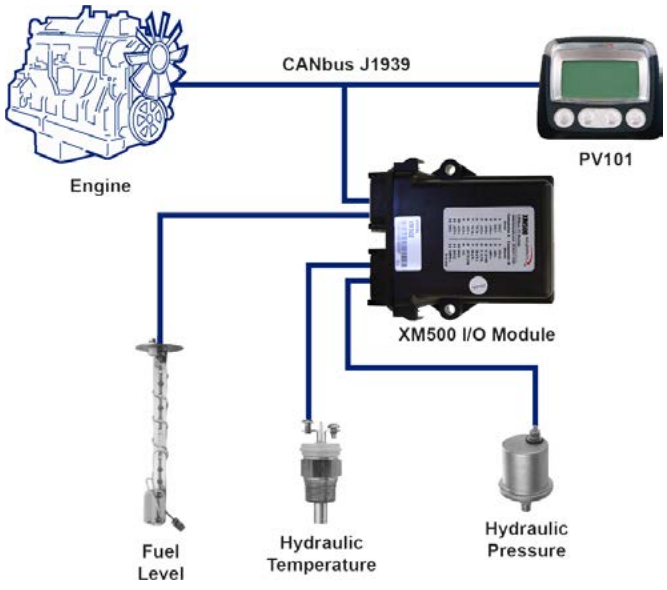
XM500
I/O Module

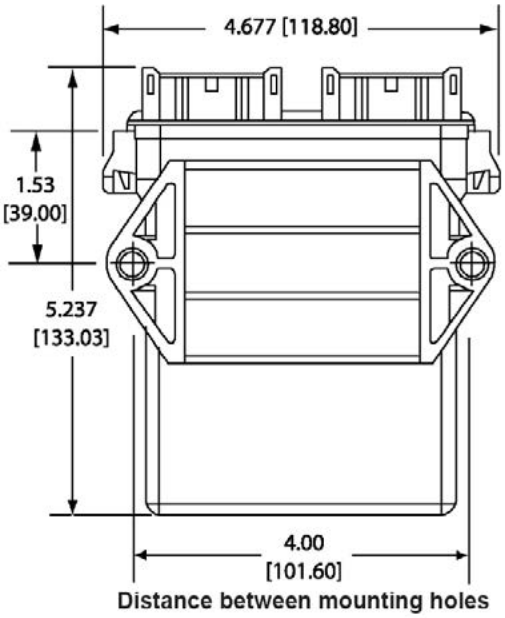
The XM500 Module is a configurable Input/Output (I/O) module designed to bring analog and digital inputs and output onto the SAE J1939 CAN. The XM500 configuration tool provides a user-friendly interface allowing the user to create or change the configuration used on the XM500 module.

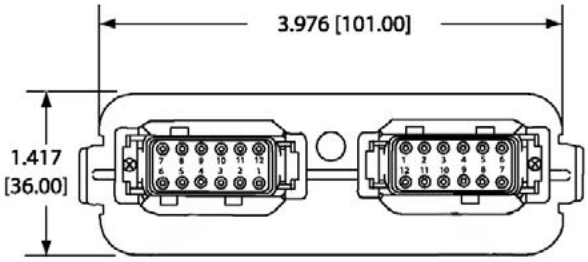
Your application may require monitoring of other information which may not be provided by the OEM engine or transmission electronic control unit (ECU), such as fuel level, hydraulic oil pressure or a low engine coolant level switch. The XM500 is ideally suited to bring the additional information you need onto the J1939 CAN bus and can be configured to broadcast fault codes and activate digital outputs per input condition such as fuel level low, hydraulic oil temperature high, etc. Because the XM500 broadcasts information using the J1939 standard protocol, the information can be displayed using standard J1939 display modules, such as the PowerView® 101.

Diagram



Dimensions and Connections





Specifications

Electrical

Power Input: 8 to 28VDC

Communication Ports: CAN J1939

Operating Temperature: -40° F to 185° F (-40° C to 85° C)

Digital Inputs: 4 - Ground or battery positive activation

Digital Outputs*: 2 Sinking (500 mA)

Product Weight: 10 ounces

Shipping Weight: 12 ounces

Shipping Dimensions: 4" x 6" x 2"

***(Outputs are NOT reverse polarity protected. Damage will occur if B+ is connected to the outputs. Damage incurred from improper installation is not covered under the Murphy limited warranty policy.)

