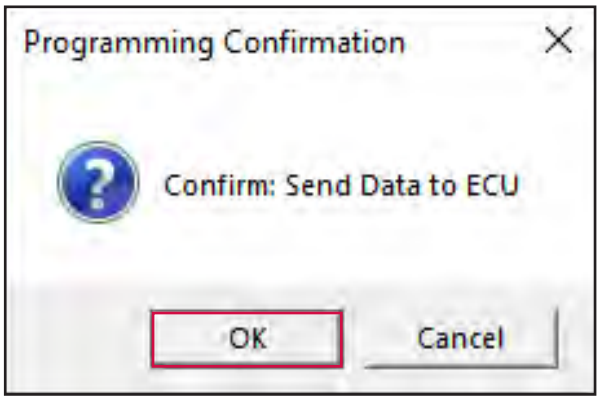
Step 10:

Remove EB+ Soft Docking CAN BUS cable from EB+ 4.0 / ABS 4.0 ECU.



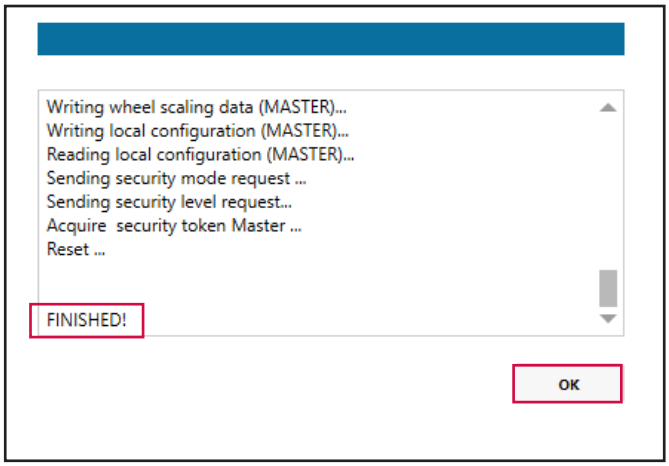
Step 11:

Select 'OK' to send data to ECU.



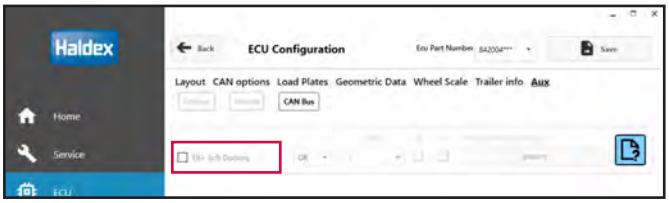
Step 12:

Sending data screen. Click OK when finished



Step 13:

Check using DIAG++ that the EB+ Soft Docking has now been removed (box unticked)



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

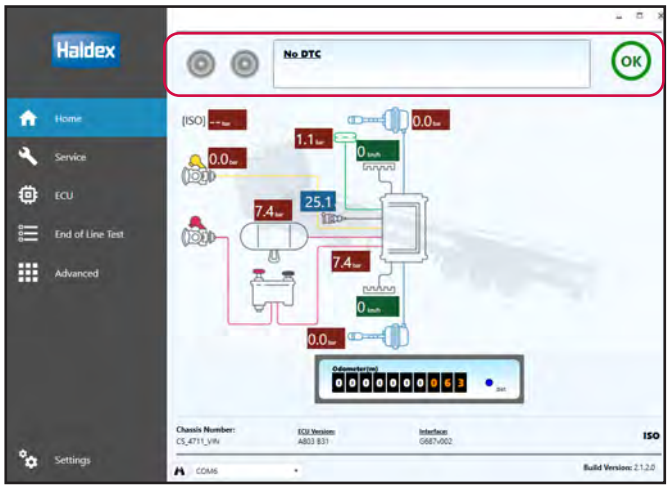
Step 1:
Turn 'off' the power to EB+ 4.0 / ABS 4.0

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

Step 3:
Turn 'on' the power to EB+ 4.0 / ABS 4.0

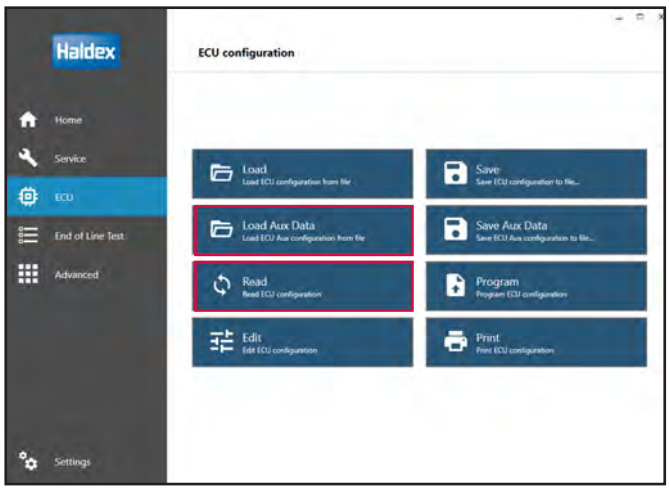
Step 4:
Check installation using DIAG++

Step 5:
Open DIAG++, check that no DTC's are shown.



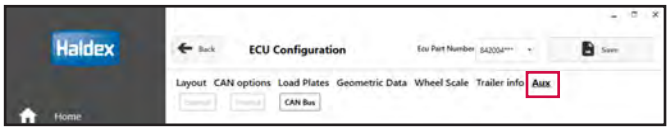
Step 6:

If no DTC's are shown read ECU configuration then select ECU Edit configuration.



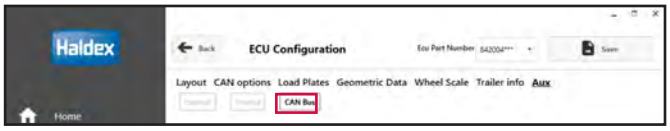
Step 7:

Select Aux tab.



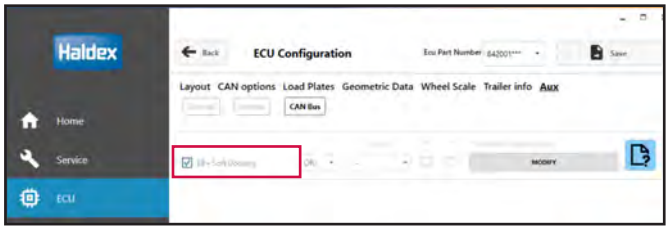
Step 8:

Select CAN Bus tab.



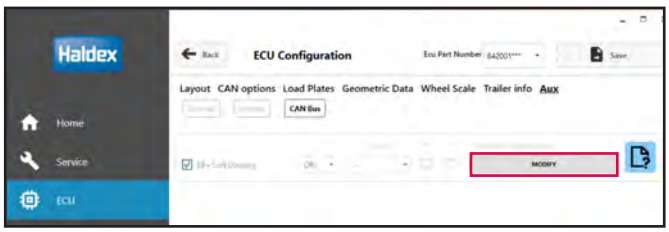
Step 9:

Observe the EB+ Soft Docking tick box.



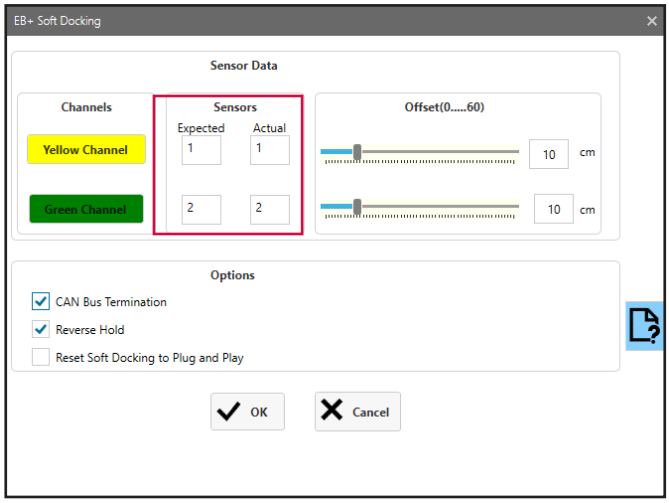
Step 10:

Select 'Modify' button.



Step 11:

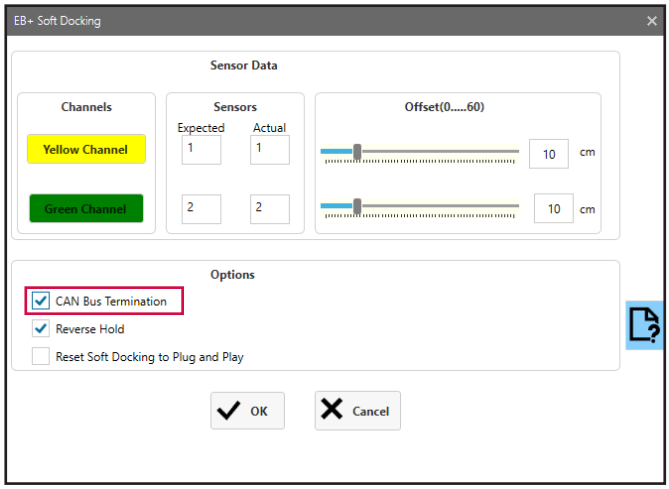
Check that the number of sensors is correct.



Step 12:

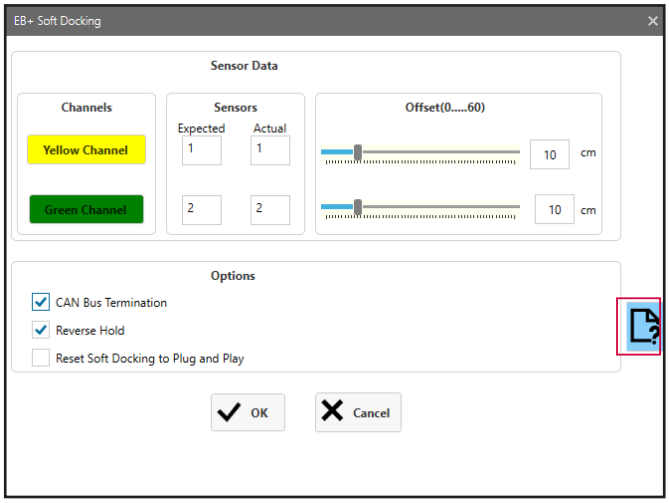
Ensure that the 'CAN Bus Termination' box is selected.

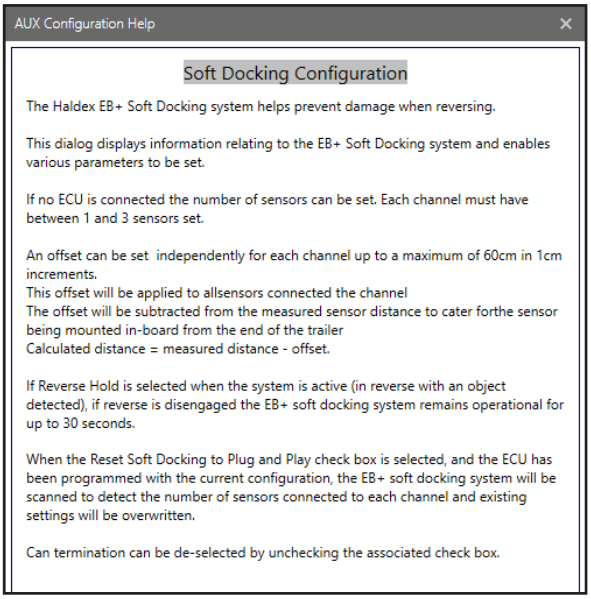
Note: the 'CAN Bus termination' shall always be selected unless otherwise advised by Haldex.



Step 13:

Select 'Help' button for additional information.



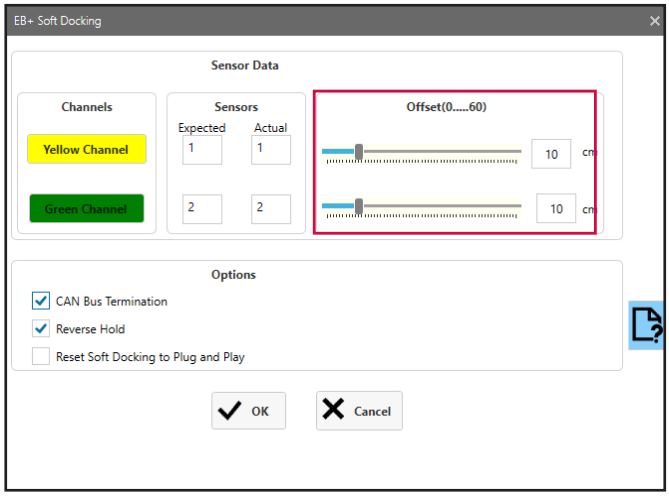


Step 14:
If no sensor channel offsets are required, go to step 15.

If sensor channel offsets are required, go to step 16.

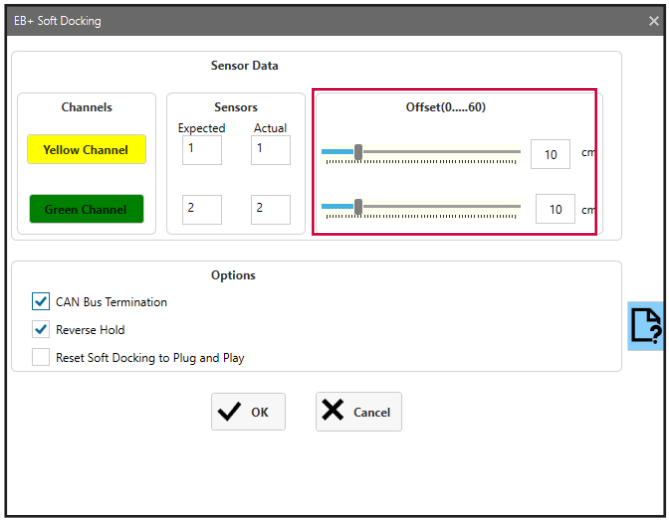
Step 15:
Proceed to EB+ Soft Docking EOLT.

Step 16:
Adjust channel values to sensor installation offset.



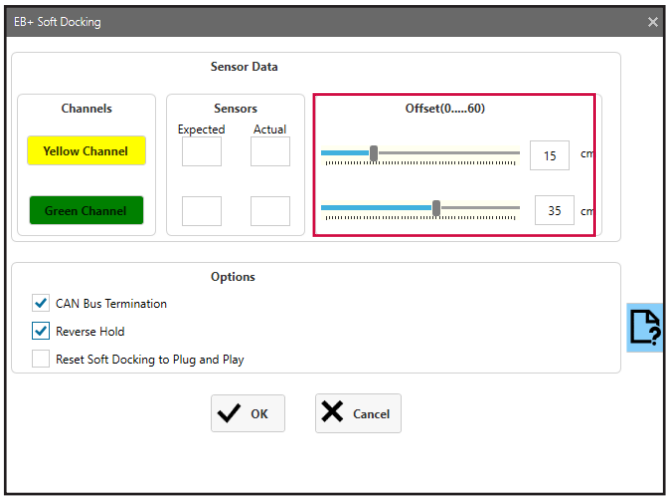
Offset example 1:

Both channels the same value.



Offset example 2:

Both channels are different values.

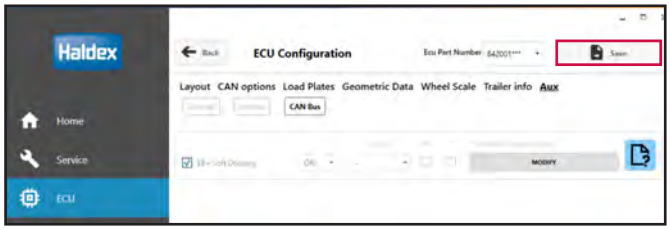


Step 17:

Click on 'OK' (tick) to save changes and exit this dialog

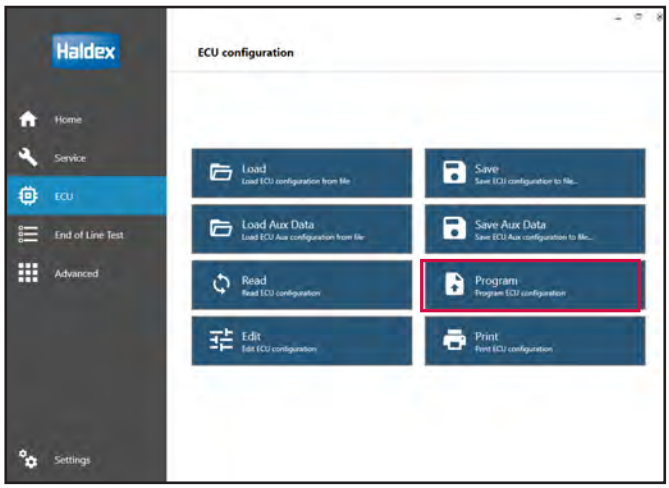
Step 18:

Important - Click 'Save' button, to save the changes made.



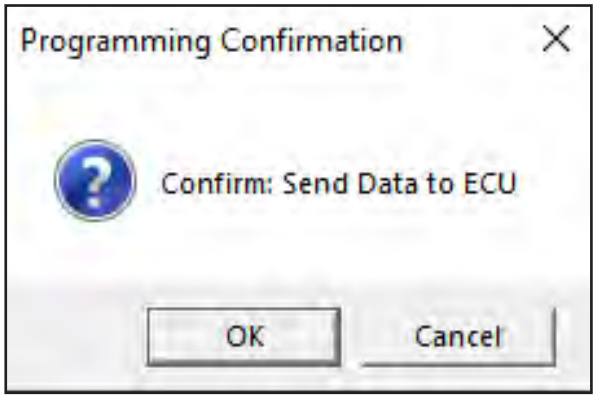
Step 19:

Programme the changed configuration into the EB+ 4.0 ECU.



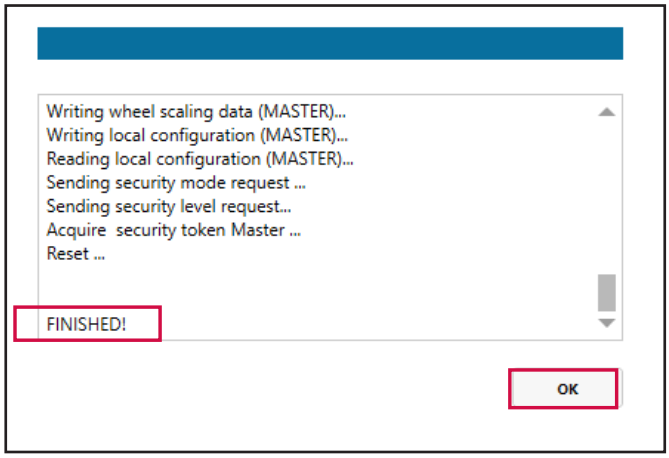
Step 20:

Select 'OK' to send data to ECU.



Step 21:

Sending data screen. Click OK when finished

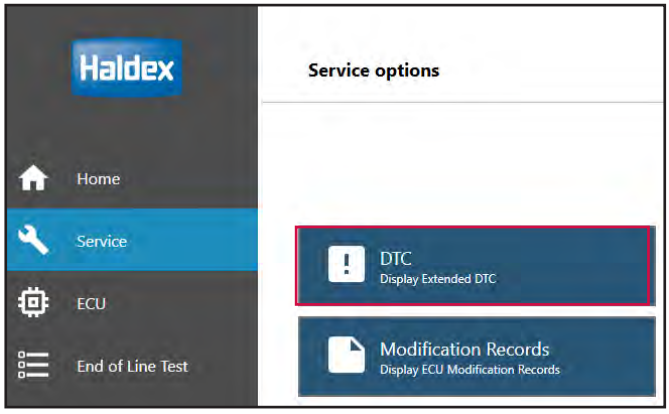


Checking for a faulty EB+ Soft Docking installation using DIAG++

Step 1:

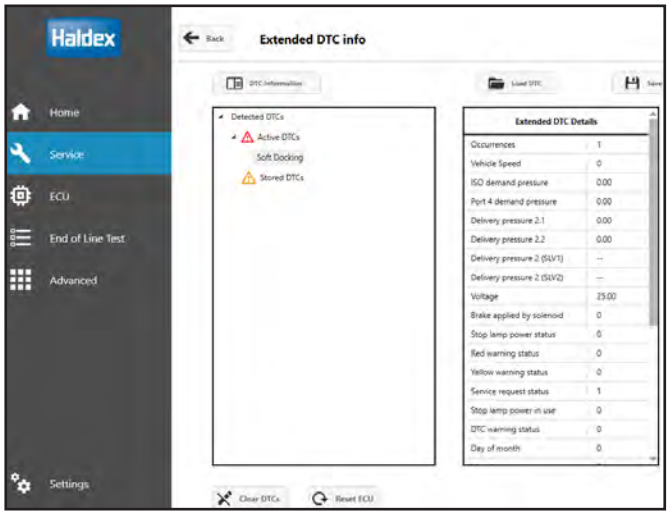
Check if any active EB+ Soft Docking DTCs are present.

Click on 'Service' tab then click 'DTC' button to show any DTCs.



Step 2:

Currently, only 1 generic EB+ Soft Docking DTC is reported with no indication as to the cause of fault.



An indication as to what has gone wrong will be added in a future release.

