



November 2008

Application note A40Z090218-k

Standard J1939

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CRE Technology.
Allée Charles-Victor Naudin - Zone des Templiers - Sophia Antipolis
06410 BIOT - FRANCE
Téléphone: + 33 (0)4.92.38.86.82 - Fax: + 33 (0)4.92.38.86.83
Internet: <http://www.cretechnology.com>
SARL au Capital de 300.000 Euros RCS Antibes: 7488 625 000
15 N°TVA FR54 488 625 583

1 Object

This application note describes The J1939 configuration for the GENSYS. We will see that there is common setting and a specific file to download in the GENSYS depending of the engine brand.

2 Configuration

The GENSYS must be configured with "**option 4 CAN Engine Communication**" enabled. Contact your CRE dealer for key code & procedure.

1. Set parameter **E1855** to 2, to select standard J1939 protocol.
2. Set parameter **E1856** to 17, to set the address of the GENSYS (17 is the default value).
3. Press SHIFT + I to save the configuration into the FLASH memory.
4. Connect the engine CAN bus on COM3 of the GENSYS with cable A40W2 or equivalent.
Note:
CAN Hi: on terminal 7 of GENSYS COM3 connector,
CAN Lo: on terminal 2 of GENSYS COM3 connector,
GND : on terminal 3 of GENSYS COM3 connector.
5. Switch the power supply OFF then ON to reset the system.
6. In order to display understandable texts in display menus, all the following custom language files must be downloaded: J1939_0.txt, J1939_1.txt, J1939_2.txt, J1939_3.txt and J1939_4.txt.

NB: since v3.04d J1939 texts are integrated in the software without with using custom language file.

7. However the engines brand those 5 files must be downloaded.

Note: Communication speed: 250 Kbits non modifiable.

3 Basic operations

The GENSYS provides with the following J1939 features:

3.1 J1939 Fault

Variable **E2511** shows the state of J1939 reception. **E2511** equals 1, means that no frames were received for more than 2 seconds. This error is not latched and reset to 0 if a new frame is received.

3.2 Engine Speed

Variable **E0330** contains engine speed value read from J1939 in RPM from 0 to 8031.

To use this J1939 speed value instead of the internal measurement set **E1854** to 330.

To use internal measurement set **E1854** to 33 (default value).

3.3 Coolant temperature

Variable **E0333** contains coolant temperature value read from J1939 in °C from -40 to +210.

To use this J1939 coolant temperature value instead of the internal measurement set **E1853** to 333.

To use internal measurement set **E1853** to 30 (default value).

3.4 Oil pressure

Variable **E0331** contains oil pressure value read from J1939 in Bars from 0.00 to 10.00.

To use this J1939 oil pressure value instead of the internal measurement set **E1852** to 331.

To use internal measurement set **E1852** to 29 (default value).

3.5 Engine diagnostic

The GENSYS is able to monitor diagnostic messages (DM1) from the engine. Only relevant diagnostic messages are taken into account and used in the GENSYS Fault /alarm system.

RESET message (DM3) is sent to the engine when internal GENSYS RESET is activated (RESET button or internal variable).

If the diagnostic message is not sent for more than 3 seconds, the corresponding Fault /alarm is automatically set to OFF.

3.5.1 Red "lamp"

This message is used to relay trouble code information that is of a severe enough condition that it warrants stopping the engine.

Variable **E0403** contains the "Red lamp" value read from J1939. Value of 0 means Not Activated. Value of 1 means Activated.

To set the behavior of the GENSYS when receiving the "Red lamp" message from the engine, variable **E1866** must be set to:

- 0: Disable
- 1: Generator electrical Fault
- 2: Mains electrical Fault
- 3: Alarm
- 4: Soft Shutdown
- 5: Hard Shutdown (default value)
- 7: Help + Fault (Soft shut down)
- 8: Help + Gen. Electrical Fault

3.5.2 Amber "lamp"

This message is used to relay trouble code information that is reporting a problem with the engine system but the engine need not be immediately stopped. Variable **E0386** contains the "Amber lamp" value read from J1939. Value of 0 means Not Activated. Value of 1 means Activated.

To set the behavior of the GENSYS when receiving the "Amber lamp" message from the engine,, variable **E1865** must be set to:

- 0: Disable (default value)
- 1: Generator electrical Fault
- 2: Mains electrical Fault
- 3: Alarm
- 4: Soft Shutdown
- 5: Hard Shutdown
- 7: Help + Fault (Soft shut down)
- 8: Help + Gen. Electrical Fault

3.5.3 Protect "lamp"

This message is used to relay trouble code information that is reporting a problem with an engine system that is most probably not electronic subsystem related. For instance, engine coolant temperature is exceeding its prescribed temperature range. Variable **E0363** contains the "Protect lamp" value read from J1939. Value of 0 means Not Activated. Value of 1 means Activated.

