

# Z-Deck

Stable platform for electrophysiology and neuroscience  
Manual Version 2.1



FM 61600

## Worldwide distribution

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The Z-Deck is a height adjustable platform, designed for neuroscientists and electrophysiologists. The Z-Deck is easy to install and use. Motorised manual and fixed stage versions of the Z-Deck are available. This manual will cover the motorised variants, since these are potentially the most complex to install. The Z-Deck has been successfully installed on both Olympus (BXWI and FVMPE-RS) and Nikon (FNI and Ni) systems and instructions for these microscopes are provided in this manual. For other microscopes, please contact Prior Scientific.

We hope and expect that the Z-Deck will prove to be a reliable and precise addition to your microscopy set up. Please do take the time to read both this manual and the ProScan III manual before using this product. If you have any question, suggestions or comments about this product please do not hesitate to contact Prior Scientific.

# SAFETY

## SECTION I

**READ AND UNDERSTAND THIS MANUAL THOROUGHLY BEFORE USE IN ORDER TO AVOID INJURY OR DAMAGE. RETAIN THIS MANUAL. IF YOU ARE UNSURE ABOUT ANY ASPECT OF INSTALLATION OR USE THEN CONTACT PRIOR SCIENTIFIC.**

- Make sure the system is installed so that the front panel power switch is easily accessible.
- **Do not attempt to disassemble the product. Doing so will void the warranty. This product does not contain user serviceable parts. All service should only be performed by Authorised Service Centres.**
- Do not use this product in a manner not specified in this manual without contacting Prior Scientific.
- Do not expose this unit to damp or wet conditions, excessive temperatures, dust, vibration, liquids, falling objects or open flames.
- Keep fingers, hands, clothes and hair clear of moving parts when it is operating.
- Note that the unit is heavy . Ensure that at least two people are involved in lifting,. Ensure all surfaces can support the weight!
- **Read and understand the ProScan III and, if applicable, the PS3J100 manual in addition to this one before using the Z-Deck. Important information about the operation of the Z-Deck is contained in these manuals.**

# UNPACKING THE Z-DECK

## SECTION 2

### 2.1 Introduction

To start the installation, open the shipping container(s) and carefully begin to unpack the contents. The Z deck is packed in a single box. The packed box is heavy and it is recommended that two people lift and carry the box into the area where installation will take place.

The Z Deck is shipped with the towers packed separately. Remove each component, and place it in a safe location. When the X-Y stage is unpacked, place on a large table area where it will be safe from damage. A layer of cardboard or bubble wrap should be used to protect the finish and the surface the Z Deck is placed on.

The components shipped with the Z Deck are described on the following pages. Note that this is a master list. Some components are only shipped on Olympus installations, and some components are only shipped on Nikon installations. Before commencing installation and set up, ensure that all the parts ordered are present (ensure that none have been discarded in the packing material). It is important to contact the distributor or Prior Scientific immediately if any parts are missing or damaged.

### 2.2 List of parts

- 1 x XY stage (665 x 315 mm; 13.5 kg)
- 4 x towers
- 2 x Encoder cables (*for encoder stages ONLY*)
- 1 x Adaptor for standard sample holders
- 1 x Universal sample holder
- 1 x Aluminium plate
- 2 x spacers to adjust sample holder height (if needed) (Olympus only)
- 4 x 10mm spacer pads
- 4 x 25 mm tower spacer pads (Nikon only)
- 8 x pedestal clamp (for use with optical tables OR 25 mm spacer pads)
- 8 x 50 mm mounting clamp for 25 mm spacer pads
- 1 x condenser extender for moving condenser up 30 mm (Olympus only)
- 2 x mounting adapter for Nikon NI installations (Nikon only)

