DEIF A/S

Description of options

Options H5 and H7, MTU MDEC and J1939 CANbus engine interface comm. Multi-line 2

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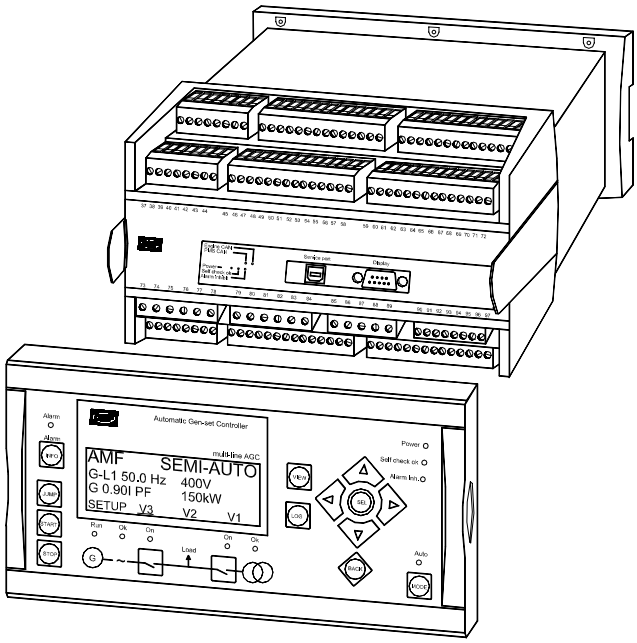
SW version 3.0X.X



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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

H5 option

Option H5 is a hardware option, and therefore a separate PCB is installed in slot #8 in addition to the standard-installed hardware.

ANSI numbers

Function	ANSI no.
Serial engine communication	-

Terminal description

The PCB for the engine interface communication module is placed in slot #8.

Term.	Function	Description
133	Can-H	CANbus card option H5, Engine Interface Communication
132	Ground	
131	Can-L	
130	Can-H	
129	Ground	
128	Can-L	
127	Not used	
126	Not used	

Terminals 133 and 130 are internally connected.
Terminals 131 and 128 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.

H7 option

Option H7 is a software option, using the standard hardware.

Function	ANSI no.
Serial engine communication	-

Terminal description

The PCB for the engine interface communication module is placed in slot #7.

Term.	Function	Description
A1	Can-H	CANbus interface 1
A2	GND	
A3	Can-L	

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 slot #2, if the controller unit is equipped with option H2 (modbus).

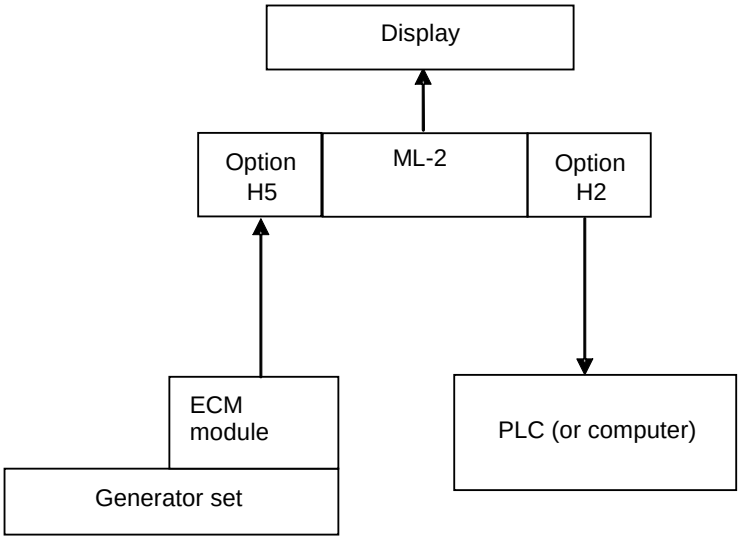
Term.	Function	Description
29	DATA + (A)	Modbus RTU/ASCII, RS485
30	GND	
31	DATA - (B)	
32	Not used	
33	DATA + (A)	
34	Not used	
35	DATA - (B)	
36	Not used	

Terminals 29 and 33 are internally connected.
Terminals 31 and 35 are internally connected.