To set the behavior of the GENSYS when receiving the "Protect lamp" message from the engine,, variable **E1864** must be set to:

- 0: Disable (default value)
- 1: Generator electrical Fault
- 2: Mains electrical Fault
- 3: Alarm
- 4: Soft Shutdown
- 5: Hard Shutdown
- 7: Help + Fault (Soft shut down)
- 8: Help + Gen. Electrical Fault

3.5.4 Malfunction "lamp"

A message used to relay only emissions-related trouble code information. This message is only illuminated when there is an emission-related trouble code active. Variable **E0359** contains the "Malfunction lamp" value read from J1939. Value of 0 means Not Activated. Value of 1 means Activated.

To set the behavior of the GENSYS when receiving the "Malfunction lamp" message from the engine, variable **E1863** must be set to:

- 0: Disable (default value)
- 1: Generator electrical Fault
- 2: Mains electrical Fault
- 3: Alarm
- 4: Soft Shutdown
- 5: Hard Shutdown
- 7: Help + Fault (Soft shut down)
- 8: Help + Gen. Electrical Fault

3.5.5 Very high engine speed

This message is used to relay that the engine speed is above the most severe high level threshold set for the engine. Variable **E0358** contains the "Very high engine speed" value read from J1939. Value of 0 means Not Activated. Value of 1 means Activated.

To set the behavior of the GENSYS when receiving the "Very high engine speed" message from the engine, variable **E1862** must be set to:

- 0: Disable
- 1: Generator electrical Fault
- 2: Mains electrical Fault
- 3: Alarm
- 4: Soft Shutdown
- 5: Hard Shutdown (default value)
- 7: Help + Fault (Soft shut down)
- 8: Help + Gen. Electrical Fault

3.5.6 High engine speed

This message is used to relay that the engine speed is above the most severe high level threshold set for the engine. Variable **E0332** contains the "High engine speed" value read from J1939. Value of 0 means Not Activated. Value of 1 means Activated.

To set the behavior of the GENSYS when receiving the "High engine speed" message from the engine, variable **E1857** must be set to:

- 0: Disable (default value)
- 1: Generator electrical Fault
- 2: Mains electrical Fault
- 3: Alarm
- 4: Soft Shutdown
- 5: Hard Shutdown
- 7: Help + Fault (Soft shut down)
- 8: Help + Gen. Electrical Fault

3.5.7 Very high coolant temperature

This message is used to relay that the coolant temperature is above the most severe high level threshold set for the engine. Variable **E0356** contains the "Very high coolant temperature" value read from J1939. Value of 0 means Not Activated. Value of 1 means Activated.

To set the behavior of the GENSYS when receiving the "Very high coolant temperature" message from the engine, variable **E1861** must be set to:

- 0: Disable
- 1: Generator electrical Fault
- 2: Mains electrical Fault
- 3: Alarm
- 4: Soft Shutdown (default value)
- 5: Hard Shutdown
- 7: Help + Fault (Soft shut down)
- 8: Help + Gen. Electrical Fault

3.5.8 High coolant temperature

This message is used to relay that the coolant temperature is above the least severe high level threshold set for the engine. Variable **E0343** contains the "High coolant temperature" value read from J1939. Value of 0 means Not Activated. Value of 1 means Activated.

To set the behavior of the GENSYS when receiving the "High coolant temperature" message from the engine, variable **E1859** must be set to:

- 0: Disable (default value)
- 1: Generator electrical Fault
- 2: Mains electrical Fault
- 3: Alarm
- 4: Soft Shutdown
- 5: Hard Shutdown
- 7: Help + Fault (Soft shut down)
- 8: Help + Gen. Electrical Fault

3.5.9 Very low oil pressure

This message is used to relay that the oil pressure is below the most severe low level threshold set for the engine. Variable **E0355** contains the "Very low oil pressure" value read from J1939. Value of 0 means Not Activated. Value of 1 means Activated.

To set the behavior of the GENSYS when receiving the "Very low oil pressure" message from the engine, variable **E1860** must be set to:

- 0: Disable
- 1: Generator electrical Fault
- 2: Mains electrical Fault
- 3: Alarm
- 4: Soft Shutdown
- 5: Hard Shutdown (default value)
- 7: Help + Fault (Soft shut down)
- 8: Help + Gen. Electrical Fault

3.5.10 Low oil pressure

This message is used to relay that the oil pressure is below the least severe low level threshold set for the engine. Variable **E0339** contains the "Low oil pressure" value read from J1939. Value of 0 means Not Activated. Value of 1 means Activated.

To set the behavior of the GENSYS when receiving the "Very low oil pressure" Low oil pressure» message from the engine, variable **E1858** must be set to:

- 0: Disable (default value)
- 1: Generator electrical Fault
- 2: Mains electrical Fault
- 3: Alarm
- 4: Soft Shutdown
- 5: Hard Shutdown
- 7: Help + Fault (Soft shut down)
- 8: Help + Gen. Electrical Fault

Note: All the parameters are available in web pages in menu System, then Serial port and COM3.

