

# Pulse Cios Navigation Quickstart Guide

This guide is intended to be used for Pulse as a refresher on how to quickly use the Navigation application. For additional support, please call the **Support Hotline: 877.963.8768**

## Setup

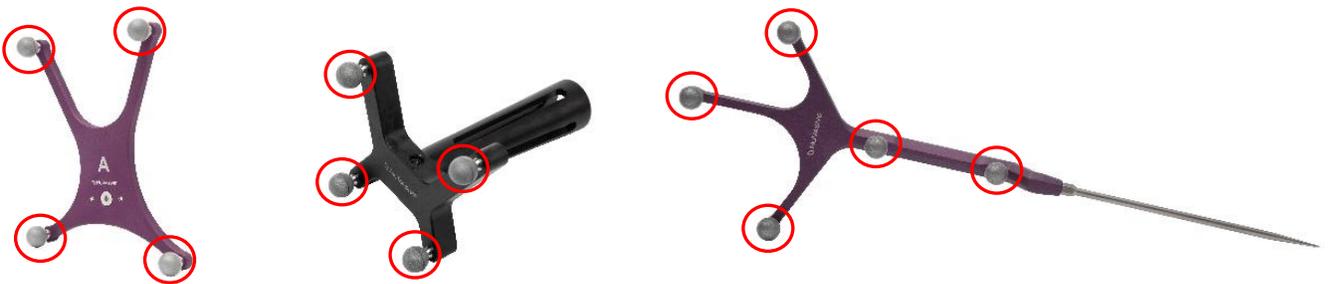
### Setting up Instruments and Array

*Performed by Scrub Tech (Sales rep to guide)*

1. Pull all instruments and arrays that the surgeon wishes to navigate.
  - a) *Note: this includes instruments with built in arrays (ie. Pointer), instruments with the nav lock component (ie. screwdriver), and hospital owned instruments (ie. Midas Rex).*
2. Pull a lettered instrument array for each navigation lock instrument that will be navigated.



3. Place new navigation spheres on the confirmation block and all the instruments and arrays to be navigated. (5050156)



4. Remove the sterile patient fiducial(s) that the surgeon wishes to use.
  1. PSIS pin is sterile packed (5050310 or 5050315)
    - a) *Note: PSIS pins are typically used for MIS lumbar cases up to L2*
    - b) *Use pin cap to mallet PSIS pin*



2. Spinous process clamps are in the Pulse tray (5050260 or 5050263)
  - a) *Note: Spinous process clamps are typically used for open and/or long construct cases*
  - b) *Suggested to use Counter Torque when placing spinous process clamp. Place using Hexalobe driver.*



