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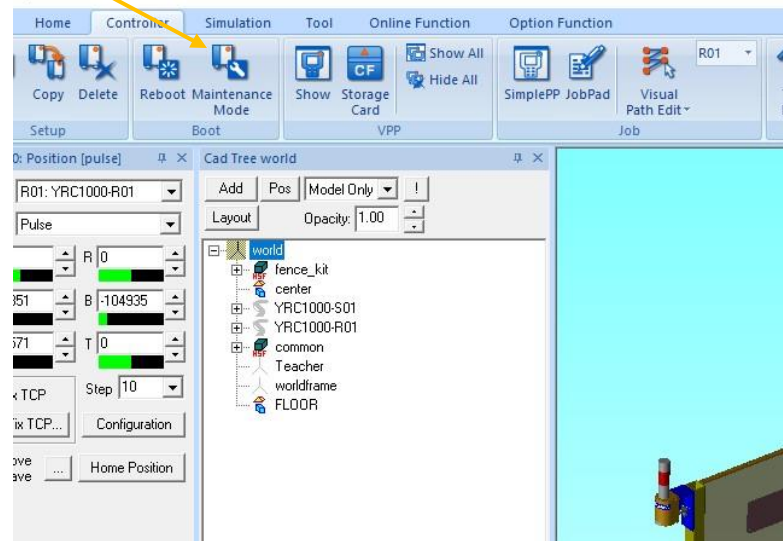
External Reference Point

Introduction

This document will walk through the process of enabling, setting up, and programming with external reference point or external TCP. This will cover the steps needed to complete this in MotoSim, with similarities in the real controller.

SETUP

1. **MotoSim** - Boot controller into maintenance mode.

