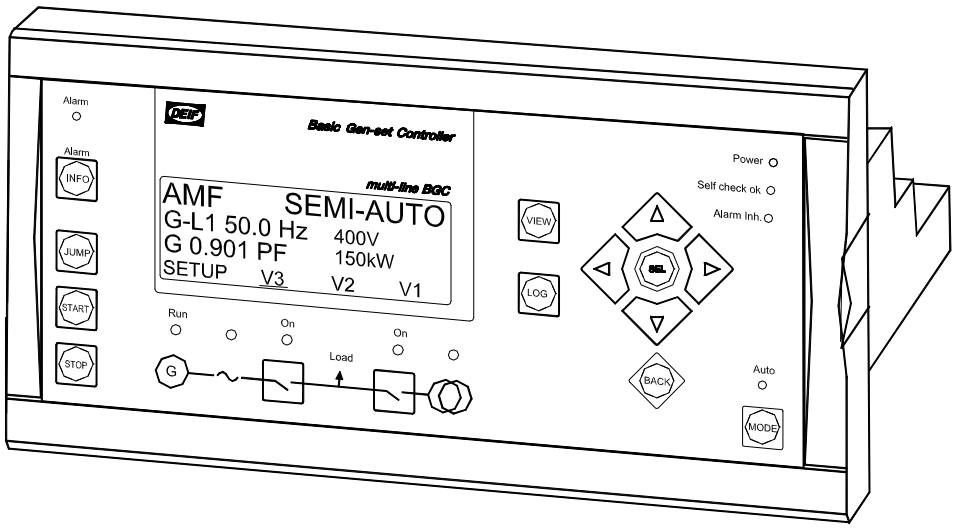
DEIF A/S

Description of options

Option H5
Serial communication (CANbus)
Basic Gen-set Controller

4189340349G
SW version 2.5X.X



- *Description of option*
- *Functional description*
- *Parameter list*
- *Modbus communication*

CE

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1. Warnings and legal information

Legal information and responsibility

DEIF takes no responsibility for installation or operation of the generator set. If there is any doubt about how to install or operate the generator set controlled by the unit, the company responsible for the installation or the operation of the set must be contacted.

The units are not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.

Electrostatic discharge awareness

Sufficient care must be taken to protect the terminals against static discharges during the installation. Once the unit is installed and connected, these precautions are no longer necessary.

Safety issues

Installing the unit implies work with dangerous currents and voltages. Therefore, the installation should only be carried out by authorised personnel who understand the risks involved in working with live electrical equipment.

Be aware of the hazardous live currents and voltages. Do not touch any AC measurement inputs as this could lead to injury or death.

Definitions

Throughout this document a number of notes and warnings will be presented. To ensure that these are noticed, they will be highlighted in order to separate them from the general text.

Notes

The notes provide general information which will be helpful for the reader to bear in mind.

Warning

The warnings indicate a potentially dangerous situation which could result in death, personal injury or damaged equipment, if certain guidelines are not followed.

2. Description of option

Option H5 is a hardware option. Therefore a separate PCB is installed in the slot #2 or slot #3 besides the standard installed hardware.

Function	ANSI no.
Serial engine communication	-

Terminal description

CANbus communication

The PCB for the engine interface communication module is placed in either slot #2 or slot #3. The actual slot is indicated on the label of the BGC.

Term.		Function	Description
47	55	Can-H	CANbus card Option H5, Engine Interface Communication
48	56	Ground	
49	57	Can-L	
50	58	Can-H	
51	59	Ground	
52	60	Can-L	
53	61	Not used	
54	62	Not used	

Slot #2 used:
Terminals 47 and 50 are internally connected.
Terminals 49 and 52 are internally connected.
Slot #3 used:
Terminals 55 and 58 are internally connected.
Terminals 57 and 60 are internally connected.

The can-H and can-L lines must be connected to the proper can-H and can-L terminals on the engine communication module. Please refer to the installation instructions of the specific type.

Modbus communication

The PCB for the Modbus card is placed in either slot #2 or slot #3, if the BGC unit is equipped with Option H2 (Modbus option).

Term.		Function	Description
47	55	DATA + (A)	Modbus RTU/ASCII, RS485
48	56	GND	
49	57	DATA - (B)	
50	58	Not used	
51	59	DATA + (A)	
52	60	Not used	
53	61	DATA - (B)	
54	62	Not used	

Modbus communication

If option H2 is present in the ML-2 unit, it's possible to read engine data over the Modbus.

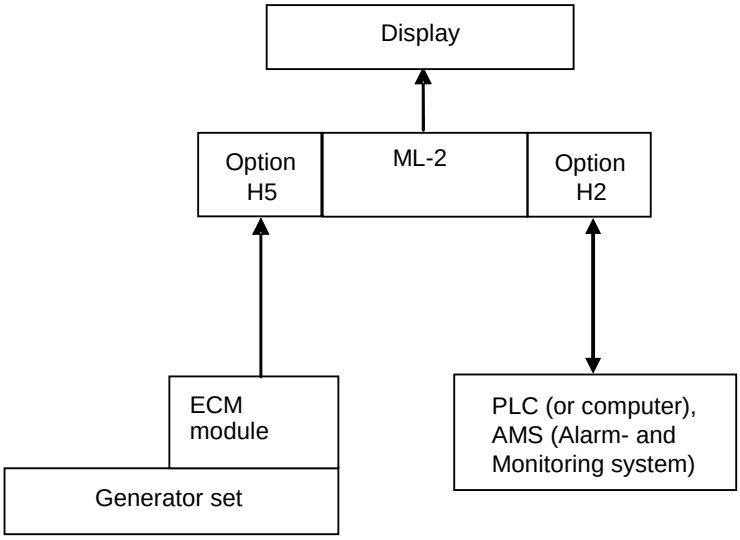
Please refer to the document "Description of Option H2" for the relevant ML-2 unit.

Wiring

AGC/PPM: for wiring details, please refer to the document "Installation Instructions".

GC-1F: For wiring details, please refer to the document "Installation Instructions and Reference Handbook".

Principle diagram



3. Functional description

This communication extracts information from the Electronic Control Module (ECM) of an engine equipped with an ECM module with CANbus interface. The values can be used as display values, alarms/shutdown alarms and values to be transmitted through Modbus.

Engine types

Data can be transmitted between the ML-2 units and the following engine controllers/types:

Engine manu-facturer	Engine controller/type	Comment
Caterpillar	ADEM III and A4/C4.4, C6.6, C9, C15, C18, C32	Rx/Tx
Cummins	CM570 and CM850/QSL, QSB5 and 7, QSM11, QSK19, 50 and 60	Rx/Tx
Detroit Diesel	DDEC III and IV/Series 50, 60 and 2000	Rx/Tx
Deutz	EMR 2/3 (EMR)/912, 913, 914 and L2011	Rx/Tx
-	General J1939	Rx/Tx
Iveco	EDC7 (Bosch MS6.2)/Series NEF, CURSOR and VECTOR 8	Rx/Tx
John Deere	JDEC/PowerTech M, E and Plus	Rx/Tx
MTU	MDEC, module M.302 or M.303/Series 2000 and 4000	Rx
MTU	MDEC, module M.201 or M.304/Series 2000 and 4000	Rx Select M.303
MTU	ADEC/Series 2000 and 4000	Rx/Tx
Perkins	Series 1100, 1300, 2300, 2500 and 2800	Rx/Tx
Scania	EMS	Rx
Scania	EMS S6 (KWP2000)/Dx9x, Dx12x, Dx16x	Rx/Tx
Volvo Penta	EDC4	Rx Select EMR 2
Volvo Penta	EMS	Rx
Volvo Penta	EMS 2 and EDCIII/D6, D7, D9, D12 and D16 (GE and AUX variants only)	Rx/Tx

Rx/Tx: Please go to the section 'Specific engine type descriptions' for details of data read and write.