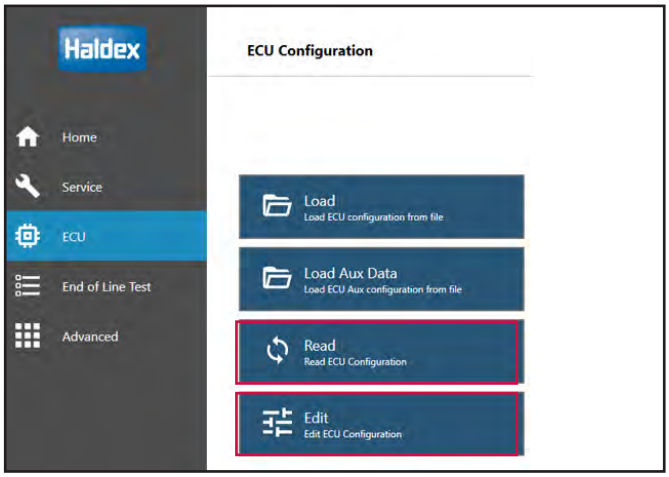
Step 3

Check EB+ Soft Docking configuration is correct.

a. Click on 'ECU' tab.

b. Then click 'Read' button to read the ECU configuration.

c. Then click 'Edit' button to view ECU configuration

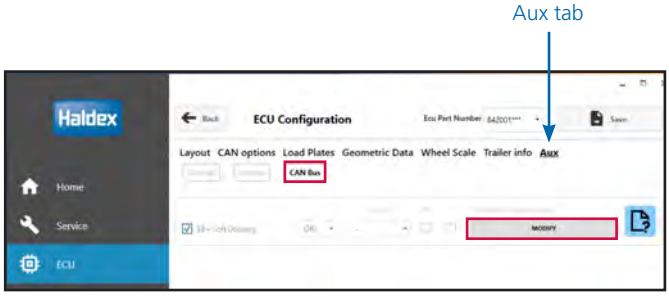


Step 4:

a. Click 'Aux' tab to view Auxiliary configurations.

b. Then click 'CAN Bus' button to view H-CAN configuration.

c. Then click 'Modify' button to view EB+ Soft Docking configuration.



Step 5:

Check displayed sensor numbers for errors.

If a faulty sensor is suspected the following actions should be taken:

a. Power down parent EB+ 4.0 / ABS 4.0

b. Replace suspected faulty sensor with a new sensor.

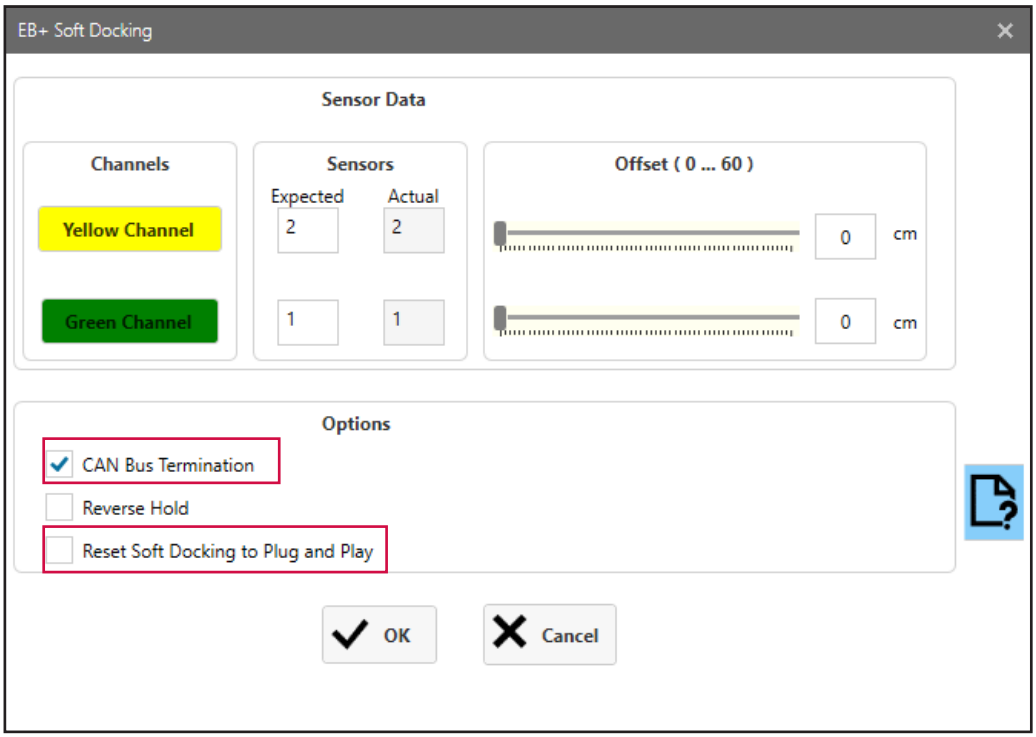
c. Power up parent EB+ 4.0 / ABS 4.0

d. Use DIAG++ to check for any active DTCs.

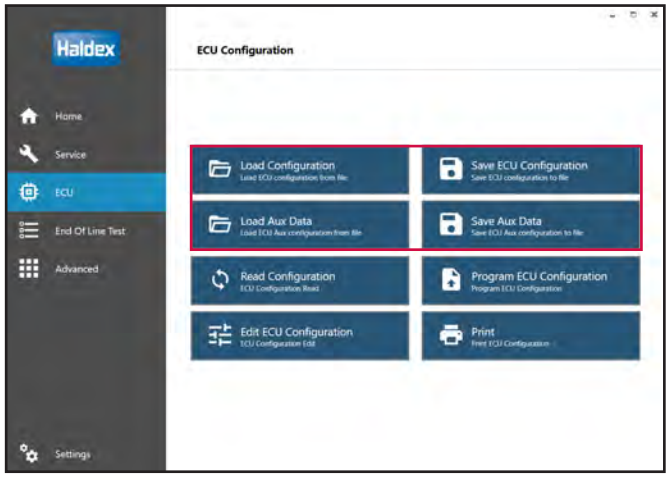
e. Repeat steps (a) to (d) until no active EB+ Soft Docking (sensor) DTCs are shown.

If a CAN bus termination error is suspected the termination applied in the EB+ Soft Docking ECU (default applied) can be removed by disabling the 'CAN Bus Termination' tick box, saving the changed configuration and re-programming the ECU.

A 'Plug and Play' reset of EB+ Soft Docking can be initiated by enabling the 'Reset Soft Docking to Plug and Play' tick box, saving the changed configuration and re-programming the ECU. This will force EB+ Soft Docking to re-calculate its configuration as for an initial power-on after installation.



Saving and loading the ECU parameters



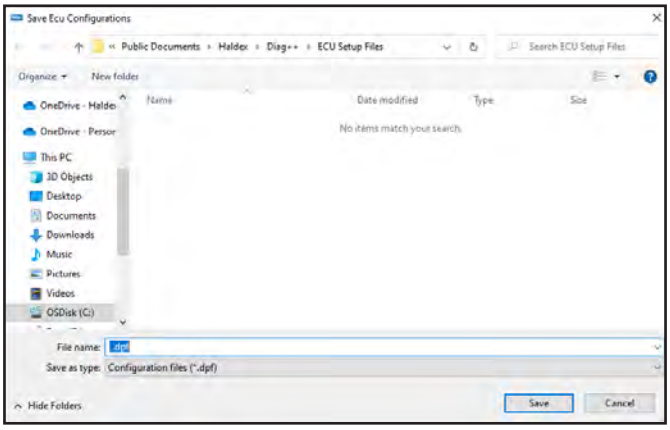
Saving the ECU parameters to disc

In ECU configuration dialog click on 'Save' button.

This will throw up a Windows Explorer dialog.

The suggested filename (based on VIN) can be altered if required.

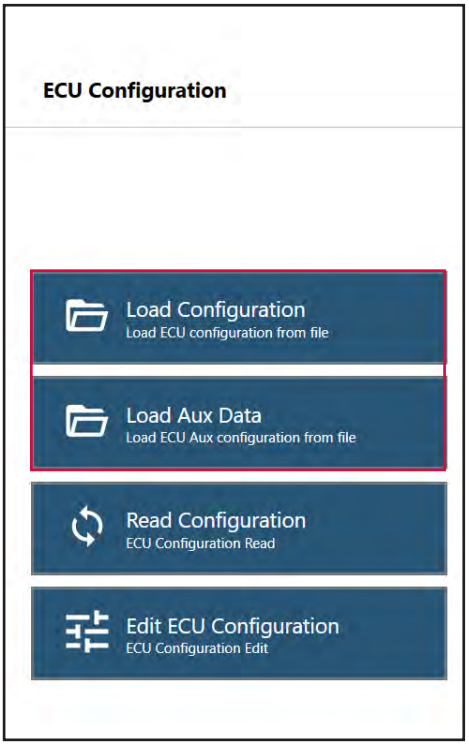
File is saved as a .dppf file type when Save button clicked (default save directory is C:\Program Files\ Haldex\Diag++\ECU setup files).



Note: The saved .dppf file can be used to program other EB+ 4.0 EBS & ABS 4.0(with same configuration) by clicking on Load ECU configuration from file button and selecting the relevant .dppf file – then programming that configuration into the EB+ 4.0 EBS / ABS 4.0.

Note: in the same way the ECU AUX configuration (only) can be saved (press 'Save Aux Data' button) or loaded (press 'Load Aux Data' button). A ".dppf" file type is again used for this.

A configuration file (.dppf file type) can be programmed into the ECU when its configuration is locked but there is a very limited number of settings that can be changed once locking is active.

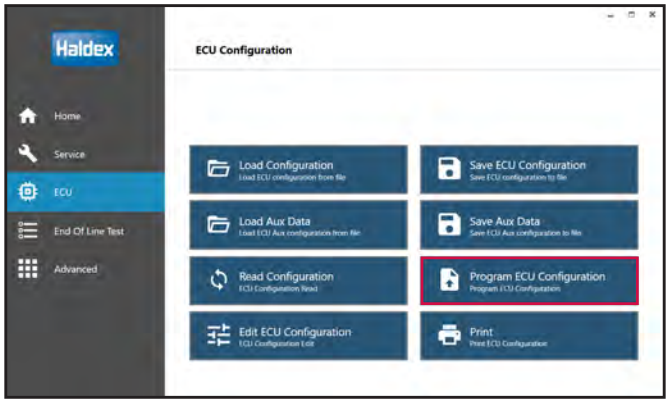


Programming the ECU.

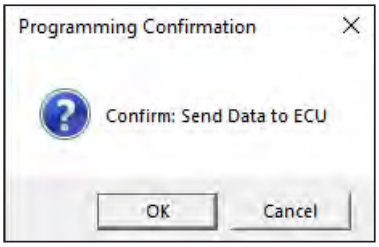
In ECU configuration dialog click on 'Program' button.

A 'programming confirmation' dialog is displayed, click 'OK' button to proceed, or 'Cancel' button to abort.

(The configuration can be obtained from a loaded .dppf file or setup manually via Edit configuration dialog.)

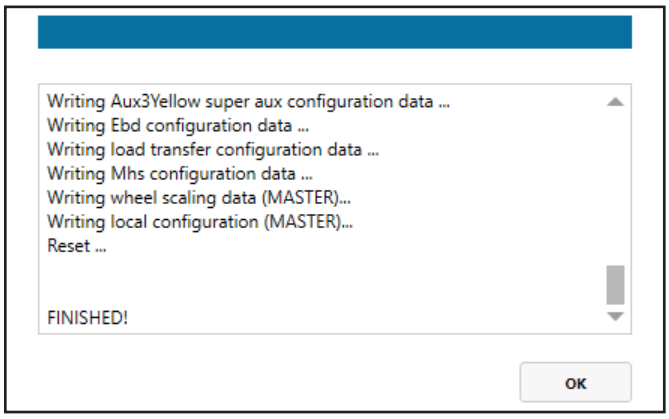


During programming a progress dialog is displayed. This displays both a progress bar and informational messages on programming progress.



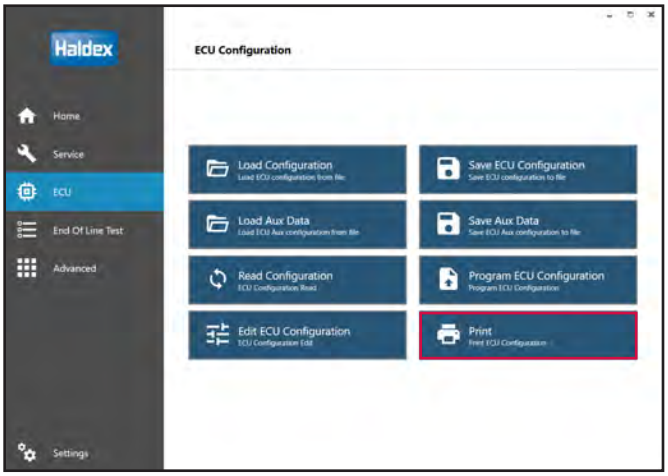
Note: After programming all active DTCs are deleted and the ECU is reset.

During programming the trailers EBS warning lamp will flash.



Load plate label printing

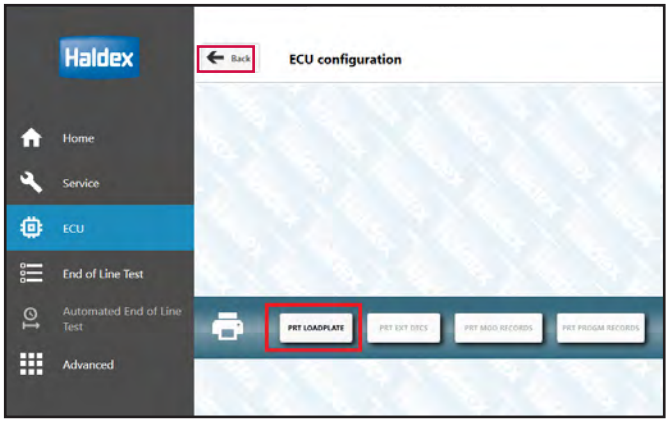
Click on the 'ECU' button then click on the 'Print' button to show options.



Click 'PRT Loadplate' to print the load plate report.

Print label using Haldex blank label
Part no. 028 0424 09 / 10 (pack of ten labels)

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.

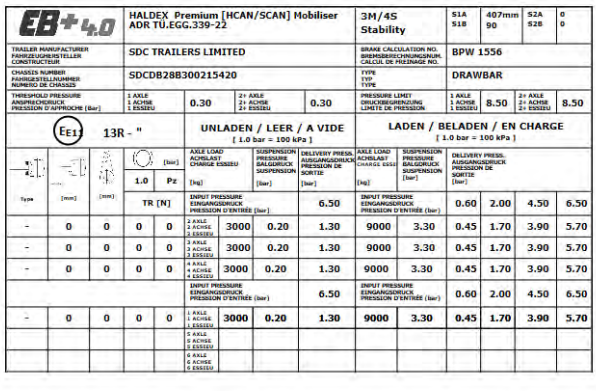


Click on the 'Back' button to return to the ECU configuration options.

Example Load Plate label (EB+ 4.0) for a semi or centre axle trailer.

Click the Print icon to print the label.

If the Load Plate label needs adjustment to print correctly, use the x and y axis sliders to adjust then click the "SAVE OFFSET VALUES" button to save. When next entering the Print Preview Window, if the same adjustments are required for printing the current label click the "LOAD OFFSET VALUES" button to apply the saved adjustments to the current label.

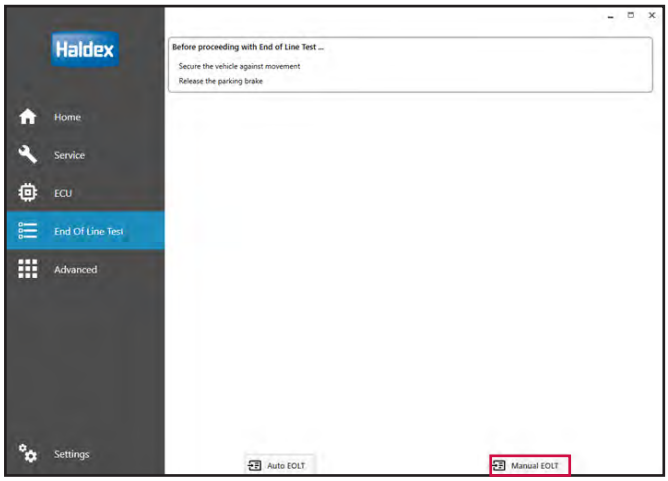


End of line test (EOLT) - EB+ 4.0

Starting manual EOLT

Click on the 'End of Line Test' button to enter the EOLT dialog.

Click 'Manual EOLT' button to commence manual EOLT



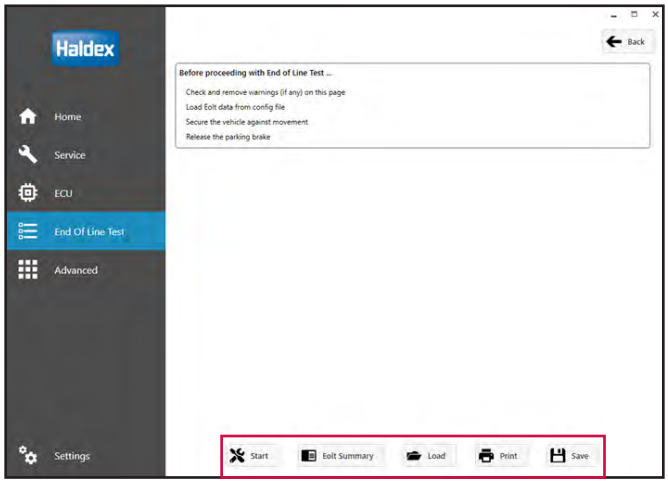
Click 'Start' button to start the manual EOLT.

Click 'EOLT summary' button to display EOLT summary.

An existing EOLT file can be opened (.eol) by clicking the 'Load' button ('View / Print' only).

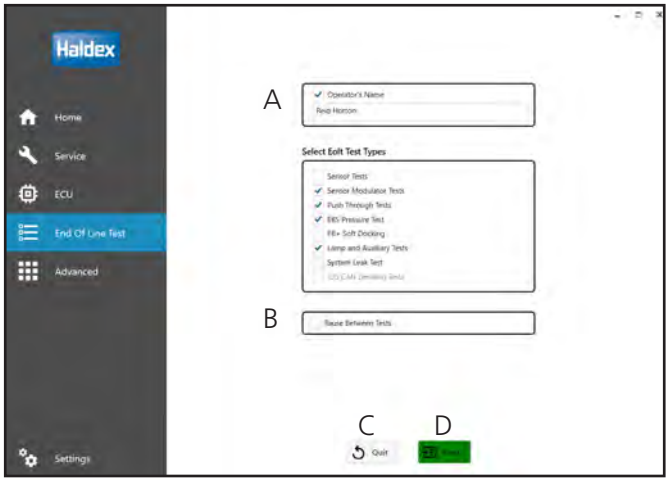
Press 'Print' button to print out EOLT results.

Press 'Save' button to save EOLT results to a file (.eol)



EOLT initialisation

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



A. 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.

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

C. Click on the 'Quit' button to return to return to the previous dialog.

D. Click on the 'Next' button to start the EOLT.

Note: Unlike EB+ Gen3 EBS, during the EOLT procedure the cab / trailer warning lamp will not flash (to indicate the EOLT is in progress).

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

Note: For EB+ 4.0 units, the following tick-boxes will be active:

- Operator Name
- Sensor Tests
- Sensor Modulator Tests
- Push Through Tests
- EBS Pressure Tests
- Soft Docking
- Lamp and Auxiliary Tests
- System Leak Test
- Pause between Tests

Sensor tests

This full sensor test is optional, as the sensors will also be tested during the 'Sensor modulator tests'

Procedure:

- Rotate each wheel through 3 revolutions in 5 secs
- The test sequence is S1A, S1B, S2A, S2B, SL1A, SL1B, SL2A, SL2B

Result section:

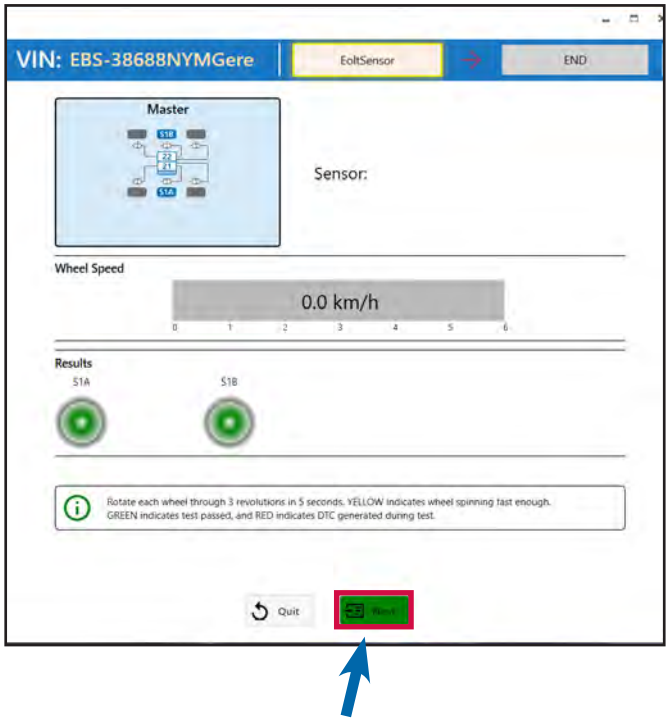
Yellow indicates wheel spinning fast enough.

Green indicates test passed.

Red indicates DTC generated during test.

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

Next icon only becomes active when test has completed.

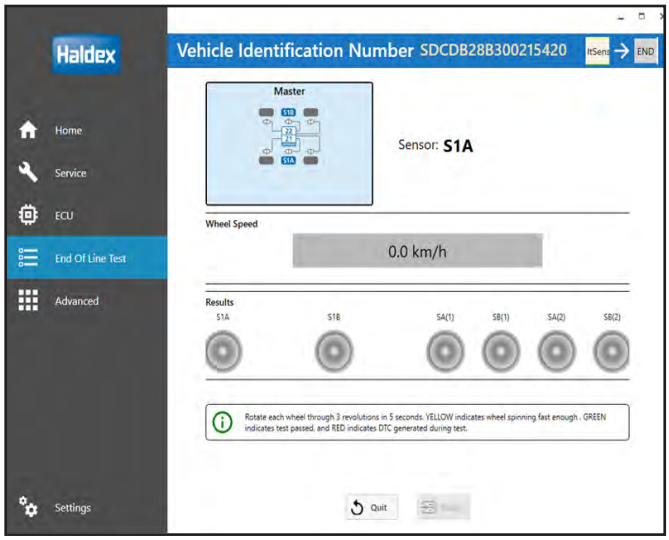


Sensor tests - 4M Systems only

Please be aware that for 4M systems only (these have 2 Slave ECUs) the system may do a Slave swap if Slave 1 SA wheel speed sensor is not on the same side as the Master S1A (and S2A if configured) wheel speed sensors.

