PowerView®
Model PV1100

Installation Manual

In order to consistently bring you the highest quality, full-featured products, we reserve the right to change our specifications and designs at any time. The latest version of this manual can be found at enovationcontrols.com.

WARNING

Please read the following information before installing.

BEFORE BEGINNING INSTALLATION OF THIS MURPHY PRODUCT:

Read and follow all installation instructions.

Please contact Enovation Controls immediately if you have any questions.

Table of Contents

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Hardware Installation

The following instructions will guide you through installing the PowerView display.

Inspecting Package Contents

Before attempting to install the product, it is recommended that you ensure all parts are accounted for and inspect each item for damage (which sometimes occurs during shipping). The items included in the box are:

- PV1100 unit
- Installation manual web reference insert

Dash-Mounted Installation
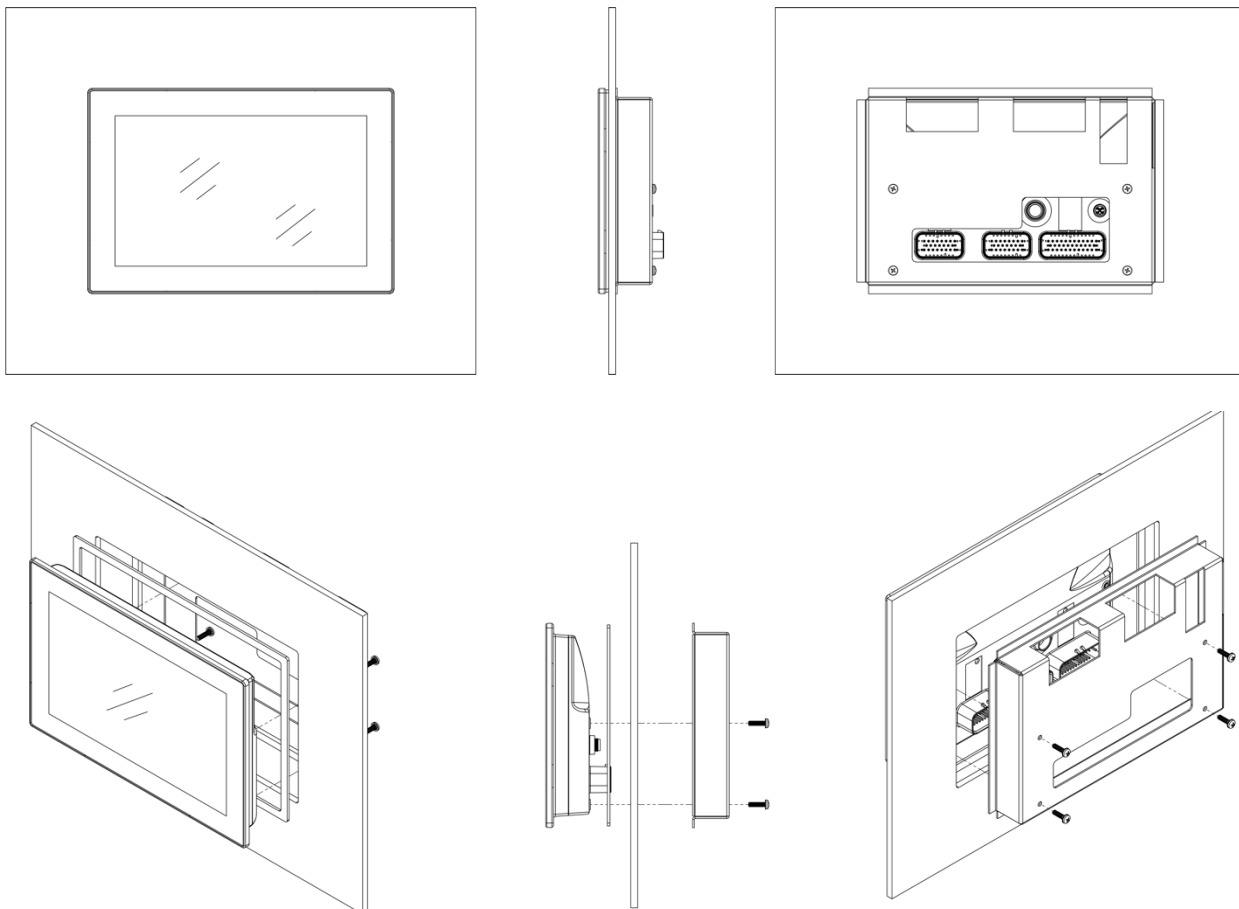
Installation kit (sold separately) – P/N 78-00-1277 includes:

- Bracket
- Panel Seal
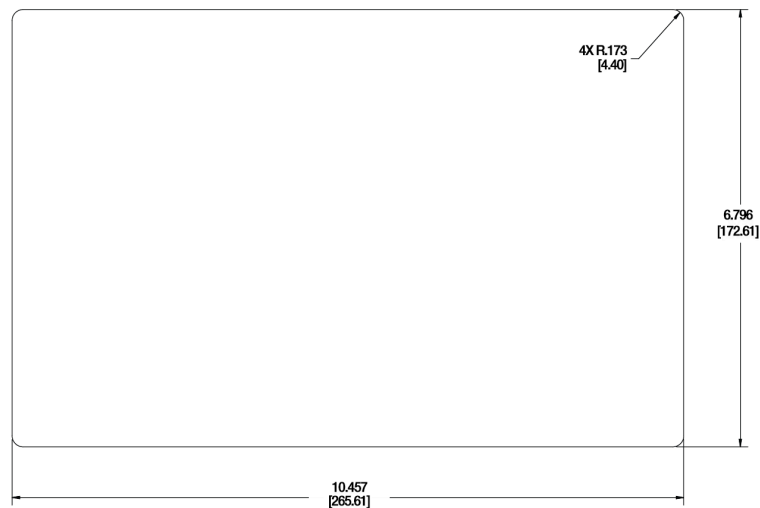- (4) 8-32 machine screws

Tools needed.
- Drill with 7/32 in. size bit
- Jigsaw

Preparing the Dash

Determine the location of the PV1100 in the dash. Cut a hole in the dash to these dimensions: (For actual cutout template, see support.enovationcontrols.com, then search for PV1100)

- (recessed mounting): 10.45" x 6.79" (265.61mm x 172.61mm)

- (surface mounting): 7.28" x 2.56" (185mm x 65mm)
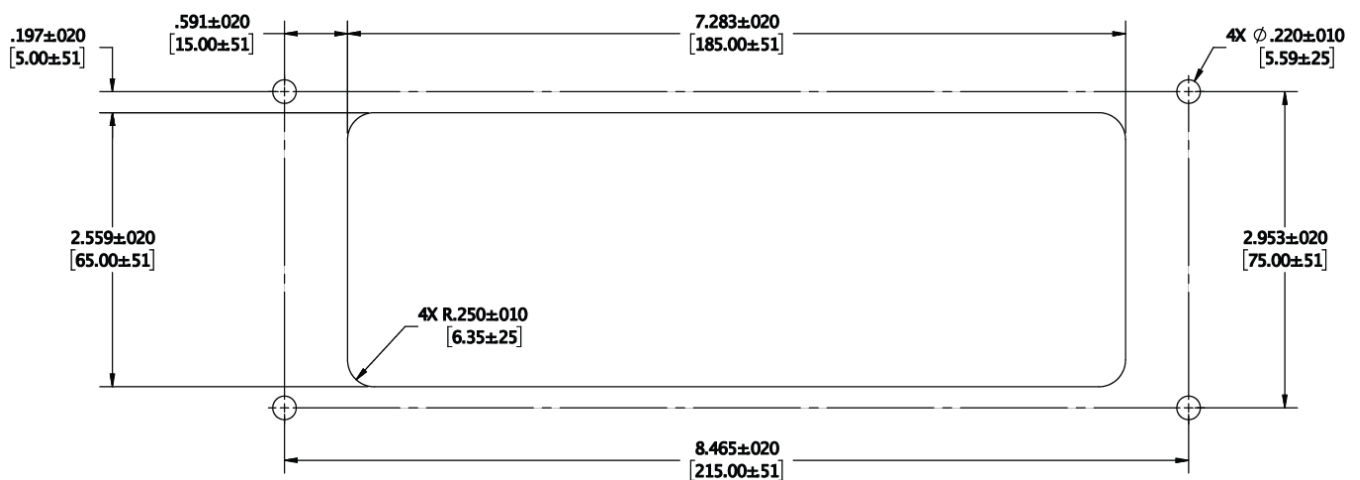
Mounting the Unit

1. Place the back side of the display through the opening in the dash.
2. Use the four included screws from the mounting kit (78-00-1277) to attach the unit to the bracket and torque to 10 inch-pounds.