5. Remove the sterile packed patient array(s) (5050401) using the patient array inserter tool from the Pulse tray.

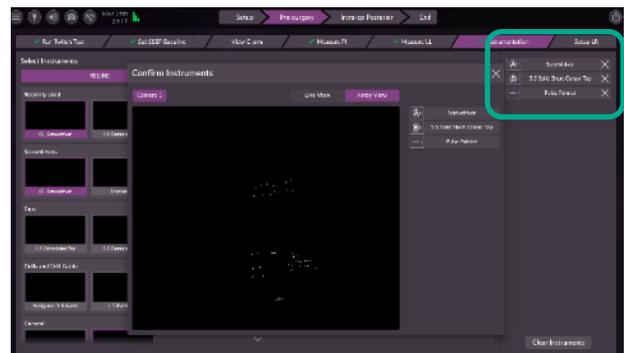


## Confirming Instruments

Completed by sales rep and scrub tech

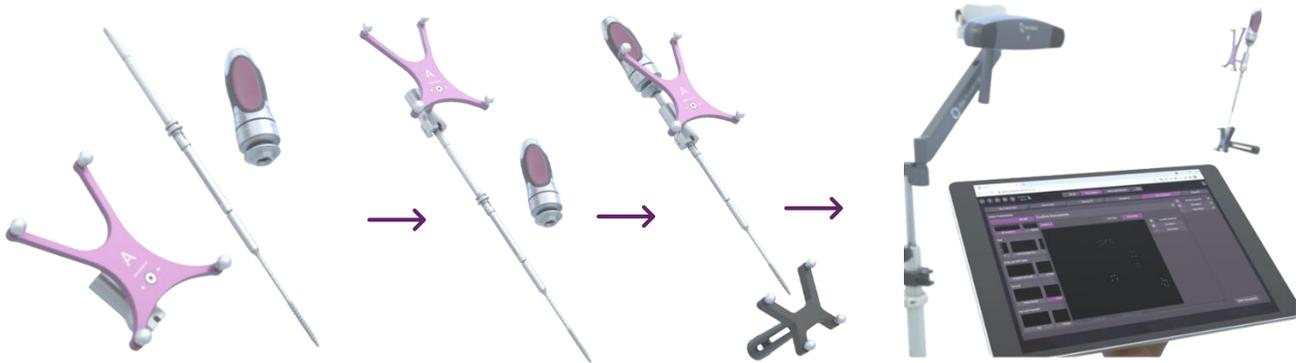
1. Move to the PRE-SURGERY stage of Pulse. Select the INSTRUMENTATION tab to open instrument selection and confirmation page.
  - a. *Note: During the INTRA-OP stage of the procedure, this page can be accessed by clicking the Instrument Icon  from the Navigation screen.*
2. Select the instruments the surgeon would like to use. Once the instruments are selected, they will appear in the right-hand column.
  - a. *Note: If your surgeon is using a screwdriver, attach a 45 mm screw (14mm screw for cervical) for the confirmation step.*

3. For instruments that require an attachable instrument array (A – E), tap the auto assigned letter from the right-hand column and assign the correct letter for the array that is on that instrument.



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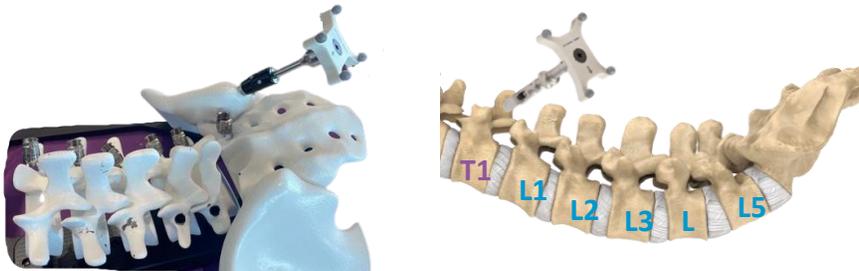
4. Once all instruments are selected and instrument arrays have been assigned, tap one of them to open the camera view.
5. Inform the scrub tech to put the distal tip of the first instrument into the divot on the confirmation block and show all navigation spheres to the camera simultaneously.
  - a. *Note: An audible noise will play, and the instrument will show as confirmed in the software. Repeat for all instruments that the surgeon wishes to navigate.*



### Placing the Patient Array and set up Registration

*Sales Rep to inform the surgeon*

1. Inform the surgeon to place the patient fiducial(s) of choice angled towards the camera

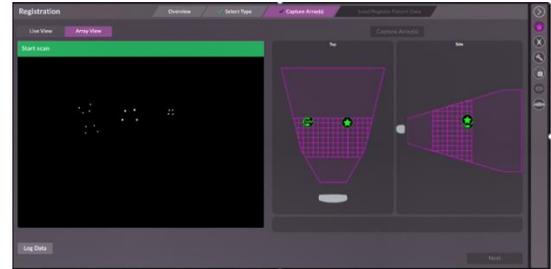


*Example: PSIS pin and spinous process clamp placed and angled 30 degrees toward the camera*

