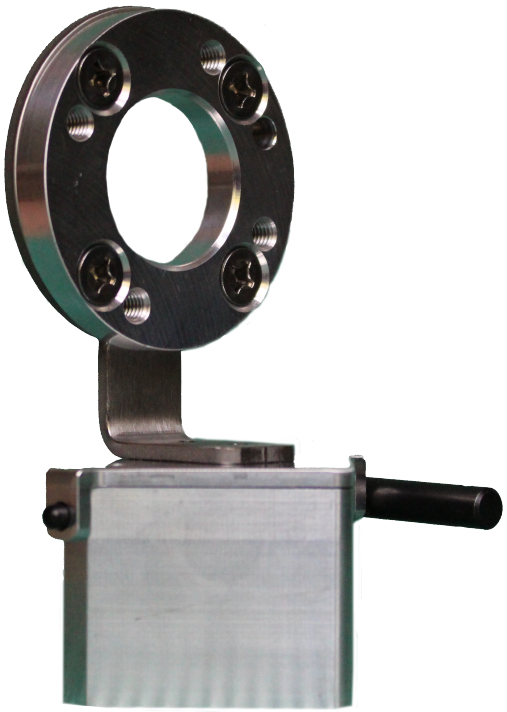
FLEXXBOTICS

Flexx Reference User Manual

FlexxBotics Corp. Product

June 2019



Revision Sheet

Release No.	Date	Revision Description
Rev. 0	3/28/18	Creation
Rev 1	5/24/18	Flexx Lockout AssemblyV2, License Key
Rev 1.1	6/25/18	Spacer Call Outs and Updated Terms
Rev 1.2	8/9/18	Flexx Lockout Assembly V3
Rev 1.3	1/16/19	Positional Tolerance, Software Installation Internet Connectivity
Rev 1.4	6/5/19	Conversion to 3.9 and 5.3

1. Product Overview

1.1. The Flexx Reference pairs with your Universal Robot through the seamless integration of a URCap Plugin and the simple Flexx Lockout Assembly mechanical mating system. The Flexx Reference enables flexible deployment and repurposing of any UR robot utilizing relative calibration and native nodes. Whether it be increasing robot uptime, decreasing installation time or finding new applications for your robot, the Flexx Reference can help make any work space more efficient.

1.2. Key Terms and Definitions

Flexx Reference	Software and Mechanical Assembly that can help repurpose any UR robot within minutes without having to rewrite programs.
Flexx Feature	6 degrees of freedom (X, Y, Z, Rx, Ry, Rz) captured in the UR Polyscope while in a Flexx Lockout. This point relatively calibrates the robot.
Flexx Lockout Assembly	Mechanical assembly that when mated together creates a 6 degree of freedom lock or Flexx Lockout.
Flexx Point	A Move and Waypoint node representing a robot pose in reference to a Flexx Feature.
Female Reference Component	Mechanical interface between robot end and male reference component
Male Reference Component	Mechanical interface between work station and female reference component
Flexx Lockout Assembly	Mechanical assembly that when mated together creates a 6 degree of freedom lock or Flexx Lockout.

2. Installation and Setup

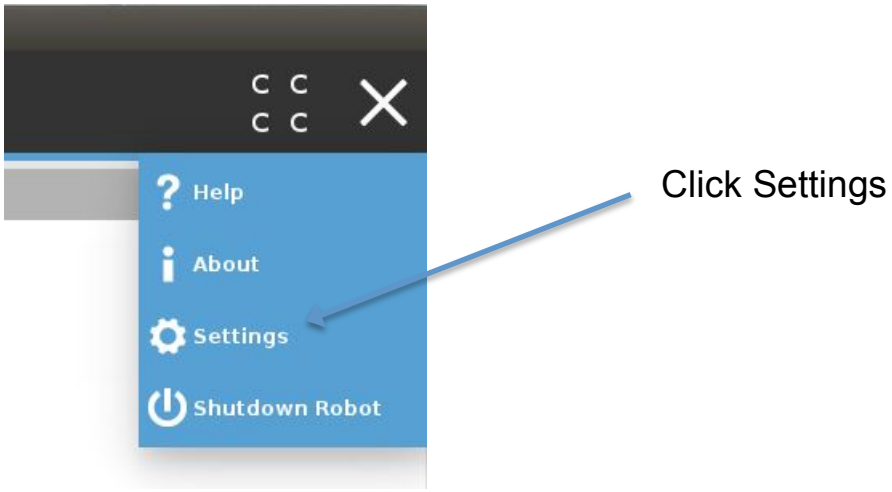
In this section, the user should learn how to properly install the Flexx Reference URCap, efficiently integrate the Flexx Lockout Assembly, and effectively sync the URCap with the Flexx Lockout assembly. The Flexx Lockout Assembly has been intuitively designed to mate once the male assembly has been connected with the end effector. It is imperative to understand the best practices for the female assembly's placement.

Proper maintenance is equally important to ensure your Flexx Lockout Assembly provides consistent precision. The mechanical mate's precision directly correlates to your robot's precision

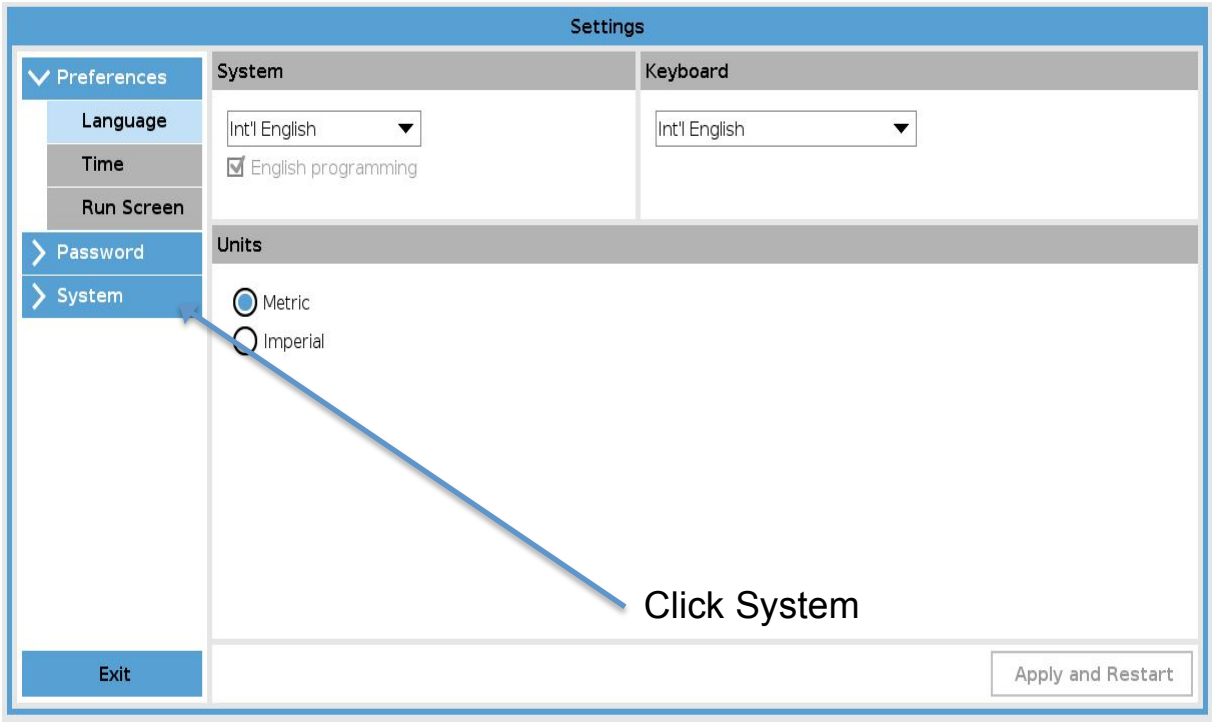
2.1. URCap Installation

2.1.1. Plug the USB into the Universal Robots teach pendant

2.1.2. Navigate to the **Settings** page within Polyscope.



2.1.3. On the left side of the screen, click on the **System** tab.



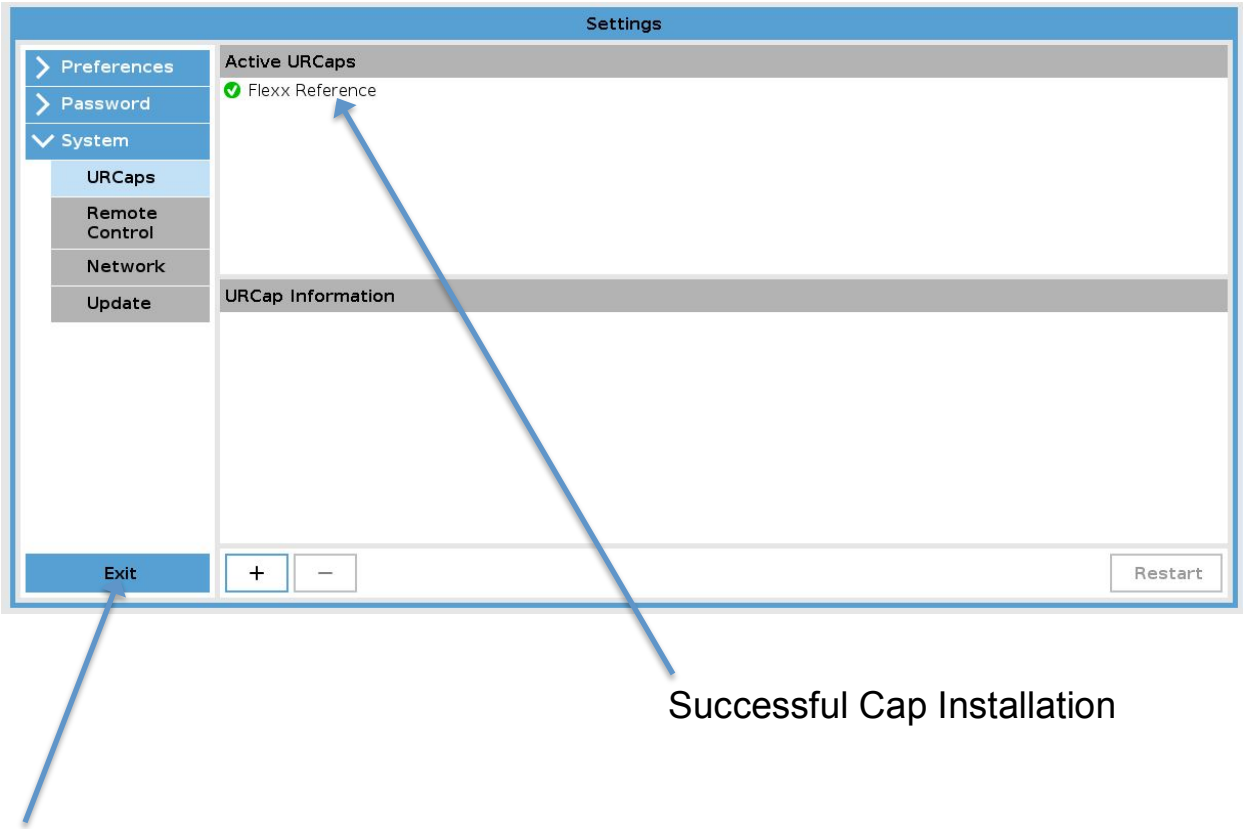
2.1.4. Click the **plus (+)** button in the bottom left corner of the screen.

