SIEMENS Healthineers

Atellica Solution

Adjustment
Atellica Immunoassay (IM) Analyzer

Sample Probe

Document Version

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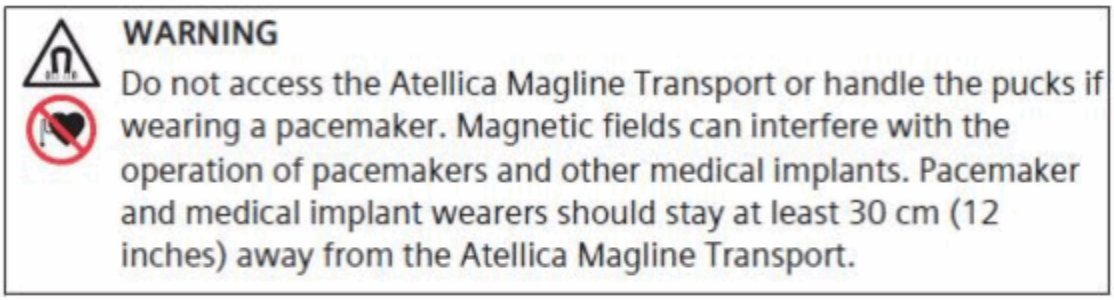
1.1 General Information

Read this procedure in its entirety before starting the alignment. For general safety information, refer to the Safety section of the Atellica Solution CB-DOC.

Fig. 1: Strong Magnetic Field / No Pacemakers Warning



WARNING

The probe tip is sharp and can cause skin punctures.

» Use care when working with the probe.

This document contains manual alignment procedures and a semi-automated alignment procedure.

For the semi-automated alignment procedure, refer to (→ Sample Probe Semi-Auto Alignments / Page 19).

2.1 Required Tools and Materials

Tools and Materials	Quantity
Inspection Mirror	1
Flashlight	1
Sample Probe Alignment Tool, SMN 11313416	1

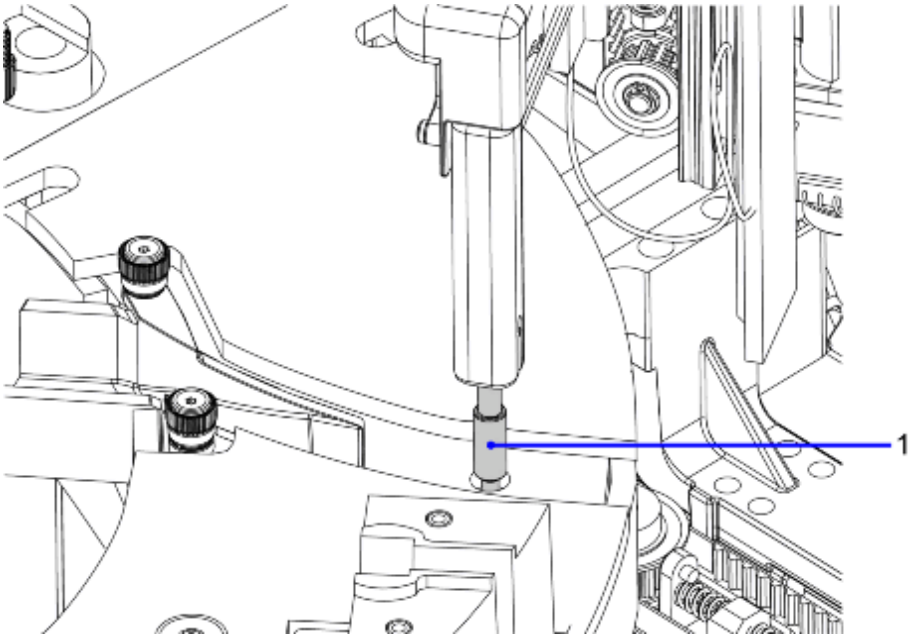
2.2 Sample Probe Mechanical Alignment Check Procedure

1. Disable the sample probe rotational and vertical amplifiers:

   a) Disable the Sample Probe Rotational Amplifier: In Service Utility UI, go to the **Execution** tab. Send the command: **SampleProbeRotationalAmplifierDisable**.

   b) Disable the Sample Probe Vertical Amplifier: In Service Utility UI, go to the **Execution** tab. Send the command: **SampleProbeVerticalAmplifierDisable**.

Fig. 2: Sample Probe to Outer Incubation Ring Mechanical Check



(1) Sample Probe

2. Check the Sample Probe to the Outer Incubation Ring Access Hole:

   a) By hand, exercise the Sample Probe on its rotational axis such that the Sample Probe plunger is directly above the Sample Probe Outer Incubation Ring Access Hole on the Incubation Ring Cover.

   b) By hand, exercise the Sample Probe on its vertical axis such that it travels in and out of the Incubation Ring Access Hole.

   c) Determine if the alignment passes or fails:

Pass	Fail
The Sample Probe plunger enters the Incubation Ring Access Hole with adequate clearance on all sides.	The Sample Probe does not have adequate clearance.

d) If the alignment fails, perform the (➔ Sample Probe Mechanical Coarse Alignment / Page 9).

Perform this procedure only if an expected result in the (➔ Sample Probe Mechanical Alignment Check Procedure / Page 7) is not met.

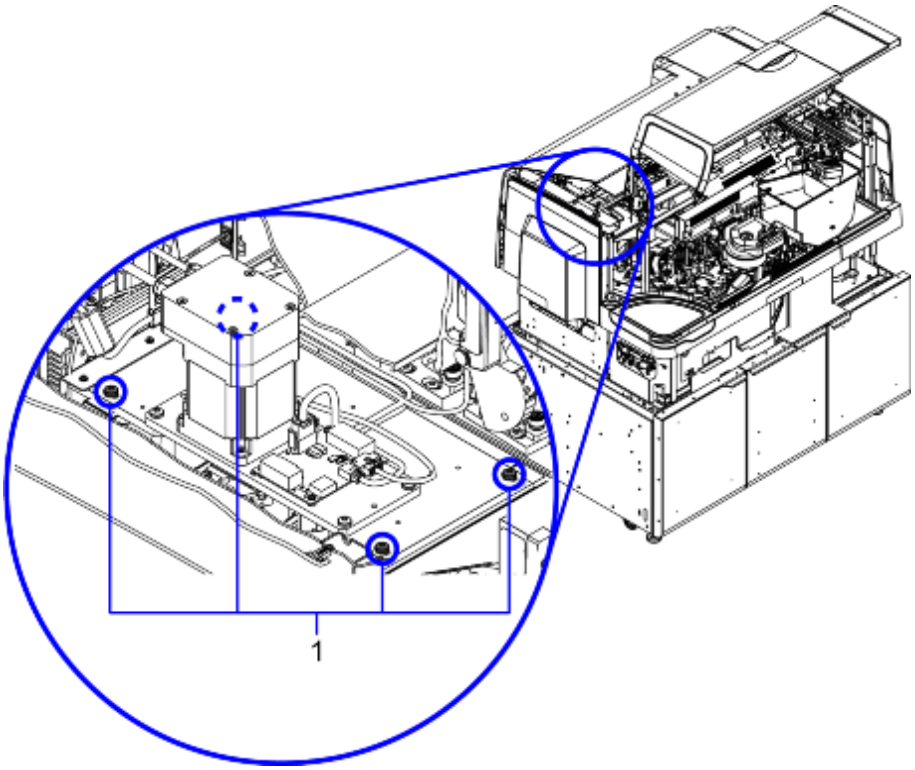
3.1 Required Tools and Materials

Tools and Materials	Quantity
T30 wrench	1

3.2 Sample Probe Mechanical Coarse Alignment Procedure

1. Perform the (➔ Sample Probe Mechanical Alignment Check Procedure / Page 7). Determine in which direction the Sample Probe Mechanism is not aligned, and plan accordingly before performing the following steps.
2. Use a T30 wrench to loosen 4 screws that fasten the Sample Probe Mounting Plate to the IM analyzer Upper Deck.

Fig. 3: Loosening the Sample Probe Mounting Plate

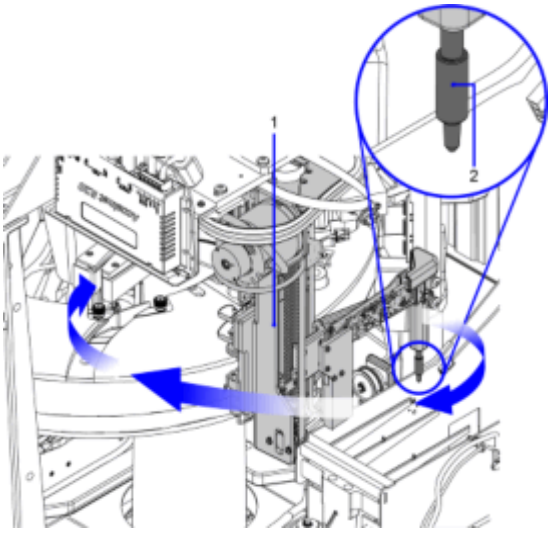


(1) Sample Probe Mounting Plate Screws

3. Slide the Sample Probe Mounting Plate and move the Sample Probe on its rotational axis until it hits the center of the Sample Probe Outer Incubation Ring Access Hole.