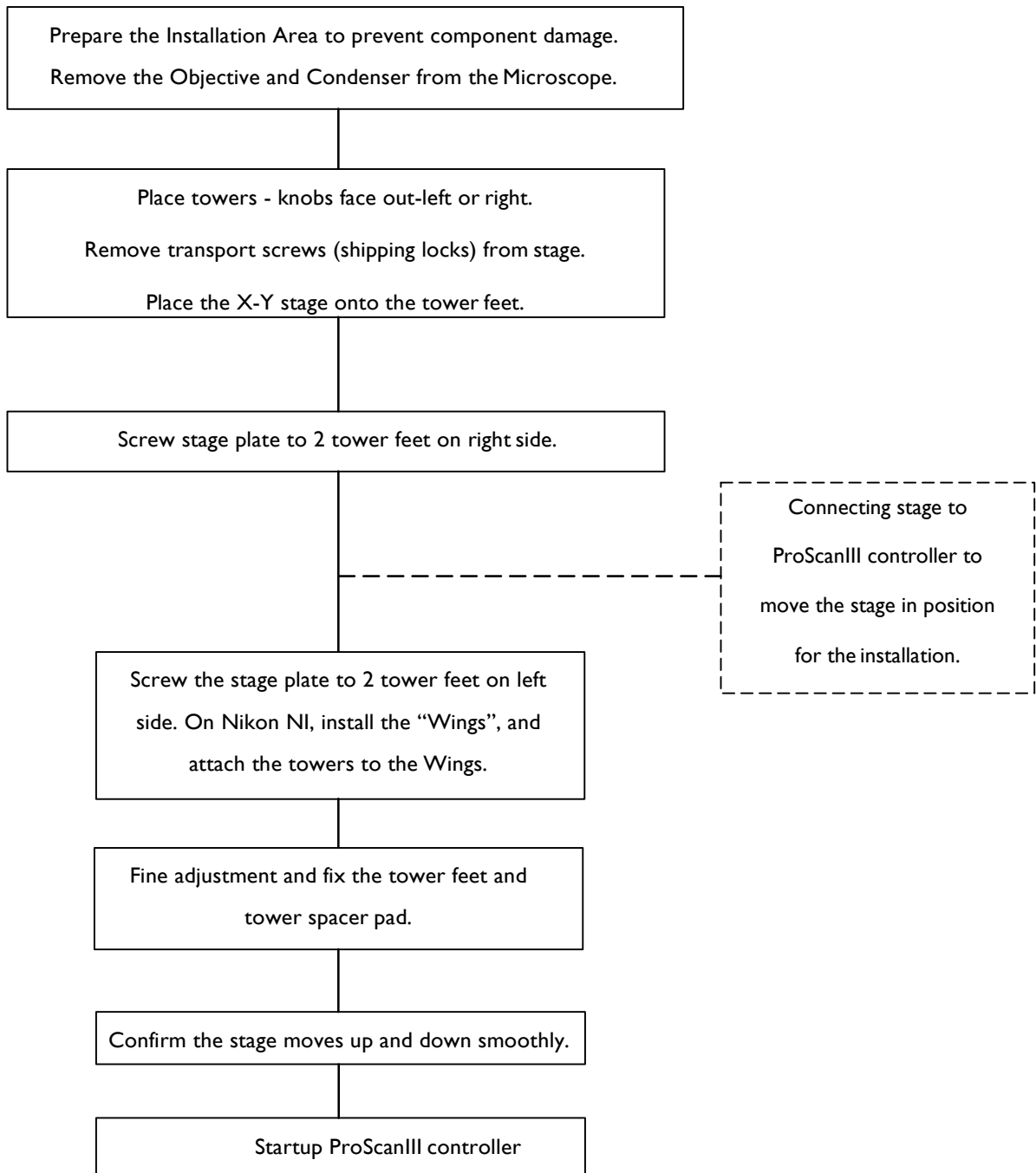
If you are unsure what you should have received contact Prior Scientific.

The separate ProScan III controller kit will usually contain:

- ProScan III controller
- PS3J100 interactive control centre
- Stage cable
- RS232 cable
- USB cable
- Power cable

**Note that operation and installation of the ProScan III is not covered in this manual.**

### 2.3 Installation flowchart



# PLACING THE XY STAGE ON THE TOWERS

## SECTION 3

### *3.1 Preparing for the Installation*

The first step in the installation is to attach the X-Y Stage to the Towers.

Before starting this procedure, please remove the condenser and the objective lens from the Microscope to avoid collision to Z-Deck parts, if this was not done previously

Place each of the four towers on any table (protect the table surface if needed), spaced out about the distance of the 4 corners of the Z Deck. The lock knobs should all face out, to the left or the right, so that they will be easy to access when the stage is installed on top of the posts.

Loosen the piston fixing screw of the tower foot, then turn the piston clockwise so that 2 holes on the piston are aligned front to back along the Y axis. For consistency, the socket head screw on one side of the Tower Post should have the head on the same side as the locking knob.

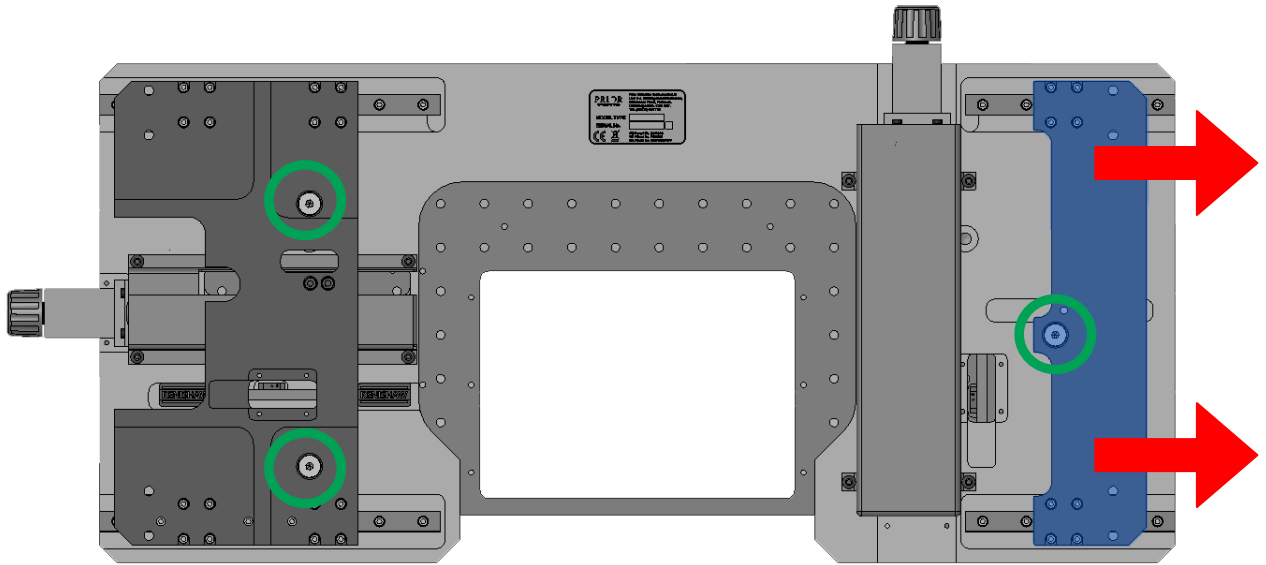
### *3.2 Fix the XY stage to the right tower posts*

