



YOUR PRODUCT DEVELOPMENT PARTNER



The MicroDisplay makes it easy to create screens with custom graphics, text and even gauges that automatically adjust based on J1939 values.

Because the MicroDisplay is controlled via J1939 commands, native coding is not required. Screens and graphic objects are created with the included PC software tool and stored in the on-board flash memory. When in use, the vehicle's ECU (Engine Control Unit) sends and receives commands to control the display.

#### ENVIRONMENTAL SPECIFICATIONS

|                                |                          |   |
|--------------------------------|--------------------------|---|
| Operating temperature          | ANSI/ASEA EP455 5.1.1    | Level 2: -50°C to +85°C with optional heater<br>-25°C to +85°C without heater |
| Storage Temperature            | ANSI/ASEA EP455 5.1.2    | Level 2: -50°C to +85°C   |
| Thermal Shock                  | ANSI/ASEA EP455 5.1.3    | -40°C to 70°C at a rate of 4°C/min (1 hour at extremes)                       |
| Altitude (Barometric Pressure) | ANSI/ASEA EP455 5.2      | 101.3kPa to 18.6kPa   |
| Sand and Dust                  | SAE J1455                |   |
| Solar Radiation                | ISO 4892-2               | Method B  |
| Wash Down                      | ANSI/ASEA EP455 5.6      | Level 2   |
| Humidity                       | ANSI/ASEA EP455 5.13     | 96% humidity at 35°C for 240 hours  |
| Salt Fog                       | ANSI/ASEA 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 |   |
| Ingress Protection             | IP67                     | with mating connector   |

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

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

## Graphic MicroDisplay

- Easily display custom graphic icons, text boxes and active gauge elements
  - Use PC-based software tools to develop graphic objects
  - Store graphic objects in on-board flash memory
  - Recall objects at runtime via J1939 commands
- Controlled via J1939 PGNs
  - Native coding not required
- Ideal for off-highway vehicle applications
  - Virtual gauges
  - Diagnostic menus
  - Fault indicators & service reminders
- Rated for off-highway vehicles
  - Extended operating temperature range: -50°C to +85°C (with heater)
  - Protected against the ingress of liquids and dust: IP67 rated seal
- 3.2-inch backlit LCD (256x128)
  - Excellent daylight readability
  - Transflective LCD with anti-glare
  - Software controlled RGB backlighting
  - Four level grayscale graphics
- Custom options available
  - Keypad backlight color
  - Key colors and legends
  - Icons/screens pre-loaded
- System Interface
  - One CAN-bus port
  - One RS-485 serial port
  - Two 200mA outputs
  - Three discrete inputs

Agriculture



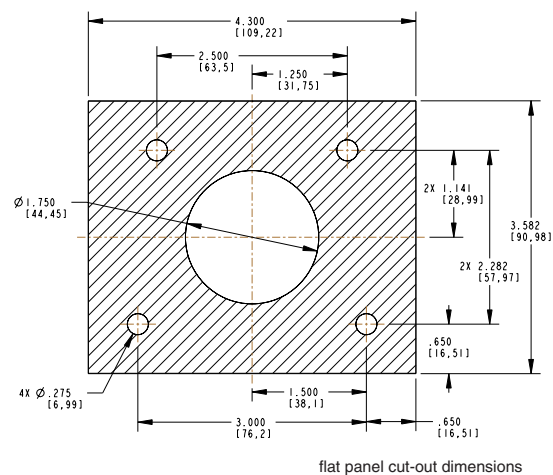
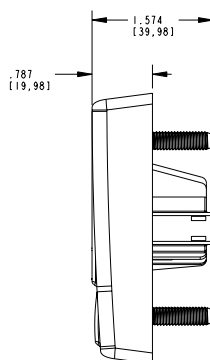
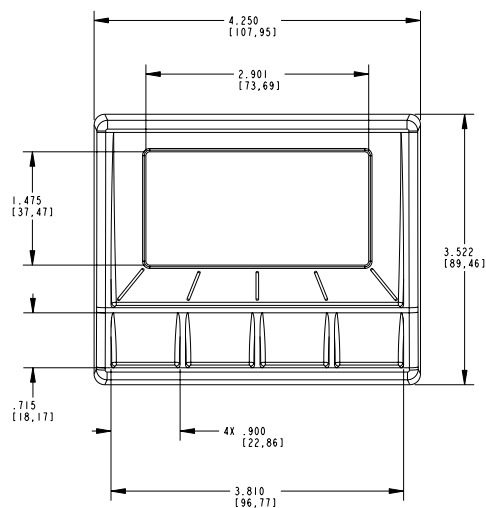
Construction





