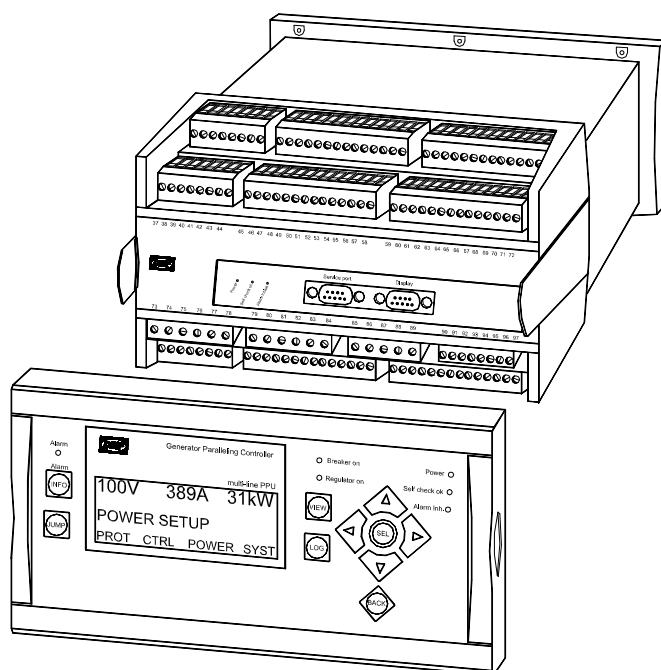# Description of options

**DEIF**
*-power in control*

# Option H5
# Serial communication (CAN bus)
# Multi-line 2 – version 2
*4189340359E*
*SW version 2.4X.X*



- *Description of option*

- *Functional description*

- *Parameter list*

- *Modbus communication*

CE

Table of contents

**This manual is valid for standard multi-line 2 GPU/GPC/PPU units with firmware version 2.40.0 or later.**

# 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.

| Function | ANSI no. |
|---|---|
| Serial engine communication | - |

## Terminal description

**CAN bus communication**

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

| Term. | Function | Description |
|---|---|---|
| 133 | Can-H | CAN bus card option H5, |
| 132 | Ground | Engine Interface Communication |
| 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.**

**Modbus communication**

The PCB for the Modbus card is placed in slot #2 if the controller unit is equipped with option H2 (Modbus).

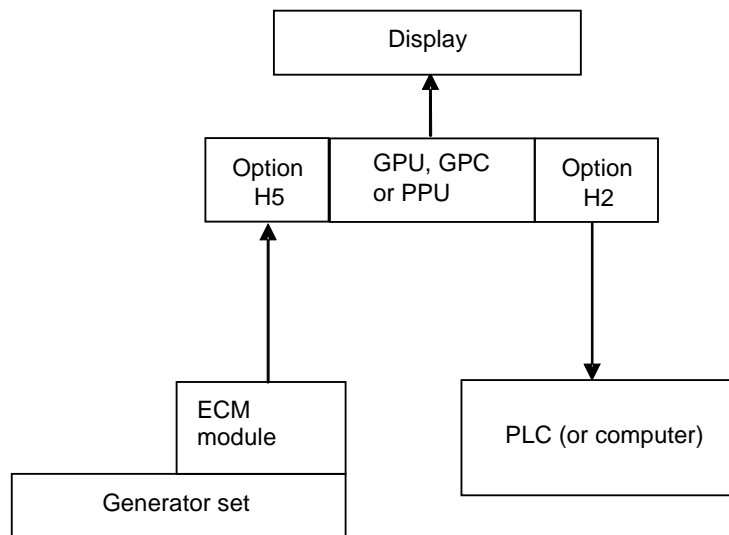| Term. | Function | Description |
|-------|-----------|-------------|
| 29 | DATA + (A) | Modbus RTU/ASCII, RS485 |
| 30 | GND | |
| 31 | DATA - (B) | |
| 32 | Not used | |
| 33 | DATA + (A) | |
| 34 | Not used | |
| 35 | DATA - (B) | |
| 36 | Not used | |

