



3D2104 10.4-INCH DISPLAY

Versatile CAN-based Display for Off-Highway 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 application 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
- 900 NITS backlight intensity
- XGA resolution (1024×768)
- 16-bit color TFT, LED backlight
- Optional touchscreen
- 7 soft keys with adjustable backlight
- 3-second boot time (VUI Builder)



Processor and Memory

- 800 MHZ i.MX6 Dual Core Processor
- 512 MB 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)

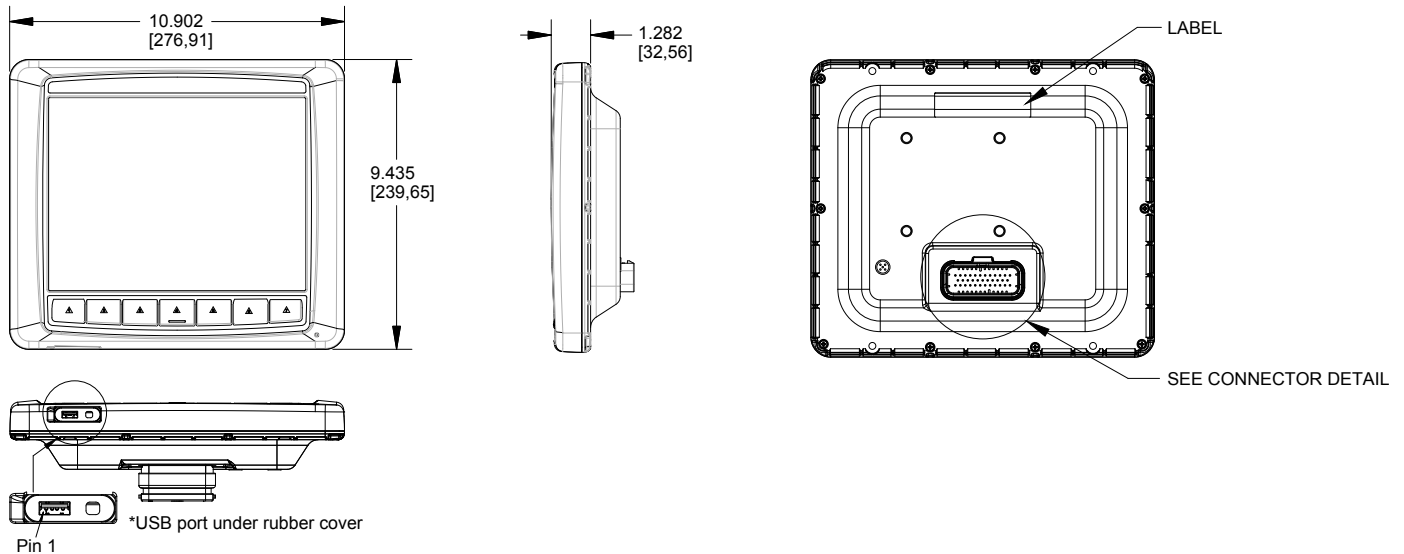
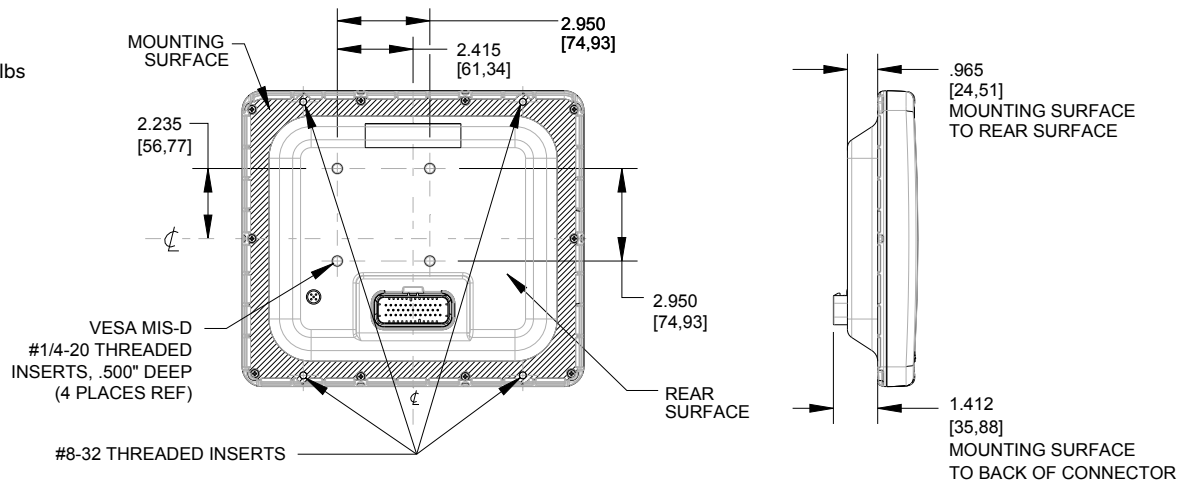
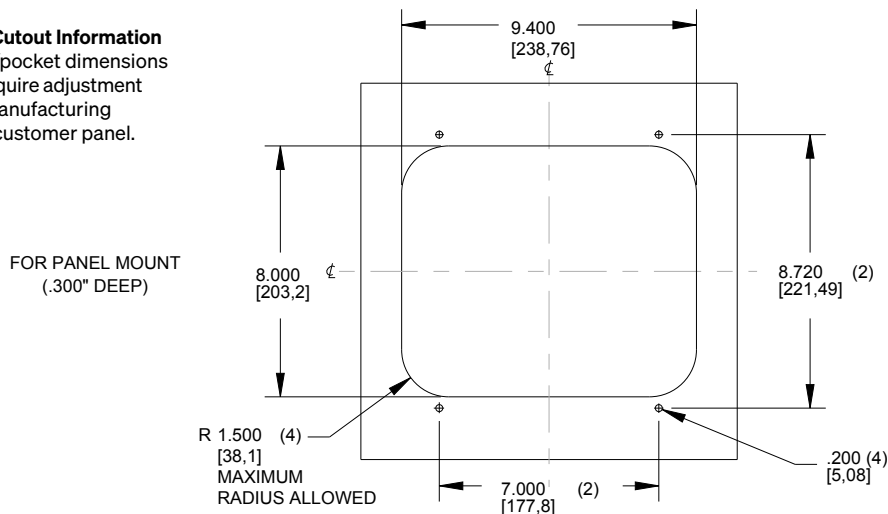
Mating Connector

