

725REVISION HISTORY

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PC-COMPATIBLE TRACKBALL


IN METAL ENCLOSURE

THREE BUTTON MILITARY USB TRACKBALL

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One Step Ahead

A COMPONENTS CORPORATION OF AMERICA COMPANY

THIRD ANGLE PROJECTION



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

TOLERANCES

DECIMALS	ANGLES	FRACTIONS
X ± .03	± .12°	± 1/64
XX ± .010		
XXX ± .005		

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1.0 SCOPE

This Specification Control Document (SCD) describes the detailed characteristics of one of the M7 family of data entry devices using Molder Elastomer Technology (MET). This SCD defines the P/N M725/0002 Trackball Assembly, which replaces the obsolete M725/0001. The Trackball in the M725/0001 has become obsolete, requiring a redesign of the Trackball Assembly. The original trackball was an analog device with encoders which because of its obsolescence, has been upgraded to a trackball that utilizes solid state sensing.

1.1. Description

The M725/0002 PC-Compatible Trackball Assembly includes a 2" diameter ball and a three button Keypad in a metal enclosure. The three button Keypad is equivalent to a three-button mouse functionality. The trackball electrical interface is through a MIL-C-38999 connector, and is USB compatible. The trackball Assembly is designed to meet USB Specification 1.1.