2.1.5. Open the USB device folder from the file explorer.

2.1.6. Select the Flexx Reference. **URCap file** and click **Open**.

2.1.7. Verify that Flexx Reference now appears in the **Active URCaps** list with a green check mark.

2.1.8. Click **Exit** to leave the Polyscope settings window.



2.2. License Activation

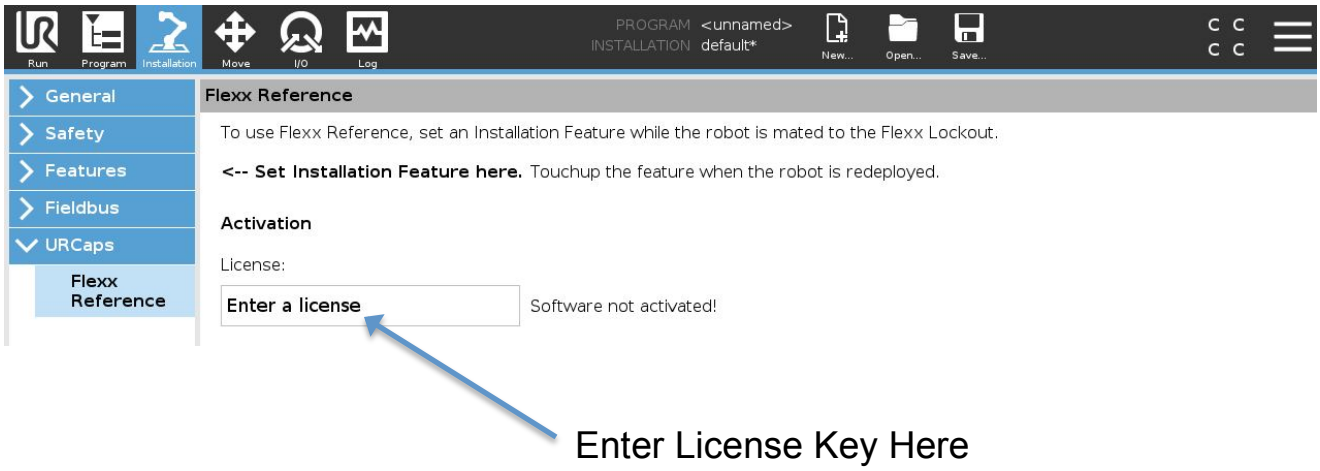
2.2.1. Navigate to the **Installation Tab** within Polyscope.

2.2.2. On the left side of the screen, click on the **URCaps** tab.

2.2.3. Select the **Flexx Reference** urcap. This will open the Flexx Reference Installation Node.

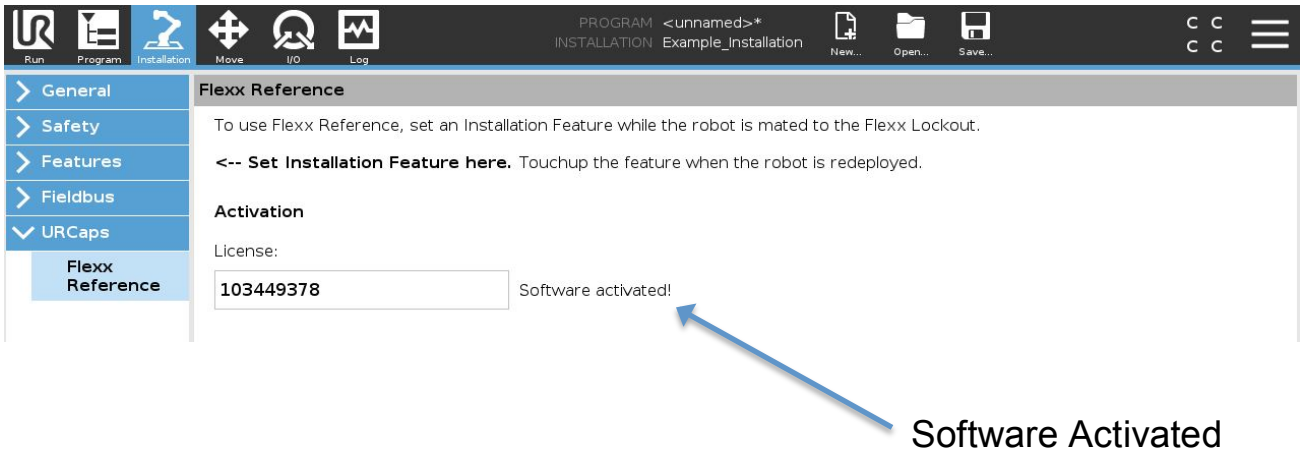
2.2.4. Click the **"Enter a License"** text box to launch the keyboard.

2.2.5. Enter the license code provided by Flexxbotics and click **Submit**.



2.2.6. Verify the Flexx Reference Installation Node displays **"Software activated!"**.

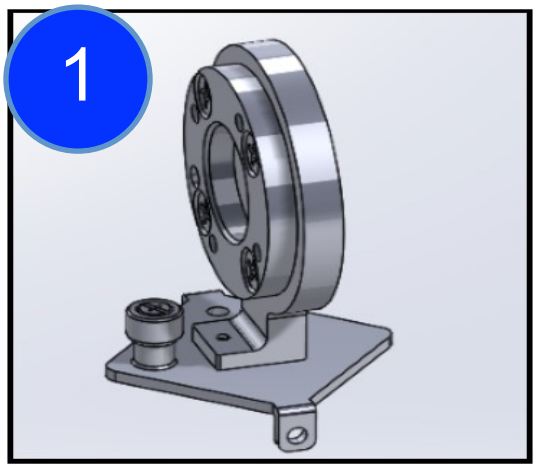
2.2.7. Save the Installation File.

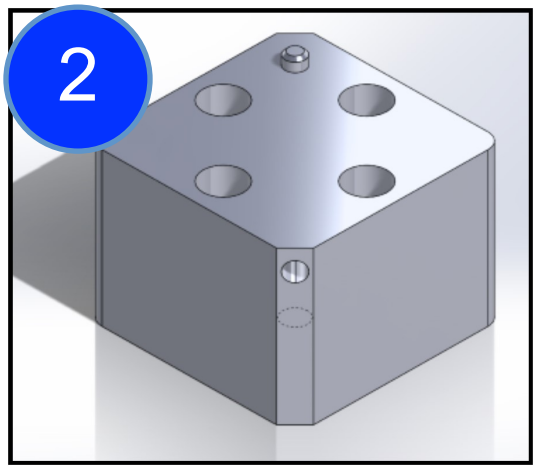


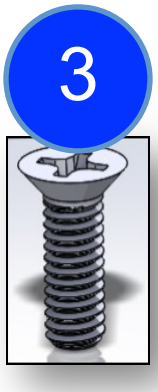
2.3. Mechanical Installation

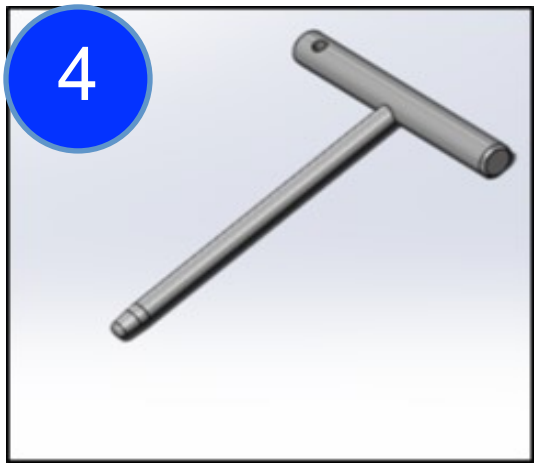
Verify that you have all of the following components:

1. Female Reference Component
2. Male Reference Component
3. Four (4) M6 Mounting Screws
4. Mating Pin

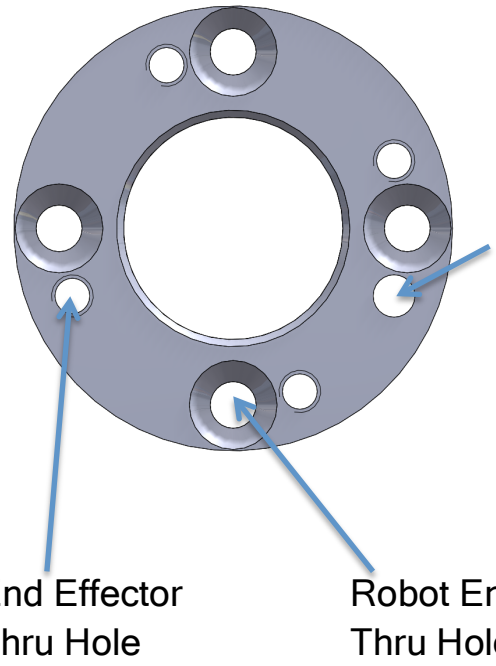


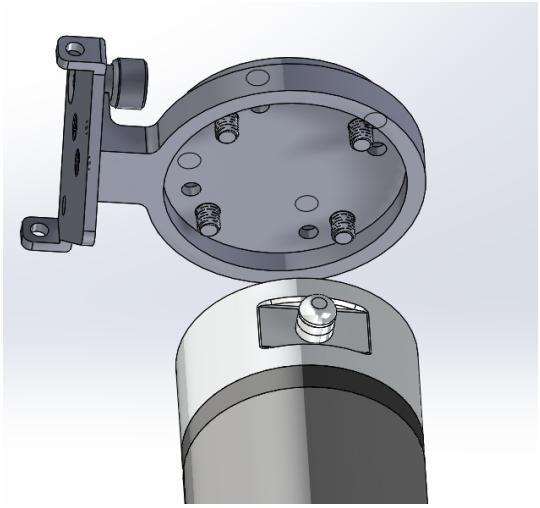




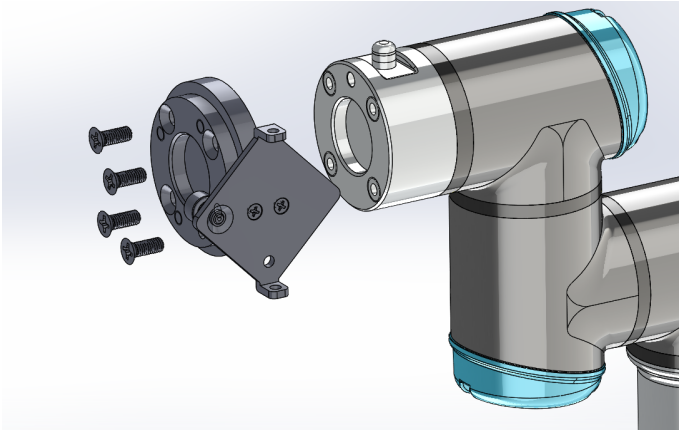


2.3.1 Once you have confirmed you have all the necessary hardware, prepare to mount the Female Reference Component to the end of the robot arm, Grab the female and align it with the five through holes on the mounting face of the robot. Ensure the female flange is essentially flush with the robot as seen in the images below.