- a. *Note: **Multiple fiducials may be placed for longer construct.*** For Cios, it is recommended to place one patient fiducial per each ~5 thoracic/lumbar levels for Cios (the fiducial does not need to be in the scan).
2. Inform the surgeon to place the patient array(s) on the fiducial(s) using the patient array inserter
  3. Setup registration in software
    - a. Move to the INTRA-OP stage of Pulse. Use the top Navigation screen or tablet to register your 3D spin.
    - b. Select the REGISTRATION button from the right button panel on the Navigation screen.
    - c. Select to START A NEW REGISTRATION.
    - d. Select CIOS registration.
    - e. Ask a sterile staff member to drape the patient for a 3D scan while leaving the sterile patient array visible to the camera. (Note: if doing a multi-level registration, only have the array corresponding to the anatomy you are scanning being shown at a time. Cover other arrays with a 4x4.)

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4. Take scouting shots to ensure the anatomy to be navigated can be seen in AP and Lateral shots.
5. Inform the C-arm tech to setup for taking a 3D scan.
6. Inform the C-Arm tech to select NUVASIVE from the drop-down navigation menu on the CONFIGURATION tab on the Cios screen.
7. With the C-arm in the 3D scan start position, confirm the camera can see both the patient array and Cios array on the Navigation Screen. Once visible, the banner at the top of the Navigation Screen will appear green.
  - a. Note: A target volume grid will appear. Although not required to capture a 3D scan, it is recommended to have both arrays within the grid feature for optimized navigation accuracy.
8. Ask anesthesia if they are comfortable and ready to hold respiratory for the 60 second scan,
9. Inform the C-arm tech to complete the 3D scan after everyone leaves the room.
10. After the 3D scan has been completed, click READ FROM NETWORK on the Pulse screen. Once scan appears, select the scan, Select IMPORT STUDY, CONFIRM orientation, and COMPLETE REGISTRATION
  - a. Note: It may take up to 60 seconds for the scan to appear. Keep clicking Read from Network until it appears.
  - b. Note: If you are importing a second scan, make sure to wait until the second scan appears from the list with a (1) next to the name. If you import the first scan accidentally, you will have to re-spin.



## Intra-op Navigation

**Note: It is suggested to do the entire trajectory and screw planning from the tablet and not the Navigation monitor. To access the Navigation screen from a wireless device, click the  Teardrop icon on top right corner and then select NAVIGATION.**

## Top things to remember

Navigation inaccuracies can happen if navigation arrays are damaged or the patient array is bumped

- **Important:** ALWAYS have surgeon confirm navigation accuracy on known landmarks immediately after scan and before navigating (no matter what registration method is used)
- **Important:** Train OR staff to treat navigation arrays with care

## Navigation Views

1. By default, the axial and sagittal navigation views are selected. To change this, select the Layout icon  from the right column on the navigation screen.

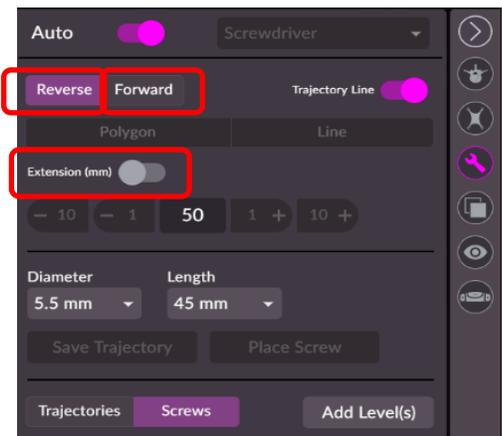
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2. Select/deselect views as necessary and then select APPLY LAYOUT TO WORKSPACE.
  - a. Common views include the DRR view, which appears like a static X-ray view.
  - b. *Note: When using the DRR view, one can rotate anatomy to get a different perspective. To do so, select the rotate button from the Eyeball icon  and manually rotate the view with two-finger touch.*

### On-the-fly Trajectory Planning

1. Select the Wrench icon  to open the Tool Panel on the navigation screen.
2. Click ADD LEVELS to select the levels that trajectories will be planned for.
3. Choose between a polygon, line, or template screw trajectory based on surgeon preference.
4. Adjust the diameter and length of the trajectory as necessary using the appropriate drop down.