Turn the Z Deck X-Y stage over, to see the underside.

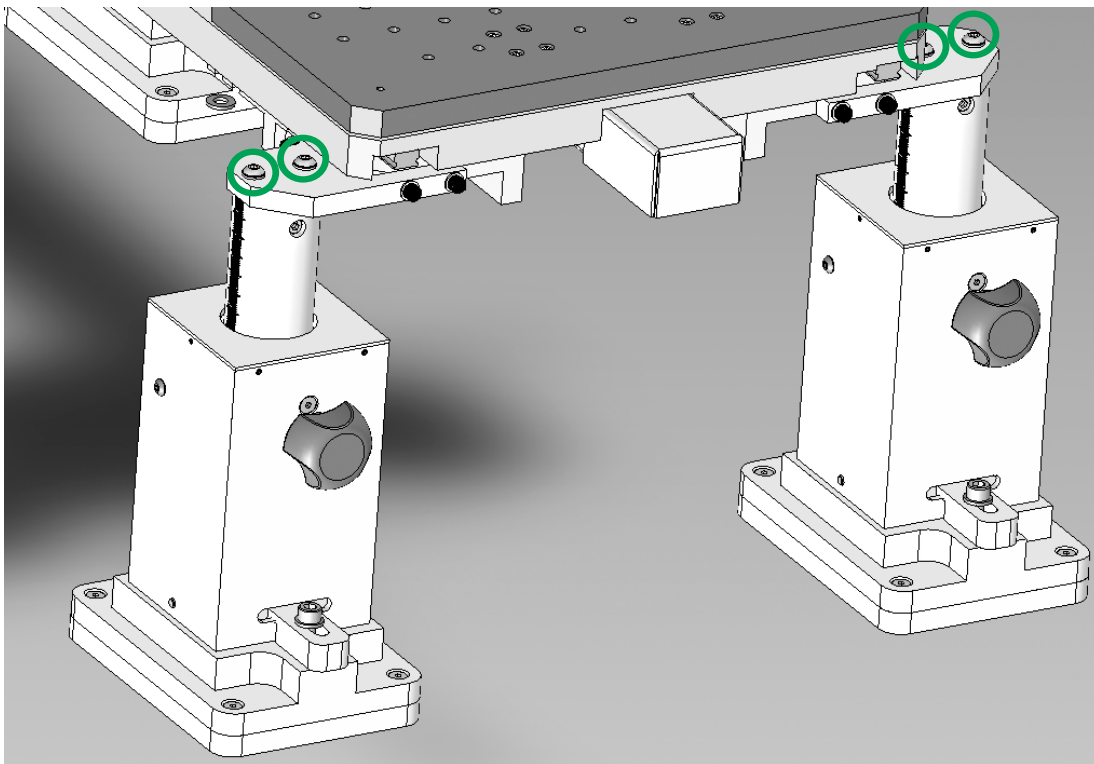
Remove the 3 transport screws (green circled) before attempting to move any parts. The position the stage is in at this point is called the 'Centre of Travel'.

Push the movable part on the right side (blue) over to the right (red arrow) to allow access to the tower mounting holes. Do not touch or try to move the left side for now.





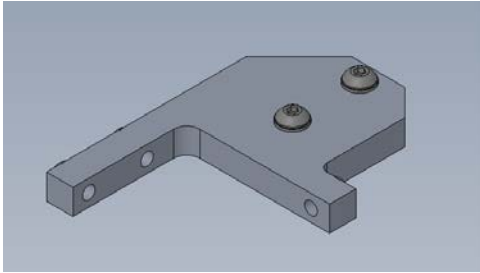
Fix the stage plate to the right tower feet by M5 x 14 button head screws and washers (green circle)