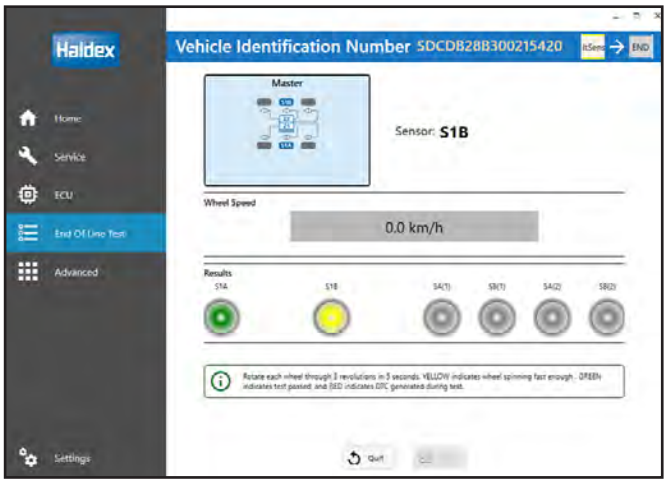
The following screenshots describe the Slave swap procedure if required:

For a 4M system the sensor test will start in the normal way with a check on the Master wheel speed sensors.

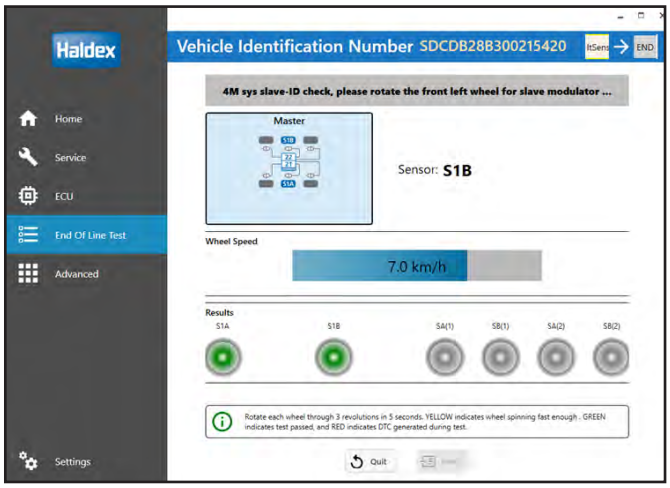


Sensor S1A passed (green)

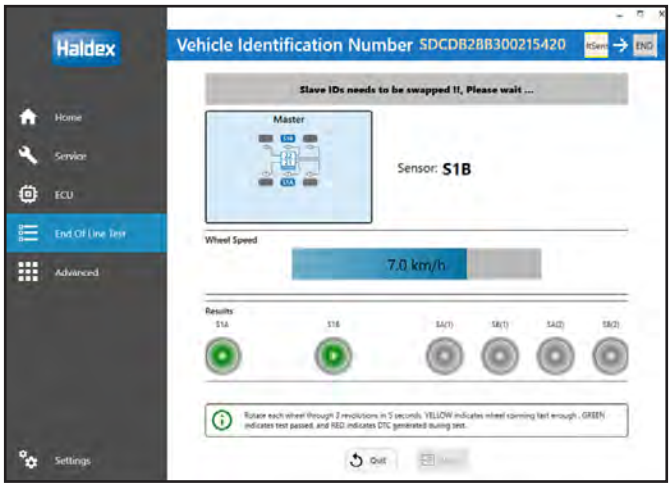
Sensor S1B testing (yellow)



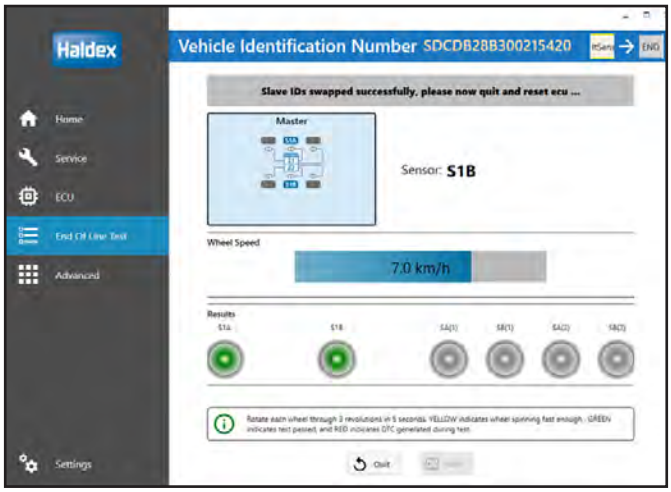
After the final Master wheel speed sensor has been checked, the user is prompted to spin Slave 1 left wheel speed sensor:



If Slave 1 SA wheel speed sensor is not detected as being spun then the system will initiate a Slave swap:

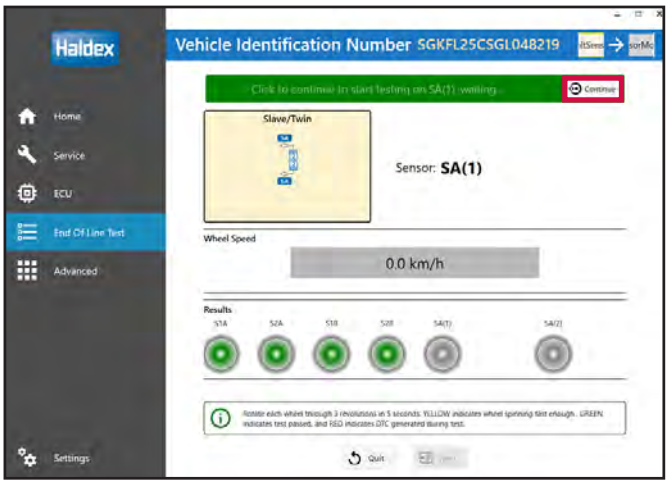


The user is then prompted to quit the EOLT and power cycle the ECU:

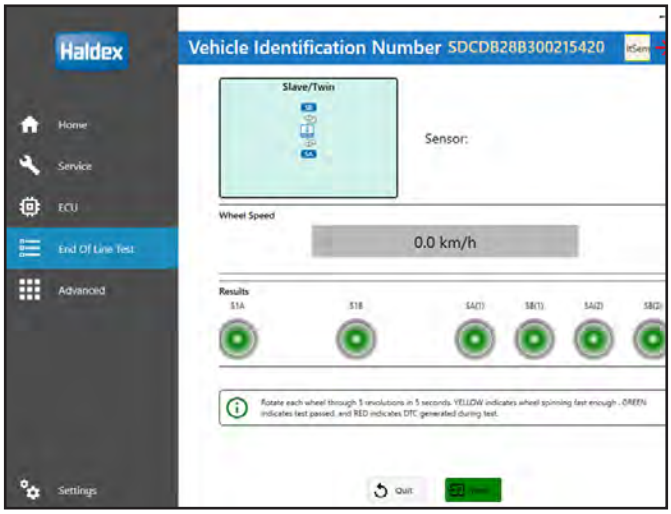


When the ECU has reset the user should run the EOLT wheel sensor test again. This time, the system should not do the Slave swap routine but should just cycle through testing the Slave wheel speed sensors.

Note: if a Slave is present, the user is prompted to click the "Continue" button prior to spinning the first Slave wheel speed sensor, as is shown in the screenshot:



At the end of the sensor test all equipped wheel speed sensors (both Master and Slave) should show "Passed":



Sensor modulator tests

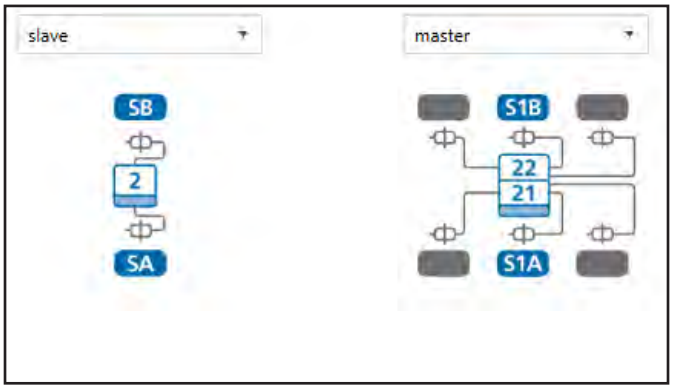
The sensor-modulator tests is a combination of the sensor input to the correct modulator.

Prodcedure:

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

The test sequence is as listed in the results section of the dialog (e.g. S1A, S1B, SL1A, SL1B for this example shown)

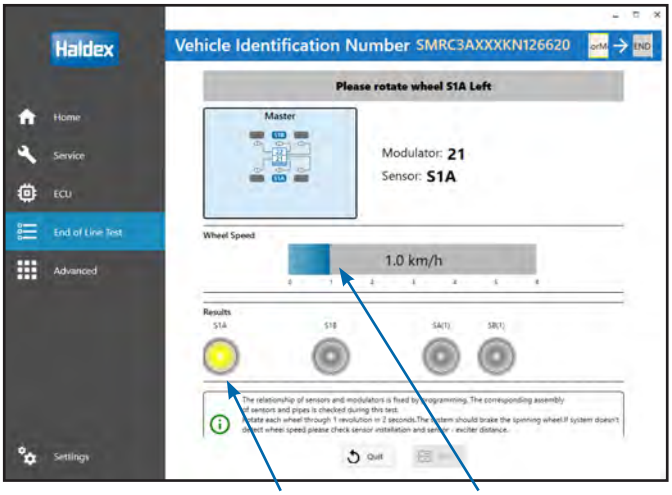
Result section:
Yellow indicates wheel has moved.
Green indicates test passed.
Red indicates test failed.



The screen display shown is relevant to a Master & Slave 4S / 3M system.

S1A test started

Manually rotate wheel S1A at 1 revolution in 2 seconds.

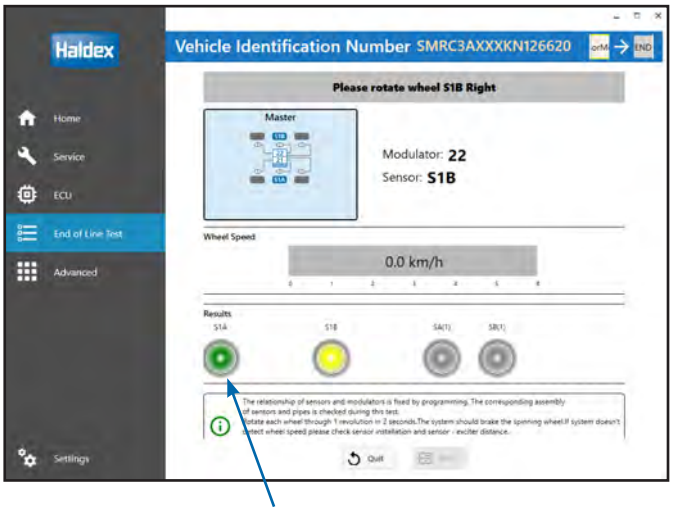


Moving wheel (yellow indication)

Wheel speed detected (moving blue bar)

S1A test passed

If the moving wheel is successfully braked, the S1A test will pass and move onto the next wheel to be tested.



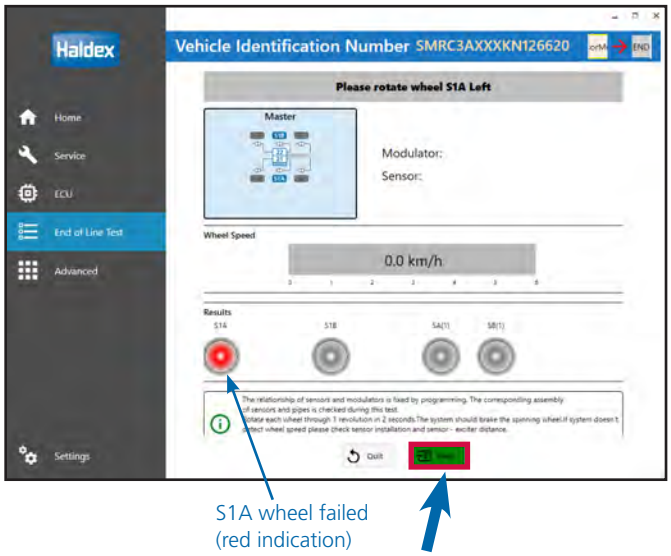
Correct wheel braked (green indication)

Failed test

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

- Correct testing sequence
- Rotating the wrong wheel
- Incorrect wiring
- Incorrect piping

Click 'Next' to exit the test



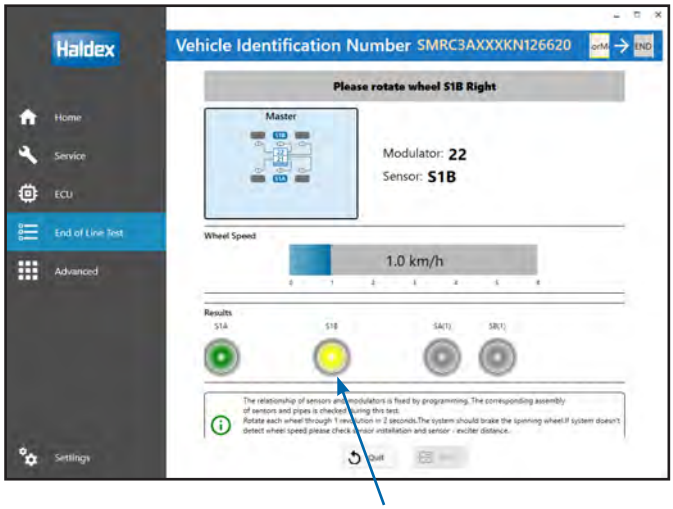
S1A wheel failed (red indication)

S1B test started

Manually rotate wheel S1B at 1 revolution in 2 seconds.

S1B test passed

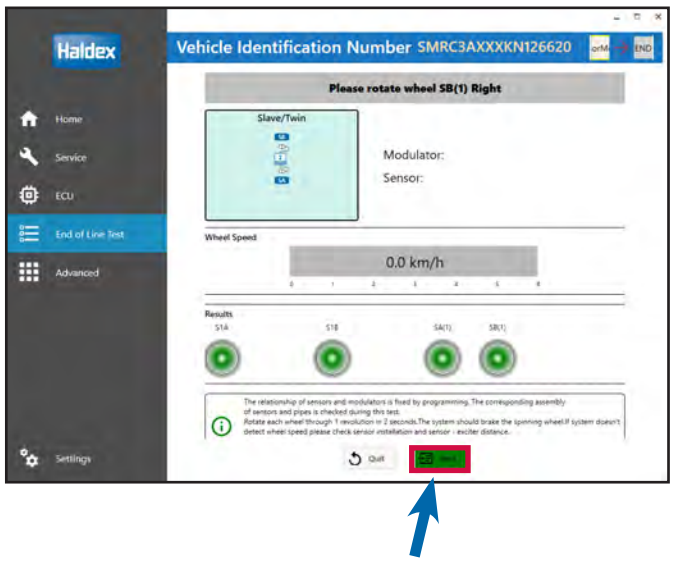
If the moving wheel is successfully braked, the S1B test will pass and move onto the next configured sensor in the sequence.



Moving wheel (yellow indication)

Repeat the 'Sensor modular test' for all the programmed ECU sensors (Master and any Slaves)

Next icon only becomes active when test has completed.



Push through tests

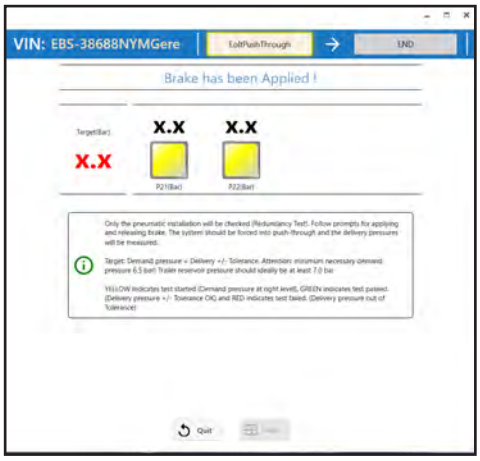
1. Apply brake
   The system should be forced into push-through condition (approx. 1:1) and the delivery pressures will be measured.
2. Release brake
   The target pressure is a calculated value.

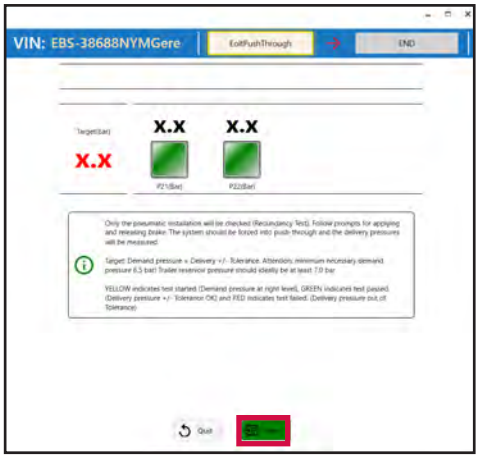
   The actual pressures (Master) measured at the EPRV are displayed above the P21 and P22 result icons.

   The actual pressures (3M Slave 0 if present) measured at the EPRV are displayed above the Slave 0 P2 result icon.

   The actual pressures (4M Slave1 if present) measured at the EPRV are displayed above the Slave1 P2 result icon.

Result section:
Yellow indicates test started.
Green indicates test passed.
Red indicates test failed.



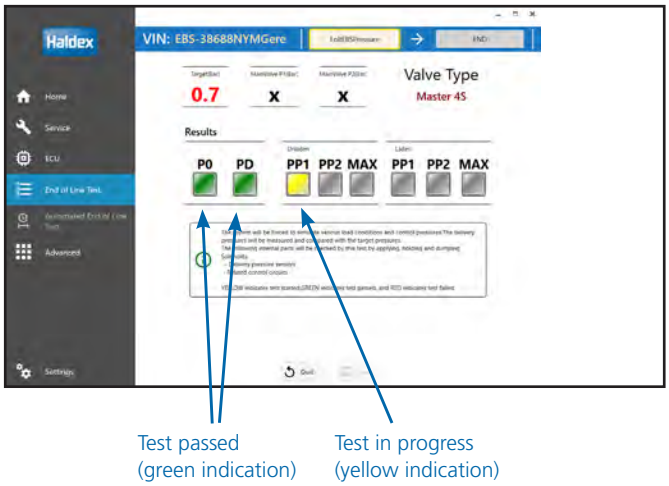


Next icon only becomes active when test has completed.

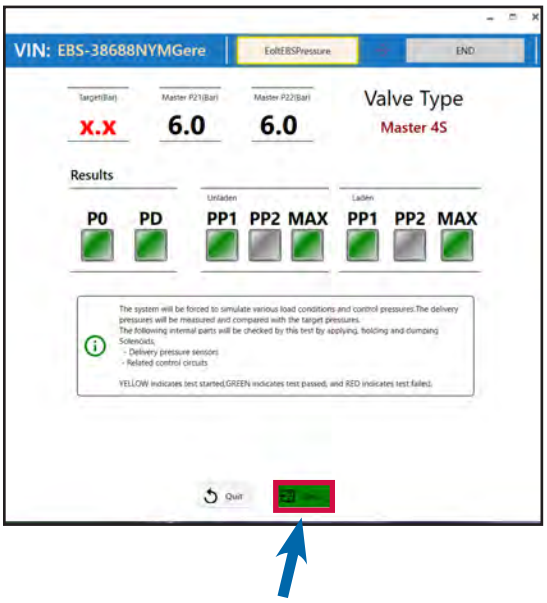
EBS Pressure function tests

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 Slave 0'.
For 4M three screens appear in sequence '4M Master' and '4M Slave 0' and '4M Slave1'



Next icon only becomes active when test has completed.

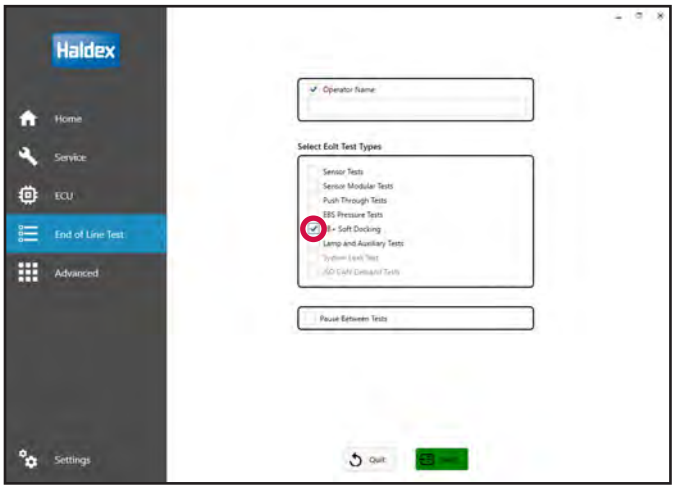
Note: Before this test a warning screen may appear.

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.

EB+ Soft Docking

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

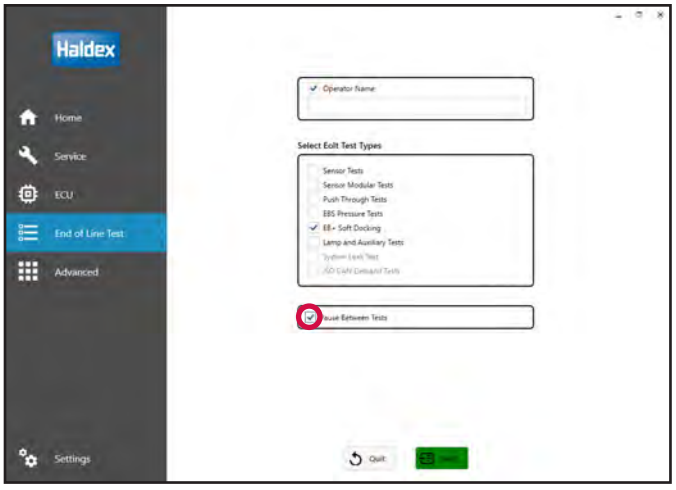
Tick the EB+ Soft Docking box.