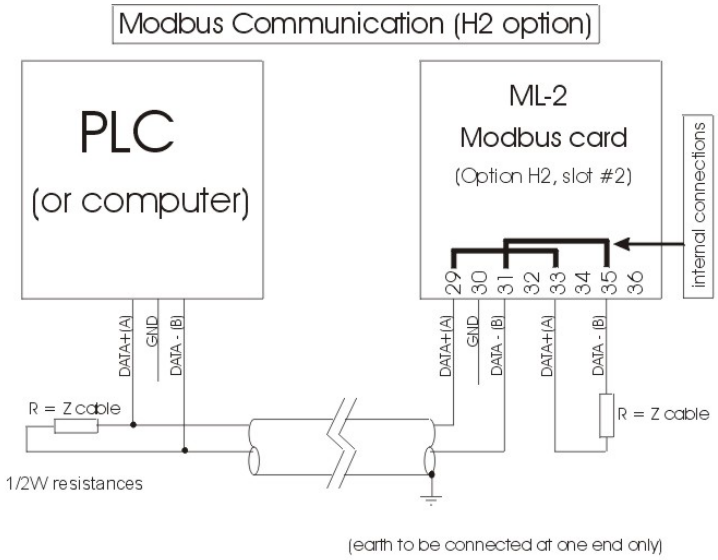
Only modbus can be used to transmit the data to the PLC. Profibus cannot be used.

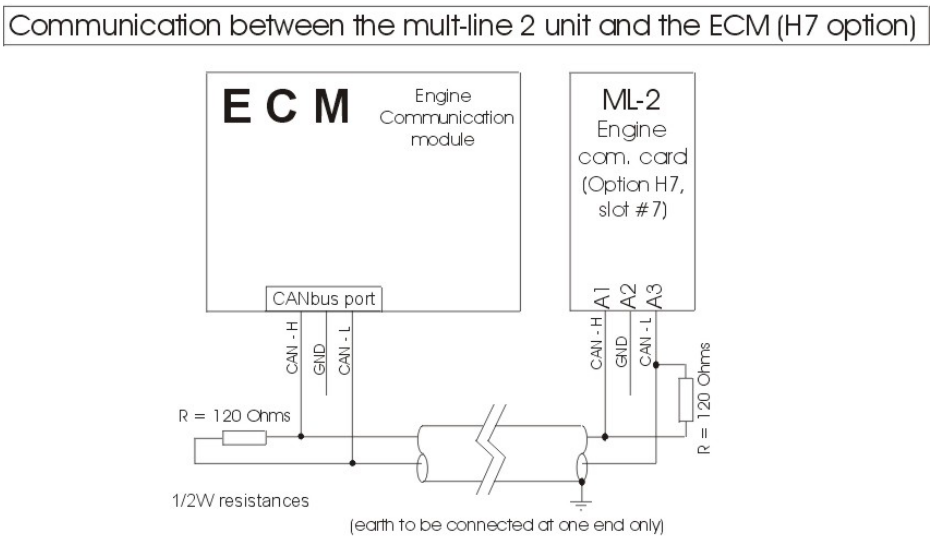
Wirings

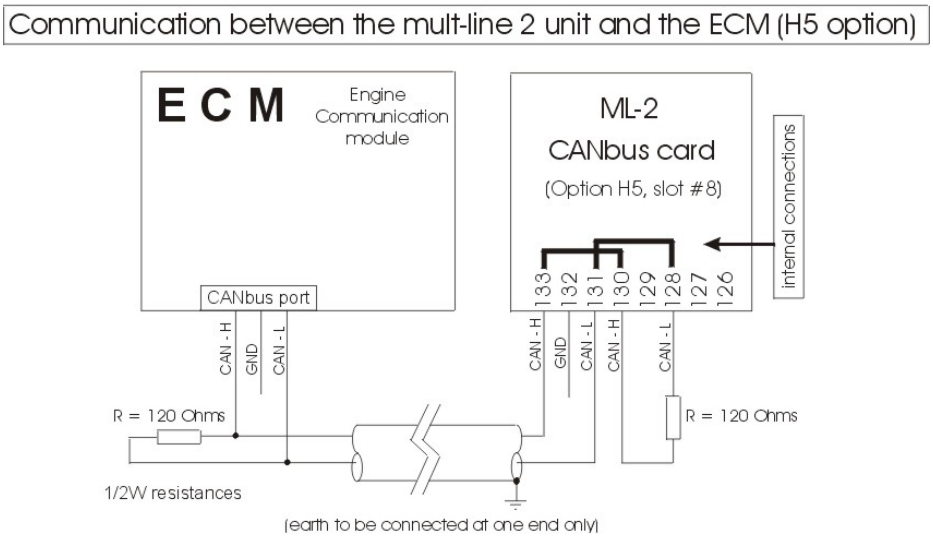
Principle diagram



Connection 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 read from the following engine types:

Engine manufacturer	Controller/engine type	Comment
Caterpillar	CAT C4.4 and CAT C6.6	
Detroit Diesel	DDEC	
Deutz	EMR 2	
Iveco	EDC7C1 / series NEF and CURSOR	
John Deere	JDEC	
MTU	MDEC, module M.302 or M.303 / series 2000 and 4000	
MTU	MDEC, module M.201 or M.304 / series 2000 and 4000	Select M.303
Perkins	EMS 1100D Electronic	
Scania	EMS	
Scania	EMS S6 (KWP2000)	Commands, e.g. start/stop, and settings, e.g. speed, will be written to the EMS
Volvo Penta	EMS	
Volvo Penta	EMS 2 / TAD941GE	Commands, e.g. start/stop, and settings, e.g. speed, will be written to the EMS

The communication type is set up menu 7562 and can be set up via the display or the PC utility software.

