



DEEP SEA ELECTRONICS PLC

Electronic Engines and DSE Controllers

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Electronic Engines and DSE Controllers (Previously named CAN AND DSE CONTROLLERS)

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Amendments List

Issue	Comments
1	Added DSE7000 Series
2	Updated most engines with more detail
3	Added 3110 controller
4	Added 7500 series
5	Added more ADEC information (Issue 5.1)
6	Changed manual layout and added new information.
6.1	Added ADEM3 wiring amendments.
6.2	Added ECU8 wiring
6.3	Added photo for DDEC, MDEC, EDC4, EEMR3, EMR2, EMR3, S6, CM570 & CM2250

Typeface: The typeface used in this document is *Arial*. Care should be taken not to mistake the upper case letter I with the numeral 1. The numeral 1 has a top serif to avoid this confusion.

	NOTE:	Highlights an essential element of a procedure to ensure correctness.
	CAUTION!:	Indicates a procedure or practice which, if not strictly observed, could result in damage or destruction of equipment.
	WARNING!:	Indicates a procedure or practice which could result in injury to personnel or loss of life if not followed correctly.
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SAE		Society of Automotive Engineers (USA)

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1 BIBLIOGRAPHY

This document refers to and is referred to by the following DSE publications which can be obtained from the DSE website www.deepseapl.com

1.1 TRAINING GUIDES

Training Guides are produced to give 'handout' sheets on specific subjects during training sessions.

DSE PART	DESCRIPTION
056-023	Adding New CAN Files

1.2 MANUALS

DSE PART	DESCRIPTION
057-086	31xx Series Operators Manual
057-087	31xx Series Configuration Suite Software Manual
057-111	44xx Mk2 Series Operators Manual
057-093	44xx Series Configuration Suite Software Manual
057-013	5310 Operators Manual
057-014	5320 Operators Manual
057-006	52/xx53xx Series Configuration Suite Software Manual
057-015	5510 Operators Manual
057-016	5520 Operators Manual
057-007	55xx Series Configuration Suite Software Manual
057-112	60xx Series Operators Manual
057-114	60xx Series Configuration Suite Software Manual
057-095	61xx Series Operators Manual
057-096	61xx Series Configuration Suite Software Manual
057-113	71xx Series Operators Manual
057-117	71xx Series Configuration Suite Software Manual
057-074	72/73xx Series Operators Manual
057-077	72/73xx Series Configuration Suite Software Manual
057-088	7510 Operators Manual
057-089	7520 Operators Manual
057-078	75xx Series Configuration Suite Software Manual
057-115	8610 Operators Manual
057-119	86xx Series Configuration Suite Software Manual
057-124	8710 Operators Manual
057-127	87xx Series Configuration Suite Software Manual

2 INTRODUCTION

2.1 CAN

Controller Area Network (CAN) is a serial bus standard, originally developed in the 1980s by Robert Bosch GmbH, for connecting electronic control units (ECUs). CAN was specifically designed to be robust in noisy environments. It can be even more robust against noise if twisted pair wire is used. Although initially created for automotive purposes, nowadays it is used in many embedded control applications (e.g., generator sets) that may be subject to noise.

2.2 SAE J1939

SAE J1939 is the Vehicle Network Communication standard using CAN for communication and diagnostics by the heavy duty truck industry. As generator engines are usually based upon truck engines, this standard has also been adopted by the majority of (but not all) Generator Engine Manufacturers.

For instance MTU engines use CAN but have not adopted J1939. However DSE controllers are also compatible with and officially certified for use with MTU engines.

2.3 RS485

RS485 is a serial bus standard for connecting multiple devices to the same bus.

This connection standard is used by Cummins on some engine ranges rather than the CAN standard adopted by other genset manufacturers. However DSE 5300 Series controllers are also compatible with the Cummins RS485 enabled engines.

2.4 TWISTED PAIR CABLING

Twisted pair (TP) cabling is a common form of wiring in which two conductors are wound around each other for the purposes of canceling out electromagnetic interference (known as crosstalk). The number of twists in the cable per meter make up part of the specification for a given type of cable. The greater the number of twists, the more crosstalk is reduced.

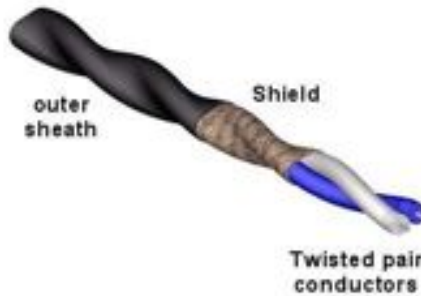
Twisting wires decreases interference because:

The loop area between the wires (which determines the magnetic coupling into the signal) is reduced as much as physically possible.

The directions of current generated by a uniform coupled magnetic field is reversed for every twist, canceling each other out.

The characteristic impedance of a twisted pair cable is around 100Ω making it suitable for both CAN or RS485 use. Screened, Shielded Twisted Pair is particularly suitable as the screening and shield offer even more protection.

If incorrect cable type is used it will lead to data transmission errors in the future, potentially after commissioning and the engineer has left site!



NOTE: DSE stock and supply Belden cable 9841 which is a high quality 120Ω impedance cable suitable for CAN or RS485 use (DSE part number 016-030)

2.5 IMPEDANCE MATCHING

When sending power down a transmission line, it is desirable that all the power is absorbed by the load and none of it is reflected back to the source. This can be ensured by making the source and load impedances equal in which case the line is said to be matched.

CAN and RS485 specifies 120Ω cable be used with 120Ω termination resistors at each end to match impedances. The termination resistor is fitted internally into the DSE CAN interface controller so is not required externally. Ensure that the DSE controller is the 'last' device on the communications link where more than one device is connected to the engine ECU's CAN connector.

If the cable impedance and/or termination resistors are not correctly fitted, this can cause some of the received signal to be 'reflected' back to the transmitting module. This reflection will 'collide' with further data transmissions, causing data transmission errors.

NOTE: The DSE RS485 interface does not include the 120Ω termination resistor internally so must be fitted externally.
The RS485 interface is NOT used for CAN engines.

3 ELECTRONIC ENGINES AND THE DSE MODULE

3.1 INSTRUMENTATION

As the Engine ECU is connected to measurement sensors on the engine, this instrumentation is available to be read into the DSE controller.

All DSE electronic engine enabled controllers will read engine oil pressure, engine coolant temperature and engine speed from the engine ECU.

In addition to this, DSE44xx, DSE5xxx, DSE6xxx, DSE7xxx and DSE8xxx controllers will display "enhanced engine ECU instrumentation" when it is supported by the engine ECU.

This information can also be viewed using the *Engine instrumentation* pages of the configuration software.

When the ECU is not powered it is not possible to read the diagnostic trouble codes or instrumentation. See the section entitled *Turning on the ECU manually*.

Enhanced CANbus			
Engine Oil Temperature		Inlet Manifold Temperature	
94 °C, 201 °F		Temp. 1	Temp. 2
		61 °C, 142 °F	
Exhaust Temperature		Coolant Pressure	
Temp. 1	Temp. 2	Press. 1	Press. 2
Fuel Pressure		Turbo Pressure	
Press. 1	Press. 2	Press. 1	Press. 2
4.80Bar, 70 PSI, 480 KPa		0.82Bar, 13 PSI, 92 KPa	
Total Fuel Used		Fuel Consumption	
13422 litres		35.10 l/hr	

 **NOTE:-** 3110 controllers do not support SCADA monitoring by PC software.

 **NOTE:-** When connected to an active ECU supporting the instrument, the instrument's value are shown on the DSE module's screen and also on the PC remote instrumentation page.

When the ECU is not powered, engine ECU instrumentation will indicate ###

When instrument has an errors (for instance sensor errors), x x x is displayed.

Unsupported instruments have blank values (no indication).

 **NOTE:-** Some engine ECUs do not support all of the 'enhanced engine ECU instrumentation'. The unsupported displays will appear blank on the module display.

3.2 USE OF ENGINE MANUFACTURERS SOFTWARE TOOLS

Occasionally it is necessary to connect the engine manufacturers software tools to the engine ECU in order to make changes to the engine configuration.

The ECU may need to be powered up to perform this operation and as the ECU is normally only powered when the engine is running, it must be turned on manually as described in the following section.

 **NOTE:-** If the manufacturers software tool connects to the same CAN interface as the DSE module, ensure the DSE module is the 'last' device on the CAN interface.

If the tool does not operate when connected to the same CAN interface as the DSE module, you are referred to your engine manufacturer.

3.3 TURNING ON THE ECU MANUALLY

When the ECU is not powered it is not possible to read the diagnostic trouble codes or instrumentation. Additionally, it is not possible to use the engine manufacturers configuration tools. As the ECU is unpowered when the engine is not running, it must be turned on manually as follows :

- Select STOP  mode on the DSE controller.
- Press and hold the START  button to power the ECU. As the controller is in STOP mode, the engine will not be started.
- Continue to hold the start button for as long as you need the ECU to be powered.
- The ECU will remain powered until a few seconds after the START button is released.

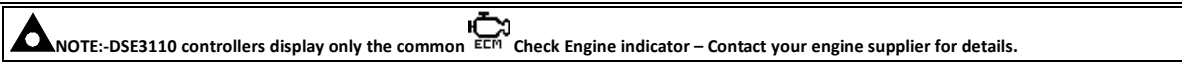
This is also useful if the engine manufacturer's tools need to be connected to the engine, for instance to configure the engine as the ECU needs to be powered up to perform this operation.

 **NOTE:-**DSE3110 does not include the ECU OVERRIDE function.

 **NOTE:-**When the ECU is not powered, engine ECU instrumentation will indicate ### on the display of the DSE controller.

 **NOTE:-**When it is required for the DSE controller to change ECU settings (ie when the Alternative Frequency setting is changed) the settings will be sent to the ECU the next time the ECU is turned on. "Setting ECU" will appear on the DSE display while this adjustment takes place.

3.4 ECU TROUBLE CODES AND DIAGNOSTICS



3.4.1 SPN/FMI CODES

If the engine ECU detects a fault with the engine, it will communicate this problem to the DSE controller in the form of a “trouble code”. There are two levels to these trouble codes

1. **SPN** = *Suspect Parameter Number*. This indicates what is wrong (i.e. Engine temperature).
2. **FMI** = *Failure Mode Indicator*. This indicates the type of failure (i.e. High).

Example taken from Volvo Penta Engine Documentation :

Oil Pressure Sensor (PID / SPN 100)

The Oil Pressure sensor is used to measure the oil pressure in the engine.

The Sensor is connected to analogue input with pull down.

Following diagnosis is supported:

FMI 1	Value below normal
FMI 3	SC +
FMI 5	OC

SPN 100, FMI 1 = Means Oil Pressure Sensor - Value below Normal

SPN 100, FMI 3 = Means Oil Pressure Sensor - Short Circuit

SPN 100, FMI 5 = Means Oil Pressure Sensor - Open Circuit

The DSE controller will display these codes in text format :

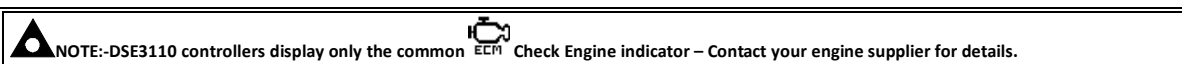
Alarm	1/1
Low Oil Pressure	
Shutdown	

Where an ‘unknown’ code is sent by the ECU, the DSE controller will display the SPN/FMI code number allowing the user to cross reference this information with the fault codes supplied by the engine manufacturer.

The DSE fault text display replaces the flashing “twinkle code” lamp available on some trouble code display systems giving a much more user friendly interface to the engine ECU.

Each alarm can be one of two types, **ECU ERROR** or **ECU FAIL**. These are detailed in the following sections.

With DSE7000 Series controllers, these alarms are named **CAN ECU WARNING** and **CAN ECU SHUTDOWN**.



3.4.2 CAN ECU WARNING (CAN ECU ERROR)

 NOTE:-DSE3110 controllers display only the common  Check Engine indicator – Contact your engine supplier for details.

This is a “warning” type alarm (Sometimes called the *yellow lamp alarm* by engine manufacturers) – the engine ECU does not shutdown the engine, it continues to run. The DSE controller takes no action other than to generate a **warning alarm** and to indicate the alarm via the fascia display.

Alarm	1/1
CAN ECU Warning	
Warning	

The display will alternate between the text display and the manufacturers error codes.

Alarm	1/1
Water Level Low	
xxx,xxx,xxx	

3.4.3 CAN ECU SHUTDOWN (CAN ECU FAIL)

 NOTE:-DSE3110 controllers display only the common  Check Engine indicator – Contact your engine supplier for details.

This is a “shutdown” type alarm (Sometimes called the *red lamp alarm* by engine manufacturers) – the engine has been shutdown by the ECU. The DSE controller performs the relevant shutdown procedure for the ECU as dictated by the *CAN file* selection, generates a **shutdown alarm** and indicates the alarm via the fascia display.

