

Cooperative Development for PANDA DCS to Control High Voltage Power Supply

L. Böhm³, F. Feldbauer^{1,2}, A. Hartmann³, J. Pöthig³, J. Römer³

¹Helmholtz-Institut Mainz

²Johannes Gutenberg-Universität Mainz

³iseg Spezialelektronik GmbH

LI. Collaboration Meeting

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- At least EMC and LMD are using EDS/EHS high voltage power supplies from iseg
 - Maybe other groups as well?
 - EHS/EDS modules offer very high precision and accuracy
 - EHS/EDS modules are controlled via CANbus
 - No convenient EPICS device support available
- ⇒ Program our own device support



- drvAsynCan: EPICS device support module for CANbus
https://github.com/ffeldbauer/epics_RPi_can
- Currently used for iseg EHS/EDS modules (and others)
- Drawbacks:
 - Reads one module after another
 - ⇒ CANbus usage not optimized
 - Need to configure each module/board individually
 - Timing has to be managed by user (within records)
has to be adjusted when number of modules changes
 - ⇒ Can be error-prone

EHS/EDS ⇔ Backplane ⇔ Crate Controller ⇔ PC
socketCAN kernel module ⇔ EPICS(drvAsynCan ⇔ IOC

ECH44A: New Crate from iseg







- Cooperative software development together with iseg to program EPICS device support for new crate
⇒ isegIOC
- "Data miner" collecting and caching all informations of all connected modules
(already used for iseg's OPC server)
- Reads out all connected modules in parallel

⇒ Optimized usage of CANbus

- Autoconfiguring
- isegIOC asks "data miner" for cached data
- API of data miner defined according to our needs and wishes
- Timing withing records independent from CANbus/configuration
- Recommended OS: Debian wheezy LTS (kernel 3.14 or newer)

socketCANKernelModule ⇔ DataMiner ⇔ isegIOC

New Developments for LMD DCS

Florian Feldbauer

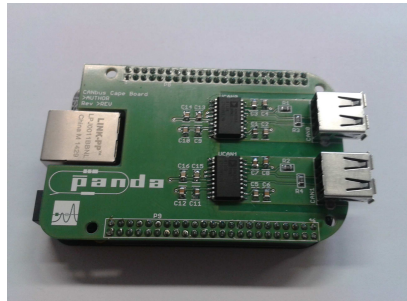
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- Used Raspberry Pi Computer as host for EPICS IOC with CANbus support
- Now tested BeagleBone Black as a alternative





	Raspberry Pi	BeagleBone Black
CPU	ARM1176JZF-S (ARMv6) 700 MHz	AM3358 (ARMv7 Cortex-A8) 1 GHz
RAM	512 MB	512 MB DDR3
Network	100 Mbit	100 Mbit
Storage	SD card	μ SD card + 4 GB eMMC
Price	26.95 €	38.48 €



Raspberry Pi

- Need to connect CAN controller via GPIO to Raspberry Pi
- ⇒ Bit banging
- Need hacked/customized kernel
- Nearly all GPIOs used for one CANbus interface
- Only 1 RS232 interface in addition to CAN

BeagleBone Black

- **Two** CAN-Cores integrated into CPU
- No kernel hack needed
- Only need to modify Device Tree (Device Overlay) for configuration
- Only 2 GPIO lines per CANbus interface needed
- Second Cape board in pipeline providing 2 RS232 and 1 RS422/RS485 interfaces
- Still ~ 55 GPIOs + 8channel ADC unused



- To simplify maintainability of EPICS installations created Apt-Repository
- Will be hosted at GSI
- Containing epics-base, asynDriver, SEQ, streamDevice, devSNMP, drvAsynCan, IOCs for Raspberry Pi/BeagleBone
- Repository available for amd64, i386 and armhf (rpi/beaglebone)
- Packages build according to Debian Packaging Policy and FHS