

## ControlReg series Engine interface communication

Instruction manual

**LEROY-SOMER**™

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All for dreams

# ControlReg series

## Engine interface communication

### CONTENTS

<b>1 - GENERALITIES .....</b>	<b>4</b>
1.1 - Engine communication .....	4
1.2 - Wiring .....	4
<b>2 - FUNCTIONAL DESCRIPTION .....</b>	<b>5</b>
2.1 - Electronic Control Module (ECM) .....	5
2.2 - Engine types .....	5
2.3 - Communication system .....	6
2.4 - EIC unit .....	6
2.5 - Common for all alarm functions .....	6
2.6 - J1939 measurement table .....	6
2.6.1 - J1939 measurement table .....	6
2.6.2 - Error messages .....	7
2.6.3 - Object selection, J1939 .....	7
2.6.4 - For the Iveco Vector 8 type only .....	9
2.6.5 - For the MTU Smart Connect type only .....	9
2.7 - Show engine values in display unit .....	9
2.7.1 - Show engine values in display unit .....	9
2.7.2 - Configuration of user view .....	10
2.7.3 - Activation of auto views .....	10
2.8 - Verification of J1939 objects .....	10
2.9 - Control commands sent to the engine .....	11
2.9.1 - Control commands .....	11
2.9.2 - EIC 50 Hz - 60 Hz switch .....	12
2.9.3 - EIC Droop .....	13
2.9.4 - EIC Inhibit .....	13
2.9.5 - EIC Idle .....	13
<b>3 - SPECIFIC ENGINE TYPE DESCRIPTIONS .....</b>	<b>14</b>
3.1 - About type descriptions .....	14
3.2 - Caterpillar/Perkins (J1939) .....	14
3.2.1 - Object selection, J1939 .....	14
3.2.2 - Readings from the display .....	15
3.2.3 - Warnings and shutdowns .....	15
3.2.4 - Write commands to engine controller .....	16
3.3 - Cummins CM850-CM570 (J1939) .....	16
3.3.1 - Warnings and shutdowns .....	16
3.3.2 - Write commands to engine controller .....	16
3.4 - Detroit Diesel DDEC (J1939) .....	17
3.4.1 - Warnings and shutdowns .....	17
3.4.2 - Write commands to engine controller .....	17
3.5 - Deutz EMR 2 - EMR 3 (J1939) .....	17
3.5.1 - Warnings and shutdowns .....	17
3.5.2 - Write commands to engine controller .....	17
3.6 - Generic J1939 (J1939) .....	18
3.6.1 - Warnings and shutdowns .....	18
3.6.2 - Write commands to engine controller .....	18
3.7 - Iveco (J1939) .....	18
3.7.1 - Warnings and shutdowns .....	18
3.7.2 - Write commands to engine controller .....	19
3.8 - John Deere JDEC (J1939) .....	19
3.8.1 - Warnings and shutdowns .....	19
3.8.2 - Write commands to engine controller .....	19
3.9 - MTU J1939 Smart Connect .....	19
3.9.1 - Smart Connect .....	19

# ControlReg series

## Engine interface communication

3.9.2 - Warnings and shutdowns .....	20
3.9.3 - Write commands to engine controller .....	20
3.10 - MTU ADEC (CANopen) .....	21
3.10.1 - MTU ADEC (CANopen) .....	21
3.10.2 - Readings from the display .....	21
3.10.3 - Warning .....	22
3.10.4 - Shutdown .....	23
3.10.5 - Write commands to engine controller .....	23
3.11 - MTU ADEC module 501, without SAM module .....	24
3.11.1 - MTU ADEC module 501, without SAM module .....	24
3.11.2 - Displayed values .....	24
3.11.3 - Alarms .....	24
3.11.4 - Write commands to engine controller .....	25
3.12 - MTU MDEC module 302/303 (MTU) .....	26
3.12.1 - MTU MDEC module 302/303 (MTU) .....	26
3.12.2 - Readings from the display .....	26
3.12.3 - Alarms .....	27
3.12.4 - Write commands to engine controller .....	28
3.13 - Scania EMS (J1939) .....	28
3.13.1 - Warning/shutdown .....	28
3.13.2 - Write commands to engine controller .....	28
3.14 - Scania EMS 2 S6 (J1939) .....	28
3.14.1 - Scania EMS 2 S6 (J1939) .....	28
3.14.2 - Warnings and shutdowns (DNL2 alarms) .....	28
3.14.3 - Error log .....	29
3.14.4 - Write commands to engine controller .....	30
3.14.5 - Control .....	30
3.15 - Volvo Penta EMS (J1939) .....	30
3.15.1 - Warnings and shutdowns .....	30
3.15.2 - Write commands to engine controller .....	30
3.16 - Volvo Penta EMS 2 (J1939) .....	31
3.16.1 - Volvo Penta EMS 2 (J1939) .....	31
3.16.2 - Warnings and shutdowns .....	31
3.16.3 - Write commands to engine controller .....	31
3.16.4 - Readable states .....	31
<b>4 - PARAMETERS .....</b>	<b>32</b>
4.1 - Parameters related to engine communication .....	32
<b>5 - MODBUS COMMUNICATION .....</b>	<b>33</b>
5.1 - Readings .....	33
5.1.1 - Analogue values .....	33
5.1.2 - Diagnostic codes .....	36
5.2 - Alarms .....	40
5.2.1 - Caterpillar/Perkins .....	40
5.2.2 - Cummins .....	41
5.2.3 - DDEC – Detroit engines .....	42
5.2.4 - EMR 2 – EMR 3 - Deutz engines .....	42
5.2.5 - Generic J1939 .....	43
5.2.6 - Iveco .....	43
5.2.7 - JDEC – John Deere engines .....	44
5.2.8 - MTU Smart Connect .....	44
5.2.9 - MTU ADEC .....	45
5.2.10 - MTU ADEC module 501, without SAM module .....	46
5.2.11 - MTU MDEC series - 2000/4000 - module 302 & 303 .....	47
5.2.12 - Scania .....	48
5.2.13 - Volvo Penta .....	50

# ControlReg series

## Engine interface communication

### 1 - GENERALITIES

This description covers the following products:

ControlReg200	SW version 1.00.x or later
ControlReg200P	SW version 1.00.x or later

This document is a complementary part of the installation and maintenance manual ref. 5304 that can be downloaded in the Leroy-Somer homepage.

#### 1.1 - Engine communication

This feature gives the possibility to communicate between ControlReg and several engine types over the CANbus. The engine interface communication module is given below:

Term.	Function	Description
1	CAN-L	CANbus Engine Interface Communication
2	CAN-GND	
3	CAN-H	

#### 1.2 - Wiring

For wiring details, please refer to the document ref. 5304 entitled « Installation and maintenance ».

# ControlReg series

## Engine interface communication

## 2 - FUNCTIONAL DESCRIPTION

### 2.1 - Electronic Control Module (ECM)

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.

### 2.2 - Engine types

Data can be transmitted between the ControlReg series and the following engine controllers/ types:

Engine manufacturer	Engine controller/type	Comment
Caterpillar	ADEM III and A4/C4.4, C6.6, C9, C15, C18, C32	Rx/Tx
Cummins	CM850/570/2150/2250, QSL, QSB5, QXL15 and 7, QSM11, QSK19, 50 and 60	Rx/Tx
Detroit Diesel	DDEC III and IV/Series 50, 60 and 2000	Rx/Tx
Deutz	EMR3, EMR 2 (EMR)/912, 913, 914 and L2011	Rx/Tx
-	Generic 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 (ECU7), with SAM module	Rx/Tx
MTU	J1939 Smart Connect/Series 1600 (ECU8)	Rx/Tx
MTU	ADEC/Series 2000 and 4000 (ECU7), without SAM module (software module 501)	Rx/Tx
Perkins	Series 850, 1100, 1200, 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 7561.**

## ControlReg series

### Engine interface communication

### 2.3 - 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. The Baud rate is fixed by the engine manufacturer at:

<b>MDEC, ADEC</b>	<b>Caterpillar, Cummins, Detroit Diesel, Deutz, Iveco, John Deere, Perkins, MTU J1939 Smart Connect, Scania and Volvo Penta</b>
125 kb/s	250 kb/s

### 2.4 - 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.

### 2.5 - 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
7570	EI comm. error	Communication error
7580	EIC warning	Any alarm listed as warning for the selected engine type in the section "Specific engine type descriptions".
7590	EIC shutdown	Any alarm listed as shutdown for the selected engine type in the section "Specific engine type descriptions".
7600	EIC overspeed	Actual RPM
7610/7620	EIC coolant t. (2 levels)	Actual temperature
7630/7640	EIC oil press. (2 levels)	Actual pressure
7650/7660	EIC oil temp. (2 levels)	Actual temperature
7670/7680	EIC coolant level (2 levels)	Actual cooling water level

### 2.6 - J1939 measurement table

#### 2.6.1 - 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 below shows which values can be displayed in the view menu.

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

## ControlReg series

### Engine interface communication

#### 2.6.2 - 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.

#### 2.6.3 - Object selection, J1939

The view lines can be configured with these available values.