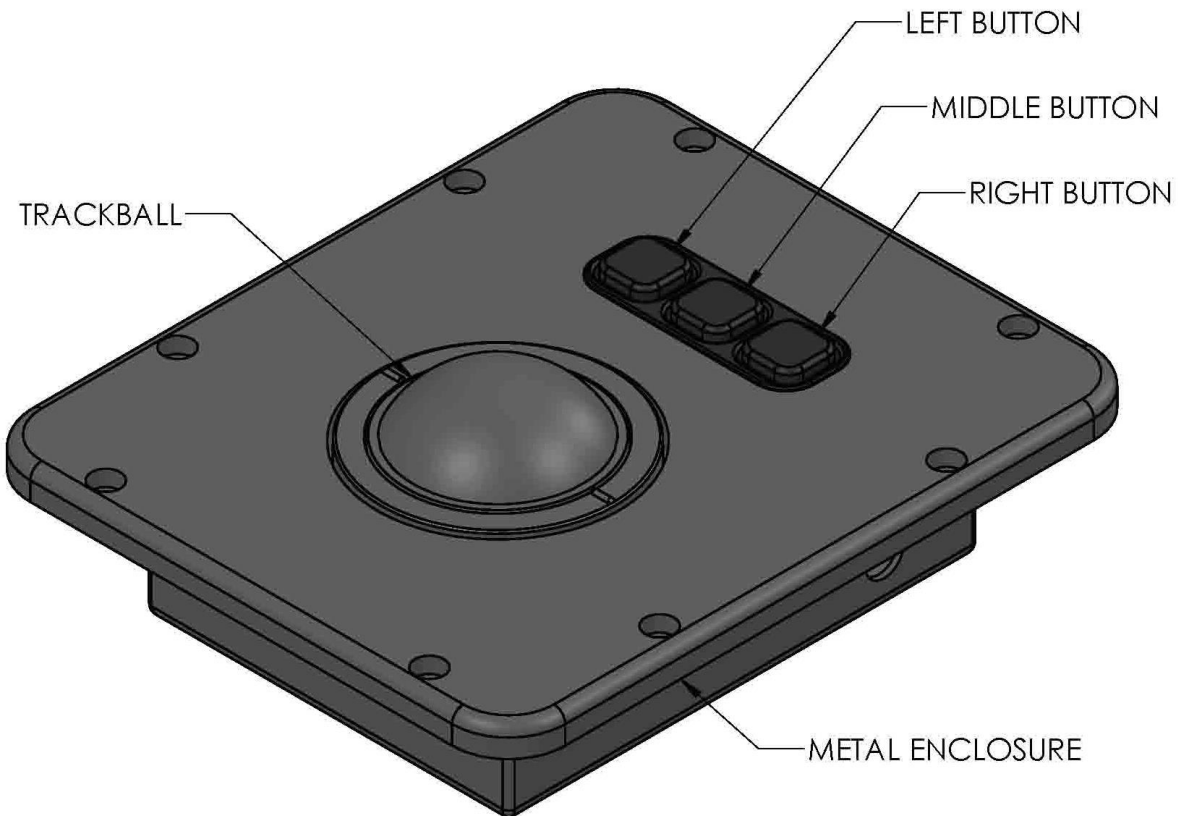


FIGURE 1: TRACKBALL ASSEMBLY

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2.0 PC-COMPATIBLE TRACKBALL

2.1. Product Features

The PC-Compatible Trackball Assembly is designed to be rugged and durable. It is compatible with Windows 95, 98, 2000, ME, NT4, XP, Vista, Redhat Linux, and Sun Sparc operating systems. The Trackball has optical tracking with solid state sensing, therefore there are no moving parts except the ball. The Trackball Assembly is designed to be a plug and play device

2.2. Color

The trackball is black in color and the three-button keypad is gray in color. The top of the faceplate is black in color.

2.3. Equalizing Pressure

There is a breather vent installed on the side of the enclosure for equalizing the air pressure inside the trackball Assembly to that of the surrounding atmosphere. It is required to clean the breather vent periodically with a soft tooth brush and clean water.

2.1. Waterproof

The trackball Assembly is designed to be waterproof from the top after insulation. The trackball is rated at IP65. The mating surfaces of the trackball / faceplate and enclosure / faceplate are sealed with gaskets. The Three-button keypad is elastomer, providing a sealed interface with the faceplate. RTV is added at the mating surface of the Three-button keypad and faceplate for extra protection. The breather vent is not waterproof making the trackball Assembly beyond the installation mating surface susceptible.