**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 and CAN open cannot be used.**

## Wirings

**Principle diagram**



**For wiring diagrams, please refer to the installation instructions.**

# 3. Functional description

This communication extracts information from the Electronic Control Module (ECM) of an engine equipped with an ECM module with CAN bus 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 | Protocol | Comment |
|---|---|---|
| MTU | MDEC communication, module 302 or 303 | |
| MTU | MDEC communication, module M.201 or M.304 | Select M.303 |
| Detroit Diesel | DDEC communication | |
| Deutz | EMR CAN bus communication | |
| John Deere | JDEC communication | |
| Volvo | Volvo Penta D12 AUX communication | |

The communication type can be set up via the display or the PC utility software.

## Engine type selection

The proper communication is selected via the PC utility software in the dialog box shown below. It can also be selected in the display (menu 4770).

If OFF is selected it means that no communication is selected.
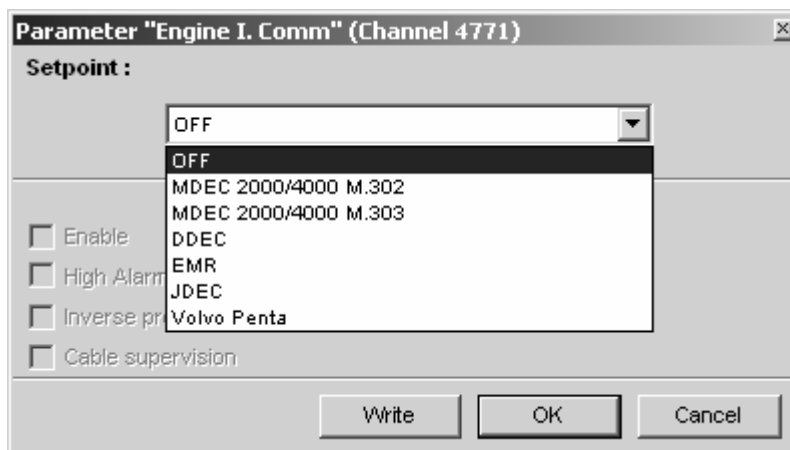


**Please choose MDEC 2000/4000 M.303, when M.201 or M.304 is required.**

# Communication system

All these protocols are based on a CAN bus 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: Series 2000/4000-module 302 | MDEC: Series 2000/4000-module 303 | DDEC | EMR | JDEC | Volvo Penta |
|---|---|---|---|---|---|
| 125 kBit/s | 125 kBit/s | 250 kBit/s | 250 kBit/s | 250 kBit/s | 250 kBit/s |

# EIC unit

The selection of the EIC unit determines whether bar/Celsius or psi/Fahrenheit is used in the display. The selection is made in menu 4780. 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 |
|---|---|---|
| 4790 | Communication error | |
| 4810 | EIC shutdown | Binary value<br>See shutdown table below |
| 4820 | Overspeed | Actual RPM |
| 4830/4840 | Coolant temperature (2 levels) | Actual temperature |
| 4850/4860 | Oil pressure (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 | MDEC: Module 303 | DDEC | EMR | JDEC | Volvo Penta |
|---|---|---|---|---|---|---|---|
| 1 | MDEC yellow alarm | X | X | - | - | - | - |
| 2 | Low oil pressure warning | X | X | - | - | - | - |
| 3 | EIC temp. lube oil | X | X | - | - | - | - |
| 4 | High coolant temp. warning | X | X | - | - | - | - |
| 5 | High intercooler temp. | X | X | - | - | - | - |
| 6 | Defect coolant level switch | X | X | - | - | - | - |
| 7 | EMR warning | - | - | - | X | - | - |
| 8 | JDEC warning | - | - | - | - | X | - |
| 9 | Oil pressure | - | - | - | - | X | - |
| 10 | Intake manifold | - | - | - | - | X | - |
| 11 | Coolant temperature | - | - | - | - | X | - |
| 12 | Fuel injection pump | - | - | - | - | X | - |