Alarm	1/1
CAN ECU Shutdown	
Shutdown	

The display will alternate between the text display and the manufacturers error codes.

Alarm	1/1
Fuel Pressure Low	
xxx,xxx,xxx	

 NOTE: - If the CAN message is a manufacturers specific code, it may not be displayed as text. If this is the case, the display will show the generic manufacturers code only, which must be cross-referenced with the engine manufacturer's literature. Please contact the engine manufacturer for further assistance.

The above displays show a standard J1939 based system. Other manufacturers systems supported by the module work in a similar way though the exact detail may vary from those illustrated.

Example

Alarm	1/1
CAN ECU Shutdown	
xxx,xxx,xxx	

To reset latched warning faults on the engine ECU, press the DSE controller mute  button.

To reset latched shutdown faults on the engine ECU, press the DSE controller stop/reset  button.

3.4.4 CAN ECU DATA FAIL

As the engine ECU CAN link is used to provide engine protection, it is a matter of safety that the CAN link remains intact. If the link is not operative during normal running, an engine shutdown will occur and ‘**Can data fail**’ is shown on the module's display :

Alarm	1/1
CAN ECU Data Fail	
Shutdown	

As the CAN link is not operative, shutdown of the engine cannot be made using a CAN message (!). In this case, the only method of shutdown is via the **ECU STOP** output.

 NOTE:-The check for data on the ECU link takes place after the DSE controller's safety delay timer.

 NOTE:-DSE3110 controllers display only the common  Check Engine indicator – Contact your engine supplier for details.

4 CONNECTIONS

As the connections to DSE controllers are similar across the DSE range the engine ECU connections are common for all controllers. The following table details the differences between the different ranges.

4.1 OUTPUTS

	Fuel	Start	Auxiliary Output 1	Auxiliary Output 2
3110	Use output A (terminal 3)	Use output B (terminal 4)	5 (C)	6 (D)
44xx	3	4	6	7
53xx	4	5	6	7
55xx	4	5	6	7
60xx	4	5	8 (C)	9 (D)
61xx	4	5	8 (C)	9 (D)
71xx	4	5	8 (E)	9 (F)
72xx	4	5	8 (E)	9 (F)
73xx	4	5	8 (E)	9 (F)
75xx	4	5	8 (E)	9 (F)
86xx	4	5	8 (E)	9 (F)
87xx	4	5	8 (E)	9 (F)

4.2 CAN / RS485

	CAN SCR	CAN H	CAN L	RS485 SCR	RS485 B	RS485 A
3110	N/A	10	11	N/A	N/A	N/A
44xx	14	12	13	N/A	N/A	N/A
53xx	20	21	22	23	24	25
55xx	23	24	25	29	30	31
60xx	18	16	17	N/A	N/A	N/A
61xx	18	16	17	N/A	N/A	N/A
71xx	27	25	26	N/A	N/A	N/A
72xx	27	25	26	SCR	B	A
73xx	27	25	26	SCR	B	A
75xx	27	25	26	SCR	B	A
86xx	27	25	26	SCR	B	A
87xx	27	25	26	SCR	B	A

 **NOTE:-** The CAN and RS485 specifications, require that a 120Ω terminator is fitted to each end of the communications link. This termination resistor is fitted internally into the DSE CAN interface so is not required externally. Ensure that the DSE controller is the 'last' device on the communications link where more than one device is connected to the engine ECU's CAN connector. However, the DSE RS485 interface does not include the 120Ω termination resistor internally, this is supplied loose with the RS485 enabled controller.

 **NOTE:-** DSE31xx Series fuel/start outputs are rated at 2A DC. DSE31xx auxiliary outputs are rated at 2A DC.

 **NOTE:-** DSE44xx Series fuel/start outputs are rated at 2A DC. DSE44xx auxiliary outputs are rated at 2A DC.

 **NOTE:-** DSE5xxx Series fuel/start outputs are rated at 15A DC. DSE5xxx auxiliary outputs are rated at 5A DC.

 **NOTE:-** DSE6xxx Series fuel/start outputs are rated at 2A DC. DSE6xxx auxiliary outputs are rated at 2A DC.

 **NOTE:-** DSE7xxx Series fuel/start outputs are rated at 15A DC. DSE7xxx auxiliary outputs are rated at 2A DC.

 **NOTE:-** DSE8xxx Series fuel/start outputs are rated at 15A DC. DSE7xxx auxiliary outputs are rated at 2A DC.

4.3 DSE CONTROLLER AND CAN FILE COMPATIBILITY



NOTE:- If a DSE module does not have the CAN file you require, please contact DSE Technical Support for more information.

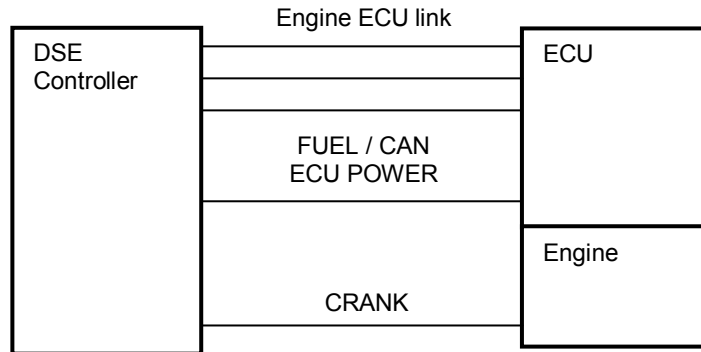
	CUMMINS CM570	CUMMINS CM850	CUMMINS CM2250	CUMMINS ISB	CUMMINS QSK	CUMMINS QST	CUMMINS QSX	DEUTZ EMR2	DEUTZ EMR3	ECONTROLS GCP	GENERIC J1939	GENERIC PLUS	GM PSI
3110	x	✓	x	✓	x	x	x	✓	✓	✓	✓	x	x
44xx	x	✓	x	x	x	x	x	✓	✓	✓	✓	x	✓
53xx	✓	✓	x	✓	✓	✓	✓	✓	✓	x	✓	x	x
55xx	x	✓	✓	✓	✓	✓	✓	x	x	x	✓	x	x
60xx	x	✓	x	x	x	x	x	✓	✓	✓	✓	x	✓
61xx	x	✓	x	✓	x	x	x	✓	✓	x	✓	x	x
71xx	x	✓	x	x	x	x	x	✓	✓	✓	✓	x	✓
72xx	✓	✓	x	✓	x	x	x	✓	✓	✓	✓	x	✓
73xx	✓	✓	✓	x	✓	✓	✓	✓	✓	x	✓	✓	✓
75xx	x	✓	✓	✓	✓	✓	✓	x	x	x	✓	x	x
86xx	✓	✓	✓	x	✓	✓	✓	✓	✓	x	✓	✓	✓
87xx	✓	✓	✓	x	✓	✓	✓	✓	✓	x	✓	✓	✓

	ISUZU 4H	IVECO EDC62	IVECO EDC7C1	IVECO EDC7UC31	IVECO T3	JOHN DEERE JDEC	JOHN DEERE PUMP	MTU ADEC	MTU ECU8	MTU MDEC201	MTU MDEC302	MTU MDEC303	MTU MDEC304	MTU MDEC506
3110	x	x	x	x	✓	✓	x	✓	x	x	x	✓	✓	✓
44xx	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	✓	✓	✓
53xx	x	x	x	x	✓	✓	✓	x	x	✓	✓	✓	✓	✓
55xx	✓	✓	✓	x	x	✓	x	✓	x	x	x	✓	✓	x
60xx	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	✓	✓	✓
61xx	x	x	x	x	✓	✓	x	✓	x	x	x	✓	✓	✓
71xx	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	✓	✓	✓
72xx	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	✓	✓	✓
73xx	✓	✓	✓	✓	✓	✓	x	✓	✓	x	x	✓	✓	✓
75xx	✓	✓	✓	x	x	✓	x	✓	x	x	x	✓	✓	x
86xx	✓	✓	✓	✓	✓	✓	x	✓	✓	x	x	✓	✓	✓
87xx	✓	✓	✓	✓	✓	✓	x	✓	✓	x	x	✓	✓	✓

	PERKINS 1100	PERKINS 1300	PERKINS ADEM3	PERKINS ADEM4	SCANIA S6	SISU EEM3	VOLVO EDC3	VOLVO EDC4	VOLVO EMS2	VOLVO EMS2B	YANMAR ECO
3110	x	✓	✓	✓	✓	x	✓	✓	✓	✓	x
44xx	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
53xx	✓	x	✓	✓	✓	x	✓	✓	✓	✓	x
55xx	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓
60xx	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
61xx	x	✓	✓	✓	✓	x	✓	✓	✓	✓	x
71xx	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
72xx	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
73xx	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
75xx	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓
86xx	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
87xx	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

4.4 TYPICAL CONNECTIONS

Connections between the DSE controller and the engine system are similar for all engine types and includes connection to the Engine ECU link and in some engine types, ancilliary control is also required.



NOTE:- RUN/POWER and CRANK are not required with all engine types. See specific connection lists elsewhere in this manual for further details.

4.5 ECU POWER AND ECU STOP OUTPUTS

DSE controllers have configurable output sources specifically designed to control the engine ECU. These are labelled CAN ECU Power and ECU Stop in the DSE configuration software.

The exact timing/sequence of their operation varies slightly depending upon the configuration of "Electronic Engine type" but essentially their functions are as follows:

Relay Outputs (Supplied from Emergency Stop Input)		
	Source	Polarity
Output A	CAN ECU Power	Energise
Output B	CAN ECU Stop	Energise

4.5.1 CAN ECU POWER

Normally used to turn on the ECU (sometimes via an external slave relay).

Some engine ECUs are permanently powered in which case the ECU Power output is used to give input to a Run (or similarly named) input on the ECU.

4.5.2 CAN ECU STOP

Used to give input to a Stop (or similarly named) input on the ECU. This is used as a backup stop system should the ECU Data link fail. In this instance, it's not possible to stop the engine using a data command as the link is not operative. As a backup, the STOP signal is given to the engine via a separate hardwired connection.



CAUTION!: Check the current rating of the ECU terminals that CAN ECU POWER and CAN ECU STOP signals are connected to and ensure the DSE output rating is not exceeded.

4.6 REMOTE SPEED CONTROL

4.6.1 DSE53XX SERIES

As the DSE module's analogue inputs for oil pressure and coolant temperature are not used when the module is configured for use with an electronic engine, it is possible to use the coolant temperature input as engine speed control by connecting a potentiometer. Contact Deep Sea Electronics Technical Support Department for further details and to confirm the list of engines that support this feature.

4.6.2 DSE55XX SERIES

Version 10 and later DSE5510/5520 controllers have a configurable speed parameter that can be adjusted when the engine is running. Refer to the relevant operator and PC software configuration manual for further details on enabling and utilising this function.

4.6.3 DSE7XXX AND DSE8XXX SERIES

The DSE7XXX and DSE8XXX controllers have a configurable speed parameter that can be adjusted when the engine is running. Refer to the relevant operator and PC software configuration manual for further details on enabling and utilising this function.

5 CATERPILLAR

Engines in the Caterpillar range are split into subgroups depending upon the type of engine governing are employed. These different systems are fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link.



NOTE:-Caterpillar engines use the ADEM3 and ADEM4 ECUs which are also found on the Perkins range of engines. Please refer to the section entitled 'Perkins' else where in this manual for more information.

6 CUMMINS

Engines in the Cummins range are split into subgroups depending upon the type of engine governing are employed. These different systems are fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link. We have collated the following data for the electronically governed engines.

6.1 CM570



CM570 Mounted on the engine



J1939 Data link connector

6.1.1 ECU FUNCTIONALITY

CM570 FUNCTIONALITY	
MODBUS Engine Hours	x
MODBUS Oil Pressure	x
MODBUS Coolant Temperature	x
MODBUS Engine RPM	x
MODBUS Charge Alt	x
MODBUS Speed Feed	x
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	✓
Inlet Temperature	✓
Exhaust Temperature	✓
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	✓
Fuel Used	✓
Atmospheric Pressure	x
Water in Fuel	x

CM570 FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	x
DM1 Malfunction	x
Start	x
Stop	✓
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✓
Source address	0xDC
ECU Power	
ECU Stop	
J1939 msg	RQST, CCVS
Proprietary msg	GAP, GCP, EG
Notes	
DTC Ignore	

Legend

✓	Function supported
x	Not supported
DSE	DSE controller measures/calculates the value

6.1.2 ECU WIRING

DSE TERMINAL DESCRIPTION	CUMMINS CM570 '6 PIN POWER CONNECTOR' TERMINALS	NOTES
Fuel Relay Output	H	NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i>. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	-	Connect directly to engine starter solenoid. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.