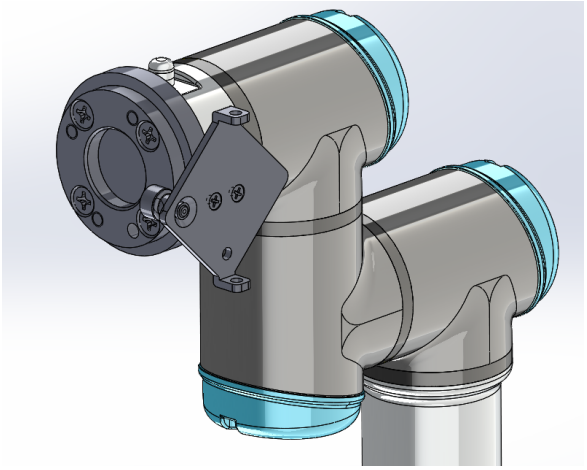




Top down view approaching robot



Align with robot end joint



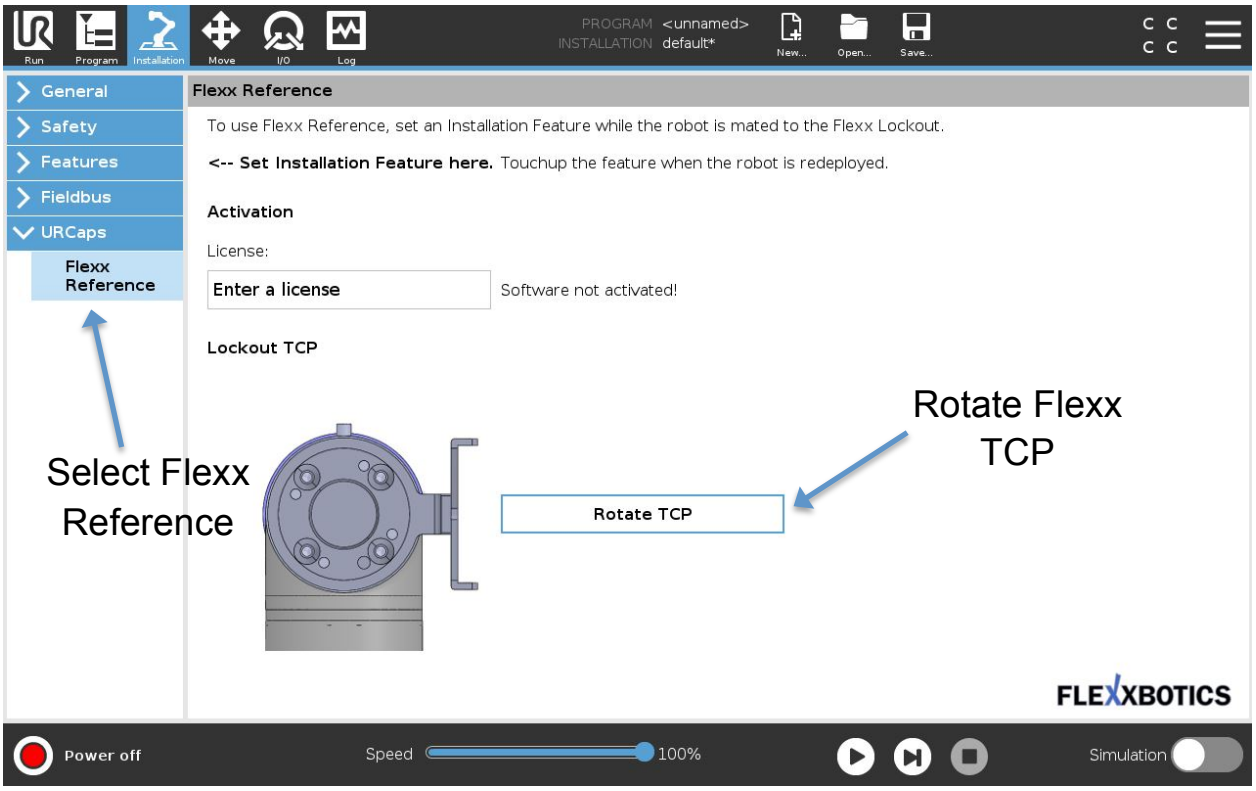
Fully interfaced female with robot

2.4. Recording a Flexx Feature

2.4.1. Navigate to the **Installation Tab** within Polyscope.

2.4.2. On the left side of the screen, click on the **URCaps** tab.

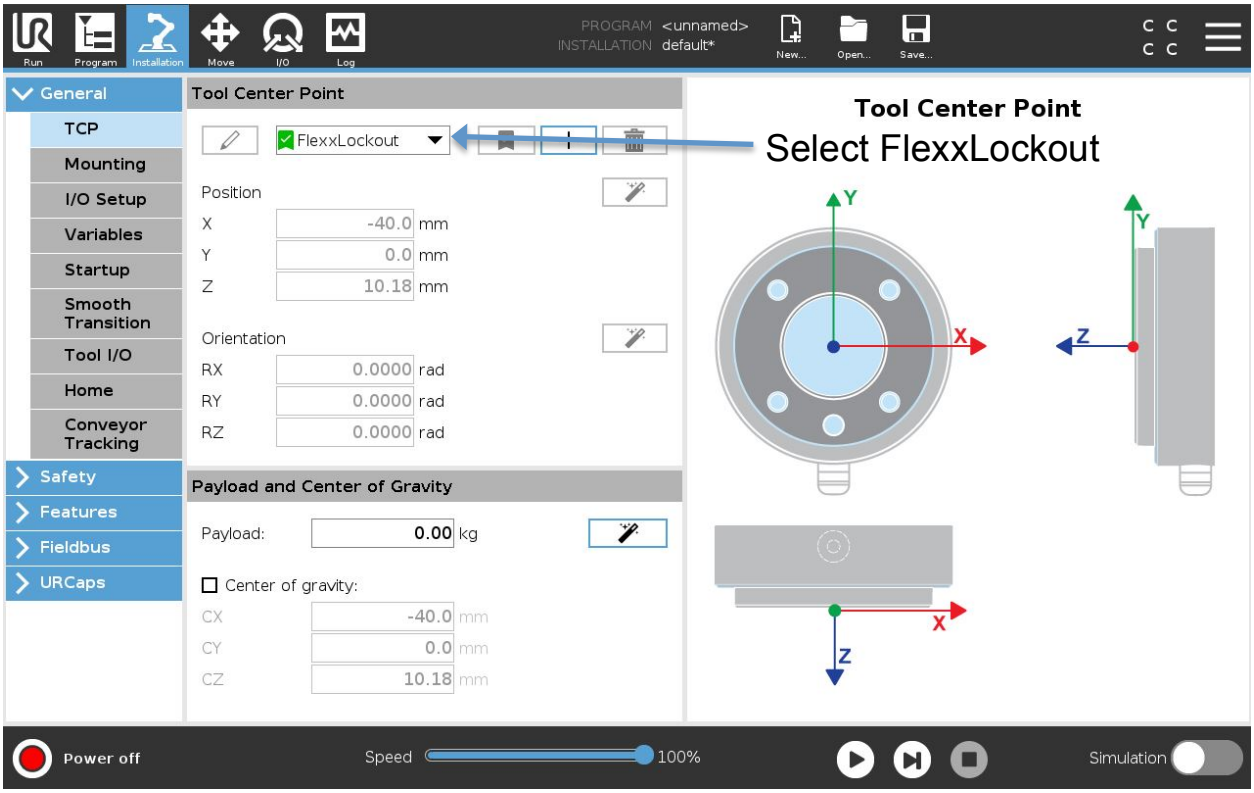
2.4.3. Select the **Flexx Reference** URCap. This will open the Flexx Reference Installation Node. Read the text information at the top of the page.



2.4.4. Use the **Rotate TCP** button to select the **Flexx Lockout TCP** that represents the orientation of the male component of the assembly when mounted to the robot.

2.4.5. On the left side of the screen, click the **General** tab.

2.4.6. Click the **TCP** button. Set the TCP as the **FlexxLockout**.



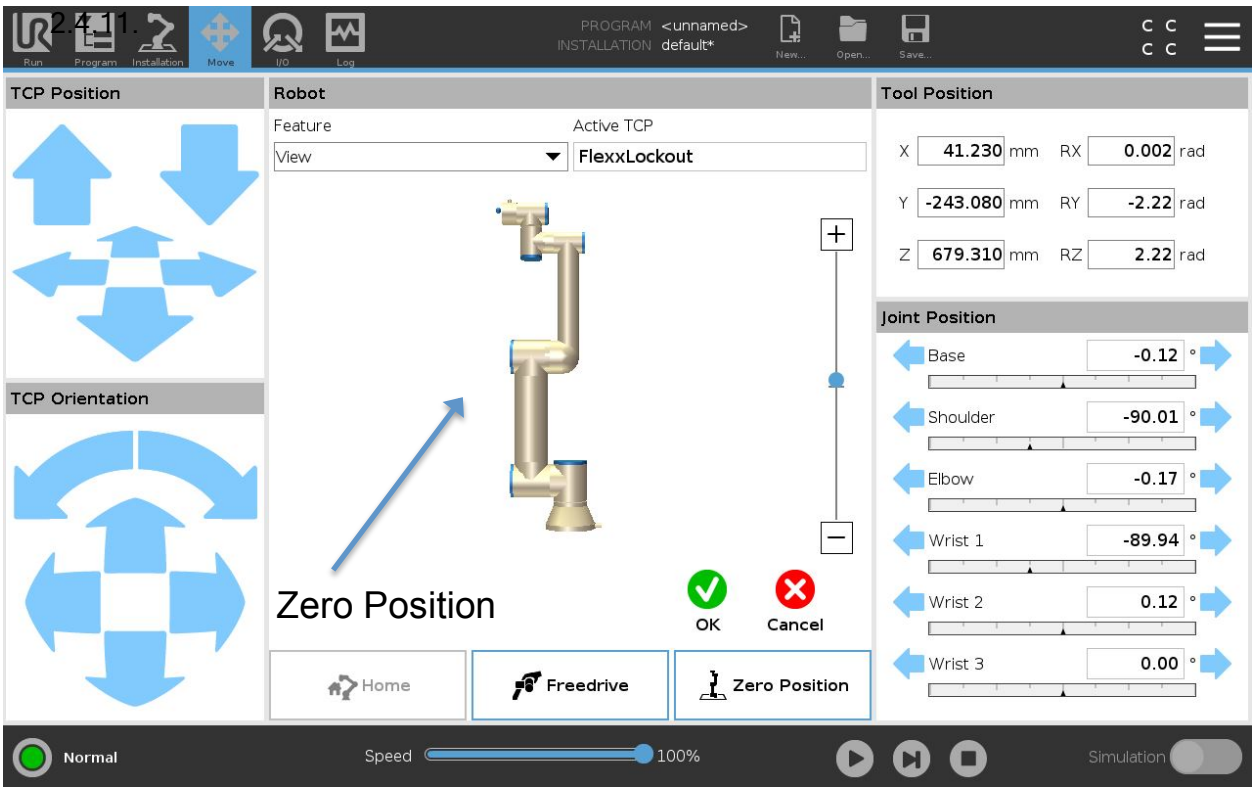
2.4.7. On the left side of the screen, click on the **Features** tab.

2.4.8. Click the **Point** button to add a point feature.

2.4.9. In the bottom right corner of the screen, click **Set Feature**. This will launch the user interaction screen to free drive the robot to a position.

2.4.10. Click the **Zero Position** button. Use the **Auto** move button to move the robot into the zero position.

2.4.11.



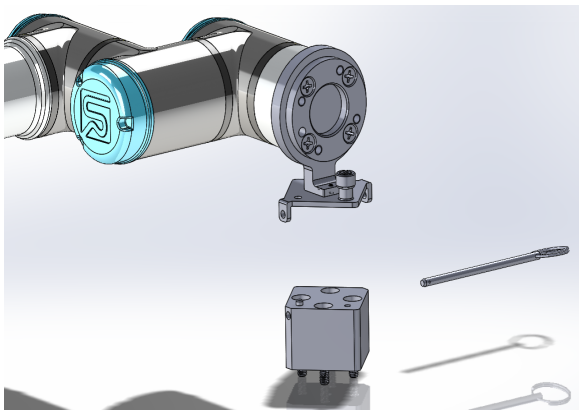
NOTE: This step is not required; however, it is recommended to allow easier navigation to the Flexx Lockout position.

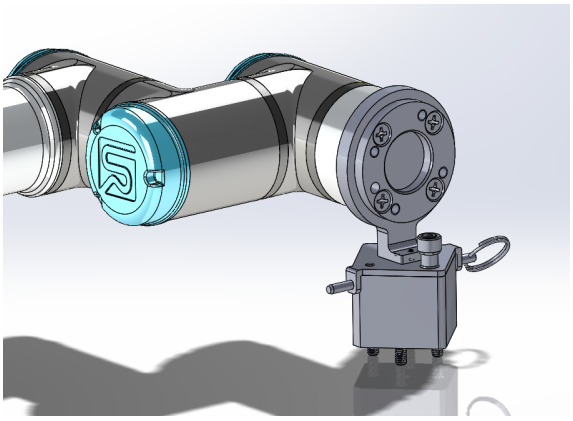
2.4.12. Click **Set Feature** to open the user interaction screen. **Free Drive** the robot to the Flexx Lockout assembly.