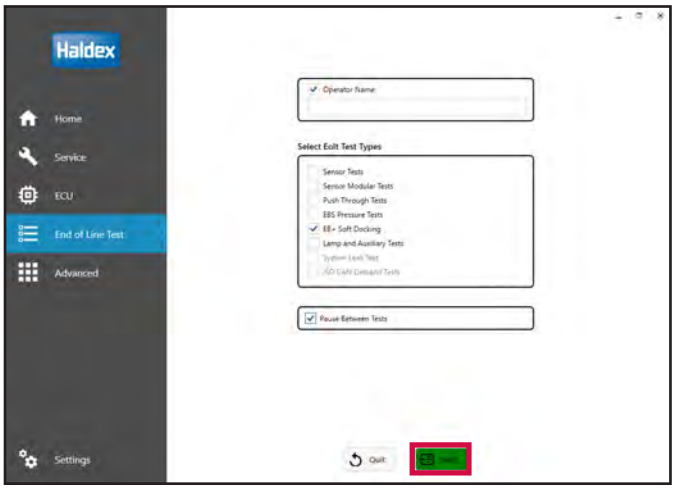
EOLT option:

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

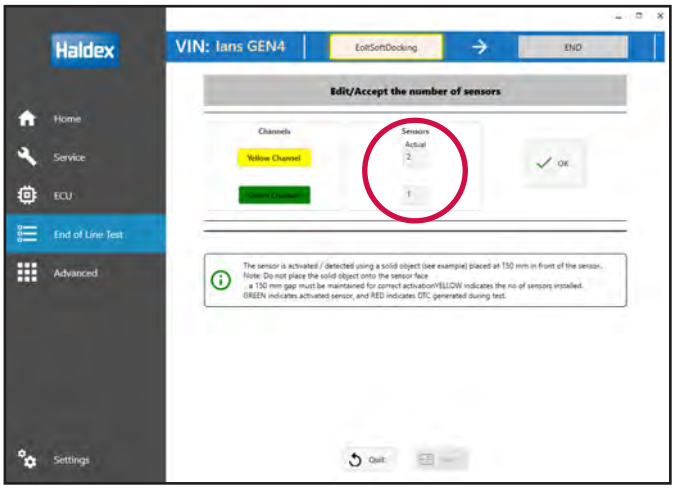
When ticked the EOLT waits for a prompt from the operator before proceeding to the next test.



Click 'Next' to start the EOLT.

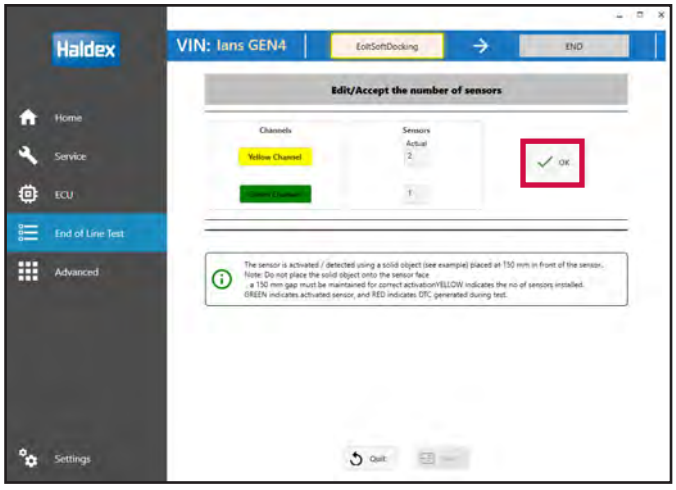


Check 'Actual Sensors' displayed value is correct.

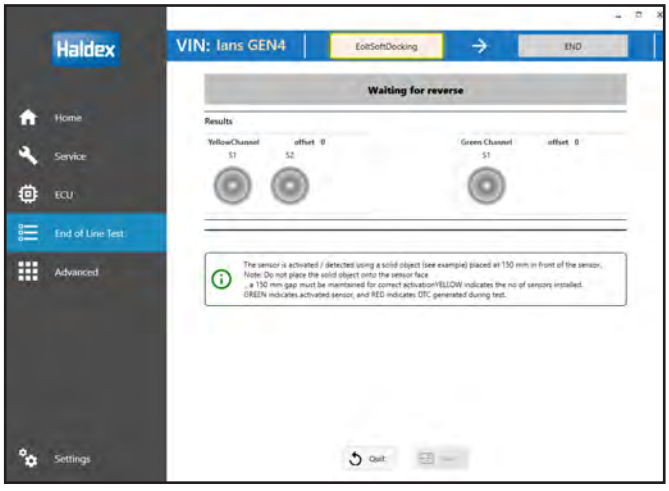


Note: Manually edit the sensor boxes for the correct values before proceeding with the EOLT.

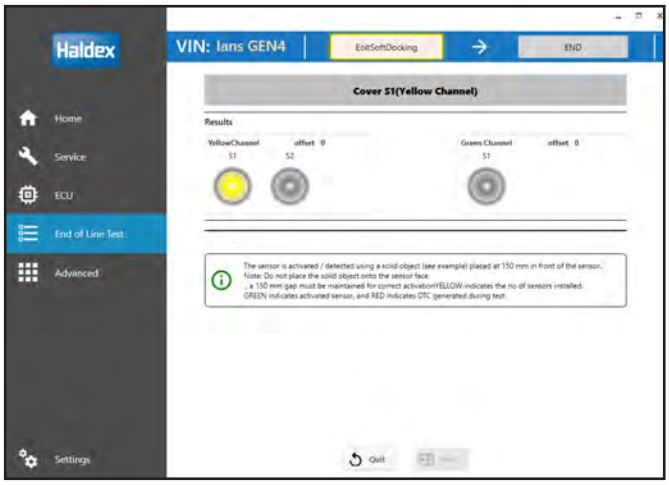
Select 'OK' button.



Select vehicle reverse gear.



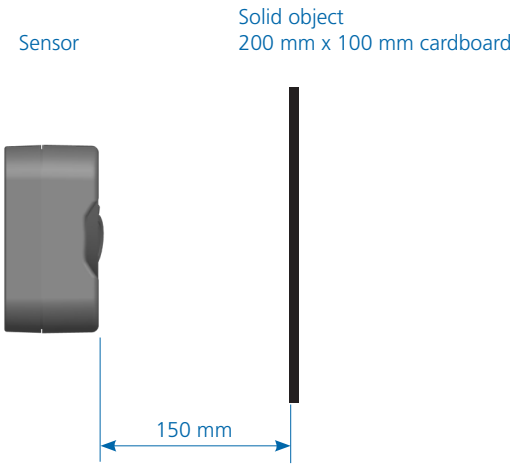
Activate the sensor on the yellow channel.



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.



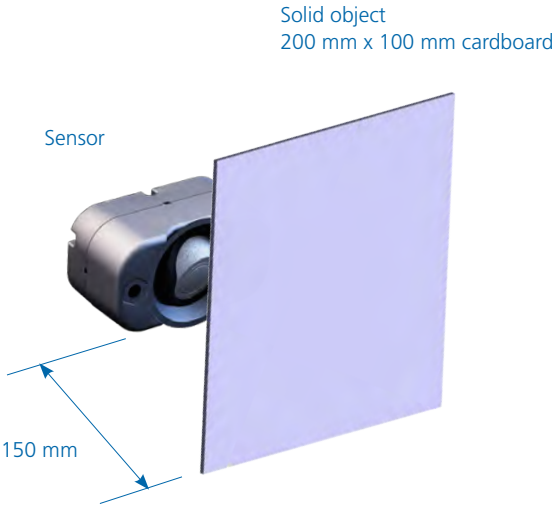
Solid object examples:

Rigid cardboard (200 mm x 100 mm)

Rigid metal sheet (200 mm x 100 mm)

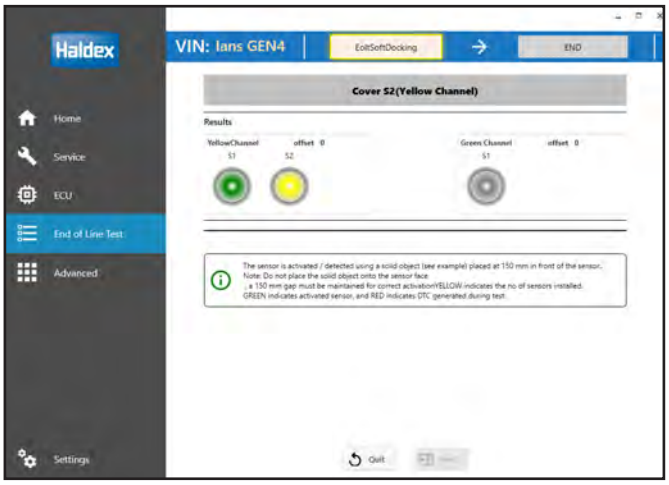
Test sequence:

- 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)



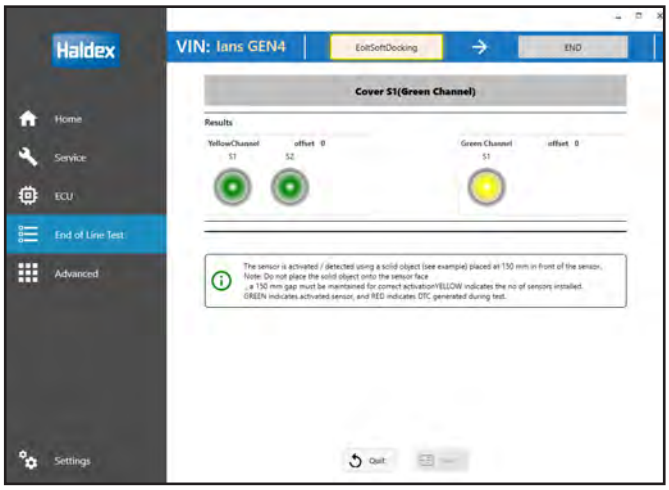
Sensor on the yellow channel has been detected (S1 box green).

Activate next sensor on the yellow channel.



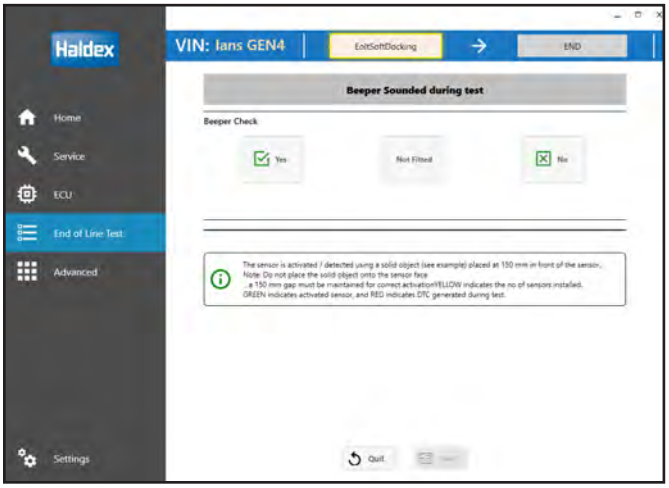
Sensor on yellow channel has been detected (S2 box green).

Activate the next sensor on the green channel.



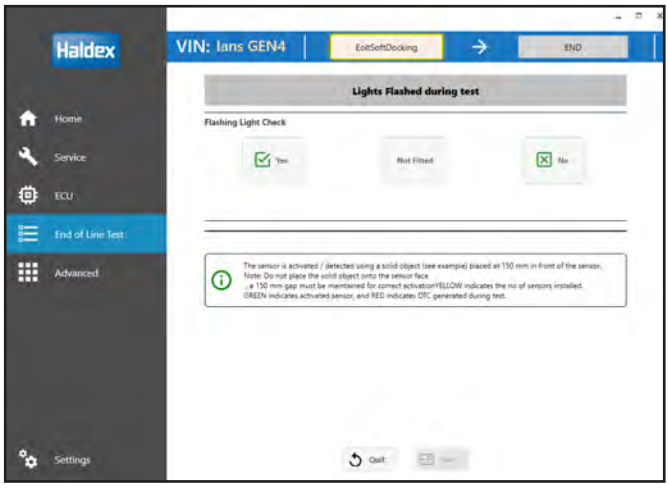
Beeper check

Select / click the correct button.

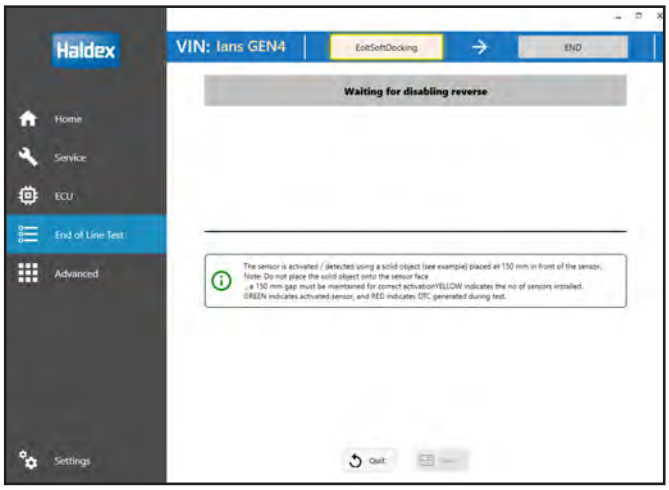


Flashing light check

Select / click correct button.

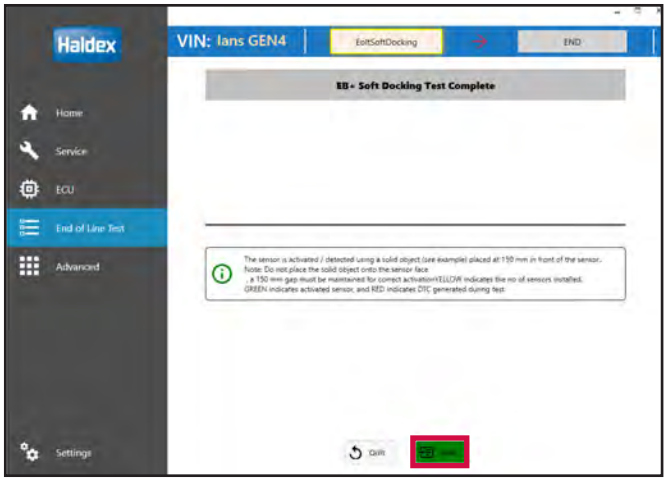


Disable vehicle reverse gear.



EOLT completed.

EOLT passed, click 'Next' 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.

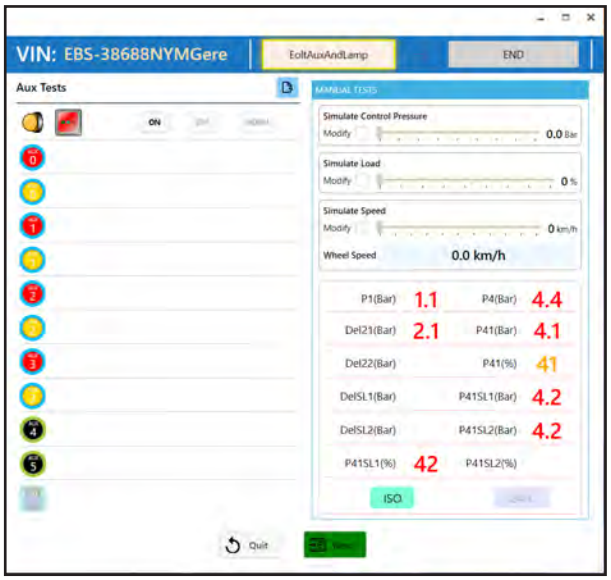
To switch to manual testing click on the 'on' button the 'off' and 'norm' buttons are highlighted, toggle between the 'on' and 'off'. The 'norm' resets to automatic mode.

Result section:

Yellow indicates test started.

Green indicates test passed.

Red indicates test failed.



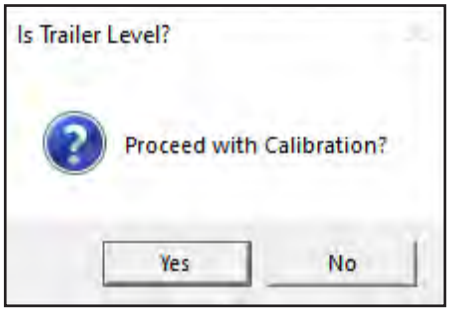
Lateral accelerometer

Note: Ensure that the trailer is on flat ground before calibrating the lateral accelerometer.

The dialog prompting for the lateral accelerometer calibration is displayed automatically.

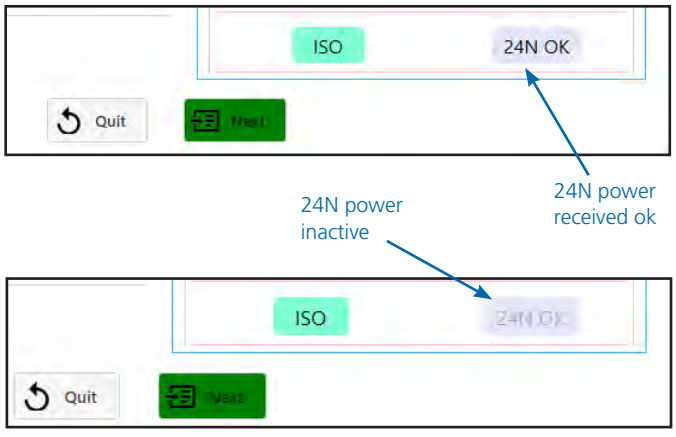
Click on the 'Yes' button to calibrate the accelerometer.

Click on the 'No' 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.

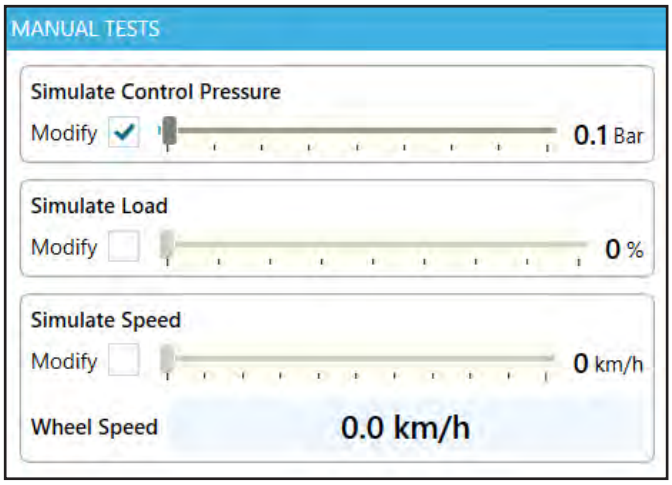


Additional auxiliary simulation tests

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:

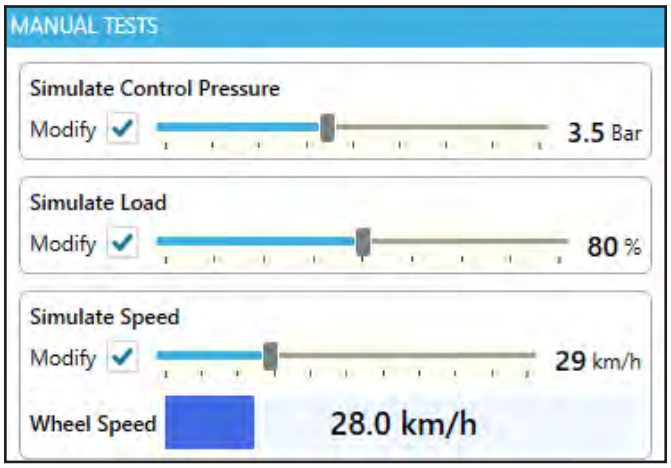
- Control pressure
- Load
- Speed



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 'Next' button or 'Quit' button to return to EOLT start screen.

System leak test

A trailer system leak test can be completed during the EOLT (EBS only).

The leak test pressurises the trailer pneumatic system between the EBS and the brake chambers, and looks for pressure decay in the reservoir.

What is tested:

- Service line connection to the brake chambers.
- Spring brake line connection to the brake chamber.

What is not tested:

- Supply / emergency line (red) from the trailer coupling head to the EBS.
- Control line (yellow) from the trailer coupling head to the EBS.

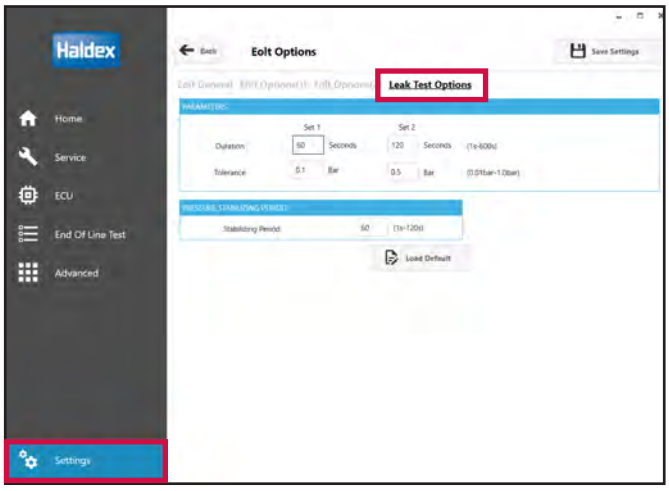
Steps

Before starting EOLT

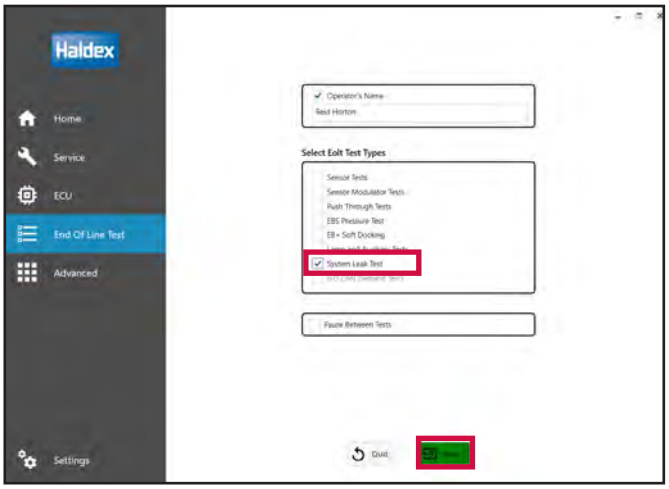
1. Click the 'Settings' button from the 'Home' page.
2. Click the 'Leak test options' tab.
3. Enter the required leak test parameters.