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2. **Real controller** – The controller parameter file will have to be updated to turn on the external reference point funciton. You will have to contact Yaskawa and send the file in to have that feature added.   You will need to obtain a onetime password from Yasakwa in order to load the updated parameter file if you are using a DX200 or YRC1000.
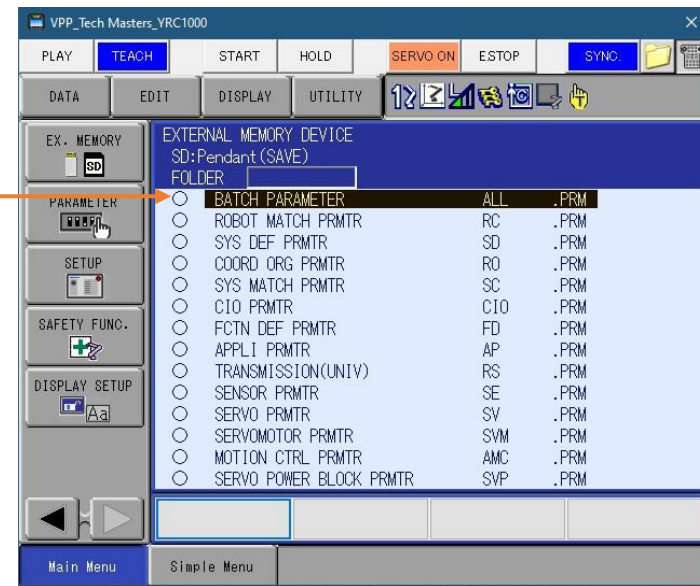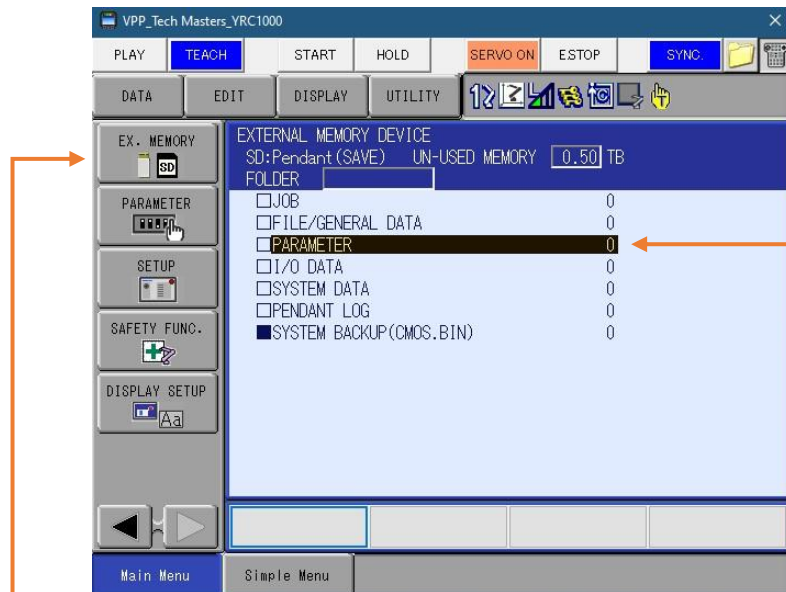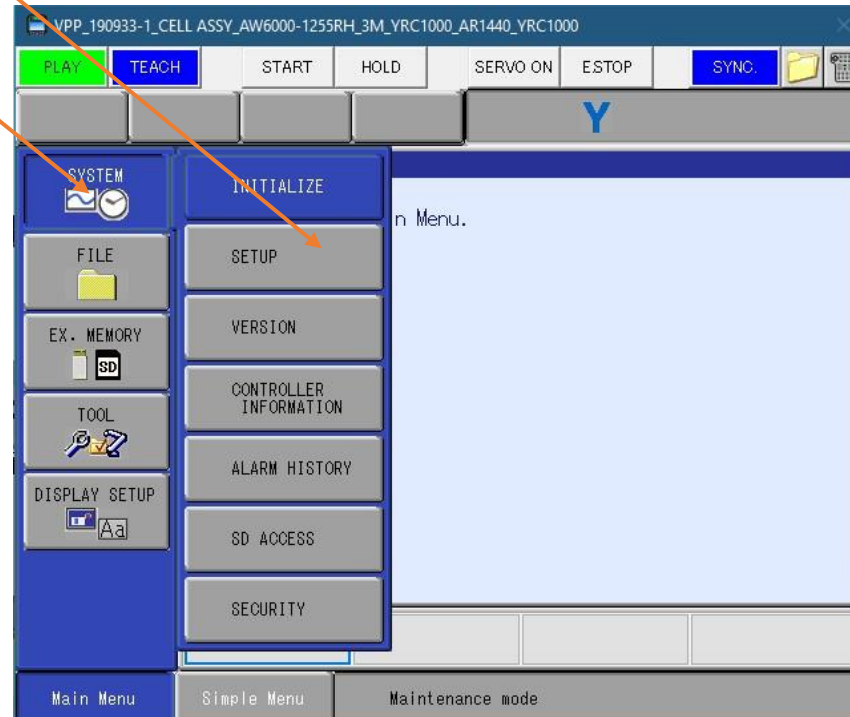