The engine type is selected in menu 4131.

For support of controller/engine types not listed, please contact DEIF A/S.

Communication system

All these protocols are based on a CANbus communication system. Except for the MDEC and ADEC communication, all of them are based on the J1939. The MDEC and ADEC protocols are MTU-designed protocols based on CANopen.

The Baud rate is fixed by the engine manufacturer at:

MDEC, ADEC	Caterpillar, Cummins, Detroit Diesel, Deutz, Iveco, John Deere, Perkins, Scania and Volvo Penta
125 kb/s	250 kb/s

EIC unit

The selection of the EIC unit (menu 10970) determines whether bar/PSI and Celsius/Fahrenheit is used. The selection affects display readings, values used for alarm evaluation (menu 76xx) and data readable by Modbus communication (Option H2).

Common for all alarm functions

A number of alarms can be configured.

The following items can be configured to an alarm:

Menu number	Alarm	Comment
4150	EI comm. error	Communication error
4340	EIC warning	Any alarm listed as warning for the selected engine type in the section “Specific engine type descriptions”.
4160	EIC shutdown	Any alarm listed as shutdown for the selected engine type in the section “Specific engine type descriptions”.
4170	EIC overspeed	Actual RPM
4180/4190	EIC coolant t. (2 levels)	Actual temperature
4200/4210	EIC oil press. (2 levels)	Actual pressure
4270/4280	EIC oil temp. (2 levels)	Actual temperature

J1939 measurement table

This is the common J1939 measurement overview showing which measurements are available. Note that not all measurements are supported by the individual engines; please refer to the specific engine description.

The table shows which values can be displayed in the view menu. That is in V1, V2 and V3.

For information about the menu structure, please see the Designer's Reference Handbook.

The display values corresponding to the engine communication have a description beginning with "EIC".

Error messages

The following error messages can occur:

Message	Description
Engine I. value N.A.	The view is not selectable for the present engine type.
Value selected error	The value cannot be read due to sensor error, sub-system or module error.
"N.A."	The value is not supported by the engine, or due to communication error.

Object selection, J1939

The view lines can be configured with these available values.

For Modbus scaling, please see the table on page 32.

The engine is expected to use source address 0.

Object	PGN no.	Priority	Start position of 1st data byte	Length (bytes)	SPN no.	Unit	J1939-71 scaling
EIC speed	61444	3/6	4	2	190	RPM	0.125 rpm/bit, offset 0
EIC coolant temp. (*1)	65262	3/6	1	1	110	oC	1 deg C/bit, offset -40 C
EIC oil pressure (*2)	65263	6	4	1	100	kpa	4 kpa/bit, offset 0
EIC faults	65230	6	1	1	1218		1/bit, offset 0
EIC oil temp. (*3)	65262	3/6	3	2	175	oC	0.03125 °C/bit, offset -273 °C
EIC fuel temp.	65262	3/6	2	1	174	oC	1 °C/bit, offset -40 °C
EIC intake manifold #1 P. (also called EIC boost P.)	65270	6	2	1	102	kpa	2 kpa/bit, offset 0
EIC air inlet temp.	65269	6	6	1	172	oC	1 °C/bit, offset -40 °C
EIC coolant level	65263	6	8	1	111	%	0.4 %/bit, offset 0
EIC fuel rate	65266	6	1	2	183	l/h	0.05 l/h per bit, offset 0
EIC intake manifold 1 temp. (also called EIC charge air temp.)	65270	6	3	1	105	oC	1 °C/bit, offset -40 °C
EIC d.d. % torque	61444	3/6	2	1	512	%	1 %/bit, offset -125%
EIC actual % torque	61444	3/6	3	1	513	%	1 %/bit, offset -125%
EIC acc. pedal pos.	61443	3/6	2	1	91	%	0.4 %/bit, offset 0
EIC % load, c. speed	61443	3/6	3	1	92	%	1 %/bit, offset 0
EIC air inlet pressure	65270	6	4	1	106	kpa	2 kpa/bit, offset 0
EIC exhaust gas temp.	65270	6	6	2	173	oC	0.03125 °C/bit, offset -273 °C
EIC engine hours	65253	6	1	4	247	h	0.05 hr/bit, offset 0, max: 32767hrs
EIC oil filter diff. press.	65276	6	4	1	99	kpa	0.5 kpa/bit, offset 0
EIC key switch battery potential	65271	6	7	2	158	V DC	0.05 V DC/bit, offset 0
EIC fuel del. press.	65263	6	1	1	94	kpa	4 kpa/bit, offset 0
EIC oil level	65263	6	3	1	98	%	0.4 %/bit, offset 0
EIC crankcase press.	65263	6	5	2	101	kpa	1/128 kpa/bit, offset -250 kpa
EIC coolant pressure	65263	6	7	1	109	kpa	2 kpa/bit, offset 0
EIC water in. fuel	65279	6	1	2 bit	97		00: No, 01: Yes, 10: Error, 11: Not available
EIC turbo oil temp.	65262	3/6	5	2	176	oC	0.03125 °C/bit, offset -273 °C
EIC particulate trap inlet	65270	6	1	1	81	kpa	0.5 kpa/bit, offset 0
EIC air filter diff.	65270	6	5	1	107	kpa	0.05 kpa/bit, offset 0
EIC coolant filter diff.	65270	6	8	1	112	kpa	0.5 kpa/bit, offset 0
EIC atmospheric press.	65269	6	1	1	108	kpa	0.5 kpa/bit, offset 0
EIC ambient air temp.	65269	6	4	2	171	oC	0.03125 °C/bit, offset -273 °C

Object	PGN no.	Priority	Start position of 1st data byte	Length (bytes)	SPN no.	Unit	J1939-71 scaling
EIC trip fuel_gaseous	65199	7	1	4	1039	kg	0.5 kg/bit, offset 0
EIC total fuel used_gaseous	65199	7	5	4	1040	kg	0.5 kg/bit, offset 0
EIC engine trip fuel	65257	6	1	4	182	L	0.5 L/bit, offset 0
EIC engine total fuel used	65257	6	5	4	250	L	0.5 L/bit, offset 0

For the Iveco Vector 8 type only:
(*1): EIC coolant temp.: PGN=65282, priority=6, start at byte 5, length=1byte, SPN=110, same scale
(*3): EIC oil temp.: PGN=65282, priority=6, start at byte 6, length=1byte, SPN=175, same scale
(*2): EIC oil pressure. PGN=65282, priority=6, start at byte 7, length=1byte, 8kPa/bit gain, 0kPa offset, data range: 0 to +2000 kPa

The objects are not supported by all engines. Please refer to the specific engine type manual for information about the specific engine.

The Modbus addresses are read only (function code 03h), and are only available if Option H2 (Modbus RTU) is implemented.

Verification of J1939 objects

To verify the communication, various CAN PC tools can be used. Common for these are that they must be connected to the CANbus between the Multi-line 2 unit and the engine controller. When the tool is connected, it is possible to monitor the communication between the two units. For use of the CAN tool, please refer to the manual for the product used.

As an example, you may see the following telegram:

0xcf00400 ff 7d 7d e0 15 ff f0 ff
DATA BYTE: 1 2 3 4 5 6 7 8

- 0xc is the priority
- f004 is the PGN number (61444 in decimal value)
- The 8 bytes following the CAN ID (**0xcf00400**) are data, starting with byte 1

The priority needs to be converted to decimal. Note that the 3 priority bits in this case are displayed in the CAN id (You see 0x**c**f00400 instead of 0x**0c**f00400). In other cases you may read e.g. 0x18fef200 (PGN 65266).

