## SERVICING AND CLEANING PROCEDURE FOR X-RANGE TRACKBALLS

## 1. X-Range overview

The X-Range Laser Trackerballs™ (see figure 1) are robust, solid state modules designed for controlling a cursor in extreme environments where high levels of sealing are required.

The X-Range design incorporates a removable top ring as standard to allow for easy cleaning, decontamination, sterilisation and maintenance – ensuring continued optimum performance and operation under the harshest of conditions.

This application note details the processes required to clean and decontaminate an X-Range trackball safely and without damaging the module.



Figure 1 – X Range Trackballs

## 2. Why does the trackball have to be cleaned?

After exposure to extreme environments, or after extended use, it may become necessary to service the trackball to ensure continued optimum tracking and performance. The ball tracking technology requires an optically clear line of sight from the sensor to the surface of the ball - see figure 2. If the path is impaired by particulate contamination (both fluid and/or solid) the trackball may exhibit some loss of functionality.
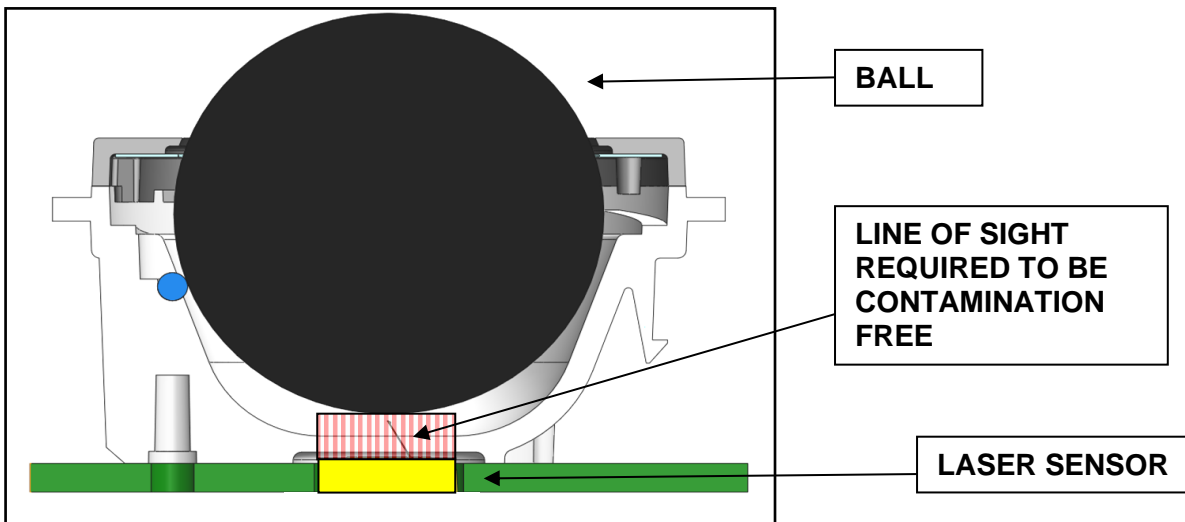


**BALL**

**LINE OF SIGHT REQUIRED TO BE CONTAMINATION FREE**

**LASER SENSOR**

Figure 2 – Optical Path Details

# 3. How often should the trackball be cleaned?

The trackball is designed to eliminate the need for scheduled maintenance, with the typical requirement for maintenance arising due to a direct functional loss of the trackball performance.

# 4. Removing the removable ring and ball

Before proceeding with servicing/maintenance of the trackball, please ensure the power to the trackball is turned OFF. If the trackball is installed in a system, please ensure the power to the main system is also turned OFF.

There are several different removable ring styles available, each requiring a slightly different removal procedure.