4. Use a T30 wrench to securely tighten 4 screws that fasten the Sample Probe Mounting Plate the IM analyzer Upper Deck.

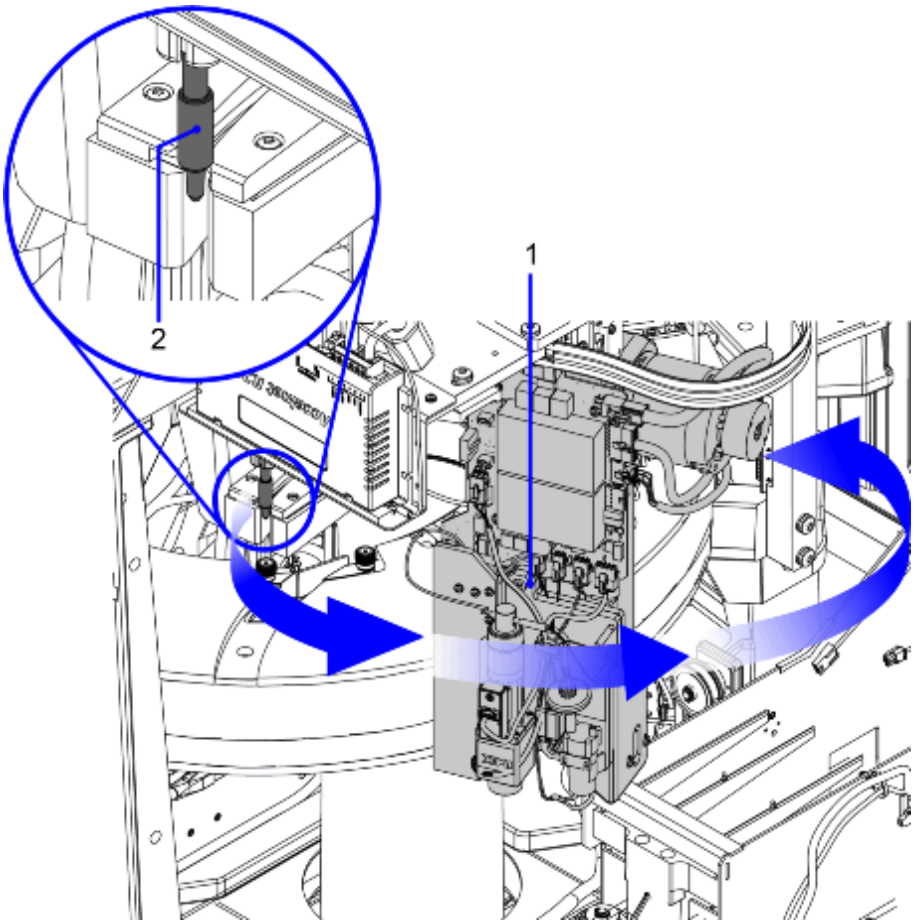
Fig. 4: Move the Sample Probe to the Center of the Outer Incubation Ring



(1) Sample Probe Assembly
(2) Sample Probe

After adjusting the sample probe mounting plate, ensure that the sample probe is at its full rotational range of motion.

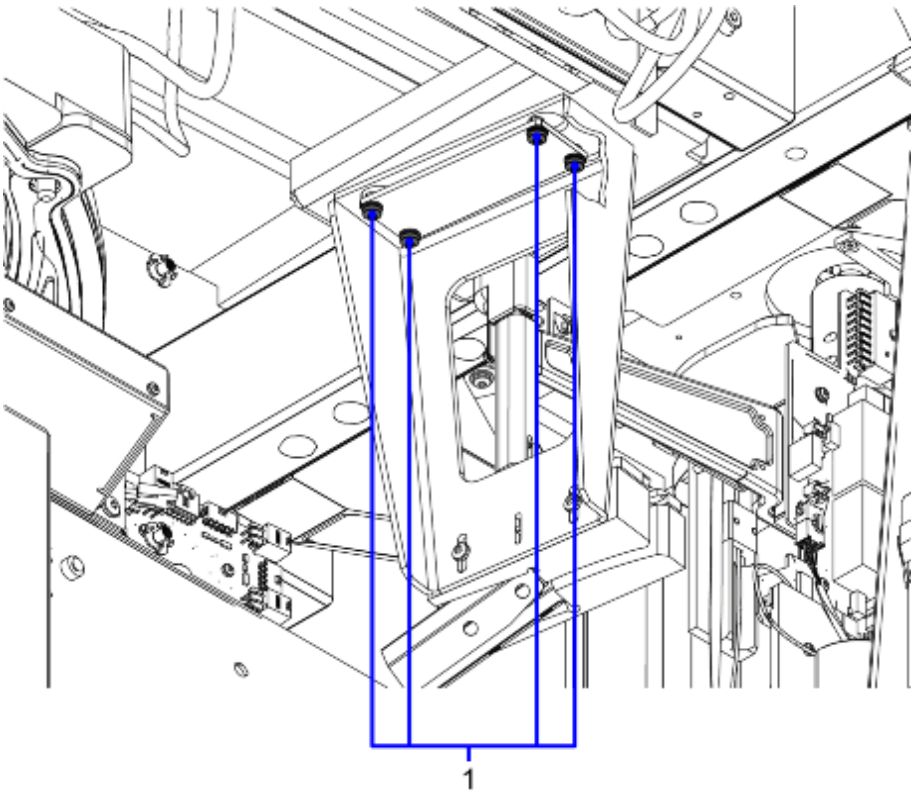
Fig. 5: Sample Probe has Full Range of Motion



(1) Sample Probe Assembly
(2) Sample Probe

1. Using a T20 driver, loosen four wedge bracket screws by a quarter turn or as necessary to be able to move the bracket in the theta direction without motion in the Z.

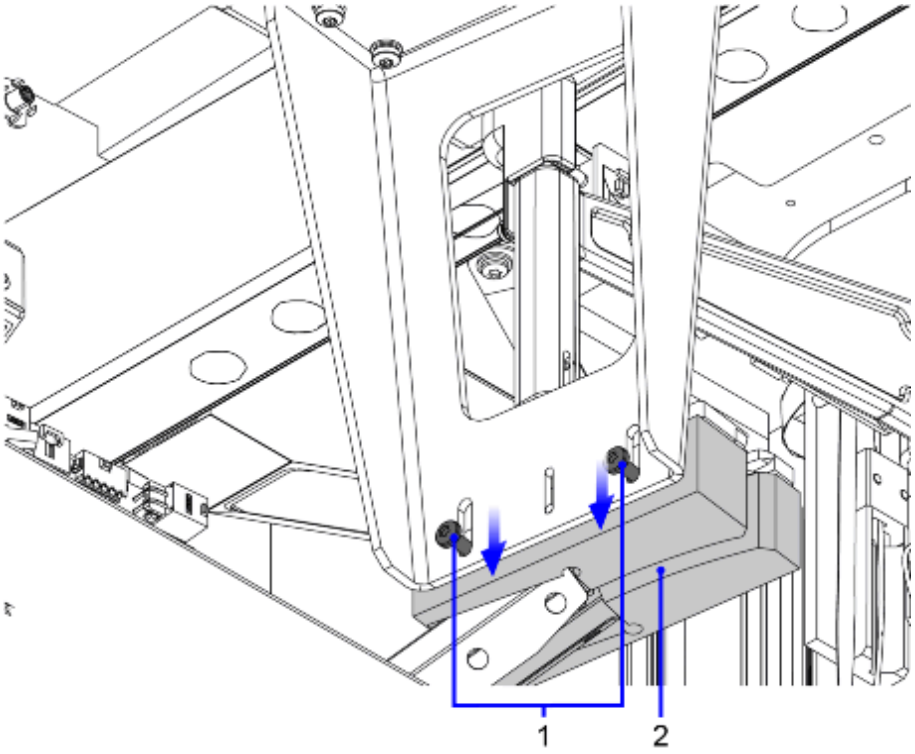
Fig. 6: Wedge Bracket Screws



(1) Bracket Screws

2. Lower the theta wedge height by loosening the two screws so that the wedge is at its lowest vertical position.

Fig. 7: Adusting the Theta Wedge Height

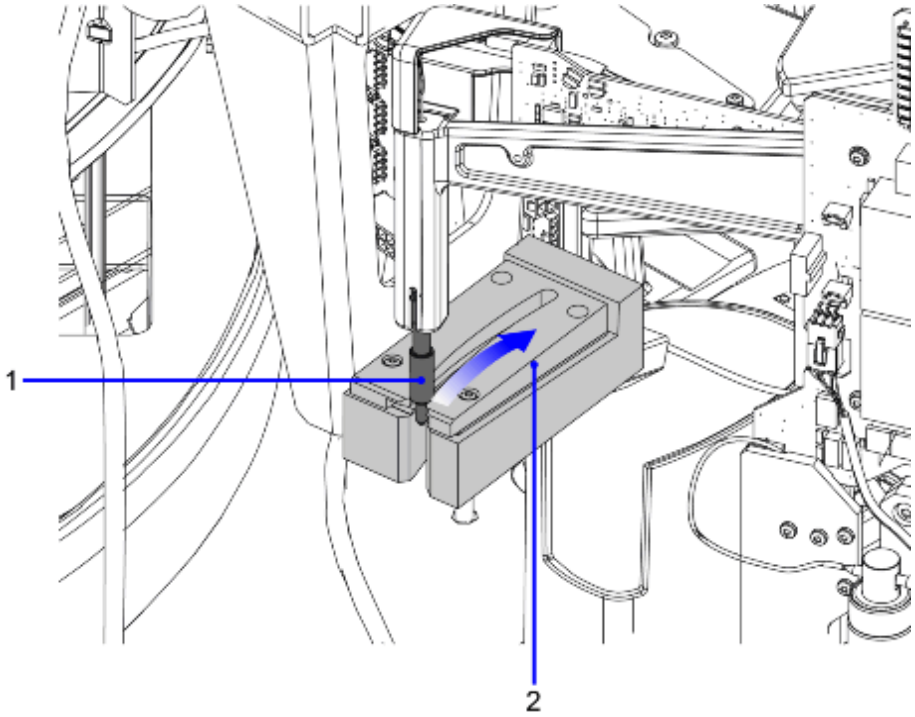


(1) Adjustment Screws (x2)
(2) Lowest Vertical Position

3. Move the Sample Probe plunger into the theta wedge, Adjust the theta wedge so that the sample probe plunger can reach the back wall of the theta wedge.
4. Confirm that there is no mechanical interference between the sample plunger and the Theta Wedge. Check that there is visible clearance on both sides while the plunger is

engaged in the Wedge slot (centered in the slot); clearance must be consistent from the beginning to the end of the slot.