The formula to find the priority number (P) is to divide by 4:

0xc = 12 (Dec) => Priority 3

Priority	DecID	HexID
1	4d	0x4
2	8d	0x8
3	12d	0xc
4	16d	0x10
5	20d	0x14
6	24d	0x18

Normally in SAE J1939, only priority 3 and 6 are used.

Hereafter the data can be read (PGN 61444):

0xcf00400 xD ff 7d 7d e0 15 ff f0 ff

Engine torque	(Data byte 1)	ff	Not available
Driver demand torque	(Data byte 2)	7d	
Actual engine torque	(Data byte 3)	7d	
Engine speed	(Data byte 4)	e0	
Engine speed	(Data byte 5)	15	
Source address	(Data byte 6)	ff	Not available
Engine starter mode	(Data byte 7)	f0	
Engine Demand	(Data byte 8)	ff	Not available

Calculation example:

RPM resolution is 0.125 RPM/bit, offset 0.
The result is then 15e0 (Hex) or 5600 (dec)*0.125 = 700 RPM.

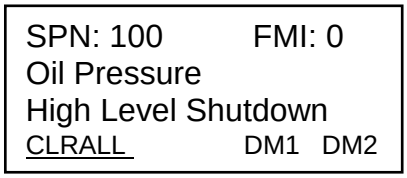
Displaying of J1939 DM1/DM2 and Scania KWP2000 alarms

Besides some engine-specific alarms which are shown in the standard alarm list, the J1939 Diagnostic messages DM1 (active alarms) and DM2 (historic alarm log list) as well as the Scania KWP 2000 alarms can all be shown on the display.

J1939

Press the LOG button for 3 seconds. That will bring the alarm log on the display.

Example:



The alarm log always shows the DM1 (active alarms) as default. By selecting DM2 (move the cursor under DM2 and press ENTER), the historical alarm list can be shown.

Use the and buttons to scroll through the list.

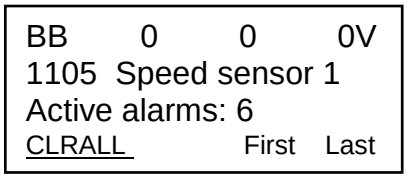
CLRALL: By pressing ENTER, the entire alarm log list will be cleared. For safety reasons, this requires the master password (please see the Designer's Reference Handbook for details of passwords).

If the controller has no translation text of an SPN diagnostic number, "Text N/A" will be shown. For information about particular SPN numbers, please consult the engine manufacturer's documentation or SAE J1939-71 for a general description.

Scania KWP 2000

Press the LOG button for 2 seconds. That will bring the alarm log on the display. The top line shows readings of AC values and is not used by the alarm list.

Example:



The Scania KWP 2000 log shows active and passive alarms in a mix.

Use the and buttons to scroll through the list.

CLRALL: By pressing ENTER, the entire alarm log list will be cleared. For safety reasons this requires the master password (please see the Designer's Reference Handbook for details of passwords).

Control commands sent to the engine

Engine types with the possibility to send commands to the ECM via the CANbus communication line:

Engine type / Command	Detroit Diesel DDEC	John Deere JDEC	Caterpillar	Perkins	Cummins	Generic J1939	Deutz EMR	Iveco	MTU MDEC	MTU ADEC	Scania EMS	Scania EMS S6	Volvo Penta	Volvo Penta EMS 2
Preheat	-	-	-	-	-	-	-	X	-	-	-	-	-	X
Start/Stop	-	-	-	-	-	-	-	X	-	X	-	X	-	X
Engine speed	X	X	X	X	X	X	X	X	-	X	-	X	-	X
Nominal frequency	-	-	-	-	X	-		-	-	X	-	X	-	X
Governor gain	-	-	-	-	X	-	-	-	-	-	-	-	-	-
Idle speed	-	-	-	-	-	-	-	-	-	-	-	X	-	X
Droop	-	-	-	-	X	-	-	-	-	-	-	X	-	X
Shutdown override	-	-	-	-	X	-	-	-	-	-	-	X	-	-

For engine types not mentioned, CANbus control is not supported. In these cases start/stop etc. must be sent to the controller using hardwired connections.

The menu number 4133 has to be used for enabling or disabling the transmission of all the Multi-line 2 unit EIC control frames listed in the above table.

When the droop command is available for an engine communication type, the droop function must be enabled by using M-logic only. See the M-logic documentation.

When the droop command is not available for an engine communication type, the droop-emulated function can be selected by using M-logic. In this case, it will be the Multi-line 2 unit that will operate the droop function. See the M-logic documentation.

4. Specific engine type descriptions

The J1939 warnings/shutdowns with corresponding SPN and FMI numbers in this chapter refer to those that will automatically appear in the alarm list. The alarms can be acknowledged from the display.

The available alarms vary from engine type to engine type. Besides these, the entire log list can be read in the engine controller by holding the 'LOG' button for 3 seconds.

Caterpillar/Perkins (J1939)

Warnings and shutdowns

Warning/shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	17	1
Intake manifold #1 P	102	15	-
Coolant temperature	110	15	1
High inlet air temp.	172	15	-
Fuel temperature	174	15	-
Overspeed	190	15	0
EIC yellow lamp	-	X	-
EIC red lamp	-	-	X

FMI indication "–" means that the alarm in question is not supported.

Write commands to engine controller

- Engine controls
  All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 4133 (EIC Controls).
- Engine speed
  CANbus ID for speed control: 0x0c000000. J1939 TSC1.

Cummins CM850 (J1939)

Warnings and shutdowns

Warning/shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	18	1
Coolant temperature	110	16	0
Oil temperature	175	16	0
Intake manifold temp	105	16	0
Fuel temperature	174	16	0
Coolant level low	111	18	1
Overspeed	190	-	16
Crankcase pressure high	101	-	0
Coolant pressure low	109	-	1
EIC yellow lamp	-	X	-
EIC red lamp	-	-	X

FMI indication "–" means that the alarm in question is not supported.

Write commands to engine controller

- Engine controls

  All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 4133 (EIC Controls).

- Engine speed

  CANbus ID for speed control: 0x00FF69DC. For Cummins proprietary "Engine governing" EG telegram, the source address of the ML-2 controller is 0xDC/220 dec).

- Frequency selection

  Nominal frequency is written automatically based on the frequency nominal setting. 50Hz is written if f_{NOM} < 55Hz, 60Hz is written if f_{NOM} is >55Hz.

- Gain setting

  Gain is set in menu 2264.

Detroit Diesel DDEC (J1939)

Warnings and shutdowns

Warning/shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
EIC yellow lamp	-	X	-
EIC red lamp	-	-	X

FMI indication "–" means that the alarm in question is not supported.

Write commands to engine controller

- Engine controls
  All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 4133 (EIC Controls).

- Engine speed
  CANbus ID for speed control: 0x0c000000. J1939 TSC1.

Deutz EMR 2 (J1939)

Warnings and shutdowns

Warning/shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	-	1
Coolant temperature	110	-	0
Overspeed	190	-	0
EIC yellow lamp	-	X	-
EIC red lamp	-	-	X

FMI indication ' – ' means that the alarm in question is not supported.

Write commands to engine controller

- Engine controls

  All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 4133 (EIC Controls).

- Engine speed

  CANbus ID for speed control: 0xc000003. For J1939 TSC1, the source address of the ML-2 controller is 3.

General J1939 (J1939)

Warnings and shutdowns

Warning/shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
EIC yellow lamp	-	X	-
EIC red lamp	-	-	X

FMI indication ' – ' means that the alarm in question is not supported.

Write commands to engine controller

- Engine controls
  All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 4133 (EIC Controls).

