

## 3D35 3.5-INCH DISPLAY

Versatile CAN-based Display for Off-Highway Vehicles

- Easy application creation and integration with TouchGFX
- Up to 2 CAN bus ports (CAN FD capable)
- Powerful processor with sub-second boot time
- Scratch-resistant/anti-glare cover glass is optically bonded to LCD for superior mechanical and visual performance
- Bright, 1000-nit display is backlit and provides high-contrast text and full-color graphics for excellent sunlight readability
- Convenient flush mounting provides a modern look and feel to seamlessly blend with vehicle cab design
- Armrest, A-post, and dashboard mounting
- Rugged design for extreme environments
- Functions as an engine monitor or input device



## 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



## VERSATILE DISPLAY. MANY FEATURES.

### Bright.

This 3.5-inch backlit LCD (480×320) is very bright (1000 nits) providing good daylight readability. It has software controlled LED backlighting and 18 bit color.

### Adaptable.

Designed for integration into off-highway vehicles. It functions in 12V/24V operation and is sealed against the ingress of liquids and dust.

### Powerful.

The powerful embedded computer can monitor and display many events simultaneously:

- 550MHz
- 16MB RAM
- 32MB Flash

### Useful.

Ideal for agriculture and construction vehicle applications, including virtual gauges, diagnostic menus, engine monitor, operator input, fault indicators and service reminders.

### Easy to Program.

PC-based configuration tools make application development fast and easy. Add drag and drop graphics, bitmaps, and text with the click of a mouse.

### Rugged.

The protective cover lens is scratch resistant glass, not plastic. Optical bonding of the cover glass improves impact resistance.

### Adjustable.

There are many system interface options:

- Up to two CAN bus ports
- Up to three analog/digital inputs
- Up to two digital outputs

### Readable.

Optically bonding the display and cover glass reduces reflections. An anti-glare etching further improves readability in bright sunlight.



# VERSATILE DISPLAY. ALL THE SPECIFICATIONS.

## General Information

Display	3.5" color transmissive TFT LCD, IPS wide viewing angle
Resolution	480x320 pixels, 18 bit color
Aspect Ratio	3:2
Backlighting	LED, 1000 cd/m <sup>2</sup> or nits
Microprocessor	CORTEX M7, 550MHZ
Flash Memory	32MB
RAM	16MB
Real Time Clock	Internal non-rechargeable battery backup
CAN	(2) CAN 2.0 B CAN FD Capable
Inputs	(3) 0-32 VDC discrete digital or 0-10V Analog
Outputs	(2) digital 200 mA switched high side
Approximate Unit Weight	250g

## Power Specifications

Operating Voltage	8VDC to 32VDC
Power Consumption	3 Watts (typical)

## Electrical Performance Specifications

Maximum Load	ISO 16750-4 5.1.2.2	T(max) = +75C
Jump Start Voltage	ISO 16750-2 4.3.2	36V for 60 min
Short Circuit Protection	ISO 16750-2 4.10	36V
Reverse Polarity Protection	ISO 16750-2 4.7	-36V
Starting Profile	ISO 16750-2 4.6.3	12V, Level II Class B and Level IV Class A 24V, Level II Class A and Level III Class A
Superimposed Alternating Voltage	ISO 16750-2 4.4	Severity 2 and 3
Load Dump (Unclamped)	ISO16750-2 4.6.4.2.2	12V: Us = 101V, Ri = 0.5 ohm, td=400ms 24V: Us = 202V, Ri = 1.0 ohm, td=350ms
Parallel Inductive Load	ISO7637-2 Pulse 1	-600V
Wire Harness Inductance Switching	ISO 7637-3 Pulse A & B	CCC Fast a/b: Level 4 -80V/+80V ICC Slow a/b: Level 4 -10V/+10V

## CE Compliance

EMC	ISO 13766-1:2018	ESA
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## Mechanical Performance

Vibration, Random	ANSI/ASAE EP455 5.15.1	2h each axis 50Hz to 2000Hz
Vibration, Sinusoidal	ANSI/ASAE EP455 5.15.2	A logarithmic sweep from 10Hz to 2000Hz to 10Hz over a period of 20 minutes for 4 hours in each axis
Shock	ANSI/ASAE EP455 5.14	11ms half sine pulse of 490 m/s <sup>2</sup> in 3 axis
Drop	ANSI/ASAE EP455 5.14.2 Level 1	400 mm onto a hardwood bench top on all practical edges

## Environmental Specifications

Operating Temperature	ISO 16750-4 Section 5.1.1.2, 5.1.2.2	-30°C to +75°C
Storage Temperature	ISO 16750-4 Section 5.1.1.1, 5.1.2.1	-40°C to +85°C
Thermal Shock	ISO 16750-4 Section 5.4.3	
Altitude (Barometric Pressure)	ANSI/ASAE EP455 5.2.2	101.3kPa to 18.6kPa
Ingress: Wash Down	ISO 20653	IPX9K
Ingress: Submersion	ISO 20653	IPX7
Ingress: Sand and Dust	ISO 20653	IP6K
Solar Radiation	ISO 4892-2	Method B, Cycle 2
Storage Humidity	ISO 16750-4	85% humidity at 40°C for 240 hours
Chemical Resistance	ISO 16750-5	Table 1 except Battery Fluid and Runway De-icer
Screen Impact	IK7 rating	2 joules