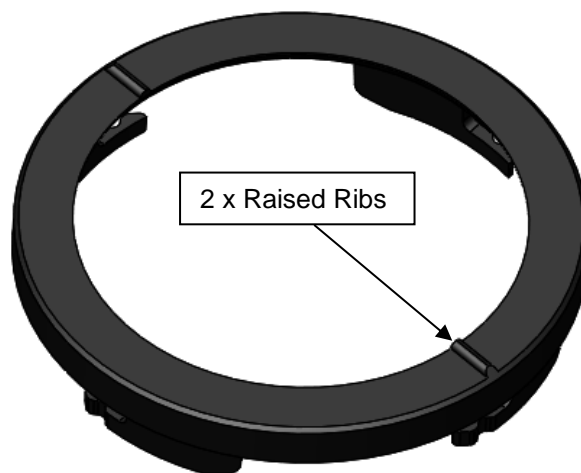- **Removable rings with raised ribs** – refer to removal procedure in section 4.1

2 x Raised Ribs

Figure 3 – Raised Rib Style

- **Removable rings with indented recesses** – refer to removal procedure in section 4.2
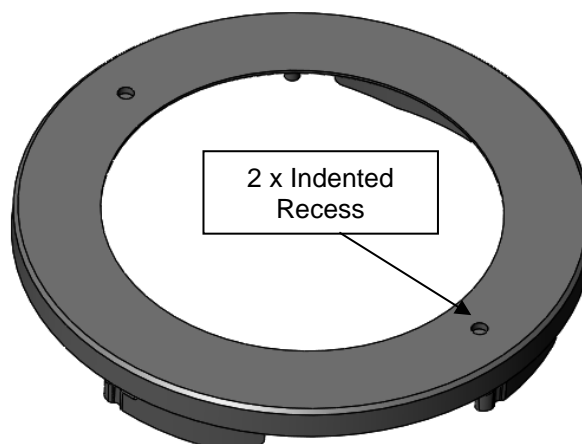
2 x Indented Recess

Figure 4 – Indented Recess Style

## 4.1. Removal Procedure – Raised Rib Style

- The raised ribs allow for purchase on the removable ring with either finger tips or nails. Using the ribs as leverage, twist the ring anti-clockwise. As the ring is rotated it will start to lift above the surface of the panel.
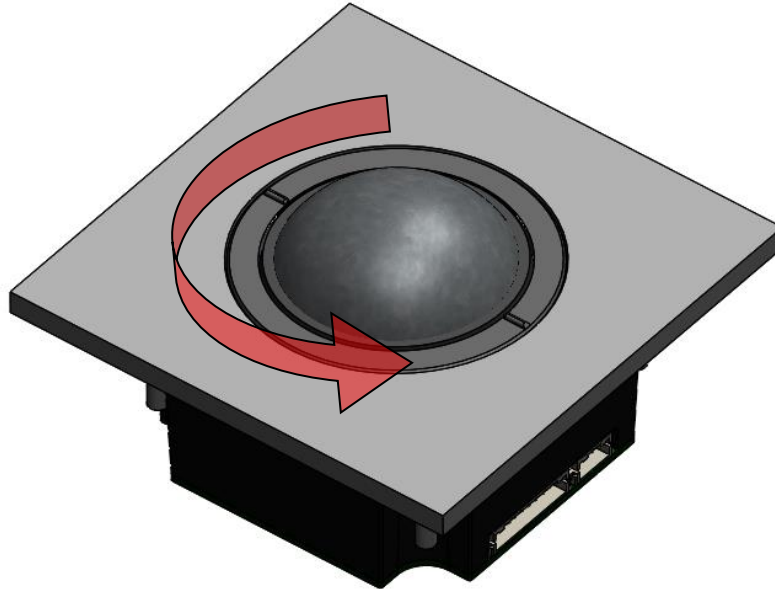


