EEPOD
CAN GATEWAY MODULE
(CGM)
QUICK SPEC

PREPARED BY: EEPod LLC

Filename: CGM Quick Spec.doc

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REVISION HISTORY

| Revision	Release Date	Author	Change Descriptions
1.01	Nov. 30, 2021	Kerby Suhre	First Draft
1.02	Dec. 3, 2021	Kerby Suhre	Updated vehicle diagram and description for FD-CAN based wakeup/sleep.
1.03	June 12, 2024	Kerby Suhre	Updated drawings.
1.04	Aug. 15, 2024	Kerby Suhre	Minor updates.

1   MODULE FEATURES

This CAN Gateway Module Quick Spec has been prepared for customers to use for determining how to integrate the module into their vehicles. The following text and pictures describe the high-level functionality of the module.

1.1 ELECTRICAL

- The module will have very low operating current consumption (~100mA @ 12VDC) when the ignition is ON. The module will be direct battery feed (HAT – Hot All Times) and will go into low-power / sleep mode when no messages are received on the CAN-FD network for a period of 10 seconds. The sleep mode current will be less than 400uA.

- The module will operate beyond the required 9V-16V range. The full operating range is estimated to be 6V-27V.

- The module will support both classic CAN as well as CAN-FD networks in order to support all current and future vehicle powertrain systems. The module will be re-programmable via the CAN network using the standard Ford re-programming method with a 12-byte security algorithm.

- The module will have two spare digital / analog inputs for future use.

- The internal electronics will be potted and have an industrial operating temperature range (-40 to +85C) for anywhere on the vehicle except "under hood" (engine compartment).

1.2 ENCLOSURE

- The module will be small and light with an enclosure made from ABS/PC material. It will be approximately 2x2x1.5 inches and weighing about 8 ounces (reference the mockup pictures below).

- The module enclosure will have mounting tabs to support a variety of mounting options.
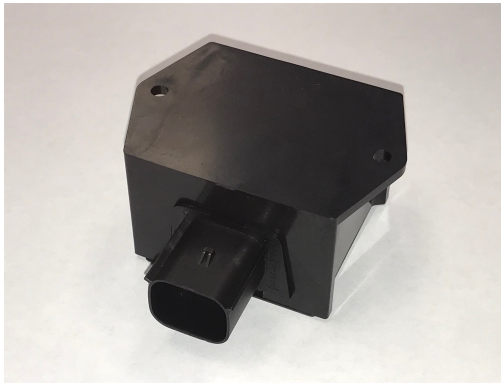
CGM ECU
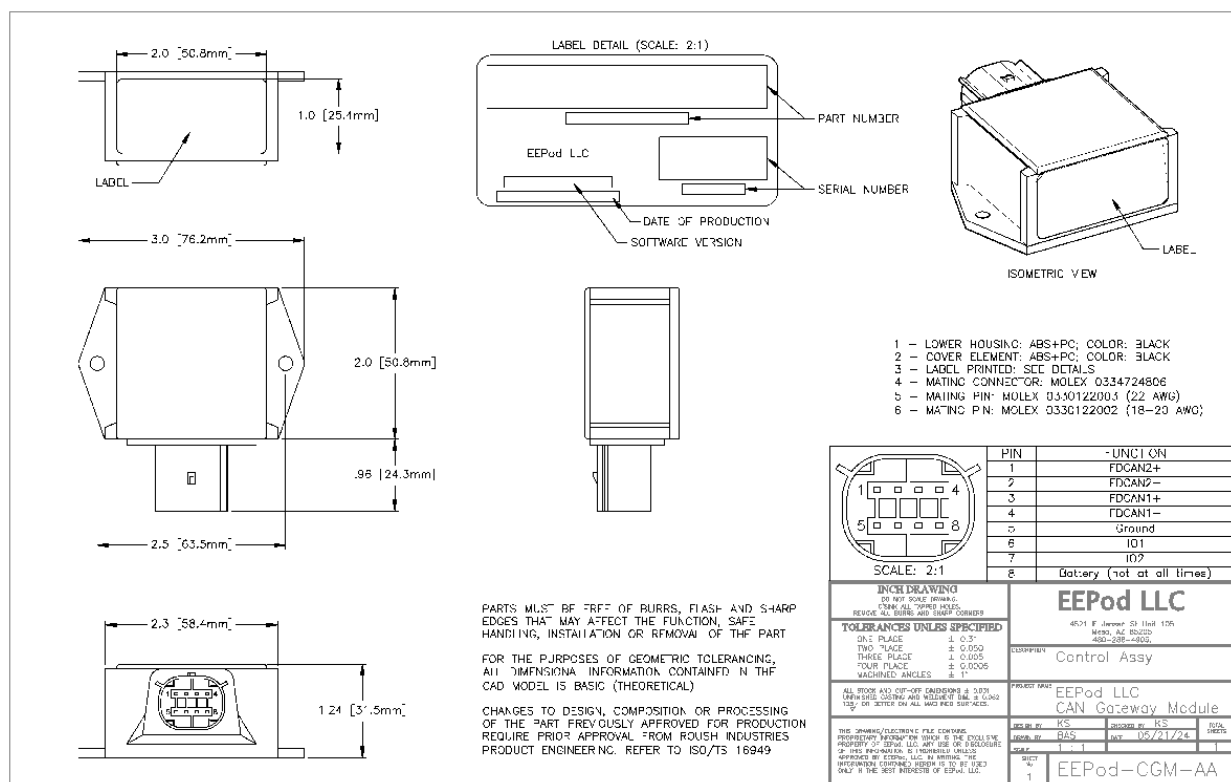
1.3 CONNECTOR