DSE TERMINAL DESCRIPTION	CUMMINS 'DATA LINK CONNECTOR' TERMINALS	NOTES
CANbus common	C	Screen for the J1939 cable. Connect at Cummins ECU end only.
CANbus H	A	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	B	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

6.1.2.1 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

6.1.2.2 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

The image shows two screenshots from the DSE Configuration Suite Software. The top screenshot displays the 'ECU (ECM) Options' window, which includes fields for 'Engine Type' (set to 'Cummins CM570'), 'Enhanced J1939' (checked), 'Alternative Engine Speed' (checked), and 'Modbus Engine Comms Port' (set to 'RS485 Port'). Below this is another identical 'ECU (ECM) Options' window, but with 'Engine Type' set to 'Cummins ISB'. The bottom screenshot shows the 'Governor' window, which has two sliders: 'Centre (SW1)' set to 5.0 and 'Range (SW2)' set to 4.0. Each slider has a 'Reset' button next to it.

The DSE controller must be configured for the **Cummins CM570** or **Cummins ISB** CAN file depending which is available.

Using the **Cummins CM570** CAN file will require a SW 1 setting of 5.0 and an SW2 setting of 4.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

6.1.2.3 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

The image shows two screenshots from the DSE5XXX/75XX PC Software. The top screenshot displays the 'CANbus options' window, which includes fields for 'Engine type' (set to 'Cummins-CM570'), 'Enable watchdog' (set to 'Shutdown'), and 'Enhanced CANbus instrumentation' (unchecked). Below this is another identical 'CANbus options' window, but with 'Engine type' set to 'Cummins ISB'. The bottom screenshot shows the 'Governor interface' window, which has two sliders: 'Centre (SW1)' set to 5.0 and 'Range (SW2)' set to 2.0.

The DSE controller must be configured for either the **Cummins-CM570** or **Cummins ISB** CAN file depending which is available.

Using the **Cummins-CM570** CAN file will require a SW 1 setting of 5.0 and an SW2 setting of 2.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps

6.2 CM850



6.2.1 ECU FUNCTIONALITY

CM850 FUNCTIONALITY	
MODBUS Engine Hours	✓
MODBUS Oil Pressure	×
MODBUS Coolant Temperature	×
MODBUS Engine RPM	×
MODBUS Charge Alt	×
MODBUS Speed Feed	×
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	✓
Inlet Temperature	✓
Exhaust Temperature	×
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	✓
Fuel Used	✓
Atmospheric Pressure	×
Water in Fuel	×

CM850 FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	×
DM1 Malfunction	×
Start	×
Stop	✓
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✓
Source address	0xDC
ECU Power	
ECU Stop	
J1939 msg	RQST, CCVS
Proprietary msg	GAP, GCP, EG
Notes	
DTC Ignore	

Legend	
✓	Function supported
×	Not supported
DSE	DSE controller measures/calculates the value

6.2.2 ECU WIRING

DSE TERMINAL DESCRIPTION	CUMMINS CM850 50 PIN CONNECTOR TERMINALS	NOTES
Fuel Relay Output	39	NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i>. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	-	Connect directly to engine starter solenoid. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.

DSE TERMINAL DESCRIPTION	CUMMINS CM850 9 PIN CONNECTOR TERMINALS	NOTES
CANbus common	E	Screen for the J1939 cable. Connect at Cummins ECU end only.
CANbus H	C	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	D	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

6.2.2.1 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

6.2.2.2 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

The DSE controller must be configured for the **Cummins CM850** CAN file.

Using the Cummins CM850 CAN file will require a SW 1 setting of 5.0 and an SW2 setting of 4.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

6.2.2.3 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

The DSE controller must be configured for the **Cummins-CM850** CAN file.

Using the **Cummins-CM850** CAN file will require a SW1 setting of 5.0 and an SW2 setting of 2.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps

6.3 CM2250



6.3.1 ECU FUNCTIONALITY

CM2250 FUNCTIONALITY	
MODBUS Engine Hours	×
MODBUS Oil Pressure	×
MODBUS Coolant Temperature	×
MODBUS Engine RPM	×
MODBUS Charge Alt	×
MODBUS Speed Feed	✓
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	✓
Inlet Temperature	✓
Exhaust Temperature	×
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	✓
Fuel Used	×
Atmospheric Pressure	×
Water in Fuel	×

CM2250 FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	×
DM1 Malfunction	×
Start	×
Stop	✓
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✓
Source address	0xDC
ECU Power	
ECU Stop	
J1939 msg	RQST, CCVS
Proprietary msg	GAP, GCP, EG
Notes	
DTC Ignore	

Legend	
✓	Function supported
×	Not supported
DSE	DSE controller measures/calculates the value

6.3.2 ECU WIRING

NOTE:- DSE currently do not have any wiring information for this ECU. Please contact the engine supplier for more information.

6.3.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

6.3.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

The DSE controller must be configured for the **Cummins CM2250** CAN file.

Using the Cummins CM2250 CAN file will require a SW 1 setting of 5.0 and an SW2 setting of 4.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

6.3.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

The DSE controller must be configured for the **Cummins-CM2250** CAN file.

Using the **Cummins-CM570** CAN file will require a SW 1 setting of 5.0 and an SW2 setting of 2.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps

6.4 GCS



6.4.1 ECU FUNCTIONALITY

GCS FUNCTIONALITY	
MODBUS Engine Hours	x
MODBUS Oil Pressure	x
MODBUS Coolant Temperature	x
MODBUS Engine RPM	x
MODBUS Charge Alt	x
MODBUS Speed Feed	x
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓ (Not available on QSK)
Coolant Pressure	✓ (Not available on QSK)
Inlet Temperature	✓
Exhaust Temperature	x
Fuel Temperature	✓ (Not available on QSK)
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	✓
Fuel Used	✓
Atmospheric Pressure	x
Water in Fuel	x

GCS FUNCTIONALITY	
DM1 Conv. Method	N/A
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	x
DM1 Malfunction	x
Start	x
Stop	x
1500/1800 switch	x
Idle Mode	x
Speed Control	x
Source address	N/A
ECU Power	&delay
ECU Stop	
J1939 msg	N/A
Proprietary msg	N/A
Notes	
DTC Ignore	

Legend	
✓	Function supported
x	Not supported
DSE	DSE controller measures/calculates the value

6.4.2 ECU WIRING

DSE TERMINAL DESCRIPTION	CUMMINS 'D' PIN CONNECTOR 6' TERMINALS	NOTES
Fuel Relay Output	5,8	External relay used to close terminal 5 to terminal 8. NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i>. CAUTION:- An external slave relay will be needed. Check the current consumption and specify relay accordingly.
Start Relay Output	-	Connect directly to engine starter solenoid. CAUTION:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
RS485 A	18	RS485 - Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
RS485 B	21	RS485 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
	19, 22	Link 19 and 22 together to enable Cummins ECU 120Ω termination resistor.

NOTE:- Newer variants of these engines may be fitted with the CM850 ECU (as fitted to the QSL11 engines). Contact Cummins for further information.

NOTE:- The GCS uses a MODBUS RS485 protocol and consequently a DSE controller with MODBUS engine control must be used with these controllers (DSE53XX (RS485 version), DSE55XX (RS485 version), DSE73XX, DSE75XX and DSE8XXX).

6.4.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

6.4.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

NOTE:- The GCS uses a MODBUS RS485 protocol and consequently a DSE controller with MODBUS engine control must be used with either of these controllers DSE73XX, DSE75XX and DSE8XXX.

The figure shows four screenshots of the 'ECU (ECM) Options' configuration window. Each window has the following fields:

- Engine Type:** A dropdown menu. The first three screenshots show 'Cummins QSK' and the fourth shows 'Cummins QSK'.
- Enhanced J1939:** A checkbox, all are unchecked.
- Alternative Engine Speed:** A checkbox, all are unchecked.
- Modbus Engine Comms Port:** A dropdown menu. The first three show 'RS485 Port' and the fourth shows a dropdown with 'RS485 Port' and 'DSENet Port' options.

Using the Cummins QSK engine select the **Cummins QSK** CAN File. Selecting the incorrect CAN file will result in instrumentation not being display

Using the Cummins QST engine select the **Cummins QST** CAN File. Selecting the incorrect CAN file will result in instrumentation not being display

Using the Cummins QSK engine select the **Cummins QSK** CAN File. Selecting the incorrect CAN file will result in instrumentation not being display

The Cummins GCM ECU uses MODBUS communication over RS485 rather than J1939 over CAN. The user can select if they wish to use the DSE module's RS485 port or the DSEnet port if either or is in use.

6.4.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

NOTE:- The GCS uses a MODBUS RS485 protocol and consequently a DSE controller with MODBUS engine control must be used with either of these controllers DSE53XX (RS485 version) and DSE55XX (RS485 version).

The figure shows three screenshots of the 'CANbus options' configuration window. Each window has the following fields:

- Engine type:** A dropdown menu. The first two show 'Cummins-QSK-Modbus' and the third shows 'Cummins-QSX-Modbus'.
- Enable watchdog:** A dropdown menu, all show 'Shutdown'.
- Enhanced CANbus instrumentation:** A checkbox, all are unchecked.

Using the Cummins QSK engine select the **Cummins-QSK-Modbus** CAN File. Selecting the incorrect CAN file will result in instrumentation not being display

Using the Cummins QST engine select the **Cummins-QST-Modbus** CAN File. Selecting the incorrect CAN file will result in instrumentation not being display

Using the Cummins QSK engine select the **Cummins-QSX-Modbus** CAN File. Selecting the incorrect CAN file will result in instrumentation not being display.

6.5 ISB



6.5.1 ECU FUNCTIONALITY

ISB FUNCTIONALITY	
MODBUS Engine Hours	x
MODBUS Oil Pressure	x
MODBUS Coolant Temperature	x
MODBUS Engine RPM	x
MODBUS Charge Alt	x
MODBUS Speed Feed	x
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	✓
Inlet Temperature	✓
Exhaust Temperature	x
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	✓
✓	✓
Atmospheric Pressure	x
Water in Fuel	x

ISB FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	x
DM1 Malfunction	x
Start	x
Stop	x
1500/1800 switch	x
Idle Mode	x
Speed Control	x
Source address	0x2B
ECU Power	
ECU Stop	
J1939 msg	RQST
Proprietary msg	None
Notes	
DTC Ignore	

Legend	
✓	✓
x	Not supported
DSE	DSE controller measures/calculates the value

6.5.2 ECU WIRING

DSE TERMINAL DESCRIPTION	CUMMINS ISB 'CONNECTOR B' TERMINALS	NOTES
Fuel Relay Output	39	Key switch input ⚠ CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	-	Connect directly to engine starter solenoid. ⚠ CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Auxiliary Output 1	1, 7, 12, 13	Using PC software configure 'Auxiliary Output 1' to be 'ECU POWER' External relay used to close terminal 1, 7, 12 and 13 to DC battery supply. ⚠ CAUTION!:- An external slave relay will be needed. Check the current consumption and specify relay accordingly.

DSE TERMINAL DESCRIPTION	CUMMINS ISB '9 PIN DEUTSCH CONNECTOR' TERMINALS	NOTES
CANbus common	SAE J1939 shield	Screen for the J1939 cable. Connect at one end only.
CANbus H	SAE J1939 signal	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	SAE J1939 return	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

6.5.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

6.5.3.1 DSE CONFIGURATION SUITE SOFTWARE

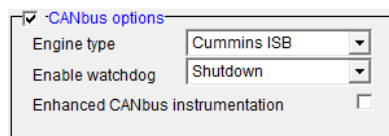
These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.



The DSE controller must be configured for the **Cummins ISB** CAN file.

6.5.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.



The DSE controller must be configured for the **Cummins ISB** CAN file.

7 DETROIT

Engines in the Detroit range are fitted with only one type of engine governing. This system is fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link. We have collated the following data for the electronically governed engines.

7.1 DDEC III/IV



7.1.1 ECU FUNCTIONALITY

DDEC III/IV FUNCTIONALITY	
MODBUS Engine Hours	*
MODBUS Oil Pressure	*
MODBUS Coolant Temperature	*
MODBUS Engine RPM	*
MODBUS Charge Alt	*
MODBUS Speed Feed	*
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	✓
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	✓
Inlet Temperature	✓
Exhaust Temperature	✓
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	✓
Fuel Used	✓
Atmospheric Pressure	*
Water in Fuel	*

DDEC III/IV FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	✓
DM1 Malfunction	✓
Start	*
Stop	*
1500/1800 switch	✓
Idle Mode	✓
Speed Control	*
Source address	0x2B
ECU Power	
ECU Stop	
J1939 msg	RQST, TSC1
Proprietary msg	None
Notes	OEM DTC lookup table
DTC Ignore	

LEGEND	
✓	Function supported
*	Not supported
DSE	DSE controller measures/calculates the value

7.1.2 ECU WIRING

DSE TERMINAL DESCRIPTION	DETROIT CONNECTOR	NOTES
Fuel Relay Output	-	NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i>. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	-	Connect directly to engine starter solenoid. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	12	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	13	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

7.1.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

7.1.3.1 DSE CONFIGURATION SUITE SOFTWARE

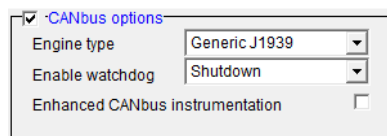
These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

A screenshot of a software dialog box titled "ECU (ECM) Options". It contains four rows of settings: "Engine Type" with a dropdown menu showing "Generic J1939", "Enhanced J1939" with a checked checkbox, "Alternative Engine Speed" with a checked checkbox, and "Modbus Engine Comms Port" with a dropdown menu showing "RS485 Port".