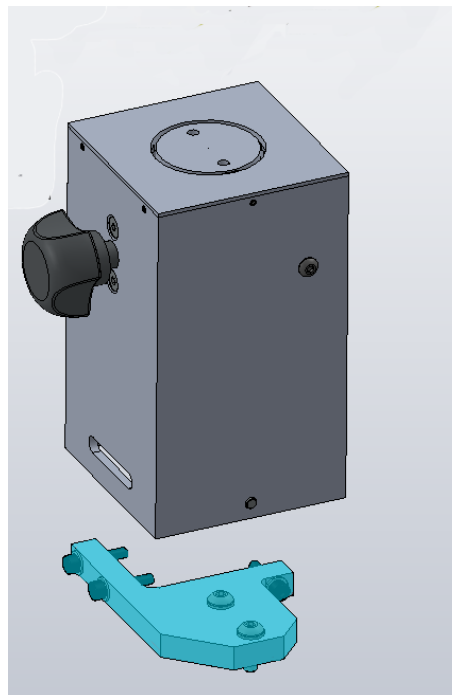
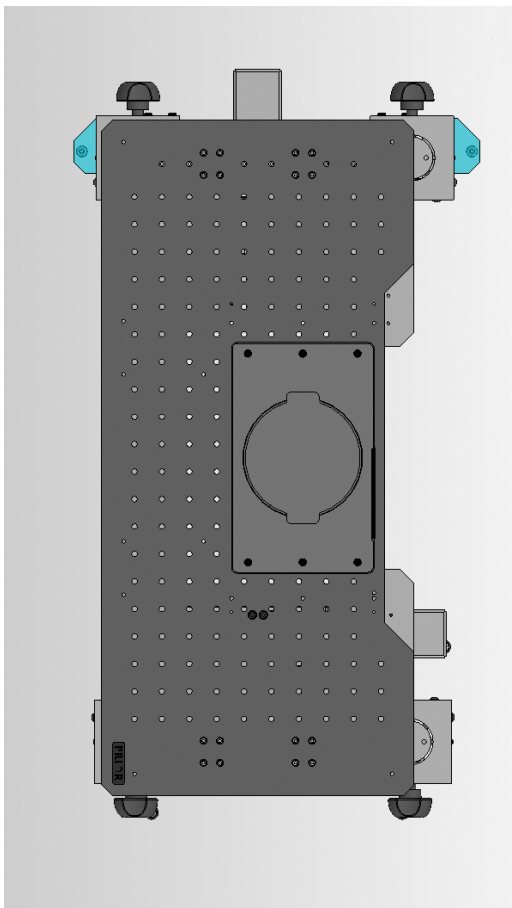
### 3.3 Fix the X-Y Stage to left tower posts:

#### 3.3.1 Nikon NI Installation Only:

On Prior Z Deck Kits for Nikon Microscopes, there are 2 pieces that are mounting adapters that are used on the left side of the Z Deck to space the towers further apart. These are used on installations for the Nikon NI Microscope.



If the installation you are doing is for the Nikon NI, install these adapters (blue) as shown in the models below, using the 6 M4 x 18mm long Socket Head Screws supplied with the Nikon installation kit.



These screw directly onto the bottom edges of the bottom plate on the left side only. They “fit around the corner”. (The Z Deck was designed to also allow their installation on the right side, but we have never seen an installation that required this.)

Once these adapters are installed (Nikon NI Installations only) you can attach the adapters to the Tower Posts, using the M5 x 18mm Long Button Head Screws in the Nikon kit, and skip the rest of this section.

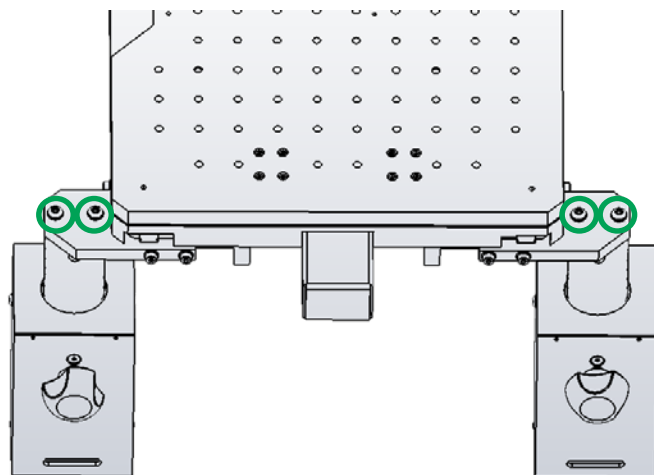
### 3.3.2 All installations other than Nikon Ni

To attach the X-Y stage to the left tower posts, we need to move the stage to the right side direction to expose the mounting holes. Please refer to Section 5 “Connect to Proscan III controller” to check how to control the stage with the ProScan III controller and joystick. The stage should only be moved with the controller, under power. Do not push it into position by hand.

**IMPORTANT: Never connect or disconnect electrical cables between the Proscan and the Stage when power is turned on. This will damage the Proscan Controller.**

Connect the stage to ProScan III and move the stage to right. To expose the threaded holes, you need to move the stage about 34mm to the right. After threaded holes are exposed, fix the X-Y Stage to the tower feet with the M3 x 14mm screws provided, and tighten securely (left). Once you have connected the Z Deck X-Y Stage to all 4 towers, you need to move the stage back in position so that the left side of the stage is back in the “Centre of Travel” position.

The “Centre of Travel” position is the position you started in, with the stage middle plate overhanging the stage bottom plate by 8mm or .325 inches on the left side. (This is also the position where the shipping transport screws would line up for installation. Do not reinstall those shipping transport screws, you just need to get back to this centred position.)