Figure 5 – Unlocking the removal ring

- Once the removable ring has been rotated and unlocked, use your fingers to carefully remove it from the module - see figure 6.
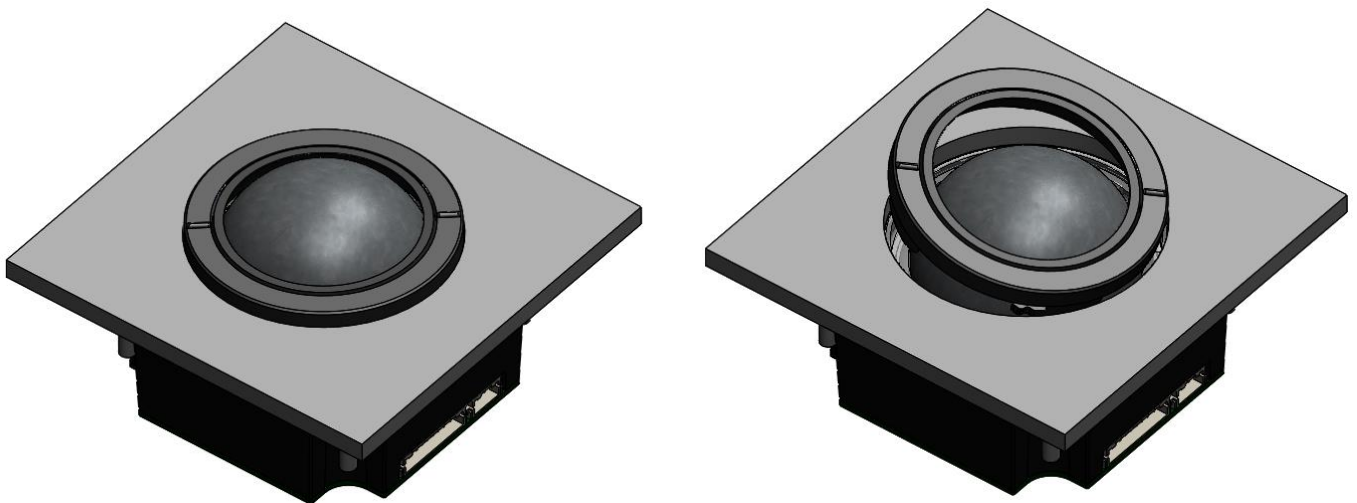


Figure 6 – Removing the ring

- Carefully lift the ball out of the transparent housing/cup and place to one side. Ensure that the ball is contained to avoid the possibility that it may roll and drop from a surface. This may damage the ball.

## 4.2. Removal Procedure – Indented Recess Style

- Insert the appropriate removal tool (supplied separately) into the removable ring location holes. Twist the removable ring anti-clockwise – as the tool is rotated the removable ring will rise above the panel - see figure 7.