Thermocouple Input[1]: Type K and Type J

Analog Inputs[2]:

1 - Battery Supply Voltage (dedicated)

7 - Configurable as 0-5 VDC, 4-20 mA, resistive senders[3] or used as an additional digital input

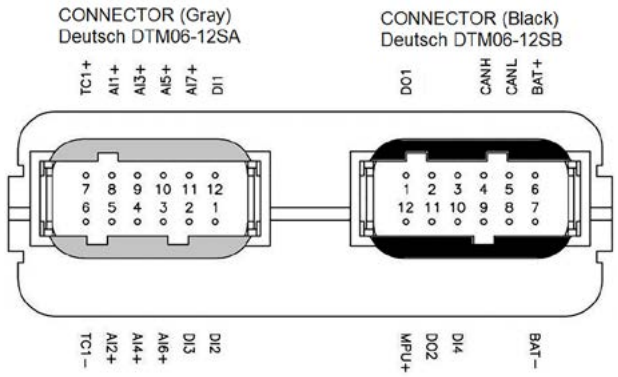
Speed Sensing Input: Magnetic pickup (2 to 120 VAC RMS from 30 to 10,000 Hz)

[1]When the thermocouple input is used, only 5 resistive, 4-20 mA, or 0-5 VDC can be used instead of 7.

[2]Analog inputs can be exchanged for digital inputs (battery ground activation only) for a total of 11 digital inputs.

[3]Other resistive senders can be supported. Contact Murphy's Industrial Panel Division for programming charges.

Connector Pins



Connector A (gray)	
Pin	Description
1	Digital IN 2
2	Digital IN 3
3	Analog 6
4	Analog 4
5	Analog 2
6	J & K Type -
7	J & K Type +
8	Analog 1
9	Analog 3
10	Analog 5
11	Analog 7
12	Digital IN 1

Connector B (black)	
Pin	Description
1	Digital OUT 1
2	
3	
4	CAN high
5	CAN low
6	Battery +
7	Battery -
8	
9	
10	Digital IN 4
11	Digital OUT 2
12	MAG pickup

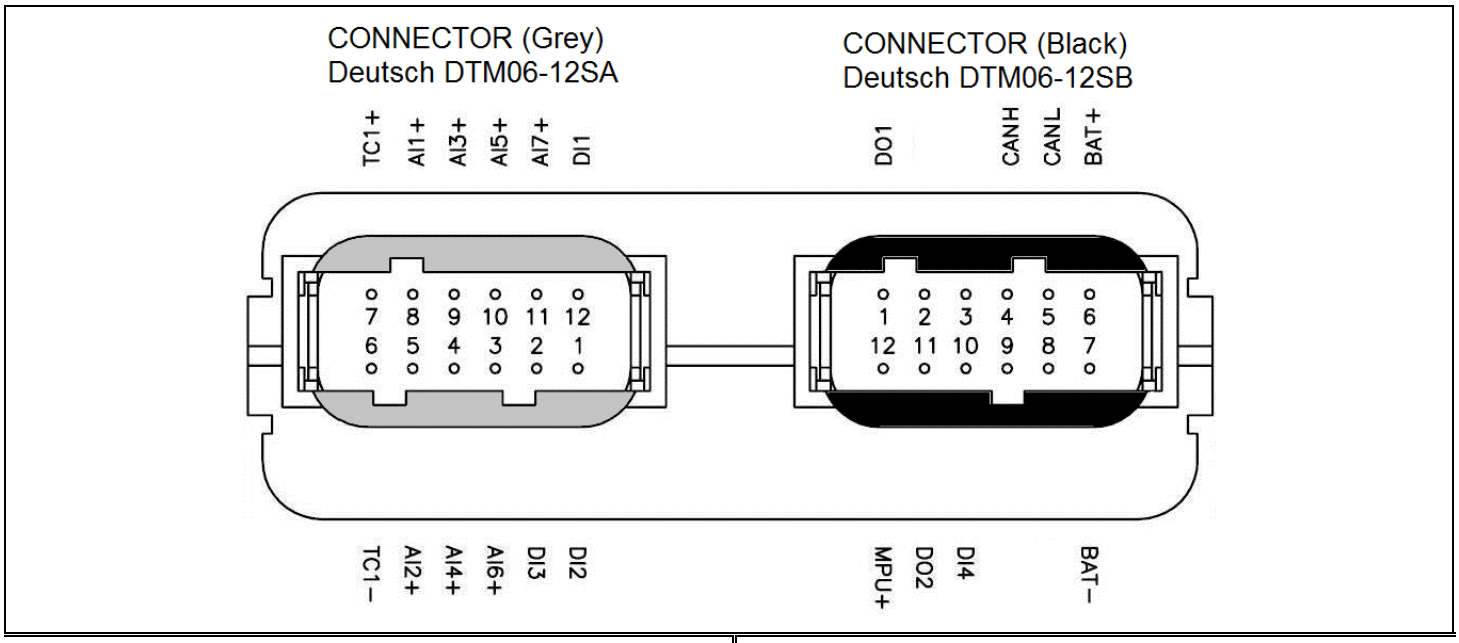
How To Order

Part Number	Description	Notes
78700420	XM500 Murphy Standard*	Module
78700534	XM500 Configuration Tool	Tool
30000669	6' harness with terminating resistor	Wire Harness
30000685	6' harness without terminating resistor	
30000670	12' harness with terminating resistor	
30000686	12' harness without terminating resistor	

* To determine other configurations, review XM500 Config & Wiring documents.
Refer to www.murphybyenovationcontrols.com

Murphy Standard Configuration for the XM500

This document contains standard connector and wiring diagram information for the XM500 I/O Module (78-70-0420). For additional information about the XM500 I/O Module, see www.fwmurphy.com and search XM500.