**Shutdown**

All shutdown alarms are grouped in the table below. It is possible to configure 'EIC shutdown' (menu 4810) 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 | MDEC: Module 303 | DDEC | EMR | JDEC | Volvo Penta |
|---|---|---|---|---|---|---|---|
| 1 | Overspeed shutdown | X | X | - | X | - | - |
| 2 | MDEC red alarm | X | X | - | - | - | - |
| 3 | Low oil pressure shutdown | X | X | - | X | X | - |
| 4 | EIC temp. lube oil | X | X | - | - | - | - |
| 5 | Low coolant level shutdown | X | X | - | - | - | - |
| 6 | MDEC ECU failure | X | X | - | - | - | - |
| 7 | High coolant temp. shutdown | X | X | - | - | - | - |
| 8 | High oil temp. shutdown | X | X | - | - | - | - |
| 9 | High charge air temp. shutdown | X | X | - | - | - | - |
| 10 | High coolant temp. shutdown | - | - | - | X | X | - |
| 11 | EMR shutdown | - | - | - | X | - | - |
| 12 | JDEC shutdown | - | - | - | - | X | - |
| 13 | Fuel temperature | - | - | - | - | X | - |
| 14 | Fuel control valve | - | - | - | - | X | - |
| 15 | ECU failure | - | - | - | - | X | - |

## Displayed values

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

**(i)**    **For information about the menu structure of the ML2, please see the Designer's Reference Handbook.**

**(i)**    **In the GPU without option G2 only V1 is available.**

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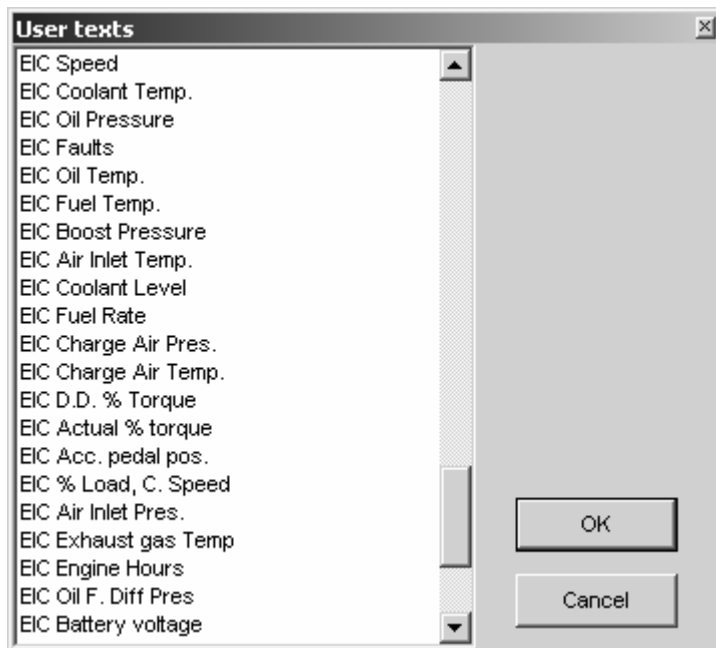