Removal Tool
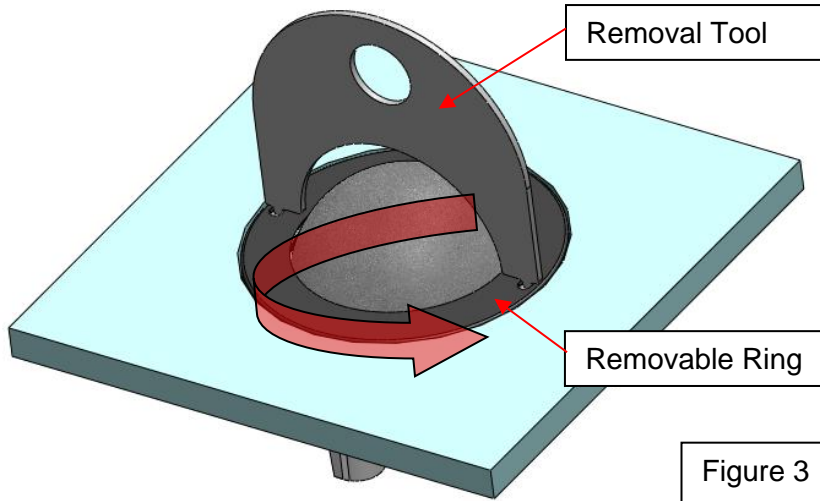
Removable Ring

Figure 3

Figure 7 – Unlocking the removal ring

- Alternatively, this process can be achieved by inserting any two blunt instruments into the location holes and rotating. A typical example would be using two ball point pens - see figure 8 below.
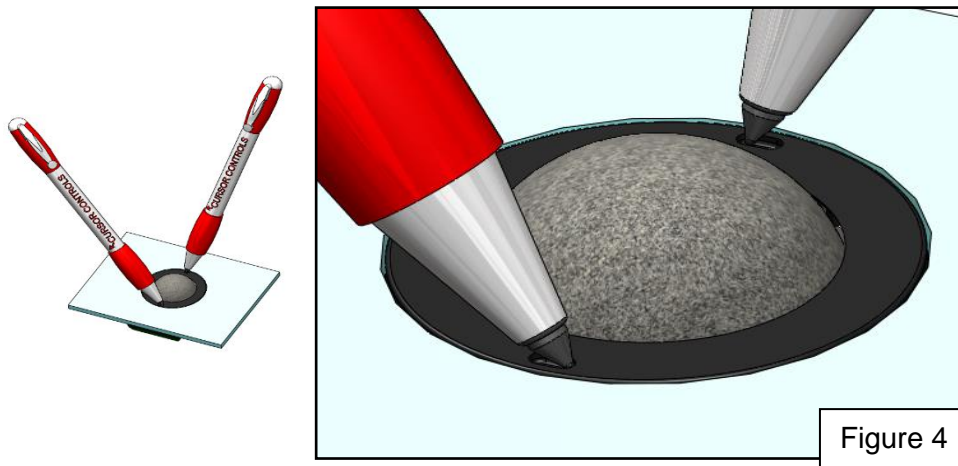


Figure 4

Figure 8 – Unlocking the removal ring – Alternative method

- Once the removable ring has been successfully rotated and unlocked, use your fingers to carefully remove it from the module - see figure 9.
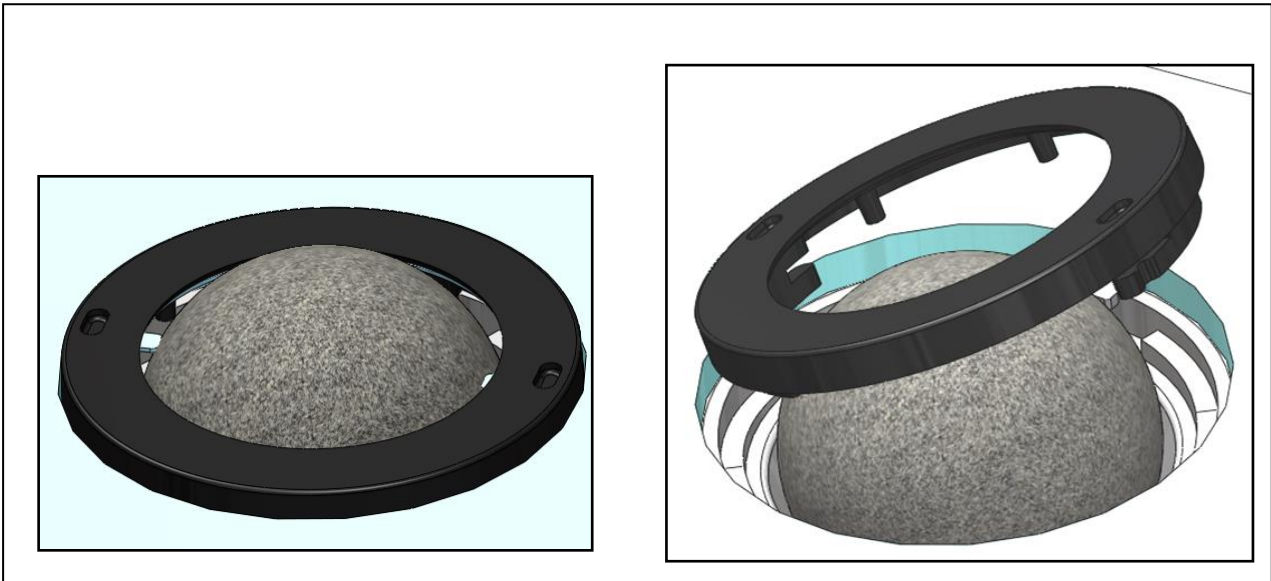


Figure 9 – Removing the ring

- Carefully lift the ball out of the transparent housing/cup and place to one side. Ensure that the ball is contained to avoid the possibility that it may roll and drop from a surface. This may damage the ball.