# INSTALLATING THE Z DECK ONTO AN OPTICAL TABLE

## SECTION 4

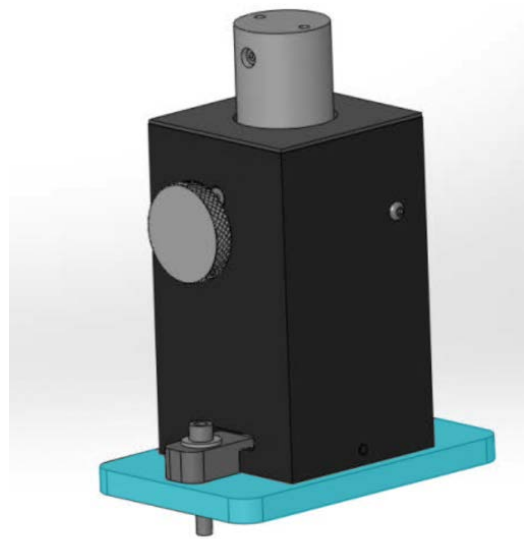
Place the tower spacer pads (if used) on the bench

### 4.1 Spacer Pads

To start the installation on the Microscope Optical Table, you need to determine what will be needed for the Tower Spacer Pads, if any. The following notes may be used as a general guide for the selection of the tower spacer pads. Installations are different, and customers have varying set-ups and sample mounting, so this is only a general guide. It will give you a good starting point, and in most cases, this is the spacing that you will work best for you. Once you have gone through the installation initially, you may need to come back to this step if additional height adjustments are needed to optimize your installation.

#### 4.1.1 Olympus Spacers

On Olympus installations, no spacer pad is typically needed unless the Microscope is installed on a mounting plate (the scope would be mounted to the mounting plate, and the plate would then be mounted to the optical table). The Olympus Mounting plate (left), when used, is typically 10mm thick, and this would require the use of the 10mm thick spacer pad, which is used under each tower for this type of installation. The 25mm thick spacers are typically not used on Olympus installations, and not included with Olympus kits.



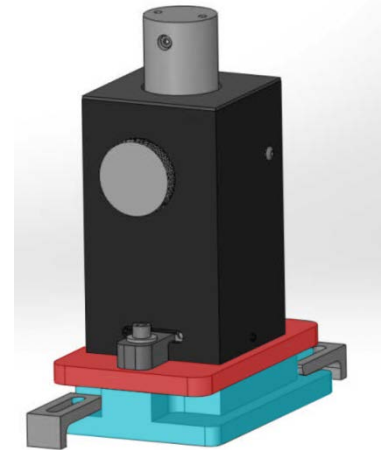
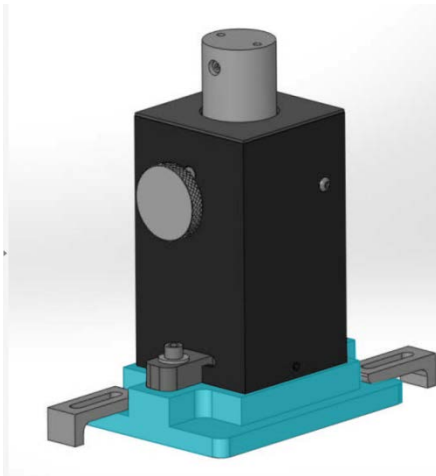
The Prior kit (for Olympus BXWI) is optimally designed to be used with the Olympus BXWI Elevator Kit that includes an extended objective bracket (40mm lift) and a binocular spacer (40mm lift). The “Extender Kit” supplied by Olympus may also include a condenser spacer (40 mm lift), which may or may not be used. Included with the Prior supplied Installation Kit for the Z Deck is a 30mm condenser spacer. The 30mm condenser spacer will provide more travel range than the 40mm Olympus spacer on systems that have forward detectors installed. In those systems, the condenser mount is typically lifted by about 13mm, to allow for the insertion of the forward detector mount below the condenser mount. This additional 13mm lift on those systems that have this feature will

require use of the shorter 30mm condenser spacer provided with this kit, to allow suitable travel range.

This kit may still be used on systems without these Olympus 40mm lift kits, although it won't have the same range of usable travel. If the lift kits are not used, you will find that this kit will still work, with the 30mm condenser spacer provided in the installation kit. When using the condenser, the objective will need to be positioned most of the way up, and the adjustable platform will be positioned almost as low as it can go without hitting the condenser mount.

#### 4.1.2 Nikon Spacers

On Nikon Installations, the 25mm Spacer Pad is typically used under each tower (below left). In some cases, using both the 25mm spacer and the 10mm spacer (below right).

