



3D121 12.1-INCH DISPLAY

Versatile, Ultra-Sized CAN-based Display for Off-Highway Vehicles

- Ideal for gauges, diagnostics, cameras, guidance and other vehicle functions
- Sealed to IP67
- VESA MIS-D standard mount
- Four video inputs: capable of displaying three simultaneous cameras
- Easy apps creation and integration with Linux Qt
- Scratch resistant/anti-glare cover glass
- Optically bonded display for superior mechanical and sunlight readability
- Wide viewing angle
- 1000 NITS backlight intensity
- WXGA resolution (1280 × 800)
- 24-bit color IPS, LED backlight
- Optional touchscreen
- 5-second boot time



Processor and Memory

- 1.2GHz STM32MP255 dual core processor
- 400MHz Cortex M33 real time co-processor
- 1GB DDR4
- 8GB eMMC
- Linux operating system
- Ambient light sensor
- Real time clock with 10-year battery backup

Mating Connector

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

Interfaces

- 1 USB host port
- 3 CAN bus ports FD capable
- 10/100 ethernet port
- Optional 100BASE-T1 automotive ethernet port

Input/Output

- 4 NTSC/PAL video inputs (AHD capable)
- 1 RS-232 ports
- 4 I/O ports (200 mA max)
- Input voltage: 8 VDC to 32 VDC
- Buzzer (85 db)
- Audio speaker

Technical drawings of the 15.5-inch display unit, showing front, side, and rear views with dimensions in inches and millimeters.

Front View Dimensions:

- Overall Width: 308.66 [12.152]
- Display Area Width: 262.12 [10.320]
- Display Area Height: 164.20 [6.465]
- Overall Height: 212.46 [8.365]

Side View Dimensions:

- Top Flange Width: 54.35 [2.140]
- Mounting Flange Width: 48.85 [1.608]

Rear View Dimensions:

- Overall Width: 308.66 [12.152]
- Overall Height: 212.46 [8.365]
- Mounting Flange Width: 48.85 [1.608]
- Top Flange Width: 54.35 [2.140]
- Distance from Top Flange to First Mounting Hole: 37.27 [1.467]
- Distance between Mounting Holes: 75.00 [2.953]
- Distance from Bottom Flange to First Mounting Hole: 100.00 [3.937]
- Distance from Bottom Flange to Connector: 100.00 [3.937]
- Distance from Bottom Flange to First Mounting Hole (Centered): 200.00 [7.874]
- Distance from Bottom Flange to First Mounting Hole (Centered): 75.00 [2.953]
- Connector Pin #1 (See Connector Detail)

Notes:

- M6 X 1.0 THREADED INSERT FOR MOUNTING, 12.5 MM DEEP MAX (8 PLACES)

[illegible]

CONNECTOR DETAIL

Pin	Function	Pin	Function	Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	VIDEO2+	7	RS232 RX	13	VIDEO3+	19	CAN3 HI	25	VIDEO4-	31	CAN2 LO
2	VIDEO2-	8	RS232 TX	14	VIDEO3-	20	CAN3 LO	26	ETH1 TPI+	32	IO3
3	VIDEO1+	9	IO4	15	ETH1 TPO+	21	IO2	27	ETH1 TPI-	33	USB D-
4	VIDEO1-	10	IO1	16	ETH1 TPO-	22	USB 5V	28	CAN1 HI	34	USB D+
5	AC GND	11	USBGND	17	ETH2 TRX+	23	VIN SWITCHED	29	CAN1 LO	34	VIN
6	AGND	12	VIN RETURN	18	ETH2 TRX-	24	VIDEO4+	30	CAN2 HI		

SPECIFICATIONS

Electrical Performance Specifications

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
Reverse Polarity	ANSI/ASAE EP455 Sec 5.10.3	
Short-Circuit Protection	ANSI/ASAE EP455 Sec 5.10.4	
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	CISPR 25	Class 3

Mechanical Performance Specifications

Vibration, Random	ANSI/ASEA EP455 5.15.1	2 hr each axis @ 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 min 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 hr
Ingress Protection/Rain	ANSI/ASAE EP455 5.6 Level 2	375 kPa and 8.3 L/min for 10 min @ 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 hrs
Chemical Resistance	ISO 16750-5 EP 455 (5.8.2)	
Thermal Cycling	ISO 16750-4	-40 °C to 85 °C 2 hrs at extremes change rate = 1 °C/min (8 hrs) repeat for 30 cycles

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VERSATILE DISPLAY. ORDER INFORMATION.

PART NUMBER	RS232	USB 2.0	CAN1	CAN2	CAN3	VIDEO1	VIDEO2	VIDEO3	VIDEO4	RTC	TOUCH	I/O	BUZZER	SPEAKER	100BASE-TX ETHERNET	100BASE-T1 ETHERNET
3D121VT-100	X	X	X	X	X	X	X	X	X	X	X	4	X	X	X	X
3D121VX-100	X	X	X	X	X	X	X	X	X	X		4	X	X	X	X
3D121XT-100	X	X	X								X					
3D121XX-100	X	X	X													
3D121DEV-100	Development Kit with 3D121VT-100 display															

Specifications are subject to change.

grayhill.com
CAN Bus Displays
Series 3D121

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