- Engine speed
  CANbus ID for speed control: 0x0c000000. J1939 TSC1.

Iveco (J1939)

Warnings and shutdowns

Warning/shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	17	1
Intake manifold #1 P	102	15	-
Coolant temperature	110	15	0
High inlet air temp.	172	15	-
Fuel temperature	174	15	-
Overspeed	190	15	0
EIC yellow lamp	-	X	-
EIC red lamp	-	-	X

FMI indication "– " means that the alarm in question is not supported.

Write commands to engine controller

- Engine controls

  All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 4133 (EIC Controls).

- Engine speed

  CANbus ID for speed control: 0xc000003.
  For J1939 TSC1, the source address of the ML-2 controller is 3.
  For the Iveco Vector 8 type only: CANbus ID for speed control: 0xcFF0027.

John Deere JDEC (J1939)

Warnings and shutdowns

Warning/shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	18	1
Intake manifold	105	16	-
Coolant temperature	110	16	0
Fuel injection pump	1076	10	6
Fuel temperature	174	-	16
ECU failure	2000	-	6
EIC yellow lamp	-	X	-
EIC red lamp	-	-	X

FMI indication "–" means that the alarm in question is not supported.

Write commands to engine controller

- Engine controls

  All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 4133 (EIC Controls).

- Engine speed

  CANbus ID for speed control: 0x0c000000. J1939 TSC1.

MTU ADEC (CANopen)

The MTU ADEC is not a part of the J1939, therefore the reading of values, alarms and shutdowns are different.

Display readings

Object
EIC speed
EIC coolant temp.
EIC oil pressure
EIC faults
EIC oil temp.
EIC fuel temp.
EIC Coolant level
EIC charge air pressure
EIC charge air temp. (or EIC intake manifold 1 temp.)
EIC air inlet press.
EIC running hours
EIC ECU power supp.
EIC oil level
EIC after cooler water inlet temp.
EIC atmospheric press.
EIC ambient air temp.
EIC exch. temp. A
EIC exch. temp. B
EIC temp. winding 1
EIC temp. winding 2
EIC temp. winding 3
EIC turbo 1 outlet temp.
EIC engine intercooler temp.

The Modbus addresses are read only (function code 04h), and are only available if Option H2 Modbus RTU is implemented.

Warning

Below is a list of warnings that can be shown on the display. The warnings will be shown as an alarm in the alarm window. The alarms can be acknowledged from the display, but they will be visible until the alarm disappears in the ECM module.

Warning list
Coolant temp. high
Charge air temp. high
Intercooler coolant temp. high
Lube oil temp. high
ECU temp. high
Engine speed too low
Prelube fail.
Start speed not reached
Common alarm (yellow)
Lube oil pressure low
Coolant level low
Intercooler coolant level low
ECU defect
Speed demand failure
Power supply low voltage
Power supply high voltage
Overspeed
Lube oil press. low
Coolant temp. high
Lube oil temp. high
Charge air temp. high

Warning list
ECU power supply high
ECU power supply low
Generator temp. high
Holding tank high level
Holding tank low level
Generator winding 1 high temp.
Generator winding 2 high temp.
Generator winding 3 high temp.
Ambient temp. high
Water in fuel 1
Water in fuel 2
Fuel temp. high
Exhaust bank A high temp.
Exhaust bank B high temp.
Fuel high pressure 1
Fuel high pressure 2
Day tank high level
Day tank low level
Run-up speed not reached
Idle speed not reached

Shutdown

Below is a shutdown value that can be shown on the display. It is possible to configure “EIC shutdown” in the system setup to put the unit in a shutdown state and/or to activate relay outputs if necessary. The shutdown state is present, until it disappears in the ECM module.

Shutdown list
AL Com. Alarm Red

Write commands to engine controller

- Engine controls

  All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 4133 (EIC Controls).

- Engine speed

  CANbus ID for speed control: 0x300+ADEC ID – speed demand telegram (ADEC ID is selected in menu 4132, default ID is 6 ➔ 0x306).

- Start/Stop command

- Frequency selection

  Nominal frequency is written automatically based on the frequency nominal setting. 50Hz is written if f_{NOM} < 55Hz, 60Hz is written if f_{NOM} is >55Hz.

The CANopen node ID no is selected in setting 4132. The default value (6) usually matches the ADEC setting.

MTU MDEC module 302/303 (MTU)

The MTU MDEC is not a part of the J1939, therefore the reading of values, alarms and shutdowns are different.

Displayed values

Object
EIC speed
EIC coolant temp.
EIC oil pressure
EIC faults
EIC oil temp.
EIC fuel temp.
EIC charge air pressure
EIC charge air temp. (or EIC intake manifold 1 temp.)

The Modbus addresses are read only (function code 04h), and are only available if the Option H2 Modbus RTU is implemented.

Alarms

Below is a list of alarms that can be shown on the display. The alarms will be shown in the alarm window. The alarms can be acknowledged from the display, but they will be visible until the alarm disappears in the ECM module.

Alarm list	Warning	Shutdown
MDEC yellow alarm	X	-
MDEC red alarm	-	X
Overspeed	-	X
Low oil pressure	X	X
High coolant temp.	X	X
High oil temp	-	X
High intercooler temp.	X	-
Defective cool. level switch	X	-
Low coolant level	-	X
MDEC ECU failure	-	X

MDEC indication " – " means that the alarm in question is not supported.

Write commands to engine controller

None.

Scania EMS (J1939)

Warning/shutdowns

None.

Write commands to engine controller

None.

Scania EMS 2 S6 (J1939)

Scania EMS 2 S6 does not use the J1939 SPN/FMI (Suspect Parameter Number/Failure Mode Indicator) system for alarm handling. Instead the DNL2 system is used. For this reason, the alarm handling is also different.

Warnings and shutdowns (DNL2 alarms)

Below is a list of warnings and shutdowns that can be shown on the display. They will be shown as an alarm in the alarm window. The alarms can be acknowledged from the display, but they will be visible until the alarm disappears in the ECM module.

Warning/shutdown list	DNL2 warning	DNL2 shutdown
EMS warning	X	-
Low oil pressure	X	-
High coolant temp	X	-
Stop limit exceeded	-	X
Charge 61	X	-
EIC yellow lamp	X	-
EIC red lamp	-	X

DNL2 indication " – " means that the alarm in question is not supported.

Handling of alarms is only active when the engine is running.

Error log

It is possible to retrieve and acknowledge alarms in the error log of the Scania EMS S6 (KWP 2000).

The alarms available are the same alarms which can be read by the flash combination of the diagnostics lamp on the EMS S6 (please refer to the engine documentation).

For Option H5, the EMS S6 software version and engine number is automatically retrieved when CANbus communication is established.