Mounting Bracket

How to Order

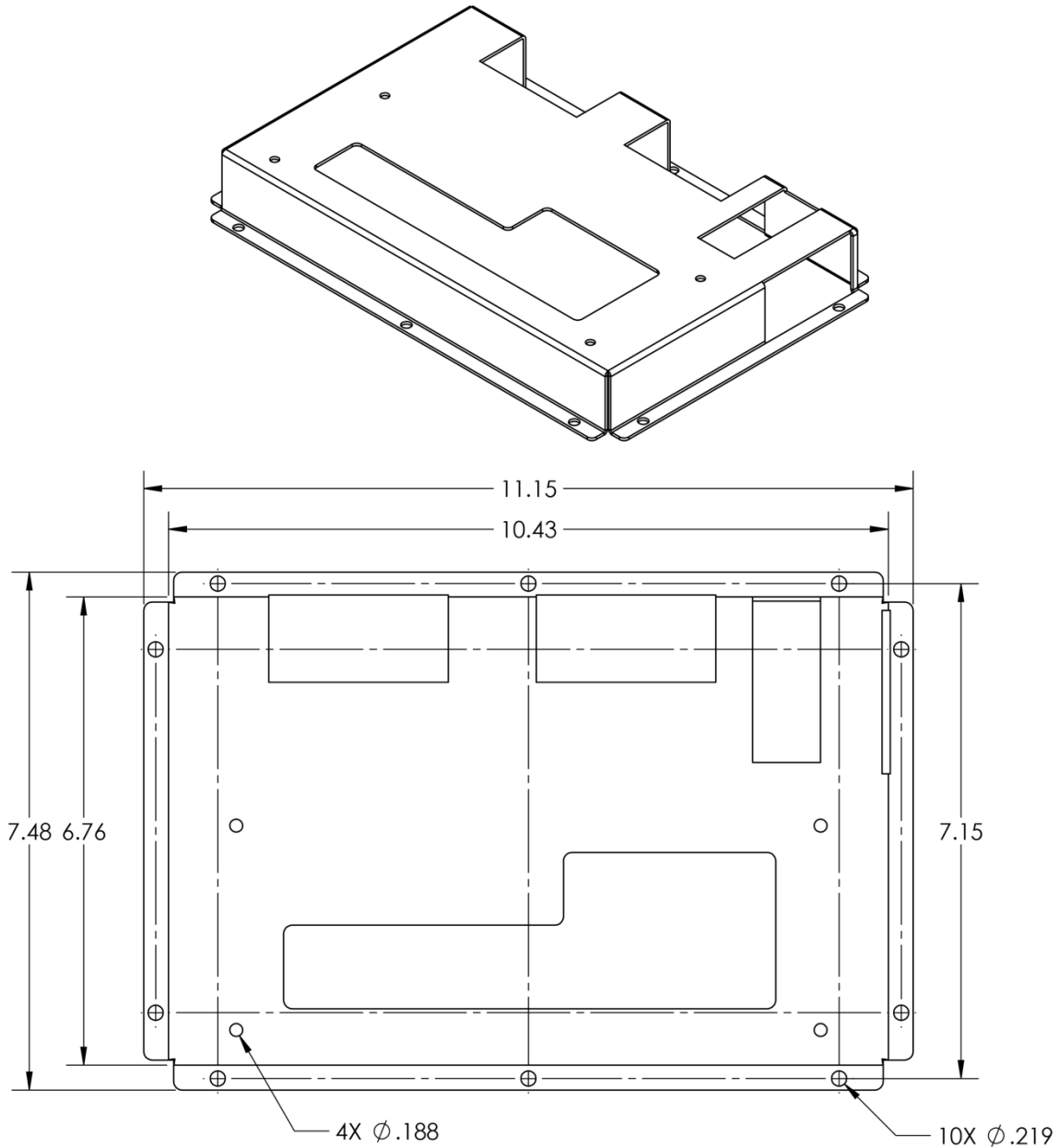The following PV1100 displays and accessories are available through Enovation Controls:

Part Number	Description	Order Details
78700636	PV1100, Touch, Non-connected, Landscape	**Display**
78700654	PV1100, Touch, Non-connected, Portrait	**Display**
78090098	Programming Kit, PV780/PV1100	**Accessories**
78001277	Kit, Mounting Bracket, PV1100	
78001055	Harness, Gray Connector, USB	
78001056	Harness, Gray Connector, Flying Leads	
78001057	Harness, Black Connector, Flying Leads	
78001017	Harness, Black Connector, Development	
78001018	Harness, Gray Connector, Development	
78090069	Harness, PV750/PV1100 Conversion, Power/CAN	