### Error messages

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 M.302 | MDEC M.303 | DDEC | EMR | JDEC | Volvo Penta |
|---|---|---|---|---|---|---|
| EIC speed | Avail. | Avail. | Avail. | Avail. | Avail. | Avail. |
| EIC coolant temp. | Avail. | Avail. | Avail. | Avail. | Avail. | Avail. |
| EIC oil pressure | Avail. | Avail. | Avail. | Avail. | Avail. | Avail. |
| EIC faults | Avail. | Avail. | N. A. | Avail. | N. A. | N. A. |
| EIC oil temp. | Avail. | Avail. | Avail. | N. A. | N. A. | Avail. |
| EIC fuel temp. | Avail. | Avail. | Avail. | N. A. | Avail. | N. A. |
| EIC boost pressure | N. A. | N. A. | Avail. | N. A. | N. A. | Avail. |
| EIC air inlet temp. | N. A. | N. A. | Avail. | N. A. | N. A. | Avail. |
| EIC coolant level | N. A. | N. A. | Avail. | N. A. | N. A. | N. A. |
| EIC fuel rate | N. A. | N. A. | Avail. | N. A. | Avail. | Avail. |
| EIC charge air pressure | Avail. | Avail. | N. A. | N. A. | N. A. | N. A. |
| EIC charge air temp. | Avail. | Avail. | N. A. | N. A. | Avail. | Avail. |
| EIC d.d. % torque | N. A. | N. A. | N. A. | N. A. | N. A. | Avail. |
| EIC actual % torque | N. A. | N. A. | N. A. | N. A. | N. A. | Avail. |
| EIC acc. pedal pos. | N. A. | N. A. | N. A. | N. A. | N. A. | Avail. |
| EIC % load, c. speed | N. A. | N. A. | N. A. | N. A. | N. A. | Avail. |
| EIC air inlet pressure | N. A. | N. A. | N. A. | N. A. | N. A. | Avail. |
| EIC exhaust gas temp. | N. A. | N. A. | N. A. | N. A. | N. A. | Avail. |
| EIC engine hours | N. A. | N. A. | N. A. | N. A. | N. A. | Avail. |
| EIC oil f. diff. press. | N. A. | N. A. | N. A. | N. A. | N. A. | Avail. |
| EIC battery voltage | N. A. | N. A. | N. A. | N. A. | N. A. | Avail. |
| EIC fuel del. press. | N. A. | N. A. | N. A. | N. A. | N. A. | Avail. |
| EIC oil level | N. A. | N. A. | N. A. | N. A. | N. A. | Avail. |
| EIC crankcase press. | N. A. | N. A. | N. A. | N. A. | N. A. | Avail. |
| EIC coolant pressure | N. A. | N. A. | N. A. | N. A. | N. A. | Avail. |
| EIC water in. fuel | N. A. | N. A. | N. A. | N. A. | N. A. | Avail. |

# 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 multi-line 2 controller to an external PLC (or computer).**

# 4. Parameter list

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

## 4770 Engine communications

| No. | Setting | 1st setting | 2nd setting | 3rd setting | 4th setting | 5th setting | 6th setting | 7th setting |
|-----|---------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 4771 | Engine comm. | OFF | MDEC M.302 | MDEC M.303 | DDEC | EMR | JDEC | Volvo Penta |

## 4780 CAN unit

| No. | Setting | | First setting | Second setting | Factory setting |
|-----|---------|---|---------------|----------------|-----------------|
| 4781 | CAN unit | Set point | Bar/Celsius | Psi/Fahrenheit | Bar/Celsius |

## 4790 EI communication error

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|-----|---------|---|--------------|--------------|-----------------|
| 4791 | EI comm. error | Delay | 0.0 s | 100.0 s | 0.0 s |
| 4792 | EI comm. error | Relay output A | R0 (none) | Option | R0 (none) |
| 4793 | EI comm. error | Relay output B | R0 (none) | dependent | R0 (none) |
| 4794 | EI comm. error | Enable | OFF | ON | OFF |

## 4810 EIC shutdown

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|-----|---------|---|--------------|--------------|-----------------|
| 4812 | EIC shutdown | Delay | 0.0 s | 100.0 s | 0.0 s |
| 4813 | EIC shutdown | Relay output A | R0 (none) | Option | R0 (none) |
| 4814 | EIC shutdown | Relay output B | R0 (none) | dependent | R0 (none) |
| 4815 | EIC shutdown | Enable | OFF | ON | OFF |

## 4820 EIC overspeed

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|-----|---------|---|--------------|--------------|-----------------|
| 4821 | EIC overspeed | Set point | 0 RPM | 2000 RPM | 1600 RPM |
| 4822 | EIC overspeed | Delay | 0.0 s | 100.0 s | 2.0 s |
| 4823 | EIC overspeed | Relay output A | R0 (none) | Option | R0 (none) |
| 4824 | EIC overspeed | Relay output B | R0 (none) | dependent | R0 (none) |
| 4825 | EIC overspeed | Enable | OFF | ON | ON |