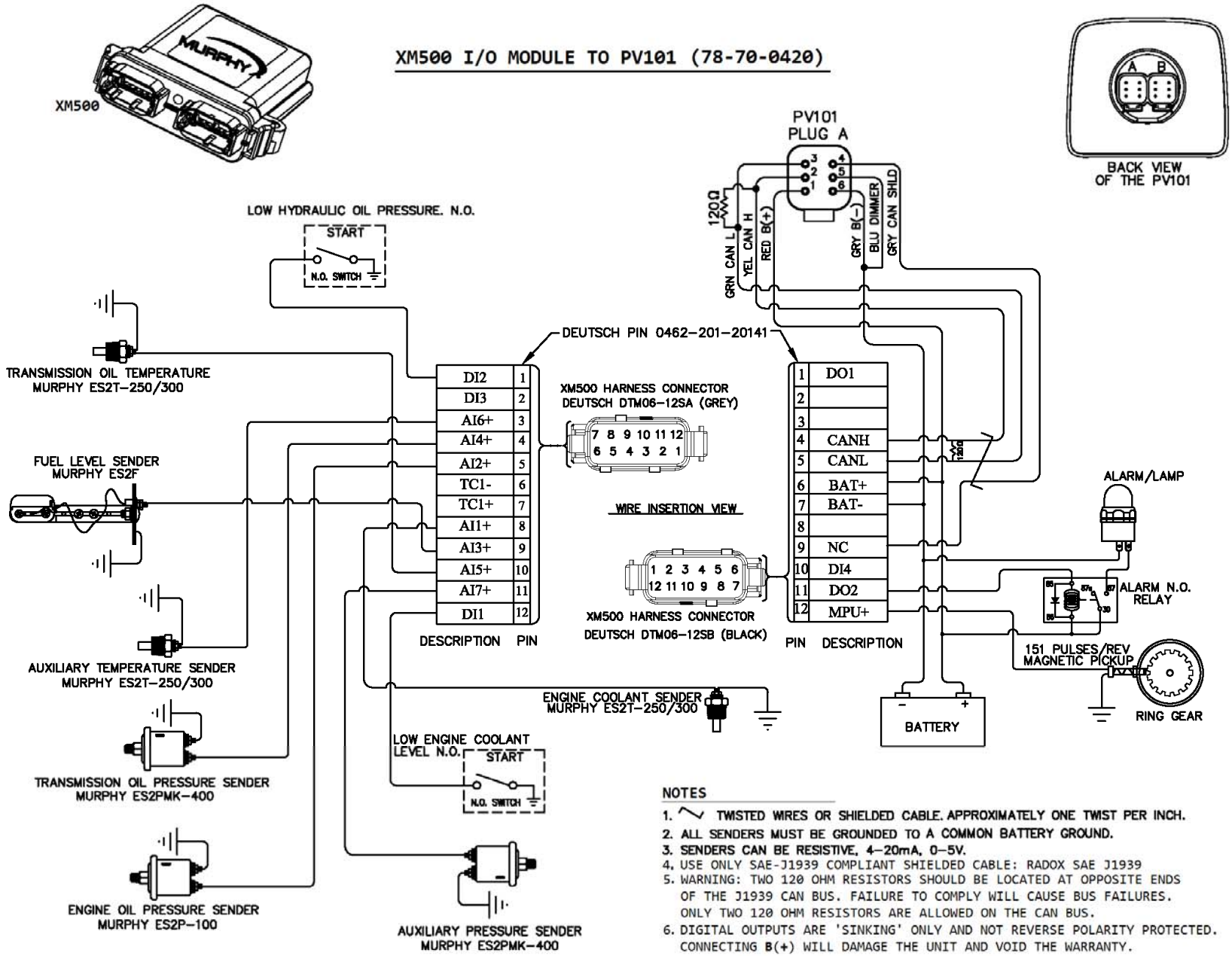
CONNECTOR A		CONNECTOR B	
LABEL	**APPLICATION**	**LABEL**	**APPLICATION**
D12	Low Hydraulic Oil Pressure N.O.	DO1	Not Used
D13	Not Used		
A16+	Auxiliary Temperature 1 (ES2T-250/300)		
A14+	Transmission Oil Pressure (ES2PMK-400)	CANH	CAN High
A12+	Engine Oil Pressure (ES2P-100)	CANL	CAN Low
TC1-	Not Used	BAT+	8 to 32 VDC+
TC1+	Not Used	BAT-	8 to 32 VDC-
AI1+	Engine Coolant Temperature (ES2T-250/300)		
AI3+	Fuel Level 1 (ES2F)		
AI5+	Transmission Oil Temperature (ES2T-250/300)	DI4	Not Used
AI7+	Auxiliary Pressure # 1 (ES2PMK-400)	DO2	Alarm N.O.
DI1	Low Engine Coolant Level N.O.	MPU+	Engine Speed, Mag Pickup (151 pulses/rev)

