

# VEHICLE INTERFACE CONTROLLER

## Multiple Display Functions within Reach

- Five hot keys for rapid navigation
  - Scroll with rotary encoder
  - Select with pushbutton
  - Navigate with joystick
- Three configurations
  - Optical rotary encoder
  - Encoder with pushbutton
  - Joysticking encoder with pushbutton
- J1939 and CANopen versions
- Dimmable LED indicators and legends
- Sealed to IP67
- Vibration and impact resistant
- Operating temperature: -40 °C to +85 °C
- Long Life: 500,000 cycles
- Support for multiple key combinations
- Designed for 12/24 volt systems
- Custom legends and configurations



Joysticking Encoder Version



Rotary Encoder Version  
with Target Legends



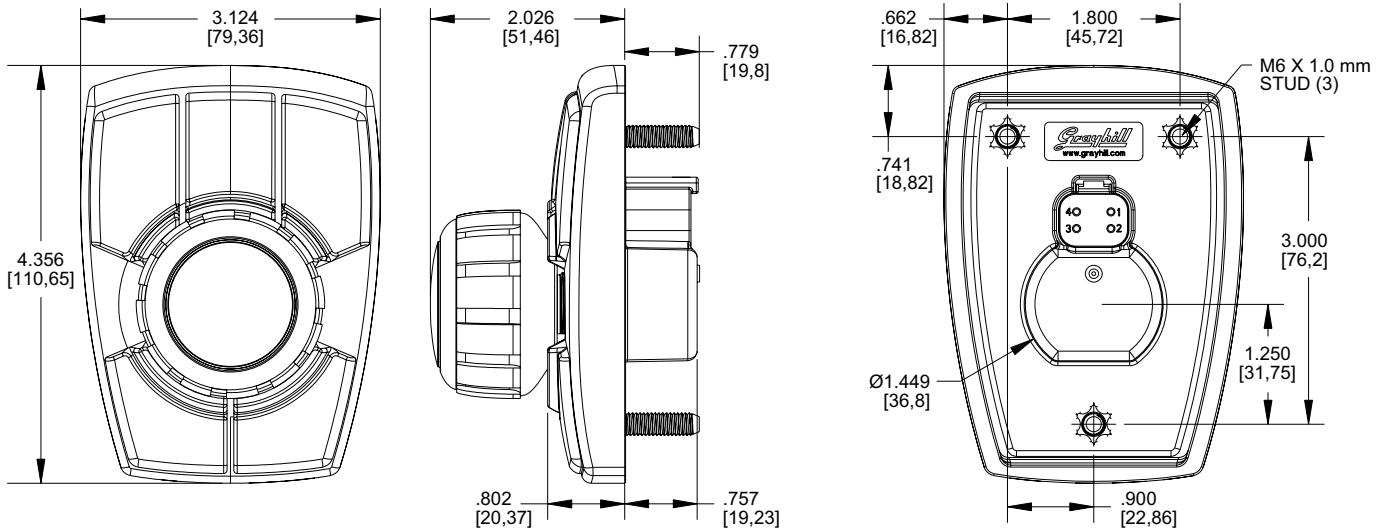
## YOUR EXPERTS IN CAB CONTROLS

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

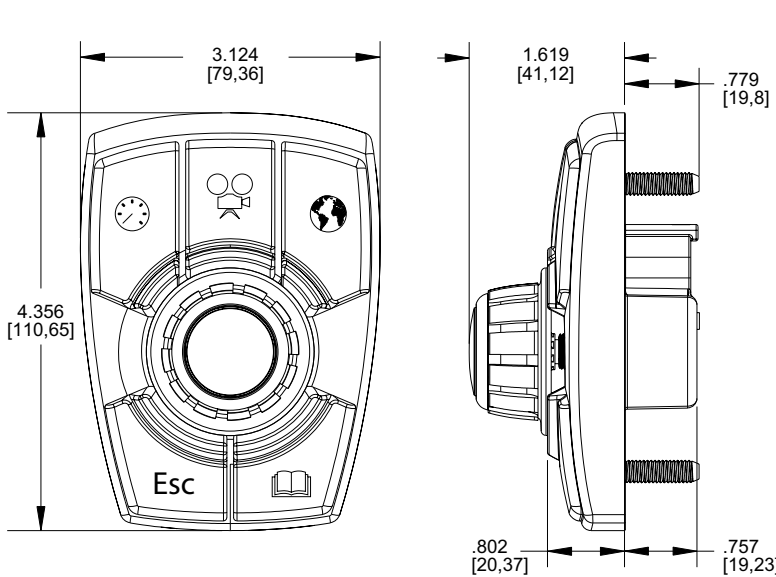
- Cab user interface design
- Customized control panels
- CAN bus interface devices