**4830 EIC cooling water temperature 1**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4831 | EIC cool w. t. 1 | Set point | -40 deg. | 210 deg. | 100 deg. |
| 4832 | EIC cool w. t. 1 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4833 | EIC cool w. t. 1 | Relay output A | R0 (none) | Option | R0 (none) |
| 4834 | EIC cool w. t. 1 | Relay output B | R0 (none) | dependent | R0 (none) |
| 4835 | EIC cool w. t. 1 | Enable | OFF | ON | OFF |

**4840 EIC cooling water temperature 2**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4841 | EIC cool w. t. 2 | Set point | -40 deg. | 210 deg. | 110 deg. |
| 4842 | EIC cool w. t. 2 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4843 | EIC cool w. t. 2 | Relay output A | R0 (none) | R16 (relay 16) | R0 (none) |
| 4844 | EIC cool w. t. 2 | Relay output B | R0 (none) | R16 (relay 16) | R0 (none) |
| 4845 | EIC cool w. t. 2 | Enable | OFF | ON | OFF |

**4850 EIC oil pressure 1**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4851 | EIC oil press. 1 | Set point | 0.0 bar | 10.0 bar | 2.0 bar |
| 4852 | EIC oil press. 1 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4853 | EIC oil press. 1 | Relay output A | R0 (none) | R16 (relay 16) | R0 (none) |
| 4854 | EIC oil press. 1 | Relay output B | R0 (none) | R16 (relay 16) | R0 (none) |
| 4855 | EIC oil press. 1 | Enable | OFF | ON | OFF |

**4860 EIC oil pressure 2**

| No. | Setting | | Min. setting | Max. setting | Factory setting |
|---|---|---|---|---|---|
| 4861 | EIC oil press. 2 | Set point | 0.0 bar | 10.0 bar | 1.0 bar |
| 4862 | EIC oil press. 2 | Delay | 0.0 s | 100.0 s | 5.0 s |
| 4863 | EIC oil press. 2 | Relay output A | R0 (none) | R16 (relay 16) | R0 (none) |
| 4864 | EIC oil press. 2 | Relay output B | R0 (none) | R16 (relay 16) | R0 (none) |
| 4865 | EIC oil press. 2 | Enable | OFF | ON | OFF |

# 5.  Modbus communication

This chapter has to be considered as additional information for the option H2 documentation. 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 number of engine data can be transmitted from the engine communication module to the multi-line 2 unit. They can be transmitted through the option H2 (Modbus).

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

The data readable by the Modbus communication are converted into the chosen unit in menu 4780.

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

Measurement table (words (2 bytes), read only registers - function code = 03h).

| Addr. | Content | Type | |
|---|---|---|---|
| 78 | 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 |
| 79 | 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 |
| 80 | EIC speed | Engine comm. speed [rpm] | |
| 81 | EIC coolant temp. | Engine comm. coolant temperature [deg][F] | |
| 82 | EIC oil pressure | Engine comm. engine oil pressure [bar/100][psi/100] | |
| 83 | EIC faults | Engine comm. number of actual faults | |
| 84 | EIC oil temp. | Engine comm. engine oil temperature [deg][F] | |
| 85 | EIC fuel temp. | Engine comm. fuel temperature [deg/10][F/10] | |
| 90 | EIC charge air pressure | Engine comm. charge air pressure [bar/100][psi/100] | |
| 91 | EIC charge air temp. | Engine comm. charge air temperature [deg][F] | |

## DDEC – Detroit engines

Measurement table (words (2 bytes), read only registers - function code = 03h).

| Addr. | Content | Type | |
|-------|---------|------|---|
| 78 | 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 |
| 80 | EIC speed | Engine comm. speed [rpm] | |
| 81 | EIC coolant temp. | Engine comm. coolant temperature [deg][F] | |
| 82 | EIC oil pressure | Engine comm. engine oil pressure [bar/100][psi/100] | |
| 84 | EIC oil temp. | Engine comm. engine oil temperature [deg][F] | |
| 85 | EIC fuel temp. | Engine comm. fuel temperature [deg][F] | |
| 86 | EIC boost pressure | Engine comm. boost pressure [bar/100][psi/100] | |
| 87 | EIC air inlet temp. | Engine comm. air inlet temperature [deg][F] | |
| 88 | EIC coolant level | Engine comm. coolant level [%/10] | |
| 89 | EIC fuel rate | Engine comm. fuel rate [L/h/10] | |