**For Modbus scaling, please see the chapter «Modbus communication».**

**The engine is by default settings expected to use source address 0 which is also the most commonly used setting on ECUs. If a different source address is required, it can be changed in parameter 7562.**

Object	PGN	P	S	L	SPN	Unit	J1939-71 scaling
EIC speed	61444	3/6	4	2	190	RPM	0.125 rpm/bit, offset 0
EIC coolant temp. <sup>3</sup>	65262	3/6	1	1	110	°C	1 deg C/bit, offset -40°C
EIC oil pressure <sup>4</sup>	65263	6	4	1	100	Bar	4 kPa/bit, offset 0
EIC faults <sup>6</sup>	65230	6	1	1	1218	NA	1/bit, offset 0
EIC oil temp. <sup>5</sup>	65262	3/6	3	2	175	°C	0.03125°C/bit, offset -273°C
EIC fuel temp.	65262	3/6	2	1	174	°C	1°C/bit, offset -40°C
EIC intake manifold #1 P. <sup>1</sup>	65270	6	2	1	102	Bar	2 kPa/bit, offset 0
EIC air inlet temp.	65269	6	6	1	172	°C	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. <sup>2</sup>	65270	6	3	1	105	°C	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	Bar	2 kPa/bit, offset 0
EIC exhaust gas temp.	65270	6	6	2	173	°C	0.03125°C/bit, offset -273°C
EIC engine hours	65253	6	1	4	247	h	0.05 hrs/bit, offset 0, max: 32767 hrs

## ControlReg series

### Engine interface communication

Object	PGN	P	S	L	SPN	Unit	J1939-71 scaling
EIC oil filter diff. press.	65276	31/6	4	1	99	Bar	0.5 kPa/bit, offset 0
EIC key switch battery potential	65271	6	7	2	158	V DC	0.05V DC/bit, offset 0
EIC fuel del. press.	65263	6	1	1	94	Bar	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	Bar	1/128 kPa/bit, offset -250 kPa
EIC coolant pressure	65263	6	7	1	109	Bar	2 kPa/bit, offset 0
EIC water in. fuel	65279	6	1	2 bit	97	NA	00: No, 01: Yes, 10: Error, 11: not available
EIC turbo oil temp.	65262	3/6	5	2	176	°C	0.03125°C/bit, offset -273°C
EIC particulate trap inlet	65270	6	1	1	81	Bar	0.5 kPa/bit, offset 0
EIC air filter diff.	65270	6	5	1	107	Bar	0.05 kPa/bit, offset 0
EIC coolant filter diff.	65270	6	8	1	112	Bar	0.5 kPa/bit, offset 0
EIC atmospheric press.	65269	6	1	1	108	Bar	0.5 kPa/bit, offset 0
EIC ambient air temp.	65269	6	4	2	171	°C	0.03125°C/bit, offset -273°C
EIC trip fuel gaseous	65199	6	1	4	1039	kg	0.5 kg/bit, offset 0
EIC total fuel used gaseous	65199	6	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
EIC Nominal Power	65214	7	1	2	166	kW	0,5 kW/bit
EIC Mean trip fuel consumption	65203	7	5	2	1029	l/h	0,05 [l/h]/bit
EIC Intake manifold #1 absolute pressure	64976	6	5	1	3563	Bar	2 kPa/bit
EIC Air filter diff. pressure	64976	6	1	1	2809	Bar	0.05 kPa offset 0
EIC Fuel supply pump inlet pressure	65130	6	2	1	1381	Bar	2 kPa/bit offset 0
EIC Fuel filter (ss) diff. pressure	65130	6	3	1	1382	Bar	2 kPa/bit offset 0
Diagnostic message 1/2	65226	3/6/7	-	-	-	-	-

PGN: Parameter group number

P: J1939 priority

S: Object's start byte in CAN telegram

L: Object's length (byte)

Unit: Unit in display (Bar/°C can be changed to PSI/°F)



# ControlReg series

## Engine interface communication

**Objects marked<sup>1</sup> also called EIC boost P.**  
**Objects marked<sup>2</sup> also called EIC charge air temp.**

### 2.6.4 - For the Iveco Vector 8 type only

The following footnotes refers to the table in chapter «Object selection, J1939».

<sup>3</sup>: EIC coolant temp.: PGN = 65282, priority = 6, start at byte 5, length = 1 byte, SPN = 110, same scale

<sup>4</sup>: EIC oil pressure. PGN = 65282, priority = 6, start at byte 7, length = 1 byte, 8 kPa/bit gain, 0 kPa offset, data range: 0 to +2000 kPa

<sup>5</sup>: EIC oil temp.: PGN=65282, priority = 6, start at byte 6, length = 1byte, SPN = 175, same scale

### 2.6.5 - For the MTU Smart Connect type only

The following footnote refers to the table in chapter «Object selection, J1939».

<sup>6</sup>: EIC Faults: PGN=65284, priority = 6, start at byte 1, length = 2 byte

**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 04h).**

## 2.7 - Show engine values in display unit

### 2.7.1 - Show engine values in display unit

It is possible to parameterize the ControlReg so all values from the engine CAN bus is shown in the display unit. This is an example where speed, coolant and air inlet temperature is shown. The number of available views is 20. The number can be increased with the Autoview function.

Speed	1500 rpm
T.Coolant	85 deg
T.Oil	50 deg
Run Asbsolute	100hrs

The ControlReg can be set up in two ways:

1. Using the function of the PC Utility Software «configuration of the user views». This way the 20 three line views can be configured to show the desired. A total of 20 views is displayed (unless fewer is set up).

2. Using the Autoview function in the communication setup (menu number 7564). This way the 20 three line views are kept with their present setup and all engine values are added to the list of the 20 three line views. A total of 20 + 14 three line views are available. The 20 lines are user configurable (as mentioned above) but the additional 14 three line views are dedicated to EIC and cannot be modified by the user.

The first option is useful when a few EIC values needs to be shown and if all off the 20 user configurable views are not already used to display requested values.

The second option is useful if it is requested to read **all available** EIC data from the ECU. It must be noted that all available data is shown when using this method until the additional 14 three line views are used. The number of extra display views depends on the available data from the specific engine controller connected to the ControlReg.

## ControlReg series

### Engine interface communication

#### 2.7.2 - Configuration of user view

This configuration is done in PC Utility Software by pressing the user view icon in the horizontal toolbar.



#### 2.7.3 - Activation of auto views

The extra view lines are displayed if the menu 7564 switched to «ON» and the engine CANbus is active. Note that it might be necessary to start the engine before switching 7564 to «ON». The setting automatically returns to «OFF».

To de-activate the auto view function, please follow below steps:

1. Adjust Engine I/F type to «OFF» (menu 7561)
2. Adjust EIC AUTOVIEW to «ON» (menu 7564)
3. Adjust EIC AUTOVIEW to «OFF» (menu 7564)

(The menu is not reset automatically when no engine is selected)

#### 2.8 - Verification of J1939 objects

To verify the communication, various CAN PC tools can be used. Commonly they must be connected to the CANbus between the ControlReg and the engine controller. When the tool is connected, it is possible to monitor the communication between the two units.

As an example, you may see the following telegram:

**0xc f00400 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 (**0xc f00400**) 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 0xc f00400 instead of 0x0c 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	Decimal ID	Hexadecimal ID
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.

# ControlReg series

## Engine interface communication

Hereafter the data can be read (PGN 61444):

0xc00400 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.

## 2.9 - Control commands sent to the engine

### 2.9.1 - Control commands

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

Engine type	Detroit Diesel DDEC	John Deere JDEC	Caterpillar	Perkins	Cummins	Generic J1939	Deutz EMR	Iveco	Iveco Vector 8
Command									
Preheat	-	-	-	-	-	-	-	-	-
Start/Stop	-	-	X	X	-	-	-	-	-
Run/Stop (fuel)	-	-	-	-	X <sup>4</sup>	-	-	-	-
Engine speed	X	X	X	X	X	X	X	X	X
Nominal frequency	-	-	-	-	X	-	-	-	-
Governor gain	-	-	-	-	X	-	-	-	-
Idle speed	X	X	X	X	X	X	X	X	-
Drop	-	-	X	X	X	-	-	-	-
Shutdown override	-	-	-	-	X	-	-	-	-
Engine over-speed test	-	-	-	-	-	-	-	-	-
Enable cylinder cut out	-	-	-	-	-	-	-	-	-
Intermittent oil priming	-	-	-	-	-	-	-	-	-
Engine operating mode	-	-	-	-	-	-	-	-	-
Demand switch	-	-	-	-	-	-	-	-	-
Trip counter reset	-	-	-	-	-	-	-	-	-
Engine speed GOV parameter command	-	-	-	-	-	-	-	-	-

## ControlReg series

### Engine interface communication

Engine type	MTU MDEC	MTU ADEC	MTU ADEC M501	MTU J1939 Smart Connect	Scania EMS	Scania EMS S6	Volvo Penta	Volvo Penta EMS 2
Command								
Preheat	-	-	-	-	-	-	-	X
Start/Stop	-	X	X	X	-	X	-	X
Run/Stop (fuel)	-	-	-	-	-	-	-	-
Engine speed	-	X	X	X	-	X	-	X
Nominal frequency	-	X	X	X	-	X	-	X
Governor gain	-	-	-	-	-	-	-	-
Idle speed	-	X	X	X	-	X	-	X
Droop	-	X	X	X	-	X	-	X
Shutdown override	-	X	X	X	-	X	-	X
Engine over-speed test	-	-	-	X	-	-	-	-
Enable cylinder cut out	-	X	X	X	-	-	-	-
Intermittent oil priming	-	-	-	X	-	-	-	-
Engine operating mode	-	-	-	X	-	-	-	-
Demand switch	-	X	X	X	-	-	-	-
Trip counter reset	-	X	X	X	-	-	-	-
Engine speed GOV parameter command	-	-	-	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 7563 has to be used for enabling or disabling the transmission of ControlReg series EIC control frames listed in the above table.**

**Commands marked X<sup>4</sup> only apply to Cummins CM570 ECU.**

#### 2.9.2 - EIC 50 Hz - 60 Hz switch

If the set point  $f_{\text{nominal}}$  is changed in the ControlReg between 50 and 60 Hz then the change is made with a frequency ramp of 2 Hz per second. This frequency ramp is used when switching between nominal settings 1 - 4 or if the parameter of the nominal frequency is changed between 50 and 60 Hz.