A. First, go to EX. MEMORY
B. PARAMETER
C. BATCH PARAMETER, and select this file
D. The file will be saved to a flash card you insert into the pendant. Take the file from the card and e-mail that to partnersupport@motoman.com

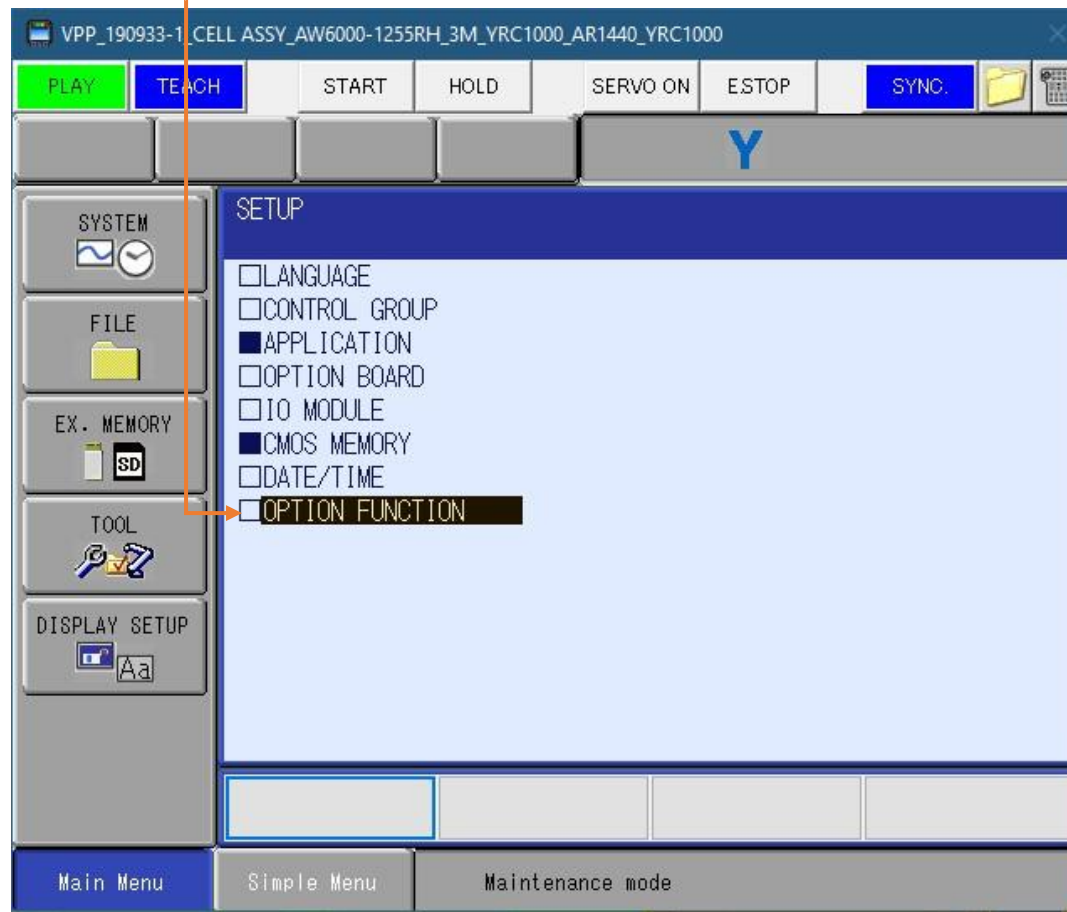**If you are on a real controller, then you can skip to page 7. Starting on STEP 7**

