



VEHICLE INTERFACE CONTROLLER PLUS

Multifunctional Control for Intuitive Operation

- Three mechanical form factors:
 - Rotary encoder with optional pushbutton
 - Digital joystick encoder with pushbutton
 - Proportional joystick with optional pushbutton
- Modern flush styling
- No-tool snap-in front mounting
- Designed for ISO 13849 safety rated vehicles
- Self-diagnostics include:
 - Supply voltage monitoring
 - Indicator operation verification
 - Button short detection
- J1939 and CANopen options
- Designed for 12/24 volt systems
- Dimmable LED indicators and legends
- Low current sleep mode (<1.5 mA current draw; wake up on key press/CAN message)
- Same field-tested reliability as our original VIC with over 500,000 in operation
- Software backwards compatible with our original VIC
- Customizable legends, indicator colors, backlight colors, knob colors



Rotary Encoder with 16-Position Continuous Rotation



Digital Joystick with 20-Position Continuous Rotation



Proportional Joystick with Momentary Rotation

YOUR EXPERTS IN CAB CONTROLS

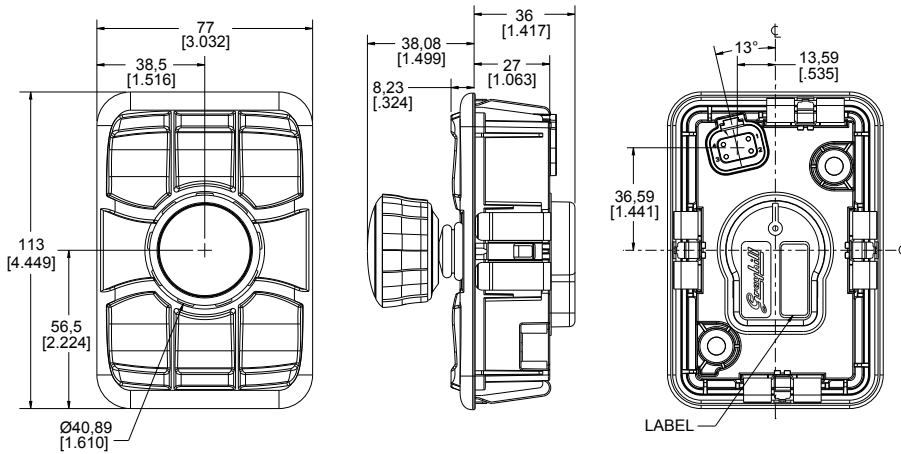
Grayhill specializes in the design, development, and production of human interface controls, including:

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

DIMENSIONS in millimeters [and inches]