## ControlReg series

### Engine interface communication

#### 2.9.3 - EIC Droop

There are two ways of obtaining a speed droop:

For engines where the droop command or setpoint can be sent to the engine controller, the droop setting in parameter 2771 is the actual droop that is being used and this setpoint is sent to the ECU. This method is referred to as «EIC droop».

For engines where the droop command or setpoint cannot be sent to the engine controller, the droop setting in parameter 2771 is used for droop emulation in the ControlReg. This method is referred to as «EIC droop emulation». EIC droop emulation is a generic function which it is possible to use on every engine type.

In both cases, the droop function is activated in the M-Logic (EIC droop/EIC droop emulation) command out-put.

In the table below, it is shown which engine types support EIC droop with a command or setpoint.

Engine type/protocols	Command	Setpoint
Scania	X	X
Cummins	X	X
Iveco	X	-
Perkins	X	-
Caterpillar	X	-
Volvo	X	-
MTU	-	-
DDEC (Detroit Diesel)	-	-
JDEC (John Deere)	-	-
EMR (Deutz)	-	-
Generic J1939	-	-

#### 2.9.4 - EIC Inhibit

The EIC alarms can be inhibited through M-Logic. This would typically be necessary during stopping of the engine. The following alarm can be inhibited:

- EIC red alarm
- EIC yellow alarm
- EIC malfunction
- EIC protection

#### 2.9.5 - EIC Idle

The «Idle» function of the ControlReg is activated in menu 6290. If this is used with engines with speed control from CAN bus communication the speed is defined to be 700 rpm.

# ControlReg series

## Engine interface communication

### 3 - SPECIFIC ENGINE TYPE DESCRIPTIONS

#### 3.1 - About type descriptions

The J1939 warnings/shutdowns with corresponding SPN (Suspect Parameter Number) and FMI (Failure Mode Indicator) numbers in this chapter refer to those that will automatically appear in the alarm list. The alarms can be acknowledged from the display.

#### 3.2 - Caterpillar/Perkins (J1939)

##### 3.2.1 - Object selection, J1939

The view lines can be configured with these available values.

For Modbus scaling, please see the chapter «Modbus communication».

EIC Exhaust Gas P1...P16 are fixed to the source address 241. The remaining entries in the below table are fixed to source address 0.

Object	PGN	P	S	L	SPN	Unit	J1939-71 scaling
EIC Exhaust Gas P1 Temp	65187	7	1	2	1137	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P2 Temp	65187	7	3	2	1138	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P3 Temp	65187	7	5	2	1139	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P4 Temp	65187	7	7	2	1140	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P5 Temp	65186	7	1	2	1141	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P6 Temp	65186	7	3	2	1142	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P7 Temp	65186	7	5	2	1143	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P8 Temp	65186	7	7	2	1144	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P9 Temp	65185	7	1	2	1145	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P10 Temp	65185	7	3	2	1146	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P11 Temp	65185	7	5	2	1147	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P12 Temp	65185	7	7	2	1148	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P13 Temp	65184	7	1	2	1149	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P14 Temp	65184	7	3	2	1150	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P15 Temp	65184	7	5	2	1151	°C	0.03125 °C/bit, -273°C offset
EIC Exhaust Gas P16 Temp	65184	7	7	2	1152	°C	0.03125 °C/bit, -273°C offset
EIC Coolant Temp 2	64870	6	1	1	4076	°C	1 °C/bit, -40 °C offset
EIC Coolant Temp 3	64870	6	8	1	6209	°C	1 °C/bit, -40 °C offset
EIC Coolant Pump Outlet Temp	64870	6	2	1	4193	°C	1 °C/bit, -40 °C offset
EIC Filtered Fuel Delivery Pressure	64735	6	2	1	5579	kPa	4 kPa/bit, 0 offset
EIC Auxiliary Coolant Temp	65172	6	2	1	1212	kPa	4 kPa/bit, 0 offset
EIC Turbo 1 Intake Temp	65176	6	1	2	1180	°C	0.03125 °C/bit, -273°C offset
EIC Turbo 2 Intake Temp	65176	6	3	2	1181	°C	0.03125 °C/bit, -273°C offset

PGN: Parameter group number

P: J1939 priority

S: Object's start byte in CAN telegram

L: Object's length (byte)

Unit: Unit in display (Bar/°C can be changed to PSI/°F)

## ControlReg series

### Engine interface communication

#### 3.2.2 - Readings from the display

SAE name	Displayed text
Engine Exhaust Gas Port 1 Temperature	Exh.P T01
Engine Exhaust Gas Port 2 Temperature	Exh.P T02
Engine Exhaust Gas Port 3 Temperature	Exh.P T03
Engine Exhaust Gas Port 4 Temperature	Exh.P T04
Engine Exhaust Gas Port 5 Temperature	Exh.P T05
Engine Exhaust Gas Port 6 Temperature	Exh.P T06
Engine Exhaust Gas Port 7 Temperature	Exh.P T07
Engine Exhaust Gas Port 8 Temperature	Exh.P T08
Engine Exhaust Gas Port 9 Temperature	Exh.P T09
Engine Exhaust Gas Port 10 Temperature	Exh.P T10
Engine Exhaust Gas Port 11 Temperature	Exh.P T11
Engine Exhaust Gas Port 12 Temperature	Exh.P T12
Engine Exhaust Gas Port 13 Temperature	Exh.P T13
Engine Exhaust Gas Port 14 Temperature	Exh.P T14
Engine Exhaust Gas Port 15 Temperature	Exh.P T15
Engine Exhaust Gas Port 16 Temperature	Exh.P T16
Engine Coolant Temperature 2	T. Coolant2
Engine Coolant Temperature 3	T. Coolant3
Engine Coolant Pump Outlet Temperature	T. Cool PO
Engine Filtered Fuel Delivery Pressure	P. FilFuel
Engine Auxiliary Coolant Temperature	T. Cool Aux
Engine Turbocharger 1 Turbine Intake Temperature	Turb.int1
Engine Turbocharger 2 Turbine Intake Temperature	Turb.int2

#### 3.2.3 - Warnings and shutdowns

Engine type/protocols	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
EIC malfunction	-	X	-
EIC protection	-	X	-

FMI indication « - » means that the alarm in question is not supported.

# ControlReg series

## Engine interface communication

### 3.2.4 - Write commands to engine controller

- Engine controls

All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 7563 (EIC Controls).

- Engine speed

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

- M-Logic commands are available to enable/disable start/stop and speed controls

- EIC start/stop enable
- EIC speed control inhibit

### 3.3 - Cummins CM850-CM570 (J1939)

#### 3.3.1 - 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
EIC malfunction	-	X	-
EIC protection	-	X	-

**FMI indication « - » means that the alarm in question is not supported.**

#### 3.3.2 - Write commands to engine controller

- Engine controls

All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 7563 (EIC Controls).

M-Logic commands are available to enable/disable speed controls:

- EIC speed control inhibit.

- Engine speed

CANbus ID for speed control: 0x00FF69DC. For Cummins proprietary «Engine governing» EG telegram, the source address of the ControlReg is 0xDC/220 dec).

- Engine speed (engine with PCC controller)1, 2

CAN bus ID for speed control: 0x00FF5FDC. For Cummins proprietary «Engine governing» EG telegram the source address og the ControlReg is 0xDC/220 (dec.). This speed telegram is used by enabling the M-logig function «EIC select Cummins PCC1301».



## ControlReg series

### Engine interface communication

#### - Frequency selection

Nominal frequency is written automatically based on the frequency nominal setting. 50 Hz is written if fNOM < 55 Hz, 60 Hz is written if fNOM is > 55 Hz.

#### - Gain setting

Gain is set in menu 2773

### 3.4 - Detroit Diesel DDEC (J1939)

#### 3.4.1 - Warnings and shutdowns

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

**FMI indication « - » means that the alarm in question is not supported.**

#### 3.4.2 - Write commands to engine controller

##### - Engine controls

All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 7563 (EIC Controls).

##### - Engine speed

CANbus ID for speed control: 0x0c000003. J1939 TSC1.

M-Logic commands are available to enable/disable start/stop and speed controls:

- EIC speed control inhibit.

### 3.5 - Deutz EMR 2 - EMR 3 (J1939)

#### 3.5.1 - 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
EIC malfunction	-	X	-
EIC protection	-	X	-

**FMI indication « - » means that the alarm in question is not supported.**

#### 3.5.2 - Write commands to engine controller

##### - Engine controls

All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 7563 (EIC Controls).

## ControlReg series

### Engine interface communication

#### - Engine speed

CANbus ID for speed control: 0xc000003. For J1939 TSC1, the source address of the ControlReg is 3.

M-Logic commands are available to enable/disable speed controls:

- EIC speed control inhibit.

### 3.6 - Generic J1939 (J1939)

#### 3.6.1 - Warnings and shutdowns

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

**FMI indication « - » means that the alarm in question is not supported.**

#### 3.6.2 - Write commands to engine controller

##### - Engine controls

All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 7563 (EIC Controls).

##### - Engine speed

CANbus ID for speed control: 0x0c000003. J1939 TSC1.

M-Logic commands are available to enable/disable start/stop and speed controls:

- EIC speed control inhibit.