Wiring Information

Pin Out Specifications

	Black Connector
1	Digital Input 1
2	Analog Input 3
3	Analog Input 2
4	Analog Input 1
5	CAN1 Low
6	CAN1 High
7	Battery
8	Ground
9	Analog Input 3 Ground
10	Analog Input 2 Ground
11	Analog Input 1 Ground
12	Digital Input 3
13	Digital Input 2
14	Frequency Output 1
15	Ignition Input
16	No Connect
17	No Connect
18	CAN2 Low
19	CAN2 High
20	Digital Input 4
21	Digital Input 5
22	Digital Output
23	Frequency Output 2
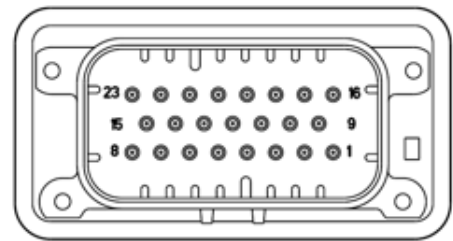
AMP 770680-1

Gray Connector	
1	Video Input 1 NTSC/PAL
2	Video Input 2 NTSC/PAL
3	Video Input 3 NTSC/PAL
4	RS-485 High
5	RS-485 Low
6	LINE_OUT_1_R Negative Audio Out - Right
7	LINE_OUT_1_R Positive Audio Out - Right
8	LINE_OUT_1_L Negative Audio Out - Left
9	Video Input 1 Ground
10	Video Input 2 Ground
11	Video Input 3 Ground
12	No Connect
13	Frequency Input
14	Frequency Return
15	LINE_OUT_1_L Positive Audio Out - Left
16	USB D- White (Data -)
17	USB D+ Green (Data +)
18	USB 5V Red (+5V)
19	USB Ground Black
20	USB Shield
21	No Connect
22	No Connect
23	No Connect
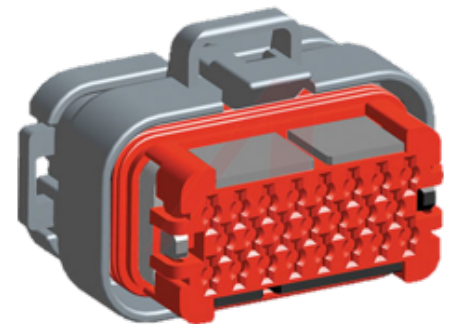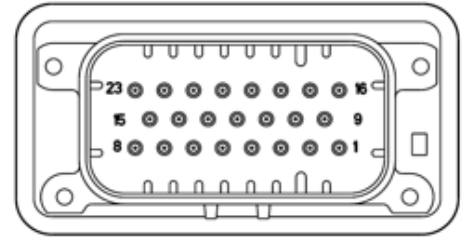
AMP 770680-4

35 Pin Black Connector	
1, 2, 3, 4	No Connect
5	LINE_IN_1_L Audio In
6	LINE_IN_1_L Return Audio In
7	LINE_IN_1_R Audio In
8	LINE_IN_1_R Return Audio IN
9	LINE_IN_2_L Audio In
10	LINE_IN_2_L Return Audio In
11	LINE_IN_2_R Audio In
12	LINE_IN_2_R Return Audio In
13, 14, 15	No Connect
16	LINE_OUT_5_L Positive Audio Out - Left
17	LINE_OUT_5_L Negative Audio Out - Left
18	LINE_OUT_4_L Positive Audio Out - Left
19	LINE_OUT_4_L Negative Audio Out - Left
20	LINE_OUT_3_L Positive Audio Out - Left
21	LINE_OUT_3_L Negative Audio Out - Left

AMP 776164-1

22	LINE_OUT_2_L Positive Audio Out - Left	**29**	LINE_OUT_5_R Negative Audio Out - Right
23	LINE_OUT_2_L Negative Audio Out - Left	**30**	LINE_OUT_4_R Positive Audio Out - Right
24	AMP_TURN_ON 3 Accessory Output 2	**31**	LINE_OUT_4_R Negative Audio Out - Right
25	AMP_TURN_ON 2 Accessory Output 1	**32**	LINE_OUT_3_R Positive Audio Out - Right
26	AMP_TURN_ON 1 Amp Control	**33**	LINE_OUT_3_R Negative Audio Out - Right
27	No Connect	**34**	LINE_OUT_2_R Positive Audio Out - Right
28	LINE_OUT_5_R Positive Audio Out – Right	**35**	LINE_OUT_2_R Negative Audio Out - Right
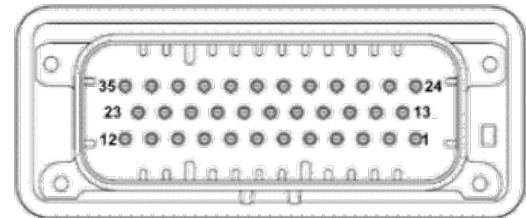
NOTE: The 35-pin connector pins are only active for the connected stereo option.