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3. Click on SYSTEM and then SETUP

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4. Under setup, you will click on OPTION FUNCTION

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5. Under option function, enable the external ref point.
6. Once it is enabled, the system will prompt you to modify the files. Click YES
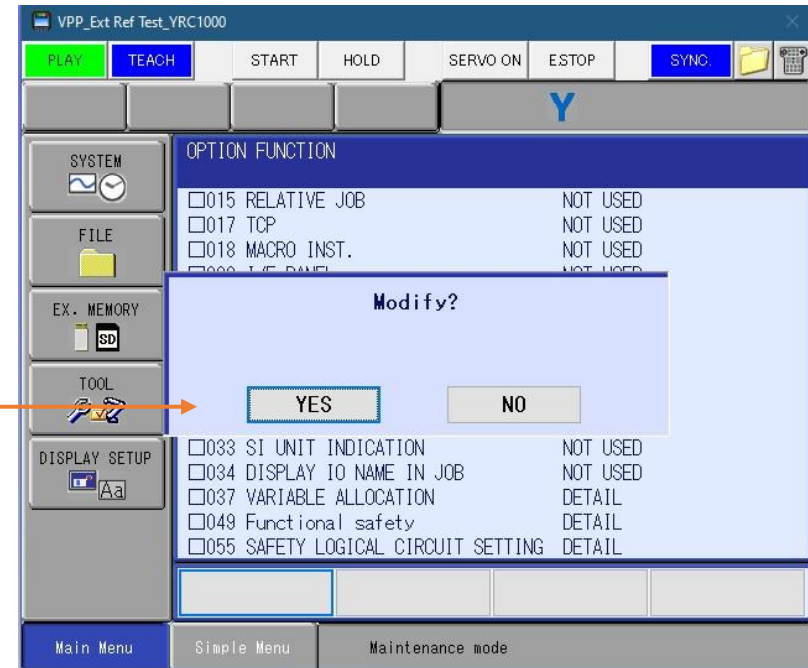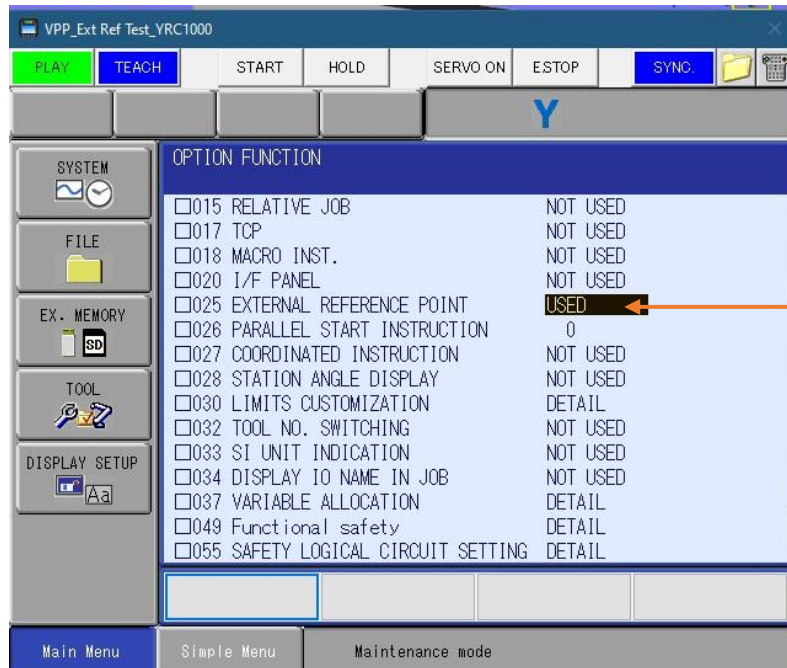
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7. After all options are turned on that you need, re-boot controller to normal power up by clicking END on small window behind pendant screen.