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## DIMENSIONS



## ELECTRICAL PERFORMANCE SPECIFICATIONS

|                                   |                                 |   |
|-----------------------------------|---------------------------------|---|
| Maximum load                      | ANSI/ASEA EP455 5.1.1           | Level 2                                 |
| Jump start voltage                | EP455 5.10.2                    | 36V for 60 minutes; -36V for 60 minutes |
| Short circuit protection          | EP455 5.10.4                    | 36V                                     |
| Reverse polarity protection       | EP455 5.10.3                    | -36V                                    |
| Starting profile                  | ISO 16750-2                     | Level II code C, Level IV code A        |
| Battery-less operation            | ANSI/ASEA EP455 5.11.3          | Level 2                                 |
| Load dump                         | ISO 7637-2 Test Pulse 5b        | Us* = 60V                               |
| Switching spikes                  | ISO 7637-2 Test Pulse 3a and 3b |   |
| Wire harness inductance           | ISO 7637-2 Test Pulse 2a and 2b |   |
| Wire harness inductance-switching | ISO 7637-3 Test Pulse a and b   |   |
| Inductive load pulse              | ANSI/ASEA EP455 5.11.4          |   |
| Mutual coupling                   | ANSI/ASEA EP455 5.11.6          | Level 2                                 |
| Alternator field decay            | ANSI/ASEA EP455 5.11.2          |   |

## ELECTROMAGNETIC COMPATIBILITY SPECIFICATIONS

|                     |                      |                 |
|---------------------|----------------------|-----------------|
| ESD                 | ANSI/ASEA EP455 5.12 | Level 1 +/- 25V |
| Radiated Immunity   | EP455 5.16           | Level 1         |
| Conducted emissions | SAE J1113-41         | Level 4         |
| Radiated emissions  | ISO14982             |                 |

## MECHANICAL PERFORMANCE

|                       |                        |   |
|-----------------------|------------------------|---|
| Vibration, Random     | ANSI/ASEA EP455 5.15.1 | 2h each axis @52.4m/s <sup>2</sup> RMS overall acceleration and spectral power density of 2m <sup>2</sup> /s <sup>3</sup> 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/s <sup>2</sup> RMS from 40Hz to 2KHz |
| Shock / Crash Safety  | ANSI/ASEA EP455 5.14   | 11ms half sine pulse of 490 m/s <sup>2</sup> in 3 perpendicular axes  |
| Drop                  | ANSI/ASEA EP455 5.14.2 | Drop component 400 mm onto a hardwood benchtop on all practical edges.  |

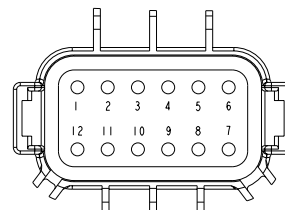
specifications subject to change

| PART NUMBER | DESCRIPTION              |
|-------------|--------------------------|
| 3D32XK-100  | MicroDisplay             |
| 3D32HK-100  | MicroDisplay with heater |

## CONTACT GRAYHILL FOR CUSTOM OPTIONS



## REAR CONNECTOR



Mating Connector: DEUTSCH DT06-12SA

| Pin | Function      |
|-----|---------------|
| 1   | V in Positive |
| 2   | V Return      |
| 3   | RS-485 +      |
| 4   | RS-485 -      |
| 5   | Digital in 1  |
| 6   | Digital in 2  |
| 7   | Digital in 3  |
| 8   | Digital out 1 |
| 9   | Digital out 2 |
| 10  | CAN shield    |
| 11  | CAN HI        |
| 12  | CAN LOW       |

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