

Connecting EPICS to TwinCAT

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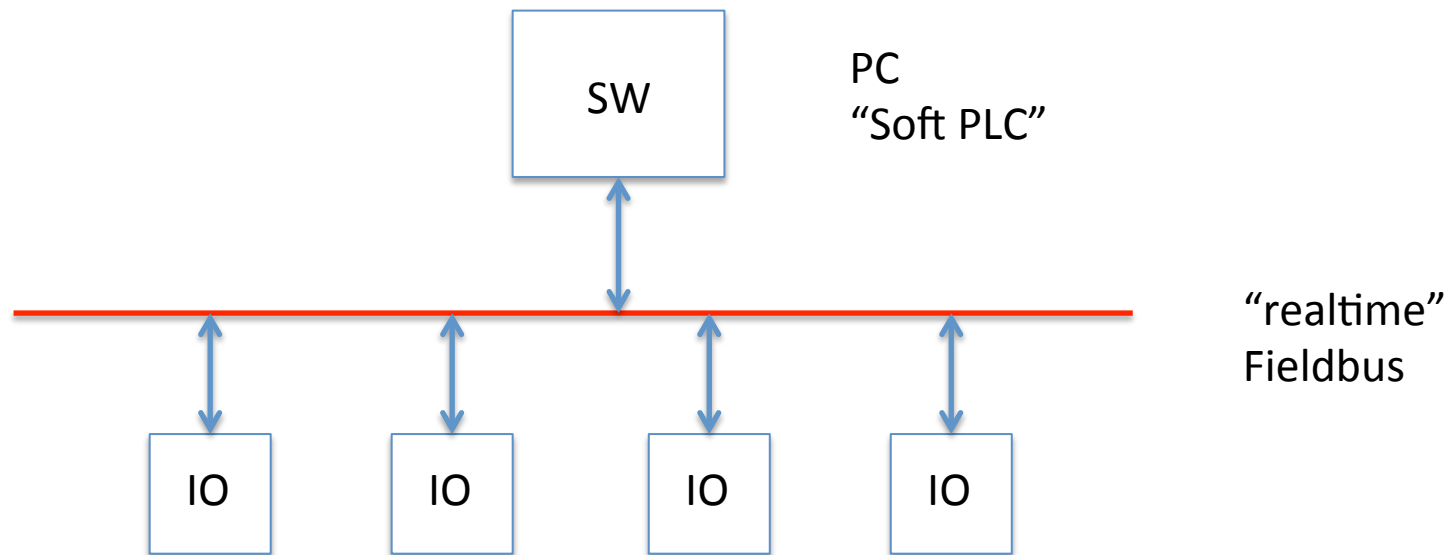
2015-05-19