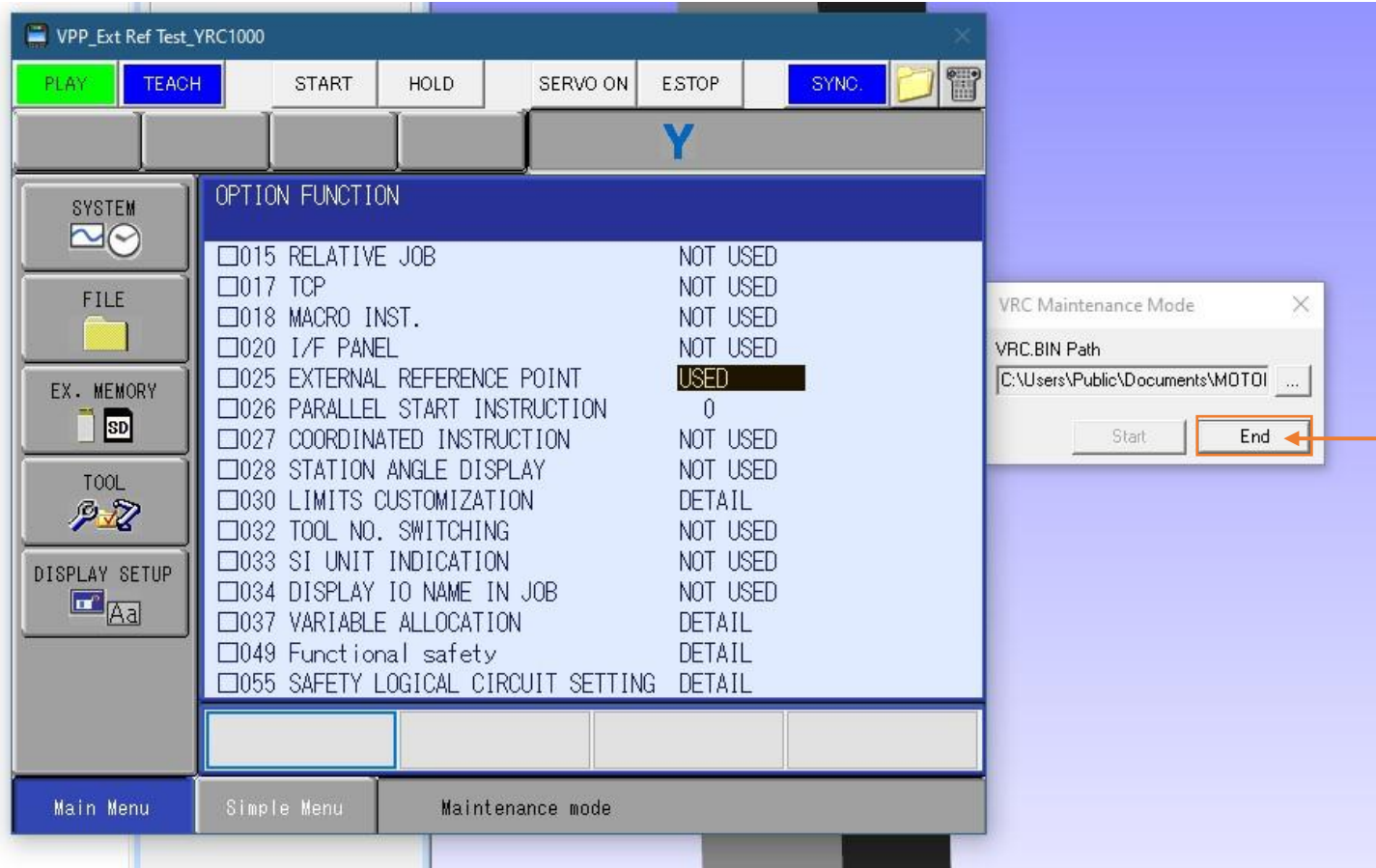
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8. Once controller boots back up in normal mode. Teach a user frame on the point you wish.
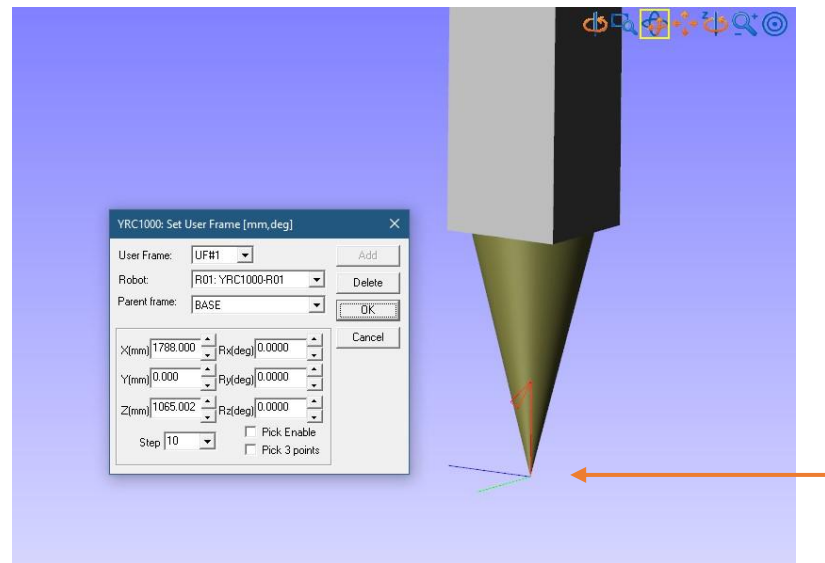
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9. The user frame can be changed to show 3 colors from the standard cyan.   Which will show the X, Y and Z elements directions more clearly.
   a. Go to the top of the page and click on the robot icon.
   b. Cursor down to OPTIONS