Flash code	ML-2 displayed text	Description
11	Overreving	One or both engine speed sensors have indicated above 3000 RPM
12	Speed sensor 1	Engine sensor 1
13	Speed sensor 2	Engine sensor 2
14	Water T sen.	Engine coolant temperature sensor
15	Char. air T sen	Charge air temperature sensor
16	Char. air P sen	Charge air pressure sensor
17	Oil temp. sen.	Oil temperature sensor
18	Oil pres. sen.	Oil pressure sensor
23	Fault in cor.	Fault in coordinator
25	Throttle pedal	CAN message for fine tune nominal speed out of range
27	Emerg. stop o.r	Engine stop overridden
31	Oil pres. prot	Oil pressure protection activated
32	Wrong parameter	Wrong parameter setting for defect CAN communication
33	Battery voltage	Battery voltage out of range
37	Emerg. stop cor	Emergency stop switch activated
43	CAN cir. defect	CAN circuit defect
48	CAN mess. DLN1	CAN message from the coordinator missing or not correct
49	Wrong CAN ver.	Non-matching CAN version in EMS and coordinator
51	Un. inj. cyl. 1	Unit injector cylinder 1
52	Un. inj. cyl. 2	Unit injector cylinder 2
53	Un. inj. cyl. 3	Unit injector cylinder 3
54	Un. inj. cyl. 4	Unit injector cylinder 4
55	Un. inj. cyl. 5	Unit injector cylinder 5
56	Un. inj. cyl. 6	Unit injector cylinder 6
57	Un. inj. cyl. 7	Unit injector cylinder 7
58	Un. inj. cyl. 8	Unit injector cylinder 8
59	Extra ana. inp.	Voltage out of range on extra analogue input pin
61	System shutdown	System shut down incorrectly
66	Coola. l. prot.	Low engine coolant level
86	HW watchdog	Hardware watchdog
87	Fault in RAM	The EMS has detected that the fault code memory is not functioning correctly
89	Seal	The programme in the EMS has been altered in a prohibited manner
94	Coola. shut off	Engine coolant temperature/oil pressure shutdown
96	Overheat prot.	Overheat protection activated
99	Fault in TPU	Error in TPU Timer Processor Unit

Write commands to engine controller

- Engine controls

  All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 4133 (EIC Controls)

- Droop

- Engine speed

  CANbus ID: Offset: 0xcfff727
  Speed: 0x0cff8027

- Frequency selection

  Nominal speed/frequency is selected in 2262. If “User” is selected, nominal speed/frequency is written automatically, based on the frequency nominal setting.

- Start/stop command

It is only possible to write commands to the engine when the Scania Coordinator is NOT mounted.

Control

In the parameter 2260, it is possible to configure the droop setting and the initial speed setting.

Volvo Penta EMS (J1939)

Warnings and shutdowns

Warning/shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	5	-
Intake manifold #1 P	102	-	-
Coolant temperature	110	5	-
High inlet air temp.	172	5	-
Fuel temperature	174	-	-
Fuel pressure	94	5	-
Oil level	98	5	-
Overspeed	190	-	0
Coolant level low	111	-	1
EIC yellow lamp	-	X	-
EIC red lamp	-	-	X

Write commands to engine controller

None.

Volvo Penta EMS 2 (J1939)

EMS 2 and EDCIII/D6, D7, D9, D12 and D16 (GE and AUX variants only).

Warnings and shutdowns

Warning/shutdown list	J1939 codes		
	SPN	FMI warning	FMI shutdown
Low oil pressure	100	5	-
Intake manifold #1 P	102	-	-
Coolant temperature	110	5	-
High inlet air temp.	172	5	-
Fuel temperature	174	-	-
Fuel pressure	94	5	-
Oil level	98	5	-
Overspeed	190	-	0
Coolant level low	111	-	1
EIC yellow lamp	-	X	-
EIC red lamp	-	-	X

FMI indication " – " means that the alarm in question is not supported,

Write commands to engine controller

- Engine controls
  All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 4133 (EIC Controls).
- Engine speed
  CANbus ID for speed control: 0x0cff4611 – Volvo Penta proprietary telegram.
- Preheat
- Start/stop

Readable states

- Preheat and running

5. Parameters

2260 Scania control

No.	Setting		Min. setting	Second setting	Third setting	Max. setting	Factory setting
2261	Droop	Setpoint	0.0	-	-	25.0	4.0
2262	Speed	Setpoint	User	1500 RPM	1800 RPM	Low idle	User

4130 Engine communications

No.	Setting	1st setting	2nd setting	3rd setting	4th setting	5th setting	6th setting	7th setting	8th setting
4131	Engine comm.	OFF	MDEC M.302	MDEC M.303	DDEC	EMR	JDEC	Volvo Penta	Scania

4130 Engine communications

No.	Setting	9th setting	10th setting	11th setting	Factory setting
4131	Engine comm.	Volvo Penta EMS 2	Scania EMS 2	ADEC	OFF

4140 EIC unit

No.	Setting		First setting	Second setting	Factory setting
4141	EIC unit	Setpoint	Bar/Celsius	Psi/Fahrenheit	Bar/Celsius

4150 EI communication error

No.	Setting		Min. setting	Second setting	Max. setting	Factory setting
4151	EI comm. error	Delay	0.0 s		100.0 s	0.0 s
4152	EI comm. error	Relay output A	R0 (none)		R0 (none)	R0 (none)
4153	EI comm. error	Relay output B	R0 (none)		R0 (none)	R0 (none)
4154	EI comm. error	Enable	OFF	ON	RUN	OFF
4155	EI comm. error	Fail class	1 Alarm		6 Trip MB	2 Warning

4160 EIC shutdown

No.	Setting		Min. setting	Second setting	Max./third setting	Factory setting
4161	EIC shutdown	Delay	0.0 s		100.0 s	0.0 s
4162	EIC shutdown	Relay output A	R0 (none)		R0 (none)	R0 (none)
4163	EIC shutdown	Relay output B	R0 (none)		R0 (none)	R0 (none)
4164	EIC shutdown	Enable	OFF	ON	RUN	OFF
4165	EIC shutdown	Fail class	1 Alarm		6 Trip MB	2 Warning

4170 EIC overspeed

No.	Setting		Min. setting	Second setting	Max./third setting	Factory setting
4171	EIC overspeed	Setpoint	0 RPM		2000 RPM	1600 RPM
4172	EIC overspeed	Delay	0.0 s		100.0 s	2.0 s

4173	EIC overspeed	Relay output A	R0 (none)		R0 (none)	R0 (none)
4174	EIC overspeed	Relay output B	R0 (none)		R0 (none)	R0 (none)
4175	EIC overspeed	Enable	OFF	ON	RUN	OFF
4176	EIC overspeed	Fail class	1 Alarm		6 Trip MB	2 Warning

4180 EIC cooling water temperature 1

No.	Setting		Min. setting	Second setting	Max./third setting	Factory setting
4181	EIC cool w. t. 1	Setpoint	-40 deg.		210 deg.	100 deg.
4182	EIC cool w. t. 1	Delay	0.0 s		100.0 s	5.0 s
4183	EIC cool w. t. 1	Relay output A	R0 (none)		R0 (none)	R0 (none)
4184	EIC cool w. t. 1	Relay output B	R0 (none)		R0 (none)	R0 (none)
4185	EIC cool w. t. 1	Enable	OFF	ON	RUN	OFF
4186	EIC cool w. t. 1	Fail class	1 Alarm		6 Trip MB	2 Warning

4190 EIC cooling water temperature 2

No.	Setting		Min. setting	Second setting	Max./third setting	Factory setting
4191	EIC cool w. t. 2	Setpoint	-40 deg.		210 deg.	110 deg.
4192	EIC cool w. t. 2	Delay	0.0 s		100.0 s	5.0 s
4193	EIC cool w. t. 2	Relay output A	R0 (none)		R0 (none)	R0 (none)
4194	EIC cool w. t. 2	Relay output B	R0 (none)		R0 (none)	R0 (none)
4195	EIC cool w. t. 2	Enable	OFF	ON	RUN	OFF
4196	EIC cool w. t. 2	Fail class	1 Alarm		6 Trip MB	2 Warning

4200 EIC oil pressure 1

No.	Setting		Min. setting	Second setting	Max./third setting	Factory setting
4201	EIC oil press. 1	Setpoint	0.0 bar		10.0 bar	2.0 bar
4202	EIC oil press. 1	Delay	0.0 s		100.0 s	5.0 s
4203	EIC oil press. 1	Relay output A	R0 (none)		R0 (none)	R0 (none)
4204	EIC oil press. 1	Relay output B	R0 (none)		R0 (none)	R0 (none)
4205	EIC oil press. 1	Enable	OFF	ON	RUN	OFF
4206	EIC oil press. 1	Fail class	1 Alarm		6 Trip MB	2 Warning