During EOLT

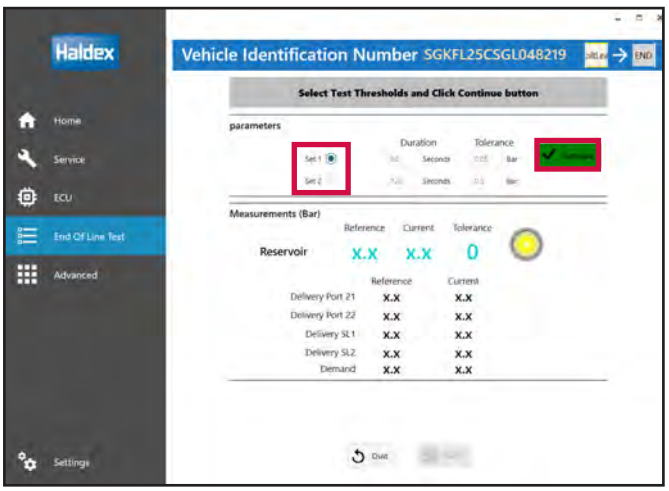
4. Ensure that the 'System Leak Test' box is ticked
5. Click the 'Next' button
6. Select 'Set 1' or 'Set 2'
7. Click the 'Continue' button to start the test.
8. Follow the on screen instructions.



Leak test options page - steps 1 to 3



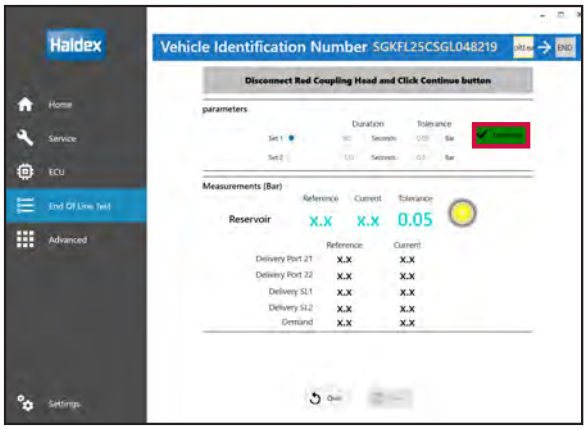
EOLT home page - steps 4 & 5



System leak test page - steps 6 to 8

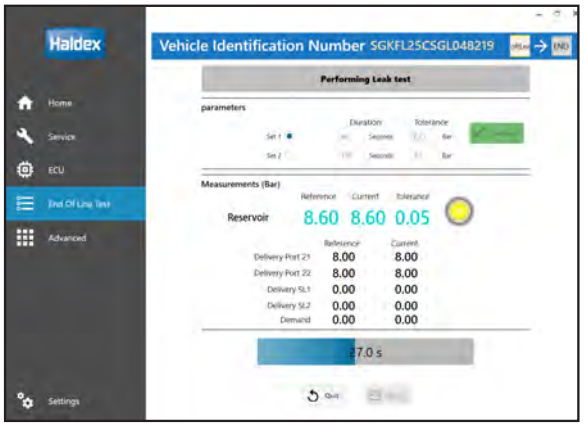
Disconnect red coupling head

Click 'Continue' button

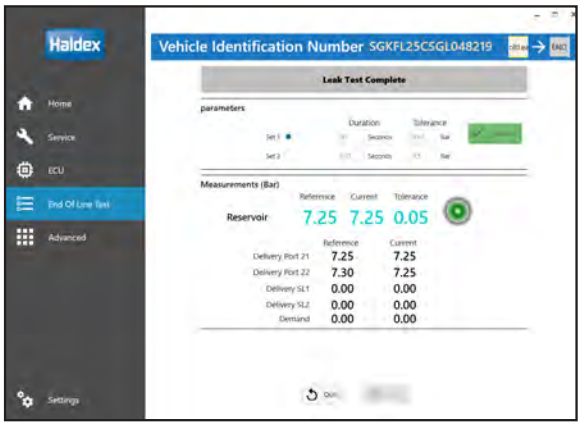


System stabilisation has started (Pre test pause).

Leak test has started.



Leak test has passed

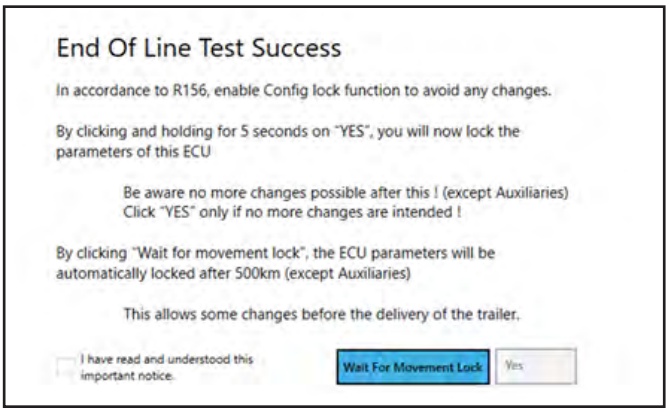


Configuration lock

The option to lock the configuration will be presented to the customer after the 'Manual' or 'Auto' EOLT has completed. This is the dialog that will be shown.

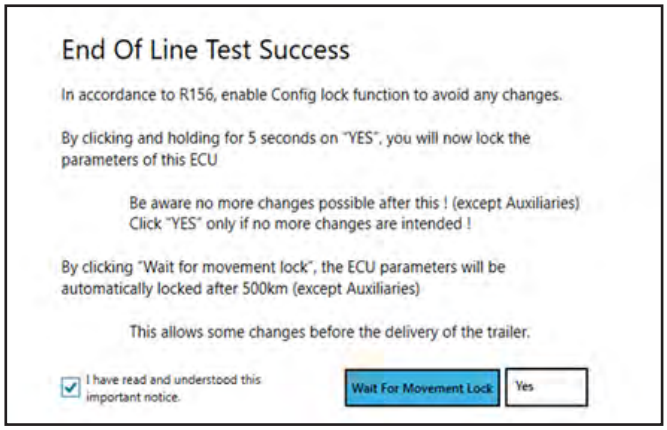
Note: The configuration will lock automatically once the odometer exceeds 500 Km.

If the customer wants to wait for the Movement Lock (i.e. when odometer reaches 500km) they should click the "Wait For Movement Lock" button to exit the configuration lock procedure.



If the customer wants to lock the configuration at this point they must tick the "I have read and understand this important notice" tick-box to indicate they have read the instructions written in this dialog.

Once this tick-box is ticked, the "Yes" button will be enabled. The customer should then click and hold "Yes" button for 5 seconds to proceed with locking the configuration.



When the configuration has been locked this dialog will be shown to indicate that the lock has been successful.

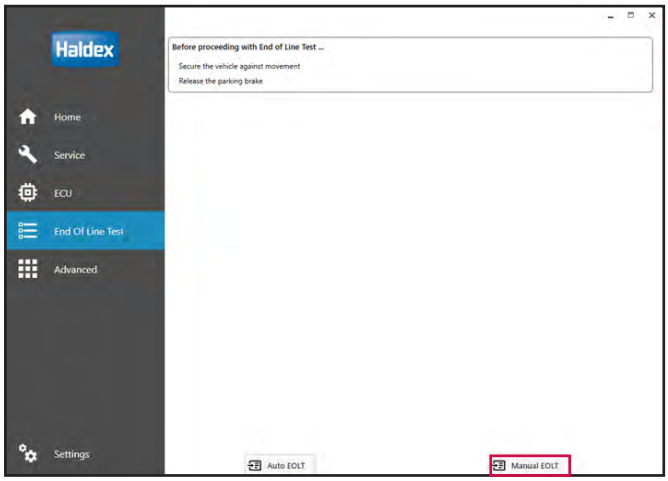
Press "OK" button to proceed.

End of line test (EOLT) - ABS 4.0

Starting manual EOLT

Click on the 'End of Line Test' button to enter the EOLT dialog.

Click 'Manual EOLT' button to commence manual EOLT



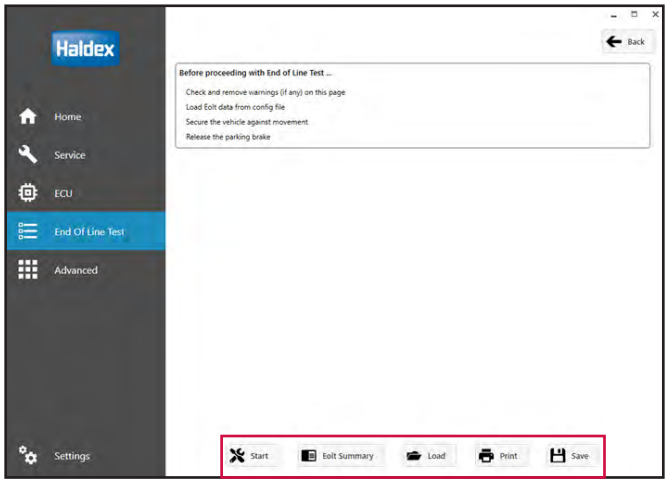
Click 'Start' button to start the manual EOLT.

Click 'EOLT summary' button to display EOLT summary.

An existing EOLT file can be opened (.eol) by clicking the 'Load' button ('View / Print' only).

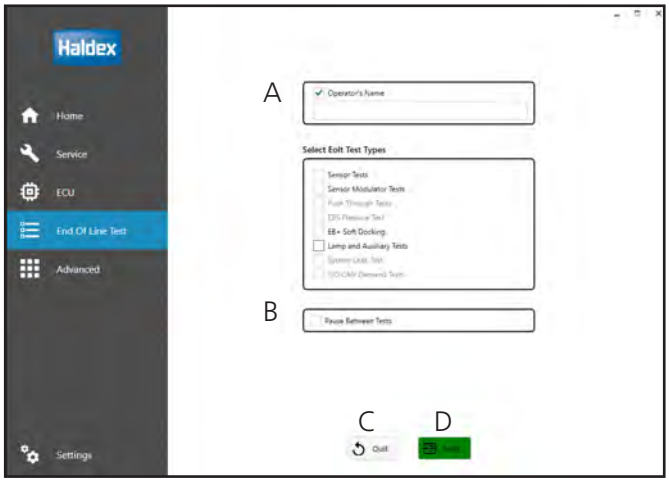
Press 'Print' button to print out EOLT results.

Press 'Save' button to save EOLT results to a file (.eol)



EOLT initialisation

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



A. 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.

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

C. Click on the 'Quit' button to return to return to the previous dialog.

D. Click on the 'Next' button to start the EOLT.

Note: For ABS 4.0 units, only the following tick-boxes will be active:

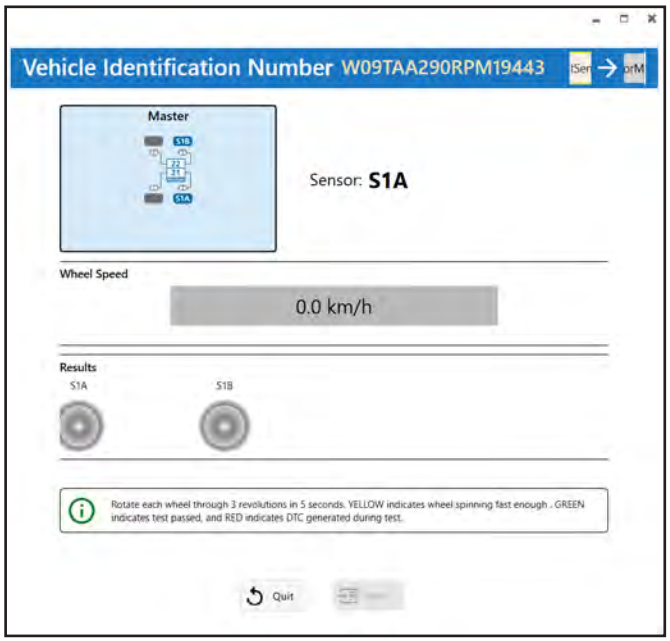
- Operator Name
- Sensor Tests
- Sensor Modulator
- Soft Docking
- Lamp and Auxiliary Tests
- Pause between Tests

Sensor tests

This full sensor test is optional, as the sensors will also be tested during the 'Sensor modulator tests'

Procedure:

- Foot brake 'off' (no pressure in the service line)
- Rotate each wheel through 3 revolutions in 5 secs
- The test sequence is S1A, S1B, S2A, S2B, SL1A, SL1B, SL2A, SL2B



Result section:

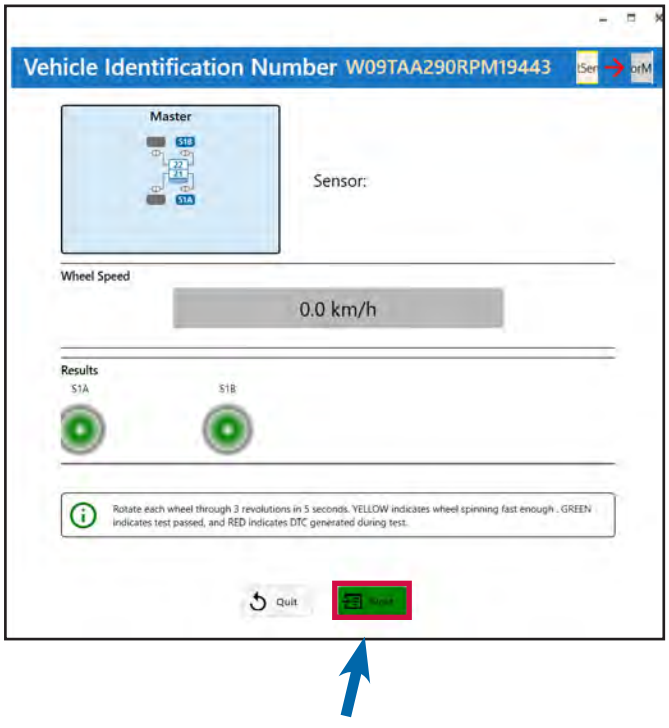
Yellow indicates wheel spinning fast enough.

Green indicates test passed.

Red indicates DTC generated during test.

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

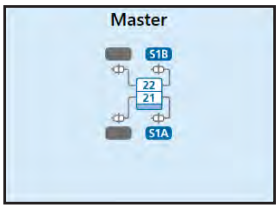
Next icon only becomes active when test has completed.



Sensor modulator tests

Procedure:

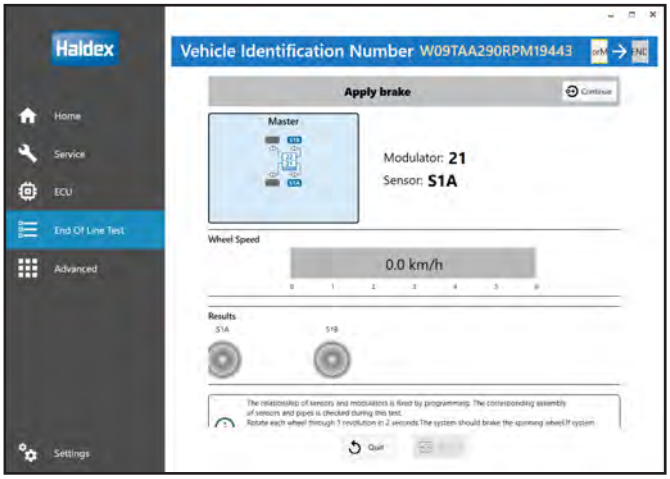
- Apply foot brake continuously (pressure in the service line)
- Rotate each wheel through 1 revolution in 2 seconds
- The test sequence is S1A, S1B, S2A, S2B etc
- The EOLT will release the wheel to be rotated. Rotate each wheel through 1 revolution in 2 seconds.
- The system will brake the spinning wheel.
-
- The test sequence is S1A, S1B, S2A, S2B etc



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

Result section:

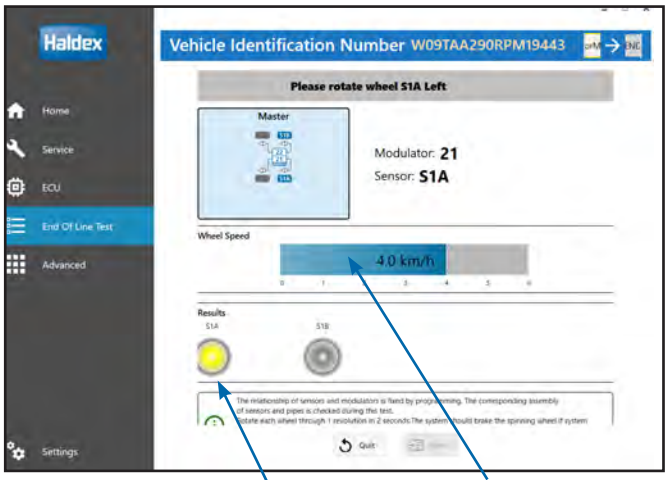
Yellow indicates wheel has moved.
Green indicates test passed.
Red indicates test failed.



Note: If previously entered, the vehicle ident number (VIN) will be displayed in the title bar of each test (e.g. VIN: W09TAA290RPM19443).

S1A test started

Manually rotate wheel S1A at 1 revolution in 2 seconds.

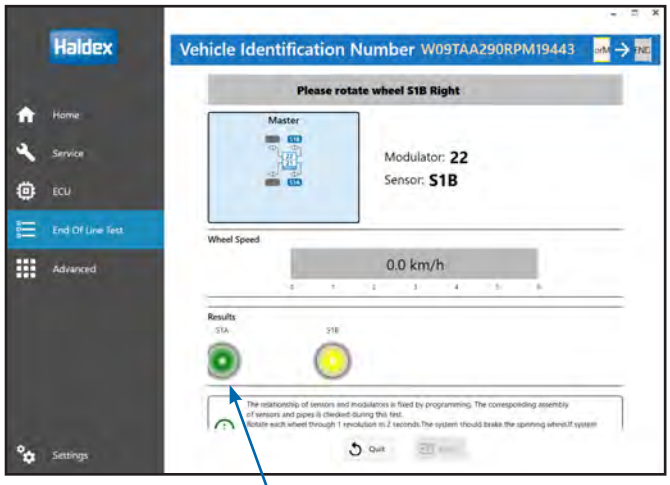


Moving wheel (yellow indication)

Wheel speed detected (moving blue bar)

S1A test passed

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



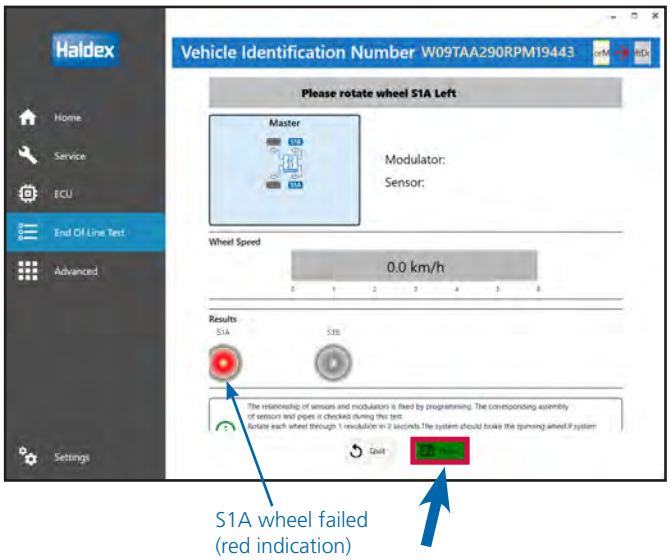
Correct wheel braked (green indication)

Failed test

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

- Correct testing sequence
- Rotating the wrong wheel
- Incorrect wiring
- Incorrect piping

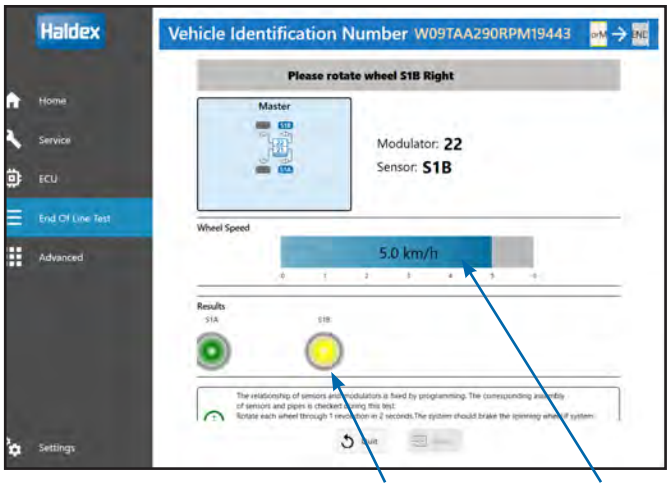
Click 'Next' to exit the test



S1A wheel failed (red indication)

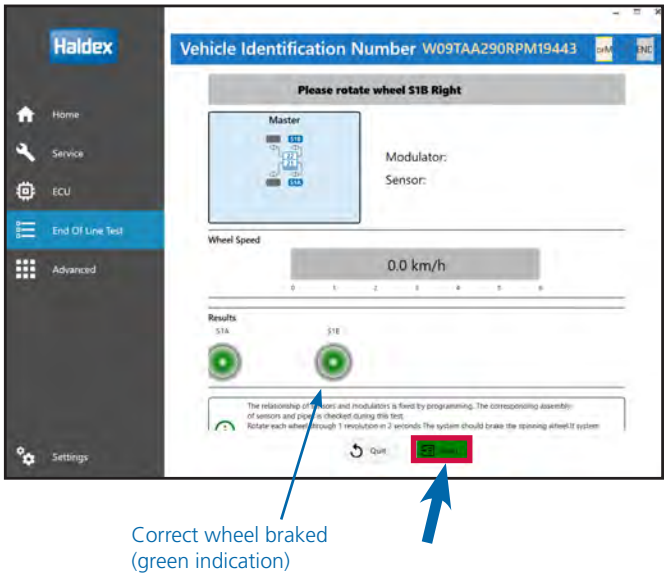
S1B test started

Manually rotate wheel S1B at 1 revolution in 2 seconds.



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.