Fig. 8: No Mechanical Interference Between the Sample Plunger and the Theta Wedge



(1) Sample Probe
(2) Theta Wedge

5. Perform the vertical software move to align the theta wedge to the plunger:
   a) Navigate to the **Execution** tab of the Service Utility.
   b) Home the Sample Probe Vertically using the **SP_VerHome** sequence.
   c) Navigate to the **Alignments** tab of the Service Utility.
   d) Under Manual Alignments, select Sample Probe and then select the **SP Vertical Tip Pre Eject Offset** and click **Run**. This will lower the probe by -22 counts.
6. Raise the theta wedge and adjust vertically until the sample probe plunger is making minimal contact with the top surface of the wedge throughout the arc of the wedge. Tighten the two screws from step 2.

4.1 Rotational Alignment Sample Probe to the Theta Wedge Pre-Eject Position

Ensure the Theta Wedge mechanical adjustment (➔ Sample Probe Theta Wedge Mechanical Alignment Procedure / Page 14) has been performed.

1. Home the Sample Probe:
   a) In the **Service Utility UI**, select the **Execution** tab.
   b) In the first filter, click **Sequence**.
   c) Type **Home** in the first column.
   d) In the second column, find the sequence **SP_VerHome** and click **Send**.
   e) In the second filter, click **Sequence**.
   f) Type **Home** in the first column.
   g) In the second column, find the sequence **SP_RotationalHome** and click **Send**.
2. Send the Sample Probe Rotationally to the Theta Wedge Pre-Eject Position:
   a) In the Service Utility UI, navigate to the **Alignments** tab and click the **Manual Alignment** tab.
   b) In the left column, select **Sample Probe** and then select **SP Rotational Tip Pre Eject Nominal** and then click **Run**.
   c) If the Sample Probe is rotationally inside the Theta Wedge, using the Sample Probe Rotational Tip Pre Eject Nominal alignment, move the Sample Probe Rotationally Counter-Clockwise to move the probe completely out of the Theta Wedge (by at least 4mm).
3. Move the Sample Probe Vertically Down to the Alignment Position:
   a) In Service Utility UI, navigate to the **Execution** tab:
   b) Send the following commands, in the order as they appear below:
      - SampleProbeVerticalClearStartMoveBit
      - SampleProbeVerticalSetTargetPosition. Set this parameter to **-2000**
      - SampleProbeVerticalStartAbsoluteMove

   This will move the probe down vertically so that the plunger collar would hit the wedge entrance if rotationally moved.
4. Perform the Rotational Alignment of Sample Probe to Theta Wedge Pre-Eject position with 2mm Gauge Block:

This alignment will also align the Sample Probe rotationally to the Sample Probe Tip Post-Eject Slot in the Theta Wedge via a calculation in the software.

   a) Hold 2 mm gauge block so that the surface of the gauge block is flush with the entrance surface of the theta wedge.

b) In the **Alignments** tab, adjust the **SP Rotational Tip Pre Eject Nominal** rotationally clockwise towards the 2 mm gauge block being held at the entrance of the Theta Wedge.

c) Record the step count at the point in which the plunger collar touches the 2 mm gauge block such that the gauge is held in place.

d) Using small steps, and with your hand under the gauge, move the sample probe counter-clockwise until the gauge falls into your hand. Record the value.

e) Find the average of the two values recorded in steps 5 c and d and record.

f) Vertically home the Sample Probe once the average rotational count from step e has been recorded.

   i) Navigate back to the **Execution** tab in the 'Service Utility UI'.

   ii) In the first filter, click **Sequence**.

   iii) Type **Home** in the first column.

   iv) In the second column, find the sequence **SP_VerHome** and then click **Send**.

g) Add **403** to the count recorded in step e and set the **SP Rotational Tip Pre Eject Nominal** to this new number.

   For example, if the value recorded in step 5 e is -1016, -1016 + 403 = -613.

h) Press **Save** to save this alignment position.

If this procedure fails, perform the manual alignment procedure in the “Sample Probe Alignments” section, (➔ Sample Probe Alignments / Page 22).

5.1 Sample Probe Semi-Auto Alignment Required Tools and Materials

Tools and Materials	Quantity
Sample Probe Semi-auto Alignment Tool, SMN 11313494	1
Phillips screwdriver	1

5.2 Sample Probe Semi-Auto Alignment Procedure

1. Home the Sample Probe:
   a) On the left, select the **Miscellaneous** tab.
   b) Select the **Home_SP** sequence and then click **Send**.
2. Select **Sample Probe Rotational Outer Nominal** and then set the Current Offset to **-1650**.
3. Select **Semi-Auto Alignment** and then **Sample Probe**.
4. Click **Start Alignment**.
5. Click **OK**.
6. Install the Sample Probe Alignment Tool onto the Sample Probe:
   a) Slide the Sample Probe Alignment Tool as far up as possible on the Sample Probe.
   b) Using a Phillips screwdriver, securely fasten the tool to the sample probe.

> **WARNING**
>
> **Tighten the lock screw with a light touch to not damage the Sample Probe.**
>
> » **Tighten the lock screw with a light touch to not damage the Sample Probe, but enough that the tool will not move when the probe is exercised.**

7. When the Sample Probe Alignment Tool is attached, click **OK**.
   » The semi-automated alignment will start.
8. When the semi-automated alignment has successfully finished, remove the sample probe alignment tool.
9. Click **OK**.

6.1 Sample Probe Alignment Required Tools and Materials

Tools and Materials	Quantity
T20 driver	1
Incubation Ring Cuvette Alignment Tool	1
Sample Probe Alignment Tool, SMN 11313416	1
Medium-sized flat head screw driver	1
Sample Tip	1
Empty Tip Tray	1

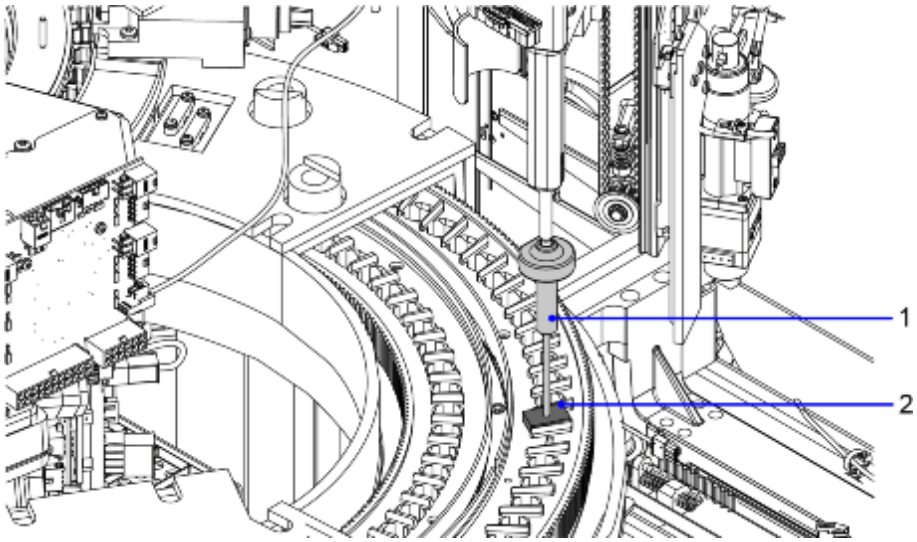
6.2 Sample Probe Alignment Procedure

6.2.1 Manual Rotational Alignment Sample Probe to Outer Incubation Ring

Perform this procedure if the semi-auto alignment is not successful.

1. Remove the Cuvette Channel (if it has not already been done). Refer to (➔ Remove the Cuvette Channel / LDAT-030.841.04).
2. Place the Incubation Ring Cuvette Alignment Tool in the Incubation Ring Position 1:
   a) From **Service Utility UI**,select the **Execution** tab.
   b) In the first filter, click **Command**.
   c) Type **Disable** in the first column.
   d) In the second column, find the command **IncubationOuterRingAmplifierDisable** and then click **Send**.
   e) Remove the Incubation Ring Sample Probe Cover (if it has not already been done). Refer to (➔ Remove the Incubation Ring Sample Probe Cover / LDAT-030.842.04).
   f) Move the Outer Incubation Ring by hand until you see Position 90.

Fig. 9: Sample Probe Rotationally Aligned to the Incubation Ring



(1) Sample Probe Alignment Tool
(2) Outer Incubation Ring Position 90

   g) Place the Cuvette Alignment Tool in Position 1, which is one slot counter-clockwise from the Blank Slot.

3. Install the Sample Probe Alignment Tool onto the Sample Probe:

   a) Disable the **Sample Probe Rotational Amplifier**:
   In **Service Utility UI**, go to the **Execution** tab.
   Send the Command: **SampleProbeRotationalAmplifierDisable**.
   b) Slide the Sample Probe Alignment Tool as far up as possible on the Sample Probe.
   c) Tighten the lock screw on the tool with a light touch so as not to damage the sample probe plunger.

WARNING

Tighten the lock screw with a light touch to not damage the Sample Probe.

» **Tighten the lock screw with a light touch to not damage the Sample Probe, but enough that the tool will not move when the probe is exercised.**

4. Home the Sample Probe and Incubation Ring:

   a) From **Service Utility UI**, go to the **Execution** tab.
   b) In the first filter, click **Sequence**.
   c) Type **Home** in the first column.
   d) In the second column, find the sequence **SP_VerHome** and click **Send**.
   e) In the second filter, click **Sequence**.
   f) Type **Home** in the first column.
   g) In the second column, find the sequence **SP_RotationalHome** and click **Send**.
   h) In the third filter, click **Sequence**.
   i) Type **Home** in the first column.
   j) In the second column, find the sequence **Home_IncOuterRing** and click **Send**.

If you move any probe rotationally or horizontally, you must home it vertically first.