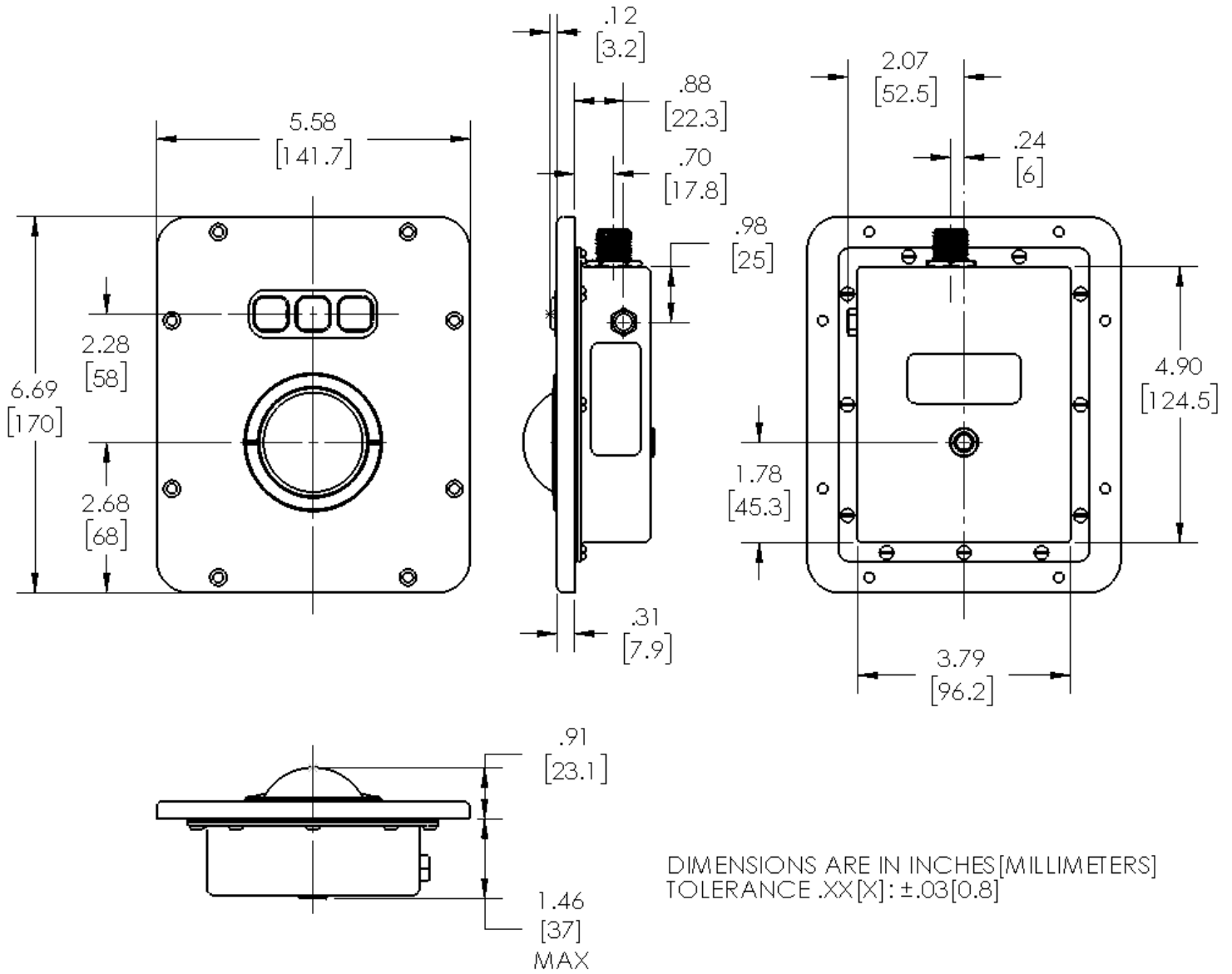
2.1. Drain Pipe

The trackball drain pipe allows for discharge water or condensation collected to exit the trackball assembly, and has a removable top ring and ball for easy cleaning and maintenance.

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3.0 REQUIREMENTS

3.1. Dimension



DIMENSIONS ARE IN INCHES [MILLIMETERS]
 TOLERANCE .XX[X]: ±.03[0.8]

FIGURE 2: TRACKBALL ASSEMBLY DIMENSIONS

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3.2. Mounting

DIMENSIONS ARE IN INCHES[MILLIMETERS]
TOLERANCE .XX[X]: ±.01[0.3]