MTU MDEC is only available in option H5.

Communication system

All these protocols are based on a CANbus communication system. Except for the MDEC communication, all of them are based on the J1939. The MDEC protocol is an MTU designed protocol.

The Baud rate is fixed by the engine manufacturer at:

MDEC	Caterpillar, 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 determines whether bar/Celsius or psi/Fahrenheit is used in the display. The selection affects display value and also the data readable by the modbus communication (option H2).

Alarm functions

A number of alarms can be configured. Please refer to the Designer's Reference Handbook for information about this configuration.

The following items can be configured to an alarm:

Menu number	Alarm	Comment
7570	EIC error	Communication error
7580	EIC warning	Binary value See warning table
7590	EIC shutdown	Binary value See shutdown table
7600	EIC overspeed	Actual RPM
7610/7620	EIC coolant t. (2 levels)	Actual temperature
7630/7640	EIC oil press. (2 levels)	Actual pressure

If the alarm must activate a relay output, please notice that the number of configurable relay outputs is option dependent.

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.

The available warnings depend on the actual communication type:

Warning list	**MDEC: Module 302/303**	**CAT/ Perkins**	**DDEC/ Volvo Penta**	**EMR**	**IVECO**	**JDEC**	**Volvo Penta EMS 2**
MDEC yellow alarm	X	-	-	-	-	-	-
Low oil pressure warning	X	X	-	-	X	-	X
High coolant temp. warning	X	-	-	-	-	-	X
High intercooler temp.	X	-	-	-		-	-
Defective cool. level switch	X	-	-	-	-	-	-
EMR warning	-	-	-	X	-	-	-
JDEC warning	-	-	-	-	-	X	-
Oil pressure	-	-	-	-	-	X	-
Intake manifold	-	-	-	-	-	X	-
Boost pressure	-	X	-	-	X		-
Coolant temperature	-	X	-	-	X	X	X
Fuel injection pump	-	-	-	-	-	X	-
High inlet air temp.	-	X	-	-	X		X
Fuel temperature	-	X	-		X		-
Overspeed	-	X	-	-	X		X
ECM yellow lamp		X	-		X		X
Coolant level	-	-	-	-	-	-	X
Battery voltage	-	-	-	-	-	-	X
Fuel pressure	-	-	-	-	-	-	X
Oil level	-	-	-	-	-	-	X

Scania EMS: Please see the chapter 'Engine-specific data'.

Shutdown

All shutdown alarms are grouped in the table below. 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.

Below the list of the alarms included in this group depending on engine communication type:

Alarm type	MDEC: Module 302/303	CAT/ Perkins	DDEC/ Volvo Penta	EMR	Iveco	JDEC	Volvo Penta EMS 2
Overspeed shutdown	X	X	-	X	X	-	-
MDEC red alarm	X	-	-	-	-	-	-
Low oil pressure shutdown	X	X	-	X	X	X	-
Low coolant level shutdown	X	-	-	-	-	-	-
MDEC ECU failure	X	-	-	-	-	-	-
High coolant temp. shutdown	X	X	-	X	X	X	-
High oil temp. shutdown	X	-	-	-	-	-	-
High charge air temp. shutdown	X	-	-	-	-	-	-
EMR shutdown	-	-	-	X	-	-	-
JDEC shutdown	-	-	-	-	-	X	-
Fuel temperature	-	-	-	-		X	-
Fuel control valve	-	-	-	-		X	-
ECU failure	-	-	-	-		X	-
ECM red lamp	-	X	-	-	X	-	X

Scania EMS: Please see the chapter 'Engine-specific data'.

Engine-specific data

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

Engine type / Command	MDEC: Module 302/303	CAT/ Perkins	Iveco	Scania EMS S6	Volvo Penta EMS 2
Preheat		-	-	-	X
Start		-	-	X	X
Stop		-	-	X	X
Engine speed		X	X	X	X
Nominal frequency		-	-	X	X

The engine types not mentioned in the above table cannot be controlled via CANbus.

Caterpillar/Perkins

Writeable commands: Engine speed.
CANbus ID for speed control: 0x0c000000.

