This document captures ideas, experiences, and informal recommendations from the Yaskawa Partner Support team. It is meant to augment – not supersede manuals or documentation from motoman.com. Please contact the Partner Support team at partnersupport@motoman.com for updates or clarification.
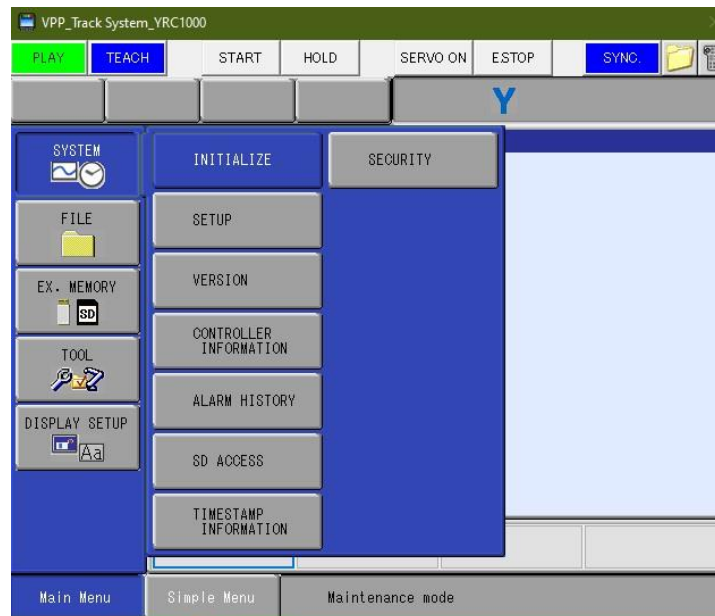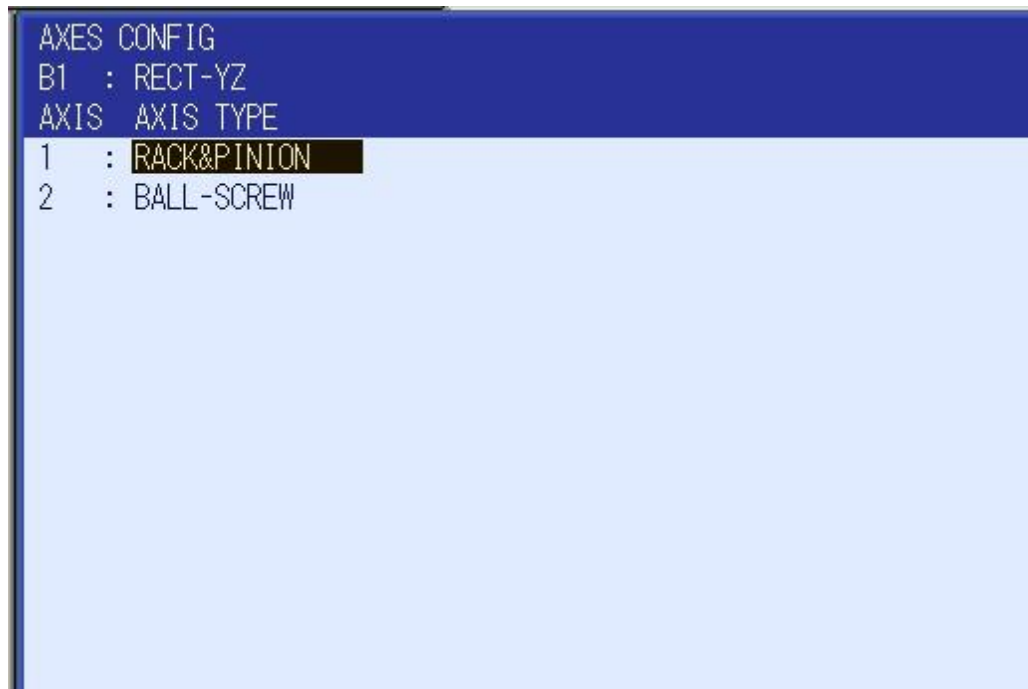
Adding Base Track for Y and Z Axis in MotoSim

Introduction

Adding a base track can be setup with many configurations (i.e., X, Y or Z, or the combination of the three, a "Y" track with "Z" elevator.) Anytime a base track is added, it is a B1, B2, etc. It cannot be separated from the robot like a station can. With a station, the group control in the job is R1+S1. With a base, the group will only show R1. In the job, you will not have a R1+B1. It will just be R1. Every position you teach with the robot, the base position will be captured as well.