4210 EIC oil pressure 2

No.	Setting		Min. setting	Second setting	Max./third setting	Factory setting
4211	EIC oil press. 2	Setpoint	0.0 bar		10.0 bar	1.0 bar
4212	EIC oil press. 2	Delay	0.0 s		100.0 s	5.0 s
4213	EIC oil press. 2	Relay output A	R0 (none)		R0 (none)	R0 (none)
4214	EIC oil press. 2	Relay output B	R0 (none)		R0 (none)	R0 (none)
4215	EIC oil press. 2	Enable	OFF	ON	RUN	OFF
4216	EIC oil press. 2	Fail class	1 Alarm		6 Trip MB	2 Warning

4270 EI temp. lube 1

No.	Setting		Min. setting	Second setting	Max./third setting	Factory setting
4271	EI temp. lube 1	Setpoint	0 deg.		100 deg.	50 deg.
4272	EI temp. lube 1	Delay	0.0 s		100.0 s	5.0 s
4273	EI temp. lube 1	Relay output A	R0 (none)		R0 (none)	R0 (none)
4274	EI temp. lube 1	Relay output B	R0 (none)		R0 (none)	R0 (none)
4275	EI temp. lube 1	Enable	OFF	ON	RUN	OFF
4276	EI temp. lube 1	Fail class	1 Alarm		6 Trip MB	2 Warning

4280 EI temp. lube 2

No.	Setting		Min. setting	Second setting	Max./third setting	Factory setting
4281	EI temp. lube 2	Setpoint	0 deg.		100 deg.	40 deg.
4282	EI temp. lube 2	Delay	0.0 s		100.0 s	5.0 s
4283	EI temp. lube 2	Relay output A	R0 (none)		R0 (none)	R0 (none)
4284	EI temp. lube 2	Relay output B	R0 (none)		R0 (none)	R0 (none)
4285	EI temp. lube 2	Enable	OFF	ON	RUN	OFF
4286	EI temp. lube 2	Fail class	1 Alarm		6 Trip MB	5 Shutdown

6. Modbus communication

This chapter is to be considered as additional information for Option H2 (Modbus RS 485 RTU). Please refer to the ECM (Engine Communication Module) user manuals for more information about the ECM protocol technical description and the details of each communication value.
If Option H2 is installed, then the data can be transmitted to a PLC, a computer, the alarm-and-monitoring system or a Scada system.

Please refer to the Option H2 technical documentation for more information about our standard external Modbus communication.

A certain amount of engine data can be transmitted from the engine communication module to the controller unit. They can be transmitted through Modbus Option H2.

The available values depend on the selected type of engine communication.

The data readable by the Modbus communication are converted into the chosen unit in menu 4141.

Reading of analogue values

The reading of values is independent of engine type, so all readings below are available in the Modbus protocol.

The availability of data from the individual engine types is dependent on the specific engine. Please refer to the engine manual in question.

These data refer to the common J1939 display reading list as well as the overview of readings in the MTU ADEC (CANopen) and MTU MDEC (MTU protocol).

Measurement table (read only) function code 03h.						
Addr	**Content**	**Unit**	**Scaling**			**Description**
			J1939	**ADEC**	**MDEC**	
71	EIC speed	[RPM]	1/1	1/1	1/1	Speed
72	EIC coolant temp.	[deg] [F]	1/1	1/10	1/10	Coolant temperature
73	EIC oil pressure	[bar] [psi]	1/100	1/100	1/100	Engine oil pressure
74	EIC no of faults	[Faults]	1/1	1/1	1/1	Number of faults
75	EIC oil temp.	[deg] [F]	1/10	1/10	1/10	Engine oil temperature
76	EIC fuel temp.	[deg] [F]	1/1	1/10	1/10	Fuel temperature
77	EIC intake manifold #1 P	[bar] [psi]	1/100	1/100	-	Intake manifold #1 P
78	EIC air inlet temp.	[deg] [F]	1/1	-	-	Air inlet temperature
79	EIC coolant level	[%]	1/10	-	-	Coolant level
80	EIC fuel rate	[L/h]	1/10	-	-	Fuel rate

Measurement table (read only) function code 03h.						
Addr	**Content**	**Unit**	**Scaling**			**Description**
			J1939	**ADEC**	**MDEC**	
81	EIC charge air press	[bar] [psi]	-	-	1/100	Charge air press
82	EIC intake manifold 1 T (or EIC charge air T)	[deg] [F]	1/1	-	1/10	Intake manifold 1 temperature
83	EIC d.d. % torque	[%]	1/1	-	-	Driver's demand engine - percent torque
84	Reserved	-	-	-	-	-
85	Reserved	-	-	-	-	-
86	Reserved	-	-	-	-	-
87	Reserved	-	-	-	-	-
88	EIC actual % torque	[%]	1/1	-	-	Actual engine - percent torque
89	EIC acc. pedal pos.	[%]	1/1	-	-	Accelerator pedal position
90	EIC % load, c. speed	[%]	1/1	-	-	Percent load at current speed
91	EIC air inlet pressure	[bar] [psi]	1/100	-	-	Air inlet pressure
92	EIC exhaust gas temp.	[deg] [F]	1/10	-	-	Exhaust gas temperature
93	EIC engine hours	[H]	1/1	1/1	-	ENGINE HOURS
94	EIC oil filter diff. press.	[bar] [psi]	1/100	-	-	Oil filter diff press
95	EIC battery voltage	[V]	1/10	1/10	-	Key switch battery potential
96	EIC fuel del. press.	[bar] [psi]	1/100	1/100	-	Fuel delivery pressure
97	EIC oil level	[%]	1/10	-	-	Engine oil level
98	EIC crankcase press.	[bar] [psi]	1/100	-	-	Crankcase pressure
99	EIC coolant pressure	[bar] [psi]	1/100	-	-	Coolant pressure
100	EIC water in fuel	[2 bits]	1/1	-	-	Water in fuel (1 = Yes, 0 =NO)
101	Reserved	-	-	-	-	-
102	Reserved	-	-	-	-	-
103	Reserved	-	-	-	-	-
104	Reserved	-	-	-	-	-
105	Reserved	-	-	-	-	-
106	Reserved	-	-	-	-	-
107	Reserved	-	-	-	-	-
108	Reserved	-	-	-	-	-
109	Reserved	-	-	-	-	-
110	Reserved	-	-	-	-	-
111	Reserved	-	-	-	-	-

Measurement table (read only) function code 03h.						
Addr	**Content**	**Unit**	**Scaling**			**Description**
			J1939	**ADEC**	**MDEC**	
112	Reserved	-	-	-	-	-
113	Reserved	-	-	-	-	-
114	EIC Atm press	[bar] [psi]	1/100	-	-	Atmospheric pressure
115	EIC Ambient air temp	[deg] [F]	1/10	-	-	Ambient air temp [F/10]
116	EIC turbo oil temp.	[deg] [F]	1/10	-	-	Turbo oil temp.
117	EIC trap inlet	[bar] [psi]	1/100	-	-	Trap inlet
118	EIC Air filter diff press	[bar] [psi]	1/1000	-	-	Air filter diff press
119	EIC Cool filter diff press	[bar] [psi]	1/100	-	-	Cool filter diff press
120	EIC exch. temp A	[deg] [F]	-	1/10	-	Exh. temp bank A
121	EIC exch. temp B	[deg] [F]	-	1/10	-	Exch. temp bank B
122	EIC Winding 1 temp	[deg] [F]	-	1/1	-	Gen winding 1 temp
123	EIC Winding 2 temp	[deg] [F]	-	1/1	-	Gen winding 2 temp
124	EIC Winding 3 temp	[deg] [F]	-	1/1	-	Gen winding 3 temp
125	Reserved	-	-	-	-	-
126	Reserved	-	-	-	-	-
127	EIC Turbo 1 compr outlet press	[bar] [psi]	-	1/10	-	Turbo 1 compr outlet press
128	EIC Intercooler temp	[deg][F]	-	1/10	-	Intercooler temp
129	EIC trip fuel_gaseous	[kg]	1/1	-	-	Trip fuel, gaseous
130	EIC total fuel used_gaseous	[ton]	1/10	-	-	Total fuel used, gaseous
131	EIC engine trip fuel	[L]	1/1	-	-	Engine trip fuel
132	EIC engine total fuel used	[kL]	1/10	-	-	Engine total fuel used

Alarms, Caterpillar/Perkins

Alarm, status and measurement table (read only) function code 03h.