OPERATION - The following parameters broadcast to the J1939 network by using the analog inputs from XM500.

Parameter	**PGN**	**SPN**
Engine Speed	61444	190
Auxiliary Temperature 1	65164	441
Auxiliary Pressure 1	65164	1387
Engine Coolant Temperature	65262	110
Engine Oil Pressure	65263	100
Keyswitch Battery Potential	65271	158
Transmission Oil Pressure	65272	127
Transmission Oil Temperature	65272	177
Fuel Level 1	65276	96

POSSIBLE FAULTS: XM500 and Inputs, sending faults from XM500 to the J1938 and Lamp indicators.

SPN	FMI	LED LAMP	Description
100	18	Amber	Engine Oil Pressure < 10 PSI. 10 sec delay.
110	16	Amber	Engine Coolant Temperature > 212°F.
111	1	Amber	Low Engine Coolant Level , input closed.
127	18	Amber	Transmission Oil Pressure < 75 PSI. 10 sec delay.
1762	18	Amber	Low Hydraulic Oil Pressure, input closed. 10 sec delay.


XM500 I/O MODULE TO PV101 (78-70-0420)
XM500
PV101
PLUG A
BACK VIEW
OF THE PV101
LOW HYDRAULIC OIL PRESSURE. N.O.
START
N.O. SWITCH
120Ω
GRN CAN L
YEL CAN H
RED B(+)
GRY B(-)
BLU DIMMER
GRY CAN SHLD
DEUTSCH PIN 0462-201-20141
TRANSMISSION OIL TEMPERATURE
MURPHY ES2T-250/300
XM500 HARNESS CONNECTOR
DEUTSCH DTM06-12SA (GREY)
7 8 9 10 11 12
6 5 4 3 2 1
FUEL LEVEL SENDER
MURPHY ES2F
WIRE INSERTION VIEW
1 2 3 4 5 6
12 11 10 9 8 7
XM500 HARNESS CONNECTOR
DEUTSCH DTM06-12SB (BLACK)
ALARM/LAMP
ALARM N.O.
RELAY
AUXILIARY TEMPERATURE SENDER
MURPHY ES2T-250/300
ENGINE COOLANT SENDER
MURPHY ES2T-250/300
151 PULSES/REV
MAGNETIC PICKUP
RING GEAR
BATTERY
LOW ENGINE COOLANT
LEVEL N.O.
START
N.O. SWITCH
TRANSMISSION OIL PRESSURE SENDER
MURPHY ES2PMK-400
ENGINE OIL PRESSURE SENDER
MURPHY ES2P-100
AUXILIARY PRESSURE SENDER
MURPHY ES2PMK-400
DESCRIPTION PIN
PIN DESCRIPTION
DI2 1
DI3 2
AI6+ 3
AI4+ 4
AI2+ 5
TC1- 6
TC1+ 7
AI1+ 8
AI3+ 9
AI5+ 10
AI7+ 11
DI1 12
1 DO1
2
3
4 CANH
5 CANL
6 BAT+
7 BAT-
8
9 NC
10 DI4
11 DO2
12 MPU+
NOTES
1. TWISTED WIRES OR SHIELDED CABLE. APPROXIMATELY ONE TWIST PER INCH.
2. ALL SENDERS MUST BE GROUNDED TO A COMMON BATTERY GROUND.
3. SENDERS CAN BE RESISTIVE, 4-20mA, 0-5V.
4. USE ONLY SAE-J1939 COMPLIANT SHIELDED CABLE: RADOX SAE J1939
5. WARNING: TWO 120 OHM RESISTORS SHOULD BE LOCATED AT OPPOSITE ENDS OF THE J1939 CAN BUS. FAILURE TO COMPLY WILL CAUSE BUS FAILURES. ONLY TWO 120 OHM RESISTORS ARE ALLOWED ON THE CAN BUS.
6. DIGITAL OUTPUTS ARE 'SINKING' ONLY AND NOT REVERSE POLARITY PROTECTED. CONNECTING B(+) WILL DAMAGE THE UNIT AND VOID THE WARRANTY.