

## 10.4-inch Display for Vehicles

- Ideal for gauges, diagnostics, cameras, guidance and other vehicle functions
- Sealed to IP67
- Bezel mount or VESA MIS-D standard mount
- Four video inputs: capable of displaying three simultaneous cameras
- Easy apps creation and integration with VUI Builder (J1939) and Linux Qt (J1939 and CANopen)
- Scratch resistant/Anti-glare cover glass
- Optically bonded display for superior mechanical and sunlight readability
- Wide viewing angle
- 600 NITS backlight intensity
- XGA resolution (1024 X 768)
- 16-Bit color TFT, LED backlight
- Optional touch screen
- 7 soft keys with adjustable backlight
- 3 second boot time (VUI Builder)



### Processor AND MEMORY

- 800 MHZ i.MX6 Dual Core Processor
- 512MB DDR3
- 4GB e.MMC
- Linux Operating System
- Real time clock with 10 year battery backup

### INTERFACES

- 1 USB host port
- 3 CAN bus ports
- 10/100 ethernet port

### INPUT / OUTPUT

- 4 NTSC/PAL video inputs
- 1 RS-232 ports
- 4 I/O Ports (200 mA max)
- Input voltage: 9VDC to 32VDC

### MATING CONNECTOR

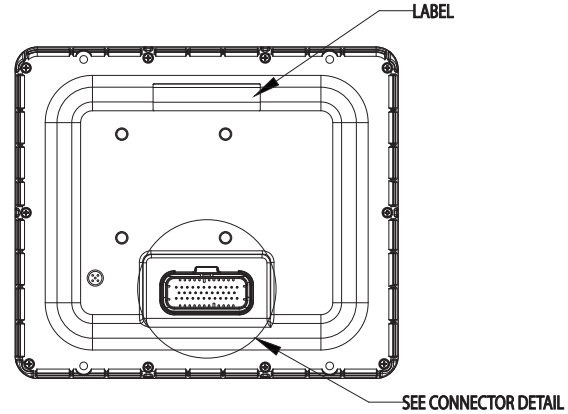
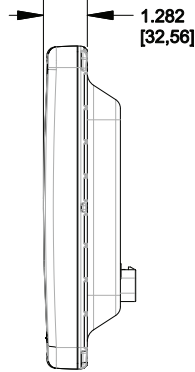
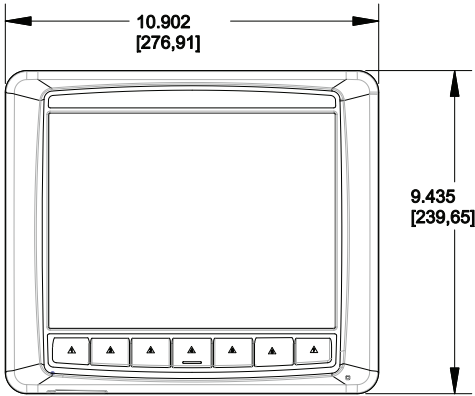
- AMP 776164-1 mating connector with AMP 770520-1 or AMP 770854-1 contacts