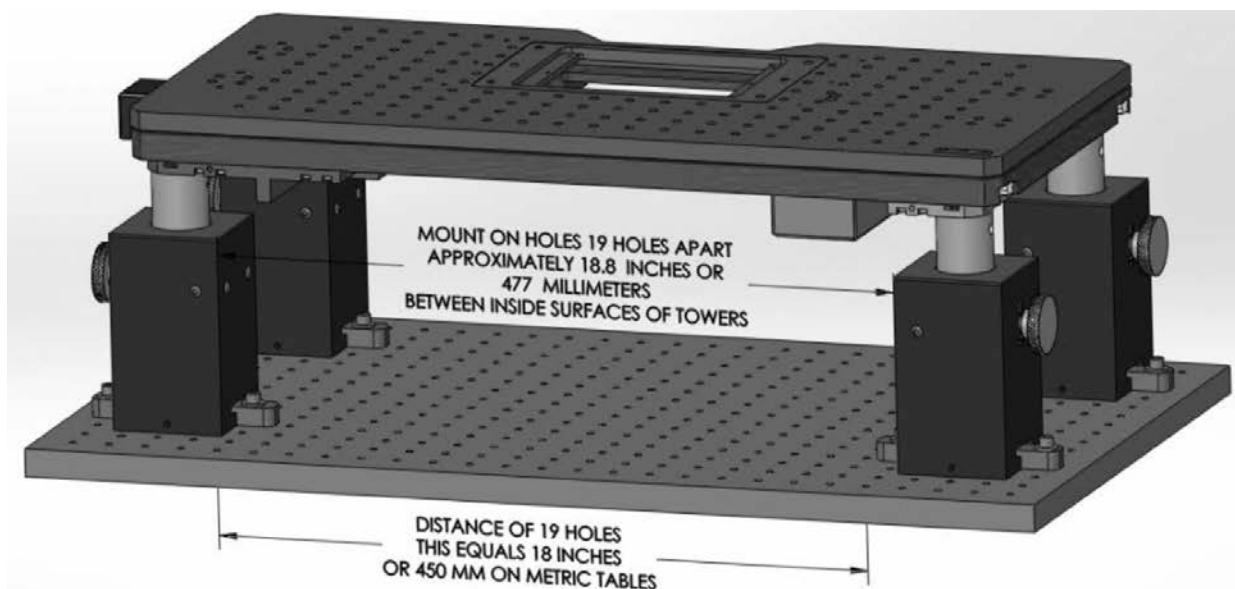


The 10mm spacer may be stacked on top of the 25mm spacer, as shown in the following diagrams.

#### 4.2 Continuing the Installation

Place the Z-Deck, with towers attached, onto the optical bench. The Z-Deck may be adjusted up or down as required. Centre the sample area of the Z-Deck approximately over the optical centreline of the microscope.

If these instructions have been followed the left “Drive” section of the Z-Deck has been set to the centre of travel. Move the right side bottom plate of the Z-Deck to position it so that the inside edges of the left and right towers are approximately 477 mm or 18.8 inches apart. The towers also need to be approximately centred on the hole pattern in the optical baseplate. There should be 19 holes (19 holes will be a distance of 450 mm or 18 inches) showing between the inside surfaces of the left and right side towers. The right side bottom plate of the Z-Deck is a bearing support only with the drive mechanism exclusively on the left hand side.



The right hand side floats and must be positioned as described above so that it will not limit the travel of the Z-Deck in the X Axis.

#### 4.3 Installing the Spacer Pads (if required)

Install the appropriate thickness spacing pads (described in the previous section) under the tower legs. Ensure that the range of height adjustment is suitable – make adjustment to the pad usage if required. Position the Z-Deck legs all the way down, or as far down as you can go in your installation, and lock the post locking screws

The Z-Deck system works on both metric and imperial spaced optical tables, and both metric and inch hardware is provided with the hardware kit included with the Z-Deck. The locking knobs should be positioned to the outside of the towers, facing left or right as previously described.

Hardware is provided in the installation hardware kit in both  $\frac{1}{4}$ -20 x 1 inch and 1.5 inch lengths, and in 6 mm x 25 mm and 35 mm lengths. The appropriate length bolts with flat washers should be used to attach the towers and spacers to the optical table.

### 4.3 Tower Spacing

#### 4.3.1 Tower spacing for Olympus microscopes

On the Olympus kits, the towers have less adjustment range than on the Nikon kits due to the clamping method used. On the Olympus installations, use the mounting holes that are 19 holes apart.

On inch spaced table surfaces the clamping bolts that mount through the tower clamps that face the inside (towards each other) should be offset closer to the towers (push the towers together in the clamps) using the imperial holes 18 inches apart. On metric installations, the bolts will go through the clamps further away from the towers (it may be required to push the towers apart) using the metric holes 450 mm apart. In both cases the holes should be 19 holes apart. By placing the clamping bolts in different positions depending on whether the table is spaced metrically or imperially, the difference in spacing between inch spaced and 25 mm spaced (or .984 inches) is compensated for. 19 inch spaced holes equal 18 inches on an imperial table, or 450 mm (17.72 inches) on a metric table, allowing the Z-Deck to fit to both.

#### 4.3.2 Tower spacing for Nikon microscopes

Nikon kits allow more adjustment so all that is needed is to position the towers so that they are close to the nominal distance apart (476 mm or 18.8 inches) between the two facing tower walls.

### 4.4 Final Adjustments

The tower mounting hardware should be tightened evenly. Ensure that the Z-Deck moves smoothly up and down.

For the final adjustment check that the Z-axis piston moves up and down smoothly. It may be the case that the four tower feet must be aligned for smoother movement.

Loosen the piston fixing knobs of the 4 tower feet and then move the stage plate up and down. The movement is assisted by gas springs which oppose rapid movement; a slow steady pressure is therefore best. If the stage does not move smoothly up and down go to the next step.