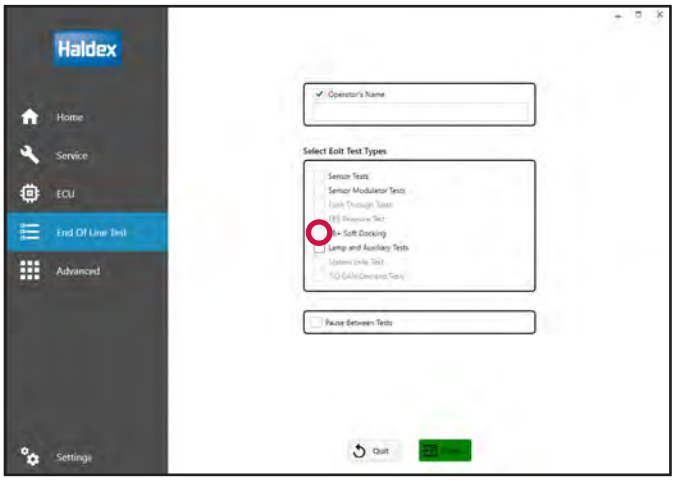
Repeat the 'Sensor modular test' for all the programmed ECU sensors.

Next icon only becomes active when test has completed.

EB+ Soft Docking

How to complete EB+ Soft Docking EOLT using DIAG++ for a 2 sensor (1 x yellow & 1 x green) system

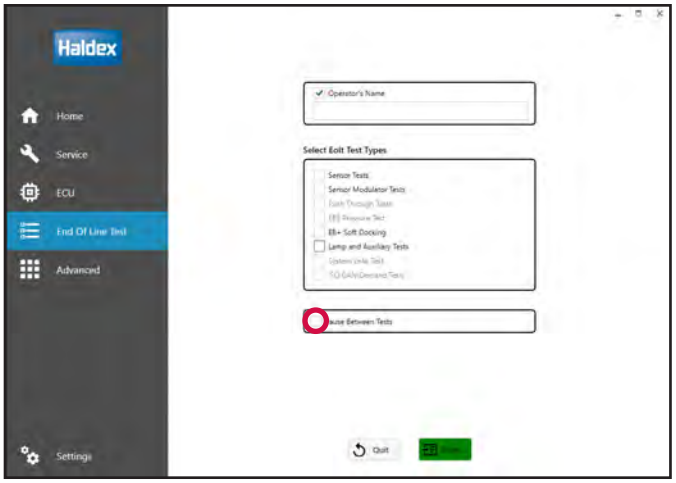
Tick the EB+ Soft Docking box.



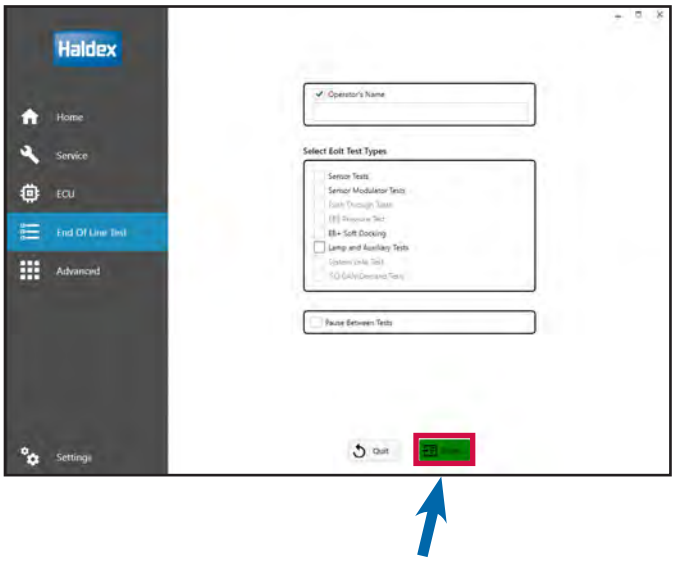
EOLT option:

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

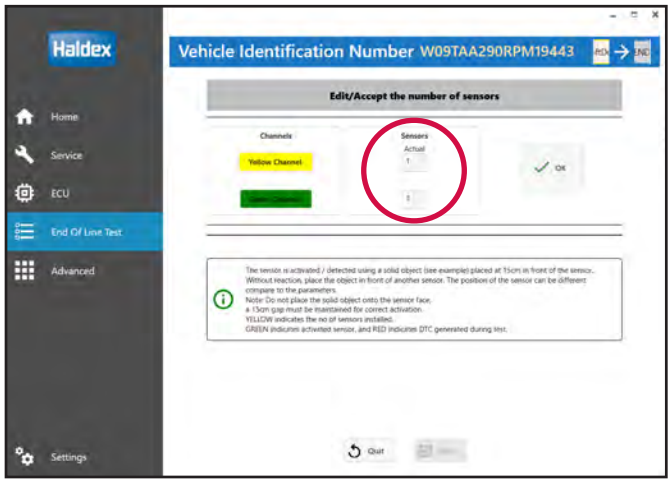
When ticked the EOLT waits for a prompt from the operator before proceeding to the next test.



Click 'Next' to start the EOLT.

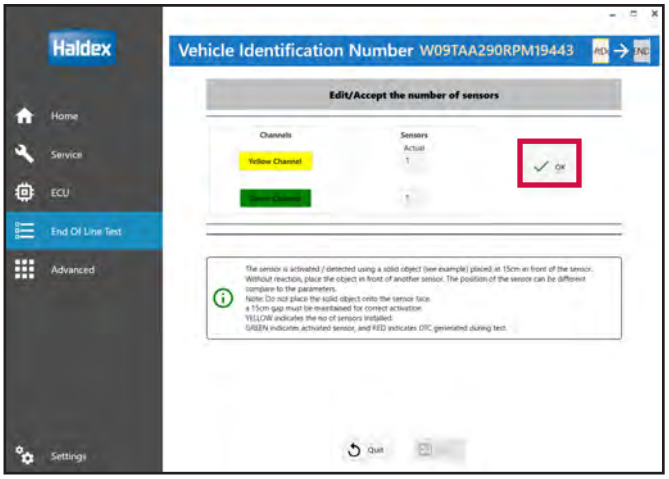


Check 'Actual Sensors' displayed value is correct.

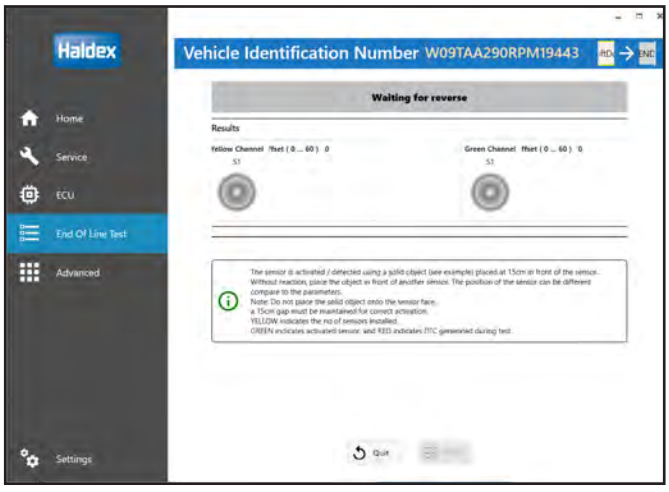


Note: Manually edit the sensor boxes for the correct values before proceeding with the EOLT.

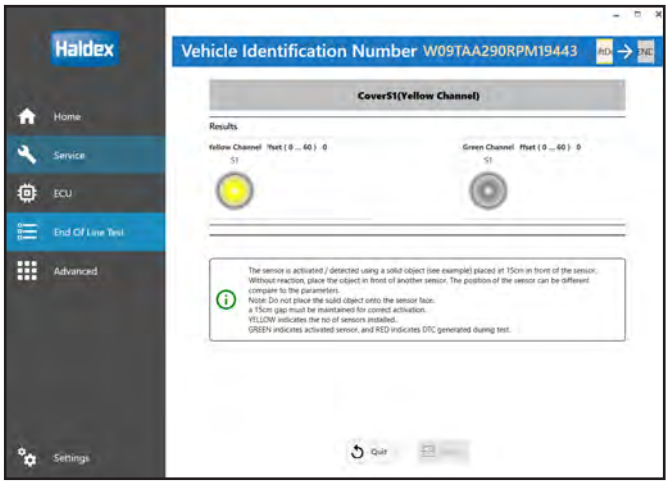
Select 'OK' button.



Select vehicle reverse gear.



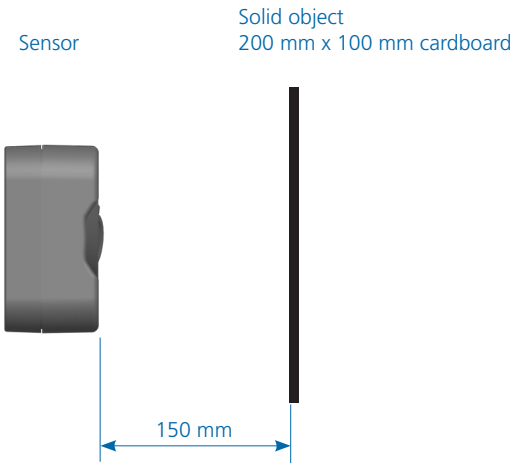
Activate the sensor on the yellow channel.



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.



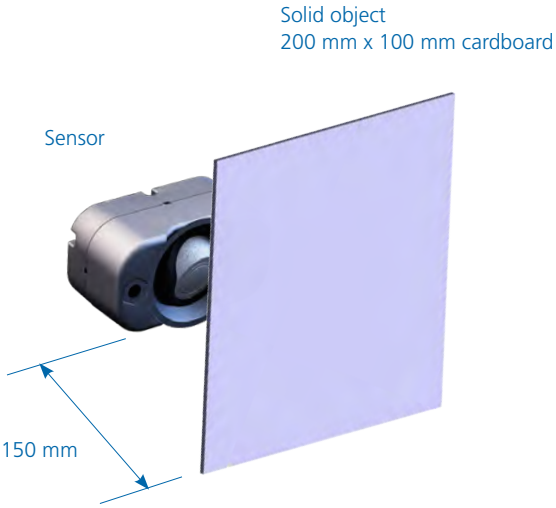
Solid object examples:

Rigid cardboard (200 mm x 100 mm)

Rigid metal sheet (200 mm x 100 mm)

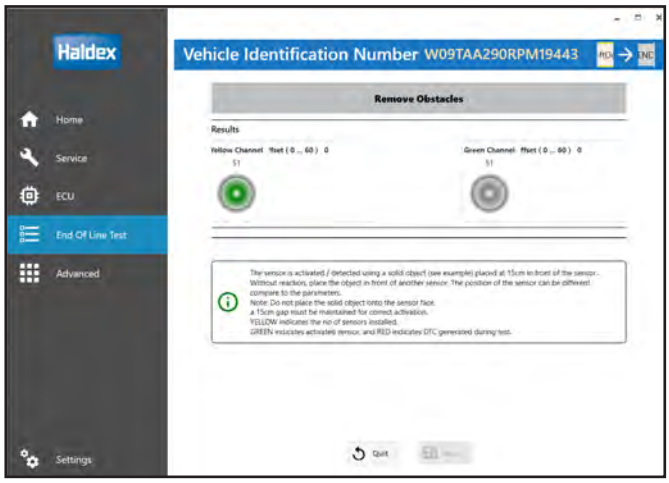
Test sequence:

- 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)

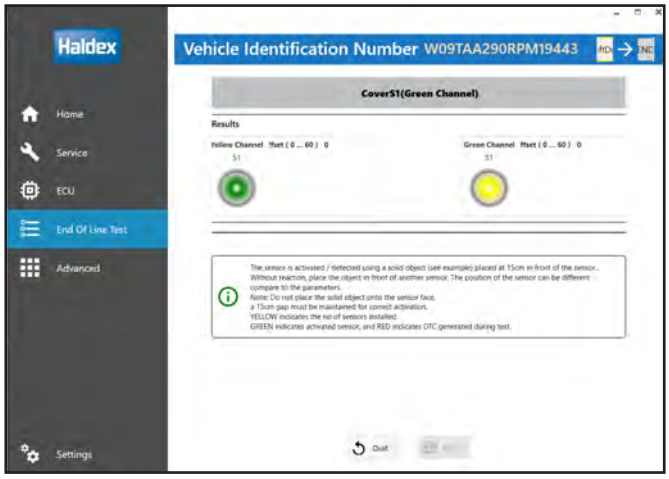


Sensor on the yellow channel has been detected (S1 box green).

Repeat until all yellow channel sensors have been activated.



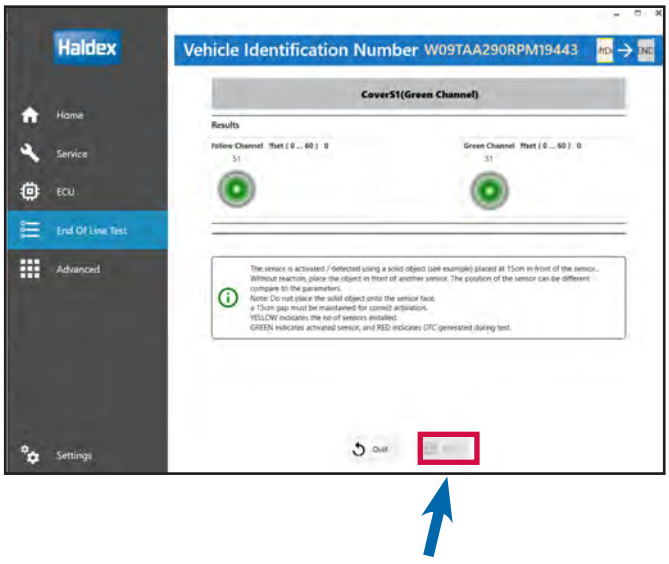
Activate the sensor on the green channel.



Sensor on green channel has been detected (S1 box green).

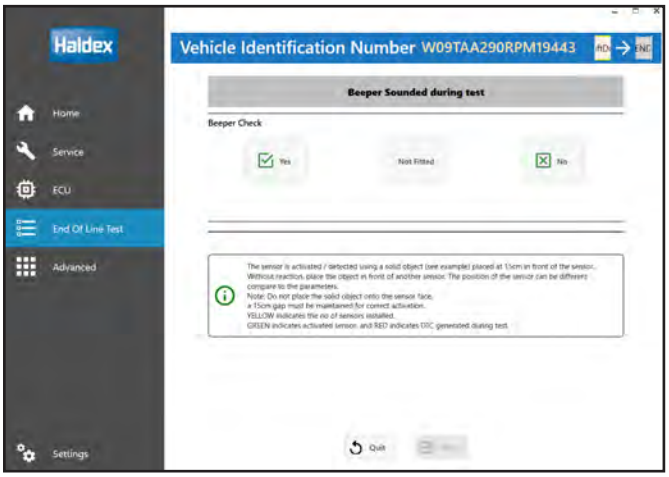
Repeat until all green channel sensors have been activated.

Click 'Next' to continue onto 'Bleeper' test.



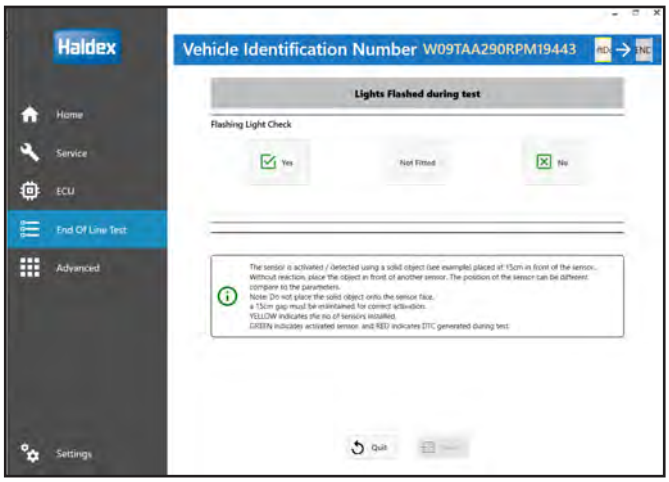
Beeper check

Select / click the correct button (Yes, Not Fitted or No).

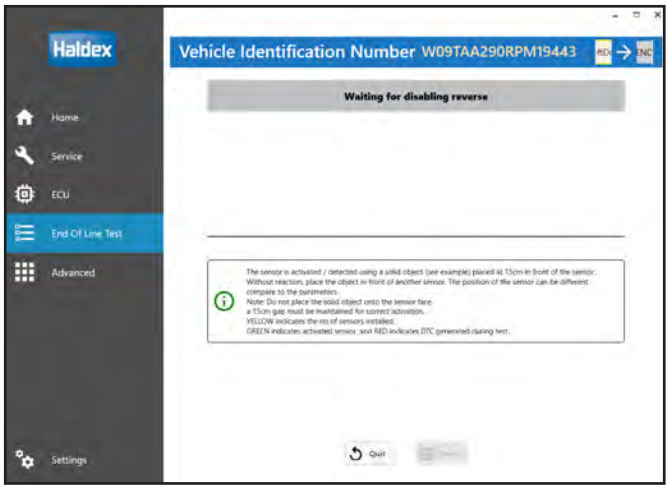


Flashing light check

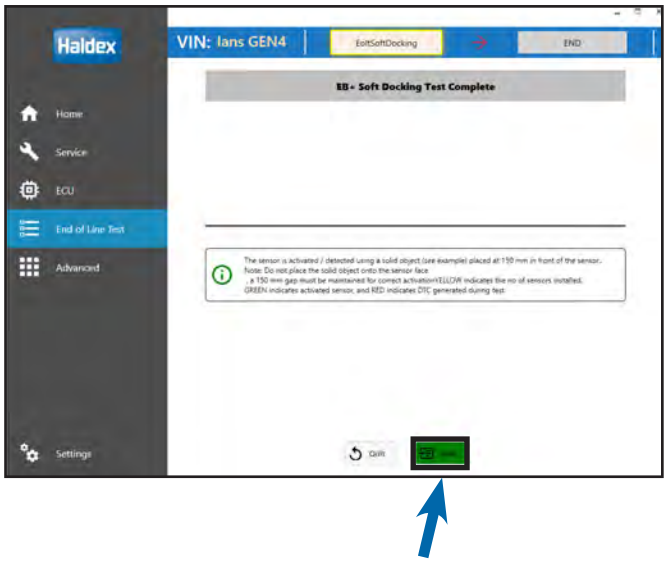
Select / click correct button (Yes, Not Fitted or No).



Disable vehicle reverse gear.



EOLT completed.



EOLT passed, click 'Next' 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.

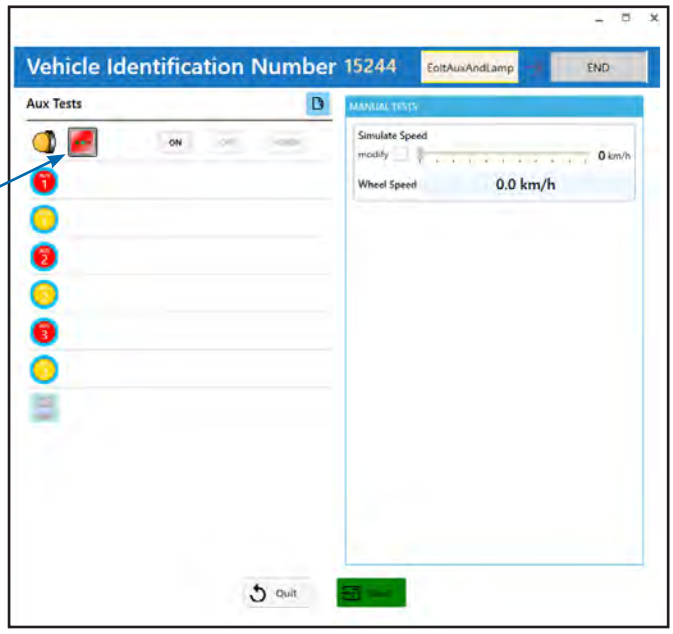
Red indicates test failed.

ABS 4.0 Auxiliary configurations

Auxiliary	ABS 4.0 Basic	ABS 4.0 Premium	ABS 4.0 with RoC
AUX0 Red	Not available	Not available	Not available
AUX0 Yellow	Not available	Not available	Not available
AUX1 Red	Available	Available	Available
AUX1 Yellow	Available	Available	Available
AUX2 Red	Not available	Available	Available
AUX2 Yellow	Not available	Available	Available
AUX3 Red	Not available	Available	Available
AUX3 Yellow	Not available	Available	Available
AUX4	Not available	Not available	Not available
AUX5	Not available	Not available	Not available
Internal Accelerometer	Not available	Not available	Available
Speed slider	Available	Available	Available
Load slider	Not available	Not available	Not available
Control pressure slider	Not available	Not available	Not available
Pressure values displayed	Not available	Not available	Only P4 & P41

Example:

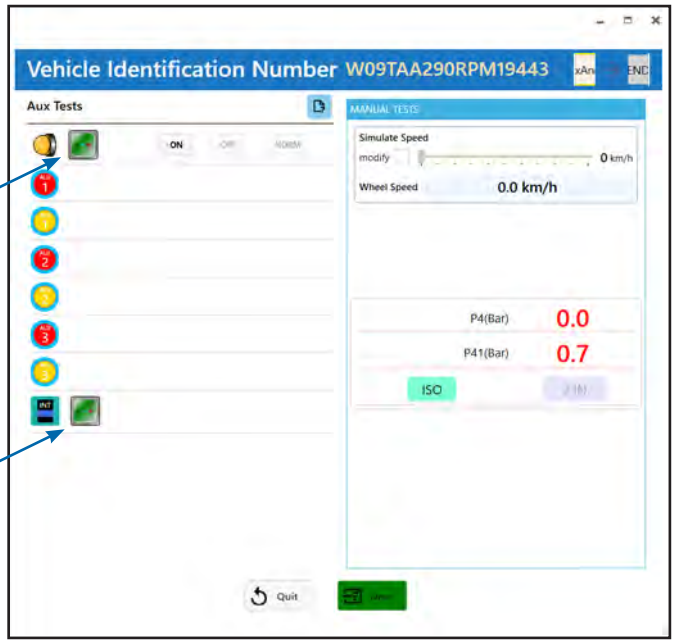
ABS 4.0 without roll-over control (RoC)



Auxiliary page - ABS 4.0 without roll-over control (RoC)

Example:

ABS 4.0 with roll-over control (RoC)



Auxiliary page - ABS 4.0 with roll-over control (RoC)

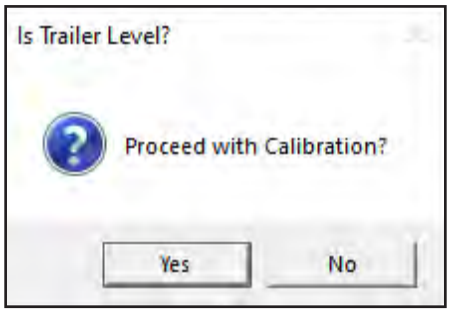
Lateral accelerometer

For ABS 4.0 units, only the roll-over control version includes an accelerometer.