Adding and configuring a Base

1. Whether you are building a new cell, or adding a track to an existing cell, the operation is almost the same. Both will be done in Maintenance Mode.

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2. Choose your type of track configuration under the CONTROL GROUP screen. In this case, it is RECT-YZ.

```
CONTROL GROUP

CONNECT :                          DETAIL
R1      : 1-06VXH12-A0*            DETAIL
B1      : RECT-YZ                  DETAIL
R2      : NONE                     DETAIL
S1      : NONE                     DETAIL
```

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3. On the AXES CONFIG screen, you will choose Ball Screw or Rack & Pinion. The Rack & Pinion is normally the correct configuration for base track and ball screw for Z lift.

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4. Then, establish the MECHANICAL SPEC. You will need a setup for this. Usually, setup is provided by Motoman. If you have a custom setup, then you will have to provide the details. It will need to be for each axis of that control group.

MECHANICAL SPEC		
B1 : RECT-YZ	AXIS: 1	
AXIS TYPE: RACK&PINION		
MOTION RANGE(+)	200.000	mm
MOTION RANGE(-)	-7000.000	mm
REDUCTION RATIO(NUMER)	1.000	
REDUCTION RATIO(DENOM)	250.000	
PINION DIAMETER	65.000	mm

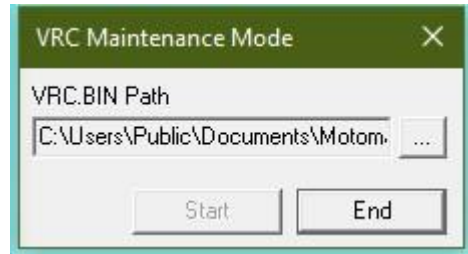| MECHANICAL SPEC		
B1 : RECT-YZ	AXIS: 2	
AXIS TYPE: BALL-SCREW		
MOTION RANGE(+)	890.000	mm
MOTION RANGE(-)	-5.000	mm
REDUCTION RATIO(NUMER)	1.000	
REDUCTION RATIO(DENOM)	220.000	
BALL-SCREW PITCH	85.000	mm/r

5. Continue following the setup sheet for the MOTOR SPEC pages. Pay attention to each axis setup. Axis 1 and Axis 2 here have different configurations.

```
MOTOR SPEC
B1       : RECT-YZ              AXIS: 1
AXIS TYPE: RACK&PINION
MOTOR              SGMAV-01ANA-YR11
SERVO AMP          CSRA-SDA01H01A06
CONVERTER          CSRA-CV05
ROTATION DIRECTION      NORMAL
MAX RPM                 3000 rpm
ACCELERATION TIME      0.300 sec
INERTIA RATIO           300 %
```

```
MOTOR SPEC
B1       : RECT-YZ              AXIS: 2
AXIS TYPE: BALL-SCREW
MOTOR              SGMAV-01ANA-YR11
SERVO AMP          CSRA-SDA01H01A06
CONVERTER          CSRA-CV05
ROTATION DIRECTION      NORMAL
MAX RPM                 3000 rpm
ACCELERATION TIME      0.300 sec
INERTIA RATIO           300 %
```