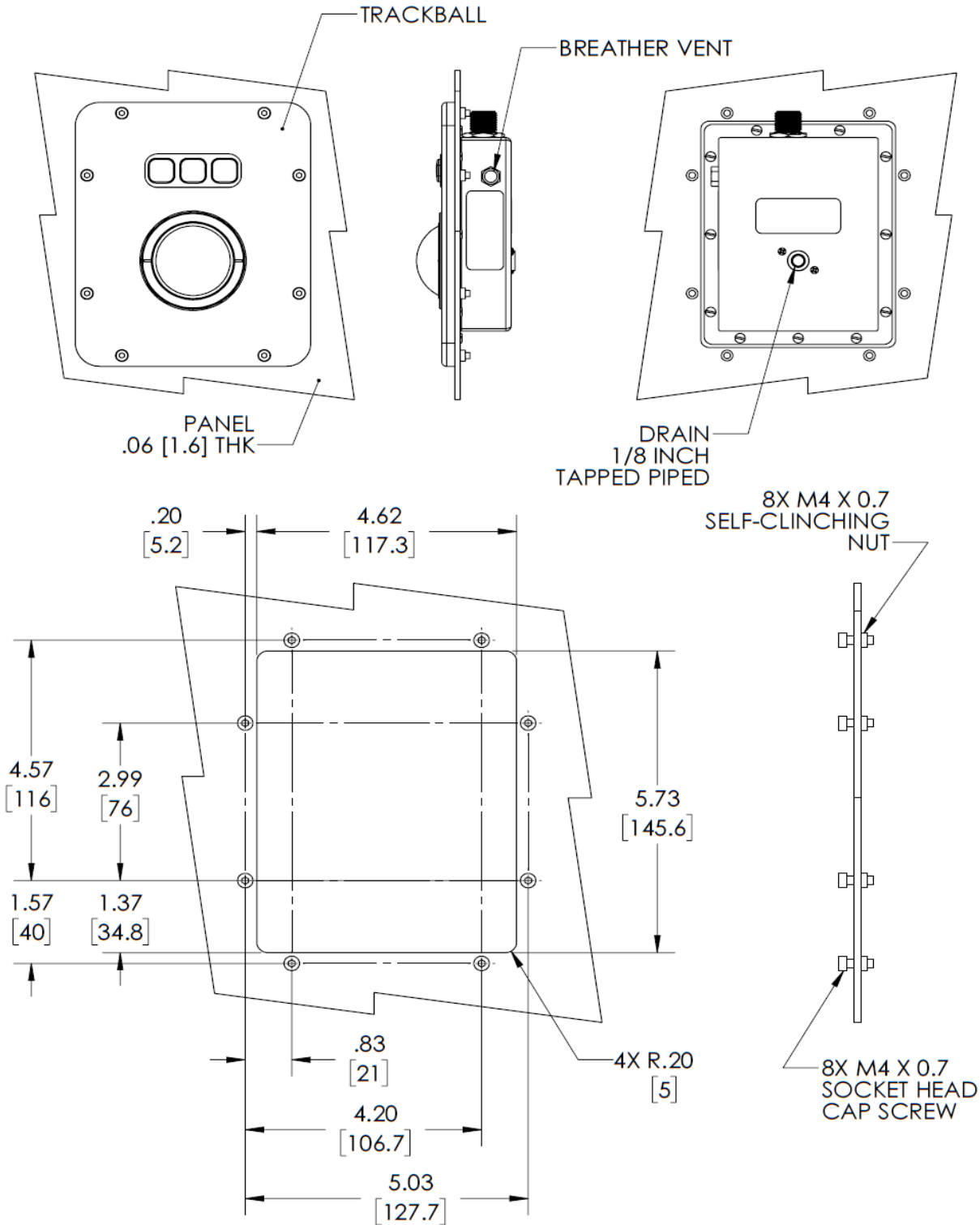


FIGURE 3: PANEL CUTOUT AND HARDWARE RECOMMENDATION FOR SURFACE MOUNTING

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3.3. Interface Connections

The trackball Assembly is designed to be directly connected to a host computer or to a host keyboard (PN: M756/0003). The connection is through a MIL-C-38999 Series III connector, PN: D38999 24WA35PA for both computer or keyboard. The connector pinouts and pin description are documented in Figure 4 and Table 1 below. Power requirement for the trackball Assembly is 5 VDC @ 125mA / 140 mA max., and it is supplied either by the host computer or the keyboard hub.

If backlighting is required a different MIL-C-38999 Series III connector would be substituted. Table 1 pins 1 through 4 designations would not change, 8 additional pins would be added for illumination.

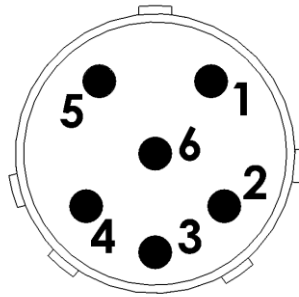


FIGURE 4: CONNECTOR PINOUTS

TABLE 1: CONNECTOR PIN NUMBER AND DESCRIPTION

PIN NUMBER	DESCRIPTION
1	UNIVERSAL SERIAL BUS, USB +5 VDC
2	UNIVERSAL SERIAL BUS, USB GND
3	UNIVERSAL SERIAL BUS, D+
4	UNIVERSAL SERIAL BUS, D-

3.4. Mechanical Performance

3.4.1. Weight

Not to exceed 1 kilogram (2.2 lbs.).

3.4.2. Track ball Mechanical Life

1,000,000 ball revolutions

3.4.3. Push Button Mechanical Life

1,000,000 cycles of operation at 25° C ambient temperature.