Iveco

Writeable commands: Engine speed.
CANbus ID for speed control: 0xc000003.

Scania EMS S6

Writeable commands: Start, stop, engine speed and frequency selection.

CANbus ID for control:
Offset: 0xcfff727.
Speed: 0x0cff8027.

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).

To retrieve the error log in the EMS S6, the LOG button on the ML-2 unit must be activated for more than 2 seconds.

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 program 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

Scania control

In the parameter 2770 it is possible to configure the droop setting and the initial speed setting. The setting 'User' in parameter 2772 refers to the factory setting in the EMS S6.

Volvo Penta EMS 2

Readable states: Preheat and running.

Writeable commands: Preheat, start, stop, accelerator set point and frequency selection.

CANbus ID for speed control: 0x0cff4611.

The start/stop and preheat commands are written by the EMS 2.

Displayed values

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

For information about the menu structure of the AGC, 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 value is not available 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 available value changes to N.A. due to communication error

Object selection

The view lines can be configured with the available values:

Object	MDEC: Module 302/303	CAT/ Perkins	DDEC	EMR	Iveco	JDEC	Scania	Volvo Penta
EIC speed	X	X	X	X	X	X	X	X
EIC coolant temp.	X	X	X	X	X	X	X	X
EIC oil pressure	X	X	X	X	X	X	X	X
EIC faults	X	-	-	X	-	-	-	-
EIC oil temp.	X	X	X	-	X	-	X	X
EIC fuel temp.	X	X	X	-	X	X	-	-
EIC boost pressure	-	X	X	-	X	-	X	X
EIC air inlet temp.	-	X	X	-	X	-	-	X
EIC coolant level	-	X	X	-	X	-	X	-
EIC fuel rate	-	X	X	-	X	X	X	X
EIC charge air pressure	X	-	-	-	-	-	-	-
EIC charge air temp.	X	-	-	-	X	X	X	X
EIC d.d. % torque	-	X	-	-	X	-	-	X
EIC actual % torque	-	X	-	-	X	-	-	X
EIC acc. pedal pos.	-	X	-	-	X	-	-	X
EIC % load, c. speed	-	X	-	-	X	-	X	X
EIC air inlet pressure	-	X	-	-	X	-	-	X
EIC exhaust gas temp.	-	X	-	-	X	-	-	X
EIC engine hours	-	X	-	-	X	-	-	X
EIC oil f. diff. press.	-	-	-	-	-	-	-	X
EIC battery voltage	-	X	-	-	X	-	-	X
EIC fuel del. press.	-	X	-	-	X	-	-	X
EIC oil level	-	X	-	-	X	-	-	X
EIC crankcase press.	-	X	-	-	X	-	-	X
EIC coolant pressure	-	X	-	-	X	-	-	X
EIC water in. fuel	-	-	-	-	-	-	-	X
EIC turbo oil temp.	-	X	-	-	X	-	-	-
EIC Trap inlet	-	X	-	-	X	-	-	-
EIC A Fil diff	-	X	-	-	X	-	-	-
EIC C Fil diff	-	X	-	-	X	-	-	-

Modbus communication

If option H2 (modbus) is installed, then the data can be transmitted to a PLC or a computer.

Please refer to the option H2 technical documentation for more information about our standard external modbus communication from the controller unit to an external PLC (or computer).

4. Parameter list

For information about the structure of the parameter descriptions, see the Designer's Reference Handbook.

7560 Engine I/F

No.	Setting		Min. setting	Max. setting	Factory setting
7561	Engine I/F	Engine type	OFF DDEC EMR JDEC Iveco Perkins Caterpillar Volvo Penta EMS Volvo Penta EMS 2 Scania EMS Scania EMS S6		OFF

Please choose MDEC 2000/4000 M.303, when M.201 or M.304 is required.

7570 EI comm. error

No.	Setting		Min. setting	Max. setting	Factory setting
7571	EI comm. error	Delay	0.0 s	100.0 s	0.0 s
7572	EI comm. error	Relay output A	Not used	Option dependent	Not used
7573	EI comm. error	Relay output B	Not used		Not used
7574	EI comm. error	Enable	OFF	ON	OFF
7575	EI comm. error	Fail class	Warning	Trip MB	Warning

7580 EIC warning

No.	Setting		Min. setting	Max. setting	Factory setting
7581	EIC warning	Delay	0.0 s	100.0 s	0.0 s
7582	EIC warning	Relay output A	Not used	Option dependent	Not used
7583	EIC warning	Relay output B	Not used		Not used
7584	EIC warning	Enable	OFF	ON	OFF
7585	EIC warning	Fail class	Alarm	Trip MB	Warning