**The speed regulation is enabled in 7563 (EIC Controls).**

### 3.7 - Iveco (J1939)

#### 3.7.1 - 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
EIC malfunction	-	X	-
EIC protection	-	X	-

**FMI indication « - » means that the alarm in question is not supported.**

## ControlReg series

### Engine interface communication

#### 3.7.2 - Write commands to engine controller

##### - Engine controls

All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 7563 (EIC Controls).

##### - Engine speed

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

M-Logic commands are available to enable/disable start/stop and speed controls:

- EIC speed control inhibit.

### 3.8 - John Deere JDEC (J1939)

#### 3.8.1 - 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
EIC malfunction	-	X	-
EIC protection	-	X	-

**FMI indication « - » means that the alarm in question is not supported.**

#### 3.8.2 - Write commands to engine controller

##### - Engine controls

All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 7563 (EIC Controls).

##### - Engine speed

CANbus ID for speed control: 0x0c000003. J1939 TSC1.

M-Logic commands are available to enable/disable start/stop and speed controls:

- EIC speed control inhibit.

### 3.9 - MTU J1939 Smart Connect

#### 3.9.1 - Smart Connect

This protocol is available with MTU series 1600 with ECU8/ECU9/Smart Connect.

# ControlReg series

## Engine interface communication

### 3.9.2 - Warnings and shutdowns

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

**FMI indication « - » means that the alarm in question is not supported.**

### 3.9.3 - Write commands to engine controller

#### - Engine controls

All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 7563 (EIC Controls).

#### - Engine speed

CAN bus ID for speed control: 0x0c0000ea.J1939TSC1.

M-Logic commands are available to enable/disable start/stop and speed controls:

- EIC start/stop enable
- EIC speed control inhibit

#### - Frequency selection

Normal frequency is written automatically based on the frequency nominal setting. 50 Hz is written if  $f_{\text{nominal}} < 55\text{Hz}$ , 60 Hz is written if  $f_{\text{nominal}} \text{ is } > 55\text{ Hz}$

#### - Shut down override

This command can be used with a digital input in order to override shut down actions from the ECU.

#### - Engine overspeed test

The command is activated through M-Logic. Testing of the overspeed function at any given rpm.

#### - Enable cylinder cutout

The command can be used to engage all cylinders if the engine is running with one bank only. The command is activated through M-Logic.

#### - Intermittent oil priming

Engage the pre-lubrication oil pump if installed. The command is activated through M-Logic.

#### - Engine operating mode

Switches the operating mode of the engine. The command is activated through M-Logic (EIC Engine opr mode command)

#### - Demand switch

Set method of speed control between digital («Up/down ECU» with relay controls), analogue («Analog ECU Relative» for analogue VDC control) or from J1939 commands («Analog CAN»). This is selected in menu 2790. Please refer to the MTU documentation for the ECU8 for further information about switching between normal and emergency operation in local or remote.

If the MTU ECU is unable to detect a valid speed demand signal, it will issue the «AI Speed deman def.». This alarm indicates that the MTU ECU may see a CAN speed bias signal, and is setup to 3 - ADEC Analog Relative or that 4 - ADEC Analog relative is used and the signal is out of range (not connected, etc.). When this happens, check the settings on the MTU ECU, PR500 (MTU SAM/Diasys reference)

0 - Default dataset ADEC

1 - ADEC Increase/Decrease Input

2 - CAN Increase/Decrease Input

## ControlReg series

### Engine interface communication

- 3 - ADEC Analog Absolute
- 4 - ADEC Analog Relative
- 5 - ADEC Frequency Input
- 6 - CAN Analog
- 7 - CAN Speed Demand Switch
- Speed gov. param command  
Parameter switch for selection between: Default and Variant 1 M-Logic is used to select variant 1 parameters.
- Trip counter reset  
This command resets the trip fuel consumption counter. The command is activated through M-Logic.
- Idle Run: This command activates Idle speed.
- Speed Increase  
This command increases the speed of the engine by a small amount. The command is activated through M-Logic.
- Speed Decrease  
This command decreases the speed of the engine by a small amount. The command is activated through M-Logic.
- Alternate Droop Setting  
This command activates alternate droop setting. The command is activated through M-Logic.
- Start: This command starts the genset.
- Stop: This command stops the genset

### 3.10 - MTU ADEC (CANopen)

#### 3.10.1 - MTU ADEC (CANopen)

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

#### 3.10.2 - Readings from the display

Display readings	Display readings
Display readings	Display readings
Battery	T. Charg A
EIC faults	T. Coolant
Engine power	T. Exh. L
Fuel rate	T. Exh. R
Mean T. fuel	T. Fuel
Nom. power	T. Int. Co.
Operation	T. Oil
P. Aux 1	T. Winding 1
P. Aux 2	T. Winding 2
P. Boost	T. Winding 3
P. Fuel	Trip fuel
P. Oil	
Speed	

**The Modbus addresses are read-only (function code 04h).**

## ControlReg series

### Engine interface communication

#### 3.10.3 - 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	Display list
Coolant temp. high	HI T-Coolant
Charge air temp. high	HI T-Charge Air
Intercooler coolant temp. high	HI T-Coolant Interc
Lube oil temp. high	HI T-Lube Oil
ECU temp. high	HI T-ECU
Engine speed too low	SS Engine Speed Low
Prelube fail.	AL Prelub. Fail
Start speed not reached	AL Start Spe. N. Re.
Common alarm (yellow)	AL Com. Alarm Yellow
Lube oil pressure low	LO P-Lube Oil
Coolant level low	LO Coolant Level
Intercooler coolant level low	LO Interc. Cool. L.
ECU defect	AL ECU Defect
Speed demand failure	AL Speed Demand Def.
Power supply low voltage	LO Power Supply
Power supply high voltage	HI Power supply
Overspeed	SS Overspeed
Lube oil pressure low low	LOLO P-Lube Oil
Coolant temp. high high	HIHI T-Coolant
Lube oil temp. high high	HIHI T-Lube Oil
Charge air temp. high high	HIHI T-Charge Air
ECU power supply high high	HIHI ECU PS Voltage
ECU power supply low low	LOLO ECU PS Voltage
Generator temp. high	T-Generator Warning
Holding tank high level	HI Level Day-Tank
Holding tank low level	LO Level Day-Tank
Generator winding 1 high temp.	HI T-Winding 1
Generator winding 2 high temp.	HI T-Winding 2
Generator winding 3 high temp.	HI T-Winding 3
Ambient temp. high	HI T-Ambient
Water in fuel 1	AL Water I F. Pref. 1
Water in fuel 2	AL Water I F. Pref. 2
Fuel temp. high	HI T-Fuel
Exhaust bank A high temp.	HI T-Exhaust A
Exhaust bank B high temp.	HI T-Exhaust B

## ControlReg series

### Engine interface communication

Warning list	Display list
Fuel high pressure 1	HI Pressure 1
Fuel high pressure 2	HI Pressure 2
Day tank high level	HI L. Holding-Tank
Day tank low level	LO L. Holding-Tank
Run-up speed not reached	AL Runup. Speed N. Re
Idle speed not reached	AL Idle Speed N. Re

#### 3.10.4 - 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	Display text
AL Com. Alarm Red	AL Com. Alarm Red

#### 3.10.5 - Write commands to engine controller

##### - Engine controls

All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 7563 (EIC Controls).

##### - Engine speed

CANbus ID for speed control: 0x300+ADEC ID – speed demand telegram (ADEC ID is selected in menu 7562, default ID is 6: 0x306).

M-Logic commands are available to enable/disable start/stop and speed controls:

- EIC start/stop enable

##### - Start/Stop command

##### - Frequency selection

Nominal frequency is written automatically based on the frequency nominal setting. 50 Hz is written if fNOM < 55 Hz, 60 Hz is written if fNOM is > 55 Hz.

##### - Demand switch

Set method of speed control between digital («Up/down ECU» with relay controls), analogue («Analog ECU Relative» for analogue VDC control) or from J1939 commands («Analog CAN»). This is selected in menu 2790. Please refer to the MTU documentation for the ECU8 for further information about switching between normal and emergency operation in local or remote.

##### - Trip counter

This command resets the trip fuel consumption counter. The command is activated through M-logic.

##### - Enable Cylinder Cutout

The command can be used to engage all cylinders if the engine is running with one bank only. The command is activated through M-logic.

##### - Shutdown override

This command can be used in order to prevent shutdown actions from the ECU.

## ControlReg series

### Engine interface communication

### 3.11 - MTU ADEC module 501, without SAM module

#### 3.11.1 - MTU ADEC module 501, without SAM module

The MTU ADEC module 501 is not a part of the J1939, therefore the reading of values, alarms and shutdowns are different.