The DSE controller must be configured for the **Generic J1939** CAN file.

7.1.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

A screenshot of a software dialog box titled "CANbus options". It has a checked checkbox at the top left. Below it are three rows: "Engine type" with a dropdown menu showing "Generic J1939", "Enable watchdog" with a dropdown menu showing "Shutdown", and "Enhanced CANbus instrumentation" with an unchecked checkbox.

The DSE controller must be configured for the **Generic J1939** CAN file.

8 DEUTZ

Engines in the Deutz range are split into subgroups depending upon the type of engine governing are employed. These different systems are fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link. We have collated the following data for the electronically governed engines.

8.1 EMR2



8.1.1 ECU FUNCTIONALITY

EMR2 FUNCTIONALITY	
MODBUS Engine Hours	x
MODBUS Oil Pressure	x
MODBUS Coolant Temperature	x
MODBUS Engine RPM	x
MODBUS Charge Alt	x
MODBUS Speed Feed	x
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	x
Coolant Pressure	x
Inlet Temperature	x
Exhaust Temperature	x
Fuel Temperature	✓
Turbo Pressure	x
Fuel Pressure	x
Fuel Consumption	✓
Fuel Used	x
Atmospheric Pressure	x
Water in Fuel	x

EMR2 FUNCTIONALITY	
DM1 Conv. Method	1
DM1 Ignored	91
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	x
DM1 Malfunction	x
Start	x
Stop	✓
1500/1800 switch	✓
Idle Mode	x
Speed Control	✓
Source address	0x2B, 0x11
ECU Power	
ECU Stop	
J1939 msg	TSC1
Proprietary msg	Volvo_STP
Notes	Uses CM1, as EMR3
DTC Ignore	91, 6771, 6279

Legend	
✓	Function supported
x	Not supported
DSE	DSE controller measures/calculates the value

8.1.2 ECU WIRING

DSE TERMINAL DESCRIPTION	DEUTZ 'VEHICLE SIDE (F) CONNECTOR' TERMINALS	NOTES
Fuel Relay Output	14	NOTE: On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i>. CAUTION: An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	-	Connect directly to engine starter solenoid. CAUTION: An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
	1	Connects directly to battery negative
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	12	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	13	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

NOTE: It may be necessary to enable the Deutz ECU for CAN control. Using the Deutz service tool software, change parameter 4400 on Page 6 to '1'. Once this is done, depending upon the Deutz ECU configuration the engine speed may change. If this occurs, terminals 17 & 18 of the Deutz ECU should be linked.

8.1.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

8.1.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

The screenshot shows two panels of the DSE Configuration Suite Software. The top panel is titled 'ECU (ECM) Options' and shows settings for 'Deutz EMR2'. The bottom panel is also titled 'ECU (ECM) Options' and shows settings for 'Volvo EDC4'. Both panels have the same layout with four rows of settings: 'Engine Type' (dropdown), 'Enhanced J1939' (checkbox), 'Alternative Engine Speed' (checkbox), and 'Modbus Engine Comms Port' (dropdown). In both panels, 'Enhanced J1939' and 'Alternative Engine Speed' are unchecked, and 'Modbus Engine Comms Port' is set to 'RS485 Port'.

The DSE controller must be configured for the **Deutz EMR2** or **Volvo EDC4** CAN file depending which is available.

8.1.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

The screenshot shows two panels of the DSE5XXX/75XX PC Software. Both panels have a checked checkbox for 'CANbus options'. The top panel is for 'Deutz-EMR2' and the bottom panel is for 'VolvoEDC4'. Both panels have the same layout with three rows of settings: 'Engine type' (dropdown), 'Enable watchdog' (dropdown), and 'Enhanced CANbus instrumentation' (checkbox). In both panels, 'Enable watchdog' is set to 'Shutdown' and 'Enhanced CANbus instrumentation' is unchecked.

The DSE controller must be configured for either the **Deutz-EMR2** or **VolvoEDC4** CAN file depending which is available.

8.2 EMR 3



Deutz EMR3-E



Deutz EMR3-S

8.2.1 ECU FUNCTIONALITY

EMR3 FUNCTIONALITY	
MODBUS Engine Hours	×
MODBUS Oil Pressure	×
MODBUS Coolant Temperature	×
MODBUS Engine RPM	×
MODBUS Charge Alt	×
MODBUS Speed Feed	×
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	×
Coolant Pressure	✓
Inlet Temperature	✓
Exhaust Temperature	✓
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	✓
Fuel Used	✓
Atmospheric Pressure	×
Water in Fuel	×

EMR3 FUNCTIONALITY	
DM1 Conv. Method	1
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	×
DM1 Malfunction	×
Start	×
Stop	✓
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✓
Source address	0x03
ECU Power	
ECU Stop	
J1939 msg	RQST, TSC1
Proprietary msg	Volvo_Stop
Notes	
DTC Ignore	

Legend	
✓	Function supported
×	Not supported
DSE	DSE controller measures/calculates the value

8.2.2 ECU WIRING

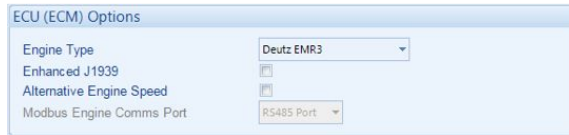
DSE TERMINAL DESCRIPTION	DEUTZ EMR3-E 'DIAGNOSTIC CONNECTOR' TERMINAL	NOTES
Fuel Relay Output	Key switch	Connect to terminal 15 NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i> . CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	-	Connect directly to engine starter solenoid. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	M	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	F	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

8.2.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

8.2.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.



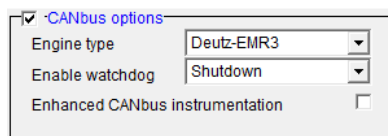
ECU (ECM) Options

Engine Type	Deutz EMR3
Enhanced J1939	☒
Alternative Engine Speed	☒
Modbus Engine Comms Port	RS485 Port

The DSE controller must be configured for the **Deutz EMR3** CAN file.

8.2.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.



☒ CANbus options

Engine type	Deutz-EMR3
Enable watchdog	Shutdown
Enhanced CANbus instrumentation	☐

The DSE controller must be configured for the **Deutz-EMR3** CAN file.

9 FIAT POWERTRAIN

Engines in the Fiat Powertrain range are split into subgroups depending upon the type of engine governing are employed. These different systems are fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link.



NOTE: -Fiat Powertrain was original named Iveco. Please refer to the section 'Iveco' elsewhere in this manual for more information.

10 FORD

Engines in the Ford range are fitted with only one type of engine governing. This system is fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link. We have collated the following data for the electronically governed engines.

10.1 GCP

Space Reserved for Photo of ECU

10.1.1 ECU FUNCTIONALITY

GCP FUNCTIONALITY	
MODBUS Engine Hours	✓
MODBUS Oil Pressure	✓
MODBUS Coolant Temperature	✓
MODBUS Engine RPM	✓
MODBUS Charge Alt	*
MODBUS Speed Feed	✓
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	✓
Inlet Temperature	✓
Exhaust Temperature	✓
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	✓
Fuel Used	✓
Atmospheric Pressure	✓
Water in Fuel	✓

GCP FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	✓
DM1 Malfunction	✓
Start	*
Stop	*
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✓
Source address	0xEA
ECU Power	
ECU Stop	
J1939 msg	RQST, TSC1
Proprietary msg	None
Notes	OEM DTC lookup table
DTC Ignore	

LEGEND	
✓	Function supported
*	Not supported
DSE	DSE controller measures/calculates the value

10.1.2 ECU WIRING

DSE TERMINAL DESCRIPTION	FORD '42 PIN CONNECTOR' TERMINALS	NOTES
Fuel Relay Output	1	 NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i> .  CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	2	Connect directly to engine starter solenoid.  CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	28	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	29	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

10.1.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

10.1.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.



The DSE controller must be configured for the **Econtrols GCP** CAN file.

10.1.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.



NOTE:- The Econtrols ECP CAN file is not currently available for the DSE5xxx and DSE75xxx range of modules. Please contact the DSE Technical Support Department for more information.

11 GM

Engines in the GM range are fitted with only one type of engine governing. This system is fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link. We have collated the following data for the electronically governed engines.

11.1 PSI



11.1.1 ECU FUNCTIONALITY

PSI FUNCTIONALITY	
MODBUS Engine Hours	✓
MODBUS Oil Pressure	✓
MODBUS Coolant Temperature	✓
MODBUS Engine RPM	✓
MODBUS Charge Alt	×
MODBUS Speed Feed	✓
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	✓
Inlet Temperature	✓
Exhaust Temperature	✓
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	✓
Fuel Used	✓
Atmospheric Pressure	✓
Water in Fuel	✓

PSI FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	✓
DM1 Malfunction	✓
Start	×
Stop	×
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✓
Source address	0xEA
ECU Power	
ECU Stop	
J1939 msg	RQST, TSC1
Proprietary msg	None
Notes	OEM DTC lookup table
DTC Ignore	

LEGEND	
✓	Function supported
×	Not supported
DSE	DSE controller measures/calculates the value

11.1.2 ECU WIRING

NOTE:- DSE currently do not have any wiring information for this ECU. Please contact the engine supplier for more information.

11.1.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

11.1.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

ECU (ECM) Options

Engine Type: GM PSI

Enhanced J1939: ☐

Alternative Engine Speed: ☐

Modbus Engine Comms Port: RS485 Port

The DSE controller must be configured for the **GM PSI** CAN file.

Governor

Centre (SW1) 5.0

Range (SW2) 4.0

Reset

Reset

Using the GM PSI CAN file will require a SW1 setting of 5.0 and an SW2 setting of 4.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

11.1.3.2 DSE5XXX/75XX PC SOFTWARE

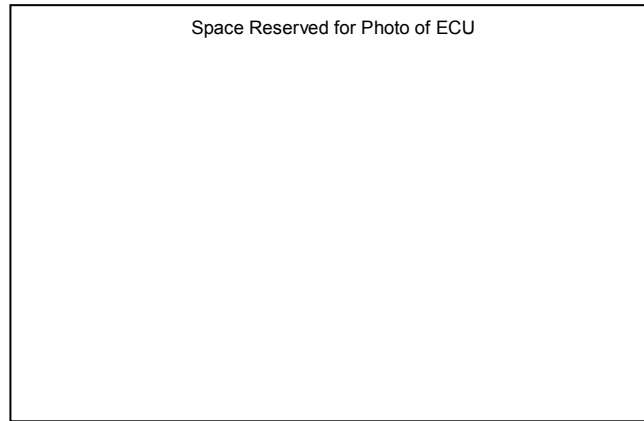
These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

NOTE:- The GM PSI CAN file is not currently available for the DSE5xxx and DSE75xxx range of modules. Please contact the DSE Technical Support Department for more information.

12 ISUZU

Engines in the Isuzu range are fitted with only one type of engine governing. This system is fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link. We have collated the following data for the electronically governed engines.

12.1 4H



12.1.1 ECU FUNCTIONALITY

4H FUNCTIONALITY	
MODBUS Engine Hours	×
MODBUS Oil Pressure	×
MODBUS Coolant Temperature	×
MODBUS Engine RPM	×
MODBUS Charge Alt	×
MODBUS Speed Feed	×
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	DSE
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	✓
Inlet Temperature	✓
Exhaust Temperature	✓
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	✓
Fuel Used	✓
Atmospheric Pressure	×
Water in Fuel	×

4H FUNCTIONALITY	
DM1 Conv. Method	1
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	✓
DM1 Malfunction	✓
Start	×
Stop	✓
1500/1800 switch	×
Idle Mode	×
Speed Control	✓
Source address	0x11, 0xE4
ECU Power	&delay
ECU Stop	
J1939 msg	RQST, RQST CI, SHUTDN, TSC1
Proprietary msg	None
Notes	
DTC Ignore	

LEGEND	
✓	Function supported
×	Not supported
DSE	DSE controller measures/calculates the value

12.1.2 ECU WIRING

DSE TERMINAL DESCRIPTION	ISUZU 'V CONNECTOR' TERMINAL	NOTES
Fuel Relay Output	24	 NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i> .  CAUTION:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	26	 CAUTION:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	18	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	37	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

12.1.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

12.1.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

The screenshot shows two panels. The top panel, titled 'ECU (ECM) Options', contains four settings: 'Engine Type' set to 'Isuzu 4H', 'Enhanced J1939' with a checked box, 'Alternative Engine Speed' with a checked box, and 'Modbus Engine Comms Port' set to 'RS485 Port'. The bottom panel, titled 'Governor', contains two sliders: 'Centre (SW1)' with a value of 5.0 and 'Range (SW2)' with a value of 4.0. Each slider has a 'Reset' button to its right.

