

Review of the \bar{P} ANDA EPICS hands-on Tutorial

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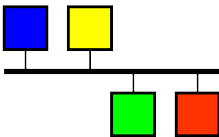
RUB



The Tutorial

- 23rd – 25th February 2015
- Took place at the Helmholtz-Institut Mainz
- Hosted by Florian Feldbauer and me
- 16 participants
- Raspberry Pi with tutorial board for every participant to take home and continue playing with EPICS

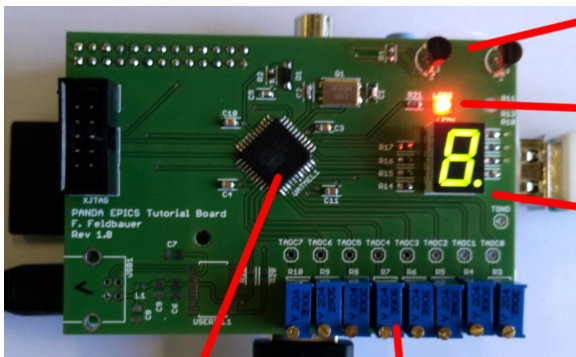
EPICS



Agenda

- Compilation and installation of
 - EPICS Base
 - Sequencer
 - Asyn
 - StreamDevice
- Creating an EPICS IOC
- Writing an EPICS database
- Using StreamDevice to control a device via serial interface
- Programming one's own device support
- Creating an operator interface (OPI) with Control System Studio (CSS)

The Tutorial Board - Overview



2 Dallas 1-wire temperature sensors

LED

Seven-segment display (0-F hexadecimal)

Atmel ATmega16A microcontroller

8 Potentiometers to feed fraction of 3.3 V to ADC channels

The Tutorial Board - Details

- Atmel ATmega16A microcontroller connected to the serial interface of the Raspberry Pi (UART pins in the GPIO)
- Simple protocol with a few commands:
 - Switch LED on/off
 - Show a hexadecimal digit in the seven-segment display
 - Read out status of LED and display
 - Read out ADC channels 0 to 7

⇒ Implement in EPICS via StreamDevice

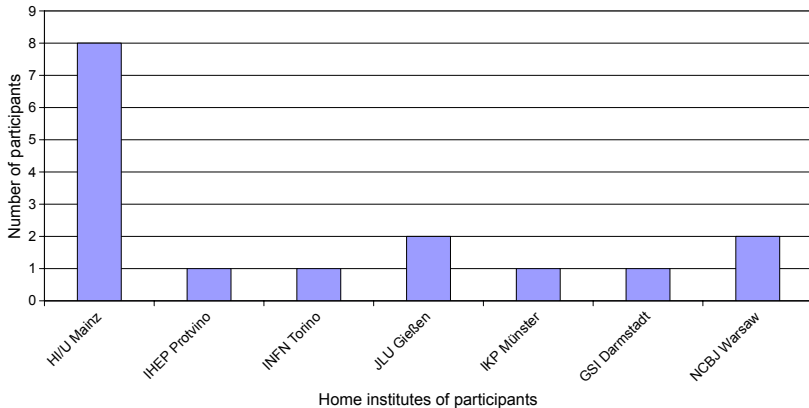
- Temperature sensors controlled via 1-wire bus (which actually needs 2 wires)
- Driver included in Linux kernel, data available in pseudo-files under `/sys/bus/w1/devices/...`

⇒ Write custom device support to read out data

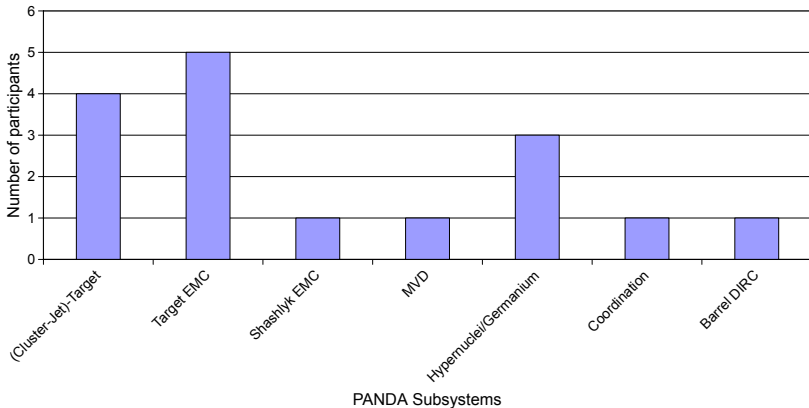
Virtual Machine

- Compilation and installation of EPICS done in virtual machine
- Reason: Compiling on Raspberry Pi is slow
- VM based on Scientific Linux 6
- Prepared with all libraries, development headers, and tarballs
- Linux, Mac OS X, and Windows successfully used as host operating systems
- Some participants also decided to work on bare hardware, this also worked

Participant Statistics I



Participant Statistics II



Interested Audience



LAN Party Atmosphere ☺



Tutorial Board in Action



Explanations for individuals...



...and for the whole Group



The End

Thank you
for your
attention!