#### 3.11.2 - Displayed values

Display readings	Display readings
Act-Droop	P. Oil
Battery	Speed
Camshaft	Speed D SW
ECU Stop activated 1	T. Ch. Air
F speed an	T. Coolant
INJECT-QUAN	T. Fuel
MDEC Faults	T. Oil
Mean T. fuel	TCOOL-HIHI
Nom power	T-ECU
Operation	T-INTERC
P L Oil Lo	T-LUBE-HI
P L Oil Lolo	T-LUBE-HIHI
P. Ch. Air	Total fuel
P. Fuel	Trip fuel

#### 3.11.3 - 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	Display text	Warning	Shutdown
ADEC yellow alarm	EIC yellow lamp WA	X	-
ADEC red alarm	EIC red lamp SD.	-	X
High high engine speed	Overspeed shutdown	X	-
Low low lube oil pressure	L Oil Pres. Shutdown	X	-
High high coolant temperature	H Coolant T Shutdown	X	-
High intercooler temperature	H Interc. T Warning	X	-
Sensor Defect Coolant Level	SD Coolant Level	X	-
Low low coolant level	L Cool. Lev. Shutdown	X	-
ADEC ECU failure	MDEC ECU Failure	X	-
Low Lube oil pressure	L Oil Pres. Warning	X	-
Low Common rail fuel pressure	LO P-Fuel Com-Rail	X	-
High Common rail fuel pressure	HI P-Fuel Com-Rail	X	-
Low preheat temperature	AL Preheat Temp. Low	X	-



## ControlReg series

### Engine interface communication

Alarm list	Display text	Warning	Shutdown
Low low Charge air coolant level	SS Cool Level Ch-Air	X	-
Power amplifier 1 failure	AL Power Amplifier 1	X	-
Power amplifier 2 failure	AL Power Amplifier 2	X	-
Transistor output status	AL Status Trans-Outp	X	-
Low ECU power supply voltage	LO ECU Power Supply	X	-
High ECU power supply voltage	HI ECU Power	X	-
High charge air temperature	HI T-Charge Air	X	-
High Lube oil temperature	HI T-Lube Oil	X	-
High ECU temperature	HI T-ECU	X	-
Low engine speed	SS Eng. Speed Low	X	-
Check error code	AL Check Error Code	X	-
Common rail leakage	AL Com. Rail Leakage	X	-
Automatic engine stop	AL Aut. Engine Stop	X	-
MG Start speed not reached	MG Start Speed Fail	X	-
MG runup speed not reached	MG Runup Speed Fail	X	-
MG idle speed reached	MG Idle Speed Fail	X	-
Low low ECU power supply voltage	LOLO ECU Pow. Supply	X	-
High high ECU power supply voltage	HIHI ECU Pow. Supply	X	-
Sensor Defect coolant level charge air	SD Cool Level Ch-Air	X	-
High fuel temperature	HI T-Fuel	X	-
Override feedback from ECU	SS Override	X	-
High high lube oil temperature	H Oil Temp. Shutdown	X	-
Speed demand defected	AL Speed demand Def.	X	-
High coolant temperature	H Coolant T Warning	X	-
High high temperature charge air	H Ch. Air T Shutdown	X	-
Low fuel oil pressure	LO P-Fuel Oil	X	-
Low low fuel oil pressure	SS P-Fuel Oil	X	-

**MDEC indication « - » means that the alarm in question is not supported.**

#### 3.11.4 - Write commands to engine controller

- Engine controls

All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 7563 (EIC Controls).

- Engine speed

M-Logic commands are available to enable/disable start/stop and speed controls:

- EIC start/stop enable
- EIC speed control inhibit

- Manual speed control (up/down)

## ControlReg series

### Engine interface communication

- Start/Stop command
- Frequency selection  
Nominal frequency is written automatically based on the frequency nominal setting. 50 Hz is written if fNOM < 55 Hz, 60 Hz is written if fNOM is > 55 Hz.
- Shut down override  
This command can be used with a digital input in order to override shut down actions from the ECU.
- Trip counter reset  
This command resets the trip fuel consumption counter. The command is activated through M-Logic.
- Enable Cylinder Cutout  
The command can be used to engage all cylinders if the engine is running with one bank only. The command is activated through M-Logic.
- Engine overspeed test  
The command is activated through M-Logic. Testing of the overspeed function at any given rpm.
- EIC alarms acknowledgement
- Intermittent oil priming  
Engage the pre-lubrication oil pump if installed. The command is activated through M-Logic.
- Priming on engine start

### 3.12 - MTU MDEC module 302/303 (MTU)

#### 3.12.1 - 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.

#### 3.12.2 - Readings from the display

Display readings	Display readings
Act-Droop	P. Oil
Battery	Speed
Camshaft	Speed D SW
ECU Stop activated 1	T. Ch. Air
F speed an	T. Coolant
Fuel Rate	T. Fuel
INJECT-QUAN	T. Oil
MDEC Faults	T-COOL-HI
Mean T. fuel	TCOOL-HIHI
Nom power	T-ECU
Operation	T-INTERC
P L Oil Lo	T-LUBE-HI
P LOil Lolo	T-LUBE-HIHI
P. Ch. Air	Total fuel
P. Fuel	Trip fuel

The Modbus addresses are read-only (function code 04h)

## ControlReg series

### Engine interface communication

#### 3.12.3 - 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	Display text	Warning	Shutdown
MDEC yellow alarm	EIC yellow lamp	X	-
MDEC red alarm	EIC red lamp SD.	-	X
High high engine speed	Overspeed shutdown	-	X
Low low lube oil pressure	L Oil Pres. Shutdown	X	X
High high coolant temperature	H Coolant T Shutdown	X	X
High high lube oil temperature	H Oil Temp. Shutdown	-	X
High intercooler temperature	H Interc. T Warning	X	-
Sensor Defect Coolant Level	SD Coolant Level	X	-
Low low coolant level	L Cool. Lev. Shutdown	-	X
MDEC ECU failure	MDEC ECU Failure	-	X
Low fuel oil pressure	LO P-Fuel Oil	X	-
Low Lube oil pressure	L Oil Pres. Warning	X	-
Low Common rail fuel pressure	LO P-Fuel Com-Rail	X	-
High Common rail fuel pressure	HI P-Fuel Com-Rail	X	-
Override feedback from ECU	SS Override	X	-
Low preheat temperature	AL Preheat Temp. Low	X	-
Low low Charge air coolant level	SS Cool Level Ch-Air	X	-
Power amplifier 1 failure	AL Power Amplifier 1	X	-
Power amplifier 2 failure	AL Power Amplifier 2	X	-
Transistor output status	AL Status Trans-Outp	X	-
Low ECU power supply voltage	LO ECU Power Supply	X	-
High ECU power supply voltage	HI ECU Power	X	-
High charge air temperature	HI T-Charge Air	X	-
High Lube oil temperature	HI T-Lube Oil	X	-
High ECU temperature	HI T-ECU	X	-
Low engine speed	SS Eng. Speed Low	X	-
Check error code	AL Check Error Code	X	-
Common rail leakage	AL Com. Rail Leakage	X	-
Automatic engine stop	AL Aut. Engine Stop	X	-
MG Start speed not reached	MG Start Speed Fail	X	-
MG runup speed not reached	MG Runup Speed Fail	X	-
MG idle speed reached	MG Idle Speed Fail	X	-

## ControlReg series

### Engine interface communication

Alarm list	Display text	Warning	Shutdown
Low low ECU power supply voltage	LOLO ECU Pow. Supply	X	-
High high ECU power supply voltage	HIHI ECU Pow. Supply	X	-
Sensor Defect coolant level charge air	SD Cool Level Ch-Air	X	-
High fuel temperature	Hi T-Fuel	X	-

#### 3.12.4 - Write commands to engine controller

None.

#### 3.13 - Scania EMS (J1939)

##### 3.13.1 - Warning/shutdown

None.

##### 3.13.2 - Write commands to engine controller

None.

#### 3.14 - Scania EMS 2 S6 (J1939)

##### 3.14.1 - 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.

##### 3.14.2 - 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
EIC malfunction	X	-
EIC protection	X	-

**DNL2 indication « - » means that the alarm in question is not supported.**

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

## ControlReg series

### Engine interface communication

#### 3.14.3 - 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).

**The EMS S6 software version and engine number is automatically retrieved when CANbus communication is established.**

Flash code	Displayed text	Description
11	Overrevving	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

## ControlReg series

### Engine interface communication

#### 3.14.4 - Write commands to engine controller

##### - Engine controls

All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 7563 (EIC Controls).

##### - Droop

##### - Engine speed

CANbus ID:    Offset: 0xcfff727

Speed            0x0cff8027

M-Logic commands are available to enable/disable start/stop and speed controls:

- EIC start/stop enable
- EIC speed control inhibit

##### - Frequency selection

Nominal speed/frequency is selected in 2772. 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.**

#### 3.14.5 - Control

In the parameter 2770, it is possible to configure the droop setting and the initial speed setting.

### 3.15 - Volvo Penta EMS (J1939)

#### 3.15.1 - 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
EIC malfunction	-	X	-
EIC protection	-	X	-

#### 3.15.2 - Write commands to engine controller

None.

## ControlReg series

### Engine interface communication

### 3.16 - Volvo Penta EMS 2 (J1939)

#### 3.16.1 - Volvo Penta EMS 2 (J1939)

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

#### 3.16.2 - 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
EIC malfunction	-	X	-
EIC protection	-	X	-

**FMI indication « - » means that the alarm in question is not supported.**

#### 3.16.3 - Write commands to engine controller

- Engine controls

All the write commands to the engine controller (ex: speed, start/stop, etc.) are enabled in setting 7563 (EIC Controls)

- Engine speed

CANbus ID for speed control: 0x0cff4611 – Volvo Penta proprietary telegram

M-Logic commands are available to enable/disable start/stop and speed controls:

- EIC start/stop enable
- EIC speed control inhibit

- Preheat

- Start/stop

#### 3.16.4 - Readable states

- Preheat and running

# ControlReg series

## Engine interface communication

### 4 - PARAMETERS

#### 4.1 - Parameters related to engine communication

This feature gives the possibility to communicate between ControlReg and several engine types. Parameters related to engine communication can be found in settings 2770-2790 and 7500-7680. For further information, please see the separate parameters list of the ControlReg.



# ControlReg series

## Engine interface communication

### 5 - MODBUS COMMUNICATION

A certain amount of engine data can be transmitted from the engine communication module to the ControlReg. They can be transmitted through Modbus. 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 10970.