The design of the Z-Deck will self align left to right for the rear set of towers. If the movement is not smooth then the front towers need to be aligned to the spacing of the rear towers. To do this, loosen the mounting screws about one turn loose for the front towers only. Loosen the clamping knobs and move the Z-Deck up and down a few times. Position the Z-Deck as low as possible and tighten the knobs on the sides fo the towers. Now retighten the clamping screws that attach the Z-Deck to the Optical Base Plate.

If the vertical movement is not now smooth repeat the above process.



# CONNECTING TO A PROSCAN III CONTROLLER

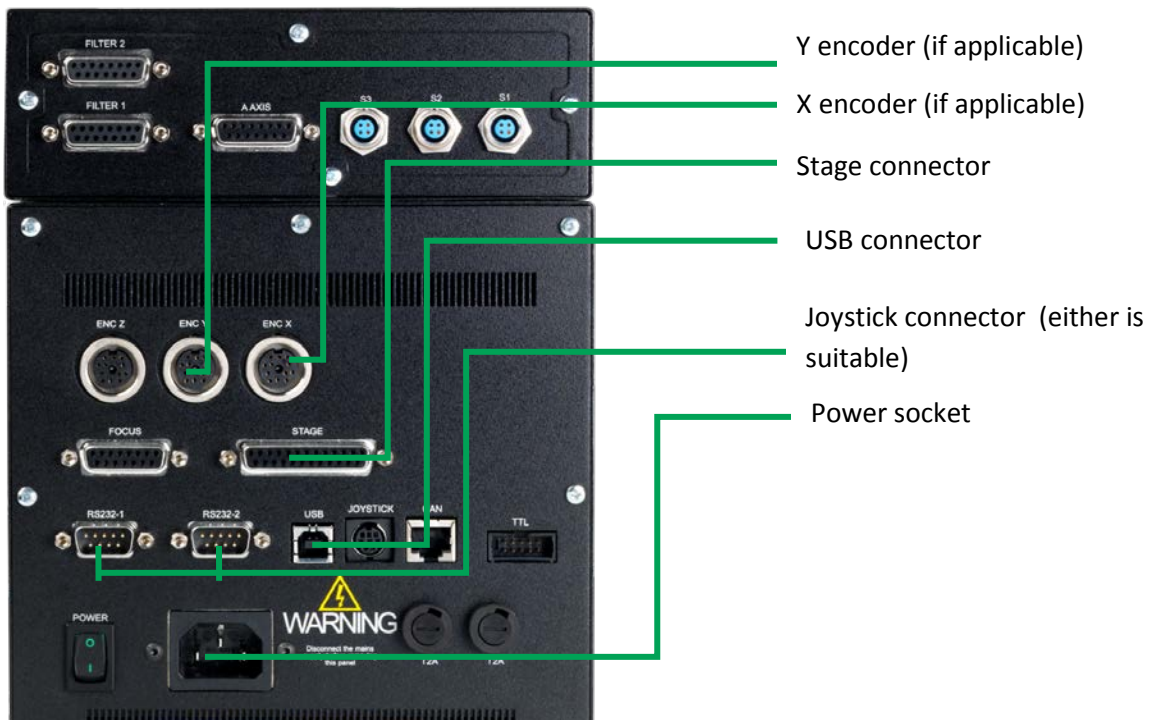
## SECTION 5

### 5.1 Connecting to the Controller

Note that this manual does not cover operation or installation of the ProScan III system. For that see the ProScan III manual.

Ensure that the ProScan III is not powered when components are (dis)connected.

Connect the stage cable to the connector on the back of the stage plate (circled).

