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

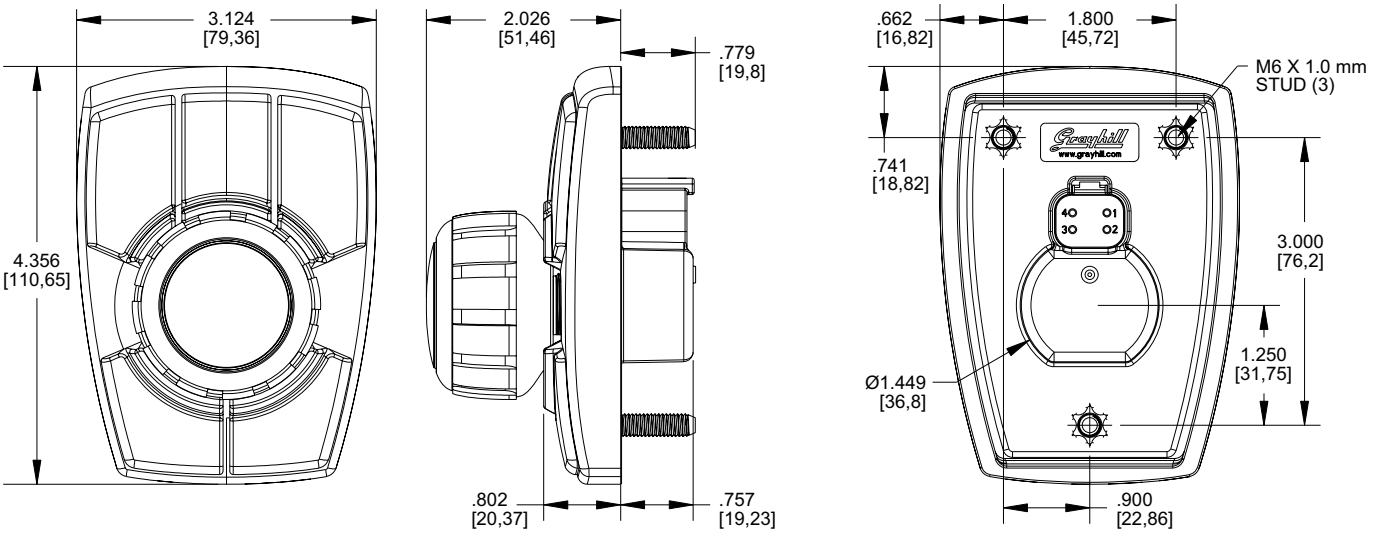
YOUR EXPERTS IN CAB CONTROLS

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

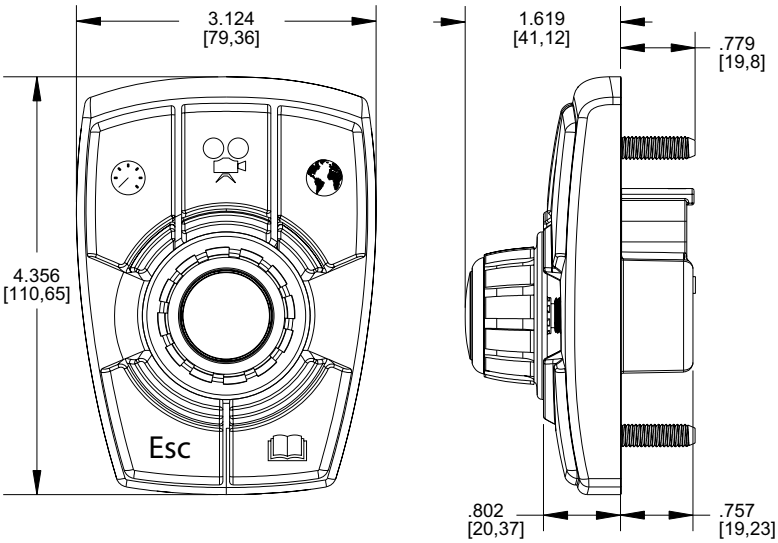
- Cab user interface design
- Customized control panels
- CAN bus interface devices

DIMENSIONS in inches [and millimeters]