Overview

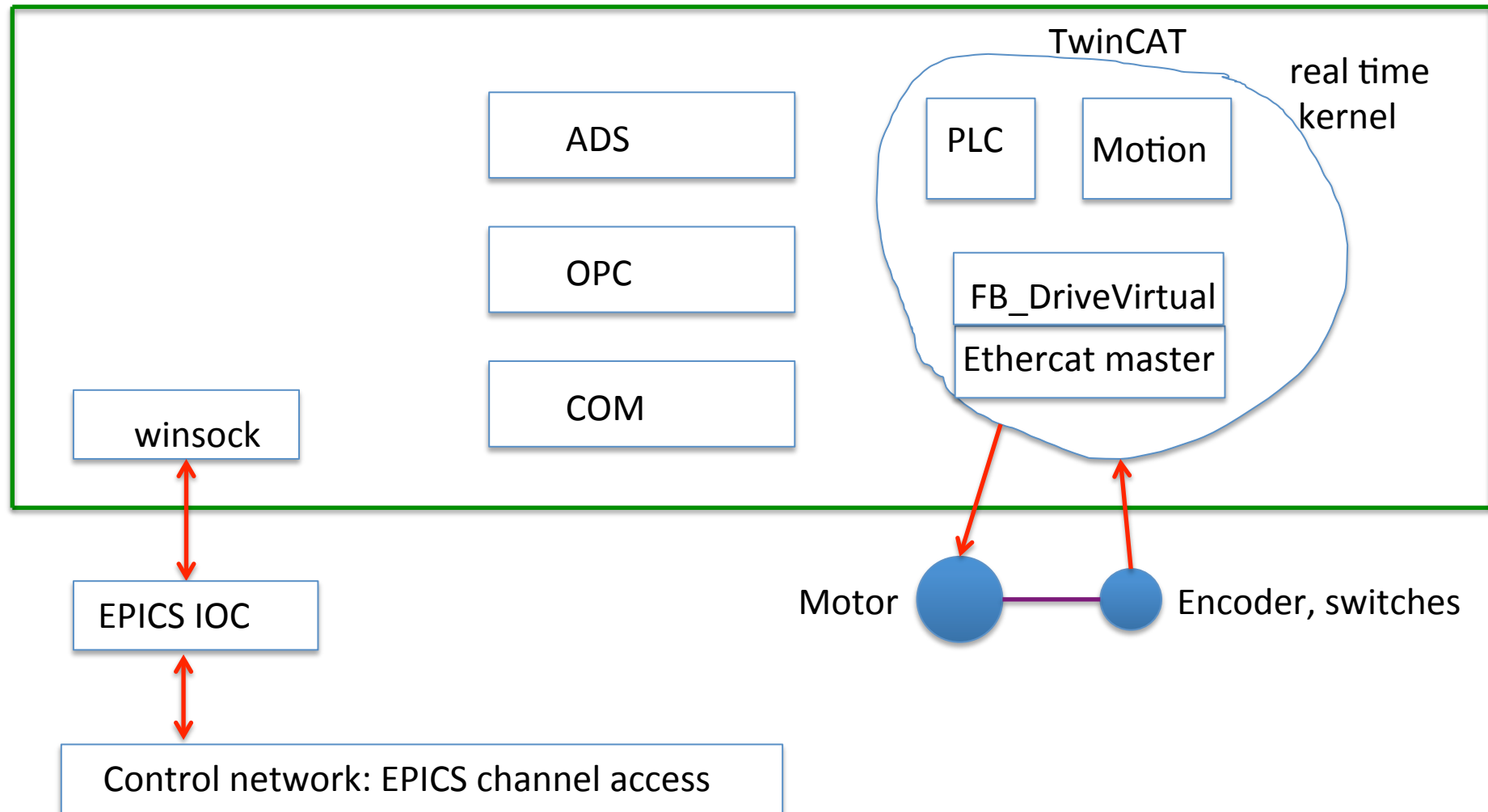


- What is a TwinCAT system ?
- Our EPICS Com Module for TwinCAT
- Using StreamDevice – Chopper (spinning disc)
- Using MotorRecord – Linear axis
- Ongoing developments