7590 EIC shutdown

No.	Setting		Min. setting	Max. setting	Factory setting
7591	EIC shutdown	Delay	0.0 s	100.0 s	0.0 s
7592	EIC shutdown	Relay output A	Not used	Option dependent	Not used
7593	EIC shutdown	Relay output B	Not used		Not used
7594	EIC shutdown	Enable	OFF	ON	OFF
7595	EIC shutdown	Fail class	Alarm	Trip MB	Shutdown

7600 EIC overspeed

No.	Setting		Min. setting	Max. setting	Factory setting
7601	EIC overspeed	Set point	0 RPM	2000 RPM	1600 RPM
7602	EIC overspeed	Delay	0.0 s	100.0 s	2.0 s
7603	EIC overspeed	Relay output A	Not used	Option dependent	Not used
7604	EIC overspeed	Relay output B	Not used		Not used
7605	EIC overspeed	Enable	OFF	ON	OFF
7606	EIC overspeed	Fail class	Alarm	Trip MB	Warning

7610 EIC coolant t. 1

No.	Setting		Min. setting	Max. setting	Factory setting
7611	EIC coolant t. 1	Set point	-40 deg.	210 deg.	100 deg.
7612	EIC coolant t. 1	Delay	0.0 s	100.0 s	5.0 s
7613	EIC coolant t. 1	Relay output A	Not used	Option dependent	Not used
7614	EIC coolant t. 1	Relay output B	Not used		Not used
7615	EIC coolant t. 1	Enable	OFF	ON	OFF
7616	EIC coolant t. 1	Fail class	Alarm	Trip MB	Warning

7620 EIC coolant t. 2

No.	Setting		Min. setting	Max. setting	Factory setting
7621	EIC coolant t. 2	Set point	-40 deg.	210 deg.	110 deg.
7622	EIC coolant t. 2	Delay	0.0 s	100.0 s	5.0 s
7623	EIC coolant t. 2	Relay output A	Not used	Option dependent	Not used
7624	EIC coolant t. 2	Relay output B	Not used		Not used
7625	EIC coolant t. 2	Enable	OFF	ON	OFF
7626	EIC coolant t. 2	Fail class	Alarm	Trip MB	Warning

7630 EIC oil press. 1

No.	Setting		Min. setting	Max. setting	Factory setting
7631	EIC oil press. 1	Set point	0.0 bar	10.0 bar	2.0 bar
7632	EIC oil press. 1	Delay	0.0 s	100.0 s	5.0 s
7633	EIC oil press. 1	Relay output A	Not used	Option dependent	Not used
7634	EIC oil press. 1	Relay output B	Not used		Not used
7635	EIC oil press. 1	Enable	OFF	ON	OFF
7636	EIC oil press. 1	Fail class	Alarm	Trip MB	Warning

7640 EIC oil press. 2

No.	Setting		Min. setting	Max. setting	Factory setting
7641	EIC oil press. 2	Set point	0.0 bar	10.0 bar	1.0 bar
7642	EIC oil press. 2	Delay	0.0 s	100.0 s	5.0 s
7643	EIC oil press. 2	Relay output A	Not used	Option dependent	Not used
7644	EIC oil press. 2	Relay output B	Not used		Not used
7645	EIC oil press. 2	Enable	OFF	ON	OFF
7646	EIC oil press. 2	Fail class	Alarm	Trip MB	Warning

Regulation

2770 Scania control

No.	Setting		Min. setting	Max. setting	Factory setting
2771	Scania control	Droop	0.0%	25.0%	4.0%
2772	Scania control	Speed	User 1500 rpm 1800 rpm Low idle		User

This menu is only available when 'Scania EMS S6' is selected in menu 7562.

5. Modbus communication

This chapter is to be considered as additional information for option H2. 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.

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 7560.