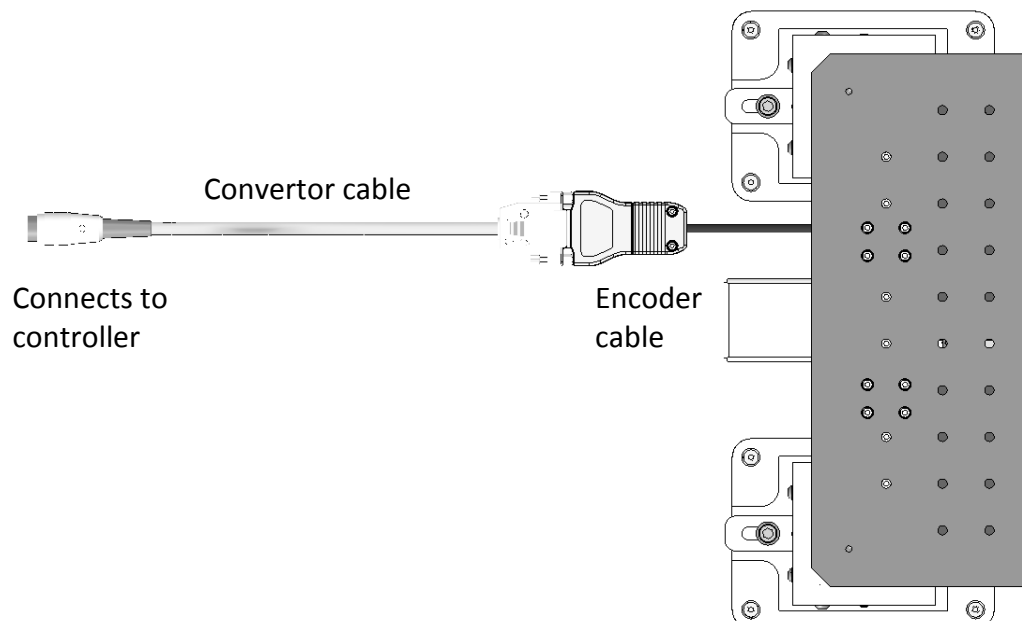
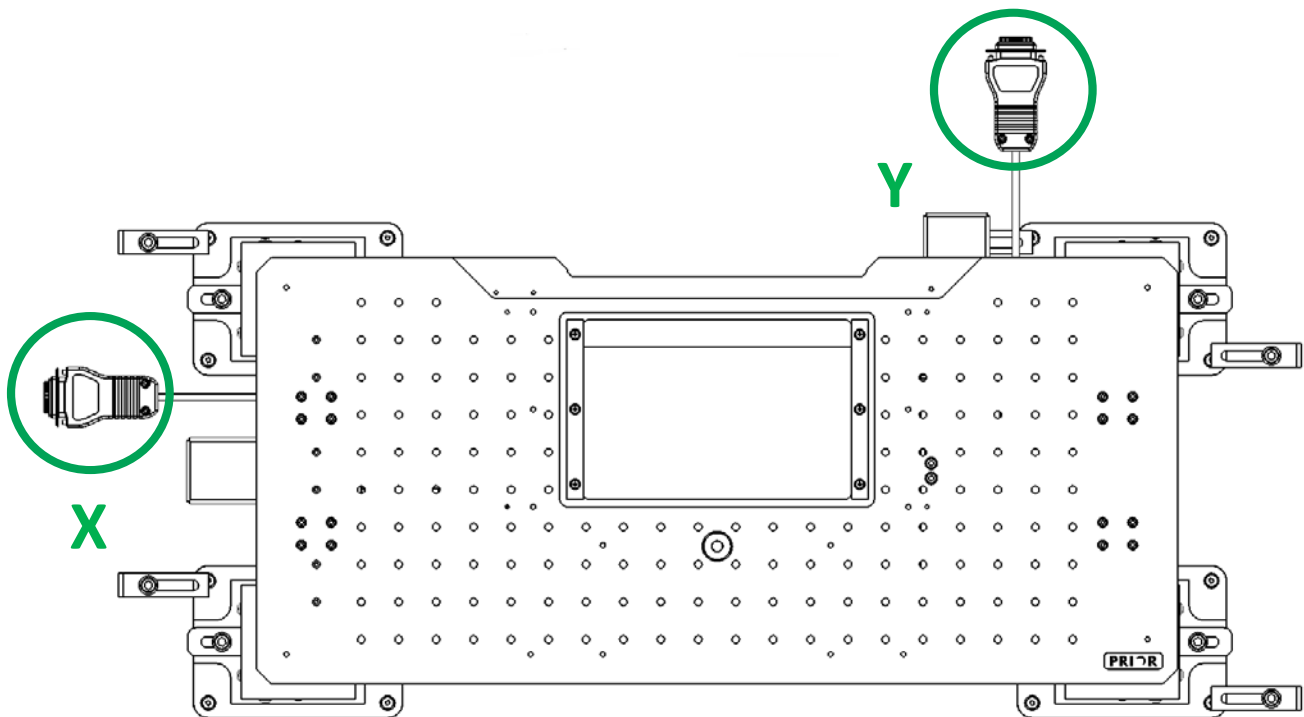


On the ProScan III, connect the cables to the correct connections.

### 5.2 Connecting the encoder cables.

Not all Z-Decks have encoded functionality. The encoder cables on the Z-Deck will NOT plug directly into the ProScan controller. Therefore conversion cables, which do connect to both the encoder cables and the ProScan controller are supplied.

Ensure that the X encoder cable is connected to the convertor cable which is plugged into the X encoder connector on the ProScan, and that the Y encoder cable is connected to the convertor cable which is plugged into the Y encoder connector.



### *5.3 Operating the Z-Deck via the ProScan controller*

Once the components are all installed then switch on the ProScan III.

For advice on controlling a stage via the ProScan III, the commands to be used, and using Prior software, consult the ProScan III manual.

If you are experiencing problems integrating the Z-Deck into non-Prior software then please consult Prior Scientific. However, please be aware that, due to the nature of such software, we may not be able to support the integration of the Z-Deck into such software and you may need to contact the software developer for more specialised enquiries, or for general help with using the software.

## Z-DECK VARIANTS

### SECTION 6

The manual Z-Decks are also available from Prior Scientific. The fixed Z-Deck has an immovable top plate, whilst the manual Z-Deck can be finely moved manually – ideal for applications where the stage must be moved but electrical noise must be kept to an absolute minimum.

The instructions for installing these variants are similar to the motorised one described above. Instructions for moving the stage via ProScan III, &c, should be ignored. However, the procedures for installing the towers and placing the Z-Deck on an optical table will remain similar between the three variants.

## RETURNS AND REPAIRS

### SECTION 7

If you experience any problems with the Z-Deck, contact your local distributor or Prior Scientific for advice and support.

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*S c i e n t i f i c*

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