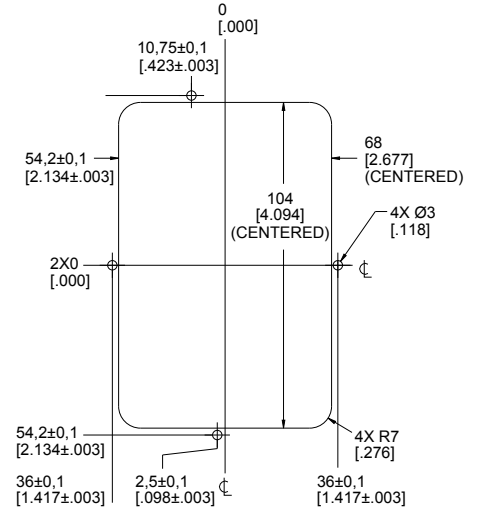
3JX2X5-G2-100X / 3JX305-G2-100X

Proportional Joystick / Dual Proportional Output Version



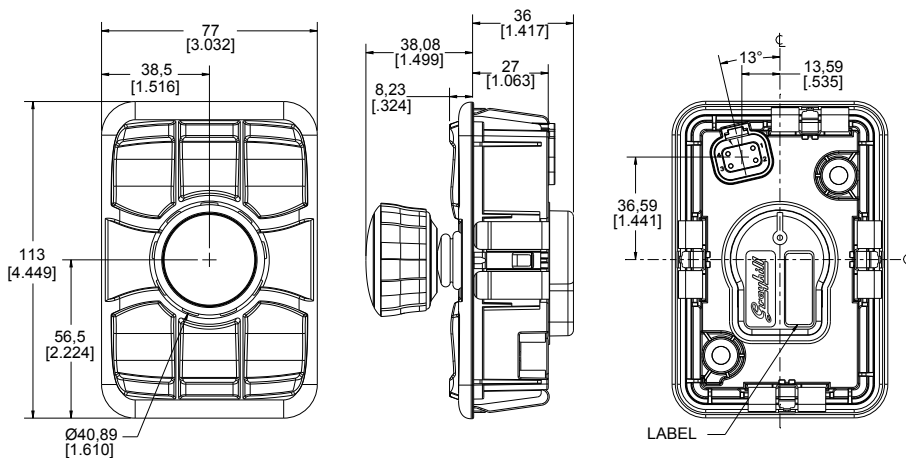
Panel Cutout

Recommended Panel Thickness: 2,5 [.098] ±1,0 [.039]



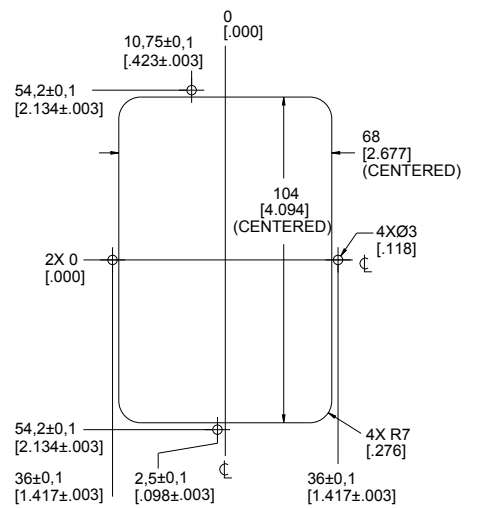
3JX2X5-G2-100X / 3JX305-G2-100X

Proportional Joystick / Dual Proportional Output Version

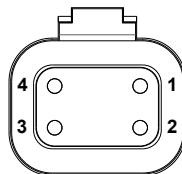


Panel Cutout

Recommended Panel Thickness: 2,5 [.098] ±1,0 [.039]



REAR CONNECTOR



PIN	SIGNAL
1	POWER
2	GROUND
3	CAN_H
4	CAN_L

Connector: Mates with Deutsch #DT06 - 4S with W4S wedge lock

SPECIFICATIONS

Electrical Specifications

Maximum Load	ISO 16750-4 5.1	Low temperature: -40 °C High temperature: +85 °C Duration: 4 hrs at low temperature, 11 hrs at high temperature Maximum load applied
Over-Voltage	ISO 16750-2 4.3.2	High voltage: 36 V Duration: 60 min Tmax -20 °C
Superimposed Alternating Voltage	ISO 16750-2 4.4	Severity 2 and 3 Ri = 50 mΩ Frequency range: 50 Hz to 25 kHz Sweep duration: 120 s Number of sweeps: 5 (continuously)
Slow Decrease and Increase of Supply Voltage	ISO 16750-2 4.5	
Momentary Drop in Supply Voltage	ISO 16750-2 4.6.1	Class B no reset
Reset Behavior at Voltage Drop	ISO 16750-2 4.6.2	Class C
Starting Profile	IISO 16750-2 Sec. 4.6.3 <i>Formerly known as Pulse 4</i>	12 V, Level II Class B and Level IV Class A 24 V, Level II Class A and Level III Class A
Load Dump	ISO16750-2 Sec 4.6.4.2.2 Test A <i>Formerly known as ISO7637-2 Pulse 5</i>	12 V: Us = 101 V, Ri = 0.5 Ω, td = 400 ms 24 V: Us = 202 V, Ri = 8.0 Ω, td = 350 ms
Reverse Polarity	ISO 16750-2 4.7.2.3	Voltage: -28 V Duration: 60 s
Open Circuit Tests	ISO 16750-2 4.9.1.2	Relay and signal outputs to be connected to load
Short-Circuit Protection	ISO 16750-2 4.10.2 Signal Circuits	Connect all signal inputs and outputs to Vmax and GND for 60 s. One circuit tested at a time.
Short-Circuit Protection	ISO 16750-2 4.10.3 for Load Circuits	ISO 8820 operating time rating +10% Minimum Class C
Parallel Inductive Load	ISO7637-2 Pulse 1	Us = -600 V
Wire Harness Inductance	ISO 7637-2 Pulse 2a	Wire harness inductance
Switching Spikes	ISO 7637-2 Pulse 3a	Pulse 3a: Us = -300 V Pulse 3b: Us = +300 V
Fast Transients Mutual Coupling	ISO 7637-2 Pulse 3b	Pulse a: 24 V Class IV Us = -80 Pulse b: 24 V Class IV Us = +80
Slow Transients Mutual Coupling	ISO7637-3 4.3.2	DCC slow + = +30 DCC slow - = -30 ICC slow + = +6 ICC slow - = -6