**DIMENSIONS** in inches [and millimeters]

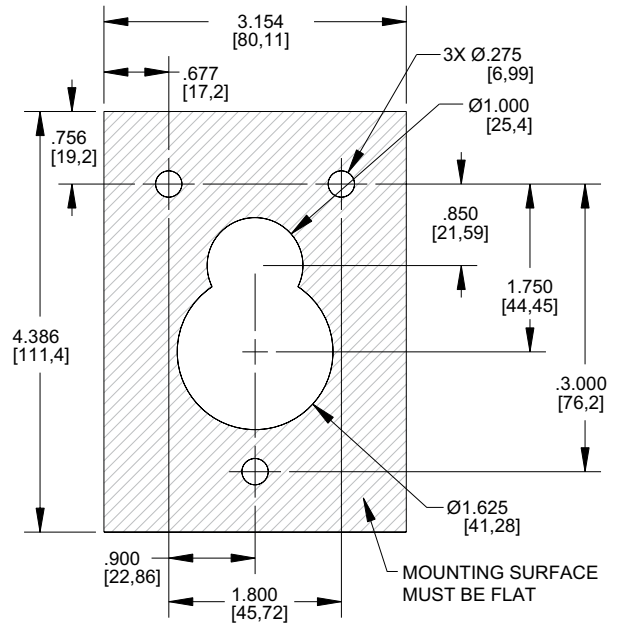
**Blank Keys Shown Below**



**ISO Symbols Shown Below**



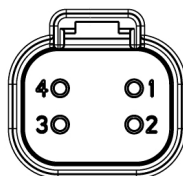
**Recommended Panel Cutout**



**REAR CONNECTOR**

**Connector**

4 pin Deutsch DT Connector.  
Power with 8 V to 32 V vehicle type inputs.



| PIN | SIGNAL |
|-----|--------|
| 1   | POWER  |
| 2   | GROUND |
| 3   | CAN_H  |
| 4   | CAN_L  |

**Mounting Information**

Use M6 nut (1 mm pitch)  
max torque 25 in-lbs

## SPECIFICATIONS

### Environmental Specifications

|   |                               |   |
|---|-------------------------------|---|
| <b>Operating Temperature</b>                        | ANSI/ASAE EP455 5.1.1 Level 2 | -40 °C for 4 hrs to +85 °C for 11 hrs   |
| <b>Storage Temperature</b>                          | ANSI/ASAE EP455 5.1.2 Level 2 | -40 °C 4 hrs to +85 °C 4 hrs  |
| <b>Thermal Shock</b>                                | ANSI/ASAE EP455 5.1.3         | -40 °C to 70 °C at a rate of 4 °C/min (1 hr at extremes)                                  |
| <b>Altitude (Barometric Pressure)</b>               | ANSI/ASAE EP455 5.2           | 101.3 kPa to 18.6 kPa   |
| <b>Sand and Dust</b>                                | ANSI/ASAE EP455 5.3           | 24 hrs with 0.88 g/m3   |
| <b>Solar Radiation</b>                              | ANSI/ASAE EP455 5.4           | 43 to 75 W/m2 UV radiation (280 to 400 nm wavelength) for 300 hrs                         |
| <b>Wash Down</b>                                    | ANSI/ASAE EP455 5.6 Level 2   | 375 kPa and 8.3 L/min for 10 min @ 15 °C water temp                                       |
| <b>Ingress Protection</b>                           | IP67                          | 1 m submersion for 30 min   |
| <b>Humidity</b>                                     | ANSI/ASAE EP455 5.13          | 96% humidity at 35 °C for 240 hrs   |
| <b>Salt Fog</b>                                     | ANSI/ASAE EP455 5.9           | 5% aqueous solution of NaCl @ 35 °C and a pH between 6.5 and 7.2 for 48 hrs               |
| <b>Chemical Resistance (Resistance to Solvents)</b> | ISO 16750-5 EP 455 (5.8.2)    |   |
| <b>Thermal Cycling (Change of Temperature)</b>      | ISO 16750-4                   | -40° to 85 °C 2 hrs at extremes<br>Change rate = 1 °C/min (8 hrs)<br>repeat for 30 cycles |

### Electromagnetic Compatibility Specifications

|                                     |                      |   |
|-------------------------------------|----------------------|---|
| <b>ESD</b>                          | ANSI/ASAE EP455 5.12 | ±25 kV for 10 pulses, 5 of each polarity  |
| <b>Radiated Immunity</b>            | ISO14982 6.6         | 10 MHz to 1000 MHz range 48 mA Bulk current injection 100 V/m   |
| <b>Conducted Emissions</b>          | SAE J1113-41         | Class 3   |
| <b>Broadband Radiated Emissions</b> | ISO14982 6.4         | 64 dB to 54 dB, 30 MHz to 75 MHz (linearly decreases) 54 dB to 65 dB, 75 MHz to 400 MHz (linearly increases) 65 dB, 400 MHz to 1000 MHz |