#### 5.1 - Readings

##### 5.1.1 - 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 04h						
Addr.	Content	Unit	Scaling			Description
			J1939	ADEC	MDEC	
593	EIC speed	[RPM]	1/1	1/1	1/1	Speed
594	EIC coolant temp.	[deg] [F]	1/10	1/10	1/10	Coolant temperature
595	EIC oil pressure	[bar] [psi]	1/100	1/100	1/100	Engine oil pressure
596	EIC no of faults	[Faults]	1/1	1/1	1/1	Number of faults
597	EIC oil temp.	[deg] [F]	1/10	1/10	1/10	Engine oil temperature
598	EIC fuel temp.	[deg] [F]	1/1	1/10	1/10	Fuel temperature
599	EIC intake manifold #1 P	[bar] [psi]	1/100	1/100	-	Intake manifold #1 P
600	EIC air inlet temp.	[deg] [F]	1/1	-	-	Air inlet temperature
601	EIC coolant level	[%]	1/10	-	-	Coolant level
602	EIC fuel rate	[L/h]	1/10	1/1	-	Fuel rate
603	EIC charge air press	[bar] [psi]	-	-	1/100	Charge air press
604	EIC intake manifold 1 T (or EIC charge air T)	[deg] [F]	1/1	-	1/10	Intake manifold 1 temperature
605	EIC d.d. % torque	[%]	1/1	-	-	Driver's demand engine - percent torque
606	EIC actual % torque	[%]	1/1	-	-	Actual engine - percent torque
607	EIC acc. pedal pos.	[%]	1/1	-	-	Accelerator pedal position

## ControlReg series

### Engine interface communication

#### Measurement table (read only) function code 04h

Addr.	Content	Unit	Scaling			Description
			J1939	ADEC	MDEC	
608	EIC % load, c. speed	[%]	1/1	-	-	Percent load at current speed
609	EIC air inlet pressure	[bar] [psi]	1/100	-	-	Air inlet pressure
610	EIC exhaust gas temp.	[deg] [F]	1/10	-	-	Exhaust gas temperature
611	EIC engine hours	[H]	1/1	1/1	1/1	ENGINE HOURS
612	EIC oil filter diff. press.	[bar] [psi]	1/100	-	-	Oil filter diff press
613	EIC battery voltage	[V]	1/10	1/10	-	Keyswitch battery potential
614	EIC fuel del. press.	[bar] [psi]	1/100	1/100	-	Fuel delivery pressure
615	EIC oil level	[%]	1/10	-	-	Engine oil level
616	EIC crankcase press.	[bar] [psi]	1/100	-	-	Crankcase pressure
617	EIC coolant pressure	[bar] [psi]	1/100	-	-	Coolant pressure
618	EIC water in fuel	[2 bits]	1/1	-	-	Water in fuel (1 = Yes, 0 = NO)
619	Reserved	-	-	-	-	-
620	Reserved	-	-	-	-	-
621	Reserved	-	-	-	-	-
622	Reserved	-	-	-	-	-
623	EIC turbo oil temp.	[deg] [F]	1/10	-	-	Turbo oil temp.
624	EIC trap inlet	[bar] [psi]	1/100	-	-	Trap inlet
625	EIC Air filter diff press	[bar] [psi]	1/1000	-	-	Air filter diff press
626	EIC Cool filter diff press	[bar] [psi]	1/100	-	-	Cool filter diff press
627	EIC Atm press	[bar] [psi]	1/100	-	-	Atmospheric pressure
628	EIC Ambient air temp	[deg] [F]	1/10	-	-	Ambient air temp [F/10]
629	EIC exch. temp A	[deg] [F]	1/10	1/10	-	Exh. temp bank A
630	EIC exch. temp B	[deg] [F]	1/10	1/10	-	Exch. temp bank B

## ControlReg series

### Engine interface communication

**Measurement table (read only) function code 04h**

Addr.	Content	Unit	Scaling			Description
			J1939	ADEC	MDEC	
631	EIC Winding 1 temp	[deg] [F]	-	1/1	-	Gen winding 1 temp
632	EIC Winding 2 temp	[deg] [F]	-	1/1	-	Gen winding 2 temp
633	EIC Winding 3 temp	[deg] [F]	-	1/1	-	Gen winding 3 temp
634	Reserved	-	-	-	-	-
635	Reserved	-	-	-	-	-
636	EIC Turbo 1 compr outlet press	[bar] [psi]	-	1/10	-	Turbo 1 compr outlet press
637	EIC Intercooler temp	[deg] [F]	-	1/10	-	Intercooler temp
638	EIC engine trip fuel	[L]	1/1	1/1	-	Engine trip fuel
639	EIC engine total fuel used	[kL]	1/10	-	-	Engine total fuel used
640	EIC trip fuel_gaseous	[kg]	1/1	-	-	Trip fuel, gaseous
641	EIC total fuel used_gaseous	[ton]	1/10	-	-	Total fuel used, gaseous
900	EIC trip average fuel rate	[L/h]	-	1/10	-	Average fuel rate (trip)
901 <sup>1</sup>	EIC nominal power	[Kwm]	1/1	1/1	-	Nominal power of the engine
902	EIC trip fuel liquid	[L]	1/2	1/10	-	High word
903	EIC trip fuel liquid	[L]	1/2	1/10	-	Low word
904	EIC total fuel liquid	[L]	1/2	1/10	-	High word
905	EIC total fuel liquid	[L]	1/2	1/10	-	Low word
906	EIC mean trip fuel consumption	[L/h]	-	1/1000	-	High word
907	EIC mean trip fuel consumption	[L/h]	-	1/1000	-	Low word
908 <sup>1</sup>	EIC engine power	[Kwm]	-	1/1	-	Nominal power of the engine (ADEC)
911 <sup>1</sup>	EIC intake manifold #1 absolute pressure	Bar or psi	1/100	-	-	*Only MTU J1939 Smart Connect
912	EIC Air filter diff. pressure	Bar or psi	1/100	-	-	-
913	EIC Fuel supply pump inlet pressure	Bar or psi	1/100	-	-	-
914	EIC Fuel filter (suction side) diff. pressure	Bar or psi	1/100	-	-	-

## ControlReg series

### Engine interface communication

#### Measurement table (read only) function code 04h

Addr.	Content	Unit	Scaling			Description
			J1939	ADEC	MDEC	
915 <sup>2</sup>	EIC Fuel filter diff. pressure	Bar or psi	1/100	-	-	Diff pressure
932 <sup>2</sup>	EIC Speed Demand source	Digit	-	-	-	Identifies speed demand source
933 <sup>2</sup>	EIC lube oil pressure LO limit	mbar	-	-	1/100	Lubrication oil pressure limit 1
934 <sup>2</sup>	EIC lube oil pressure LOLO limit	mbar	-	-	1/100	Lubrication oil pressure limit 2
935 <sup>2</sup>	EIC fuel pressure	bar	-	-	1/100	Fuel pressure
936 <sup>2</sup>	EIC coolant limit HI	[deg] [F]	-	-	1/10	Coolant high limit temp. 1
937 <sup>2</sup>	EIC coolant limit HIHI	[deg] [F]	-	-	1/10	Coolant high limit temp. 2
938 <sup>2</sup>	EIC intercooler coolant	[deg] [F]	-	-	1/10	Intercooler coolant temperature
939 <sup>2</sup>	EIC ECU temperature	[deg] [F]	-	-	1/10	ECU temperature
940 <sup>2</sup>	EIC actual droop	%	-	-	1/10	Actual droop percentage
941 <sup>2</sup>	EIC act. inject. Quantity	%	-	-	1/10	Injection quantity Act. DBR %
942 <sup>2</sup>	EIC camshaft	[RPM]	-	1/1	-	Camshaft speed
943 <sup>2</sup>	EIC Temp lube HI	[deg] [F]	-	1/10	-	Lube oil temperature HI
944 <sup>2</sup>	EIC Temp lube HIHI	[deg] [F]	-	1/10	-	Lube oil temperature HIHI
945 <sup>2</sup>	EIC speed demand analog	Digit	-	1/1	-	Speed demand analog
946 <sup>2</sup>	EIC act. inject Quantity	[bit]	-	-	-	1: Stop activated, 0: Stop not activated

#### 5.1.2 - Diagnostic codes

To interpret an SPN and/or FMI number, refer to the documentation of the engine manufacturer. SPN means «Suspect Parameter Number». E.g. if the coolant water temperature becomes too high, the SPN code «110» will be shown.

FMI means «Failure Mode Indicator». E.g. if the temperature in the above example is at shutdown level, the FMI code «0» will be shown.

Oc means «occurrence counter» and it indicates how many times a specific alarm has occurred. E.g. if the specific alarm in the above example (SPN 100, FMI 0) has occurred 2 times, the oc code «2» will be shown.

## ControlReg series

### Engine interface communication

In the table below a specific SPN number is linked to the same FMI and OC number.