Ethernet (M12) Connector	
1	Ethernet TX+
2	Ethernet RX+
3	Ethernet TX-
4	Ethernet RX-
5	Ethernet Ground
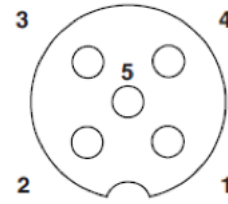
M-12, 5-pos, A-coded
Plastic Knurl Connector Only

NOTE: Ethernet connectivity is optional. Available on connected and connected stereo options.

Configuration Information

Follow these steps to download a custom configuration to the PV1100 display:

| Step	Action
1	Turn off the display.
2	Insert the USB drive that contains the new configuration file into the display's attached USB pigtail.
3	Place a magnet onto the spot shown here on the upper middle back of the display:
4	Power the display back on, continually holding the magnet in place.
5	Remove the magnet when the display shows the utility for loading new software.
6	Touch the arrow keys on the screen to select the configuration file from the USB to be loaded into the display. Start the configuration load by pressing the right arrow/green key on the screen twice. When complete, the unit will reboot into the loaded application.

Wiring Schematics – Black Connector (Valid for all non-connected wiring)

> ⚠ **WARNING**: Failure to install the unit per the specified wiring diagrams may cause damage to the unit. **DO NOT** connect power to the video ground. Warranty is void for damage caused by incorrect wiring.
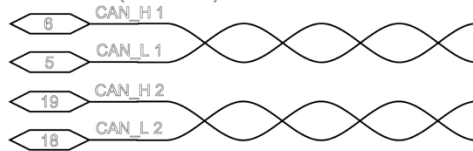
J1 (BLACK CONNECTOR)

Analog Inputs

- 8 — GND
- 7 — PWR
- 15 — IGN

Key Switch
Fuse
VBATT
6-36 VDC
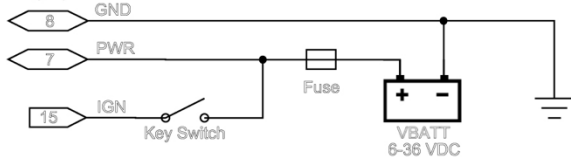
NOTES:
- Mating connector AMPSEAL 770680-1 plug with 770854-3 sockets
- Use 20 to 16 AWG (0.5 to 1.4 mm^2)
- Wire diameter of 1.7 to 2.7 mm.
- Install seal plug 770678-1 in perforated connector wire cavities
- An ISO8820 certified automotive fuse rated for no more than 5A shall be used to power the unit ⚠

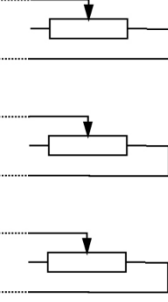Wire per J1939-11 (STP) or J1939-15 (UTP)
- J1939-11: Keep stub <1m length; up to 30 nodes; 40m max length
- J1939-15: Keep stub <3m length; up to 10 nodes; 40m max length
- Locate display node >0.1m from nearest node
- Space nodes unequally
- Keep CANbus trunk as linear as possible
- Type I - Use external 120 ohm terminator
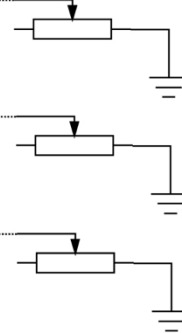- Type II - Enable internal terminator

Communications (CAN 2.0A/B)

- 6 — CAN_H 1
- 5 — CAN_L 1
- 19 — CAN_H 2
- 18 — CAN_L 2

Analog Inputs
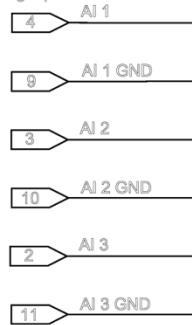
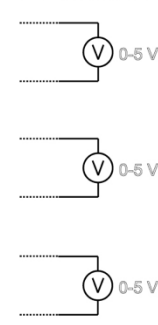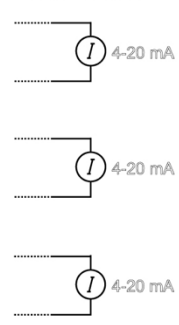|		Ungrounded Senders - Connect signal and return	Grounded Senders - Connect signal only	0-5 VDC Sensors	4-20 mA Sensors
4	AI 1			0-5 V	4-20 mA
9	AI 1 GND				
3	AI 2			0-5 V	4-20 mA
10	AI 2 GND				
2	AI 3			0-5 V	4-20 mA
11	AI 3 GND				

Digital Inputs

- 1 — DI 1
- 13 — DI 2
- 12 — DI 3
- 20 — DI 4
- 21 — DI 5

VBATT

Digital Output

VBATT

- 22 — DO 1

WARNING LAMP OR ALARM
(500 mA sink)