### CE Compliance

|   |               |     |
|---|---------------|-----|
| <b>Agriculture and Forestry Machinery EMC</b> | ISO 14982     | ESA |
| <b>Construction Machinery EMC</b>             | EN 13309:2000 | ESA |

### Mechanical Performance

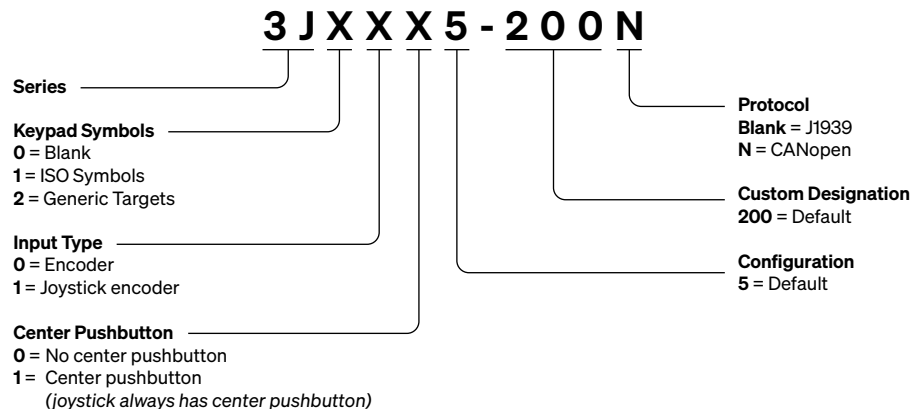
|                              |  |  |
|------------------------------|--|--|
| <b>Vibration, Random</b>     | ANSI/ASAE EP455 5.15.1                         | 2 hrs each axis @ 52.4 m/s2 RMS overall acceleration and spectral power density of 2 m2/s3 from 50 Hz to 2000 Hz   |
| <b>Vibration, Sinusoidal</b> | ANSI/ASAE EP455 5.15.2                         | A logarithmic sweep from 10Hz to 2000Hz to 10Hz over a period of 20 min for 4 hrs in each of 3 orthogonal axes with amplitude of 1.5 mm from 10 Hz to 40 Hz and a constant acceleration of 35 m/s2 RMS from 40 Hz to 2000 Hz |
| <b>Shock/Crash Safety</b>    | ANSI/ASAE EP455 5.14                           | A single 11 ms half sine pulse of 490 m/s2 in 3 perpendicular axes   |
| <b>Drop</b>                  | ANSI/ASAE EP455 5.14.2 Level 1                 | Drop component 400 mm onto a hard-wood benchtop on all practical edges   |
| <b>Shipping integrity</b>    | International Safe Transit Agency procedure 3A |  |

### Electrical Performance Specifications

|                                    |                                 |  |
|------------------------------------|---------------------------------|--|
| <b>Maximum Load</b>                | ANSI/ASAE EP455 5.1.1 Level 2   | Low temperature: -40 °C for 4 hrs<br>High temperature: +85 °C for 11 hrs<br>Maximum load applied |
| <b>Jump Start Forward Voltage</b>  | ISO 16750-2                     | 36 V for 60 min  |
| <b>Jump Start Reverse Voltage</b>  | ISO 16750-2                     | -36 V for 60 min   |
| <b>Short Circuit Protection</b>    | ISO 16750-2                     | All outputs to ground for 60 s   |
| <b>Reverse Polarity Protection</b> | ISO 16750-2                     | 28 V for 60 s  |
| <b>Starting Profile</b>            | ISO 16750-2                     | Class A  |
| <b>Battery-Less Operation</b>      | ANSI/ASAE EP455 5.11.3 Level 2  | Apply 6+12.6 sin(2*pi*f*t) f is swept from 500 Hz to 1.5 kHz for 5 min                           |
| <b>Load Dump</b>                   | ISO 7637-2 Test Pulse 5b        | Class A  |
| <b>Switching Spikes: Negative</b>  | ISO 7637-2 Test Pulse 3a        | Class A  |
| <b>Switching Spikes: Positive</b>  | ISO 7637-2 Test Pulse 3b        | Class A  |
| <b>Wire Harness Inductance</b>     | ISO 7637-2 Test Pulse 2a and 2b | Class A  |
| <b>± Inductive Load Pulse</b>      | ANSI/ASAE EP455 5.11.4          | 14-300 e <sup>-t/001</sup> V 1 Hz for 300 cycles   |
| <b>± Mutual Coupling</b>           | ANSI/ASAE EP455 5.11.6 Level 2  | 14+200 e <sup>-t/14*10<sup>-6</sup></sup> V 1 Hz for 300 cycles                                  |
| <b>Alternator Field Decay</b>      | ANSI/ASAE EP455 5.11.2          | Class A  |

## ORDERING INFORMATION

Custom options available.  
Contact Grayhill or your local Grayhill sales representative for more information.



Specifications are subject to change.