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3.4.4. Push Button Force Travel Curve

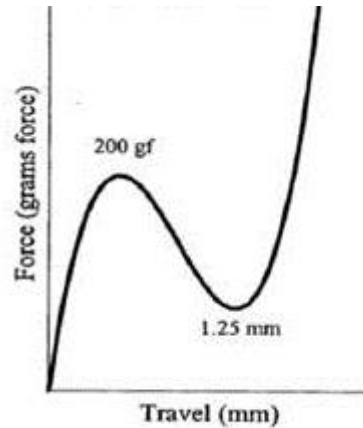


FIGURE 5: FORCE VS TRAVEL CURVE, PUSH BUTTON

Normal Key Travel: 1.25 mm (.050 in.)

Nominal Actuation Force: 200 grams

3.4.5. Trackball Force

30-80 grams (1.06-2.81 ounces)

3.4.6. Ball load

200N (44.96 lbs.) maximum downward pressure for 2 minutes at 20°C

3.4.7. Resolvable Ball Speed

30 inches per second

3.4.8. Tracking

Optical navigation technology – solid state sensing

3.4.9. Top Ring Locking Force

1000-1500 grams (35.27-52.91 ounces)

3.5. Electrical Requirements

3.5.1. Push Button

1,000,000 Actuations minimum at rated load.

3.5.2. Protocol

USB 1.1

3.5.3. Supply Voltage

4.4VDC to 5.25 VDC

3.5.4. Supply Current

125mA / 140 mA max

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3.5.5. Resolution

1000 Counts per ball revolution \pm 10% (Linear trading mode)

3.5.6. EMI/RFI Protection

The trackball Assembly is designed to minimize EMI/RFI effects. This is done with shielding, suppression resistors and ferrites for noise suppression. Stacosystems can provide optional EMI/RFI protection to meet specific customer needs with the addition of a PCBA. Testing would be required for these optional configurations.

3.6. Environmental Requirements

3.6.1. Temperature Range

Operating: 0°C to 50°C

Storage: -40°C to 85°C

3.6.2. Vibration

2g, 10-500Hz, 1 octave/min, 10 sweep cycles (IEC 60068-2-6)

3.6.3. Shock

15g/11 ms, ½ sine, 3 shocks in +ve and -ve direction, all axis (IEC 60068-2-27)

3.6.4. Impact

5 Joules

3.6.5. Humidity

Operating: 93% RH @ 40°C, non-condensing (IEC 60068-2-78)

Storage: 10% - 95% non-condensing (IEC 60068-2-78)

3.6.6. R.F.

3.6.7. Altitude

50,000 ft. operational

3.6.8. MTBF

25,000 Hours (Trackball 80,000 hours)

3.7. Material Features

3.7.1. Corrosion Resistance

All metal parts shall be designed to corrosion-resistant material requirements, or shall be suitably protected to resist corrosion.

3.7.2. Fungus

The Trackball Assembly shall be constructed of fungus inert materials. This requirement shall be demonstrated by analysis and design.

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3.7.3. Finish

The Trackball Assembly is made of materials which have been chosen for good chemical resistance.

The enclosure has black paint on non-conductive surfaces and chemical filming coating on conductive surfaces.

3.8. Quality

3.8.1. Marking

Data entry product package shall be legibly marked as follows:

- a) Stacosystems name and (optional) logo.
- b) Stacosystems Manufacturer's Cage Code Identification No. 12522.
- c) Stacosystems Part Number.
- d) Manufacturing Date Code.
- e) Serial Number.
- f) Breather Vent.

3.8.2. Workmanship

The Trackball Assembly shall be manufactured in such a manner as to be uniform in quality and free from cracked or displaced parts, sharp edges, burrs, flaws and other defects that would be detrimental to their serviceability, usage or performance.

3.8.3. Quality

The Trackball Assembly shall be inspected and tested to substantiate product conformance to drawings and specifications. Inspection and test records shall be documented and available for review.

3.8.4. Changes in Specification

Specifications defined herein are accurate at the time of release and publication of this document. Stacosystems reserves the right to make changes without prior notice.

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