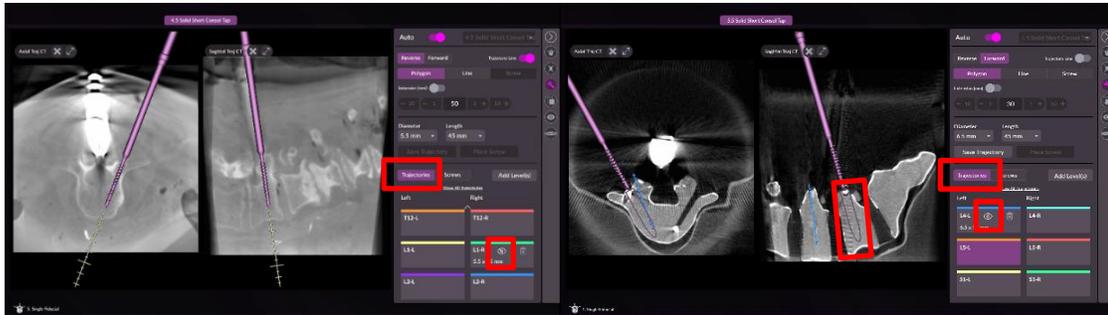
- a. Tip: Planning from the skin:
  - i. Select FORWARD trajectory and turn on the EXTENSION feature. The user may then move the extension by increments of 1 or 10 mm until the trajectory is lined up with the pedicle.
- b. Tip: Planning from the top of the pedicle:
  - i. Select FORWARD trajectory only (no extension)
- c. Tip: Planning from within the pedicle:
  - i. Select REVERSE trajectory
  - ii. *Note: it is suggested to use integrated neuromonitoring when the instrument is being inserted into the pedicle. The user will need a clip and insulated dilator for neuromonitoring.*



5. With the surgeon's instrument in view and the TRAJECTORY tab selected, click on the anatomical level the user would like to save the trajectory to, and click SAVE TRAJECTORY
  - a. *Note: If there is already a trajectory saved to that level, the user may click it and UPDATE TRAJECTORY*

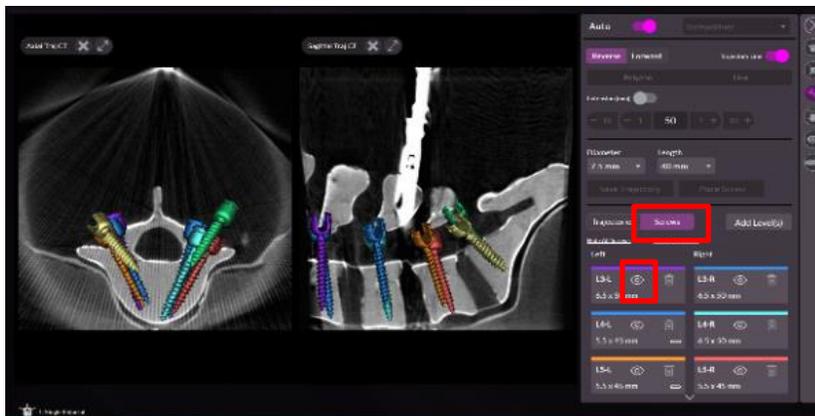


- Hide and show trajectories using the eyeball button on the anatomical level the user is working on as necessary if they are obstructing the surgeon's view.



### On-the-fly Screw Planning

- While on the TRAJECTORY page, show the trajectory for the level the surgeon is about to navigate.
- Select the SCREW tab of the planning section, and adjust the diameter and length of the screw on the screwdriver to be navigated
  - Note: The screw tab will auto select when the screwdriver is in view.
  - Note: It is suggested to use integrated neuromonitoring when the screw is being placed into the pedicle.
- With the screwdriver array in view and the screw fully seated in the pedicle, select the level and click PLACE SCREW to save the final screw placement.
- Hide and show screws using the eyeball button as necessary if they are obstructing the surgeon's view.



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