## Electromagnetic Compatibility Specifications

ESD	ISO 10605-2008 (Handling) ISO 10605-2008 (Powered)	+/-25kV Air, +/- 15kV contact +/-20kV Air, +/- 15kV contact
Radiated Immunity	ISO11452-2	ALSE: 80-2000MHz CW 100V/M ALSE: 80-2000MHz AM Mod 1KHz 80% 100V/M ALSE: 800 - 2000MHz PM1 Mod 100V/M
Conducted Emissions	CISPR25	Level 3
Radiated Emissions	ISO14982	
Conducted Immunity	ISO 11452-4	0.5-400MHz 100 mA, 1KHz AM 80% Mod 0.5-400MHz 100 mA, CW

## Software Development Tools

TouchGFX	Drag and drop application development. C language backend logic and functions.
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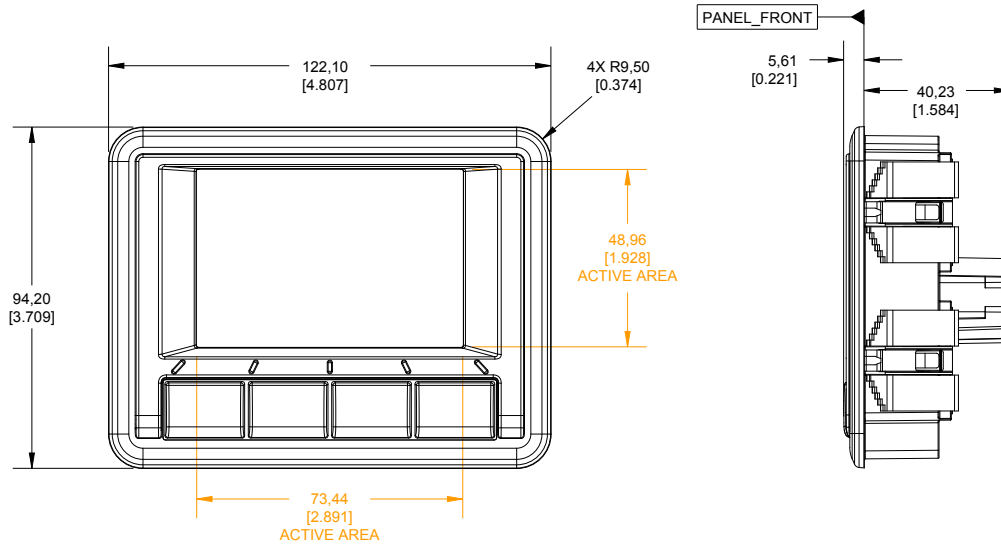
**Easily create custom graphic icons, text boxes and active gauge elements that can monitor CAN bus parameters such as J1939.**

- Applications can be developed in TouchGFX.
- A development kit is offered to provide the hardware and software required to set up a programmer's workstation for use with the device.



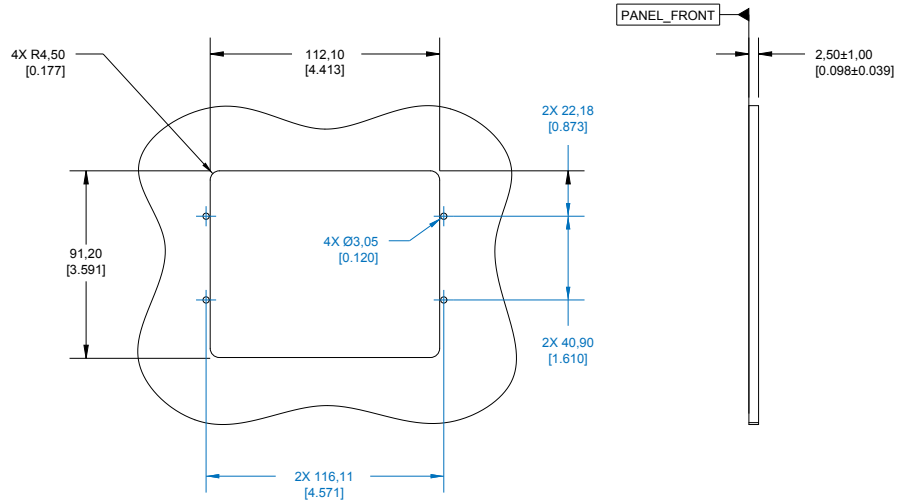


**DIMENSIONS** in mm

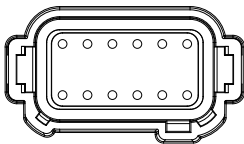


**RECOMMENDED PANEL CUT OUT**

Tolerances for this sheet are  $\pm 0.50$  [0.020].



**REAR CONNECTOR**



Mating Connector: DEUTSCH DT06-12SA

**PINOUT**

Pin	Function	Pin	Function	Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	VIN Positive	2	VIN Return	3	CAN2 HI	4	CAN2 LO	5	INPUT 1	6	INPUT 2
7	INPUT 3	8	Digital OUT 1	9	Digital OUT 2	10	Analog RET	11	CAN1 HI	12	CAN1 LO

**VERSATILE DISPLAY. ORDER INFORMATION.**

ITEM	CAN1	CAN2	RTC	DIG IN/ANALOG IN	DIG OUT	SOFTWARE DEV	IP67
3D35XK-100	Y	Y	Y	3	2	N	Y
3D35XK-101D	Y	Y	Y	3	2	Y	N
3D35DEV-100	Development Kit: 3D35XK-101D display with 3DXX1314-1 Power/CAN cable						