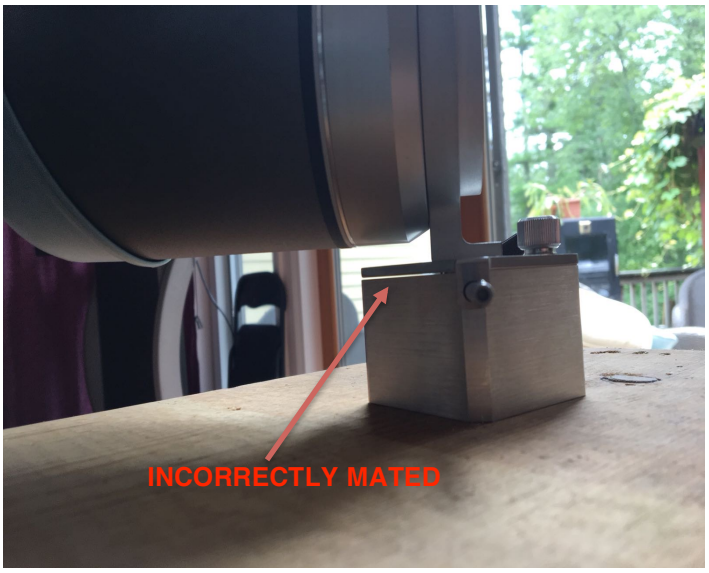
2.4.13. Mate the female component of the Flexx Lockout assembly to the male component. The components are asymmetrical and will only drop into place when properly mated in the correct orientation.

2.4.14. Install the mating pin through the coaxial locator holes of the Female and Male components. Once the pin is inserted, align and twist the thumbscrew until the male and female are completely flushed.

2.4.15. Tighten the thumbscrew.



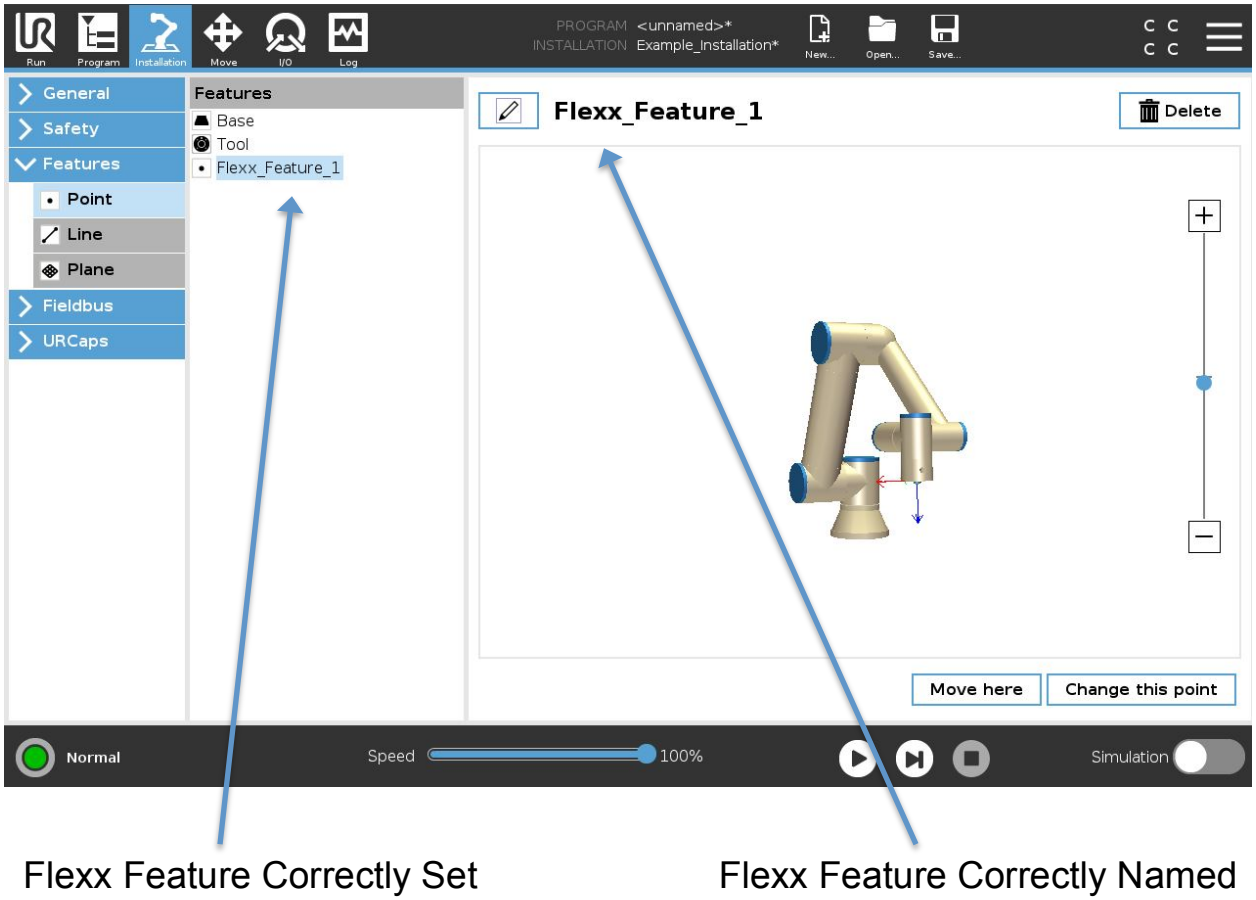




CRITICAL: Any gap between the male and female mate will propagate positional error throughout the program.

2.4.16. In Polyscope, click **OK** to set the feature.

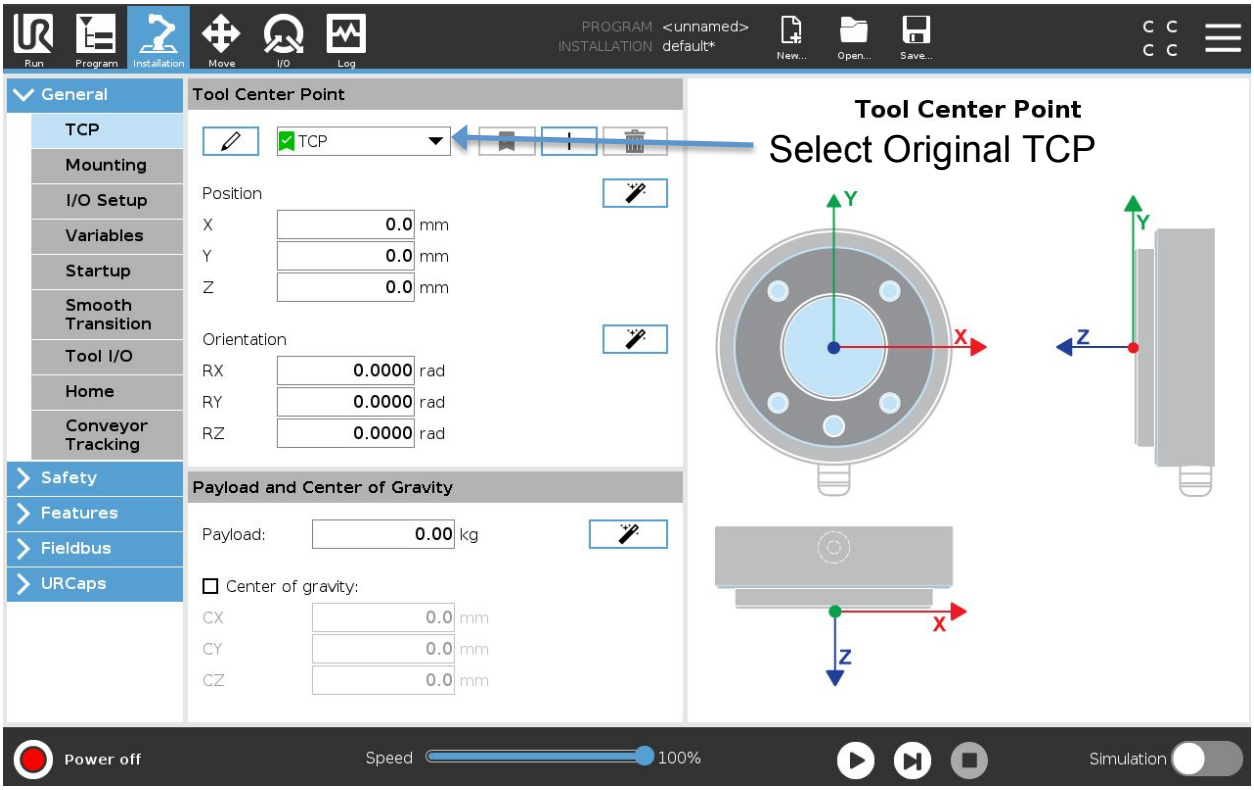
2.4.17. Select the pencil button in the title of the feature to rename it with a distinguishable name (example: Flexx_Feature_1).



2.4.18. Repeat steps 2.4.7 through 2.4.17 for any additional **Flexx Lockout** positions.

2.4.19. Reset the TCP back to the original TCP.

CRITICAL: It is extremely important to set the TCP back to the required TCP for the application.



2.4.20. Save the Installation File.

3. Flexx Reference Programming Workflow

3.1. In this section, the user should learn how to effectively program a Flexx Reference program using a combination of Flexx Features, Flexx Points and native nodes.

3.2. Adding the Flexx Reference Node

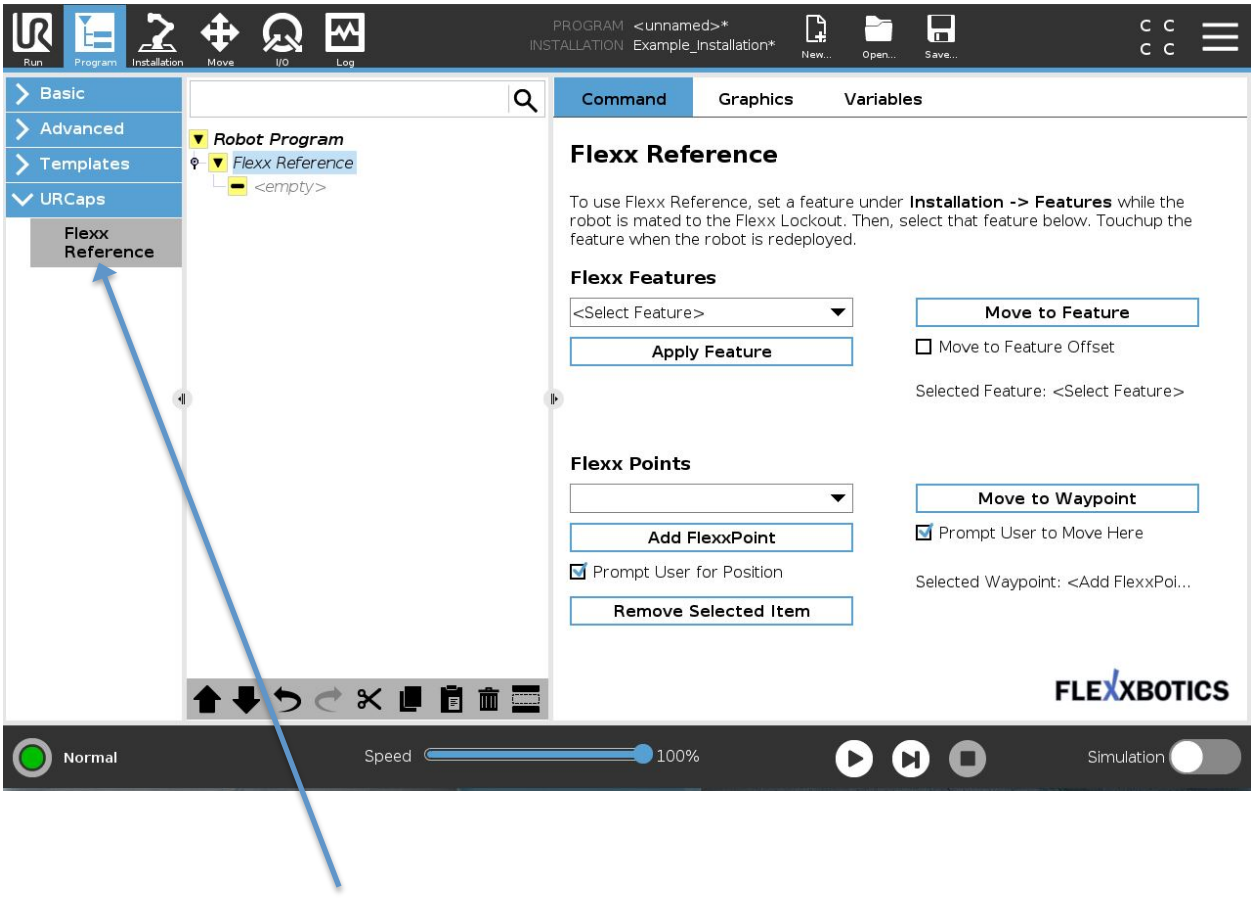
3.2.1. Navigate to the Program tab within Polyscope.