J1939

Adresse J1939:1856=

Vitesse moteur:1854=

Temp. eau :1853=

Pression Huile:1852=

[<<](#) [>>](#)

[Esc](#)

[Defaults](#) [Alarmes](#) [Informations](#)

J1939

CT vitesse > :1857=

CT vitesse >> :1862=

CT Temp eau > :1859=

CT Temp eau >>:1861=

CT P Huile < :1858=

CT P Huile << :1860=

CT Malfunction:1863=

CT Protection :1864=

CT Orange :1865=

CT Rouge :1866=

[<<](#) [>>](#)

[Esc](#)

[Defaults](#) [Alarmes](#) [Informations](#)

4 Advanced operations

4.1 Custom Rx Frames

If it is needed to get more values than those available in the basic operations, the system is able to read raw data from 5 different frames.

The variables **E2675**, **E2676**, **E2677**, **E2678** and **E2679** define the ID of the frames to be monitored. The IDs are those defined by the J1939/71 standards.

The raw data is available as 8 bytes in variable **E0410-E0417**, **E0420-E0427**, **E0430-E0437**, **E0440-E0447** and **E0450-E0457**.

There are no additional web pages to configure this system; the variables are only accessible by equations.

4.2 Custom TX Frame

If it is needed, a custom frame can be sent every 100ms by the system.

The variable **E2662** defines the size of the frame from 0 to 8. A value of -1 switches off the emission of the frame.

The variables **E2663**, **E2664**, **E2665**, **E2666** define the ID of the frame to be send (**E2663** is the least significant byte; **E2666** is the most significant byte).

The variables **E2667** to **E2674** contains the raw data to be send (**E2667** contains data 1, **E2668** contains data 2 ...).

There are no additional web pages to configure this system; the variables are only accessible by equations.

5 Engines notes

5.1 PERKINS (Engine series 2800)

The following text file must be loaded into the GENSYS on level 2 access: J1939_perkins.txt

5.2 SCANIA

Set the variable **E1917** to 1, to use the J1939 refresh time to 25ms. (Only available after V2.10b)

The following text file must be loaded into the GENSYS on level 2 accesses: J1939_SCANIA.txt

This txt file contains LEVEL 2 equation and contains START STOP and SPEED management.

5.3 VOLVO EMS2

This electronic control unit has no other means of control than J1939 CAN bus.

Note:

Do not use CIU module with GENSYS.

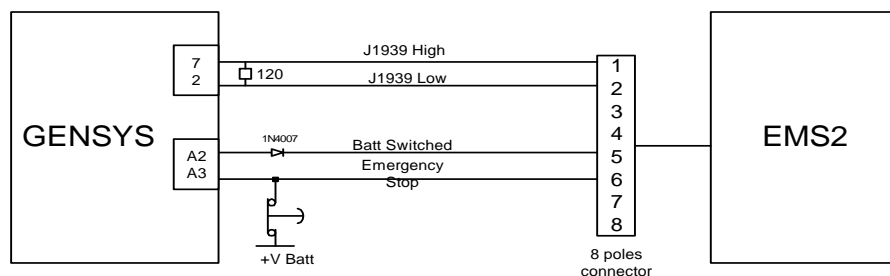


Figure 1: Wiring diagram for Volvo EMS2

The following text file must be loaded into the GENSYS on level 2 accesses: J1939_VOLVO.txt

5.4 IVECO

Note:

1. Oil pressure value from IVECO is never sent by j1939, then we use analogue input program like VDO.
2. The Fuel relay valve is used to give power to the control unit.
3. A different Crank output sequence is used because the crank signal command must be given after the unit supply. The C1 output1 is command 2 seconds after the normal Crank output.
4. On the control unit we can recover the following signals:
 - Digital oil pressure
 - Analogue oil pressure
 - Digital water temperature

Download the text file J1939_cme.txt

5.5 MTU ADEC via SAM module

To communicate with MTU ADEC you need to have a SAM module with CCB II optional module installed and activated (call you MTU retailer).

The following text file must be loaded into the GENSYS on level 2 accesses: J1939_ADEC.txt

On the control unit we can recover the following signals:

- Digital oil pressure
- Analogue oil pressure
- Digital water temperature

You also have standard J1939 Engine Diagnostic (see 3.5).

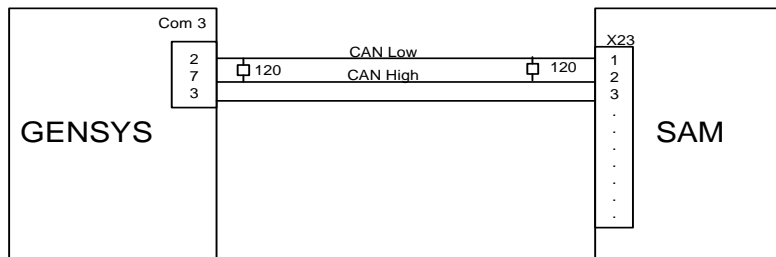


Figure 2: Wiring diagram for SAM (ADEC MTU) J1939 bus

For the present the GENSYS drives the ADEC with analog and logic input. Minimal configuration:

	GENSYS	ADEC
Start / stop	A2	X1-37
GND		X1-22
Motor speed	G9 G10	X1-31 X1-29

NB: The ADEC must be programmed to select speed control mode by analog input.

For additional input/output options contact your MTU retailer.