

XTCAV Aug 2022 - Gibreel

In The Field:

Motor: HT23-554D-ZAC

Potentiometer:

IP Address: 172.27.13.38

IP Address set: 172.27.13.100

Subnet Mask: 255.255.252.0

Test plan:

- auxiliary task has homeAsync task -> homeAsync.bcx in filesystem good enough task execution setup has. all tasks enabledParameters > Axis > Limits > EndOfTravelLimitSetup
- Home Switch Polarity needs to be Active High
- Home Limit needs to be Use CCW Input (which is the negative limit switch) This one might be correct, but please verify:
- Parameters > Axis > Motion > Home > HomeSetup
- Home Start Direction should be CCW/Negative Direction
- Limit Type should be Use End-of-Travel Limit Switch
- Marker Input Source should be Use Position FeedbackTrip CW /CCW limit
- Check on motor record screen and on aerotech to see which limits show up

Try to home -> if works, try homing again, try 3 different homes, main panel, homr/homfTest plan:

1. Update parameter
2. Save new parameter file into motion epics App
3. Power Cycle MOC, Reboot IOC, enable axis, home
4. Move to x mm.
5. Home again to see if the behavior is odd.
6. Power Cycle MOC, Don't reboot IOC.
7. enable axis, home
8. Move to x mm.
9. Home again to see if the behavior is odd.
10. Reboot IOC, Don't power cycle MOC.
11. enable axis, home
12. Move to x mm.
13. Home again to see if the behavior is odd.

Notes:

- Homing on ensemble works fine, it goes back to the 0 position which is at CCW limit switch and stays there
- On EPICS, the homing would go to the CCW limit switch, then go back to the requested position, rather than a preset offset (which is 0 in the parameter file)

In Motion Lab:

Test Stand B34:

Address: moc-b34-mc08

ioc: sioc-b34-mc02

Name: B34_MP_4Chan

IP address: 134.79.219.181

Subnet mask: 255.255.252.0

What was done:

Issue:

The homing procedure in EPICS would home the motor to the CCW LS, and go back to the preset desired position instead of stopping close to the LS.

Observations:

- The homing procedure in Ensemble works as expected.
- homeAsync.ab procedure also works as expected after some modification and running on Ensemble.
- Moving on to EPICS, when running the homing procedure, the motor would move to the CCW LS and back off a bit (follows what Ensemble does), but then adds an extra procedure of moving to the set "desired position" and setting it as the 0.
 - What was noticed is that MOTR.RBV automatically sets to the -ve value of the "desired position" as it hits the LS. This prompts the motor to want to go back to the 0 position from the -ve value to complete the homing sequence.
- Attempting to try homr worked as expected

Steps taken:

- In Ensemble:
 - Connected on Ensemble, the parameter file of the XTCAV was used to recreate the issue on the test stand in the motion lab (B34_MP_4Chan)
 - Main thing to be changed is the "Opto-Isolated Limits" parameter
 - Axis Limits EndOfTravelLimitSetup Opto-Isolated limits (change from standard to opto-isolated limits)
 - Make sure Axis/Motion/Home/HomeSetup is 0x00
 - Home Start Direction is CCW/ Neg dir
 - Axis/Limits/EndOfTravelLimitSetup:
 - End-of-travel Switch Swap: Swap CW and CCW Switches
 - Axis/Feedback/PositionFeedbackType
 - Set to 0, no feedback
 - The homing procedure HomeAsync.ab was modified:
 - line 20 IGLOBAL(32) = 1
 - uncomment line 21
 - Running the HomeAsync.ab procedure results in the expected homing procedure
- In EPICS:
 - The homing procedure in EPICS runs homf
 - Running homr resulted in the expected homing procedure
 - Switched the homing procedure to run homr instead of homf which fixed the issue.
 - Test plan:
 - Start ioc: iocConsole sioc-b34-mc02
 - In dev, open motion display and motor expert

- Enable torque, then home
- Set a "Requested Position" and move motor
- Home again
- As it is homing, check HomeSetup Param on asyn screen "*edm -m 'P=MOC:B34:MC08,R=:ASYN' fastwirescannerasyn.edl*"
- Motor should stop after hitting the CCW LS and set the position to 0.

Parameter file changes (deg to mm) 2mm lead screw:

- Axis/units:
 - 22.2222 deg to 4000 mm
- Axis/Limits
 - LimitDecelDistance: 720deg to 4mm
- Axis/Motion:
 - AbortDecelRate: 20deg/s² to 0.111 mm/s²
 - DefaultRampDistance: 900 deg to 5 mm
 - DefaultRampRate: 3600 deg/s to 20 mm/s
 - DefaultSpeed: 3600 deg/s to 20 mm/s
- Axis/Motion/Home:
 - HomeRampRate: 1000 deg/s to 5.5555 mm/s
 - HomeSpeed: 360 deg/s to 2 mm/s

Personal Notes:

EPICS:

`cd motion/motion-git/iocBoot/sioc-dmp0-mc01/`

- We need to clone the motion repository, in cmd lines:
 - `eco`
 - `motion`
 - then keep pressing enter until it starts cloning
 - `make` (to build it)
- cd into directory
 - `cd motion/motion-git/motionApp/Db/common/`
- copy whichever file you want to modify:
 - `phaseShifterGapControl` is the one that includes mm to deg
 - I copied it into `phaseShifterGapControl2`

Ensemble:

- To run HomeAsync.ab
 - load then build file
 - run (debug run)
- Main thing that was changed to get the XTCAV parameter file working on the test stand:
 - Axis Limits EndOfTravelLimitSetup Opto-Isolated limits (change from standard to opto-isolated limits)

Notes:

- `grep -r phaseShifter`
- `iocConsole sioc-b34-mc02` to run ioc from anywhere
- `find . -name <name>`