3.2.2. On the left side of the screen, click on the **URCaps** tab.

3.2.3. Select the **Flexx Reference** Program Node to add it to the Robot Program tree.

NOTE: Multiple Flexx Reference program nodes may be added to the program and act independently from each other. This functionality may be used for multiple Flexx Feature points or complicated programs.

3.2.4. Select the **Flexx Reference** Program Node within the Robot Program tree to view its user interface. Refer to the next section for a brief description of each user interface element.



Click Flexx Reference Node

3.3. Flexx Reference User Interface Elements

3.3.1. Flexx Features

3.3.1.1. **Feature Drop Down Menu:** A list of all the feature set in the installation tab.

3.3.1.2. **Apply Feature:** A button to apply the selected feature from the drop down list. Clicking this button will set the selected feature prior to programming. It will also re-configure all nodes beneath it to be in relation to the applied feature.

3.3.1.3. **Selected Feature Text:** Displays the current applied feature.

3.3.1.4. **Move to Feature:** A button to move the robot to the applied features pose.

3.3.1.5. **Move to Feature Offset Checkbox:** When using the Move to Feature button, if the offset is checked, the robot will move to a position 50mm above the applied Flexx Feature position. This avoids the robot from colliding with the male component of the Flexx Lockout assembly.

3.3.2. Flexx Points

3.3.2.1. **Add Flexx Point:** A button to add a Move and Waypoint beneath the Flexx Reference Node. The Move and Waypoint are referred to in combination as a Flexx Point, and are always configured with the applied Flexx Feature.

3.3.2.2. **Prompt User for Position Checkbox:** When using the Add Flexx Point button, if this box is checked, the software will display the user interaction screen to set the pose of the Waypoint. If it is unchecked, it will set the Waypoint as the current robot pose.

3.3.2.3. **Flexx Points Drop Down Menu:** A list of all the Waypoints found beneath the Flexx Reference Node.

3.3.2.4. **Selected Waypoint:** The currently selected Waypoint in the Flexx Points Drop Down Menu.

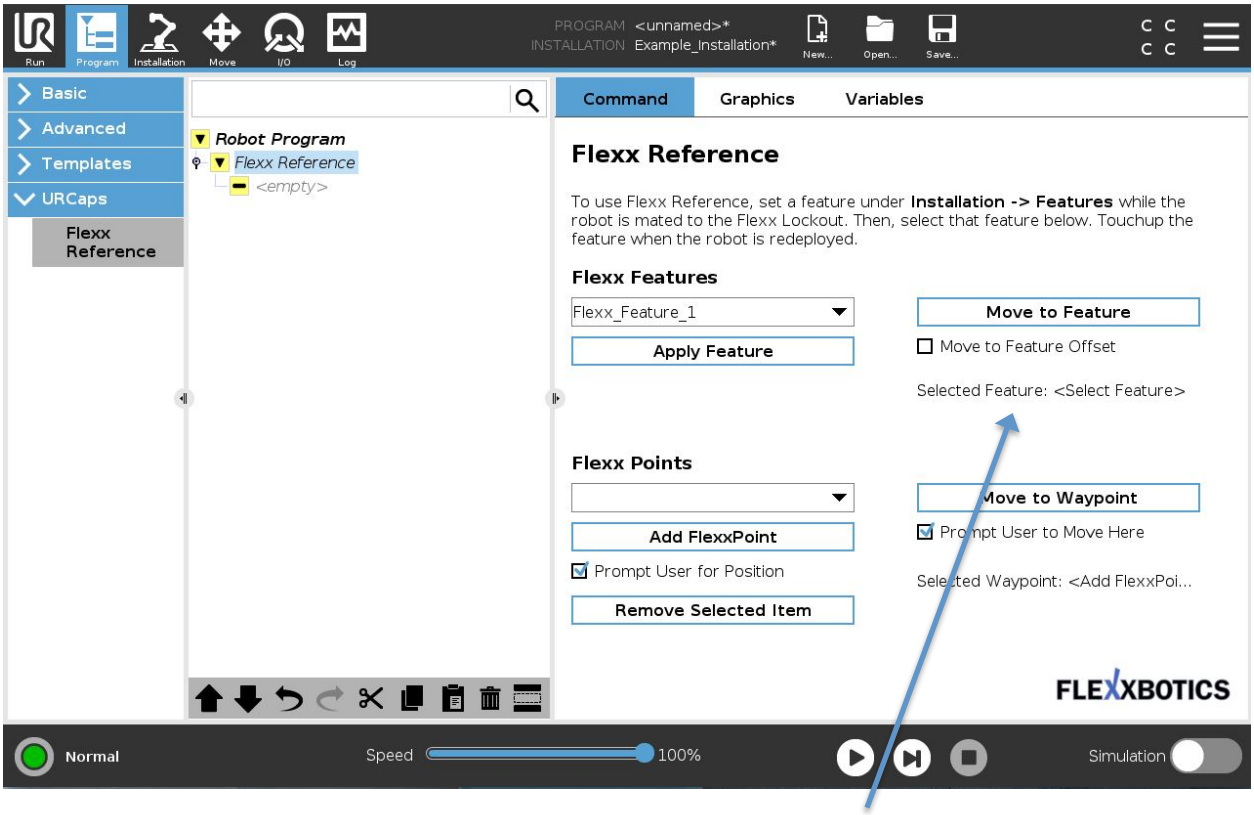
3.3.2.5. **Remove Selected Item:** A button that removes the currently selected Waypoint.

3.3.2.6. **Move to Waypoint:** A button to move the robot to the selected Waypoint pose.

3.4. Applying a Flexx Feature

3.4.1. Verify Flexx Feature is present in the Feature Drop Down List.

NOTE: If the Flexx Feature is not in the drop down list, follow the steps in 2.4 Recording a Flexx Feature. It is also important to note, if your robot base physically moves during this step, a new Flexx Feature must be taught using section 2.4.



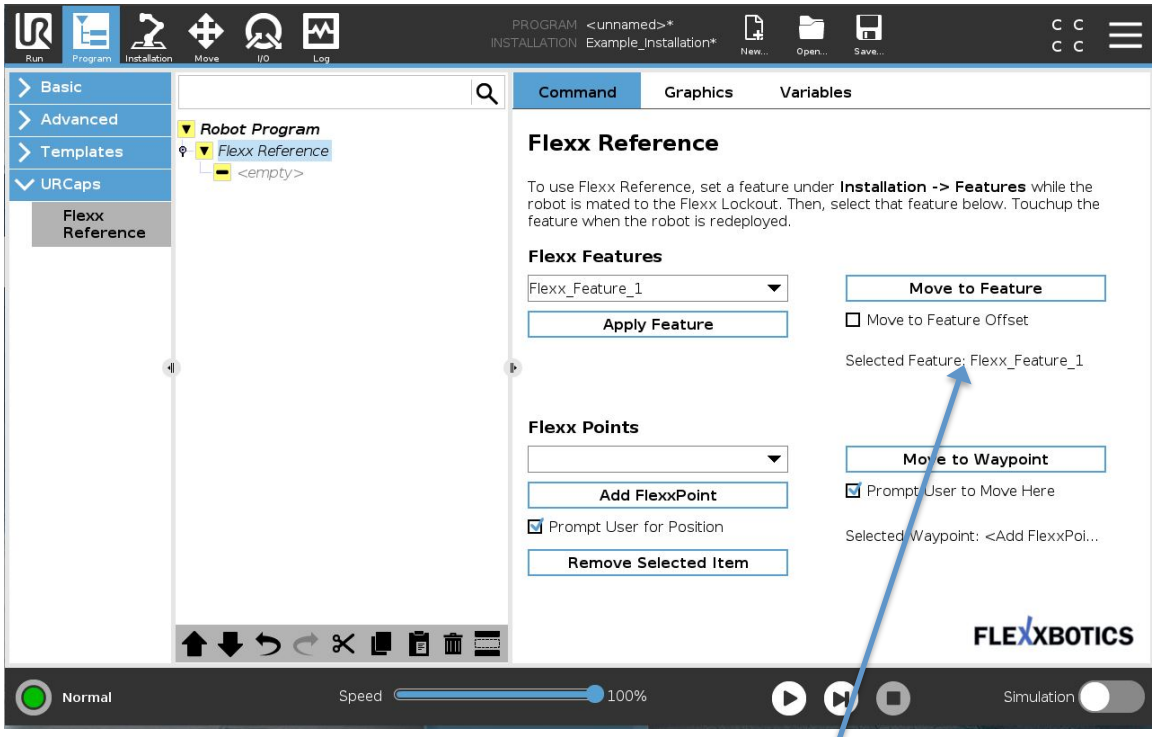
Selected Feature needs to be applied

3.4.2. **Select** the Flexx Feature relevant to current program.

NOTE: This does NOT apply the feature.