## Grayhill, Inc.

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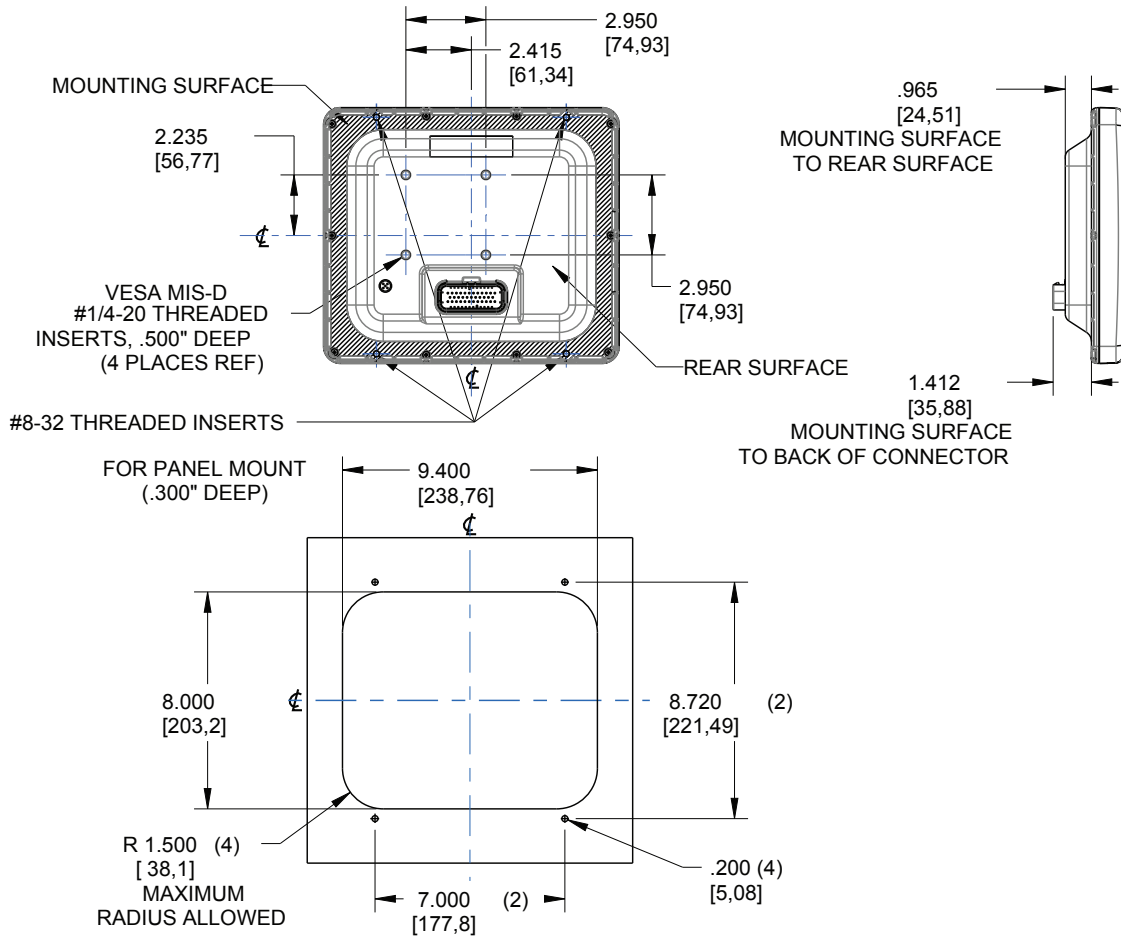


## DIMENSIONS



## PANEL MOUNTING DETAILS

MAXIMUM TORQUE: 25 IN-LBS

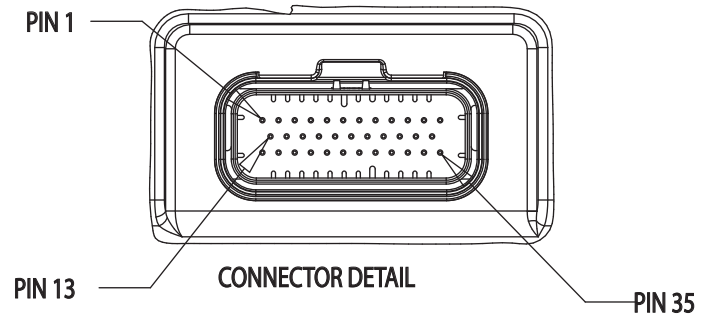


### PANEL MOUNT CUTOUT INFORMATION

NOMINAL PANEL/POCKET DIMENSIONS SHOWN MAY REQUIRE ADJUSTMENT  
BASED UPON MANUFACTURING TOLERANCES OF CUSTOMER PANEL

## PINOUTS

Pin	Function	Pin	Function	Pin	Function
1	VIDEO1+	13	VIDEO2+	24	VIDEO3+
2	VIDEO1-	14	VIDEO2-	25	VIDEO3-
3	CAN1 HI	15	ETH TPO+	26	ETH TPI+
4	CAN1 SH	16	ETH TPO-	27	ETH TPI-
5	CAN1 LO	17	CAN3 SH	28	CAN3 HI
6	CAN2 HI	18	CAN2 SH	29	CAN3 LO
7	CAN2 LO	19	VIDEO4+	30	RS232 RX
8	RS232 GND	20	VIDEO4-	31	RS232 TX
9	Digital I/O 4	21	Digital I/O 2	32	Digital I/O 3
10	Digital I/O 1	22	N/C	33	N/C
11	N/C	23	VIN SWITCHED	34	N/C
12	VIN Return			35	VIN Positive



## PART NUMBERS

Part Number	RS232	USB 2.0	CAN1	CAN2	CAN3	VIDEO1	VIDEO2	VIDEO3	VIDEO4	RTC	Touch	Ethernet	Buzzer	Digital I/O
3D2104XK-100	X	X	X	X	X	X	X	X	X	X		X	X	4
3D2104TK-100	X	X	X	X	X	X	X	X	X	X	X	X	X	4
3D2104DEV-100	Development Kit with 3D2104TK-100 display													

## DEVELOPMENT KIT



Front View



Back View

A development kit is offered to provide the hardware and software required to set up a programmer's workstation for the use with the chosen development environment.