Active Diagnostic Code (DM1/SPN)		
Addr.	Content	Description
1370	SPN diagnostic no. 1	Lo word
1371	SPN diagnostic no. 2	Lo word
1372	SPN diagnostic no. 3	Lo word
1373	SPN diagnostic no. 4	Lo word
1374	SPN diagnostic no. 5	Lo word
1375	SPN diagnostic no. 6	Lo word
1376	SPN diagnostic no. 7	Lo word
1377	SPN diagnostic no. 8	Lo word
1378	SPN diagnostic no. 9	Lo word
1379	SPN diagnostic no. 10	Lo word
1380	SPN diagnostic no. 1	Hi word
1381	SPN diagnostic no. 2	Hi word
1382	SPN diagnostic no. 3	Hi word
1383	SPN diagnostic no. 4	Hi word
1384	SPN diagnostic no. 5	Hi word
1385	SPN diagnostic no. 6	Hi word
1386	SPN diagnostic no. 7	Hi word
1387	SPN diagnostic no. 8	Hi word
1388	SPN diagnostic no. 9	Hi word
1389	SPN diagnostic no. 10	Hi word
1390-1401	Not used	Reserved

Active Fail Mode Identifier (DM1/FMI)		
Addr.	Content	Description
1402	FMI diagnostic no. 1	-
1403	FMI diagnostic no. 2	-
1404	FMI diagnostic no. 3	-
1405	FMI diagnostic no. 4	-
1406	FMI diagnostic no. 5	-
1407	FMI diagnostic no. 6	-
1408	FMI diagnostic no. 7	-
1409	FMI diagnostic no. 8	-
1410	FMI diagnostic no. 9	-
1411	FMI diagnostic no. 10	-
1412-1417	Not used	Reserved

## ControlReg series

### Engine interface communication

#### Active Occurrence Counter (DM1/OC)

Addr.	Content	Description
1418	Occurrence counter diagnostic no. 1	-
1419	Occurrence counter diagnostic no. 2	-
1420	Occurrence counter diagnostic no. 3	-
1421	Occurrence counter diagnostic no. 4	-
1422	Occurrence counter diagnostic no. 5	-
1423	Occurrence counter diagnostic no. 6	-
1424	Occurrence counter diagnostic no. 7	-
1425	Occurrence counter diagnostic no. 8	-
1426	Occurrence counter diagnostic no. 9	-
1427	Occurrence counter diagnostic no. 10	-
1428-1433	Not used	Reserved

#### Active Diagnostic Codes (DM2/SPN)

Addr.	Content	Description
1434	SPN diagnostic no. 1	Lo word
1435	SPN diagnostic no. 2	Lo word
1436	SPN diagnostic no. 3	Lo word
1437	SPN diagnostic no. 4	Lo word
1438	SPN diagnostic no. 5	Lo word
1439	SPN diagnostic no. 6	Lo word
1440	SPN diagnostic no. 7	Lo word
1441	SPN diagnostic no. 8	Lo word
1442	SPN diagnostic no. 9	Lo word
1443	SPN diagnostic no. 10	Lo word
1444	SPN diagnostic no. 1	Hi word
1445	SPN diagnostic no. 2	Hi word
1446	SPN diagnostic no. 3	Hi word
1447	SPN diagnostic no. 4	Hi word
1448	SPN diagnostic no. 5	Hi word
1449	SPN diagnostic no. 6	Hi word
1450	SPN diagnostic no. 7	Hi word
1451	SPN diagnostic no. 8	Hi word
1452	SPN diagnostic no. 9	Hi word
1453	SPN diagnostic no. 10	Hi word
1454-1465	Not used	Reserved

## ControlReg series

### Engine interface communication

#### Active Fail Mode Identifier (DM2/FMI)

Addr.	Content	Description
1466	FMI diagnostic no. 1	-
1467	FMI diagnostic no. 2	-
1468	FMI diagnostic no. 3	-
1469	FMI diagnostic no. 4	-
1470	FMI diagnostic no. 5	-
1471	FMI diagnostic no. 6	-
1472	FMI diagnostic no. 7	-
1473	FMI diagnostic no. 8	-
1474	FMI diagnostic no. 9	-
1475	FMI diagnostic no. 10	-
1476-1481	Not used	Reserved

#### Active Occurrence Counter (DM2/OC)

Addr.	Content	Description
1482	Occurrence counter diagnostic no. 1	-
1483	Occurrence counter diagnostic no. 2	-
1484	Occurrence counter diagnostic no. 3	-
1485	Occurrence counter diagnostic no. 4	-
1486	Occurrence counter diagnostic no. 5	-
1487	Occurrence counter diagnostic no. 6	-
1488	Occurrence counter diagnostic no. 7	-
1489	Occurrence counter diagnostic no. 8	-
1490	Occurrence counter diagnostic no. 9	-
1491	Occurrence counter diagnostic no. 10	-
1492-1499	Not used	Reserved

## ControlReg series

### Engine interface communication

## 5.2 - Alarms

### 5.2.1 - Caterpillar/Perkins

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

Addr.	Content	Type
1020	EIC alarms, ControlReg series	Bit 0 7570 EIC communication error
		Bit 1 7580 EIC warning
		Bit 2 7590 EIC shutdown
		Bit 3 7600 EIC overspeed
		Bit 4 7610 EIC coolant water temperature 1
		Bit 5 7620 EIC coolant water temperature 2
		Bit 6 7630 EIC oil pressure 1
		Bit 7 7640 EIC oil pressure 2
		Bit 8 7650 EIC oil temp. 1
		Bit 9 7660 EIC oil temp. 2
		Bit 10 7670 EIC coolant level 1
		Bit 11 7680 EIC coolant level2
1024	EIC alarms, engine controller (DM1)	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
		Bit 10 EIC overspeed, warning
		Bit 11 EIC overspeed, shutdown
		Bit 12 EIC protection
		Bit 13 EIC malfunction



## ControlReg series

### Engine interface communication

#### 5.2.2 - Cummins

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

Addr.	Content	Type
1020	EIC alarms, ControlReg series	Bit 0 7570 EIC communication error
		Bit 1 7580 EIC warning
		Bit 2 7590 EIC shutdown
		Bit 3 7600 EIC overspeed
		Bit 4 7610 EIC coolant water temperature 1
		Bit 5 7620 EIC coolant water temperature 2
		Bit 6 7630 EIC oil pressure 1
		Bit 7 7640 EIC oil pressure 2
		Bit 8 7650 EIC oil temp. 1
		Bit 9 7660 EIC oil temp. 2
		Bit 10 7670 EIC coolant level 1
		Bit 11 7680 EIC coolant level 2
1023	EIC alarms, engine controller (DM1)	Bit 0 EIC yellow
		Bit 1 Red
		Bit 2 EIC protection
		Bit 3 EIC malfunction
1024	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
		Bit 10 EIC fuel temp, shutdown
		Bit 11 EIC coolant pressure, shutdown
		Bit 12 EIC oil temp., warning
		Bit 13 EIC oil temp., warning
		Bit 14 EIC overspeed shutdown
Bit 15 EIC crankcase press., shutdown		

## ControlReg series

### Engine interface communication

#### 5.2.3 - DDEC – Detroit engines

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

Addr.	Content	Type
1020	EIC alarms, ControlReg series	Bit 0 7570 EIC communication error
		Bit 1 7580 EIC warning
		Bit 2 7590 EIC shutdown
		Bit 3 7600 EIC overspeed
		Bit 4 7610 EIC coolant water temperature 1
		Bit 5 7620 EIC coolant water temperature 2
		Bit 6 7630 EIC oil pressure 1
		Bit 7 7640 EIC oil pressure 2
		Bit 8 7650 EIC oil temp. 1
		Bit 9 7660 EIC oil temp. 2
		Bit 10 7670 EIC coolant level 1
Bit 11 7680 EIC coolant level 2		
1024	EIC alarms, engine controller (DM1)	Bit 0 EIC communication error, warning
		Bit 1 EIC warning
		Bit 2 EIC shutdown
		Bit 3 EIC protection
		Bit 4 EIC malfunction

#### 5.2.4 - EMR 2 – EMR 3 - Deutz engines

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

Addr.	Content	Type
1020	EIC alarms, ControlReg series	Bit 0 7570 EIC communication error
		Bit 1 7580 EIC warning
		Bit 2 7590 EIC shutdown
		Bit 3 7600 EIC overspeed
		Bit 4 7610 EIC coolant water temperature 1
		Bit 5 7620 EIC coolant water temperature 2
		Bit 6 7630 EIC oil pressure 1
		Bit 7 7640 EIC oil pressure 2
		Bit 8 7650 EIC oil temp. 1
		Bit 9 7660 EIC oil temp. 2
		Bit 10 7670 EIC coolant level 1
Bit 11 7680 EIC coolant level 2		
1024	EIC alarms, engine controller (DM1)	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)
		Bit 5 EIC communication error
		Bit 6 EIC protection
Bit 7 EIC malfunction		

## ControlReg series

### Engine interface communication

#### 5.2.5 - Generic J1939

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

Addr.	Content	Type
1020	EIC alarms, ControlReg series	Bit 0 7570 EIC communication error
		Bit 1 7580 EIC warning
		Bit 2 7590 EIC shutdown
		Bit 3 7600 EIC overspeed
		Bit 4 7610 EIC coolant water temperature 1
		Bit 5 7620 EIC coolant water temperature 2
		Bit 6 7630 EIC oil pressure 1
		Bit 7 7640 EIC oil pressure 2
		Bit 8 7650 EIC oil temp. 1
		Bit 9 7660 EIC oil temp. 2
		Bit 10 7670 EIC coolant level 1
1024	EIC alarms, engine controller (DM1)	Bit 11 7680 EIC coolant level 2
		Bit 0 EIC communication error
		Bit 1 EIC yellow
		Bit 2 EIC red
		Bit 3 EIC protection
		Bit 4 EIC malfunction

#### 5.2.6 - Iveco

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

Addr.	Content	Type
1020	EIC alarms, ControlReg series	Bit 0 7570 EIC communication error
		Bit 1 7580 EIC warning
		Bit 2 7590 EIC shutdown
		Bit 3 7600 EIC overspeed
		Bit 4 7610 EIC coolant water temperature 1
		Bit 5 7620 EIC coolant water temperature 2
		Bit 6 7630 EIC oil pressure 1
		Bit 7 7640 EIC oil pressure 2
		Bit 8 7650 EIC oil temp. 1
		Bit 9 7660 EIC oil temp. 2
		Bit 10 7670 EIC coolant level 1
1024	EIC alarms, engine controller (DM1)	Bit 11 7680 EIC coolant level 2
		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
		Bit 10 EIC overspeed, warning
		Bit 11 EIC overspeed, shutdown
Bit 12 EIC protection		
Bit 13 EIC malfunction		

