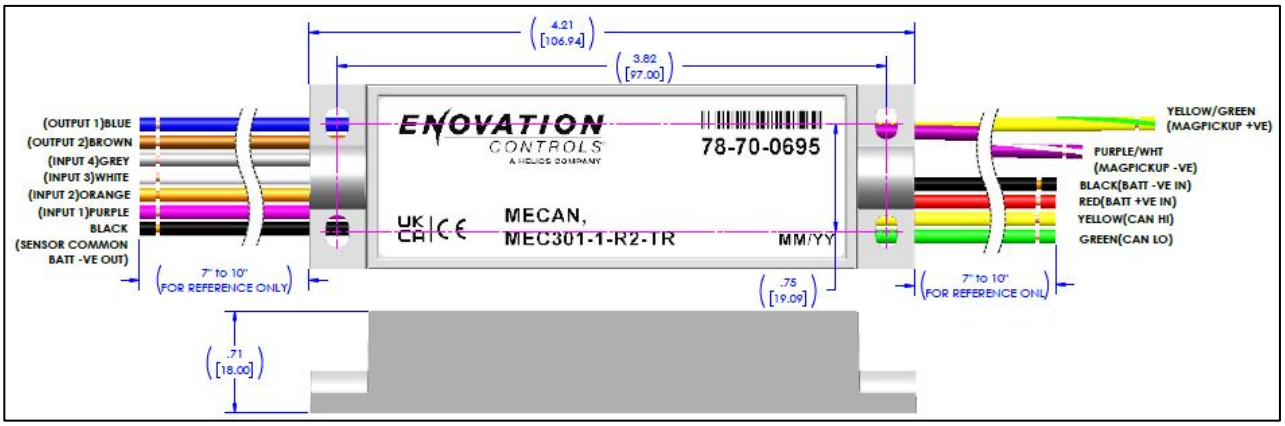
OPERATION MANUAL: 78-70-0695 Rev A

SENDERCAN PLUS P/N: 78-70-0695	DRAWING NO.:78-02-0695	ECO # C05039
DESCRIPTION: MEC301-1-R2-TR,MECAN W/ PRESS & TEMP SENDER		

I. Reference drawing (Product label might be different)



LEFT SIDE		RIGHT SIDE	
Wire Color	**I/O (Function)**	**Wire Color**	**Function**
BLACK	BATT -VE OUTPUT(***SENSOR GROUND***)	YELLOW/GRN	MAGPICKUP +VE
PURPLE	INPUT 1 (***NOT USED***)	PURPLE/WHT	MAGPICKUP -VE
ORANGE	INPUT 2 (***ES2P-100, OIL PRESS SENDER***)	BLACK	BATT -VE INPUT
WHITE	INPUT 3 (***ES2T-300, COOL TEMP SENDER***)	RED	BATT +VE INPUT
GREY	INPUT 4 (***SPEED CALIBRATION***)	YELLOW	CAN HI
BROWN	OUTPUT 2 (***NOT USED***)	GREEN	CAN LOW
BLUE	OUTPUT 1 (***SHUTDOWN***)	-	-
120 OHM SOFTWARE CONFIGURABLE TERMINATING RESISTOR IS **ENABLED**			

II. Operation.

J1939 CAN Parameters Broadcast – Source Address = 0x00:

Parameter	PGN	Start Position	Length	SPN
INPUT 2 (ENG OIL PRESSURE)	65263	4	1 byte	100
INPUT 3 (ENG COOLANT TEMPERATURE)	65262	1	1 byte	110
INPUT 4 (SPEED CALIBRATION FEEDBACK)	61444	4	2 bytes	190
INTERNAL BATTERY POTENTIAL	65271	5	2 bytes	168
CALCULATED MACHINE RUN HOURS	65253	1	4 bytes	247

J1939 DM1 Fault Messages/Setpoints – Source Address = 0x00:

Fault Condition	Warning Setpoint (Fault Messages)	Shutdown Setpoint (Fault Messages)
LOW ENG OIL PRESSURE	20psi (**SPN 100 FMI 18**)	10psi (**SPN 100 FMI 1**)
HIGH ENG COOLANT TEMPERATURE	212 Deg F (**SPN 110 FMI 16**)	230 Deg F (**SPN 110 FMI 0**)
OVERSPEED	NA	3500 RPM (**SPN 190, FMI 0**)

1939 DM1 Sender Failure Messages – Source Address = 0x00:

Fault Condition	Warning Fault Message
Oil Pressure Sender Open Circuit	SPN 100 FMI 3
Oil Pressure Sender Shorted	SPN 100 FMI 4
Coolant Temp Sender Open Circuit	SPN 110 FMI 3
Coolant Temp Sender Shorted	SPN 110 FMI 4

LED Lamp flash codes:

Condition	Normal Mode	Speed Calibration mode
No active CAN bus connected	Fast flash (10Hz)	-
No CAN data reception	Slow flash (1Hz)	-
Valid CAN data being received	ON	-
In calibration mode and is waiting for a speed signal.	-	Flash code 2 (2 quick flashes followed by approx. 1 sec off period)
Calibration in progress	-	Flash code 4 (4 quick flashes followed by approx. 1 sec off period)
Calibration complete	-	Flash code 1 (1 quick flash followed by approx. 1 sec off period)

Notes:

- Mecan source address default is set to 0x00 (0 decimal).
- Internal 120 Ohm Termination resistor is enabled across CAN Hi and Low in this module.
- Output is a Low Side FET and should be connected to the negative side of the load. When a shutdown occurs the output is latched “ON”, until the module is power cycled.
- This module supports two Engine Speed Calibration methods (Described in the sections below).

III. Speed Calibration.

The Engine Speed Signal of the MeCAN (SenderCAN Plus variant) must be calibrated to match the RPM of the engine using one of the two methods listed below depending on the available equipment.

Method 1: Calibration by CAN message

The speed calibration multiplier value can be sent using a single J1939 proprietary CAN message. The message can be sent from any device capable of transmitting J1939 CAN messages.
It is only necessary to send the message one time.

Multiplier value = $\lfloor$(60 / flywheel tooth count) * 1000$\rfloor$

Message format:

PGN:	65520 (0xFFF0)	
From source address:	Any	
Priority:	3	
Message length:	4 Bytes	
Data Byte 1:	Multiplier Value	LSB
Data Byte 2:	Multiplier Value	MSB
Data Byte 3:	90 (0x5A)	(Integrity check word LSB)
Data Byte 4:	170 (0xAA)	(Integrity check word MSB)

Method 2: Calibration with a 1K Ohm Potentiometer

1) If Calibration is being performed on the engine make sure the engine is stopped.
2) MeCAN should be de-powered.
3) Connect a 1K ohm potentiometer between the Grey wire (analogue input 4) and Black Batt-Ve Input wire.

4) Set the potentiometer to approximately quarter turn (¼ of the range clockwise).
5) Connect a display or CAN Analysis tool to the CAN data bus to see the RPM value transmitted from the MeCAN.
6) Apply power to the MeCAN.
7) Verify the MeCAN is in calibration mode. The LED will blink twice quickly and then pause 1 sec.
8) Start the engine within one minute and set the engine to a known speed between 500 to 2000 RPM using a handheld tach. (If the MeCAN does not detect a speed signal within one minute, it will exit calibration mode and process will need to be restarted at step 1)
9) The LED will begin blinking four times followed by a 1 sec pause after it detects an engine speed signal.
10) Begin adjusting the potentiometer until the RPM reading matches the actual RPM of the engine. Users has one minute to complete the calibriation. There is a one minute timer to complete this task.
11) Once calibriation is completed at one minute, the new calibration multipler value will be saved and the MeCAN will exit calibration mode which is indicated by the LED flashing once followed by a 1 sec pause.
12) Turn power off and disconnect the potentiometer. (Note: To prevent MeCAN from accidentally entering the first state of the manual speed calibration, the grey wire should remain disconnected when in normal operational use).