- AMP 776164-1 mating connector which works with either AMP 770520-1 or AMP 770854-1 socket

YOUR EXPERTS IN CAB CONTROLS

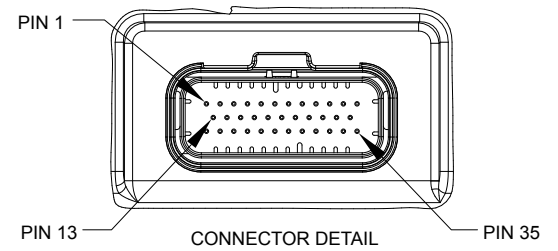
Grayhill specializes in the design, development, and production of human interface controls, including:

- Cab user interface design
- Customized control panels
- CAN bus interface devices

DIMENSIONS in millimeters [and inches]

Panel Mounting Information
 Recommended Torque: 25 in-lbs
 Maximum Torque: 40 in-lbs

Panel Mount Cutout Information
 Normal 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	NC	33	NC
11	NC	23	VIN SWITCHED (On/Off Signal)	34	NC
12	VIN RETURN			35	VIN POSITIVE (Power Input)



DEVELOPMENT KIT

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



Front View



Back View

ASK US ABOUT OUR COMPLETE CAN BUS UI PACKAGE



SPECIFICATIONS

Electrical Performance Specifications

Operating Voltage	8-32 VDC	
Digital Inputs	32 V tolerant, VIL=2.2 V(max), VIH=2.7 V(min), 12.4 K pulldown	
Digital Outputs	SWITCH VBAT TO LOAD, 200 mA (max)	
Maximum Load	ANSI / ASAE EP455 Sec 5.1.1	T(min) = -40 °C, T(max) = +65 °C
Over-Voltage	ANSI / ASAE EP455 Sec 5.10.2	Level 1, extended to 36 V
Reverse Polarity	ANSI / ASAE EP455 Sec 5.10.3	Extended to -36 V
Short-Circuit Protection	ANSI / ASAE EP455 Sec 5.10.4	Extended to 36 V
Starting Profile	ISO 16750-2 Sec. 4.6.3	12 V, Code C / 24 V Code E
Battery-Less Operation	ANSI / ASAE EP455 Sec 5.11.3	Level 1
Load Dump	ISO 7637-2 Pulse 5a	Us = 174 V, Ri = 2 Ohms, Td = 350 mS
Switching Spikes	ISO 7637-2 Pulse 3a and 3b	Pulse 3a: Us = -200 V, Pulse 3b: Us = 200 V, 3000 reps
Wire Harness Inductance	ISO 7637-2 Pulse 2a	Us = 50 V, t1 = 5 s, 60 reps
Motor Shutdown Transients	ISO 7637-2 Pulse 2b	Us = 20 V, t1 = 5 s, Ri < .05 Ohms, 60 reps
Wire Harness Inductance Switching	ISO 7637-3 Pulse a and b	Pulse a: -80 V, Pulse b: 80 V, 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	2 hrs each axis at 52.4 m/s ² RMS overall acceleration and spectral power density of 2 m ² /s ³ from 50 Hz to 2000 Hz
Vibration, Sinusoidal	ANSI/ASEA EP455 5.15.2	A logarithmic sweep from 10 Hz to 2000 Hz to 10 Hz over a period of 20 mins for 4 hrs in each of 3 orthogonal axes with amplitude 1.5 mm from 10 Hz to 40 Hz and a constant acceleration of 35 m/s ² RMS from 40 Hz to 2 KHz
Shock/Crash Safety	ANSI/ASEA EP455 5.14	11 ms half sine pulse of 490 m/s ² 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	

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 hr at extremes)
Altitude (Barometric Pressure)	ANSI/ASAE EP455 5.2	101.3 kPa to 18.6 kPa
Sand and Dust	ANSI/ASAE EP455 5.3	24 hrs with 0.88 g/m ³
Solar Radiation	ANSI/ASAE EP455 5.4	43-75 W/m ² UV radiation (280-400 nm wavelength) 300 hrs
Ingress Protection/Rain	ANSI/ASAE EP455 5.6 Level 2	375 kPa and 8.3 L/min for 10 mins at 15 °C water temp
Humidity	ANSI/ASAE EP455 5.13	96% humidity at 35 °C for 240 hrs
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.

VERSATILE DISPLAY. ORDER INFORMATION.

ITEM	RS232	USB 2.0	CAN1	CAN2	CAN3	VIDEO1	VIDEO2	VIDEO3	VIDEO4	RTC	TOUCH	ETHERNET	BUZZER	DIGITAL I/O
3D2104XK-200	X	X	X	X	X	X	X	X	X	X		X	X	X
3D2104TK-200	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3D2104DEV-200	Development Kit with 3D2104TK-200 display													