Frequency Output

- 14 — FO 1

TACHOMETER
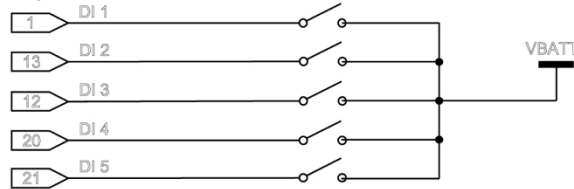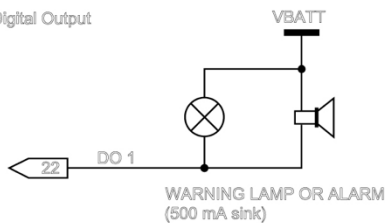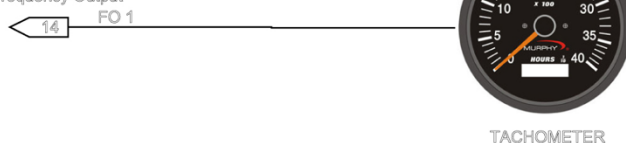
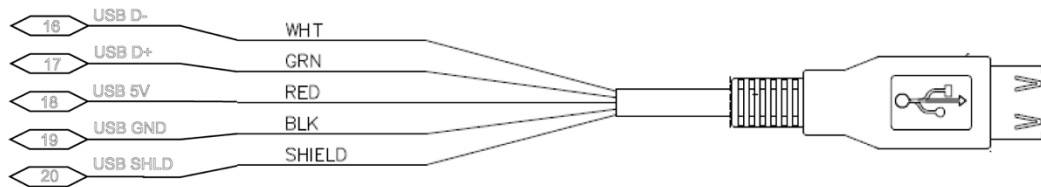# Wiring Schematics – Gray Connector (Valid for all non-connected wiring)

⚠ **WARNING**: Failure to install the unit per the specified wiring diagrams may cause damage to the unit. **DO NOT** connect power to the video ground. Warranty is void for damage caused by incorrect wiring.

J2 (GRAY CONNECTOR)

NOTES:
- Mating connector AMPSEAL 770680-4 plug with 770854-3 sockets
- Use 20 to 16 AWG (0.5 to 1.4 mm^2)
- Wire diameter of 1.7 to 2.7 mm.
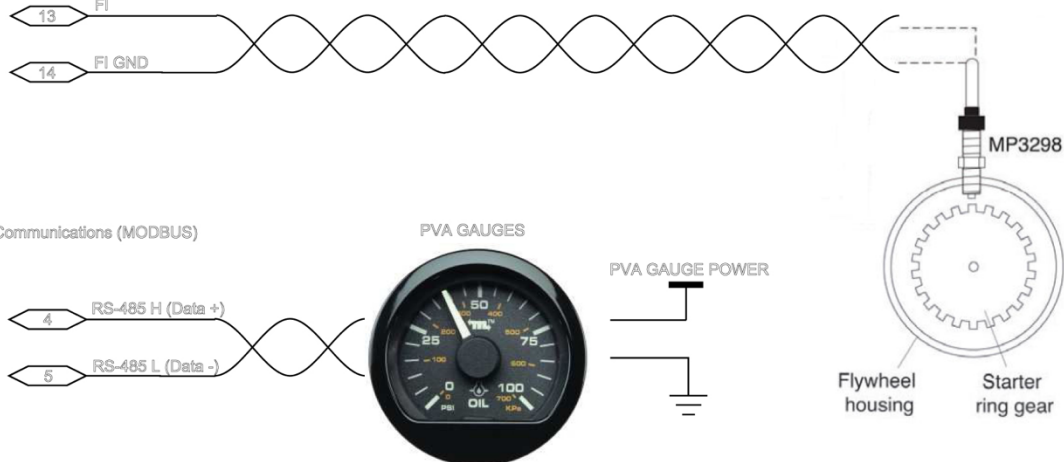- Install seal plug 770678-1 in perforated connector wire cavities

USB (Programming and Data Logging)

16	USB D-	WHT
17	USB D+	GRN
18	USB 5V	RED
19	USB GND	BLK
20	USB SHLD	SHIELD

Video Inputs

VIDEO CAMERA NOTES
- NTSC or PAL format
- Do not mix camera types
- Follow camera manufacturer specifications for power
- Do not power camera using VIDEO GND

1	VIDEO 1
9	VIDEO 1 GND
2	VIDEO 2
10	VIDEO 2 GND
3	VIDEO 3
11	VIDEO 3 GND

CAMERA POWER

Frequency Input (Engine or Shaft Speed from mag pick-up)

| 13 | FI |
| 14 | FI GND |

MP3298

Flywheel housing   Starter ring gear

Communications (MODBUS)