Addr.	Content	Type
101	EIC alarms, DEIF controller	Bit 0 4150 EI comm. error Bit 1 4340 EIC warning Bit 2 4160 EIC shutdown Bit 3 4170 EIC overspeed Bit 4 4180 EIC coolant t. 1 Bit 5 4190 EIC coolant t. 2 Bit 6 4200 EIC oil press. 1 Bit 7 4210 EIC oil press. 2 Bit 8 4270 EIC oil press. 1 Bit 9 4280 EIC oil temp. 2
105	EIC alarms, engine controller (DM1)	Bit 0 EIC Communication error Bit 1 EIC low oil pressure, warning Bit 2 EIC low oil pressure, shutdown Bit 3 EIC boost pressure, warning Bit 4 EIC high coolant temperature, warning Bit 5 EIC low coolant level, shutdown Bit 6 EIC high inlet air temperature, warning Bit 7 EIC fuel temperature, warning Bit 8 EIC ECM yellow lamp, warning Bit 9 EIC ECM red lamp, shutdown
106		Bit 0 EIC overspeed, warning Bit 1 EIC overspeed, shutdown

Alarms, Cummins

Alarm, status and measurement table (read only) function code 03h.

Addr.	Content	Type
101	EIC alarms, DEIF controller	Bit 0 4150 EI comm. error Bit 1 4340 EIC warning Bit 2 4160 EIC shutdown Bit 3 4170 EIC overspeed Bit 4 4180 EIC coolant t. 1 Bit 5 4190 EIC coolant t. 2 Bit 6 4200 EIC oil press. 1 Bit 7 4210 EIC oil press. 2 Bit 8 4270 EIC oil press. 1 Bit 9 4280 EIC oil temp. 2
105	EIC alarms, engine controller (DM1)	Bit 0 EIC DEC communication error Bit 1 EIC low oil pressure, warning Bit 2 EIC low oil pressure, shutdown Bit 3 EIC high coolant temp, warning Bit 4 EIC high coolant temperature, shutdown Bit 5 EIC low coolant level, warning Bit 6 EIC low coolant level, shutdown Bit 7 EIC intake manifold temp, warning Bit 8 EIC intake manifold, shutdown Bit 9 EIC fuel temp., warning

Addr.	Content	Type
106		Bit 0 EIC fuel temp, shutdown Bit 1 EIC coolant pressure, shutdown Bit 2 EIC oil temp., warning Bit 3 EIC oil temp., warning Bit 4 EIC overspeed shutdown Bit 5 EIC crankcase press., shutdown Bit 6 EIC yellow lamp WA. Bit 7 EIC red lamp SD.

Alarms, DDEC – Detroit engines

Alarm, status and measurement table (read only) function code 03h.

Addr.	Content	Type
101	EIC alarms, DEIF controller	Bit 0 4150 EI comm. error Bit 1 4340 EIC warning Bit 2 4160 EIC shutdown Bit 3 4170 EIC overspeed Bit 4 4180 EIC coolant t. 1 Bit 5 4190 EIC coolant t. 2 Bit 6 4200 EIC oil press. 1 Bit 7 4210 EIC oil press. 2 Bit 8 4270 EIC oil press. 1 Bit 9 4280 EIC oil temp. 2
105	EIC alarms, engine controller (DM1)	Bit 0 EIC communication error, warning Bit 1 EIC warning Bit 2 EIC shutdown

Alarms, EMR 2 – Deutz engines

Alarm, status and measurement table (read only) function code 03h.

Addr.	Content	Type
101	EIC alarms, DEIF controller	Bit 0 4150 EI comm. error Bit 1 4340 EIC warning Bit 2 4160 EIC shutdown Bit 3 4170 EIC overspeed Bit 4 4180 EIC coolant t. 1 Bit 5 4190 EIC coolant t. 2 Bit 6 4200 EIC oil press. 1 Bit 7 4210 EIC oil press. 2 Bit 8 4270 EIC oil press. 1 Bit 9 4280 EIC oil temp. 2
105	EIC alarms, engine controller (DM 1)	Bit 0 EIC high coolant temperature, shutdown Bit 1 EIC low oil pressure, shutdown Bit 2 EIC overspeed, shutdown Bit 3 EIC EMR shutdown (LS: lamp status) Bit 4 EIC EMR warning (LS: lamp status)

Alarms, General J1939

Alarm, status and measurement table (read only) function code 03h.

Addr.	Content	Type
101	EIC alarms, DEIF controller	Bit 0 4150 EI comm. error Bit 1 4340 EIC warning Bit 2 4160 EIC shutdown Bit 3 4170 EIC overspeed Bit 4 4180 EIC coolant t. 1 Bit 5 4190 EIC coolant t. 2 Bit 6 4200 EIC oil press. 1 Bit 7 4210 EIC oil press. 2 Bit 8 4270 EIC oil press. 1 Bit 9 4280 EIC oil temp. 2

Alarms, Iveco

Alarm, status and measurement table (read only) function code 03h.

Addr.	Content	Type
101	EIC alarms, DEIF controller	Bit 0 4150 EI comm. error Bit 1 4340 EIC warning Bit 2 4160 EIC shutdown Bit 3 4170 EIC overspeed Bit 4 4180 EIC coolant t. 1 Bit 5 4190 EIC coolant t. 2 Bit 6 4200 EIC oil press. 1 Bit 7 4210 EIC oil press. 2 Bit 8 4270 EIC oil press. 1 Bit 9 4280 EIC oil temp. 2
105	EIC alarms, engine controller (DM 1)	Bit 1 EIC low oil pressure, warning Bit 2 EIC low oil pressure, shutdown Bit 3 EIC boost pressure, warning Bit 4 EIC high coolant temperature, warning Bit 5 EIC high coolant temperature, shutdown Bit 6 EIC high inlet air temperature, warning Bit 7 EIC fuel temperature, warning Bit 8 EIC ECM yellow lamp, warning Bit 9 EIC ECM red lamp, shutdown
106		Bit 0 EIC overspeed, warning Bit 1 EIC overspeed, shutdown

Alarms, JDEC – John Deere engines

Alarm, status and measurement table (read only) function code 03h.