### Inside the Kit:

- 3D2104 Display
- Development Stand
- Interface PCB
- Interface Cables

**ELECTRICAL PERFORMANCE SPECIFICATIONS**

Maximum Load	ANSI / ASAE EP455 Sec 5.1.1	T(min) = -40C, T(max) = +65C
Over-voltage	ANSI / ASAE EP455 Sec 5.10.2	Level 1, extended to 36V
Reverse Polarity	ANSI / ASAE EP455 Sec 5.10.3	extended to -36V
Short-circuit Protection	ANSI / ASAE EP455 Sec 5.10.4	extended to 36V
Starting Profile	ISO 16750-2 Sec. 4.6.3	12V, Code C / 24V Code E
Battery-less Operation	ANSI / ASAE EP455 Sec 5.11.3	Level 1
Load Dump	ISO 7637-2 Pulse 5a	Us = 174V, Ri = 2 Ohms, Td = 350mS
Switching Spikes	ISO 7637-2 Pulse 3a and 3b	Pulse 3a: Us = -200V, Pulse 3b: Us = 200V, 3000 reps
Wire Harness Inductance	ISO 7637-2 Pulse 2a	Us = 50V, t1 = 5s, 60 reps
Motor Shutdown Transients	ISO 7637-2 Pulse 2b	Us = 20V, t1 = 5s, Ri < .05 Ohms, 60 reps
Wire Harness Inductance Switching	ISO 7637-3 Pulse a and b	Pulse a: -80V, Pulse b: 80V, Class A, 6 min.
Inductive Load Switching	ANSI / ASAE EP455 Sec 5.11.4	Level 1
Mutual Coupling (Power)	ANSI / ASAE EP455 Sec 5.11.6.1	Level 2
Mutual Coupling (Signal/ Input)	ANSI / ASAE EP455 Sec 5.11.6.2	
Alternator Field Decay	ANSI / ASAE EP455 Sec 5.11.2	
ESD	ANSI / ASAE EP455 Sec 5.12	Level 2
Radiated Immunity	ANSI / ASAE EP455 Sec 5.16	Level 1
Broadband Radiated Emissions	ISO 14982 Sec 6.4	
Narrowband Radiated Emissions	ISO 14982 Sec 6.5	
Conducted Emissions	SAE J1113-41	Class 3

**MECHANICAL PERFORMANCE SPECIFICATIONS**

Vibration, Random	ANSI/ASEA EP455 5.15.1	2h each axis @52.4m/s2 RMS overall acceleration and spectral power density of 2m2/s3 from 50Hz to 2000Hz
Vibration, Sinusoidal	ANSI/ASEA EP455 5.15.2	A logarithmic sweep from 10Hz to 2000Hz to 10Hz over a period of 20 minutes for 4 hours in each of 3 orthogonal axes with amplitude 1.5mm from 10Hz to 40Hz and a constant acceleration of 35m/s2 RMS from 40Hz to 2KHz
Shock / Crash Safety	ANSI/ASEA EP455 5.14	11ms half sine pulse of 490 m/s2 in 3 perpendicular axes
Drop	ANSI/ASEA EP455 5.14.2 Level 1	Drop component 400 mm onto a hardwood benchtop on all practical edges.
Weight		1400 Grams Typical



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**ENVIRONMENTAL SPECIFICATIONS**

Operating temperature	ANSI/ASAE EP455 5.1.1 Level 2	-30°C to +65°C
Storage Temperature	ANSI/ASAE EP455 5.1.2 Level 2	-40°C to +85°C
Thermal Shock	ANSI/ASAE EP455 5.1.3	-40°C to 70°C at a rate of 4°C/min (1 hour at extremes)
Altitude (Barometric Pressure)	ANSI/ASAE EP455 5.2	101.3kPa to 18.6kPa
Sand and Dust	ANSI/ASAE EP455 5.3	24 hours with 0.88g/m3
Solar Radiation	ANSI/ASAE EP455 5.4	43-75W/m2 UV Radiation (280-400nm wavelength) 300h
Ingress Protection / Rain	ANSI/ASAE EP455 5.6 Level 2	375 kPa and 8.3 L/min for 10 minutes @15°C water temp
Humidity	ANSI/ASAE EP455 5.13	96% humidity at 35°C for 240 hours
Salt Fog	ANSI/ASAE EP455 5.9	5% aqueous solution of NaCl @ 35°C and a pH between 6.5 and 7.2 for 48 hours
Chemical resistance	ISO 16750-5 EP 455 (5.8.2)	
Thermal Cycling	ISO 16750-4	-40° to 85°C 2 hours at extremes change rate = 1°C/min (8 hours) repeat for 30 cycles.

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