   c. On the graphics tab, and lower right. Check the box to display 3 colors.
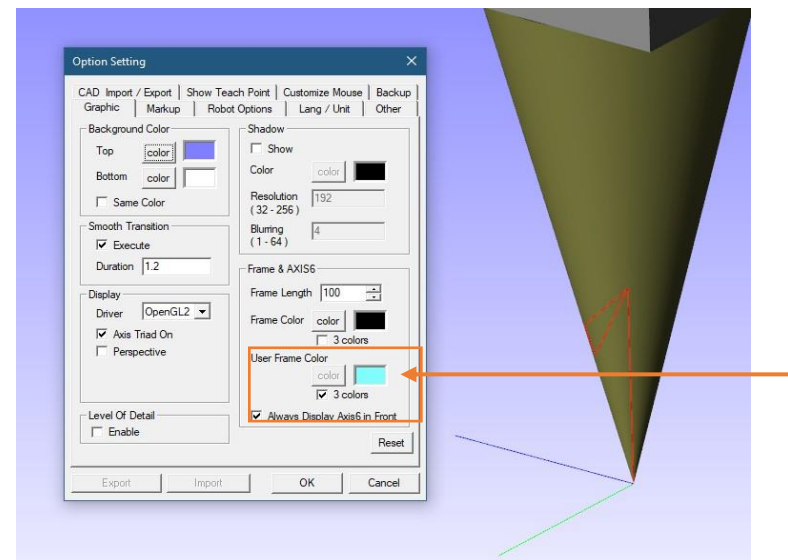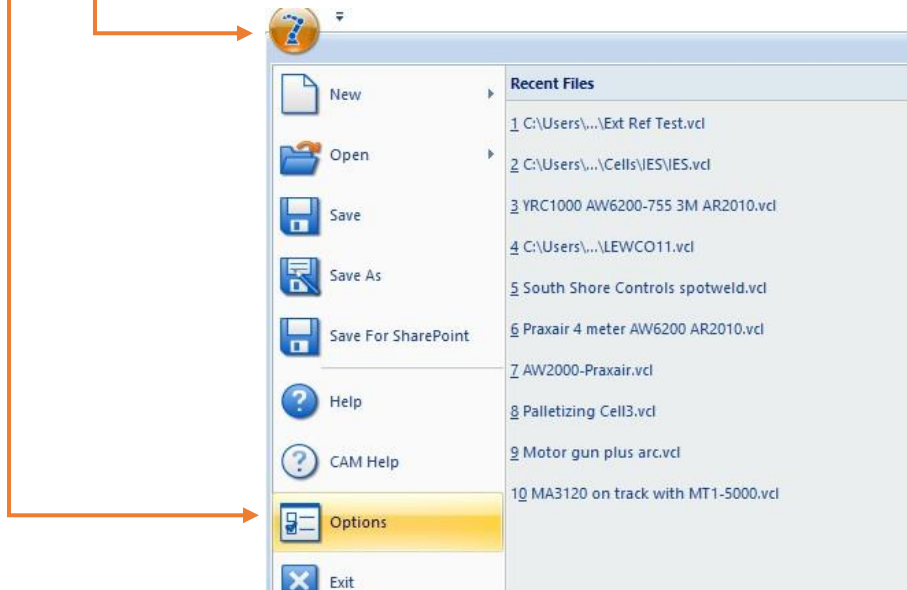
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10. Next, set up the OLP (pick tool) to be able to snap to the external ref. point.
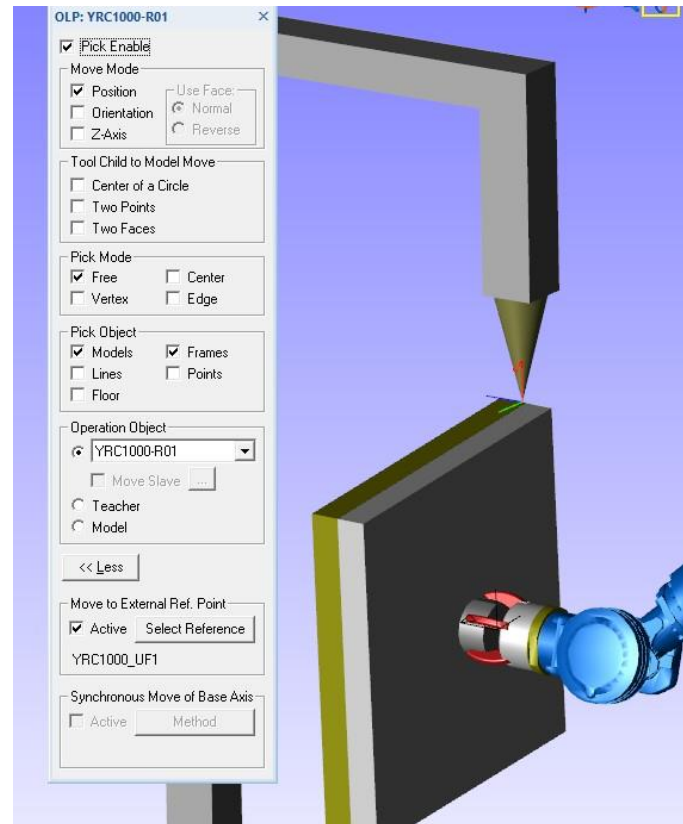
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11. Once the user frame is assigned and attached to the location needed, you can switch the robot jog type to Ext. Ref. jogging by using the coord key until the robot with red slant line through it shows at top of pendant as shown.