For the Basic and Premium versions an accelerometer is not included so this test will not be offered.

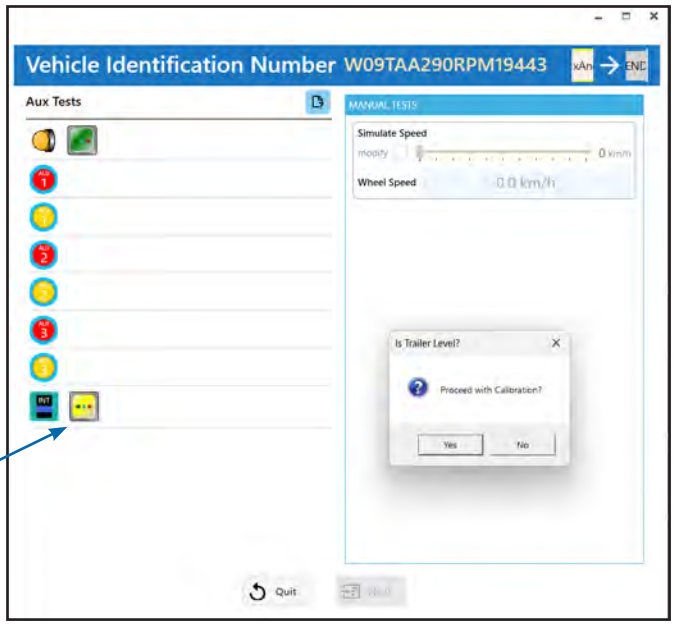
Note: Ensure that the trailer is on flat ground before calibrating the lateral accelerometer.

The dialog prompting for the lateral accelerometer calibration is displayed automatically.



Click on the 'Yes' button to calibrate the accelerometer.

Click on the 'No' button to exit without calibrating the accelerometer.

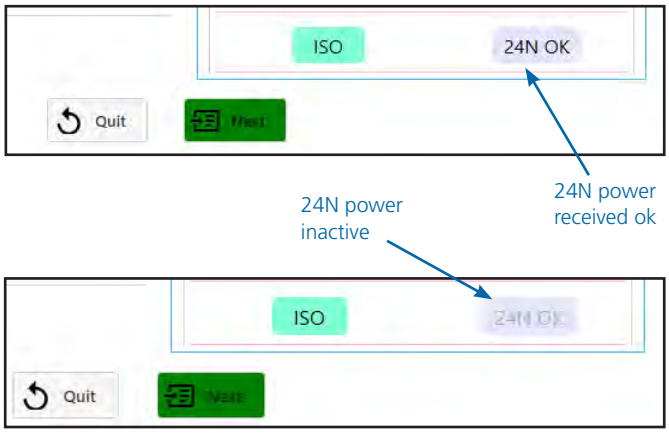


Lateral accelerometer test - in progress

Auxiliary page - ABS 4.0 with roll-over control (RoC)

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.

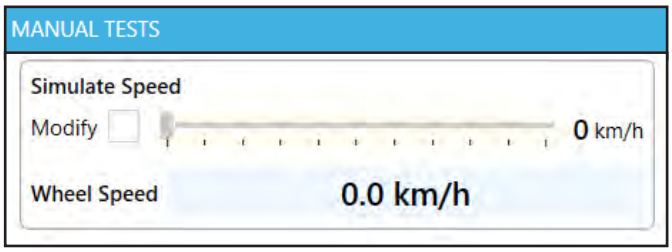


Additional auxiliary simulation tests

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 ABS parameters can be adjusted to activate the auxiliary options.

The following parameters can be adjusted:

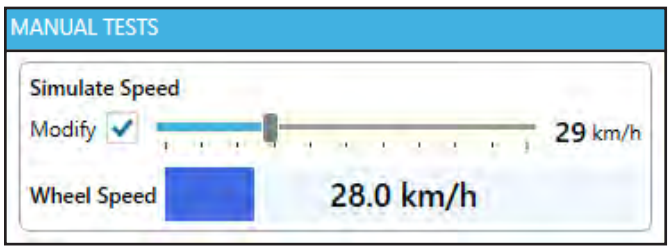
› Speed



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

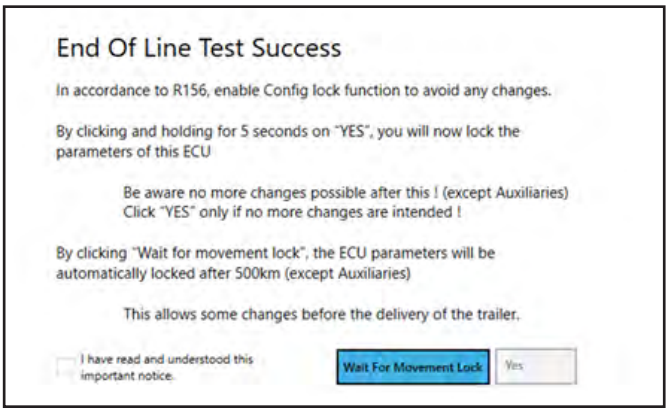
On completion of the EOLT click on the 'Next' button or 'Quit' button to return to EOLT start screen.

Configuration lock

The option to lock the configuration will be presented to the customer after the 'Manual' or 'Auto' EOLT has completed. This is the dialog that will be shown.

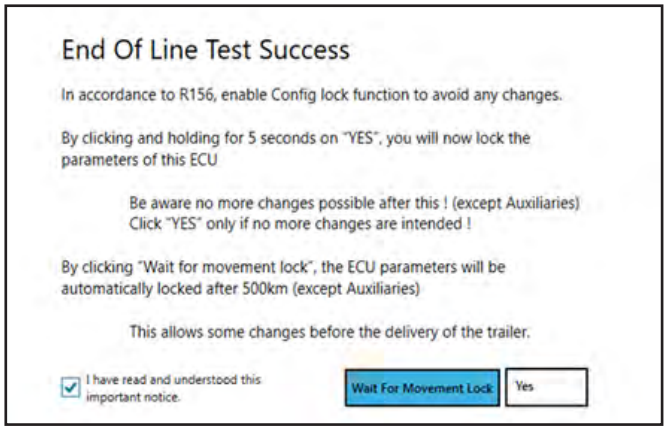
Note: The configuration will lock automatically once the odometer exceeds 500 Km.

If the customer wants to wait for the Movement Lock (i.e. when odometer reaches 500km) they should click the "Wait For Movement Lock" button to exit the configuration lock procedure.



If the customer wants to lock the configuration at this point they must tick the "I have read and understand this important notice" tick-box to indicate they have read the instructions written in this dialog.

Once this tick-box is ticked, the "Yes" button will be enabled. The customer should then click and hold "Yes" button for 5 seconds to proceed with locking the configuration.



When the configuration has been locked this dialog will be shown to indicate that the lock has been successful.

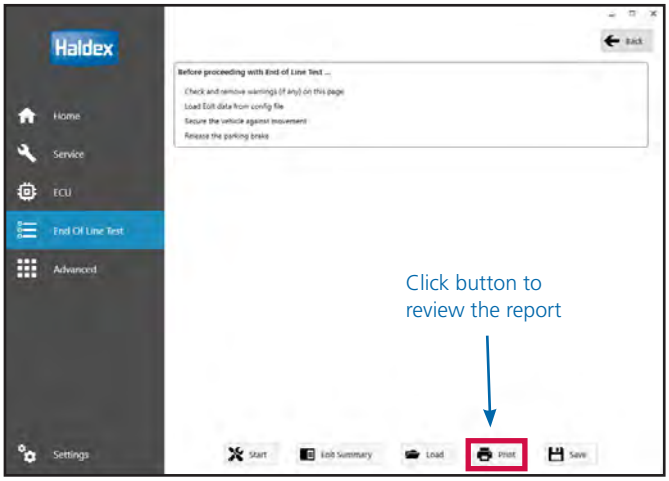
Press "OK" button to proceed.

EOLT - EBS & ABS report printing

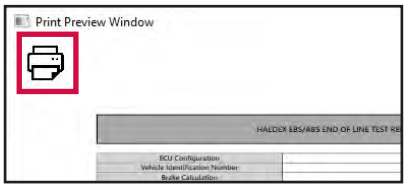
The end of line test report can be viewed by selecting the 'Print' button.

If required the report can then be printed.

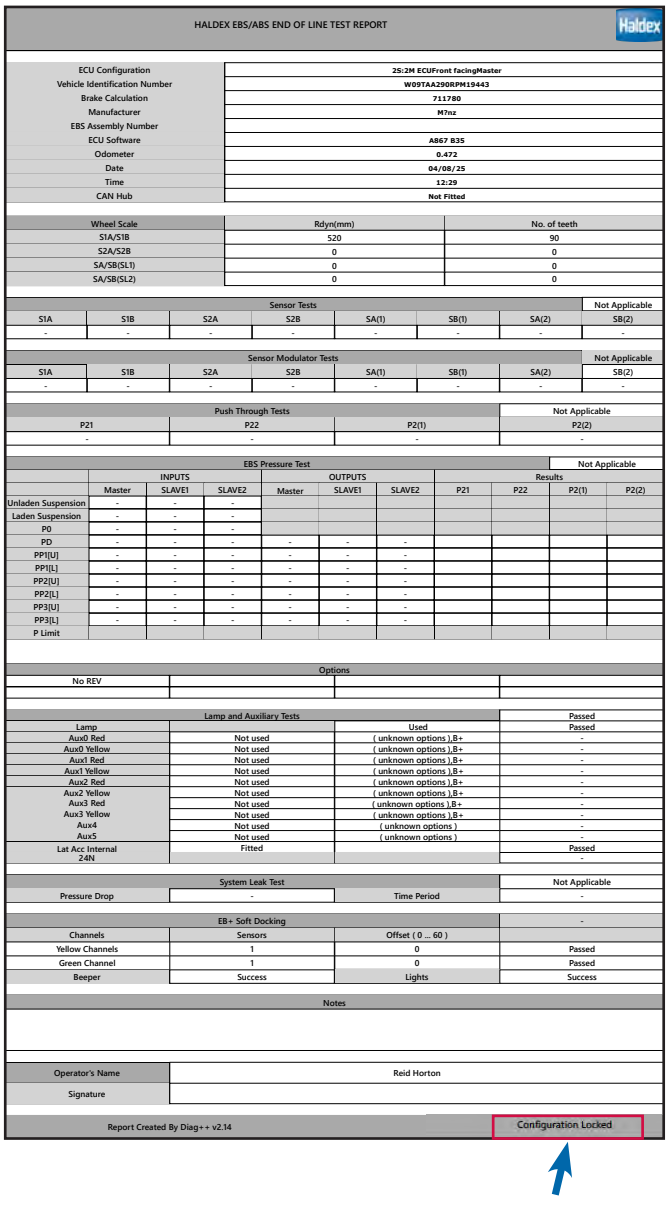
Note: EBS and ABS EOLT generate different report templates.



Click the 'Printer' icon to print the report.



Example - End of line test report.



HALDEX EBS/ABS END OF LINE TEST REPORT

ECU Configuration	2S:2M ECUFront facingMaster
Vehicle Identification Number	W09TAA290RPM19443
Brake Calculation	711780
Manufacturer	M7nz
EBS Assembly Number	
ECU Software	A867 835
Odometer	0.472
Date	04/08/25
Time	12:29
CAN Hub	Not Fitted

Wheel Scale	Rdyn(mm)	No. of teeth
S1A/S1B	520	90
S2A/S2B	0	0
SA/SB(SL1)	0	0
SA/SB(SL2)	0	0

Sensor Tests							Not Applicable
S1A	S1B	S2A	S2B	SA(1)	SB(1)	SA(2)	SB(2)
-	-	-	-	-	-	-	-

Sensor Modulator Tests							Not Applicable
S1A	S1B	S2A	S2B	SA(1)	SB(1)	SA(2)	SB(2)
-	-	-	-	-	-	-	-

Push Through Tests			Not Applicable
P21	P22	P2(1)	P2(2)
-	-	-	-

EBS Pressure Test — Not Applicable

	INPUTS			OUTPUTS			Results			
	Master	SLAVE1	SLAVE2	Master	SLAVE1	SLAVE2	P21	P22	P2(1)	P2(2)
Unladen Suspension	-	-	-							
Laden Suspension	-	-	-							
P0	-	-	-							
PD	-	-	-	-	-	-				
PP1[U]	-	-	-	-	-	-				
PP1[L]	-	-	-	-	-	-				
PP2[U]	-	-	-	-	-	-				
PP2[L]	-	-	-	-	-	-				
PP3[U]	-	-	-	-	-	-				
PP3[L]	-	-	-	-	-	-				
P Limit										

Options			
No REV			

Lamp and Auxiliary Tests			Passed
Lamp		Used	Passed
Aux0 Red	Not used	(unknown options),B+	-
Aux0 Yellow	Not used	(unknown options),B+	-
Aux1 Red	Not used	(unknown options),B+	-
Aux1 Yellow	Not used	(unknown options),B+	-
Aux2 Red	Not used	(unknown options),B+	-
Aux2 Yellow	Not used	(unknown options),B+	-
Aux3 Red	Not used	(unknown options),B+	-
Aux3 Yellow	Not used	(unknown options),B+	-
Aux4	Not used	(unknown options)	-
Aux5	Not used	(unknown options)	-
Lat Acc Internal 24N	Fitted		Passed
			-

System Leak Test			Not Applicable
Pressure Drop	-	Time Period	-

EB+ Soft Docking			-
Channels	Sensors	Offset (0 ... 60)	
Yellow Channels	1	0	Passed
Green Channel	1	0	Passed
Beeper	Success	Lights	Success

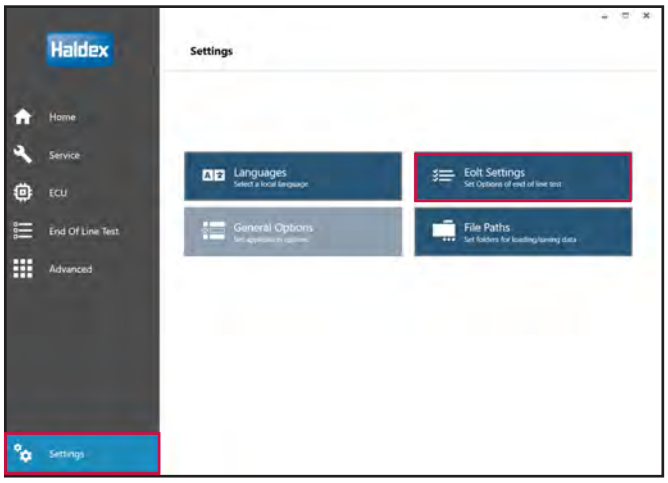
Notes	
Operator's Name	Reid Horton
Signature	
Report Created By Diag++ v2.14	Configuration Locked

Note: If the configuration is locked, this will be shown on the EOLT report.

EOLT - TPMS 2.0 Config Printing

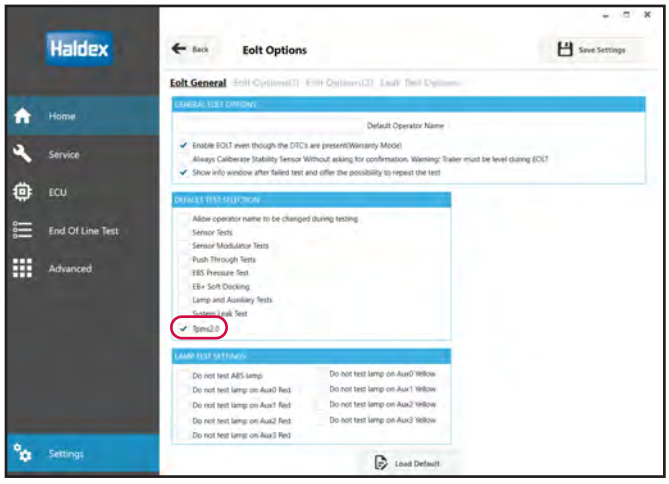
If required, the TPMS 2.0 configuration can be printed.

Click on 'Settings' button.



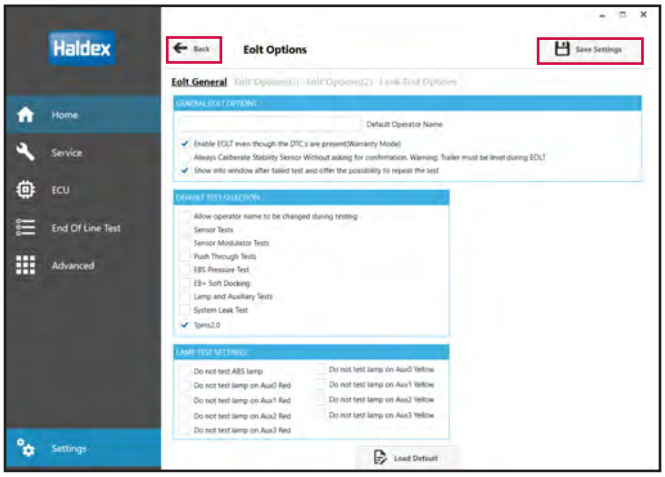
Click on 'EOLT Settings' button.

Ensure that the TPMS 2.0 box is ticked



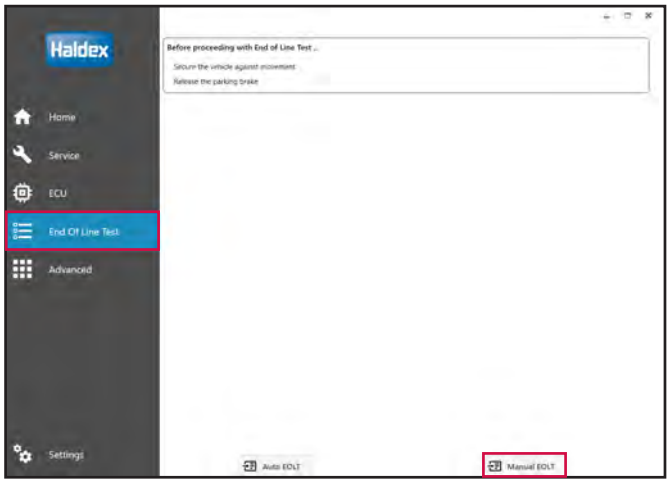
Click on 'Save Settings' button.

Click on 'Back' button.



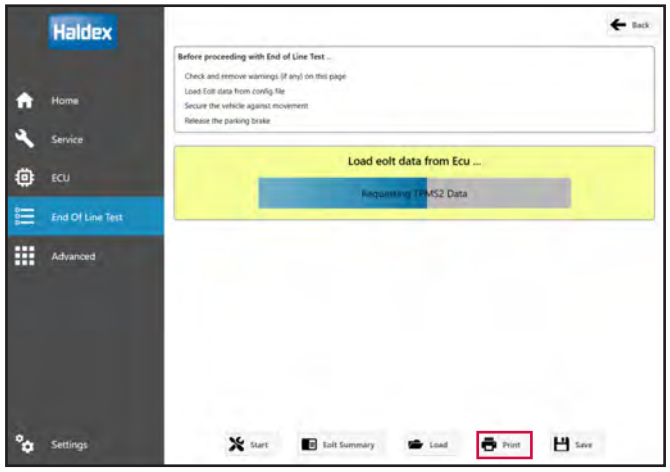
Click on 'End Of Line Test' button

Click on 'Manual EOLT'



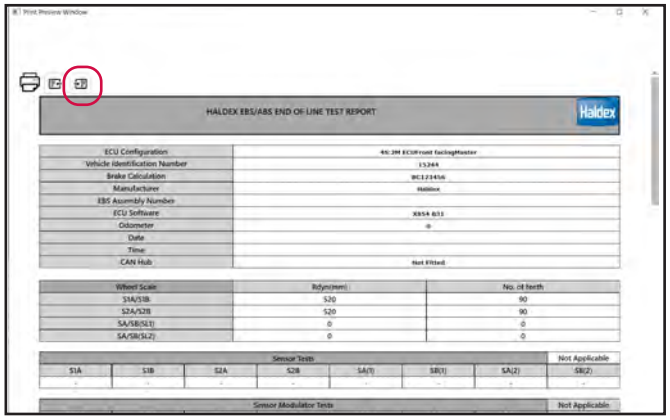
Screen now shows 'Load EOLT data from ECU'

Click on 'Print' button



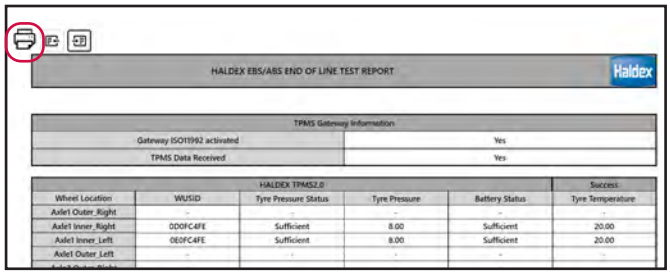
The Haldex EBS / ABS End Of Line Test report will now load.

Click on the 'Go to TPMS data' button



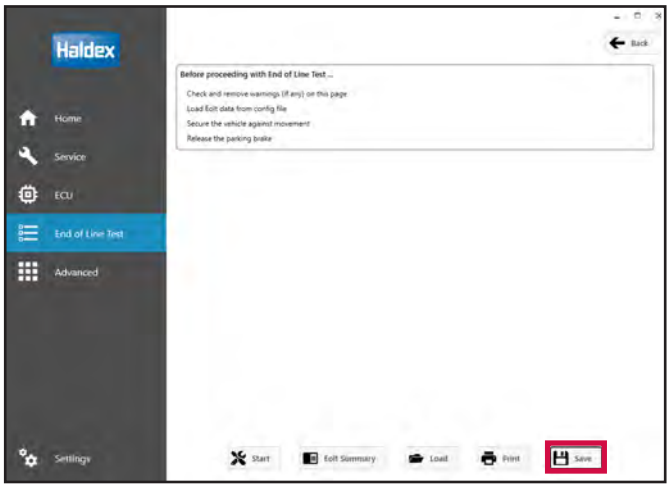
The TPMS Gateway information is now available.