5. Send the Sample Probe Rotationally to the Incubation Ring:

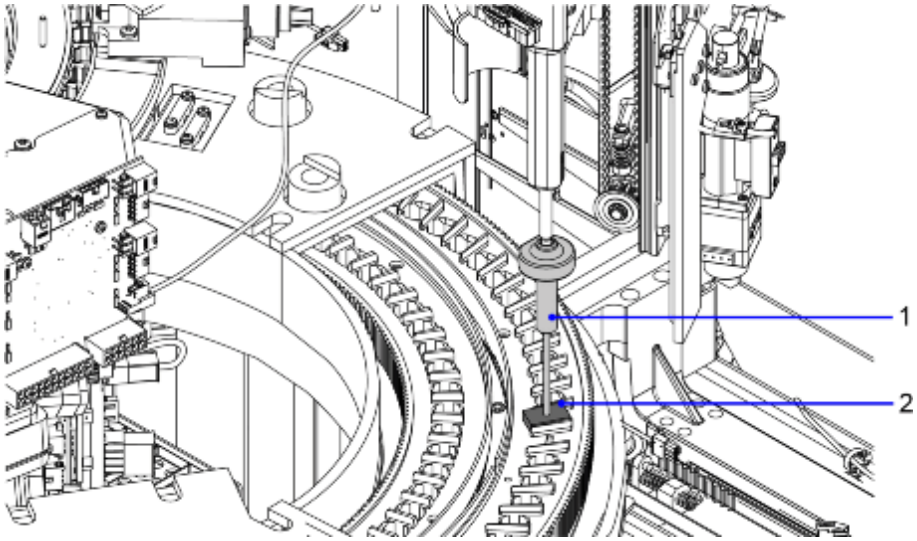
   a) In **Service Utility UI**, go to the **Alignments** tab, **Manual Alignments**.
   b) In the option column on the left, click **Sample Probe**.
   c) Highlight the row **SP Rotational Outer Nominal**.
   d) In the column to the right click **Run**.

6. Send the Incubation Ring Rotationally Position 1 to the Sample Probe:

   a) From **Service Utility UI**, go to the **Alignments** tab.
   b) In the column to the left, click the **Incubation Ring** menu.
   c) Highlight the row **Outer Ring Sample Offset**.
   d) In the column to the right, click **Run**.

7. Disable the Sample Probe Vertical Amplifier:
   a) From **Service Utility UI**, go to the **Execution** tab.
   b) In the first filter, click **Command**.
   c) Type **Disable** in the first column.
   d) In the second column, find the command **SampleProbeVerticalAmplifierDisable**.
   e) Press **Send**.
8. Standard Alignment of Sample Probe to Incubation Ring Position 90:
   a) Adjust the **SP Rotational Outer Nominal** and the **Outer Ring Sample Offset** until the Sample Probe Alignment Tool aligns with the hole in the Cuvette Alignment Tool.

Fig. 10: Aligning the Sample Probe to the Incubation Ring



(1) Sample Probe
(2) Outer Incubation Ring Position 90

9. Fine Alignment of Sample Probe to Outer Incubation Ring:
   a) From **Service Utility UI**, go to the **Alignments** tab.
   b) Engineer 1: Move the **SP Rotational Outer Nominal** one small step clockwise.
   c) Engineer 1: Move the Sample Probe up off of the Cuvette Alignment Tool, and back down until it either makes contact with the Incubation Ring or the Cuvette Alignment Tool using the belt while Engineer 2 observes the alignment.
   d) Repeat the previous steps until the Sample Probe Tool clips the side of the slot in the Cuvette Alignment Tool.
   e) Note the Current Offset in the highlighted row.
   f) Engineer 1: Move **SP Rotational Outer Nominal** one small step counter-clockwise.
   g) Engineer 1: Move the Sample Probe up off of the Cuvette Alignment Tool, and back down until it either makes contact with the Incubation Ring or the Cuvette Alignment Tool using the belt while Engineer 2 observes the alignment.

h) Repeat the previous steps until the Sample Probe Tool “clips” the opposite side of the Cuvette Alignment Tool.

i) Note the Current Offset in the highlighted row.

j) Take an average of the two noted Current Offsets, step the Sample Probe to that offset, and click **Save**.

10. Fine Alignment of Outer Incubation Ring to the Sample Probe:

These steps for fine alignment are optional, but they will provide a more precise alignment.

a) From **Service Utility UI**, go to the **Alignments** tab.

b) Engineer 1: Adjust the **Outer Ring Sample Offset** one small step clockwise.

c) Engineer 1: Move the Sample Probe up off of the Cuvette Alignment Tool, and back down until it either makes contact with the Incubation Ring or the Cuvette Alignment Tool using the belt while Engineer 2 observes the alignment

d) Repeat the previous steps until the Sample Probe Tool'clips the side of the slot in the Cuvette Alignment Tool.

e) Note the Current Offset in the highlighted row.

f) Engineer 1: Adjust the **Outer Ring Sample Offset** one small step counter-clockwise.

g) Engineer 1: Move the Sample Probe until the Sample Probe alignment tool goes into the Outer Incubation Ring Tool hole.

h) Repeat the previous steps until the Sample Probe Tool clips the opposite side of the slot in the Cuvette Alignment Tool.

i) Note the Current Offset in the highlighted row.

j) Average the two noted Current Offsets, step the Sample Probe to that offset, and click **Save**.

11. Continuously repeat steps 10-11 until the Sample Probe Tool falls directly in the center of the slot in the Cuvette Alignment Tool.

6.2.2 Vertical Alignment Sample Probe to Outer Incubation Ring

Perform this procedure if the semi-auto alignment is not successful.

1. Remove the Cuvette Channel (if it has not already been done). Refer to (➔ Remove the Cuvette Channel / LDAT-030.841.04).
2. Remove Incubation Ring Back Cover (if it has not already been done). Refer to (➔ Remove the Incubation Ring Back Cover / LDAT-030.842.04).
3. Remove Incubation Ring Sample Probe Cover (if it has not already been done). Refer to (➔ Remove the Incubation Ring Sample Probe Cover / LDAT-030.842.04).

4. Home the Sample Probe:

   a) From **Service Utility UI**, go to the **Execution** tab.
   b) In the first filter, click **Sequence**.
   c) Type **Home** in the first column.
   d) In the second column, find the sequence **SP_VerHome** and then click **Send**.
   e) In the second filter, click **Sequence**.
   f) Type **Home** in the second column.
   g) In the second column, find the sequence **SP_RotationalHome** and then click **Send**.

If you move any probe rotationally or horizontally, you must home it vertically first.

5. Send the Sample Probe Rotationally to the Incubation Ring:

   a) From **Service Utility UI**, go to the **Alignments** tab.
   b) In the option column on the left, click **Sample Probe**.
   c) Highlight the row **SP Rotational Outer Nominal**.
   d) In the column to the right click **Run**.

6. Send the Incubation Ring rotationally to Position 90 to the Sample Probe:

   a) From **Service Utility UI**, go to the **Alignments** tab.
   b) In the column to the left, click the **Incubation Ring** menu.
   c) Highlight the row **Outer Ring Sample Offset**.
   d) In the column to the right click **Run**.

7. Send the Sample Probe Down to Vertical Incubation Ring Offset:

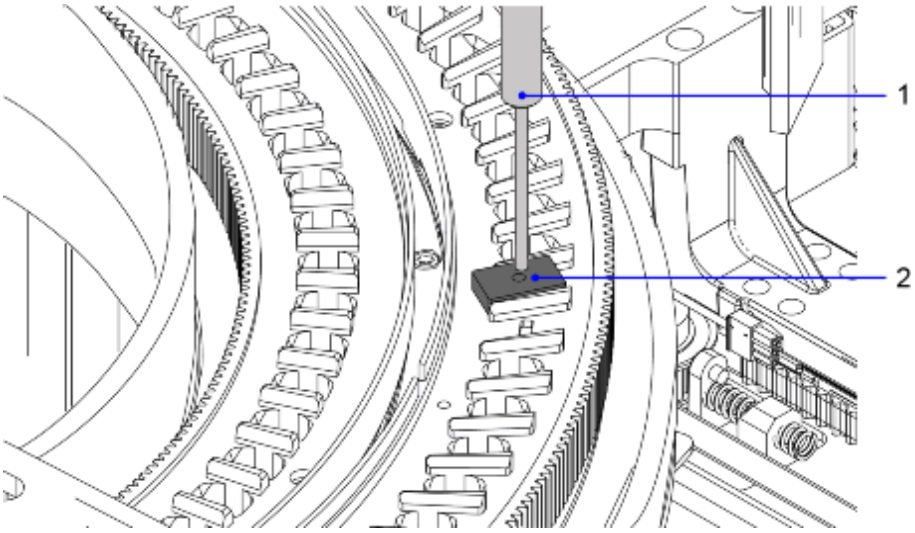
   a) Remove all Tools and Cuvettes from the Incubation Ring.

Make certain that Incubation Ring Position 90 is empty. If a tool or cuvette is in this position, the Sample Probe may forcefully crash into it and potentially cause damage.

   b) From **Service Utility UI**, go to the **Alignments** tab.
   c) In the option column on the left, click **Sample Probe**.
   d) Highlight the row **SP Vertical Outer Incubation Ring Offset**.
   e) Click **Run**.