The DSE controller must be configured for the **Isuzu 4H** CAN file.

Using the Isuzu 4H CAN file will require a SW1 setting of 5.0 and an SW2 setting of 4.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

12.1.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

The screenshot shows two panels. The top panel, titled 'CANbus options', has a checked checkbox and contains three settings: 'Engine type' set to 'Isuzu-ECM', 'Enable watchdog' set to 'Shutdown', and 'Enhanced CANbus instrumentation' with an unchecked checkbox. The bottom panel, titled 'Governor interface', contains two sliders: 'Centre (SW1)' with a value of 5.0 and 'Range (SW2)' with a value of 2.0.

The DSE controller must be configured for the **Isuzu-ECM** CAN file.

Using the **Isuzu-ECM** CAN file will require a SW1 setting of 5.0 and an SW2 setting of 2.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps

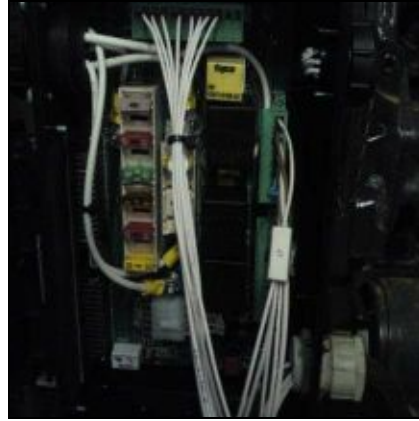
13 IVECO

Engines in the Iveco range are split into subgroups depending upon the type of engine governing are employed. These different systems are fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link. We have collated the following data for the electronically governed engines.

13.1 EDC62



Iveco EDC62 mounted on the engine



EDC62 interface board

13.1.1 ECU FUNCTIONALITY

EDC62 FUNCTIONALITY	
MODBUS Engine Hours	x
MODBUS Oil Pressure	x
MODBUS Coolant Temperature	x
MODBUS Engine RPM	x
MODBUS Charge Alt	x
MODBUS Speed Feed	x
Engine speed	✓
Oil Pressure	DSE
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	DSE
Number of Starts	DSE
Oil Temperature	x
Coolant Pressure	x
Inlet Temperature	✓
Exhaust Temperature	x
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	x
Fuel Consumption	x
Fuel Used	x
Atmospheric Pressure	x
Water in Fuel	x

EDC62 FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	x
DM1 Malfunction	x
Start	x
Stop	x
1500/1800 switch	✓
Idle Mode	✓
Speed Control	x
Source address	0x03
ECU Power	
ECU Stop	
J1939 msg	RQST, TSC1
Proprietary msg	Iveco_EDC2BC
Notes	No oil pressure via CAN
DTC Ignore	

LEGEND	
✓	Function supported
x	Not supported
DSE	DSE controller measures/calculates the value

13.1.2 ECU WIRING

EDC62 INTERFACE 'J3 CONNECTOR' TERMINALS		
DSE TERMINAL DESCRIPTION		NOTES
Fuel Relay Output	9	NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i>. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	6	CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.

EDC62 INTERFACE 'J7 CONNECTOR' TERMINALS		
DSE TERMINAL DESCRIPTION		NOTES
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	5	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	2	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

13.1.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

13.1.3.1 DSE CONFIGURATION SUITE SOFTWARE

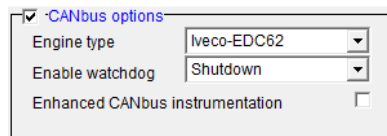
These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.



The DSE controller must be configured for the **Iveco EDC62** CAN file.

13.1.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.



The DSE controller must be configured for the **Iveco-EDC62** CAN file.

13.2 EDC7C1



13.2.1 ECU FUNCTIONALITY

EDC7C1 FUNCTIONALITY	
MODBUS Engine Hours	✓
MODBUS Oil Pressure	✗
MODBUS Coolant Temperature	✗
MODBUS Engine RPM	✗
MODBUS Charge Alt	✗
MODBUS Speed Feed	✗
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	✗
Inlet Temperature	✓
Exhaust Temperature	✗
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✗
Fuel Consumption	✗
Fuel Used	✗
Atmospheric Pressure	✓
Water in Fuel	✗

EDC7C1 FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	✗
DM1 Malfunction	✗
Start	✗
Stop	✗
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✗
Source address	0x03
ECU Power	
ECU Stop	
J1939 msg	RQST, TSC1
Proprietary msg	Iveco_EDC2BC
Notes	
DTC Ignore	

LEGEND	
✓	Function supported
✗	Not supported
DSE	DSE controller measures/calculates the value

13.2.2 ECU WIRING

EDC7UC31 INTERFACE 'J3 CONNECTOR' TERMINALS		
DSE TERMINAL DESCRIPTION		NOTES
Fuel Relay Output	9	NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i>. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	6	CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.

EDC7UC31 INTERFACE 'J7 CONNECTOR' TERMINALS		
DSE TERMINAL DESCRIPTION		NOTES
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	5	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	2	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

13.2.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

13.2.3.1 DSE CONFIGURATION SUITE SOFTWARE

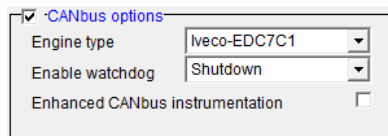
These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.



The DSE controller must be configured for the **Iveco EDC7C1** CAN file.

13.2.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.



The DSE controller must be configured for the **Iveco-EDC7C1** CAN file.

13.3 EDC7UC31



13.3.1 ECU FUNCTIONALITY

EDC7UC31 FUNCTIONALITY	
MODBUS Engine Hours	x
MODBUS Oil Pressure	x
MODBUS Coolant Temperature	x
MODBUS Engine RPM	x
MODBUS Charge Alt	x
MODBUS Speed Feed	x
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	x
Inlet Temperature	✓
Exhaust Temperature	x
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	x
Fuel Consumption	✓
Fuel Used	✓
Atmospheric Pressure	✓
Water in Fuel	x

EDC7UC31 FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	x
DM1 Malfunction	x
Start	x
Stop	x
1500/1800 switch	✓
Idle Mode	✓
Speed Control	x
Source address	0x27
ECU Power	
ECU Stop	
J1939 msg	RQST, TSC1
Proprietary msg	Iveco_EDC2BC
Notes	
DTC Ignore	

LEGEND	
✓	Function supported
x	Not supported
DSE	DSE controller measures/calculates the value

13.3.2 ECU WIRING

EDC7UC31 INTERFACE 'J3 CONNECTOR' TERMINALS		
DSE TERMINAL DESCRIPTION		NOTES
Fuel Relay Output	9	NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i>. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	6	CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.

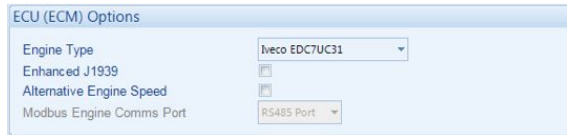
EDC7UC31 INTERFACE 'J7 CONNECTOR' TERMINALS		
DSE TERMINAL DESCRIPTION		NOTES
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	5	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	2	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

13.3.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

13.3.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.



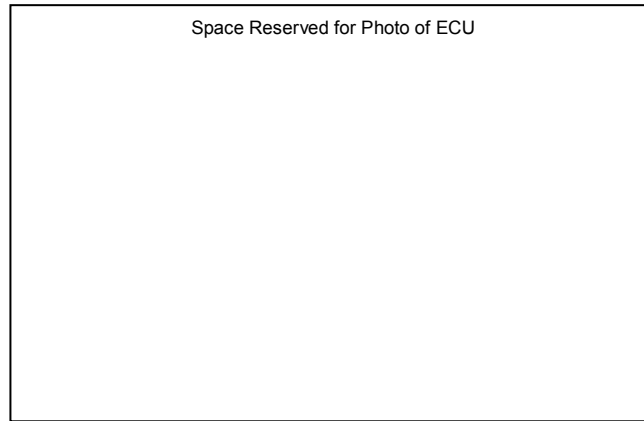
The DSE controller must be configured for the **Iveco EDC7UC31** CAN file.

13.3.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

 **NOTE:-** The Iveco EDC7UC31 CAN file is not currently available for the DSE5xxx and DSE75xxx range of modules. Please contact the DSE Technical Support Department for more information.

13.4 T3



13.4.1 ECU FUNCTIONALITY

T3 FUNCTIONALITY	
MODBUS Engine Hours	*
MODBUS Oil Pressure	*
MODBUS Coolant Temperature	*
MODBUS Engine RPM	*
MODBUS Charge Alt	*
MODBUS Speed Feed	*
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	DSE
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	*
Inlet Temperature	*
Exhaust Temperature	*
Fuel Temperature	*
Turbo Pressure	*
Fuel Pressure	*
Fuel Consumption	*
Fuel Used	*
Atmospheric Pressure	*
Water in Fuel	*

T3 FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	*
DM1 Malfunction	*
Start	✓
Stop	✓
1500/1800 switch	✓
Idle Mode	✓
Speed Control	*
Source address	0x03
ECU Power	delay
ECU Stop	
J1939 msg	RQST, TSC1
Proprietary msg	Iveco_ENG_CNTRL
Notes	Proprietary messages for oil pressure and coolant temperature
DTC Ignore	

LEGEND	
✓	Function supported
*	Not supported
DSE	DSE controller measures/calculates the value

13.4.2 ECU WIRING

DSE TERMINAL DESCRIPTION	IVECO T3 CONNECTIONS	NOTES
Fuel Relay Output	Ignition Switch Terminal	NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i> . CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	-	Connect directly to engine starter solenoid. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	31	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	32	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

NOTE: Some Iveco engines have been reported to not show the 'Hours Run' instrumentation when used with the Generic can config.

NOTE: The start input on some ECUs will not start the engine, direct wiring to the starter motor needs to be made.

13.4.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

13.4.3.1 DSE CONFIGURATION SUITE SOFTWARE

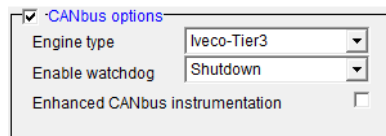
These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.



The DSE controller must be configured for the **Iveco T3** CAN file.

13.4.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.



The DSE controller must be configured for the **Iveco-Tier3** CAN file.

14 JOHN DEERE

Engines in the John Deere range are fitted with only one type of engine governing. This system is fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link. We have collated the following data for the electronically governed engines.

14.1 JDEC



14.1.1 ECU FUNCTIONALITY

JDEC FUNCTIONALITY	
MODBUS Engine Hours	✖
MODBUS Oil Pressure	✖
MODBUS Coolant Temperature	✖
MODBUS Engine RPM	✖
MODBUS Charge Alt	✖
MODBUS Speed Feed	✓
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	DSE
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	✖
Inlet Temperature	✓
Exhaust Temperature	✖
Fuel Temperature	✓
Turbo Pressure	✖
Fuel Pressure	✓
Fuel Consumption	✓
Fuel Used	✓
Atmospheric Pressure	✖
Water in Fuel	✖

JDEC FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	✖
DM1 Malfunction	✖
Start	✖
Stop	✖
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✓
Source address	0x03
ECU Power	
ECU Stop	
J1939 msg	RQST, TSC3
Proprietary msg	None
Notes	
DTC Ignore	

LEGEND	
✓	Function supported
✖	Not supported
DSE	DSE controller measures/calculates the value

14.1.2 ECU WIRING

DSE TERMINAL DESCRIPTION	JOHN DEERE 21-PIN DEUTSCH CONNECTOR TERMINAL	NOTES
Fuel Relay Output	J	Terminal J on the John Deere connection is the ignition ⚠ CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	D	Terminal D on the John Deere connection is the start input ⚠ CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Auxiliary Output 1	G	Using PC software select the relevant engine and configure 'Auxiliary Output 1' to be 'ECU POWER'. ⚠ CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	1 (Hi)	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	2 (Lo)	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

⚠ NOTE:- The JDEC ECU must be configured to enable Torque Speed Control on TSC source 1 to source address 3 and the Governor set to 'Single Governor' Isochronous governing selected.

14.1.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

14.1.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

The screenshot shows the 'ECU (ECM) Options' section with two identical panels. The first panel has 'Engine Type' set to 'John Deere', 'Enhanced J1939' checked, 'Alternative Engine Speed' checked, and 'Modbus Engine Comms Port' set to 'RS485 Port'. The second panel has 'Engine Type' set to 'John Deere Pump', 'Enhanced J1939' checked, 'Alternative Engine Speed' checked, and 'Modbus Engine Comms Port' set to 'RS485 Port'. Below these is the 'Governor' section with two sliders: 'Centre (SW1)' set to 5.0 and 'Range (SW2)' set to 4.0, each with a 'Reset' button.

The DSE controller must be configured for the **John Deere** CAN file.

The DSE controller must be configured for the **John Deere Pump** CAN file to disable speed control.