12. When getting ready to teach a move using the external reference point. Hit SHIFT, then MOTION TYPE. This will change the instruction line for a move to be as shown.

13. There are two move instructions for external reference point.
    a. EIMOVL : Used for external linear interpolation.
    b. EIMOVC : Used for external circular interpolation.
14. When a move instruction for the external reference point control is registered, the user coordinate number of the external reference point selected at the time is automatically registered.

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15. If you have mulitple user frames set up to use, then you will have to make sure the correct one to use is selected for the external ref. point.

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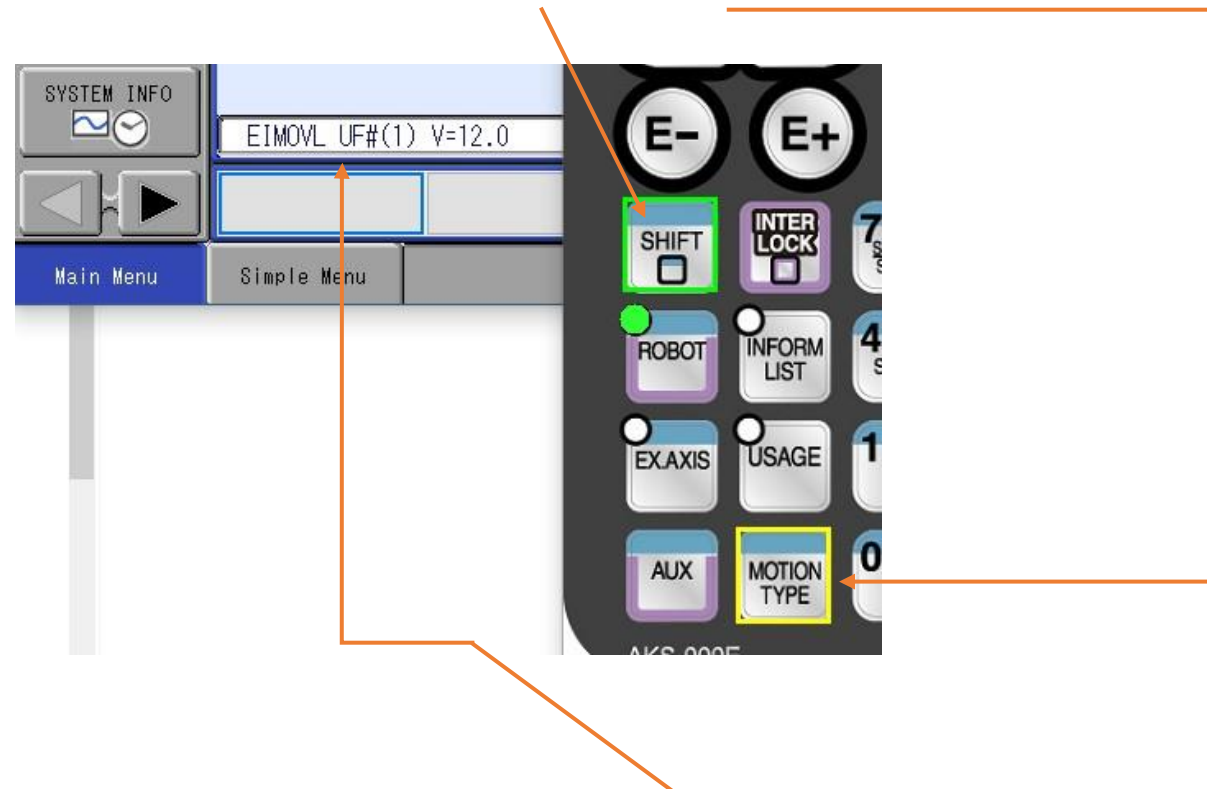![YASKAWA PARTNER SUPPORT - Shared Integration Experience]