3.4.3. Click the **Apply Feature** button.

3.4.4. Verify that the applied feature is displayed as the **Selected Feature.**



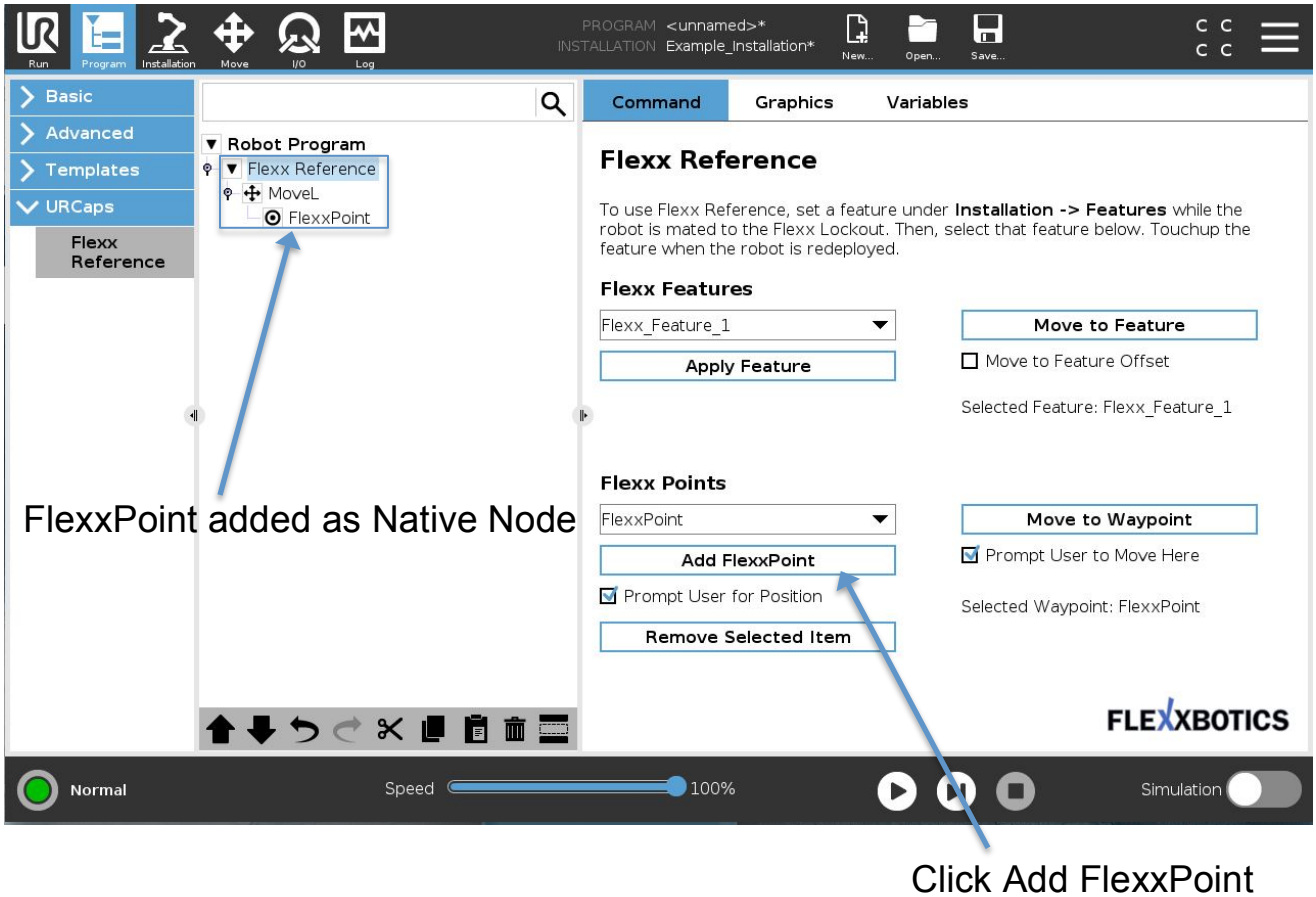
Selected Feature has been applied

3.5. Adding Flexx Points

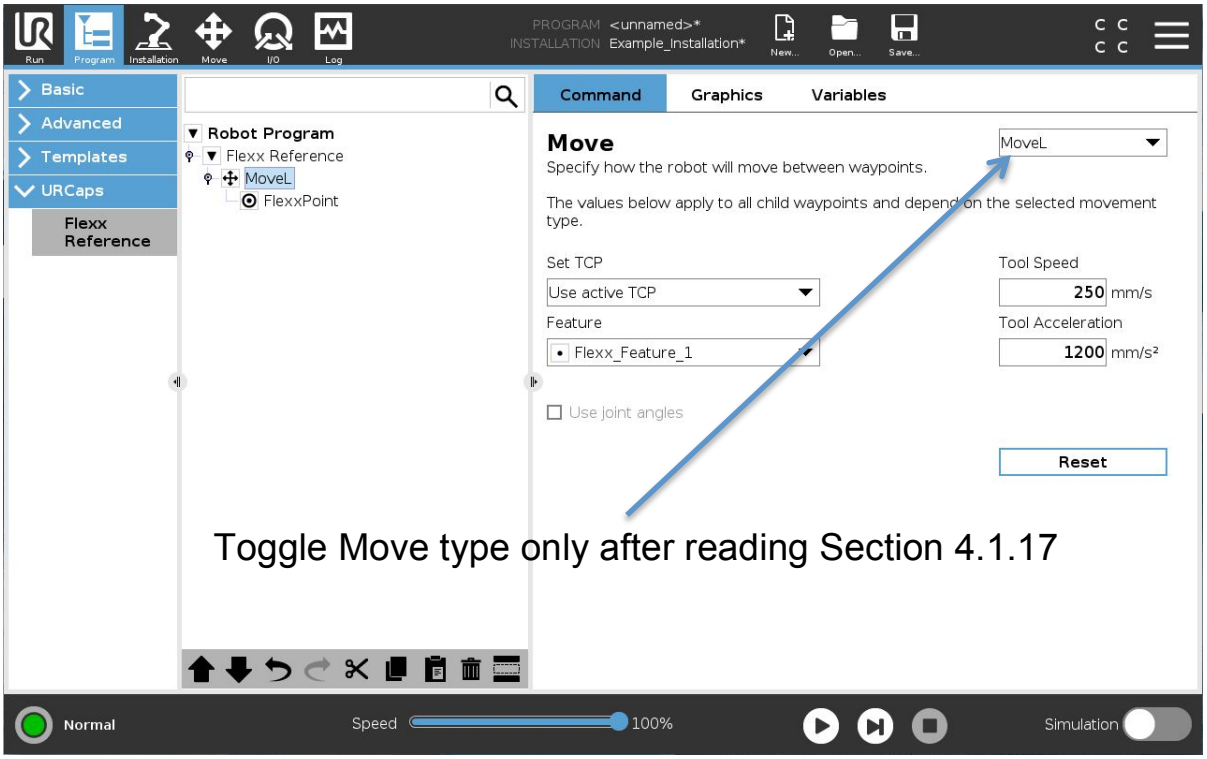
3.5.1. Verify that the robot is mated to the Flexx Lockout assembly and that the correct Flexx Feature has been applied. If a feature has not been applied, the software will prompt to do so prior to continuing.

CRITICAL: It is imperative that the applied Flexx Feature is representative of the Flexx Lockout position prior to adding Flexx Points. Failure to do so will likely result in issues when programming or updating Flexx Features during re-deployment.

3.5.2. **Free Drive** the robot to the pose. Click the **Add Flexx Point** button (See Section 3.3.2.2 for a description of the Prompt User for Position Checkbox). This will add a MoveL Node and a Waypoint configured with the selected pose with a default name “Flexx_Point”.



3.5.3. **Configure** the **Move** and **Waypoint** with parameters applicable to the robot process. These act as native UR Move and Waypoint nodes, and are configured the same way. By default, Flexx Points are added as a MoveL type. This can be changed within the Move Command interface (See Section 4.1.17 for updating programs that contain Move J node types).



WARNING: Do NOT change the Feature configuration, unless a MoveJ is being used. This is controlled by the Flexx Reference Node.

3.5.4. Rename the Flexx Point if desired. When renaming, ensure an “xx” is within the new name. This allows the program to identify the waypoint as a Flexx Point.

3.5.5. Continue to add Flexx Points until the program is complete. All other UR Program Nodes (Wait, Set, etc.) and 3rd Party Nodes (other URCaps) can be added as normal.

NOTE: Native Move and Waypoint nodes shall not be added beneath a Flexx Reference node. This is to ensure proper functionality. If a native Move or Waypoint is detected, the software will prompt the user and the Flexx Reference node will remain undefined. Delete these nodes using the trash can in the Robot Program tree and then continue.

3.5.6. Save the program when complete.

4. Updating a Flexx Feature (Re-Deployment)

4.1. The following section outlines the proper method to updating or adding an additional Flexx Feature

4.1.1. Open the existing program and installation file.

4.1.2. Navigate to the **Installation Tab** within Polyscope.

4.1.3. On the left side of the screen, click on the **URCaps** tab.

4.1.4. Select the **Flexx Reference** URCap. This will open the Flexx Reference Installation Node.

4.1.5. Use the **Rotate TCP** button to select the **Flexx Lockout TCP** that represents the orientation of the male component of the assembly when mounted to the robot.

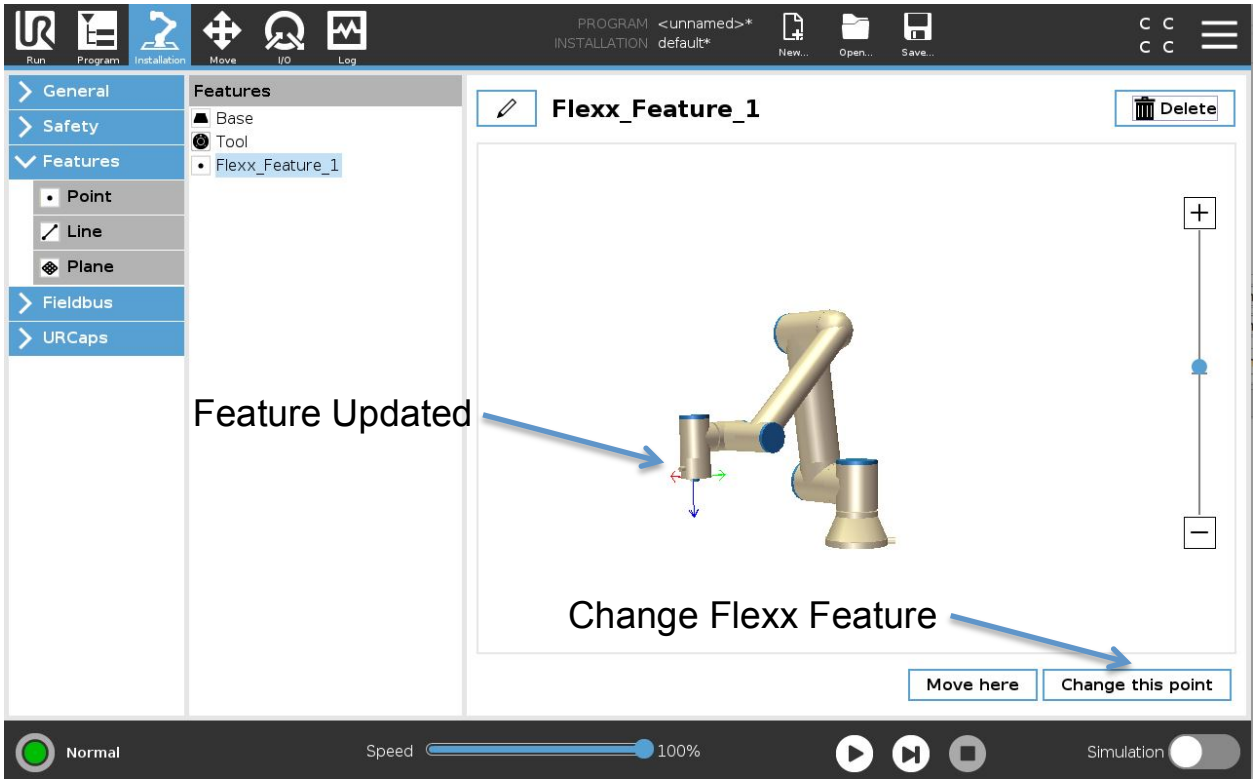
4.1.6. On the left side of the screen, click the **General** tab.

4.1.7. Click the **TCP** button. Set the TCP as the **FlexxLockout**

4.1.8. On the left side of the screen, click on the **Features** tab.

4.1.9. Select the Flexx Feature that needs to be updated and click **Change this Point**.

4.1.10. *NOTE: It is recommended that the same Flexx Feature be used when updating; however, a new Flexx Feature could also be recorded.*



4.1.11. **Free Drive** the robot to the Flexx Feature and mate it using the Flexx Lockout assembly following Section 2.4.

4.1.12. Once mated, click OK to update the feature.

4.1.13. Reset the TCP back to the original TCP.

CRITICAL: It is extremely important to set the TCP back to the required TCP for the application.

4.1.14. Navigate to the **Flexx Reference Program** Node.

4.1.15. Verify that the updated feature is selected in the Flexx Feature Drop Down List.

4.1.16. Click **Apply Feature**. This will re-configure all Move Nodes to be in reference to the Flexx Feature.

4.1.17. Check the program for MoveJ nodes (as displayed by the user prompt). Flexxbotics cannot currently re-configure MoveJ nodes due to software limitations. To do so, navigate to the MoveJ command interface by selecting the node and manually set the feature.

NOTE: If the Flexx Feature name has not changed, the MoveJ feature will be set appropriately. This is only an issue if the Flexx Feature name changes.

5. Re-Programming Existing UR Programs

5.1. The following section outlines the recommended workflow for re-programming a UR program with a Flexx Reference Node.

5.1.1. Open the Installation file for the existing program and follow Section 2.1 URCap Installation and Section 2.2 License Activation to install and setup the Flexx Reference URCap.