Using the **John Deere** CAN file will require a SW1 setting of 5.0 and an SW2 setting of 4.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

14.1.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

The screenshot shows the 'CANbus options' section with 'Engine type' set to 'John Deere', 'Enable watchdog' set to 'Shutdown', and 'Enhanced CANbus instrumentation' unchecked. Below this is the 'Governor interface' section with two sliders: 'Centre (SW1)' set to 5.0 and 'Range (SW2)' set to 2.0.

The DSE controller must be configured for the **John Deere** CAN file.

Using the **John Deere** CAN file will require a SW1 setting of 5.0 and an SW2 setting of 2.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

15 MTU

Engines in the MTU range are split into subgroups depending upon the type of engine governing are employed. These different systems are fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link. We have collated the following data for the electronically governed engines.

15.1 ADEC



ADEC ECU Mounted on the engine



SAM module mounted in the customer panel

15.1.1 ECU FUNCTIONALITY

ADEC FUNCTIONALITY	
MODBUS Engine Hours	*
MODBUS Oil Pressure	*
MODBUS Coolant Temperature	*
MODBUS Engine RPM	*
MODBUS Charge Alt	*
MODBUS Speed Feed	*
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	*
Inlet Temperature	✓
Exhaust Temperature	*
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	*
Fuel Used	*
Atmospheric Pressure	*
Water in Fuel	*

ADEC FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	*
DM1 Malfunction	*
Start	✓
Stop	✓
1500/1800 switch	✓
Idle Mode	✓
Speed Control	*
Source address	0x1
ECU Power	&delay
ECU Stop	
J1939 msg	OHECS, RQST, EBC1, CCVS, TSC1
Proprietary msg	mtu_LS, mtu_SDS, mtu_CONT
Notes	ECU permanently powered.
DTC Ignore	

LEGEND	
✓	Function supported
*	Not supported
DSE	DSE controller measures/calculates the value

15.1.2 ECU WIRING

DSE TERMINAL DESCRIPTION	MTU ADEC TERMINAL	MTU SAM TERMINAL	NOTES
Fuel Relay Output	X1 37	-	Start input of ADEC (DI 7). Connect X1 22 to GND This terminal is optional. Start command is also sent by CAN message.
Start Relay Output	X1 43	-	Stop input of ADEC (DI 1). Connect X1 28 to GND
CANbus common	-	X23 3	Screen for the J1939 cable. Connect at one end only.
CANbus H	1 (Hi)	X23 2	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	2 (Lo)	X23 1	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

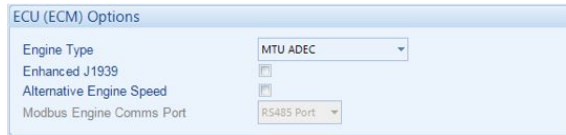
- ⚠ NOTE:- The ADEC ECU is designed to be permanently powered via the emergency stop button on the control panel.
- ⚠ NOTE:- Cranking of the engine is managed by the ADEC controller following instruction from the DSE controller.
- ⚠ NOTE:- The ADEC ECU has to be used with in conjunction with the MTU SAM display module.

15.1.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

15.1.3.1 DSE CONFIGURATION SUITE SOFTWARE

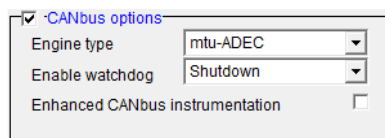
These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.



The DSE controller must be configured for the **MTU ADEC** CAN file.

15.1.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.



The DSE controller must be configured for the **mtu-ADEC** CAN file.

15.2 MDEC



15.2.1 ECU FUNCTIONALITY

MDEC FUNCTIONALITY	
MODBUS Engine Hours	x
MODBUS Oil Pressure	x
MODBUS Coolant Temperature	x
MODBUS Engine RPM	x
MODBUS Charge Alt	x
MODBUS Speed Feed	x
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	✓
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	x
Inlet Temperature	✓
Exhaust Temperature	x
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	✓
Fuel Used	✓
Atmospheric Pressure	x
Water in Fuel	x

MDEC FUNCTIONALITY	
DM1 Conv. Method	N/A
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	x
DM1 Malfunction	x
Start	✓ (Not available when using MTU MDEC 303)
Stop	✓
1500/1800 switch	
Idle Mode	
Speed Control	✓
Source address	N/A
ECU Power	&delay
ECU Stop	
J1939 msg	N/A
Proprietary msg	N/A
Notes	ECU permanently powered.
DTC Ignore	

LEGEND	
✓	Function supported
x	Not supported
DSE	DSE controller measures/calculates the value

15.2.2 ECU WIRING

DSE TERMINAL DESCRIPTION	MTU MDEC X1 CONNECTOR TERMINAL	NOTES
Fuel Relay Output	BE9	Start input of MDEC
Start Relay Output	BE1	Run input of MDEC
CANbus common	E	Screen for the J1939 cable. Connect at one end only.
CANbus H	G	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	F	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

NOTE: The MDEC ECU is designed to be permanently powered however the DSE controller can be configured to switch the ECU power by configuring an Auxiliary output to be “ECU power”. This output should be used to control the ECU power relay and will turn off the MDEC ECU when the DSE controller is placed into STOP/RESET mode. Note that using this method, the MDEC ECU takes approximately 30 seconds to power up once the DSE controller is taken out of STOP/RESET mode.

NOTE: Cranking of the engine is managed by the MDEC controller following instruction from the DSE controller.

NOTE: The MTU engine can be used with or without the MTU PIM display module. Ensure that MTU are informed prior to the despatch of your engine whether or not you intend to fit the PIM module and also that you require CAN for connection to the DSE controller. This will ensure that you receive the engine with the relevant options enabled. Incorrectly set options for PIM and secondary CAN controller may lead to “CAN 1 NODE LOST 180” errors displayed by the DSE module (and MTU PIM module)

NOTE: DSE55xx, DSE75xx and DSE8xxx can perform synchronising and loadsharing using CAN instructions to the engine ECU when using the MTU-MDEC-304 configuration file in conjunction with compatible MDEC controllers. If in doubt about the MDEC version you have, you are referred to MTU.

NOTE: MDEC Speed control is configurable. Ensure it is set to receive speed control signals via the CAN interface.

15.2.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

15.2.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

The screenshot displays the 'ECU (ECM) Options' section with three identical panels. Each panel shows 'Engine Type' set to 'MTU MDEC303', 'Enhanced J1939' checked, 'Alternative Engine Speed' checked, and 'Modbus Engine Comms Port' set to 'RS485 Port'. Below this, the 'Governor' section shows 'Centre (SW1)' set to 5.0 and 'Range (SW2)' set to 4.0, both with 'Reset' buttons.

Using the **MTU MDEC303** CAN file with a version 304 MDEC a warning error code "SD CAN SPEED DEMAND 250" will be displayed on the DSE controller (and MTU PIM module). Speed control is not available using the **MTU MDEC303** CAN file. If in doubt about the MDEC version you have, you are referred to MTU.

When using the **MTU MDEC304** CAN file, speed control is available. If in doubt about the MDEC version you have, you are referred to MTU.

When using the **MTU MDEC504** CAN file, speed control is available. If in doubt about the MDEC version you have, you are referred to MTU.

Using the MTU MDEC304 CAN file and above will require a SW1 setting of 5.0 and an SW2 setting of 4.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

15.2.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

The screenshot shows two identical 'CANbus options' panels. Each panel has 'Engine type' set to 'mtu-MDEC-303', 'Enable watchdog' set to 'Shutdown', and 'Enhanced CANbus instrumentation' unchecked.

Using the **mtu-MDEC-303** CAN file with a version 304 MDEC, a warning error code "SD CAN SPEED DEMAND 250" will be displayed on the DSE controller (and MTU PIM module). Speed control is not available using the **mtu-MDEC-303** CAN file

When using the **mtu-MDEC-304** CAN file, speed control is available.

NOTE:- The mtu-MDEC-506 CAN file is not currently available for the DSE5xxx and DSE75xxx range of modules. Please contact the DSE Technical Support Department for more information.

The screenshot shows the 'Governor interface' with 'Centre (SW1)' set to 5.0 and 'Range (SW2)' set to 2.0. Below it, the 'Charge alternator voltage' section is shown with the checkbox unchecked.

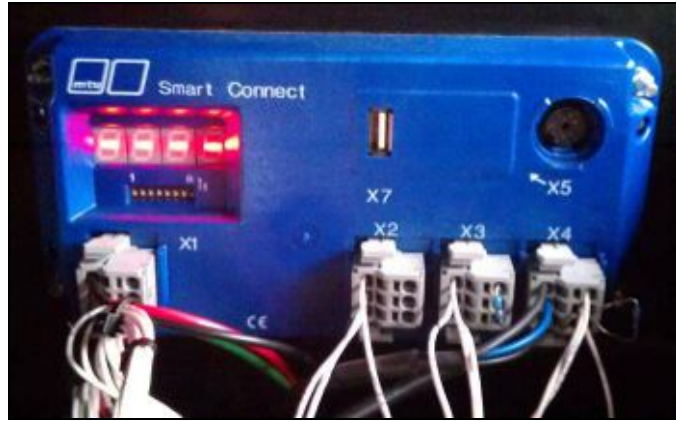
Using the **MTU MDEC304** CAN file and above will require a SW1 setting of 5.0 and an SW2 setting of 4.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

Ensure crank disconnect on **Charge Alternator Voltage** is **disabled** (not checked).

15.3 ECU8



ECU8 Mounted on the engine



Smart Connect module mounted in the customer panel

15.3.1 ECU FUNCTIONALITY

ECU8 FUNCTIONALITY	
MODBUS Engine Hours	*
MODBUS Oil Pressure	✓
MODBUS Coolant Temperature	✓
MODBUS Engine RPM	✓
MODBUS Charge Alt	*
MODBUS Speed Feed	✓
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	*
Coolant Pressure	*
Inlet Temperature	*
Exhaust Temperature	*
Fuel Temperature	*
Turbo Pressure	✓
Fuel Pressure	*
Fuel Consumption	*
Fuel Used	*
Atmospheric Pressure	*
Water in Fuel	*

ECU8 FUNCTIONALITY	
DM1 Conv. Method	N/A
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	*
DM1 Malfunction	*
Start	✓
Stop	✓
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✓
Source address	0x01
ECU Power	&delay
ECU Stop	
J1939 msg	OHECS, RQST, EBC1, CCVS, TSC1
Proprietary msg	mtu_LS, mtu_SDS, mtu_CONT
Notes	
DTC Ignore	

LEGEND	
✓	Function supported
*	Not supported
DSE	DSE controller measures/calculates the value

15.3.2 ECU WIRING

ECU8 DSE TERMINAL DESCRIPTION 'X1 CONNECTOR' TERMINAL NOTES		
Fuel Relay Output	31, 32	External relay used to close terminal 31 to terminal 32. NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i>. CAUTION!:- An external slave relay will be needed. Check the current consumption and specify relay accordingly.

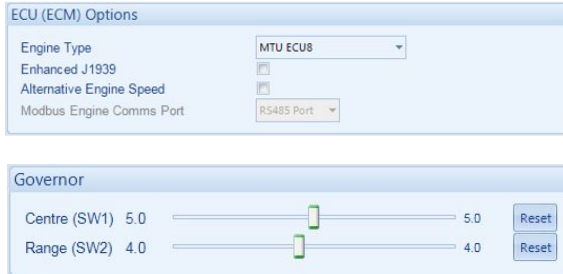
SMART CONNECT DSE TERMINAL DESCRIPTION 'X4 CONNECTOR' TERMINAL NOTES		
CANbus common	3	Screen for the J1939 cable. Connect at one end only.
CANbus H	1	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	2	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

15.3.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

15.3.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.



The screenshot shows two panels from the DSE Configuration Suite Software. The top panel, titled 'ECU (ECM) Options', contains four settings: 'Engine Type' set to 'MTU ECU8', 'Enhanced J1939' with a checked checkbox, 'Alternative Engine Speed' with an unchecked checkbox, and 'Modbus Engine Comms Port' set to 'RS485 Port'. The bottom panel, titled 'Governor', shows two sliders: 'Centre (SW1)' with a value of 5.0 and 'Range (SW2)' with a value of 4.0. Each slider has a 'Reset' button to its right.

The DSE controller must be configured for the **MTU ECU8** CAN file.

Using the MTU ECU8 CAN file will require a SW1 setting of 5.0 and an SW2 setting of 4.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

15.3.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

NOTE:- The MTU ECU8 CAN file is not currently available for the DSE5xxx and DSE75xxx range of modules. Please contact the DSE Technical Support Department for more information.

16 PERKINS

Engines in the Perkins range are split into subgroups depending upon the type of engine governing are employed. These different systems are fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link. We have collated the following data for the electronically governed engines.