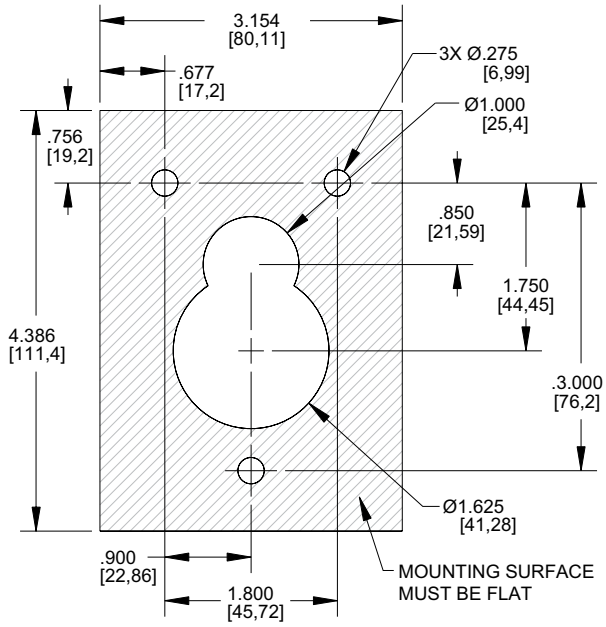
Blank Keys Shown Below



ISO Symbols Shown Below



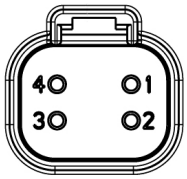
Recommended Panel Cutout



REAR CONNECTOR

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

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



PIN	SIGNAL
1	POWER
2	GROUND
3	CAN_H
4	CAN_L

SPECIFICATIONS

Environmental Specifications

Operating Temperature	ANSI/ASAE EP455 5.1.1 Level 2	-40 °C for 4 hrs to +85 °C for 11 hrs
Storage Temperature	ANSI/ASAE EP455 5.1.2 Level 2	-40 °C 4 hrs to +85 °C 4 hrs
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/m3
Solar Radiation	ANSI/ASAE EP455 5.4	43 to 75 W/m2 UV radiation (280 to 400 nm wavelength) for 300 hrs
Wash Down	ANSI/ASAE EP455 5.6 Level 2	375 kPa and 8.3 L/min for 10 min at 15 °C water temp
Ingress Protection	IP67	1 m submersion for 30 min
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 at 35 °C and a pH between 6.5 and 7.2 for 48 hrs
Chemical Resistance (Resistance to Solvents)	ISO 16750-5 EP 455 (5.8.2)	
Thermal Cycling (Change of Temperature)	ISO 16750-4	-40° to 85 °C 2 hrs at extremes Change rate = 1 °C/min (8 hrs) repeat for 30 cycles

Electromagnetic Compatibility Specifications

ESD	ANSI/ASAE EP455 5.12	±25 kV for 10 pulses, 5 of each polarity
Radiated Immunity	ISO14982 6.6	10 MHz to 1000 MHz range 48 mA Bulk current injection 100 V/m
Conducted Emissions	SAE J1113-41	Class 3
Broadband Radiated Emissions	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

Agriculture and Forestry Machinery EMC	ISO 14982	ESA
Construction Machinery EMC	EN 13309:2000	ESA

Mechanical Performance

Vibration, Random	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
Vibration, Sinusoidal	ANSI/ASAE 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 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
Shock/Crash Safety	ANSI/ASAE EP455 5.14	A single 11 ms half sine pulse of 490 m/s2 in 3 perpendicular axes
Drop	ANSI/ASAE EP455 5.14.2 Level 1	Drop component 400 mm onto a hard-wood benchtop on all practical edges
Shipping integrity	International Safe Transit Agency procedure 3A	

Electrical Performance Specifications

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

ORDERING INFORMATION

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

3 J X X X 5 - 2 0 0 N

Series

Keypad Symbols
0 = Blank
1 = ISO Symbols
2 = Generic Targets

Input Type
0 = Encoder
1 = Joystick encoder

Center Pushbutton
0 = No center pushbutton
1 = Center pushbutton
(joystick always has center pushbutton)

Configuration
5 = Default

Custom Designation
200 = Default

Protocol
Blank = J1939
N = CANopen