8. To vertically align the sample probe to the incubation ring, do the following steps:

Fig. 11: Vertically Aligning the Sample Probe to Incubation Ring



(1) Sample Probe
(2) Cuvette Alignment Tool

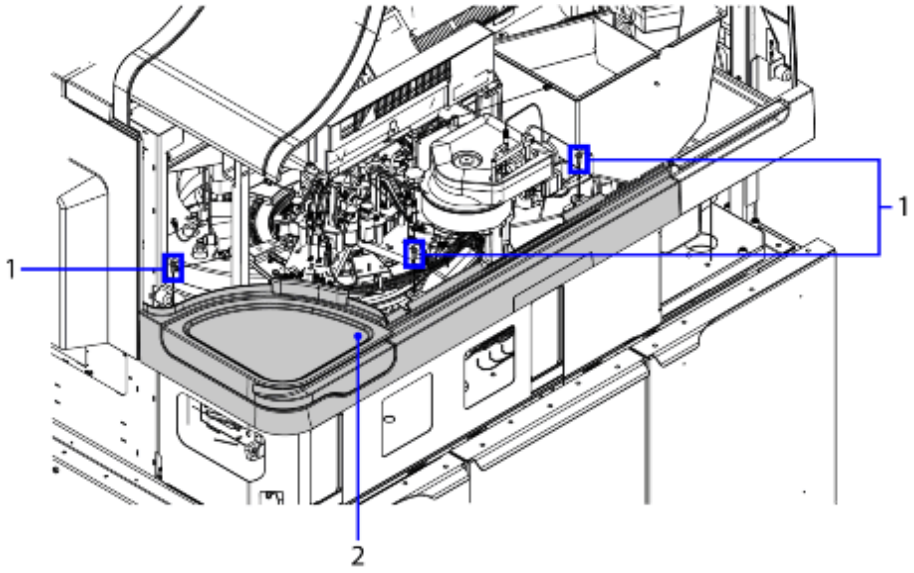
a) Disable the **Incubation Ring Rotational Amplifier**:
From Service Utility UI, go to the **Execution** tab.
Send the command: **IncubationOuterRingAmplifierDisable**.
b) Engineer 1: From the **Alignments** tab, adjust the **SP Vertical Outer Incubation Ring Offset** up a good distance until the Sample Probe Tool is above the Incubation Ring enough that the Cuvette Tool can be placed in the ring.
c) Engineer 2: Place the Cuvette Alignment Tool in Incubation Ring Position 90.
d) Engineer 1: Adjust the **SP Vertical Outer Incubation Ring Offset** down approximately 1 step.
e) Engineer 2: Swivel the Incubation Ring counter-clockwise and clockwise, moving the slot past the Sample Probe Tool each way.
f) Repeat steps d and e until the probe just scrapes the Cuvette Alignment Tool during one of the swivels.
g) Engineer 1: Adjust the **SP Vertical Outer Incubation Ring Offset** up 1 step.
h) Press **Save**.
i) Remove the alignments tools from the Incubation Ring.
j) Uninstall the Sample Probe Alignment Tool from the Sample Probe.

6.2.3 Rotational Alignment of the Sample Probe to the Tip Pickup Offset

1. Open the front cover.
2. Install the Interlock Bypass key and depress the latch.

3. Remove 3 screws to remove the bottom cover for access to the front of the IM Analyzer.

Fig. 12: Remove the Bottom Cover



(1) 3 Screws

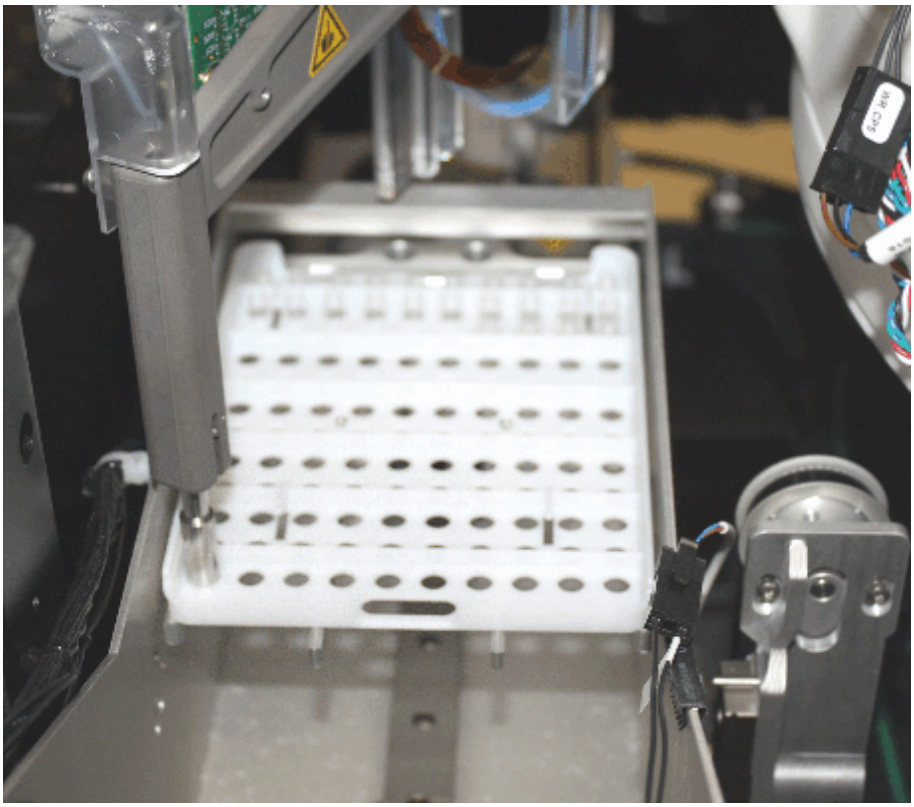
4. Prepare the tip tray stage for alignment:
   a) Remove the sample tip tray from the tip tray stage. The sample probe should not have any tips when starting this procedure.
   b) Lock an empty tip tray on to the tip tray stage.
5. Initialize the tip loader:
   a) From the Service Software, go to the **Alignments** tab.
   b) In the Manual Alignment tab, select **Tip Loader** and then select **Initialize Tip Loader** and then click **Run**.
      » This may take up to a minute to complete.
6. Home the sample probe and tip tray stage. Go to the **Execution** tab and select the following:
   a) Select sequence, type and then select from the drop down the sequence **SP_VerHome** and then click **Send**.
   b) Select sequence, type and then select from the drop down the sequence **SP_RotationalHome** and then click **Send**.
   c) Select sequence, type and then select from the drop down the sequence **TL_TipPickupStageHome** and then click **Send**.
7. Send the sample probe rotationally to the tip pickup lower left offset and send the Tip Tray Stage to tip pickup lower left offset:
   a) Go to the **Alignments** tab.

b) In the Manual Alignment tab, select **Sample Probe**.

c) Select the alignment: **SP Rotational Tip Pickup Lower Left Offset** and then click **Run**.

If the sample probe crashes during step 7c, repeat steps 6 and 7. If the issue persists, contact your regional support center for assistance.

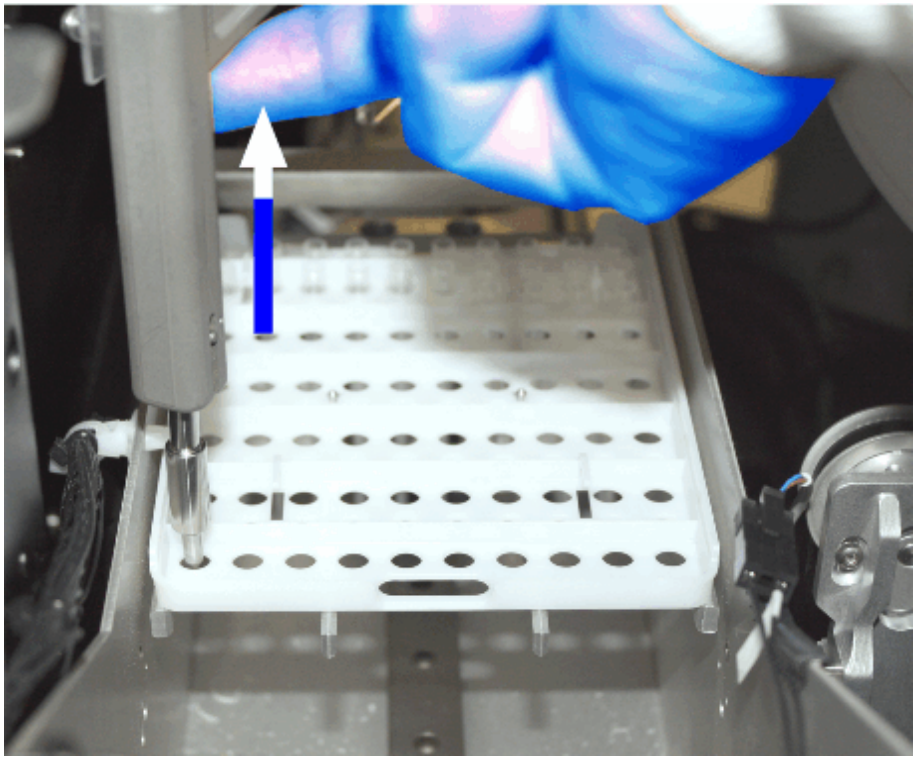
Fig. 13: Running the SP Rotational Alignment for Tip Tray Position 1, 1 (lower left)



8. Perform the rotational alignment of the sample probe to the tip pickup lower left offset:

   a) Use your hand to position the probe vertically just above the tip tray hole, to allow you to see more clearly to perform the alignment.

Fig. 14: Probe Lifted and Plunger is Visible in the Hole for Tip Tray Position 1, 1 (lower left)



   b) Using the two alignments below, adjust the sample probe and the tip pickup stage until the sample probe tip is in the center of the tip pickup lower left hole, which corresponds to tip tray position (1, 1) from the front.
      - In the Manual Alignment tab, select **Sample Probe** and then select **SP Rotational Tip Pickup Lower Left Offset** to adjust the probe position.
      - In the Manual Alignment tab, select **Tip Loader** and then select **Tip Pickup Stage Tip Pickup Lower Left Offset** to adjust the tray position.
   c) Press **Save**.