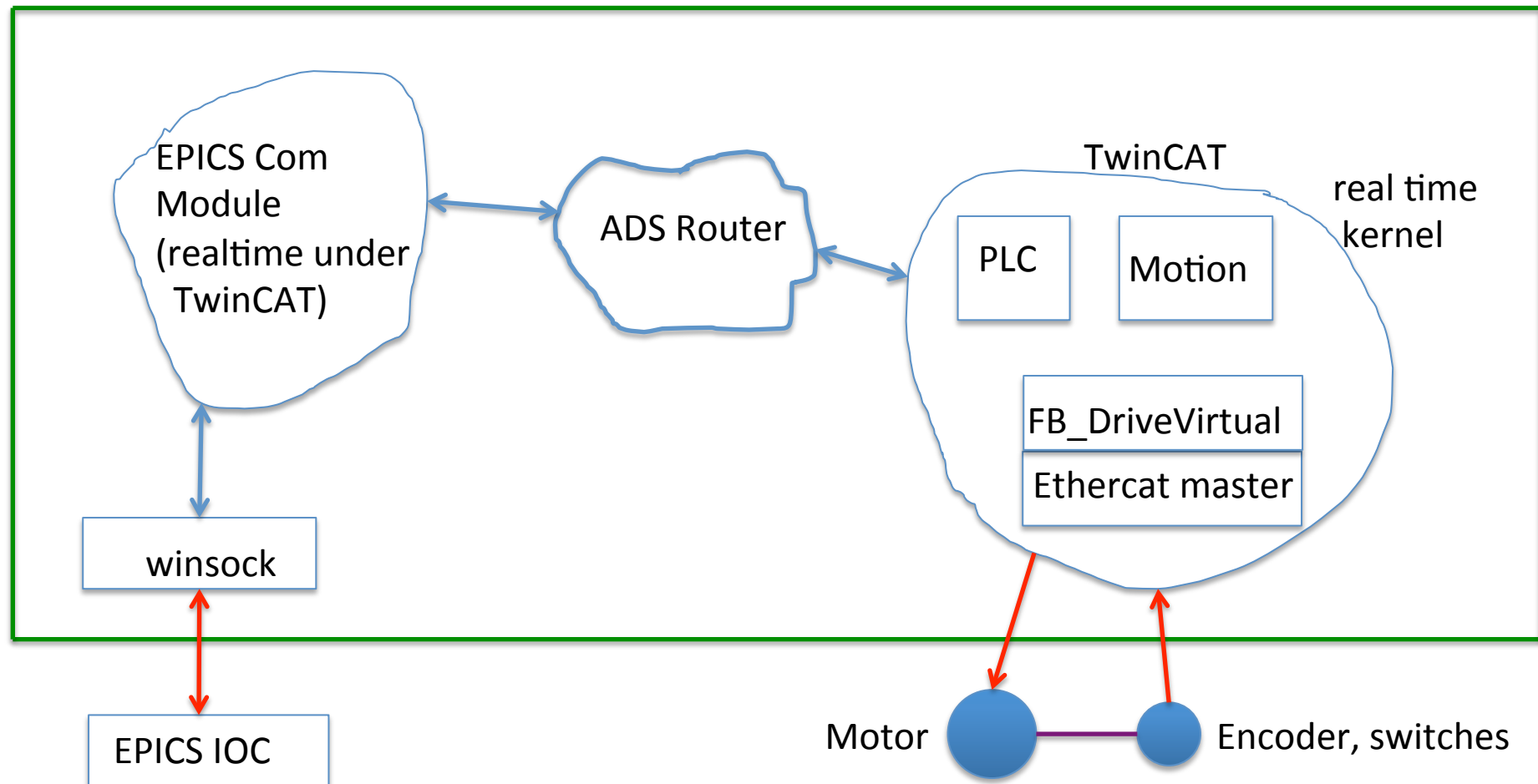
TwinCAT: a soft PLC system



Connections to TwinCAT



EPICS Com Module

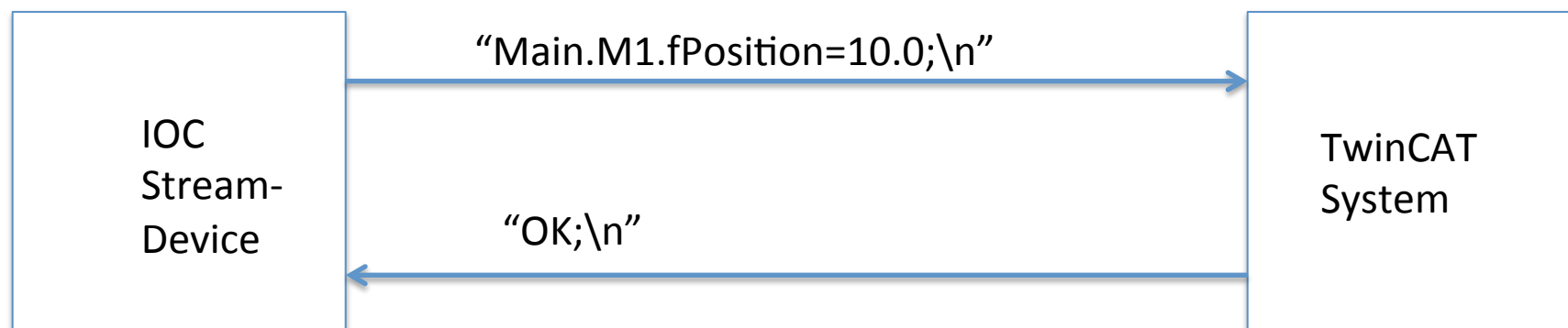