Physical Specifications

Vibration, Random	ISO 16750-3 4.1.2.7	Commercial vehicle, sprung masses
Vibration, Sinusoidal (Resonant Response between 50-80 Hz)	MIL-STD-202G, Method 204D, Test Condition C	Logarithmic sweep from 10 Hz to 2000 Hz to 10 Hz over a period of 20 min Duration: 4 hrs (12 cycles) in each of 3 orthogonal axes Maximum displacement for 10 Hz to 55 Hz: 0.06" Constant acceleration for 55 Hz to 2000 Hz: 10G
Shock/Crash Safety	ISO 16750-3 4.2.2	10 pulses per direction
Drop	ISO 16750-3 4.3	Height: 400 mm Repeat for all practical edges and faces
Mechanical Life	Internal Testing Procedure	Keypad 1 M cycles
		Center Pushbutton 1 M cycles
		Rotary Encoder 1 M cycles
		Optical Joystick 500 k cycles
		Proportional Joystick 1 M cycles
		Momentary-Turn Encoder 1 M cycles

Environmental Specifications

Operating Temperature	ISO 16750-4 5.1.1.2 ISO 16750-4 5.1.2.2	Low temperature: -40 °C for 24 hrs High temperature: +85 °C for 96 hrs
Storage Temperature	ISO 16750-4 5.1.11 ISO 16750-4 5.1.2.1	Low temperature -55 °C High temperature +105 °C
Thermal Shock (Ice Water Shock Test)	ISO 16750-4 5.4.3	High temperature +85 °C
Altitude (Barometric Pressure)	IEC60068-2-13 Method 105C Test Condition B	Sea level to 15240 m (101.3 kPa to 11.6 kPa), Exposure time: 2 hrs
Solar Radiation	ISO 4892-2 Method B	1000 hrs
Ingress Protection	IEC 60529 / ISO 20653 8.3.3 – IP6K7	Dust – Talcum powder Liquid – 1 m submersion for 30 min
Wash Down	SAE J1211 Section 4.4 >>ISO 60529 / ISO20653	375 kPa and 8.3 L/min for 10 min at 15 °C
Humidity	ISO 16750-4 5.7 (Damp Heat) ISO 16750-4 5.6.2.2 (Humidity Cycling)	96% humidity at +35 °C Duration: 240 hrs
Salt Fog	ISO 16750-4 5.5.1	5% aqueous solution of NaCl at 35 °C and a pH between 6.5 and 7.2 for 48 hrs
Thermal Cycling	Custom Test (Extended Duration Temperature and Humidity Cycling)	Low temperature: -40 °C High temperature: +85 °C
Chemical Resistance	ISO 16750-5	(All agents on table 1 except battery fluid)

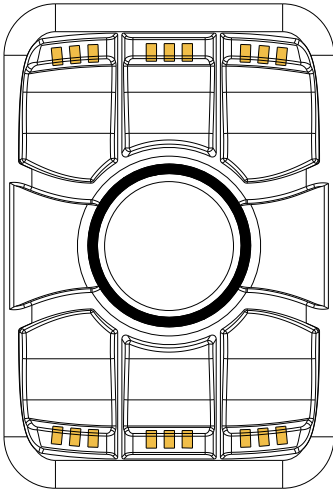
Electromagnetic Compatibility Specifications