9. Home the sample probe and tip tray stage. Go to the **Execution** tab and find the following:

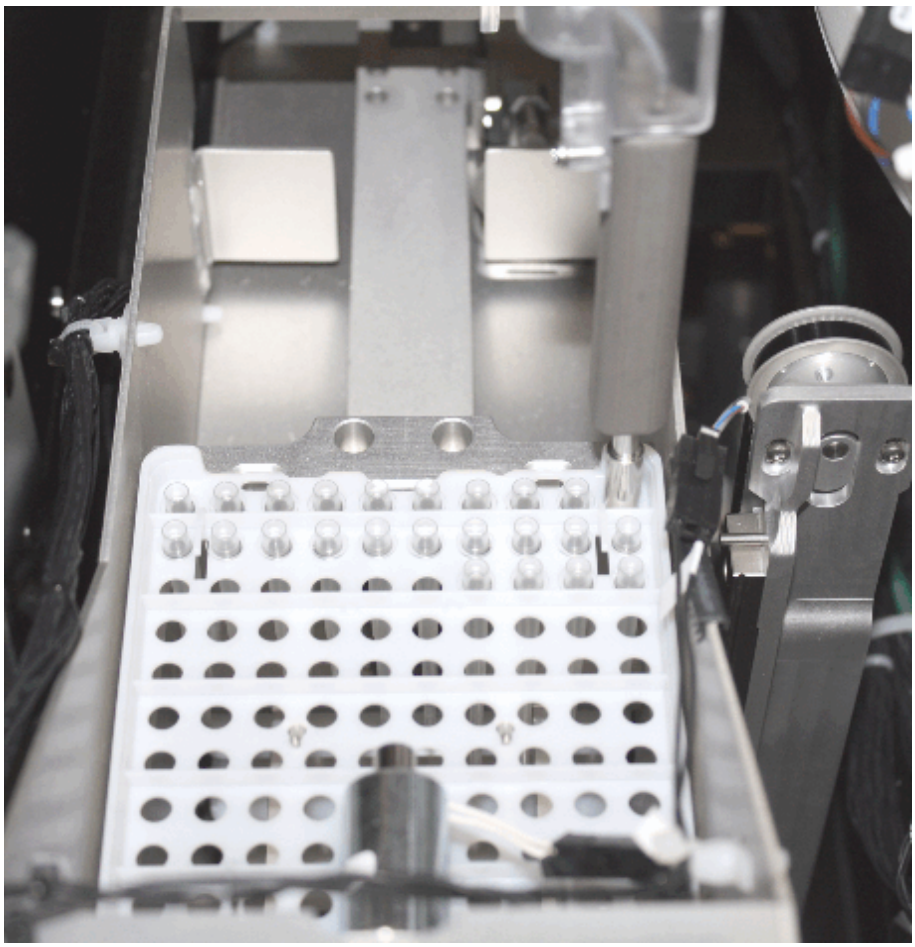
   a) Sequence **SP_VerHome** and then click **Send**.
   b) Sequence **SP_RotationalHome** and then click **Send**.
   c) Sequence **TL_TipPickupStageHome** and then click **Send**.

10. Send the sample probe rotationally to the tip pickup upper right offset and send the Tip Tray Stage to tip pickup upper right offset:

    a) Go to the **Alignments** tab.
    b) In the Manual Alignment tab, select **Sample Probe**.
    c) Select the alignment: **SP Rotational Tip Pickup Upper Right Offset** and then click **Run**.

If the sample probe crashes during step 10c, repeat steps 9 and 10. If the issue persists, contact your regional support center for assistance.

Fig. 15: Running the SP Rotational Alignment for Tip Tray Position 12, 10 (upper right)



11. Perform the rotational alignment of the sample probe to the Tip Pickup Upper Right Offset:

    a) Use your hand to position the probe vertically just above the tip tray hole, to allow you to see more clearly to perform the alignment.

b) Using the two alignments below, adjust the sample probe and the tip pickup stage until the sample probe tip is in the center of the tip pickup upper right hole, which corresponds to tip tray position (12, 10) from the front.

- In the Manual Alignment tab, select **Sample Probe** and then select **SP Rotational Tip Pickup Upper Right Offset** to adjust the probe position.
- In the Manual Alignment tab, select **Tip Loader** and then select **Tip Pickup Stage Tip Pickup Upper Right Offset** to adjust the tray position.

c) Press **Save**.

6.2.4 Vertical Alignment of the Sample Probe to the Tip Pickup Offset

1. Home the sample probe and tip tray stage:

   a) Go to the **Execution** tab.
   b) Find and send the sequence **SP_VerHome**.
   c) Find and send the sequence **SP_RotationalHome**.
   d) Find and send the sequence **TipPickupStageMoveToHome**.

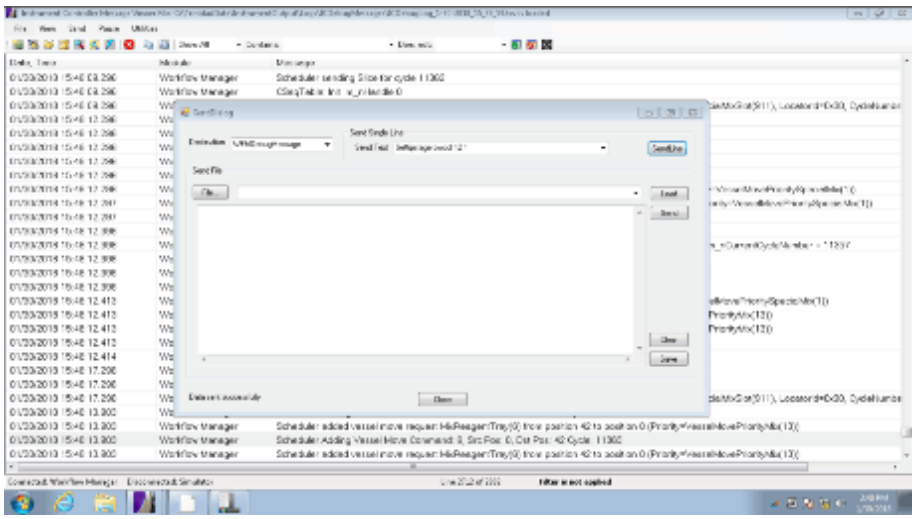
2. Send the sample probe rotationally and the tip tray stage horizontally to the tip tray position of Row 1, Column 1:

   a) From the Service Software Home page, click **Log Viewer** in the lower right corner to open the IC Debug Log in the IC Message Viewer.

This should take no longer than 5 minutes to open.

   b) In the toolbar at the top of the viewer, click **Send** (or click on the lightning bolt icon) to open the Send dialog box.

Fig. 16: IC Message Viewer with Send Dialog Box



c) In the Send Text field, type **SetTipStageRowCol 1 1**, then click **SendLine**.

d) Do not close the Send dialog box and the Log Viewer. Return to the Service Software.

e) In the Service Software, **Execution** tab, click on **Add Filter** a few times to add more lines if needed, and then type the following commands in order as listed below:

SampleProbeRotationalClearStartMoveBit

SampleProbeRotationalTipPickup

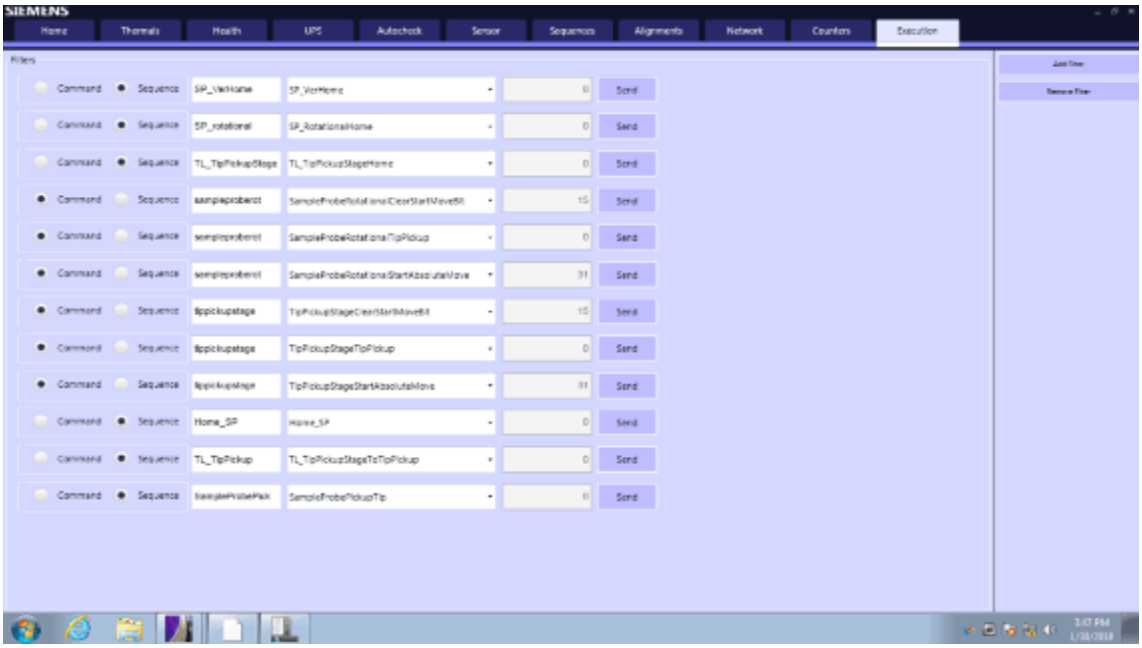
SampleProbeRotationalStartAbsoluteMove

TipPickupStageClearStartMoveBit

TipPickupStageTipPickup

TipPickupStageStartAbsoluteMove

Fig. 17: Sample Probe and Tip Loader Alignments



3. Click **Send** for the first three commands in order from step 2d for **SampleProbe**. Wait for the sample probe to stop moving.
4. Click **Send** for the last three commands in order from step 2d for **TipPickupStage**.
5. Send the sample probe vertically down to SP vertical tip pickup nominal:

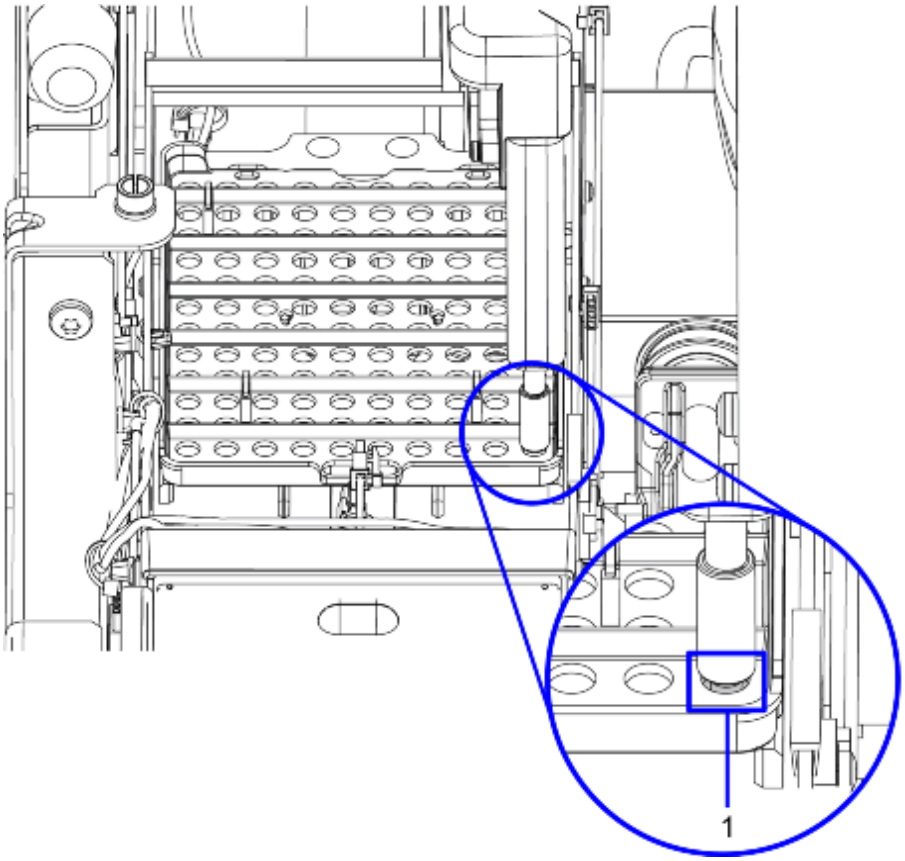
a) Go to the **Alignments** tab.

b) From the Manual Alignment tab, select **Sample Probe**.

c) Select the **SP Vertical Tip Pick up Offset** row to highlight it, then click **Run**.

6. Using the SP Vertical Tip Pick up Offset alignment, raise the probe a few steps to see a gap between the probe and the tray.

Fig. 18: Lift the Probe to See a Gap

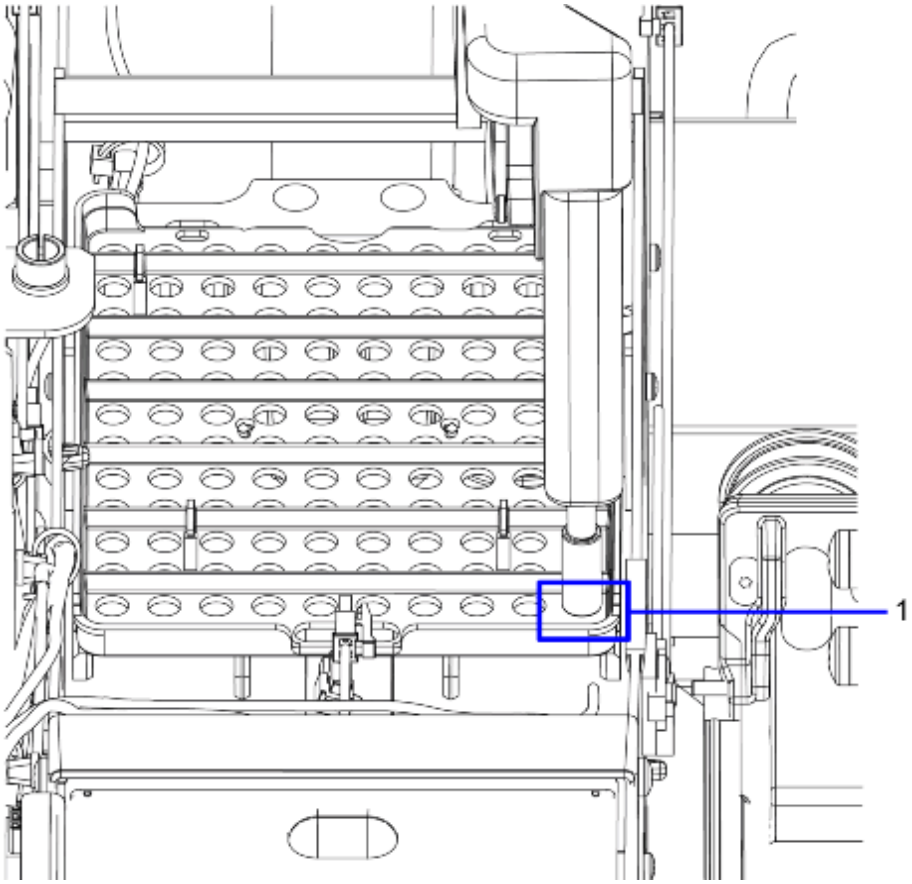


(1) Gap Between the Plunger and the Tray (showing Lower Right Position 1, 10 in this example)

7. With your fingers, grasp the tray in the corner you are aligning and gently move the tray up and down. The tray will move as long as the probe is not contacting the tray.

8. Lower the probe one step at a time until you reach the point where you can no longer move the tray at that corner.

Fig. 19: Plunger Seated Correctly in Tray



(1) No Gap Between the Plunger and the Tray (showing Lower Right Position 1, 10 in this example)

9. Select **Save**.
10. In the table below, record the SP Vertical Tip Pick up Offset value for the vertical alignment of the sample probe to the front left corner (Row 1 Col 1) of the tip tray:
11. Repeat steps 1 through 10 for the remaining three positions Row 1 Col 10 (lower right), Row 12 Col 1 (upper left), and Row 12 Col 10 (upper right) by sending the corresponding commands below in step 2c:

Since the Log Viewer is still open from step 2c, it is not necessary to open a new Log Viewer to send the command for the remaining tray positions.

Tab. 1 Sample Probe Vertical Tip Pick up Offset

Position	Command	Offset Value
Row 1 Col 1	SetTipStageRowCol 1 1	
Row 1 Col 10	SetTipStageRowCol 1 10	

Position	Command	Offset Value
Row 12 Col 1	SetTipStageRowCol 12 1	
Row 12 Col 10	SetTipStageRowCol 12 10	

12. To complete the vertical alignment, set the **SP Vertical Tip Pick up Offset** value to the highest offset value recorded in the table.

    For example if the values are -94, -90, -102, -104 the highest positive offset value is -90.

13. Save the alignment.

6.2.5 Verify the Tip Pickup Offset Alignments

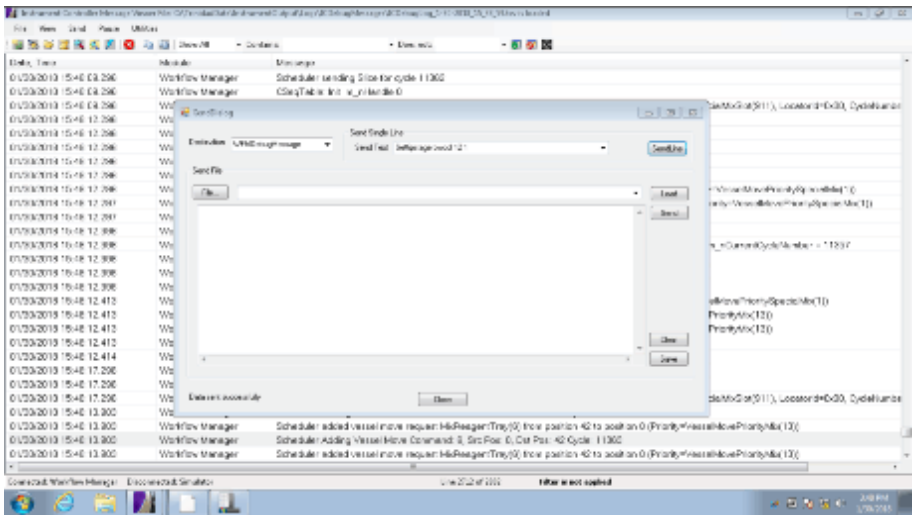
1. Home the sample probe and tip tray stage:

   a) Go to the **Execution** tab.
   b) Find and send the sequence **SP_VerHome**.
   c) Find and send the sequence **SP_RotationalHome**.
   d) Find and send the sequence **TipPickupStageMoveToHome**.

2. Place sample tips in all four corners of the empty tip tray.
3. In the IC Message Viewer, open the Send dialog box and send the command corresponding to the lowest offset value recorded in the table, (➔ Sample Probe Vertical Tip Pick up Offset / LDAT-030.896.04):

   a) From the Service Software Home page, click **Log Viewer** in the lower right corner to open the IC Debug Log in the IC Message Viewer.