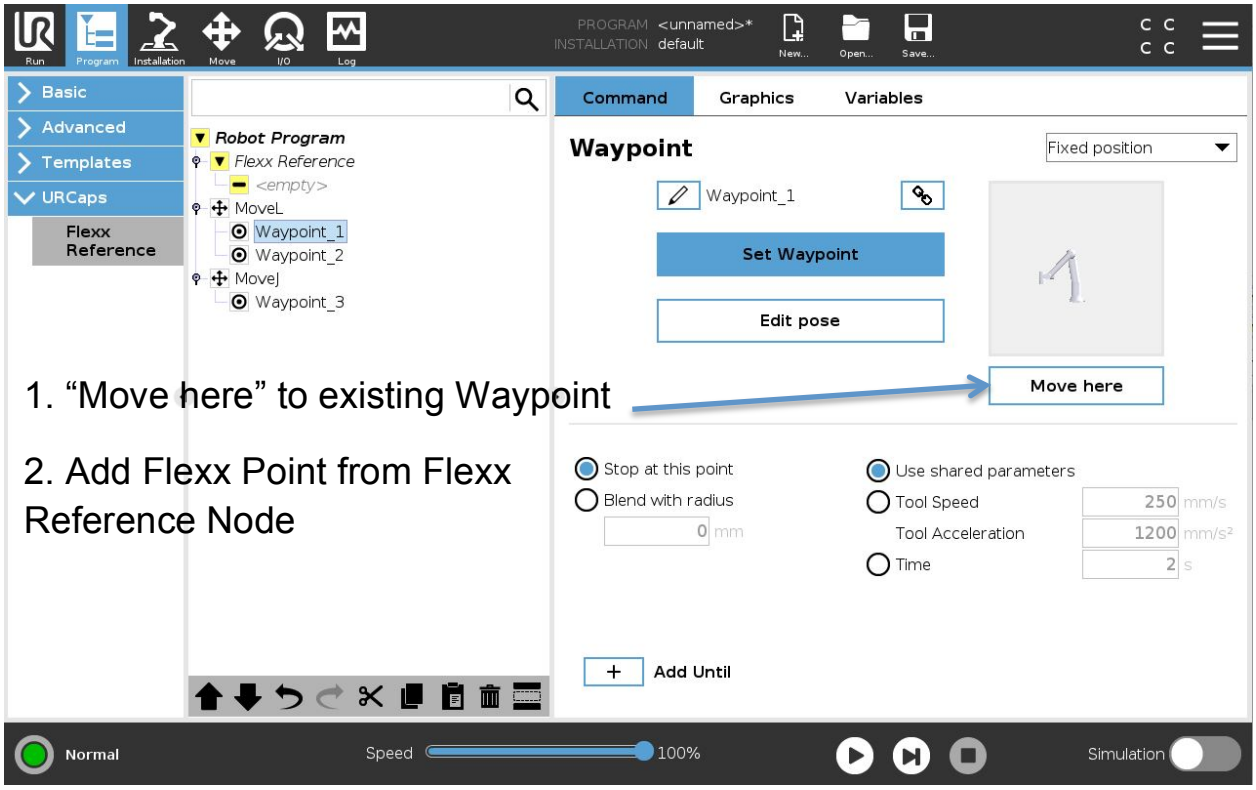
5.1.2. Set a Flexx Feature by following all steps in Section 2.4 Recording a Flexx Feature.

5.1.3. Open the Program file for the existing UR program and Add a Flexx Reference Node to the Program Tree by following all steps in Section 3.2 Adding the Flexx Reference Node.

NOTE: The node should be nested at the top level of the UR Program Tree.

5.1.4. **Set** and **Apply** the feature created in Step 5.1.2 following Section 3.4 Applying a Flexx Feature.

5.1.5. In the UR Program Tree, select the first Waypoint in your existing UR program.



5.1.6. Take note of all parameters for both the parent Move node and selected Waypoint Node. It is recommended to record all parameters.

5.1.7. Within the Waypoint Command screen, select **Move Here** to move to the selected Waypoint.

5.1.8. Navigate to the **Flexx Reference Node**.

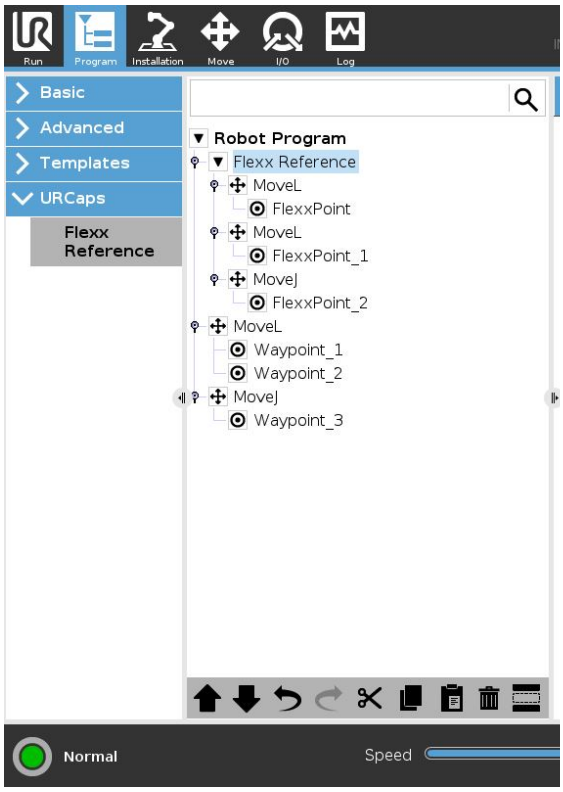
5.1.9. Add a **Flexx Point** at the current robot position by following Section 3.5 Adding Flexx Points.

5.1.10. Update the parameters of the MoveL and Flexx Point with the parameters recorded in step 5.1.6.

5.1.11. Repeat steps 5.1.5 through 5.1.10 for all Waypoints in the existing program. Add additional existing nodes as needed.

5.1.12. Delete all old Program Nodes.

Pre-Deleting Nodes



Finished Program

6. URCap Uninstallation

6.1. Delete all Flexx References within installation node.

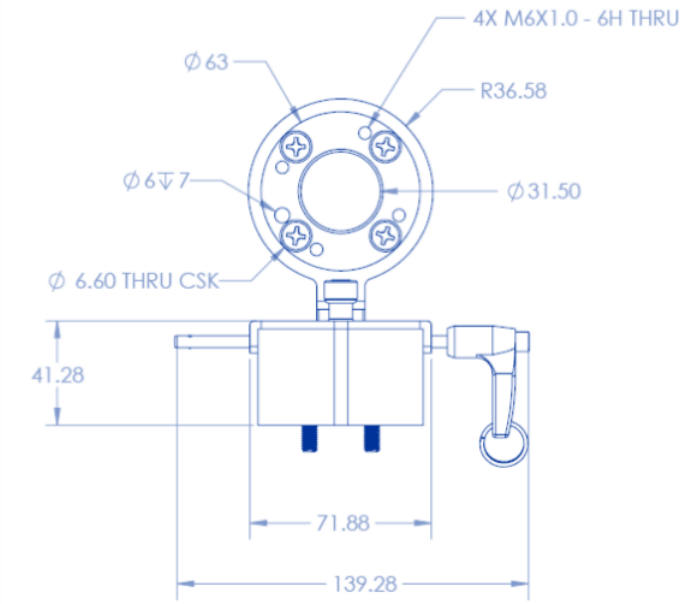
6.2. Go to setup robot and navigate to the URCaps page

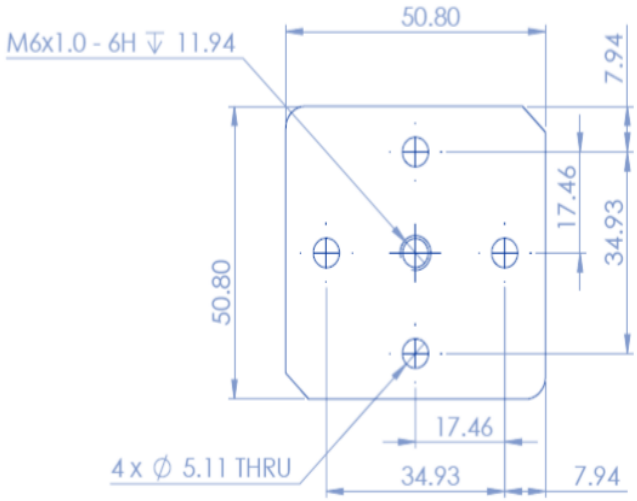
6.3. Select the FlexxBotics URCap from the list of active URCaps

6.4. Select the (-) button to delete the URCap.

6.5. Tap "Restart" (the URCap will then be uninstalled)

APPENDIX I: MECHANICAL SPECIFICATIONS AND MAINTENANCE





Male Mounting Hole Pattern for included M6 Mounting Screw. Center Hole in not needed in standard applications

Materials

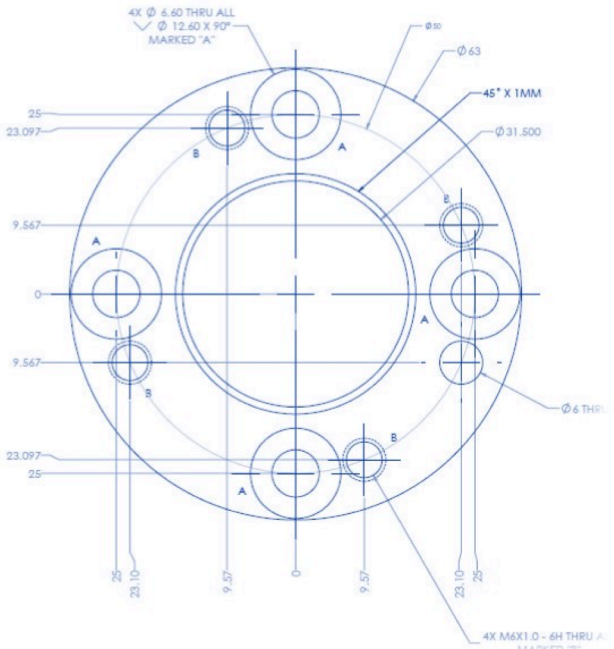
- Pin: Steel
- Flexx Reference: 304 Stainless & Aluminum

Mass

- Male Reference Component: 628G
- Female Reference Component: 167G

Positional Tolerances:

- X +/-2mm
- Y+/-2mm
- Z+/- 2mm



Female Reference Component countersunk holes are for mating with the robot end. M6 threaded holes are for mating with any third party end-effectors

Make sure to regularly clean the Male and Female references using either plain water or, if oils are present, >70% isopropyl alcohol. Dirt and oil build up will affect the accuracy of the unit and in extreme cases may stop the mating pin from being properly inserted.

Grease can be applied to the mating pin to facilitate installation and removal. The unit can accept wide variety of greases. Select grease that is best suited for the robot's operation environment and is compliant with any processes the robot will be completing.

APPENDIX II: TERMS AND CONDITIONS

Terms and Conditions of Sale

1. Contract Formation

If this instrument is a quotation, whether or not responsive to a request from the Buyer, ("**Buyer**"), it constitutes the offer of FlexxBotics ("**Seller**") to the Buyer, and becomes a binding contract under the terms and conditions set forth herein when it is accepted by the Buyer. However, any such acceptance shall be valid only if made within sixty (60) days of the date of this instrument or such other time period specified herein. If this instrument is an acknowledgment, it constitutes Seller's acceptance of the Buyer's order, subject, however, to the terms and conditions set forth herein. Upon the creation of a contract, this instrument will recite the entire agreement between the parties with respect to the goods, equipment or services being purchased, and shall supersede any other agreement, writing, or understanding whether made before or after the date of this instrument. Thus, Seller's contractual obligations are expressly limited to the terms contained herein. The inclusion of any different or additional terms in any other instrument is objected to, and performance by Seller shall occur with the express understanding that only the terms and conditions recited herein shall control.

2. Terms of Payment

a) All payments are to be made in United States dollars.

b) When credit is extended by Seller, invoices shall be due and payable within thirty (30) days from invoice date. Any amount unpaid thirty (30) days after invoice date shall bear interest at the lesser of the rate of one and one-half percent (1.5%) per month or the highest rate permissible under applicable law, calculated daily and compounded monthly. However, notwithstanding the foregoing, Seller retains the option to refuse or to revoke credit, and to require immediate payment of all outstanding balances and payment on delivery for all future deliveries.

c) Buyer shall be responsible for all taxes, duties and similar charges in connection with the goods, equipment or services being purchased, including VAT, sales, use, excise and other transaction taxes associated with same. If any deduction or withholding is required by applicable law, Buyer will so notify Seller and will pay any additional amounts necessary to ensure that the net amount received by Seller, after any deduction or withholding, equals the amount Seller would have received if no deduction or withholding had been required. In addition, Buyer will provide Seller with documentation sufficient to show that the withheld or deducted amounts have been paid to the relevant taxing authority.

d) Buyer agrees to pay any expenses incurred by Seller in collecting any unpaid balance of the purchase price, or in recovering possession of goods, including reasonable attorney's fees.

e) If Seller extends credit to the Buyer, then for the purpose of securing payment and performance of all of Buyer's obligations hereunder, Seller shall retain a security interest in all of the goods being sold pursuant to this agreement. At Seller's request, Buyer shall execute and join in executing all financing statements and other instruments, in form satisfactory to Seller, which Seller deems necessary or desirable to perfect its security interest in the goods being sold pursuant to this agreement.

f) Transfer Prices do not include and are net of any foreign or domestic governmental taxes or charges of any kind that may be applicable to the sale, licensing, marketing, or distribution of the Products, including without limitation excise, sales, use, property, license, value-added taxes, franchise, withholding or similar taxes, customs or other import duties or other taxes, tariffs or duties (other than taxes which are imposed by any government entity based on the net income of the Company). Any such taxes incurred and paid by the Company shall be billed to and promptly reimbursed by the Distributor. The Distributor shall also be the importer of record in connection with the sale of any Products outside

of the European Union.