- The module will have a Molex P/N:0348300801 waterproof 8-pin automotive (USCAR II approved) connector with an orientation/alignment key. The mating harness connector housing will be the Molex P/N:0334724806 with terminal P/N:0330122003 (22AWG wire) or terminal P/N:0330122002 (18-20AWG wire).

- The connector pinout will be as follows:

PIN	Function
1	HSCAN2+ (to OBD pin 6)
2	HSCAN2- (to OBD pin 14)
3	HSCAN1+ (to PCM)
4	HSCAN1- (to PCM)
5	Ground
6	ACC/IGN/START/KL.15
7	No Connect (Spare Input)
8	Battery (hot at all times)

1.4 ENVIRONMENTAL

The CGM has an ambient external operating temperature range from -40C to +85C and meets the Ford CETP: 00.00-E-412 (dated 201107) environmental specifications (mini-DV group M tests).

1.5 CAN MESSAGING

1.5.1   Broadcast CAN Messages

The CGM does not have any normal mode periodic messaging. The CGM will convert the necessary CAN-FD format broadcast messages from the PCM on the FDCAN network to classic CAN 2.0b format messages on the HSCAN network. The CGM will also convert the necessary classic CAN 2.0b format broadcast messages from the PCM on the HSCAN network to CAN-FD format messages on the FDCAN network.

1.5.2   Diagnostic Support

The CGM will support ISO15765 / ISO14229 diagnostic messages for reading part numbers, reading and clearing DTCs, reading DIDs, diagnostic session levels, reset, security levels, reprogramming and control I/O functions. The Ford GFM2 diagnostic CAN IDs (0x7D2 / 0x7DA) will be used. The following services will be supported.

1.5.2.1 Diagnostic Session ($10)

Diagnostic Session service is supported for Standard, Extended and Programming sessions.

1.5.2.2 Module Reset ($11)

Module reset service is supported.

1.5.2.3 Read DTCs ($14)

Read DTCs service is supported.

1.5.2.4 Clear DTCs ($19)

Clear DTCs service is supported.

1.5.2.5 Read Data By Identifier ($22)

Read DID service is supported for numerous standard Ford DIDS, including the following module identification DIDS: $F111, $F113$F188 and $F18C.

1.5.2.6 Security Access ($27)

Security Access service is supported for programming.

1.5.2.7 Routine Control ($31)

Routine Control service is supported for ODST.

1.5.2.8 Download ($34, $36, $37)

Download services are supported for reprogramming the CGM.

1.5.2.9 Tester Present ($3E)

Tester Present service is supported for maintaining the current diagnostic session.