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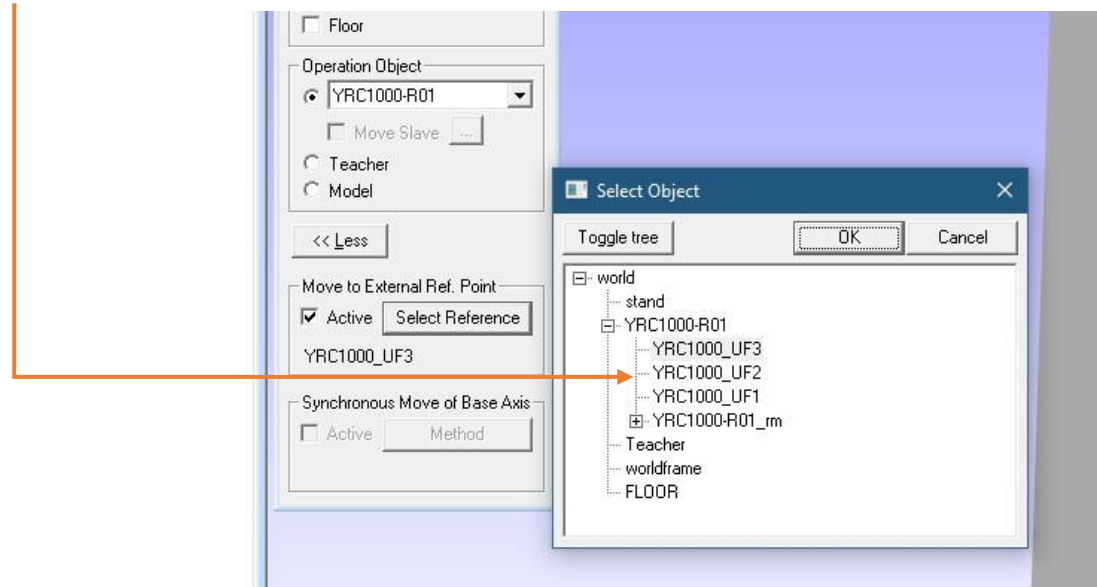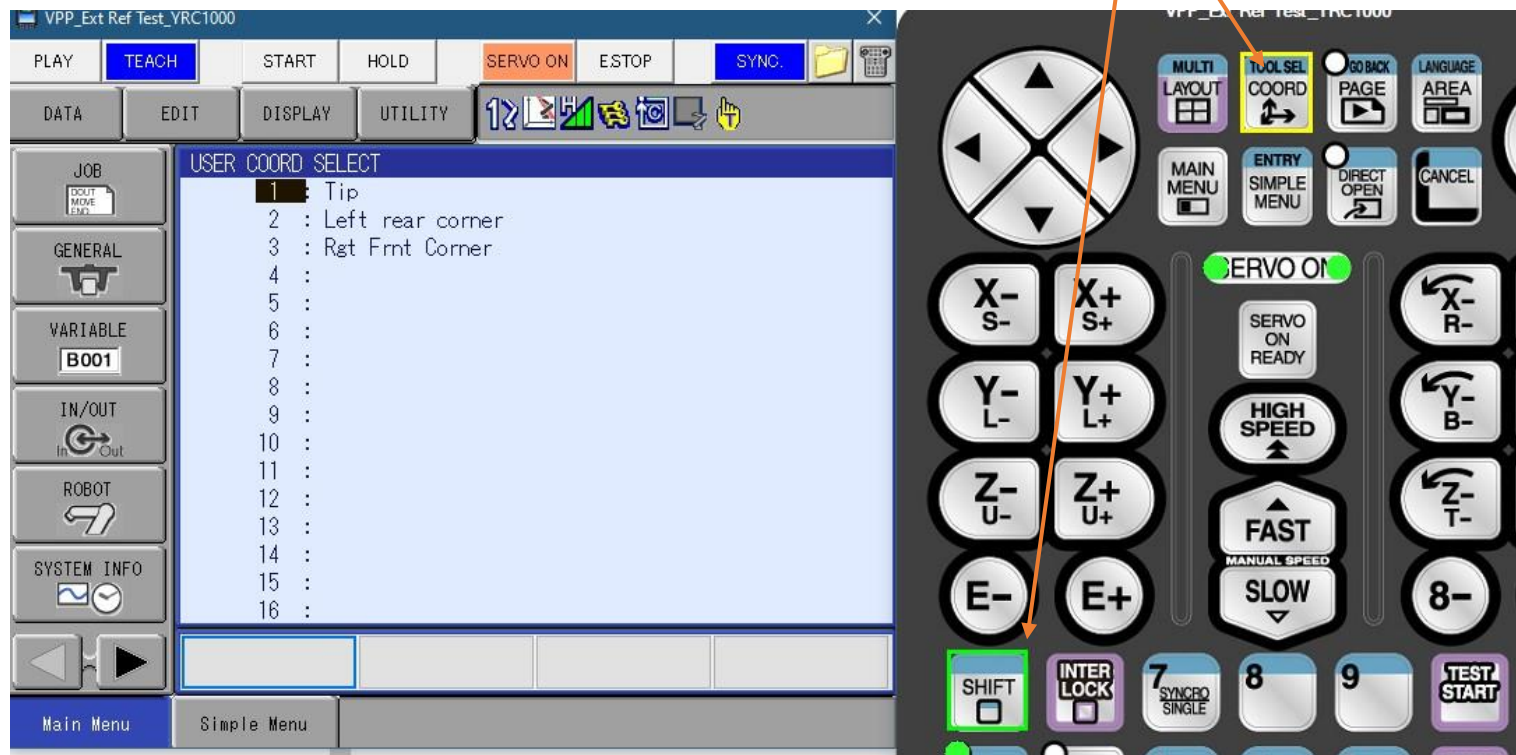
16. You may also need to choose a different external reference point to jog with.   Pick that by hitting SHIFT + COORD

17. Once you cursor to the user frame needed, just go back into your job. Where the cursor is left, is the active UF.

Conclusion

The external reference point is very usefull for dispensing and trimming. Many other applcation could benefit from this option.