## ControlReg series

### Engine interface communication

#### 5.2.7 - JDEC – John Deere engines

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

Addr.	Content	Type
1020	EIC alarms, ControlReg series	Bit 0 7570 EIC communication error
		Bit 1 7580 EIC warning
		Bit 2 7590 EIC shutdown
		Bit 3 7600 EIC overspeed
		Bit 4 7610 EIC coolant water temperature 1
		Bit 5 7620 EIC coolant water temperature 2
		Bit 6 7630 EIC oil pressure 1
		Bit 7 7640 EIC oil pressure 2
		Bit 8 7650 EIC oil temp. 1
		Bit 9 7660 EIC oil temp. 2
		Bit 10 7670 EIC coolant level 1
		Bit 11 7680 EIC coolant level 2
1024	EIC alarms, engine controller (DM1)	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)
		Bit 10 EIC JDEC warning (LS: lamp status)
		Bit 11 EIC communication error
		Bit 12 EIC protection
		Bit 13 EIC malfunction

#### 5.2.8 - MTU Smart Connect

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

Addr.	Content	Type
1020	EIC alarms, ControlReg series	Bit 0 7570 EIC communication error
		Bit 1 7580 EIC warning
		Bit 2 7590 EIC shutdown
		Bit 3 7600 EIC overspeed
		Bit 4 7610 EIC coolant water temp. 1
		Bit 5 7620 EIC coolant water temp. 2
		Bit 6 7630 EIC oil pressure level 1
		Bit 7 7640 EIC oil pressure level 2
		Bit 8 7650 EIC oil temp. 1
		Bit 9 7660 EIC oil temp. 2
		Bit 10 7670 EIC coolant level 1
		Bit 11 7680 EIC coolant level 2
1024	EIC alarms, engine controller (DM1)	Bit 0 EIC communication error
		Bit 1 EIC yellow
		Bit 2 EIC red
		Bit 3 EIC protection
		Bit 4 EIC malfunction

## ControlReg series

### Engine interface communication

#### 5.2.9 - MTU ADEC

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

Addr.	Content	Type
1020	EIC alarms, ControlReg series	Bit 0 EIC 7570 communication error
		Bit 2 EIC 7590 shutdown
		Bit 3 EIC 7600 overspeed
		Bit 4 EIC 7610 coolant water temperature 1
		Bit 5 EIC 7620 coolant water temperature 2
		Bit 6 EIC oil pressure 1
		Bit 7 EIC 7640 oil pressure 2
		Bit 8 EIC 7650 oil temp. 1
		Bit 9 EIC 7660 oil temp. 2
		Bit 10 EIC 7670 coolant level 1
		Bit 11 EIC 7680 coolant level 2
1022	EIC alarms, engine controller	Bit 0 EIC ECU power supp voltage LoLo
		Bit 1 EIC Fuel high temp
		Bit 2 EIC Exhaust A high temp
		Bit 3 EIC Exhaust B high temp
		Bit 4 EIC Pressure 1 high (Aux 1)
		Bit 5 EIC Pressure 2 high (Aux 2)
		Bit 6 EIC Day tank high level
		Bit 7 EIC Day tank low level
		Bit 8 EIC Run-up speed not reached
		Bit 9 EIC Idle speed not reached
1023	EIC alarms, engine controller	Bit 0 EIC Common alarm red
		Bit 1 EIC Overspeed
		Bit 2 EIC Lube oil press LowLow
		Bit 3 EIC Coolant temperature HiHi
		Bit 4 EIC Lube oil temp HiHi
		Bit 5 EIC Charge air temp HiHi
		Bit 6 EIC ECU power supp voltage HiHi
		Bit 7 EIC Generator temp high warning
		Bit 8 EIC Holding tank high level
		Bit 9 EIC Holding tank low level
		Bit 10 EIC Winding 1 temp high
		Bit 11 EIC Winding 2 temp high
		Bit 12 EIC Winding 3 temp high
		Bit 13 EIC Ambient temp high
		Bit 14 EIC Water in fuel 1
Bit 15 EIC Water in fuel 2		

## ControlReg series

### Engine interface communication

Addr.	Content	Type
1024	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
		Bit 10 EIC Coolant level low
		Bit 11 EIC Intercooler coolant level low
		Bit 12 EIC ECU defect
		Bit 13 EIC Speed demand defect
		Bit 14 EIC Power supply low voltage
		Bit 15 EIC Power supply high voltage

#### 5.2.10 - MTU ADEC module 501, without SAM module

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

Addr.	Content	Type
1020	EIC alarms, ControlReg series	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
1024	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 ADEC 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
		Bit 10 EIC defect coolant level switch, warning
		Bit 11 EIC ADEC yellow alarm, warning
Bit 12 EIC ADEC red alarm, shutdown		

## ControlReg series

### Engine interface communication

#### 5.2.11 - MTU MDEC series - 2000/4000 - module 302 & 303

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

Addr.	Content	Type
1020	EIC alarms, ControlReg series	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, 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
		Bit 10 EIC defect coolant level switch, warning
		Bit 11 EIC MDEC yellow alarm, warning
		Bit 12 EIC MDEC red alarm, shutdown

## ControlReg series

### Engine interface communication

#### 5.2.12 - Scania

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

Addr.	Content	Type
1026	EIC alarms (KWP 2000)	Bit 0 EIC overrevving
		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.		
1027	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		



## ControlReg series

### Engine interface communication

Addr.	Content	Type
1028	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

## ControlReg series

### Engine interface communication

#### 5.2.13 - Volvo Penta

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

Addr.	Content	Type
1020	EIC alarms, ControlReg series	Bit 0 7570 EIC communication error
		Bit 1 7580 EIC warning
		Bit 2 7590 EIC shutdown
		Bit 3 7600 EIC overspeed
		Bit 4 7610 EIC coolant water temperature 1
		Bit 5 7620 EIC coolant water temperature 2
		Bit 6 7630 EIC oil pressure 1
		Bit 7 7640 EIC oil pressure 2
		Bit 8 7650 EIC oil temp. 1
		Bit 9 7660 EIC oil temp. 2
		Bit 10 7670 EIC coolant level 1
		Bit 11 7680 EIC coolant level 2
1024	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
		Bit 12 EIC protection
		Bit 13 EIC malfunction
		Bit 15 EIC fault in RAM

# ControlReg series

## Engine interface communication

### Disposal and recycling instructions

We are committed to limiting the environmental impact of our activity. We continuously monitor our production processes, material sourcing and product design to improve recyclability and minimise our environmental footprint.

These instructions are for information purposes only. It is the user's responsibility to comply with local legislation regarding product disposal and recycling.

### Waste & hazardous materials

The following components and materials require special treatment and must be separated from the alternator before the recycling process:

- electronic materials found in the terminal box, including the automatic voltage regulator (198), current transformers (176), interference suppression module and other semi-conductors.
  - diode bridge (343) and surge suppressor (347), found on the alternator rotor.
  - major plastic components, such as the terminal box structure on some products.
- These components are usually marked with information concerning the type of plastic.

All materials listed above need special treatment to separate waste from reclaimable materials and should be entrusted to specialist recycling companies.

# ControlReg series

## Engine interface communication

# ControlReg series

## Engine interface communication

# ControlReg series

## Engine interface communication

# Service & Support

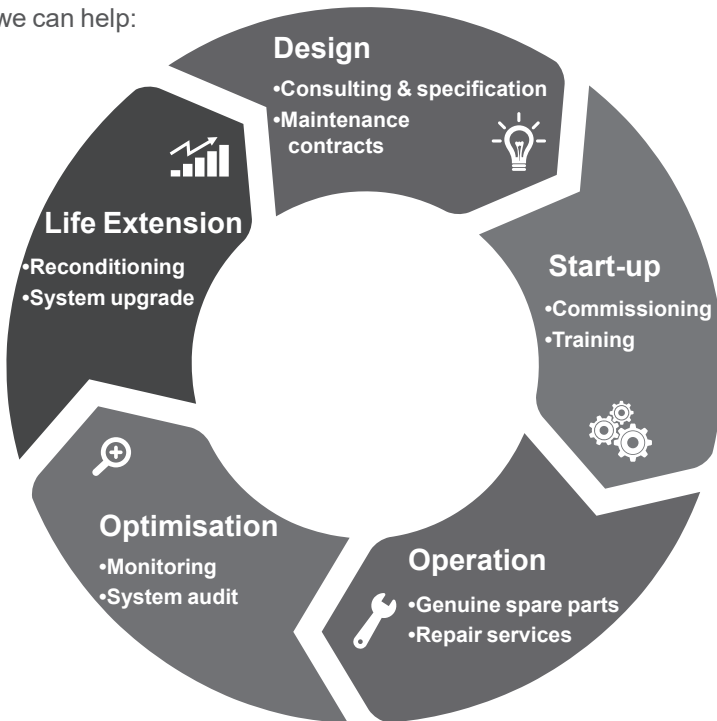
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Trust your alternator maintenance and support to electric power generation experts. Our field personnel are 100% qualified and fully trained to operate in all environments and on all machine types.

We have a deep understanding of alternator operation, providing the best value service to optimise your cost of ownership.

Where we can help:



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