MDEC series – 2000/4000 – module 302 & 303 – MTU engines

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Type
1020	EIC alarms	Bit 0 EIC communication error Bit 2 EIC shutdown Bit 3 EIC overspeed Bit 4 EIC coolant water temperature 1 Bit 5 EIC coolant water temperature 2 Bit 6 EIC oil pressure 1 Bit 7 EIC oil pressure 2
1024	EIC alarms	Bit 0 Overspeed, shutdown Bit 1 Low oil pressure, warning Bit 2 Low oil pressure, shutdown Bit 3 Low coolant level, shutdown Bit 4 MDEC ECU failure, shutdown Bit 5 High coolant temperature, warning Bit 6 High coolant temperature, shutdown Bit 7 High intercooler coolant temperature, warning Bit 8 High oil temperature, shutdown Bit 9 High charge air temperature, shutdown Bit 10 Defect coolant level switch, warning Bit 11 MDEC yellow alarm, warning Bit 12 MDEC red alarm, shutdown
593	EIC speed	Engine comm. speed [rpm]
594	EIC coolant temp.	Engine comm. coolant temperature [deg][F]
595	EIC oil pressure	Engine comm. engine oil pressure [bar/100][psi/100]
596	EIC faults	Engine comm. number of actual faults
597	EIC oil temp.	Engine comm. engine oil temperature [deg][F]
598	EIC fuel temp.	Engine comm. fuel temperature [deg/10][F/10]
603	EIC charge air pressure	Engine comm. charge air pressure [bar/100][psi/100]
604	EIC charge air temp.	Engine comm. charge air temperature [deg][F]

Caterpillar/Perkins

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Type
1020	EIC alarms	Bit 0 EIC communication error Bit 2 EIC shutdown Bit 3 EIC overspeed Bit 4 EIC coolant water temperature 1 Bit 5 EIC coolant water temperature 2 Bit 6 EIC oil pressure 1 Bit 7 EIC oil pressure 2
1024	EIC alarms	Bit 1 Low oil pressure, warning Bit 2 Low oil pressure, shutdown Bit 3 Boost pressure, warning Bit 4 High coolant temperature, warning Bit 5 Low coolant level, shutdown Bit 6 High inlet air temperature, warning Bit 7 Fuel temperature, warning Bit 8 ECM yellow lamp, warning Bit 9 ECM red lamp, shutdown Bit 10 Overspeed, warning Bit 11 Overspeed, shutdown
593	EIC speed	Engine comm. speed [rpm]
594	EIC coolant temp.	Engine comm. coolant temperature [deg][F]
595	EIC oil pressure	Engine comm. engine oil pressure [bar/100][psi/100]
597	EIC oil temp.	Engine comm. engine oil temperature [deg][F]
598	EIC fuel temp.	Engine comm. fuel temperature [deg][F]
599	EIC boost pressure	Engine comm. boost pressure [bar/100][psi/100]
600	EIC air inlet temp.	Engine comm. air inlet temperature [deg][F]
601	EIC coolant level	Engine comm. coolant level [%/10]
602	EIC fuel rate	Engine comm. fuel rate [L/h/10]
605	EIC d.d. % torque	Engine comm. driver’s demand engine - percent torque [%]
606	EIC actual % torque	Engine comm. actual engine - percent torque [%]
607	EIC acc. pedal pos.	Engine comm. accelerator pedal position [%]
608	EIC % load, c. speed	Engine comm. percent load at current speed [%]
609	EIC air inlet pressure	Engine comm. air inlet pressure [bar/100][psi/100]
700	EIC exhaust gas temp.	Engine comm. exhaust gas temperature [deg/10][F/10]
701	EIC engine hours	Engine comm. ENGINE HOURS [H]
703	EIC battery voltage	Engine comm. battery potential [V/10], switched
704	EIC fuel del. press.	Engine comm. fuel delivery pressure [bar/100][psi/100]
705	EIC oil level	Engine comm. engine oil level [%]
706	EIC crankcase press.	Engine comm. crankcase pressure [bar/100][psi/100]
707	EIC coolant pressure	Engine comm. coolant pressure [bar/100][psi/100]
709	EIC turbo oil temp.	Engine comm. [deg./10] [F/10]

Addr.	Content	Type
800	EIC trap inlet	Engine comm. [bar/100] [psi/100]
801	EIC A fil diff	Engine comm. [bar/1000] [psi/1000]
802	EIC C fil diff	Engine comm. [bar/100] [psi/100]

DDEC – Detroit engines

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Type
1020	EIC alarms	Bit 0 EIC communication error Bit 2 EIC shutdown Bit 3 EIC overspeed Bit 4 EIC coolant water temperature 1 Bit 5 EIC coolant water temperature 2 Bit 6 EIC oil pressure 1 Bit 7 EIC oil pressure 2
593	EIC speed	Engine comm. speed [rpm]
594	EIC coolant temp.	Engine comm. coolant temperature [deg][F]
595	EIC oil pressure	Engine comm. engine oil pressure [bar/100][psi/100]
597	EIC oil temp.	Engine comm. engine oil temperature [deg][F]
598	EIC fuel temp.	Engine comm. fuel temperature [deg][F]
599	EIC boost pressure	Engine comm. boost pressure [bar/100][psi/100]
600	EIC air inlet temp.	Engine comm. air inlet temperature [deg][F]
601	EIC coolant level	Engine comm. coolant level [%/10]
602	EIC fuel rate	Engine comm. fuel rate [L/h/10]