ASCII data

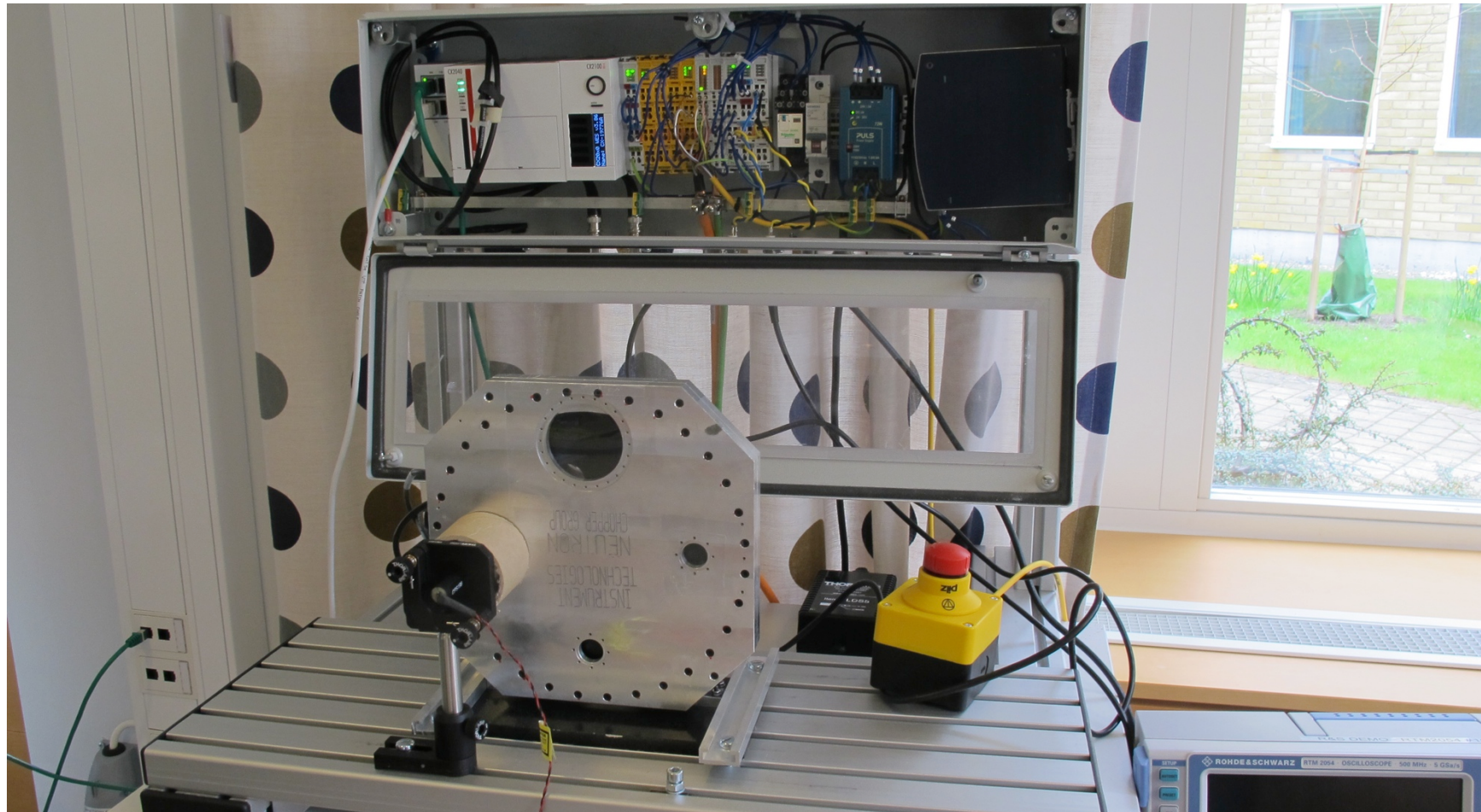
Low level debugging

```
$ telnet 192.168.88.48 200  
Main.M1.bBusy?;\r\n  
0;\r\n
```