Radiated Immunity	ISO 11452-2 ALSE	80 MHz to 1000 MHz, 200 V/m
	ISO 11452-2 ALSE	1000 to 2500 MHz, 200 V/m, 3-axis
	ISO 11452-3 TEM Cell	0.01 to 200 MHz, 300 V/m
	ISO 11452-4 Bulk Current Injection	0.5 MHz to 400 MHz, 300 mA
	ISO 11452-5 150 mm Stripline	0.01 MHz to 400 MHz, 300 V/m
Electrostatic Discharge	ISO 10605 8 Powered-Up Test	ESD capacitor network 330 pF, 330 Ω Conductive surfaces Contact discharge ±15 kV Non-conductive surfaces Air discharge ±25 kV Indirect discharge ±20 kV
Electrostatic Discharge	ISO 10605 9 Unpowered Test	ESD capacitor network 150 pF / 2 kΩ Conductive surfaces Contact discharge ±15 kV Non-conductive surfaces Air discharge ±25 kV Indirect discharge ±20 kV
Magnetic Field Immunity Test	ISO 11452-8:2007	15 Hz to 1000 Hz, 100 A/m, Class A 1 kHz to 10 kHz, 100/(F/1000)*2, Class A 10 kHz to 150 kHz, 1 A/m, Class A
Radiated Emissions: Broadband/Narrowband	ISO14982 CISPR 25 (where frequency bands are specified)	CISPR 25 Class 5 where specified Class 3: Average, Peak and Quasi Peak (where specified), on remaining CISPR 25 defined bands
Conducted Emissions	CISPR 25 6.2	Class 5

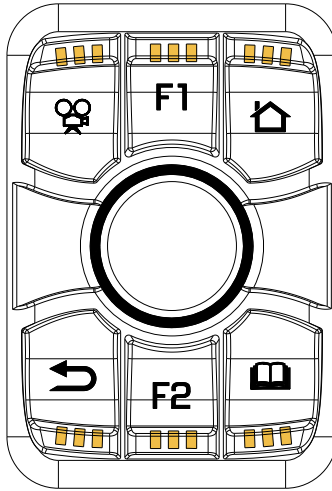
Specifications are subject to change.

STANDARD KEYPAD SYMBOL OPTIONS

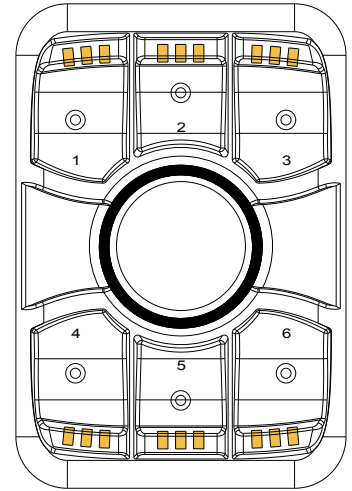
-0: Blank



-1: ISO Symbols



-2: Generic Targets



KNOBS

Contact us about optional knob colors!



LEDS

Contact us for optional LED colors

Indicator colors:

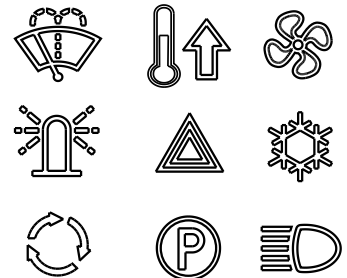
- Amber (Standard)
- Blue
- Green
- Red
- White
- Yellow

Backlight colors:

- Green (Standard)
- White (Standard)
- Amber
- Blue
- Pure Green
- Red
- Yellow

LEGENDS

Contact us for Custom Legends



ORDERING INFORMATION

3 J X X X 5 - G 2 - X 3 A X

Series

Keypad Symbols

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

Input Type

- 0 = Rotary Encoder
- 1 = Digital joystick
- 2 = Proportional joystick
- 3 = Dual proportional output joystick

Center Pushbutton/Output

- 0 = No center pushbutton (dual proportional output joystick cannot have center pushbutton)
- 1 = Center pushbutton (digital joystick always has center pushbutton)

Configuration

- 5 = Default

Back Light Color

- G = Green
- W = White
- (See product spec for additional options)

Indicator Number/Color

- 3A = 3 amber indicators per key

Protocol

- C = J1939
- N = CANopen

Generation Code

- G2 = Generation 2