EMR 2 – Deutz engines

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Type
1020	EIC alarms	Bit 0 EIC communication error Bit 2 EIC shutdown Bit 3 EIC overspeed Bit 4 EIC coolant water temperature 1 Bit 5 EIC coolant water temperature 2 Bit 6 EIC oil pressure 1 Bit 7 EIC oil pressure 2
1024	EIC alarms	Bit 0 High coolant temperature, shutdown Bit 1 Low oil pressure, shutdown Bit 2 Overspeed, shutdown Bit 3 EMR shutdown (LS: lamp status) Bit 4 EMR warning (LS: lamp status)
593	EIC speed	Engine comm. speed [rpm]
594	EIC coolant temp.	Engine comm. coolant temperature [deg][F]
595	EIC oil pressure	Engine comm. engine oil pressure [bar/100][psi/100]
596	EIC faults	Engine comm. number of actual faults

Iveco

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Type
1020	EIC alarms	Bit 0 EIC communication error Bit 2 EIC shutdown Bit 3 EIC overspeed Bit 4 EIC coolant water temperature 1 Bit 5 EIC coolant water temperature 2 Bit 6 EIC oil pressure 1 Bit 7 EIC oil pressure 2
1024	EIC alarms	Bit 1 Low oil pressure, warning Bit 2 Low oil pressure, shutdown Bit 3 Boost pressure, warning Bit 4 High coolant temperature, warning Bit 5 High coolant temperature, shutdown Bit 6 High inlet air temperature, warning Bit 7 Fuel temperature, warning Bit 8 ECM yellow lamp, warning Bit 9 ECM red lamp, shutdown Bit 10 Overspeed, warning Bit 11 Overspeed, shutdown
593	EIC speed	Engine comm. speed [rpm]
594	EIC coolant temp.	Engine comm. coolant temperature [deg][F]
595	EIC oil pressure	Engine comm. engine oil pressure [bar/100][psi/100]
597	EIC oil temp.	Engine comm. engine oil temperature [deg][F]
598	EIC fuel temp.	Engine comm. fuel temperature [deg][F]
599	EIC boost pressure	Engine comm. boost pressure [bar/100][psi/100]
600	EIC air inlet temp.	Engine comm. air inlet temperature [deg][F]
601	EIC coolant level	Engine comm. coolant level [%/10]
602	EIC fuel rate	Engine comm. fuel rate [L/h/10]
604	EIC charge air temp.	Engine comm. charge air temperature [deg][F]
605	EIC d.d. % torque	Engine comm. driver’s demand engine - percent torque [%]
606	EIC actual % torque	Engine comm. actual engine - percent torque [%]
607	EIC acc. pedal pos.	Engine comm. accelerator pedal position [%]
608	EIC % load, c. speed	Engine comm. percent load at current speed [%]
609	EIC air inlet pressure	Engine comm. air inlet pressure [bar/100][psi/100]
700	EIC exhaust gas temp.	Engine comm. exhaust gas temperature [deg/10][F/10]
701	EIC engine hours	Engine comm. ENGINE HOURS [H]
703	EIC battery voltage	Engine comm. battery potential [V/10], switched
704	EIC fuel del. press.	Engine comm. fuel delivery pressure [bar/100][psi/100]
705	EIC oil level	Engine comm. engine oil level [%]
706	EIC crankcase press.	Engine comm. crankcase pressure [bar/100][psi/100]
707	EIC coolant pressure	Engine comm. coolant pressure [bar/100][psi/100]
709	EIC turbo oil temp.	Engine comm. [deg./10] [F/10]

Addr.	Content	Type
800	EIC trap inlet	Engine comm. [bar/100] [PSI/100]
801	EIC A fil diff	Engine comm. [bar/1000] [PSI/1000]
802	EIC C fil diff	Engine comm. [bar/100] [PSI/100]

JDEC – John Deere engines

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Type
1020	EIC alarms	Bit 0 EIC communication error Bit 2 EIC shutdown Bit 3 EIC overspeed Bit 4 EIC coolant water temperature 1 Bit 5 EIC coolant water temperature 2 Bit 6 EIC oil pressure 1 Bit 7 EIC oil pressure 2
1024	EIC alarms	Bit 0 High coolant temperature, shutdown Bit 1 Low oil pressure, shutdown Bit 2 Fuel temperature, shutdown Bit 3 Fuel control valve, shutdown Bit 4 ECU failure, shutdown Bit 5 Oil pressure, warning Bit 6 Intake manifold, warning Bit 7 Coolant temperature, warning Bit 8 Fuel injection pump, warning Bit 9 JDEC shutdown (LS: lamp status) Bit 10 JDEC warning (LS: lamp status)
593	EIC speed	Engine comm. speed [rpm]
594	EIC coolant temp.	Engine comm. coolant temperature [deg][F]
595	EIC oil pressure	Engine comm. engine oil pressure [bar/100][psi/100]
598	EIC fuel temp.	Engine comm. fuel temperature [deg][F]
602	EIC fuel rate	Engine comm. fuel rate [L/h/10]
604	EIC charge air temp.	Engine comm. charge air temperature [deg][F]