Fig. 20: IC Message Viewer with Send Dialog Box



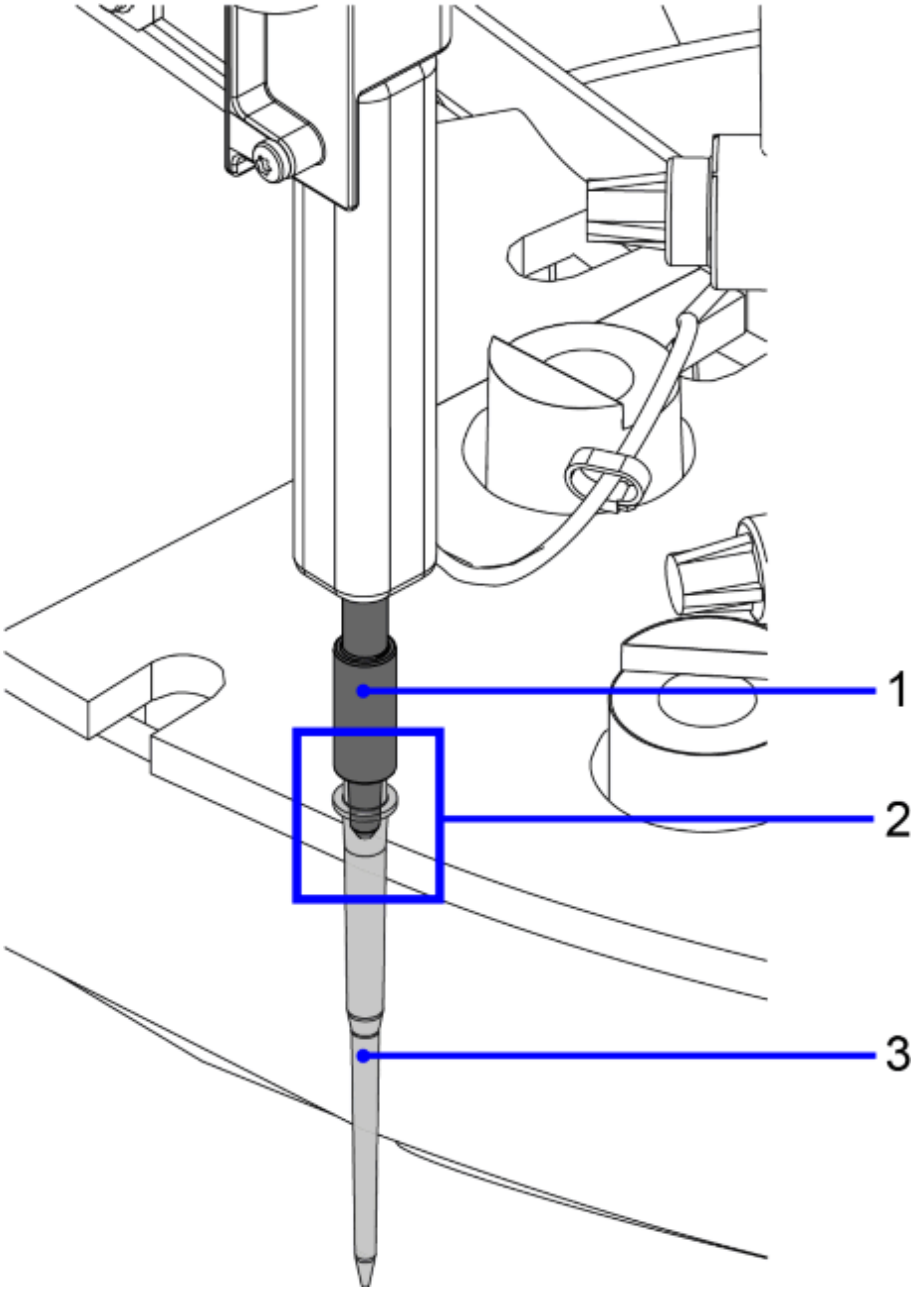
b) In the toolbar at the top of the viewer, click **Send** (or click on the lightning bolt icon) to open the Send dialog box.

c) In the Send Text field, type the command corresponding to the lowest offset value recorded in the table, then click **SendLine**.

4. From the Service Software, **Execution** tab, type in and then select from the drop down the sequence **TL_TipPickupStageToTipPickup** and then click **Send**.
5. From the Service Software, **Execution** tab, type in and select from the drop down the sequence **SampleProbePickupTip** and then click **Send**.
6. Confirm that the sample tip has no gap between the sample probe and the top of the sample tip.

» The sample tip must be fully seated on the probe to ensure proper functioning.

Fig. 21: Sample Tip is Fully Seated on the Probe



(1) Sample Probe
(2) Sample Probe Properly Seated
(3) Sample Tip

7. Remove the tip from the sample probe and repeat steps 1 through 7 for the remaining three corners to confirm that the sample tip is fully seated on the probe at all four corners.

If the tip does not fully seat in all four corners, repeat the Vertical Alignment of the Sample Probe to the Tip Pickup Offset starting on page 10, and then repeat the Final Check. If the issue persists, contact your regional support center for assistance.

In Diagnostics, discard the empty tip tray and load a new tray prior to returning the analyzer to the operator.

8. Home the sample probe and tip tray stage:
   a) Go to the **Execution** tab.
   b) Find and send the sequence **SP_VerHome**.
   c) Find and send the sequence **SP_RotationalHome**.
   d) Find and send the sequence **TipPickupStageMoveToHome**.

6.2.6 Rotational Alignment Sample Probe to Sample Rack

1. Install the Sample Probe Alignment Tool onto Sample Probe:
   a) From the **Service Utility UI**, go to the **Execution** tab.
   b) In the first filter, click **Command**.
   c) Type **Disable** in the first column.
   d) In the second column, find the sequence **SampleProbeRotationalAmplifierDisable**.
   e) Slide the Sample Probe Alignment Tool as far up as possible on the Sample Probe.
   f) Use a screwdriver to securely fasten the tool to the probe.

Tighten the lock screw lightly to not damage the Sample Probe, but enough that the tool will not move when the probe is exercised.

2. Home the Sample Probe:
   a) From the **Service Utility UI**, go to the **Execution** tab.
   b) In the first filter, click **Sequence**.
   c) Type **Home** in the first column.
   d) In the second column, find the sequence **SP_VerHome** and then click **Save**.
   e) In the second filter, click **Sequence**.
   f) Type **Home** in the second column.

g) In the second column, find the sequence **SP_RotationalHome** and then click **Send**.

3. Send Sample Probe Rotationally to Sample Rack Position 2:

a) From **Service Utility UI**, go to the **Alignments** tab, Manual Alignments.
b) In the option column on the left, click **Sample Probe**.
c) Highlight the row **SP Rotational Sample Position 1 Nominal**.
d) In the column to the right click **Run**.

4. Send Sample Rack Position 2 Horizontally to the Sample Probe:

a) Navigate to the TCCS computer screen.
b) Open the **Instrument Check** application. If there is not a shortcut on the desktop, go to the **C:/Siemens/Bin** folder.
c) Select the **Subsystems** tab.
d) Select **Sample Rack Positioner** from the column on the left side.
e) Click the **Home Subsystem** button towards the bottom left corner of the UI.

WARNING

This command will home the mechanism.

» **Stand away from the analyzer.**

f) In the central menu on the interface, select **PositionerSlot0Pos2AtAliquotter**.

WARNING

This command will move the sample rack into position.

» **Stand away from the analyzer.**

g) Place new Sample Tubes in position 2 and position 5 of a Sample Rack.
h) Place the Sample Rack in the frontmost position of the Sample Rack Positioner on the DL such that Sample Rack Position 2 is to the left and Sample Rack Position 5 is to the right.

5. Rotational Alignment of Sample Probe to DL Sample Rack Position 2

a) Disable the Sample Probe Vertical Amplifier and by hand bring the Sample Probe down to Sample Rack Position 2:
b) Adjust the **SP Rotational Sample Position 1 Nominal** and the **Positioner-Slot0Pos2AtAliquotter** until the Sample Probe falls in the center of the Sample Tube in Sample Rack Position 2.
c) Press **Save**.

6. Repeat the previous steps to perform Rotational Alignment of Sample Probe to DL Sample Rack Position 5.

    a) SP Rotational Sample Position 1 Nominal = SP Rotational Sample Position 2 Nominal
    b) PositionerSlot0Pos2AtAliquotter = PositionerSlot0Pos5AtAliquotter

6.2.7 Vertical Alignment Sample Probe to Sample Rack

1. Home the Sample Probe:

    a) From **Service Utility UI**, go to the **Execution** tab.
    b) In the first filter, click **Sequence**.
    c) Type **Home** in the first column.
    d) In the second column, find the sequence **SP_VerHome** and then click **Send**.
    e) In the second filter, click **Sequence**.
    f) Type **Home** in the second column.
    g) In the second column, find the sequence **SP_RotationalHome** and then click **Send**.
2. Send Sample Probe Rotationally to Sample Rack Position 5:

    a) From **Service Utility UI**, go to the **Alignments** tab.
    b) In the option column on the left, click **Sample Probe**.
    c) Highlight the row entitled **SP Rotational Sample Position 2 Nominal**.
    d) In the column to the right click **Run** and then click **Save**.
3. Send Sample Probe Down to Vertical Incubation Ring Offset:

Make certain that the Sample Probe is Rotationally Aligned to the Sample Rack Position before performing this step.

    a) From **Service Utility UI**, go to the **Alignments** tab.
    b) In the option column on the left, click **Sample Probe**.
    c) Highlight the row entitled **SP Vertical Sample Tube Bottom Offset**.
    d) Move the sample probe vertically so that the alignment tool does not crash into the sample rack. Then click **Save**.
    e) Click **Run**.
4. Vertical Alignment of Sample Probe to Sample Rack:

    a) Engineer 1: Adjust the **SP Vertical Sample Tube Bottom Offset** up or down approximately 1 step.
    b) Repeat the previous step until the probe just touches the metal portion of the DL Sample Rack.

c) Engineer 1: Adjust the **SP Vertical Sample Tube Bottom Offset** up 1 step.
d) Press **Save**.

5. Disable and then remove the alignment tool.
6. Home the Vertical Sample Probe:

a) Place the alignment tool on the sample probe.

If the sample probe crashes into the rack, remove the alignment tool and use the Sequence Home_SP to home the sample probe and repeat the entire alignment sequence.

b) Repeat the sample probe vertical sample tube bottom offset.

7 List of Hazard IDs

There are no Hazard IDs in this document.

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