2 VEHICLE INSTALLATION

2.1 MODULE LOCATION / WIRING

The CGM is designed for installation in a non-exterior (and not under-hood), non-customer accessible location. The CGM operates as a gateway between the PCM and the OBDII/J1962 connector, so the following is a representation of the system block diagram in a vehicle. The CGM module is not a terminating node on pins 1 & 2, so the proper CAN vehicle termination is required (e.g. 120-ohm).
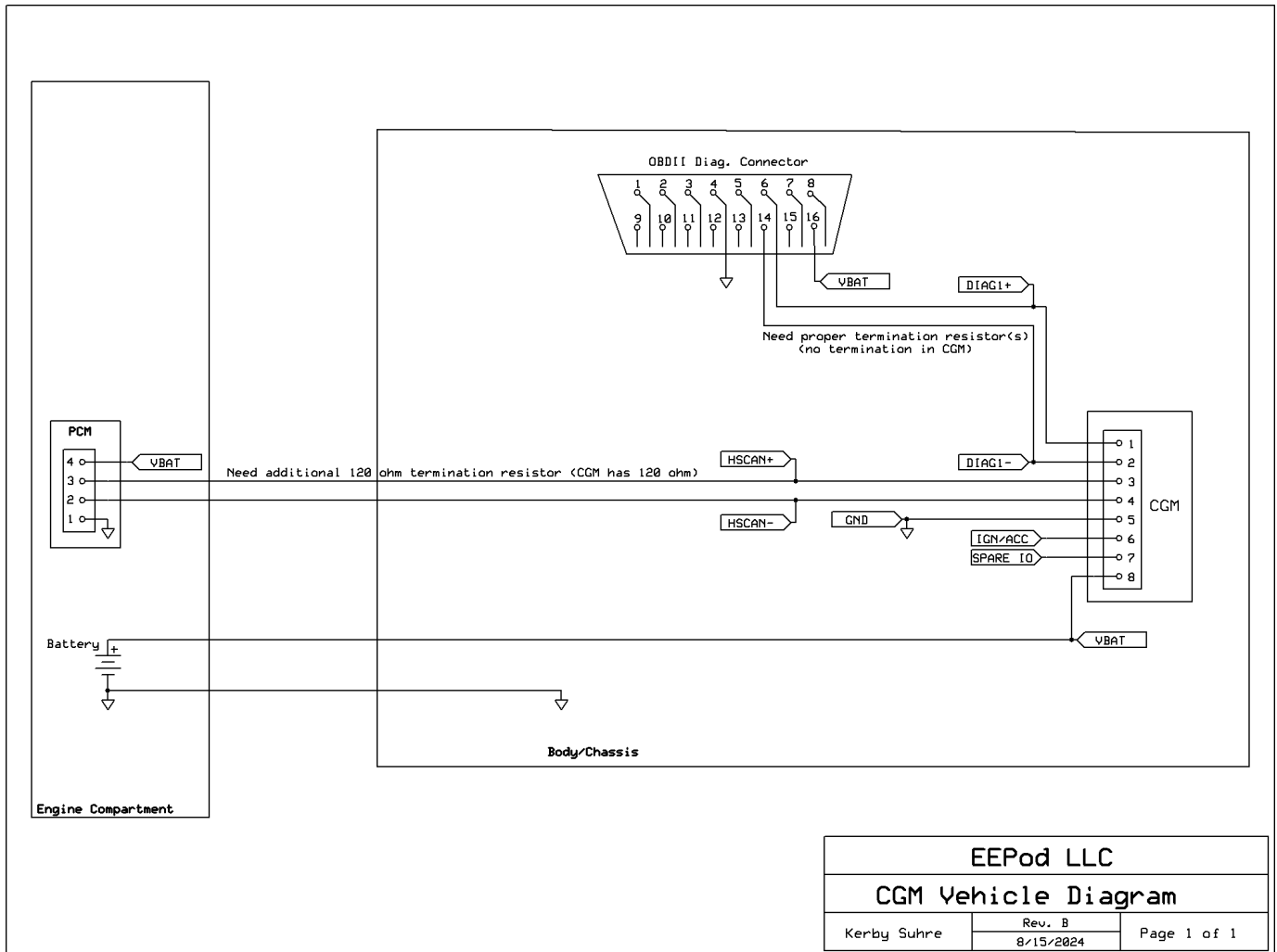
3 REFERENCES AND ACRONYMS

3.1.1 Acronyms

ABS/PC	Acrylonitrile Butadiene Styrene / Polycarbonate
CAN	Controller Area Network
CGM	CAN Gateway Module
DID	Data ID
DTC	Diagnostic Trouble Code
ECU	Electronic Control Unit
GFM	Generic Function Module
ISO	International Standards Organization
ODST	On-Demand Self Test
PCM	Powertrain Control Module
SPM	Security PATS Module