16.1 1300



16.1.1 ECU FUNCTIONALITY

1300 FUNCTIONALITY	
MODBUS Engine Hours	x
MODBUS Oil Pressure	x
MODBUS Coolant Temperature	x
MODBUS Engine RPM	x
MODBUS Charge Alt	x
MODBUS Speed Feed	x
Engine Speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	DSE
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	x
Inlet Temperature	x
Exhaust Temperature	x
Fuel Temperature	x
Turbo Pressure	✓
Fuel Pressure	x
Fuel Consumption	x
Fuel Used	x
Atmospheric Pressure	x
Water in Fuel	x

1300 FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	x
DM1 Malfunction	x
Start	x
Stop	✓
1500/1800 switch	x
Idle Mode	x
Speed Control	x
Source address	0x11
ECU Power	&delay
ECU Stop	
J1939 msg	None
Proprietary msg	Perkins_A
Notes	
DTC Ignore	

Legend	
✓	Function supported
x	Not supported
DSE	DSE controller measures/calculates the value

16.1.2 ECU WIRING

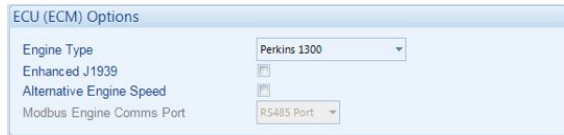
NOTE:- DSE currently do not have any wiring information for this ECU. Please contact the engine supplier for more information.

16.1.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

16.1.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.



The DSE controller must be configured for the **Perkins 1300** CAN file.

16.1.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

 **NOTE:-** The Perkins 1300 CAN file is not currently available for the DSE5xxx and DSE75xxx range of modules. Please contact the DSE Technical Support Department for more information.

16.2 ADEM3



16.2.1 ECU FUNCTIONALITY

ADEM3 FUNCTIONALITY	
MODBUS Engine Hours	✓
MODBUS Oil Pressure	✗
MODBUS Coolant Temperature	✗
MODBUS Engine RPM	✗
MODBUS Charge Alt	✗
MODBUS Speed Feed	✗
Engine Speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✗
Coolant Pressure	✗
Inlet Temperature	✓
Exhaust Temperature	✗
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✗
Fuel Consumption	✓
Fuel Used	✗
Atmospheric Pressure	✗
Water in Fuel	✗

ADEM3 FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	✗
DM1 Malfunction	✗
Start	✗
Stop	✓
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✗
Source address	0x11
ECU Power	&delay
ECU Stop	
J1939 msg	RQST, TC1, ETC3
Proprietary msg	None
Notes	
DTC Ignore	

Legend	
✓	Function supported
✗	Not supported
DSE	DSE controller measures/calculates the value

16.2.2 ECU WIRING

DSE TERMINAL DESCRIPTION	PERKINS 'J1 CONNECTOR' TERMINAL	NOTES
Fuel Relay Output	70	NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i>. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	-	Connect directly to engine starter solenoid. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
CANbus common	42	Screen for the J1939 cable. Connect at one end only.
CANbus H	50	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	34	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

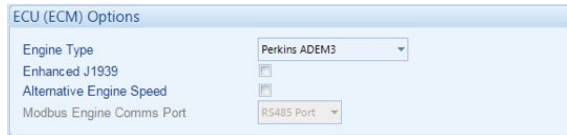
NOTE:- According to Perkins, warning lamps or equivalent must be connected to Perkins customer interface connector terminals 28, 29, 30 & 31. Failure to connect to these terminals will result in "open circuit" alarms from the ECU. Perkins have advised that a suitable equivalent for the warning lamp is a 220Ω 5W resistor. Be aware that outputs on terminals 10,19 & 20 are battery positive outputs. The outputs on terminals 28, 29, 30 & 31 are battery negative outputs.

16.2.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

16.2.3.1 DSE CONFIGURATION SUITE SOFTWARE

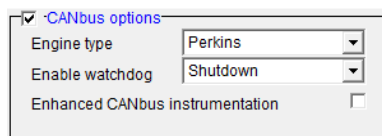
These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.



The DSE controller must be configured for the **Perkins ADEM3** CAN file.

16.2.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.



The DSE controller must be configured for the **Perkins** CAN file.

16.3 ADEM4



16.3.1 ECU FUNCTIONALITY

ADEM4 FUNCTIONALITY	
MODBUS Engine Hours	✓
MODBUS Oil Pressure	✗
MODBUS Coolant Temperature	✗
MODBUS Engine RPM	✗
MODBUS Charge Alt	✗
MODBUS Speed Feed	✗
Engine Speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✗
Coolant Pressure	✗
Inlet Temperature	✓
Exhaust Temperature	✗
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✗
Fuel Consumption	✓
Fuel Used	✓
Atmospheric Pressure	✗
Water in Fuel	✗

ADEM4 FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	✗
DM1 Malfunction	✗
Start	✗
Stop	✓
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✓
Source address	0x11
ECU Power	&delay2
ECU Stop	
J1939 msg	RQST, TC1, ETC3
Proprietary msg	None
Notes	ECU permanently powered
DTC Ignore	

Legend	
✓	Function supported
✗	Not supported
DSE	DSE controller measures/calculates the value

16.3.2 ECU WIRING

PERKINS 'COMMUNICATION INTERFACE CONNECTOR (DEUTSCH HD16-9-96S)' TERMINAL		
DSE TERMINAL DESCRIPTION		NOTES
Fuel Relay Output	Unknown	NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i>. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	Unknown	CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
CANbus common	C	Screen for the J1939 cable. Connect at one end only.
CANbus H	G	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	F	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

16.3.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

16.3.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

The DSE controller must be configured for the **Perkins ADEM4** CAN file.

Using the **Perkins ADEM4** CAN file will require a SW1 setting of 5.0 and an SW2 setting of 4.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

16.3.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

The DSE controller must be configured for the **Perkins_ADEM_4** CAN file.

Using the **Perkins_ADEM_4** CAN file will require a SW1 setting of 5.0 and an SW2 setting of 2.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

17 SCANIA

Engines in the Scania range are fitted with the S6 type of engine governing. The Scania diagnostics system is known as Keyword 2000™ and is fully compatible with the DSE Controllers when configured correctly. It can allow engine control and diagnostics via the J1939 link. We have collated the following data for the electronically governed engines below.

17.1 S6



17.1.1 ECU FUNCTIONALITY

S6 FUNCTIONALITY	
MODBUS Engine Hours	×
MODBUS Oil Pressure	×
MODBUS Coolant Temperature	×
MODBUS Engine RPM	×
MODBUS Charge Alt	×
MODBUS Speed Feed	×
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	×
Inlet Temperature	✓
Exhaust Temperature	×
Fuel Temperature	×
Turbo Pressure	✓
Fuel Pressure	×
Fuel Consumption	✓
Fuel Used	×
Atmospheric Pressure	×
Water in Fuel	×

S6 FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	×
DM1 Malfunction	×
Start	✓
Stop	✓
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✓
Source address	0x27, 0xFB
ECU Power	
ECU Stop	
J1939 msg	CCVS, KW2000
Proprietary msg	Scania_TSC, Scania_DLN1
Notes	
DTC Ignore	

Legend	
✓	Function supported
×	Not supported
DSE	DSE controller measures/calculates the value

17.1.2 ECU WIRING

DSE TERMINAL DESCRIPTION	SCANIA 'EMS B1 CONNECTOR' TERMINAL	NOTES
Fuel Relay Output	3	Ignition U15 NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i> . CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	-	Connect directly to engine starter solenoid. NOTE:- Not required on 'later' Scania S6 engines as cranking is performed by the S6 ECU. Contact Scania for more information. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	9	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	10	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

NOTE:- DSE55xx, DSE75xx and DSE8xxx can perform synchronising and load sharing using CAN instructions to the engine ECU.

17.1.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

17.1.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

The DSE controller must be configured for the **Scania S6** CAN file. The Scania Co-ordinator device must not be connected to the engine with this CAN file.

Using the Scania S6 CAN file will require a SW1 setting of 5.0 and an SW2 setting of 4.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

17.1.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

The DSE controller must be configured for the **Scania-kw2000** CAN file when the Co-ordinator device is fitted to the engine.

The DSE controller must be configured for the **Scania-kw2k-coo** CAN file when the Co-ordinator device is not fitted to the engine. The DSE controller will perform some additional functions normally performed by the Co-ordinator.

Using the **Scania-kw2000** or **Scania-kw2k-coo** CAN file will require a SW1 setting of 5.0 and an SW2 setting of 2.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

18 SISU

Engines in the Sisu range are fitted with only one type of engine governing. This system is fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link. We have collated the following data for the electronically governed engines.

18.1 EEM3



18.1.1 ECU FUNCTIONALITY

EEM3 FUNCTIONALITY	
MODBUS Engine Hours	x
MODBUS Oil Pressure	x
MODBUS Coolant Temperature	x
MODBUS Engine RPM	x
MODBUS Charge Alt	x
MODBUS Speed Feed	x
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	x
Coolant Pressure	x
Inlet Temperature	✓
Exhaust Temperature	x
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	x
Fuel Used	x
Atmospheric Pressure	x
Water in Fuel	x

EEM3 FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	✓
DM1 Malfuction	✓
Start	✓
Stop	✓
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✓
Source address	0x03, 0x11, 0x27
ECU Power	
ECU Stop	
J1939 msg	RQST, TSC1, OHECS, GPM24, DM3
Proprietary msg	None
Notes	OEM DTCs messages included
DTC Ignore	

LEGEND	
✓	Function supported
x	Not supported
DSE	DSE controller measures/calculates the value

18.1.2 ECU WIRING

DSE TERMINAL DESCRIPTION	SISU 'EEM3 CONNECTOR' TERMINAL	NOTES
Fuel Relay Output	5	NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i>. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	30	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	31	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

18.1.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

18.1.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

The screenshot shows the 'ECU (ECM) Options' window. It contains four settings: 'Engine Type' set to 'Sisu EEM3', 'Enhanced J1939' with a checked checkbox, 'Alternative Engine Speed' with a checked checkbox, and 'Modbus Engine Comms Port' set to 'RS485 Port'.

The DSE controller must be configured for the **Sisu EEM3** CAN file.

The screenshot shows the 'Governor' window. It has two sliders: 'Centre (SW1)' ranging from 5.0 to 5.0 and 'Range (SW2)' ranging from 4.0 to 4.0. Each slider has a green marker in the middle and a 'Reset' button to its right.

Using the Sisu EEM3 CAN file will require a SW1 setting of 5.0 and an SW2 setting of 4.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

18.1.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

The screenshot shows the 'CANbus options' window. It has a checked checkbox for 'CANbus options'. Below it are three settings: 'Engine type' set to 'Sisu-EEM3', 'Enable watchdog' set to 'Shutdown', and 'Enhanced CANbus instrumentation' with an unchecked checkbox.

The DSE controller must be configured for the **Sisu-EEM3** CAN file..

The screenshot shows the 'Governor interface' window. It has two sliders: 'Centre (SW1)' ranging from 5.0 to 5.0 and 'Range (SW2)' ranging from 2.0 to 2.0. Each slider has a white marker in the middle.

Using the **Sisu-EEM3** CAN file will require a SW1 setting of 5.0 and an SW2 setting of 2.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps

19 VOLVO

Engines in the Volvo Penta range are split into subgroups depending upon the type of engine governing are employed. These different systems are fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link.

We have collated the following data for the electronically governed engines.

19.1 EDC3



19.1.1 ECU FUNCTIONALITY

EDC3 FUNCTIONALITY	
MODBUS Engine Hours	*
MODBUS Oil Pressure	*
MODBUS Coolant Temperature	*
MODBUS Engine RPM	*
MODBUS Charge Alt	*
MODBUS Speed Feed	*
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	✓
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	*
Inlet Temperature	✓
Exhaust Temperature	*
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	✓
Fuel Used	*
Atmospheric Pressure	*
Water in Fuel	*

EDC3 FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	*
DM1 Malfunction	*
Start	✓
Stop	✓
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✓
Source address	0x11, 0x2B
ECU Power	
ECU Stop	Pulse
J1939 msg	RQST, TSC1
Proprietary msg	Volvo_VP_Status
Notes	Uses CM1
DTC Ignore	

Legend	
✓	Function supported
*	Not supported
DSE	DSE controller measures/calculates the value

19.1.2 ECU WIRING

DSE TERMINAL DESCRIPTION	VOLVO TAD12 'STAND ALONE CONNECTOR' TERMINAL	NOTES
Fuel Relay Output	H	⚠ CAUTION! :- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	E	⚠ CAUTION! :- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Auxiliary Output 1	P	Using PC software configure 'Auxiliary Output 1' to be 'ECU POWER' ⚠ NOTE! :- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	1 (Hi)	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	2 (Lo)	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

⚠ NOTE!:- Should the TAD12 ECU detect an engine fault not monitored by the DSE Module, an 'external reset' must be provided to reset the ECU. Volvo specify that the reset is performed using external pushbuttons to give an input to TAD12 Standalone connector terminal J (diagnostics), P (power) and H(stop).

According to Volvo, the reset sequence is:

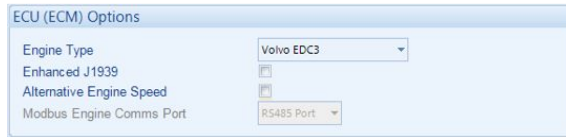
1. Press and hold down the diagnostic button (terminal J) and apply power to H (stop)
2. Apply power to P (but don't start the engine).
3. Hold these inputs for three seconds.
4. Release the diagnostic button (terminal J).
5. Remove power from H (stop).
6. Remove power from P (power).