## EMR – Deutz engines

Measurement table (words (2 bytes), read only registers - function code = 03h).

| Addr. | Content | Type | |
|-------|---------|------|---|
| 78 | 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 |
| 79 | 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) |
| 80 | EIC speed | Engine comm. speed [rpm] | |
| 81 | EIC coolant temp. | Engine comm. coolant temperature [deg][F] | |
| 82 | EIC oil pressure | Engine comm. engine oil pressure [bar/100][psi/100] | |
| 83 | EIC faults | Engine comm. number of actual faults | |

## JDEC – John Deere engines

Measurement table (words (2 bytes), read only registers - function code = 03h).

| Addr. | Content | Type | |
|---|---|---|---|
| 78 | 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 |
| 79 | 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 | EUC 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) |
| 80 | EIC speed | Engine comm. speed [rpm] | |
| 81 | EIC coolant temp. | Engine comm. coolant temperature [deg][F] | |
| 82 | EIC oil pressure | Engine comm. engine oil pressure [bar/100][psi/100] | |
| 85 | EIC fuel temp. | Engine comm. fuel temperature [deg][F] | |
| 89 | EIC fuel rate | Engine comm. fuel rate [L/h/10] | |
| 91 | EIC charge air temp. | Engine comm. charge air temperature [deg][F] | |

**Volvo Penta engines**

Measurement table (words (2 bytes), read only registers - function code = 03h).

| Addr. | Content | Type |
|-------|---------|------|
| 78 | EIC alarms | Bit 0   EIC communication error<br>Bit 2   EIC shutdown<br>Bit 3   EIC overspeed<br>Bit 4   EIC coolant water temperature 1<br>Bit 5   EIC coolant water temperature 2<br>Bit 6   EIC oil pressure 1<br>Bit 7   EIC oil pressure 2 |
| 80 | EIC speed | Engine comm. speed [rpm] |
| 81 | EIC coolant temp. | Engine comm. coolant temperature [deg][F] |
| 82 | EIC oil pressure | Engine comm. engine oil pressure [bar/100][psi/100] |
| 84 | EIC oil temp. | Engine comm. engine oil temperature [deg][F] |
| 86 | EIC boost pressure | Engine comm. boost pressure [bar/100][psi/100] |
| 87 | EIC air inlet temp. | Engine comm. air inlet temperature [deg][F] |
| 89 | EIC fuel rate | Engine comm. fuel rate [L/h/10] |
| 91 | EIC charge air temp. | Engine comm. charge air temperature [deg][F] |
| 92 | EIC d.d. % torque | Engine comm. driver's demand engine - percent torque [%] |
| 93 | EIC actual % torque | Engine comm. actual engine - percent torque [%] |
| 94 | EIC acc. pedal pos. | Engine comm. accelerator pedal position [%] |
| 95 | EIC % load, c. speed | Engine comm. percent load at current speed [%] |
| 96 | EIC air inlet pressure | Engine comm. air inlet pressure [bar/100][psi/100] |
| 97 | EIC exhaust gas temp. | Engine comm. exhaust gas temperature [deg/10][F/10] |
| 98 | EIC engine hours | Engine comm. ENGINE HOURS [H] |
| 99 | EIC oil f. diff. press. | Engine comm. engine oil filter diff. press. [bar/100][psi/100] |
| 100 | EIC battery voltage | Engine comm. battery potential [V/10], switched |
| 101 | EIC fuel del. press. | Engine comm. fuel delivery pressure [bar/100][psi/100] |
| 102 | EIC oil level | Engine comm. engine oil level [%] |
| 103 | EIC crankcase press. | Engine comm. crankcase pressure [bar/100][psi/100] |
| 104 | EIC coolant pressure | Engine comm. coolant pressure [bar/100][psi/100] |
| 105 | EIC water in. fuel | Engine comm. WATER IN FUEL INDICATOR [ON/OFF] |

**Resolution hours (98) - appr. 3.75 years supported.**