Scania

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Type
1026	EIC alarms	Bit 0 Overreving Bit 1 Speed sensor 1 Bit 2 Speed sensor 2 Bit 3 Water temp. sensor Bit 4 Charge air temp. sensor Bit 5 Charge air pressure sensor Bit 6 Oil temp. sensor Bit 7 Oil pressure sensor Bit 8 Fault in cor. Bit 9 Throttle pedal Bit 10 Emergency stop override Bit 11 Oil pressure prot. Bit 12 Wrong parameter Bit 13 Battery voltage Bit 14 Oil pressure prot. Bit 15 Emergency stop cor.
1027	EIC alarms	Bit 0 CAN cir. defect Bit 1 CAN mess. DLN1 Bit 2 Wrong CAN version Bit 3 Un. inj. cyl. 1 Bit 4 Un. inj. cyl. 2 Bit 5 Un. inj. cyl. 3 Bit 6 Un. inj. cyl. 4 Bit 7 Un. inj. cyl. 5 Bit 8 Un. inj. cyl. 6 Bit 9 Un. inj. cyl. 7 Bit 10 Un. inj. cyl. 8 Bit 11 Extra ana. inp. Bit 12 System shutdown Bit 13 Coola. L. prot. Bit 14 HW watchdog Bit 15 Fault in RAM
1028	EIC alarms	Bit 0 Seal Bit 1 Coola. shut OFF Bit 2 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

Volvo Penta

Alarm, status and measurement table (read only) function code 04h.

Addr.	Content	Type
1020	EIC alarms	Bit 0 EIC communication error Bit 2 EIC shutdown Bit 3 EIC overspeed Bit 4 EIC coolant water temperature 1 Bit 5 EIC coolant water temperature 2 Bit 6 EIC oil pressure 1 Bit 7 EIC oil pressure 2
1024	EIC alarms	Bit 0 Overspeed, warning Bit 1 Oil pressure, warning Bit 2 Oil temperature, warning Bit 3 High coolant temperature, warning Bit 4 Low coolant level, warning Bit 5 Fuel pressure, warning Bit 6 ECM yellow lamp, warning Bit 7 ECM red lamp, shutdown Bit 8 High inlet air temperature, warning Bit 10 Battery voltage, warning Bit 11 Low oil level, warning
593	EIC speed	Engine comm. speed [rpm]
594	EIC coolant temp.	Engine comm. coolant temperature [deg][F]
595	EIC oil pressure	Engine comm. engine oil pressure [bar/100][psi/100]
597	EIC oil temp.	Engine comm. engine oil temperature [deg][F]
599	EIC boost pressure	Engine comm. boost pressure [bar/100][psi/100]
600	EIC air inlet temp.	Engine comm. air inlet temperature [deg][F]
602	EIC fuel rate	Engine comm. fuel rate [L/h/10]
604	EIC charge air temp.	Engine comm. charge air temperature [deg][F]
605	EIC d.d. % torque	Engine comm. driver's demand engine - percent torque [%]
606	EIC actual % torque	Engine comm. actual engine - percent torque [%]
607	EIC acc. pedal pos.	Engine comm. accelerator pedal position [%]
608	EIC % load, c. speed	Engine comm. percent load at current speed [%]
609	EIC air inlet pressure	Engine comm. air inlet pressure [bar/100][psi/100]
700	EIC exhaust gas temp.	Engine comm. exhaust gas temperature [deg/10][F/10]
701	EIC engine hours	Engine comm. ENGINE HOURS [H]
702	EIC oil f. diff. press.	Engine comm. engine oil filter diff. press. [bar/100][psi/100]
703	EIC battery voltage	Engine comm. battery potential [V/10], switched
704	EIC fuel del. press.	Engine comm. fuel delivery pressure [bar/100][psi/100]
705	EIC oil level	Engine comm. engine oil level [%]
706	EIC crankcase press.	Engine comm. crankcase pressure [bar/100][psi/100]
707	EIC coolant pressure	Engine comm. coolant pressure [bar/100][psi/100]
708	EIC water in. fuel	Engine comm. water in fuel indicator [ON/OFF]

Resolution hours (98) - approx. 3.75 years supported.