19.1.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

19.1.3.1 DSE CONFIGURATION SUITE SOFTWARE

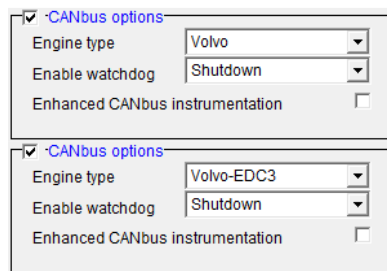
These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.



The DSE controller must be configured for the **Volvo EDC4** CAN file.

19.1.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.



The DSE controller must be configured for either the **Volvo** or **Volvo-EDC3** CAN file depending which is available.

19.2 EDC4



19.2.1 ECU FUNCTIONALITY

EDC4 FUNCTIONALITY	
MODBUS Engine Hours	×
MODBUS Oil Pressure	×
MODBUS Coolant Temperature	×
MODBUS Engine RPM	×
MODBUS Charge Alt	×
MODBUS Speed Feed	×
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	DSE
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	×
Coolant Pressure	×
Inlet Temperature	×
Exhaust Temperature	×
Fuel Temperature	✓
Turbo Pressure	×
Fuel Pressure	×
Fuel Consumption	✓
Fuel Used	×
Atmospheric Pressure	×
Water in Fuel	×

EDC4 FUNCTIONALITY	
DM1 Conv. Method	1
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	×
DM1 Malfunction	×
Start	×
Stop	✓
1500/1800 switch	✓
Idle Mode	×
Speed Control	×
Source address	0x03
ECU Power	
ECU Stop	
J1939 msg	RQST, TSC1
Proprietary msg	Volvo_EngineStopRequest
Notes	Uses CM1
DTC Ignore	91, 743, 677, 6279

Legend	
✓	Function supported
×	Not supported
DSE	DSE controller measures/calculates the value

19.2.2 ECU WIRING

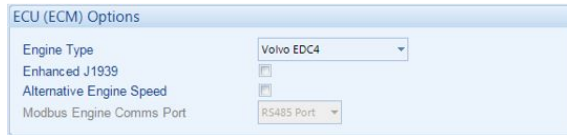
DSE TERMINAL DESCRIPTION	VOLVO EDC4 CONNECTOR TERMINAL	NOTES
Fuel Relay Output	14	NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i>. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	-	Connect directly to engine starter solenoid. CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
	1	Connects directly to battery negative
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	12	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	13	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

19.2.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

19.2.3.1 DSE CONFIGURATION SUITE SOFTWARE

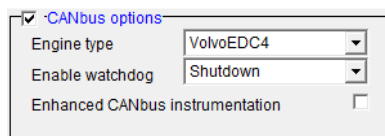
These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

A screenshot of a software dialog box titled "ECU (ECM) Options". It contains four rows of settings: "Engine Type" with a dropdown menu showing "Volvo EDC4", "Enhanced J1939" with a checked checkbox, "Alternative Engine Speed" with a checked checkbox, and "Modbus Engine Comms Port" with a dropdown menu showing "RS485 Port".

The DSE controller must be configured for the **Volvo EDC4** CAN file.

19.2.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

A screenshot of a software dialog box titled "CANbus options". It has a checked checkbox at the top left. Below it are three rows: "Engine type" with a dropdown menu showing "VolvoEDC4", "Enable watchdog" with a dropdown menu showing "Shutdown", and "Enhanced CANbus instrumentation" with an unchecked checkbox.

The DSE controller must be configured for the **VolvoEDC4** CAN file.

19.3 EMS2/B



19.3.1 ECU FUNCTIONALITY

EMS2/B FUNCTIONALITY	
MODBUS Engine Hours	*
MODBUS Oil Pressure	*
MODBUS Coolant Temperature	*
MODBUS Engine RPM	*
MODBUS Charge Alt	*
MODBUS Speed Feed	✓
Engine speed	✓
Oil Pressure	✓
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	✓
Engine Hours	✓
Number of Starts	DSE
Oil Temperature	✓
Coolant Pressure	*
Inlet Temperature	✓
Exhaust Temperature	*
Fuel Temperature	✓
Turbo Pressure	✓
Fuel Pressure	✓
Fuel Consumption	✓
Fuel Used	✓
Atmospheric Pressure	*
Water in Fuel	*

EMS2/B FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	*
DM1 Malfunction	*
Start	✓
Stop	✓
1500/1800 switch	✓
Idle Mode	✓
Speed Control	✓
Source address	0x11, 0x2B
ECU Power	
ECU Stop	Pulse
J1939 msg	RQST, TSC1
Proprietary msg	Volvo_VP_Status
Notes	
DTC Ignore	608

LEGEND	
✓	Function supported
*	Not supported
DSE	DSE controller measures/calculates the value

19.3.2 ECU WIRING

DSE TERMINAL DESCRIPTION	VOLVO EMS2/B CONNECTOR TERMINAL	NOTES
Auxiliary Output 1	5	Using PC software select the relevant engine and configure 'Auxiliary Output 1' to be 'ECU POWER' ! CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Auxiliary Output 2	6	Using PC software select the relevant engine and configure 'Auxiliary Output 2' to be 'ECU STOP' ! CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
CANbus common	-	Screen for the J1939 cable. Connect at one end only.
CANbus H	1 (Hi)	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	2 (Lo)	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

- ! NOTE:-** Speed control via CAN is not possible if the Volvo CIU is fitted to the engine or with Variable Speed (VE) engines.
- ! NOTE:-** Cranking of the engine is managed by the EMS2 controller following instruction from the DSE controller.
- ! NOTE:-** DSE55xx, DSE75xx and DSE8xxx can perform synchronising and load sharing using CAN instructions to the engine ECU.

19.3.3 CAN CONFIGURATION

EMS2 and EMS2b are different versions of the same ECU. EMS2b is a later version with some issues with the original EMS2 diagnostic reporting having been addressed. As Volvo EMS2/EMS2b has speed control via CAN, you must set the SW1 and SW2 if using a DSE Load Share controller. Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

19.3.3.1 DSE CONFIGURATION SUITE SOFTWARE

These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.

The screenshot displays the 'ECU (ECM) Options' and 'Governor' configuration windows. The 'ECU (ECM) Options' window is shown three times, each with a different engine type selected: 'Volvo EMS2', 'Volvo EMS2b', and 'Volvo EDC3'. Each instance includes checkboxes for 'Enhanced J1939' and 'Alternative Engine Speed', and a dropdown for 'Modbus Engine Comms Port' set to 'RS485 Port'. The 'Governor' window shows two sliders: 'Centre (SW1)' with a value of 5.0 and 'Range (SW2)' with a value of 4.0, each with a 'Reset' button.

Using the **Volvo EMS2b** CAN file with an **Volvo EMS2** engine will result in an alarm being continuously present.

Using the **Volvo EMS2** CAN file with an **Volvo EMS2b** engine will result in some alarms not being annunciated on the DSE controller.

If the Volvo CIU IS fitted, you must use the **Volvo EDC3** CAN file instead of the **Volvo EMS2** file. In this situation speed control by CAN is NOT possible.

Using the Volvo EMS2/b CAN file will require a SW1 setting of 5.0 and an SW2 setting of 4.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps.

19.3.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.

The screenshot displays the 'CANbus options' and 'Governor interface' configuration windows. The 'CANbus options' window is shown three times, each with a different engine type selected: 'Volvo-EMS2', 'Volvo-EMS2b', and 'Volvo'. Each instance includes checkboxes for 'Enable watchdog' (set to 'Shutdown') and 'Enhanced CANbus instrumentation'. The 'Governor interface' window shows two sliders: 'Centre (SW1)' with a value of 5.0 and 'Range (SW2)' with a value of 2.0.

Using the **Volvo-EMS2b** CAN file with an **Volvo EMS2** engine will result in an alarm being continuously present.

Using the **Volvo-EMS2** CAN file with an **Volvo EMS2b** engine will result in some alarms not being annunciated on the DSE controller.

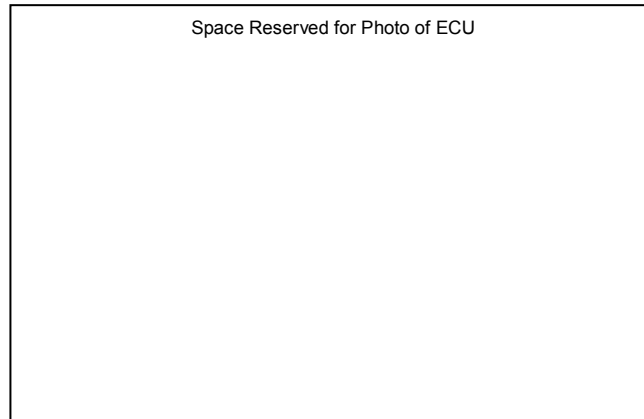
If the Volvo CIU IS fitted, you must use the **Volvo** CAN file instead of the **Volvo EMS2** file. In this situation speed control by CAN is NOT possible.

Using the **Volvo-EMS2/b** CAN file will require a SW1 setting of 5.0 and an SW2 setting of 2.0. This setting is only applicable with DSE Load Share Controllers and will need fine tuning during the DSE Four Steps to Successful Synchronisation Commissioning steps

20 YANMAR

Engines in the Yanmar range are fitted with only one type of engine governing. This system is fully compatible with the DSE Controllers when configured correctly and can allow engine control and diagnostics via the J1939 link. We have collated the following data for the electronically governed engines.

20.1 ECO



20.1.1 ECU FUNCTIONALITY

ECO FUNCTIONALITY	
MODBUS Engine Hours	*
MODBUS Oil Pressure	*
MODBUS Coolant Temperature	*
MODBUS Engine RPM	*
MODBUS Charge Alt	*
MODBUS Speed Feed	✓
Engine speed	✓
Oil Pressure	DSE
Coolant Temperature	✓
Battery Voltage	DSE
Charge Alternator Voltage	*
Engine Hours	✓
Number of Starts	✓
Oil Temperature	*
Coolant Pressure	*
Inlet Temperature	*
Exhaust Temperature	*
Fuel Temperature	*
Turbo Pressure	*
Fuel Pressure	*
Fuel Consumption	*
Fuel Used	*
Atmospheric Pressure	*
Water in Fuel	*

ECO FUNCTIONALITY	
DM1 Conv. Method	4
DM1 Ignored	
DM1 Amber	✓
DM1 Red	✓
DM1 Protect	✓
DM1 Malfunction	✓
Start	*
Stop	✓
1500/1800 switch	*
Idle Mode	*
Speed Control	*
Source address	0x11
ECU Power	
ECU Stop	
J1939 msg	RQST, TSC1
Proprietary msg	Yanmar_OLS, Yanmar_EC, Yanmar_STP
Notes	
DTC Ignore	

LEGEND	
✓	Function supported
*	Not supported
DSE	DSE controller measures/calculates the value

20.1.2 ECU WIRING

DSE TERMINAL DESCRIPTION	ECO KEYSWITCH TERMINAL	NOTES
Fuel Relay Output	4	NOTE:- On applicable modules, configure the <i>Fuel Relay Output</i> to <i>CAN ECU Power</i> . CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.
Start Relay Output	3	CAUTION!:- An external slave relay may be needed. Check the current consumption does not exceed the DSE unit's output specification.

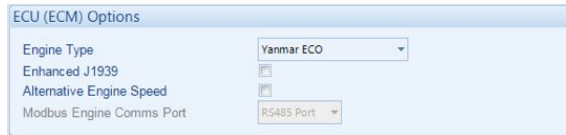
DSE TERMINAL DESCRIPTION	ECO 'R1 CONNECTOR' TERMINAL	NOTES
CANbus common	C	Screen for the J1939 cable. Connect at one end only.
CANbus H	A	J1939 + Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.
CANbus L	B	J1939 – Use only screened 120Ω impedance cable approved specifically for use in CANbus applications.

20.1.3 CAN CONFIGURATION

Information regarding these configuration parameters can be found in the products software manual, please refer to section entitled 'Bibliography' for more details.

20.1.3.1 DSE CONFIGURATION SUITE SOFTWARE

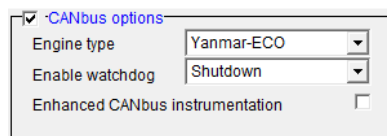
These settings are only applicable to DSE controllers which use the DSE Configuration Suite Software. This comprises of the DSE31xx, DSE44xx, DSE6xxx, DSE71xx, DSE72xx, DSE73xx and DSE8xxx series of controllers.



The DSE controller must be configured for the **Yanmar ECO** CAN file.

20.1.3.2 DSE5XXX/75XX PC SOFTWARE

These settings are only applicable to DSE controllers which use the DSE5xxx and DSE75xx PC Software. This comprises the DSE5xxx and DSE75xx series of controllers.



The DSE controller must be configured for the **Yanmar-ECO** CAN file.

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