PVA GAUGES

PVA GAUGE POWER

| 4 | RS-485 H (Data +) |
| 5 | RS-485 L (Data -) |

Specifications

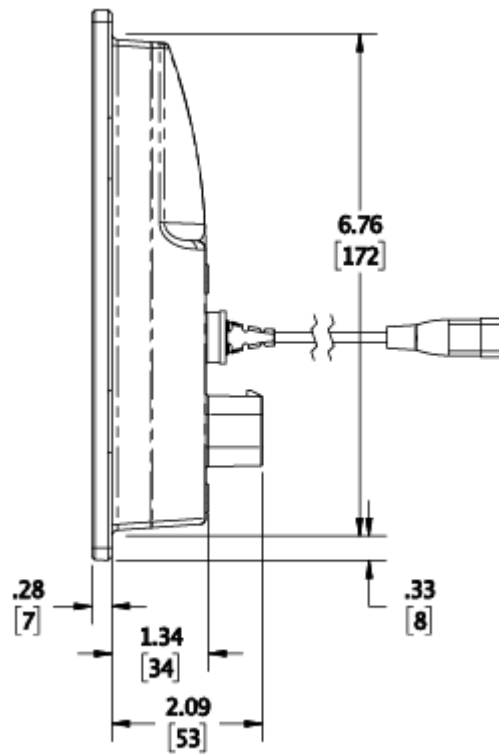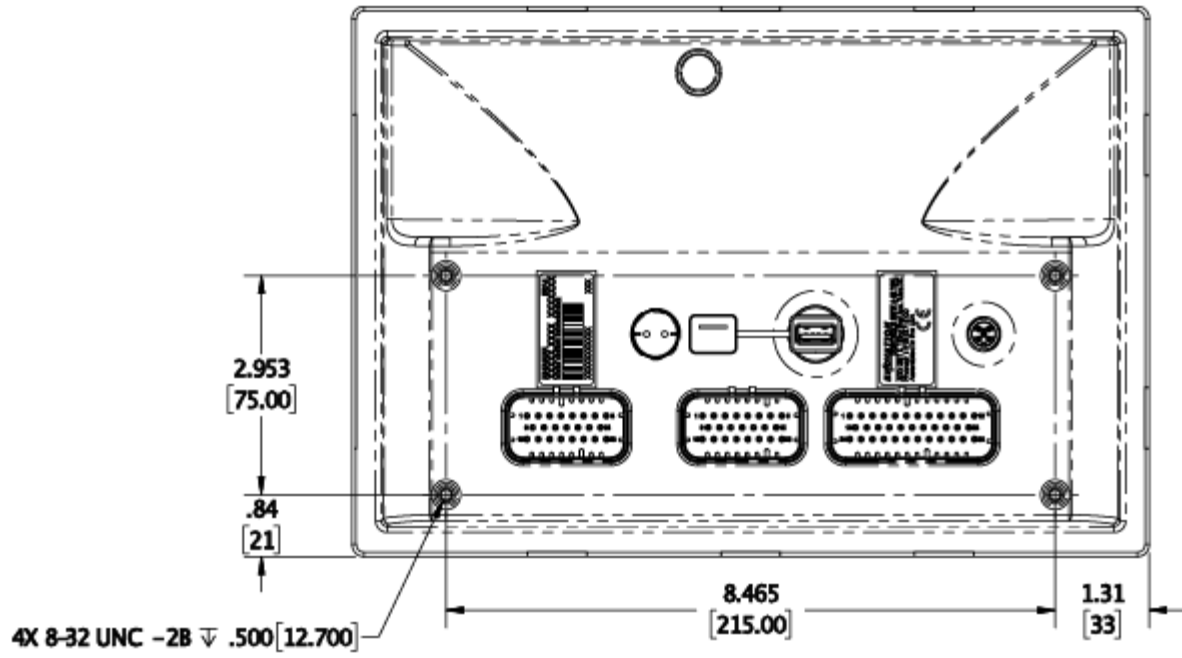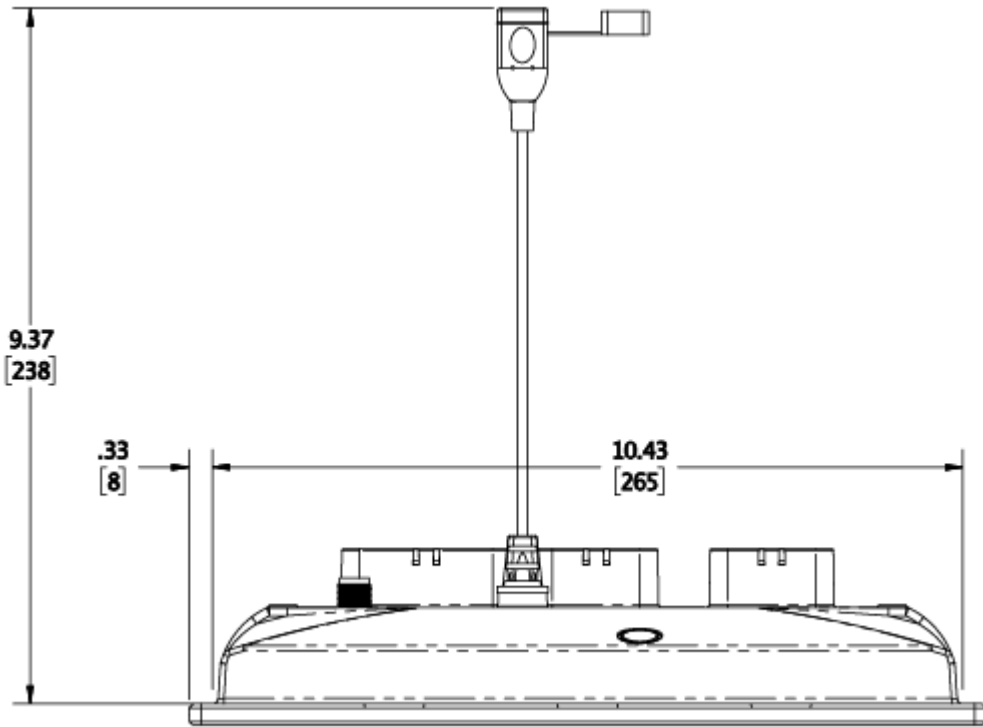| Computing	
Main Processor:	Renesas® R-Car M2 with Arm® Cortex-A15 dual core processor @ 1.5 GHz (32-bit)
Operating System:	QNX® Real-time Operating System
Storage:	8 GB Flash memory
Ram:	512 M**B** DDR3-SDRAM
Graphics:	Renesas graphics processor
Display	
Type:	10.6" [231.36 mm (H) X 138.82 mm (W)] viewable area, LVDS TFTS LCD with LED backlight, 24-bit color
Resolution:	1280 x 768
Contrast Ratio:	1000:1 (typical)
Brightness:	1000 cd/m^2
Surface:	Anti-glare
Touch Panel:	Projected capacitive (PCAP) with glove touch
Hardware	
Real-time Clock:	Available with battery backup
Connectors:	(2) Ampseal 23 pin (Main) (1) Ampseal 35 pin (1) M12, 5-pin (Ethernet) (1) USB pigtail (1) Radio antenna jack (optional)
Video Inputs:	(3) NTSC/PAL
Communication	
CAN:	(2) CAN 2.0B according to ISO 11898-2, J1939 and proprietary messaging
Serial:	(1) RS-485 serial (Modbus: Master/Slave)
USB:	(1) USB 2.0 full speed host
Ethernet:	(1) Ethernet 10/100 Base-T (optional)
Wi-Fi:	802.11 b/g radio (optional)
Bluetooth:	Fully integrated Bluetooth 2.1, Class 1 (optional)