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6. Once setup is complete, then press the END button in the small window behind the Maintenance Mode window.
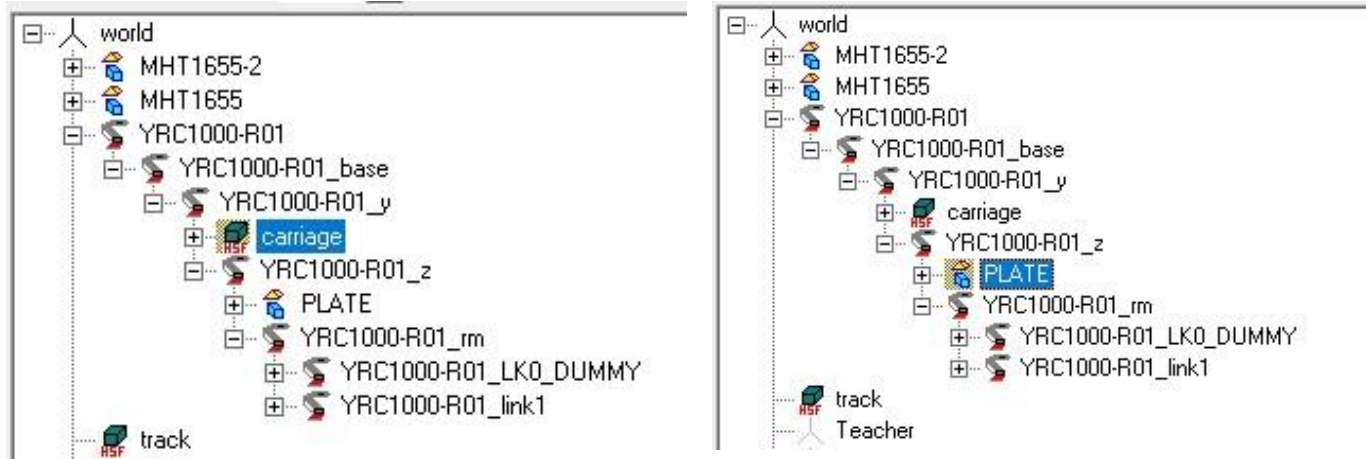

7. Since the base is part of the robot, make sure to place the robot on the carriage where you want it prior to attaching models to the control axis. This will be the same for the Z axis lift models.
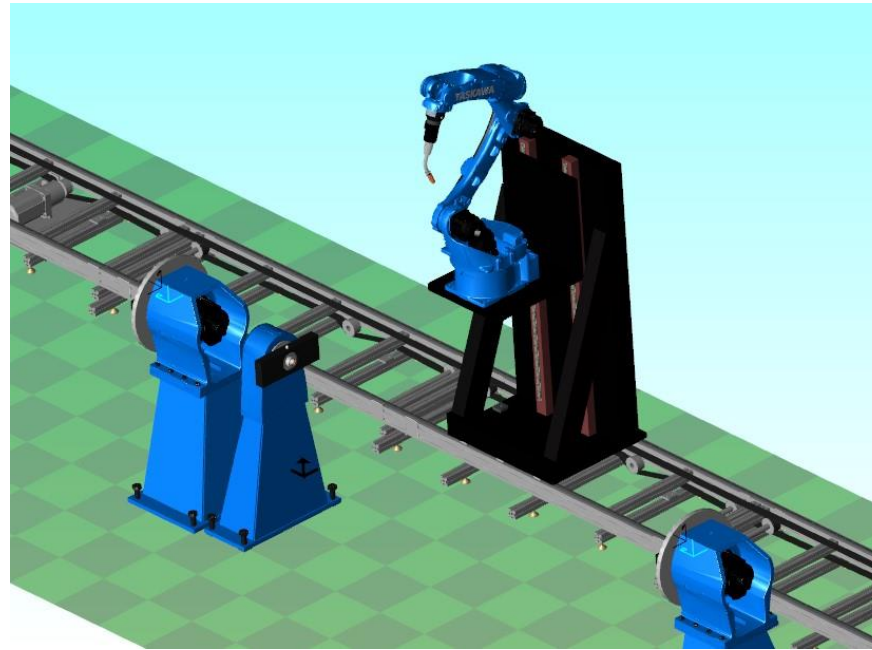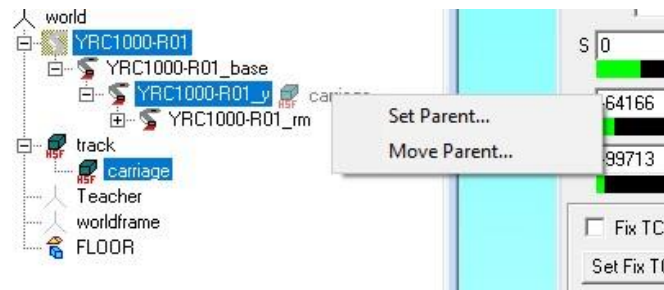
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8. Once all models are in place, attach the carriage model to the robot Y axis control frame. Then attach the Z axis models to the Z axis control frame.

   You can attach the models, by left click and hold and drag it to the model you want it to be a child of. In this case, the carriage is to the base y.

After left clicking/hold and drag to the parent, you can let go. Pick to SET parent - NOT move.

Conclusion

This is a great tool for setting different configurations for X or Y and even Z. You can also set up a track to include a X axis along with the Z. So, it will be a 3 axis setup.

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