Addr.	Content	Type
101	EIC alarms, DEIF controller	Bit 0 4150 EI comm. error Bit 1 4340 EIC warning Bit 2 4160 EIC shutdown Bit 3 4170 EIC overspeed Bit 4 4180 EIC coolant t. 1 Bit 5 4190 EIC coolant t. 2 Bit 6 4200 EIC oil press. 1 Bit 7 4210 EIC oil press. 2 Bit 8 4270 EIC oil press. 1 Bit 9 4280 EIC oil temp. 2
105	EIC alarms, engine controller (DM 1)	Bit 0 EIC high coolant temperature, shutdown Bit 1 EIC low oil pressure, shutdown Bit 2 EIC fuel temperature, shutdown Bit 3 EIC fuel control valve, shutdown Bit 4 EIC ECU failure, shutdown Bit 5 EIC oil pressure, warning Bit 6 EIC intake manifold, warning Bit 7 EIC coolant temperature, warning Bit 8 EIC fuel injection pump, warning Bit 9 EIC JDEC shutdown (LS: lamp status)
106		Bit 0 EIC JDEC warning (LS: lamp status)

Alarms, MTU ADEC

Alarm, status and measurement table (read only) function code 03h.

Addr.	Content	Type
101	EIC alarms, DEIF controller	Bit 0 4150 EI comm. error Bit 1 4340 EIC warning Bit 2 4160 EIC shutdown Bit 3 4170 EIC overspeed Bit 4 4180 EIC coolant t. 1 Bit 5 4190 EIC coolant t. 2 Bit 6 4200 EIC oil press. 1 Bit 7 4210 EIC oil press. 2 Bit 8 4270 EIC oil press. 1 Bit 9 4280 EIC oil temp. 2
105	EIC alarms, engine controller	Bit 0 EIC Coolant high temp Bit 1 EIC Charge air high temp Bit 2 EIC Intercooler coolant high temp Bit 3 EIC Lube oil high temp Bit 4 EIC ECU high temp Bit 5 EIC Engine speed low Bit 6 EIC Prelube fail Bit 7 EIC Start speed not reached Common alarm Bit 8 EIC yellow Bit 9 EIC Lube oil pressure low
106	EIC alarms, engine controller	Bit 0 EIC Coolant level low Bit 1 EIC Intercooler coolant level low Bit 2 EIC ECU defect Bit 3 EIC Speed demand defect Bit 4 EIC Power supply low voltage Bit 5 EIC Power supply high voltage Bit 6 EIC Common alarm red Bit 7 EIC Overspeed Bit 8 EIC Lube oil press LowLow Bit 9 EIC Coolant temperature HiHi Bit 10 EIC Lube oil temp HiHi Bit 11 EIC Charge air temp HiHi Bit 12 EIC ECU power supp voltage HiHi Bit 13 EIC Generator temp high warning Bit 14 EIC Holding tank high level Bit 15 EIC Holding tank low level
107	EIC alarms, engine controller	Bit 0 EIC Winding 1 temp high Bit 1 EIC Winding 2 temp high Bit 2 EIC Winding 3 temp high Bit 3 EIC Ambient temp high Bit 4 EIC Water in fuel 1 Bit 5 EIC Water in fuel 2 Bit 6 EIC ECU power supp voltage LoLo Bit 7 EIC Fuel high temp Bit 8 EIC Exhaust A high temp Bit 9 EIC Exhaust B high temp Bit 10 EIC Pressure 1 high (Aux 1) Bit 11 EIC Pressure 2 high (Aux 2) Bit 12 EIC Day tank high level Bit 13 EIC Day tank low level Bit 14 EIC Run-up speed not reached

Addr.	Content	Type
		Bit 15 EIC Idle speed not reached

Alarms, MTU MDEC series – 2000/4000 – module 302 & 303

Alarm, status and measurement table (read only) function code 03h.

Addr.	Content	Type
101	EIC alarms, DEIF controller	Bit 0 4150 EI comm. error Bit 1 4340 EIC warning Bit 2 4160 EIC shutdown Bit 3 4170 EIC overspeed Bit 4 4180 EIC coolant t. 1 Bit 5 4190 EIC coolant t. 2 Bit 6 4200 EIC oil press. 1 Bit 7 4210 EIC oil press. 2 Bit 8 4270 EIC oil press. 1 Bit 9 4280 EIC oil temp. 2
105	EIC alarms, engine controller	Bit 0 EIC overspeed, shutdown Bit 1 EIC low oil pressure, warning Bit 2 EIC low oil pressure, shutdown Bit 3 EIC low coolant level, shutdown Bit 4 EIC MDEC ECU failure, shutdown Bit 5 EIC high coolant temperature, warning Bit 6 EIC high coolant temperature, shutdown Bit 7 EIC high intercooler coolant temp, warning Bit 8 EIC high oil temperature, shutdown Bit 9 EIC high charge air temperature, shutdown
106		Bit 0 EIC defect coolant level switch, warning Bit 1 EIC MDEC yellow alarm, warning Bit 2 EIC MDEC red alarm, shutdown

Alarms, Scania

Alarm, status and measurement table (read only) function code 03h.

Addr.	Content	Type
102	EIC alarms (KWP 2000)	Bit 0 EIC overreving Bit 1 EIC speed sensor 1 Bit 2 EIC speed sensor 2 Bit 3 EIC water temp. sensor Bit 4 EIC charge air temp. sensor Bit 5 EIC charge air pressure sensor Bit 6 EIC oil temp. sensor Bit 7 EIC oil pressure sensor Bit 8 EIC fault in cor. Bit 9 EIC throttle pedal Bit 10 EIC emergency stop override Bit 11 EIC oil pressure prot. Bit 12 EIC wrong parameter Bit 13 EIC battery voltage Bit 14 EIC oil pressure prot. Bit 15 EIC emergency stop cor.
103	EIC alarms (KWP 2000)	Bit 0 EIC CAN cir. defect Bit 1 EIC CAN mess. DLN1 Bit 2 EIC Wrong CAN version Bit 3 EIC un. inj. cyl. 1 Bit 4 EIC un. inj. cyl. 2 Bit 5 EIC un. inj. cyl. 3 Bit 6 EIC un. inj. cyl. 4 Bit 7 EIC un. inj. cyl. 5 Bit 8 EIC un. inj. cyl. 6 Bit 9 EIC un. inj. cyl. 7 Bit 10 EIC un. inj. cyl. 8 Bit 11 EIC extra ana. inp. Bit 12 EIC system shutdown Bit 13 EIC coola. L. prot. Bit 14 EIC HW watchdog Bit 15 EIC fault in RAM
104	EIC alarms (KWP 2000)	Bit 0 EIC seal Bit 1 EIC coola. shut OFF Bit 2 EIC overheat prot. Bit 3 Fault in TPU Bit 4 Not used Bit 5 Not used Bit 6 Not used Bit 7 Not used Bit 8 Not used Bit 9 Not used Bit 10 Not used Bit 11 Not used Bit 12 Not used Bit 13 Not used Bit 14 Not used Bit 15 Not used

Alarms, Volvo Penta

Alarm, status and measurement table (read only) function code 03h.

Addr.	Content	Type
101	EIC alarms, DEIF controller	Bit 0 4150 EI comm. error Bit 1 4340 EIC warning Bit 2 4160 EIC shutdown Bit 3 4170 EIC overspeed Bit 4 4180 EIC coolant t. 1 Bit 5 4190 EIC coolant t. 2 Bit 6 4200 EIC oil press. 1 Bit 7 4210 EIC oil press. 2 Bit 8 4270 EIC oil press. 1 Bit 9 4280 EIC oil temp. 2
105	EIC alarms (DM 1)	Bit 0 EIC overspeed, warning Bit 1 EIC oil pressure, warning Bit 2 EIC oil temperature, warning Bit 3 EIC high coolant temperature, warning Bit 4 EIC low coolant level, warning Bit 5 EIC fuel pressure, warning Bit 6 EIC ECM yellow lamp, warning Bit 7 EIC ECM red lamp, shutdown Bit 8 EIC high inlet air temperature, warning Bit 10 EIC battery voltage, warning Bit 11 EIC low oil level, warning

DEIF A/S reserves the right to change any of the above.