# 5. X-Range Trackball Cleaning Instructions

If the trackball is contaminated with particulates such as sand, grit or dust it is very important not to rub this contamination into the optically clear plastic lens located directly above the laser sensor - see figure 10. This is to prevent scratches which may impair the laser performance. The cleaning procedure for such contaminants is determined by the sealing rating of the keyboard/panel into which the module is integrated. Please see sections below for details.
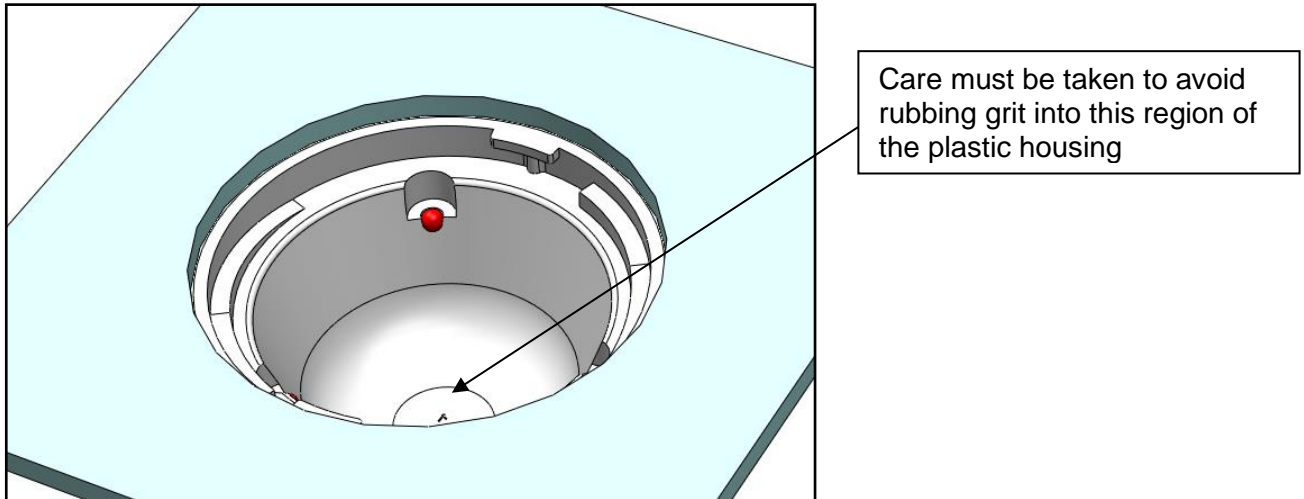


Care must be taken to avoid rubbing grit into this region of the plastic housing

Figure 10 – Lens area identification

### IP68 Keyboard/Panels

If the keyboard/panel assembly is rated to an IP67/68 level, decontamination is best achieved by flushing out the particulates with a cleaning fluid such as water or surface disinfectants (no solutions predominantly containing alcohol such as alcoholic rapid-action disinfectants)..
Apply a steady stream of the fluid until all the particulates have been washed out (application of fluid is at the user's discretion). Separately, clean both the ball and removable ring using the same method. Dry the device with a lint free cloth.

Alternatively, if a cleaning fluid is not available, the particulates may be removed using pressurized air (i.e. blown out).

### Non-sealed Trackballs

If the keyboard/panel assembly is not rated to an IP67/68 level, more care must be taken with the application of any cleaning solutions. In keyboards/panels such as this it may not be possible to flush out the contaminants as described in the procedure above. In this instance apply a small measure of cleaning fluid to a lint free cloth and gently wipe the bowl area of the trackball. Do not wipe the bowl area with a contaminated cloth and check that all streaks and marks have been removed.

## 6. Refitting the Top Plate and Ball

Once the components have been cleaned, replace the ball into the trackball module and relocate the removable ring into assembly. Use the same method as described for the removal of the ring to rotate the ring clockwise to engage the locking arms. A noticeable click should be felt when the removable ring is fully located. The location holes or ribs should also be aligned in the 12 and 6'o clock positions or the 3 and 9 o'clock positions depending on the users preference.

The servicing procedure is now complete.

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