3. Project Execution/Acceptance Tests

a) If applicable, the contract shall include (a) date(s) before which design data shall be provided by the Buyer to Seller, as required by Seller for the adaptation of the product to the Buyer's specification, as agreed upon. If the contract provides for design review meetings to be held by the Buyer and Seller, the meeting(s) shall be held at Seller's premises, unless specifically agreed otherwise. At such design review meetings, Seller shall provide system design information, interface data and/or acceptance test criteria to the Buyer. Unless specifically agreed otherwise, the Buyer shall strictly adhere to such information, data and/or criteria, in order to ensure successful product use, installation, acceptance and/or integration into Buyer's equipment. If the Buyer causes delay, including delay in providing the required design data, delay of planned design reviews, delay in delivery of equipment to be supplied by the Buyer or a third party, or delays in activities as described in Section 3(d), Buyer shall nevertheless pay according to the originally agreed payment schedule dates. In addition, the Buyer shall compensate Seller for any additional costs Seller incurs as a result of this delay.

b) Acceptance tests provided for in the contract shall, unless otherwise agreed, be carried out at the place of manufacture during normal working hours ("**Factory Acceptance**"). If the contract does not specify the technical requirements, the tests shall be carried out in accordance with industry standard practice.

c) At Buyer's request, Seller shall notify the Buyer in writing of the acceptance tests in sufficient time to permit the Buyer to be represented at the tests. If the Buyer is not represented, the test report shall be deemed to be accurate and shall, at Buyer's request, be sent to the Buyer.

d) If the contract provides for installation activities and/or acceptance tests to be performed by Seller after arrival of the product at the site of the Buyer ("**Site Acceptance**"), the Buyer shall ensure that, prior to arrival of Seller personnel, any preparatory work, agreed to be performed by the Buyer, shall be completed. The Buyer shall also ensure that the following conditions are satisfied:

i) Seller personnel shall be informed of all relevant safety and/or security regulations in force at the site;

ii) suitable office space and telecommunication facilities shall be made available to Seller personnel;

iii) suitable lifting and/or handling devices along with operating personnel shall be made available to Seller personnel; and

iv) protected storage facilities shall be provided for Seller property and/or the personal effects of Seller employees.

4. Packing and Shipment

Packing and shipment shall be in accordance with good commercial practice.

5. Delivery and Title

a) Delivery shall be FOB Seller's (or its manufacturer's) facilities in accordance with INCO terms. Title (except title to Programs) and risk of loss shall pass to the Buyer at the FOB point.

b) Under no circumstances shall Seller have any liability whatsoever for delays, loss of use, or for any indirect or consequential damages arising from any delay or loss of use.

c) Seller shall not be responsible for the failure to perform any obligation arising hereunder due to events beyond its control. These events shall include, but are not limited to, fire, storm, flood, earthquake, explosion, accidents, acts of public enemy, sabotage, strikes, labor disputes, labor shortages, work stoppages, transportation embargoes or delays, failure or shortage of materials or machinery used by Seller in the manufacture of the goods supplied hereunder, acts of God, failure of suppliers or subcontractors to satisfactorily meet scheduled deliveries, and acts or regulations or priorities of federal, state or local governments or branches or agents thereof.

d) No claim for shortage in packaging shall be allowed unless reported to Seller, in writing, within ten (10) days after receipt of goods.

6. Proprietary Rights

a) Except as otherwise provided in this Section 6, the Buyer shall not receive, as a result of the sale of goods hereunder, any right or license of any kind under any intellectual property rights or

other proprietary rights owned or controlled by Seller, or under which Seller may be licensed. However, the foregoing provision shall not limit the right of the Buyer to use or sell such goods, in the event such goods are covered by any such intellectual property or proprietary rights owned or controlled by Seller.

b) The provisions of this Section 6(b) apply only to Programs provided by Seller pursuant to this agreement. In the event a provision of any other section of this agreement conflicts with a provision of this Section 6(b), the provision of Section 6(b) will control as it relates to Programs. For purposes of this agreement, "**Programs**" means the computer programs, software, firmware and related documentation provided by Seller to Buyer under this agreement, including any customizations, enhancements, updates, upgrades, releases, replacement or successor products, defect corrections, and other modifications provided to Buyer by Seller, that is pre-loaded or pre-packaged with hardware or other goods or equipment, or embedded into hardware, goods or equipment, or otherwise provided solely for use in conjunction with the hardware, goods or equipment provided hereunder.

i) As between Buyer and Seller, Seller (or its licensor) owns all right, title and interest (including all intellectual property rights) in and to the Programs, and nothing contained in this agreement may be construed to convey to Buyer any intellectual property rights in or to the Programs other than the limited rights set forth in Section 6(b)(ii) below.

ii) Seller grants to Buyer a worldwide, non-exclusive, non-assignable (except as otherwise provided herein) license to use the Programs solely in conjunction with the hardware, goods or other equipment in connection with which the Programs are provided. Buyer may assign its license to a Program to a subsequent purchaser (or other transferee) of the hardware, goods or other equipment in connection with which the Programs are provided, provided that the assignee agrees to be bound by the terms and conditions of this Section 6.

iii) Buyer shall not: (1) copy the Programs; (2) modify, adapt, alter, translate, localize or create derivative works of the Programs; (3) reverse engineer, decompile, disassemble or otherwise attempt to derive the source code for the Programs; (4) distribute, transfer, sublicense, sell, use for service bureau, hosting or time sharing processing operations, reuse for any other purpose, lease, rent or loan the Programs; (5) remove, alter, cover or obfuscate any copyright, patent or other proprietary rights notice placed in or on or displayed by the Programs; (6) frame or mirror any content forming part of the Programs; (7) access the Programs in order to (a) benchmark against or build a competitive product, or (b) copy any ideas, features, functions or graphics of the Programs; or (8) otherwise exercise any rights in or to the Programs except as expressly permitted under this agreement.

7. Limitation of Liability

IN NO EVENT SHALL SELLER BE LIABLE TO BUYER (OR ANY PERSON OR ENTITY CLAIMING THROUGH BUYER) FOR BUYER'S LOST PROFITS OR SPECIAL, INCIDENTAL, INDIRECT, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES ARISING OUT OF OR IN ANY MANNER CONNECTED WITH THIS AGREEMENT OR ITS SUBJECT MATTER, REGARDLESS OF THE FORM OF ACTION AND WHETHER OR NOT SELLER HAS BEEN INFORMED OF, OR OTHERWISE MIGHT HAVE ANTICIPATED, THE POSSIBILITY OF SUCH DAMAGES. NOTWITHSTANDING ANYTHING IN THIS AGREEMENT TO THE CONTRARY, THE CUMULATIVE LIABILITY OF SELLER TO BUYER FOR ALL LOSSES, CLAIMS, SUITS, CONTROVERSIES, BREACHES AND DAMAGES FOR ANY CAUSE WHATSOEVER, AND REGARDLESS OF THE FORM OF ACTION OR LEGAL THEORY, SHALL NOT EXCEED THE AMOUNTS ACTUALLY PAID TO SELLER BY BUYER UNDER THIS AGREEMENT IN THE TWELVE (12) MONTH PERIOD PRECEDING THE EVENT GIVING RISE TO THE LIABILITY.

8. Seller's Standard Product Warranty

a) Seller warrants that each item of its

manufacture shall, at the time of shipment to Buyer, conform to applicable specifications and drawings in all material respects, and be free from material defects in material and workmanship (the "**Warranty**"). Design, essential performance, or other provisions expressly stated to be goals or objectives shall not be deemed to be requirements subject to this Warranty.

b) Seller's obligation under this Warranty shall be limited to repair or replacement, at Seller's option, of any item which within three (3) months from date of shipment to Buyer is proven to Seller's satisfaction to have been nonconforming at the time of shipment. As a condition of this Warranty, Buyer shall notify Seller in writing of any claimed nonconformance immediately upon discovery and shall return the item to Seller for inspection. Seller shall not be responsible for any work done or repairs made by others at any time. Disassembly by anyone other than persons authorized by Seller will void the terms of this Warranty.

c) Seller shall not be liable for improper use, installation, accidents, operation or maintenance of items manufactured or provided by Seller, or for any damage resulting therefrom, or from negligence on the part of Buyer's employees or agents.

d) Seller shall not provide field repairs, modifications, or any other field service under this Warranty.

e) THE WARRANTIES CONTAINED HEREIN ARE EXCLUSIVE AND ARE GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT. EXCEPT FOR THE WARRANTIES EXPRESSLY PROVIDED IN THIS SECTION 8, ALL GOODS, HARDWARE, EQUIPMENT, PROGRAMS AND OTHER ITEMS PROVIDED UNDER THIS AGREEMENT ARE PROVIDED "AS IS" AND "WITH ALL FAULTS".

9. Information, Data and Design

Any proposals, prints, brochures, drawings, designs, data or other information furnished to the Buyer by Seller before, after, or contemporaneously with the execution of this contract are intended for confidential use by the Buyer, shall remain the property of Seller, and shall not be used to the detriment of Seller's competitive position. When given, all such proposals, performance and production projections, prints, brochures, drawings, designs, data and other information are based on Seller's knowledge and understanding, but are, in all events, estimates only and are not guaranteed or warranted in any respect. The providing of any design information by Seller shall not constitute an assumption of design responsibility unless otherwise expressly assumed by Seller.

10. Cancellation of Contract

Under no condition may the Buyer cancel its obligations under this contract. Any attempt to do so will entitle Seller, in its sole discretion, to either (a) recover all direct, indirect, and consequential damages arising by reason of such attempted cancellation, or (b) retain as liquidated damages any Buyer deposit made under this contract.

11. Governing Law

The substantive laws of the State of Maine will in all respects govern this agreement as though this agreement was entered into, and was to be entirely performed within, the State of Maine, without regard to conflict of law principles.

12. Assignment

The Buyer's rights may not be assigned or otherwise transferred to any other person, whether by operation of law or otherwise, without Seller's prior written approval.

13. Waiver

Waiver by Seller of any breach of any of these provisions, or its failure to exercise any right or remedy, shall not be construed as a waiver of any other breach, or a waiver to exercise any other right or remedy.

14. Severability

If a court of competent jurisdiction declares any provision of this agreement to be invalid, unlawful or unenforceable as drafted, the parties intend for that provision to be amended and

construed in a manner designed to effectuate the purposes of the provision to the fullest extent permitted by law. If a provision cannot be so amended and construed, it will be severed, and the remaining provisions will remain unimpaired and in full force and effect to the fullest extent permitted by law.

15. Indemnification

If any goods are made in compliance with Buyer's plans, designs, specifications or instructions, Buyer shall indemnify and hold harmless, and defend Seller from and against any damage, loss, expense, liability, claims, suits, judgments, decrees and costs (including reasonable attorneys' fees) (collectively, "**Damages**") caused by or relating to the plans, designs, specifications or instructions for such goods, including any alleged or actual infringement or misappropriation of the intellectual property rights or other rights of any third party. In addition, Buyer shall indemnify and hold harmless, and defend Seller from and against any and all Damages arising out of or relating to (i) claims made by Buyer's employees or agents for injuries or damages including death, arising from or related to tasks performed under this quotation or contract, and/or (ii) Buyer's negligent or improper installation of any goods, hardware, equipment or other items provided by Seller hereunder.

APPENDIX III: CONTACT INFO

Website
www.flexxbotics.com

Phone
1 (877) 456-1576

Sales EXT. 1

Technical Support and Engineering EXT. 2

Accounts Receivable EXT. 3

Email
sales@flexxbotics.com for all commercial and pricing inquiries

support@flexxbotics.com for all technical issues and questions