Electrical	
Operating Volts:	6-36 VDC, reverse polarity protected
Outputs:	(1) 500 mA Switched Low-side (1) Frequency Output (2Hz – 3KHz)
Inputs:	(3) Analog 0-5 VDC, 4-20mA, Resistive, 10-bit resolution (5) Discrete digital, active high (1) Frequency input
Environmental	
Operating Temperature:	-40°C to +70°C (-40°F to +158°F)
Storage Temperature:	-40°C to +85°C (-40°F to +185°F)
Protection:	IP66 and IP67, front and back, for outdoor use
Vibration:	3.9 Grms (10 – 350Hz), 3 axes (ISO15003)
Shock:	±50G in 3 axes
EMC/EMI:	SAE J1113, ISO 13766, CE per 2014/30/EU

Dimensions

2.953
[75.00]

.84
[21]

4X 8-32 UNC −2B ⊽ .500 [12.700]

8.465
[215.00]

1.31
[33]

6.76
[172]

.28
[7]

1.34
[34]

2.09
[53]

.33
[8]

Measurements shown in inches [mm]

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TULSA, OK 74146

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SUN MURPHY INTERNATIONAL TRADING (SHANGHAI) CO., LTD
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bsi. ISO 9001 Quality Management

FM 28221 (Tulsa, OK - USA)
FM 29422 (UK)