Click 'Print the document' icon to print the EOLT report.



EOLT - Saving the report

Click on the 'Save' button to save a report.



The default naming convention for the report file is:
<trailer VIN>__.eol
(but this can be changed by the user if desired).

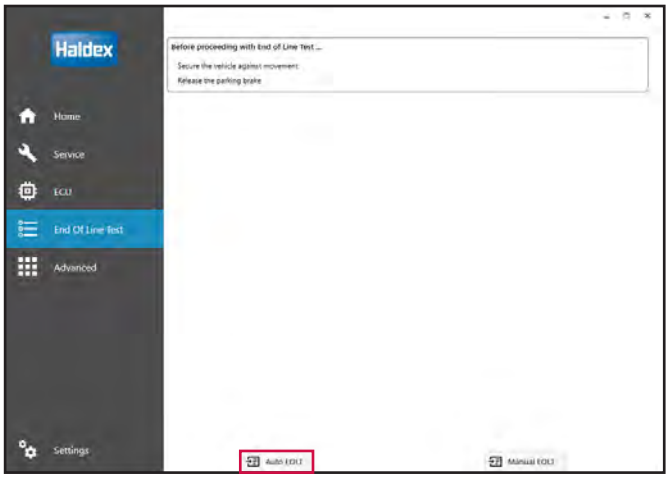
The default directory for storing the file is:
C:\Users\Public\Documents\Haldex\Diag++\EOL Reports (but this can be changed by the user if desired).

When the 'Save' button is clicked a Windows Explorer dialog is thrown up (not shown here) to aid storage of the report.

Note: The EOLT report can only be viewed using DIAG++ .

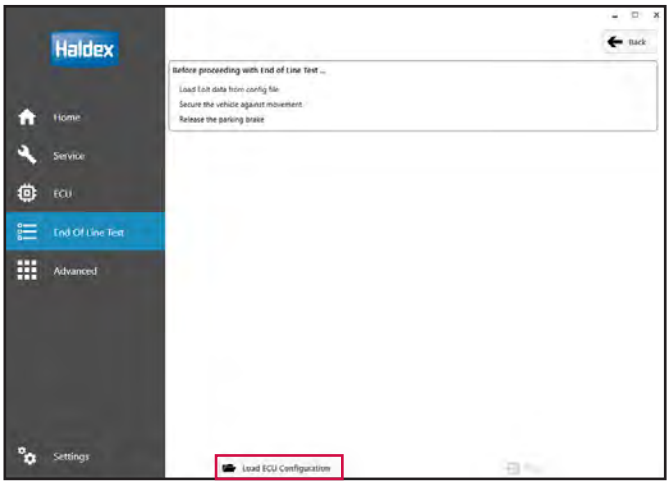
Automated End of Line Test (OEM recommended only)

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



From End of Line Test dialog click 'Auto EOLT' button to start Auto EOLT.

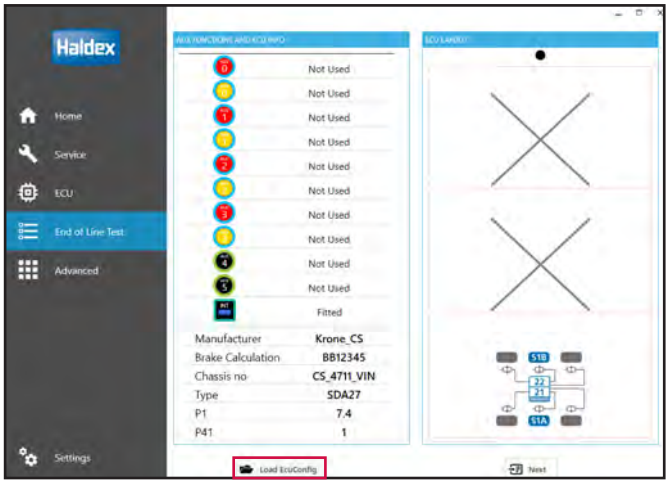
Click 'Load EcuConfig' button to load the configuration file (.dppf) to be used.



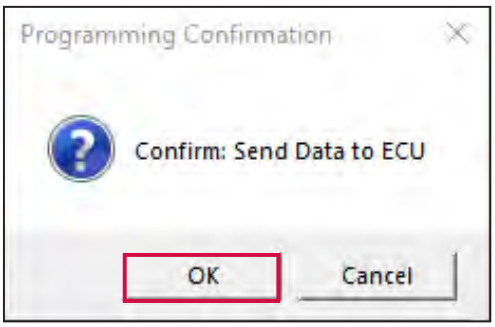
If displayed configuration is correct click 'Next' button to proceed.

Note: live reservoir and suspension pressures are displayed and this will also include slave suspension pressures (P41-1, P41-2) for 3M / 4M configurations.

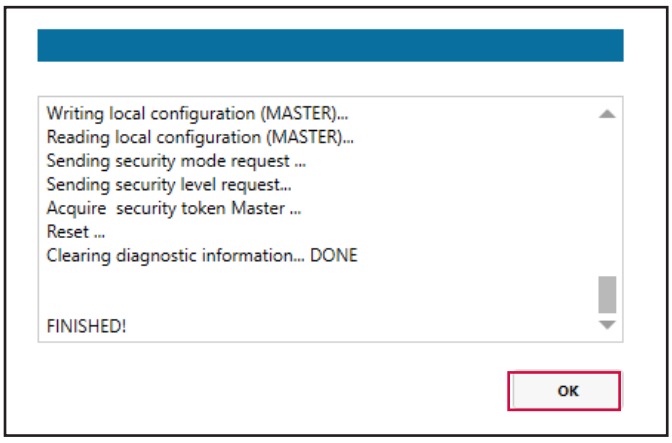
Note: if configuration shown is incorrect click 'LoadEcuConfig' button again to choose a different configuration file.



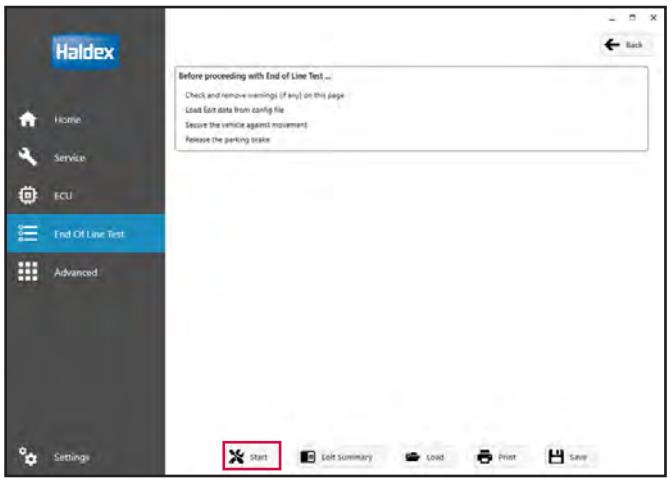
When 'Next' button is clicked a confirmational dialog is thrown up – click 'OK' to proceed with programming the ECU with this configuration.



Click 'OK' button when program of ECU has finished.



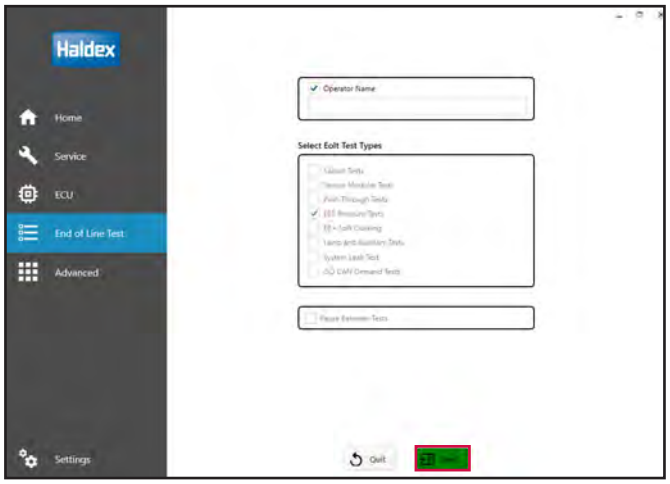
Click 'Start' button to proceed.



"Operator Name" text box can be amended if required.

Tick box settings cannot be changed (read from EOLT Settings)

Click 'Next' button to proceed with the actual EOLT.

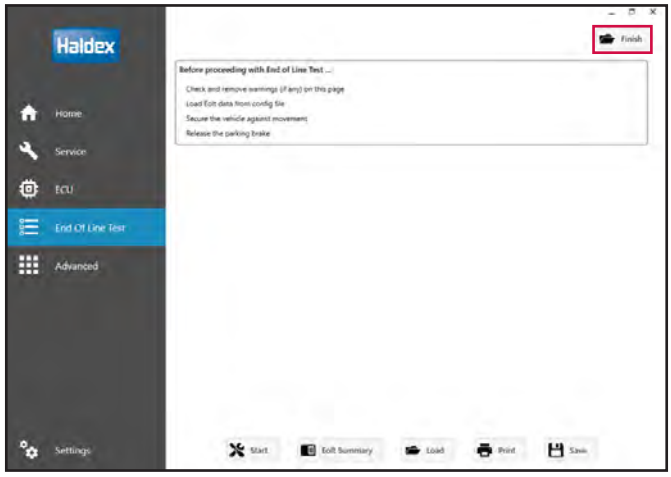


When the EOLT has finished a Windows Explorer dialog is thrown up (not shown here) for navigation to where the EOLT results (.eol file) are to be stored.

Note: for Auto EOLT the option is always given to store the results as a .eol file.

This dialog should then be displayed and this gives the user the option to view an EOLT summary or print EOLT results.

Click 'Finish' button to end Auto EOLT.

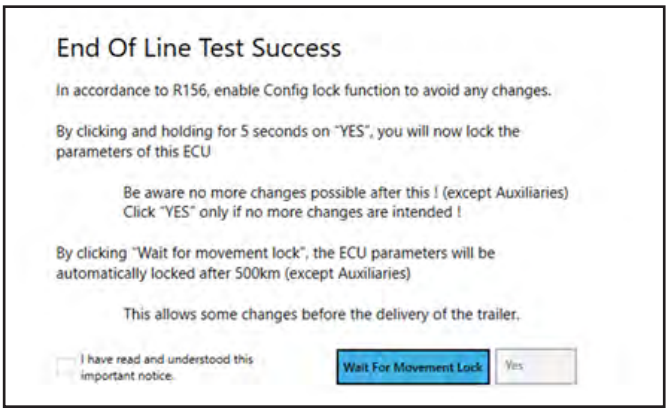


Configuration lock

The option to lock the configuration will be presented to the customer after the 'Manual' or 'Auto' EOLT has completed. This is the dialog that will be shown.

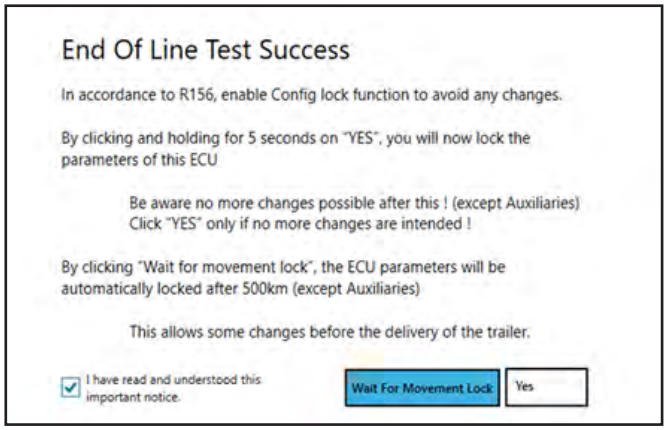
Note: The configuration will lock automatically once the odometer exceeds 500 Km.

If the customer wants to wait for the Movement Lock (i.e. when odometer reaches 500km) they should click the "Wait For Movement Lock" button to exit the configuration lock procedure.



If the customer wants to lock the configuration at this point they must tick the "I have read and understand this important notice" tick-box to indicate they have read the instructions written in this dialog.

Once this tick-box is ticked, the "Yes" button will be enabled. The customer should then click and hold "Yes" button for 5 seconds to proceed with locking the configuration.



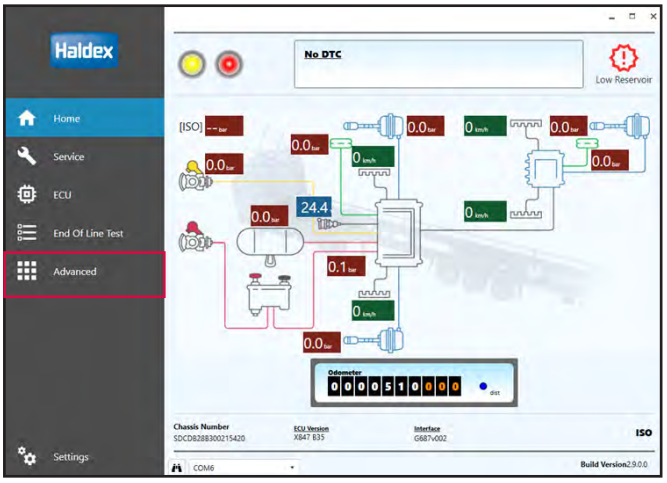
When the configuration has been locked this dialog will be shown to indicate that the lock has been successful.

Press "OK" button to proceed.

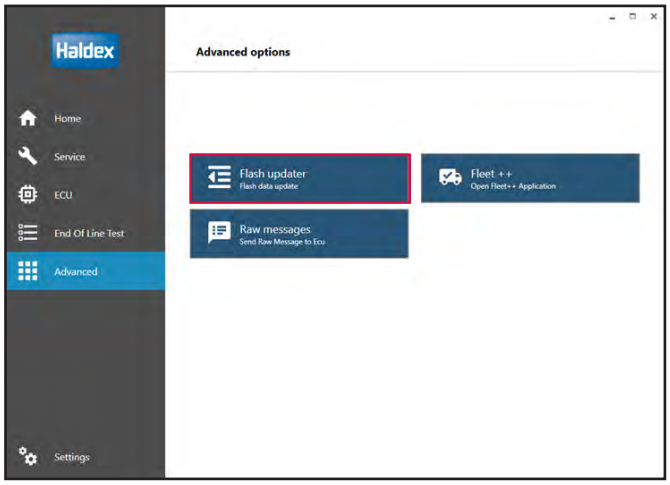
Flash update procedure

When advised by Haldex, users can flash update the software on EB+ 4.0 and ABS 4.0 ECU to a different version, using the following procedure.

Click on 'Advanced' button

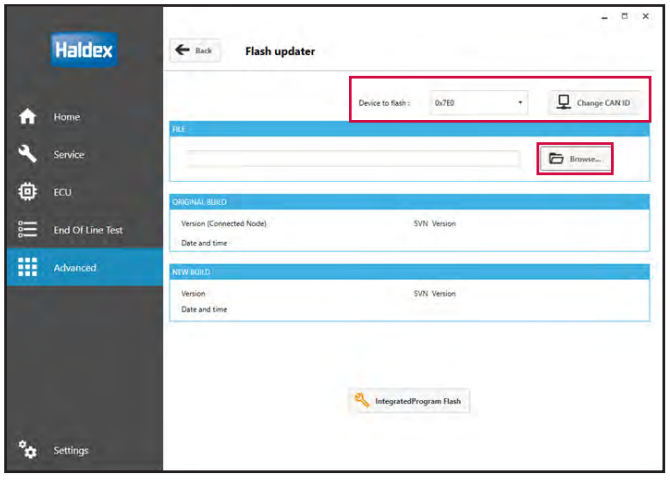


Click on 'Flash updater' button



For a Master update use the default CAN id setup (so no need to click the Device to flash drop down or the 'Change CAN' id button).

Click on 'Browse' button to select the new software build file.



For a Slave update, the correct CAN id needs to be chosen.

The correct Slave CAN ids to use are:

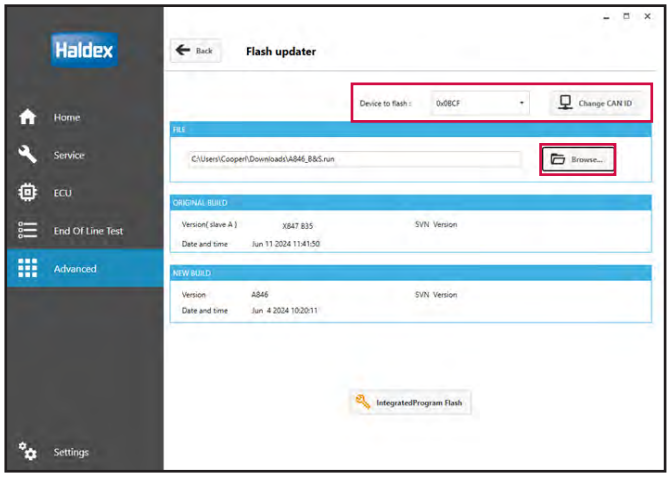
0xBCF – Slave1 (3M or 4M)

0xCCF – Slave2 (4M only)

Use the Device to flash drop down to select this and then click the 'Change CAN ID' button to set.

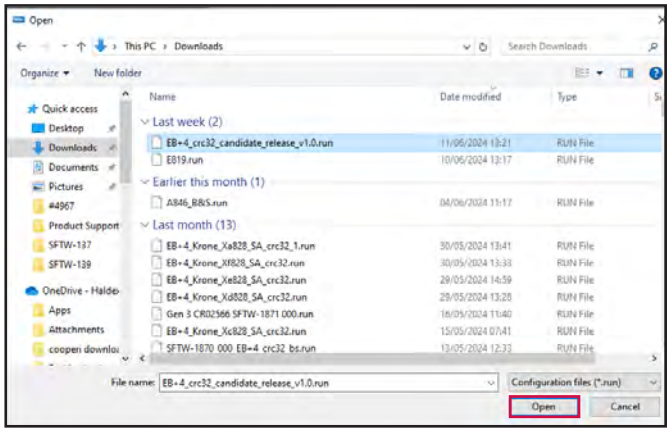
The screen snip shows Slave1 selected (0xBCF CAN id).

Click on 'Browse' button to select the new software build file.



A Windows Explorer dialog will be thrown up.

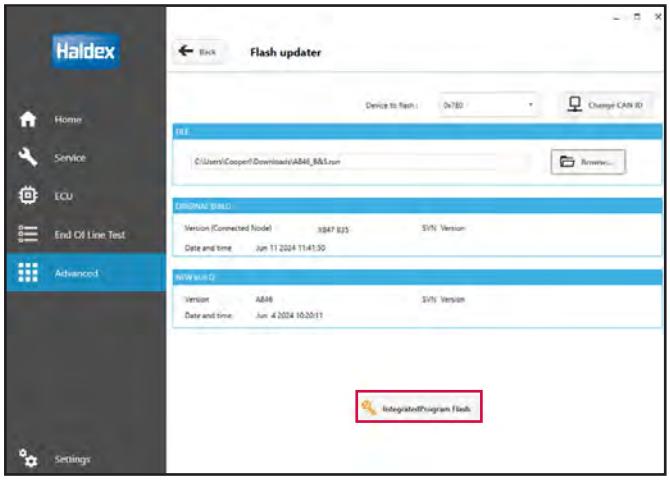
Use this to navigate to, select and then Open the new software build to be flashed onto the EB+ 4.0.



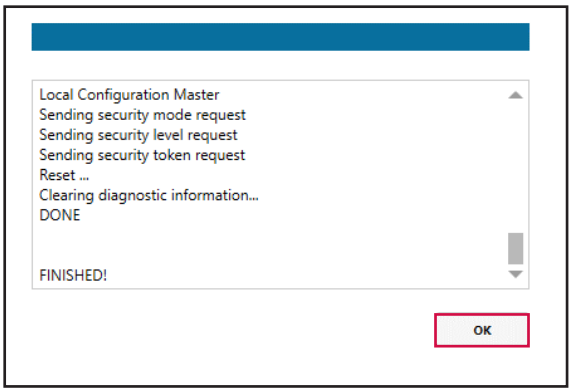
The chosen file (that contains the new software build) will now be shown in the text box next to the 'Browse' button.

The original and new software build details are now shown:

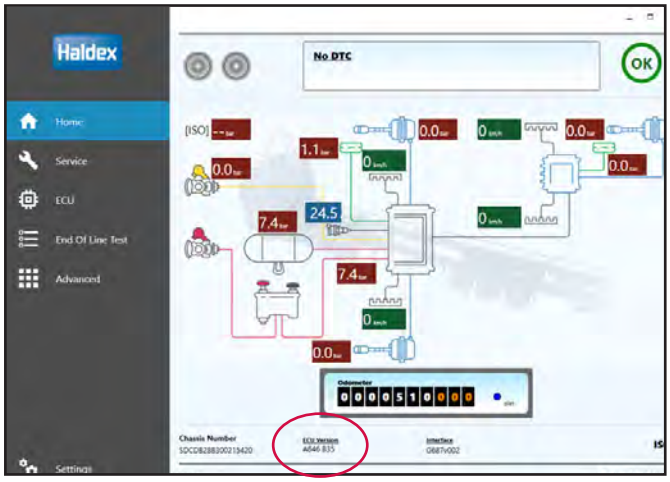
Click the 'Integrated Program Flash' button to start the flash update.



Click on the 'OK' button to proceed.



The updated software version number (for the Master) can then be seen on the DIAG++ Home screen.



Haldex develops and provides reliable and innovative solutions focused on brake and air suspension products to the global commercial vehicle industry.

Over 130 years of innovation have provided Haldex with competitive expertise in brake and air suspension systems for commercial vehicles. Haldex is a long-term partner to manufacturers of heavy trucks, trailers and buses, as well as to axle manufacturers.

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