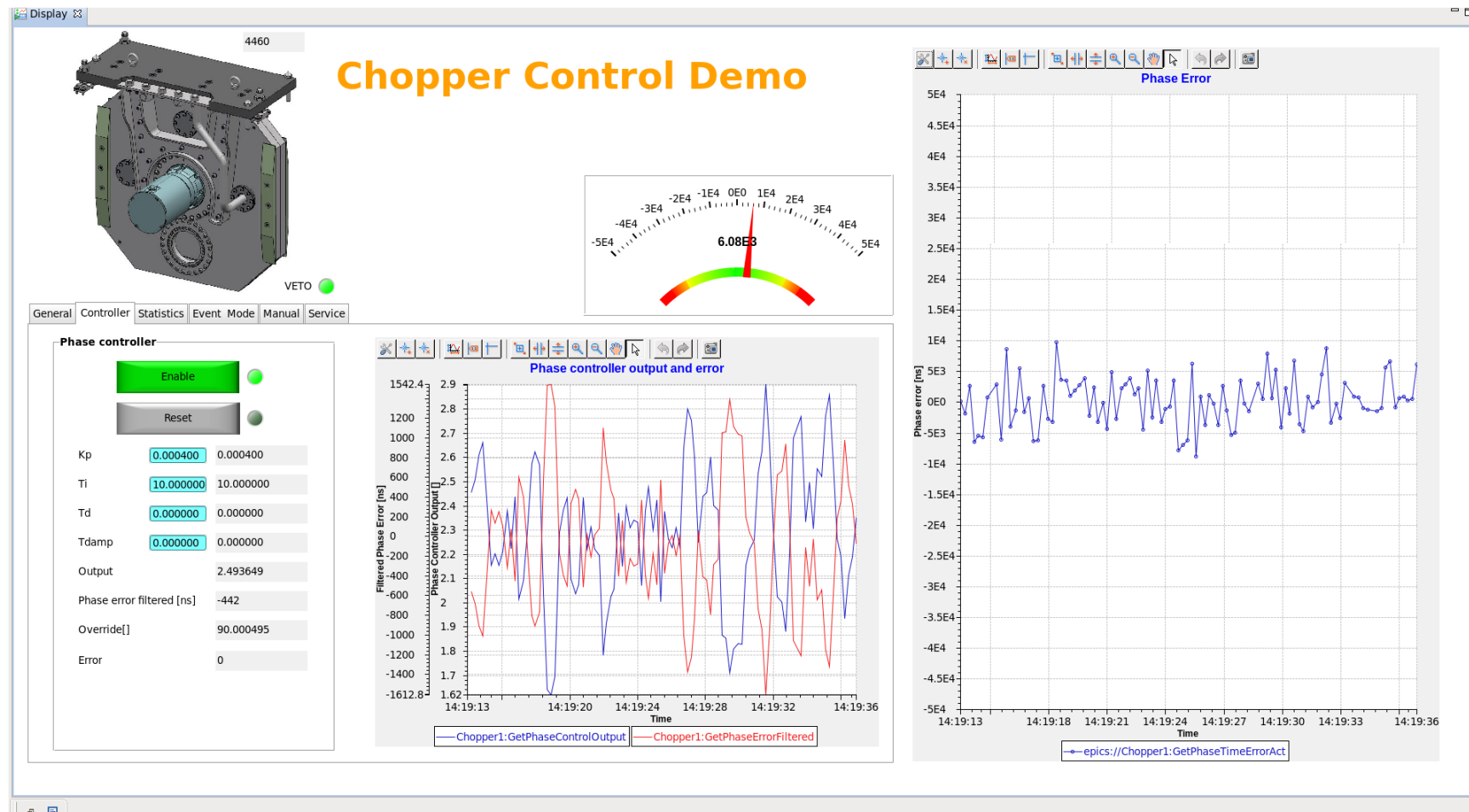
EPICS TwinCAT



Disc synchronized with the 14 Hz pulse: Baby Chopper



Chopper Control Demo



Chopper Control Service Mode

General

Controller

Statistics

Event Mode

Manual

Service

Motor

Service Mode

Enable

Execute

Reset

Jog

Jog Fwd

Jog Bwd

Error

Speed

Position

0

0

0

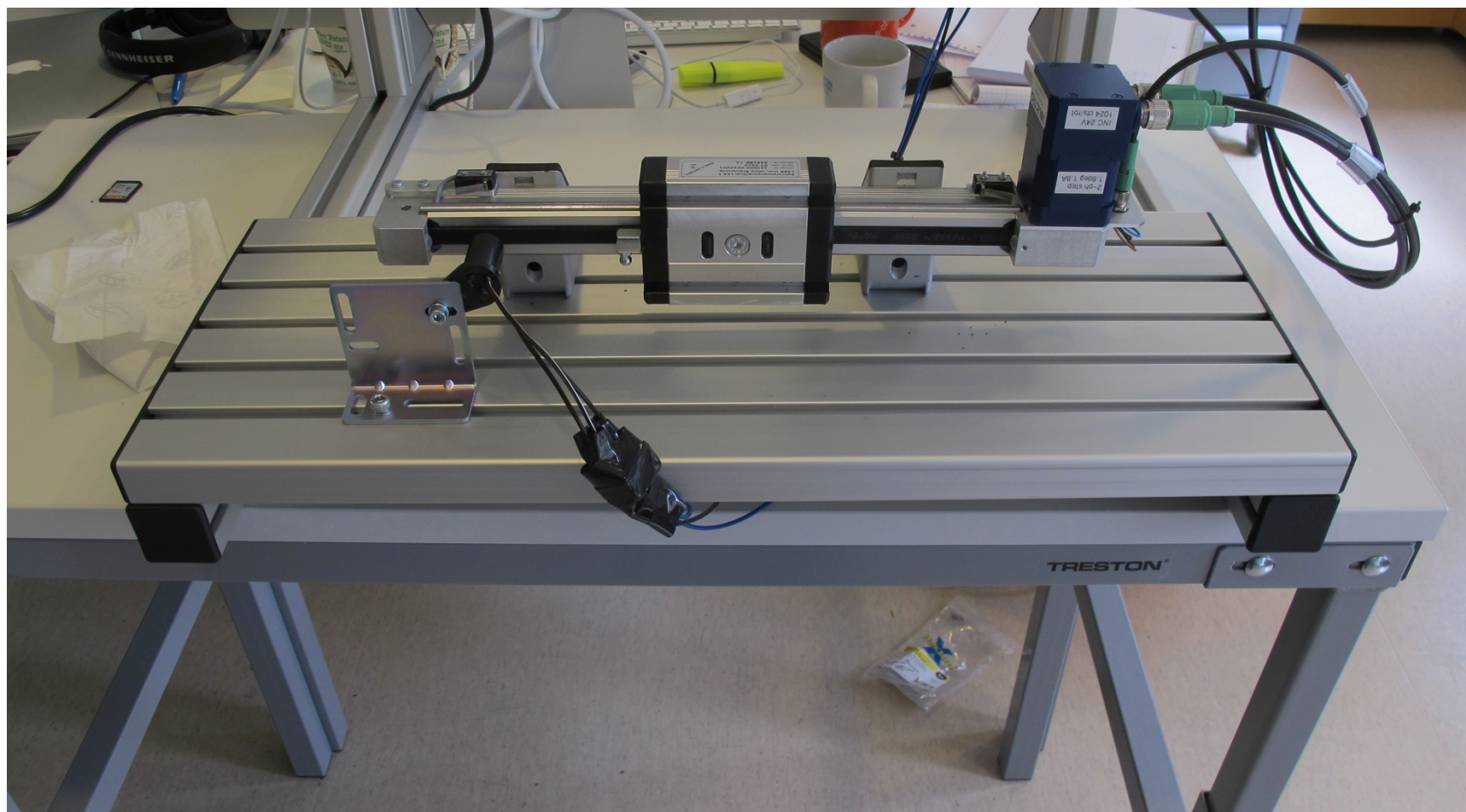
0

0

MotorRecord:: move()

- TwincatMotorAxis::move(double position, int relative, double minVelocity, double maxVelocity, double acceleration)
- { /* status checking not shown */
- stopAxisInternal();
- setValueOnAxis("nCommand", relative ? 2 : 3);
- setValueOnAxis("fPosition", position);
- sendVelocityAndAccelExecute(maxVelocity);
- }

Single Axis



Ongoing developments - 1

- Single transaction: chain commands
`"Main.M1.bBusy?;Main.M1.fActPosition?;\n"`
`"0;11.417835;\n"`
- Retrieving complete motor status as a struct
`"Main.M1.stAxisStatus?;\n"`
`"Main.M1.stAxisStatus: 1=0, 2=0, 3=0, 4=0,`
`5=0,6=0.000000,7=0.000000,8=0.000000,9=0.000000, 10=0,`
`11=0,12=1, 13=1,14=0.000000,15=0,...;\n"`
- Read the "RAW" encoder value:
`ADR=16#3040020,16#80000049,2,18/`
`ADSPORT=501/?;`

Motion Control - TODO

- Optimize
- More homing procedures
 - Implement in the motion control unit (MCU)
 - Expose them via EPICS ?
- configuration parameters
 - Which are needed in the MCU
 - which need to be exposed via EPICS ?
(Acceleration, Jerk, Soft limits)
- Health status/alarms
 - Internal alarms from the MCU
- More automated testing
 - python based, pyEpics, nose

Thanks



- Anders Sandström, MCAG
- EPICS community
- Question(s) ?