

Charge measurement progress.  
New controller for Moller target.  
HV control for Hall A

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# New BCM electronics box for Hall A

- In preparation for testing in TEDF;
- Digital signal processing with FPGA logic (flexibility to be customized for our goals);
- Has analog output from DAC (18bits, compatible with our old system);
- Has digital interface (TTL, optical) for serial data transfer. May be modified for our goals;
- Meeting with John Musson and Trent Allison on June 17th. Discussed digital BPM/BCM readout for Hall A DAQs. Bob prepared some note with explanation of our needs.

# BPM/BCM Digital Readout for HALL A DAQs (what we need from last meeting)

## 1. Several DAQ systems in different location:

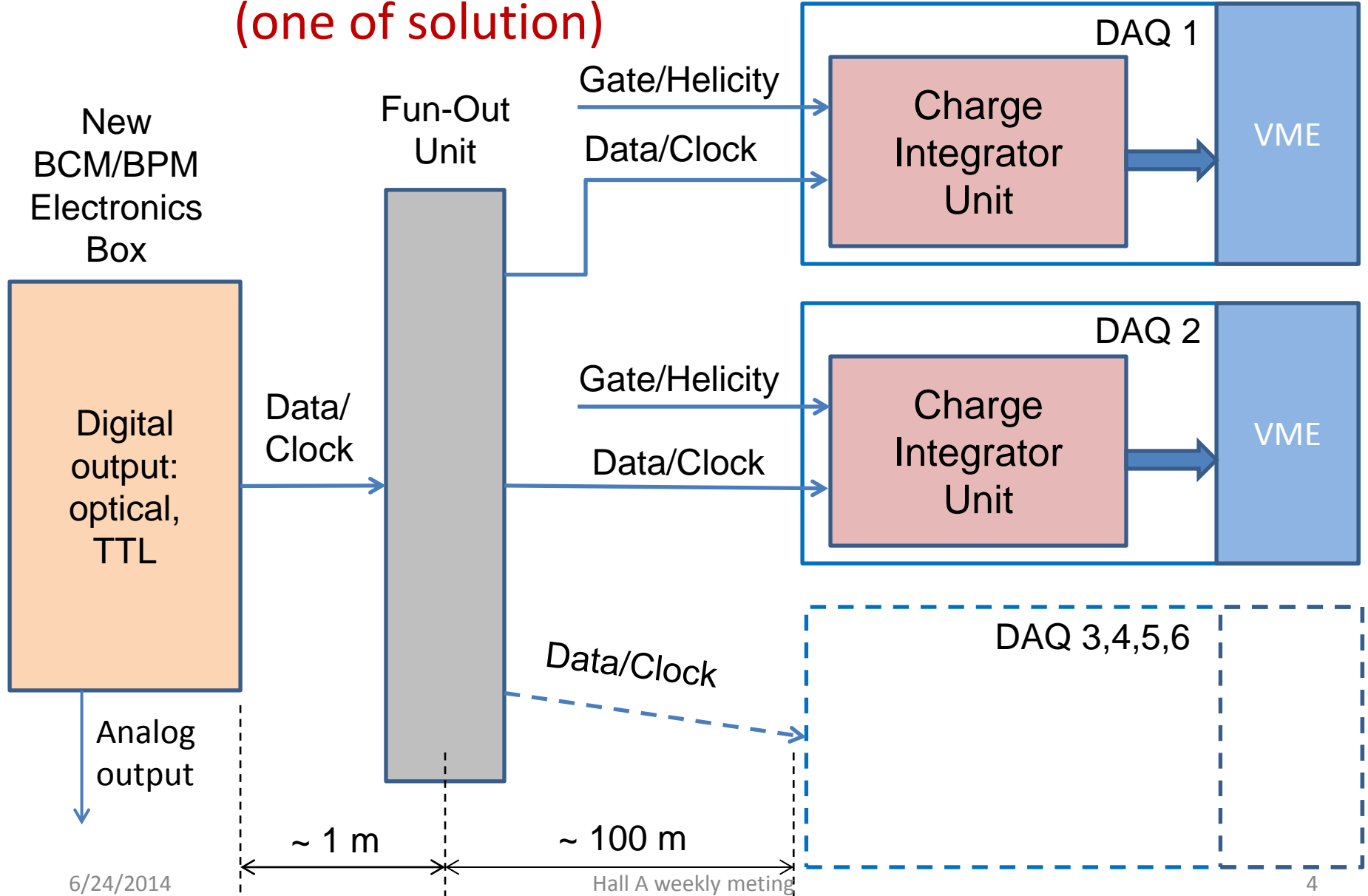
- Left HRS, Right HRS;
- Parity DAQ;
- Compton DAQ;
- Moller DAQ;
- 3d arm setup DAQ.

The electronics should have the possibility to "fan-out" digital signals to several DAQ systems.

## 2. Two modes of operation with different gates to integrate BPM/BCM signals are used :

- **Event mode:** snapshot of BPM data from trigger with integration time:  $\sim 1\mu\text{s}$ - $100\mu\text{s}$ , BCM integration time in few seconds, integration over full run 30-60min (gate from TS);
- **Parity mode:** BPM/BCM signals are integrated over interval of each helicity window.

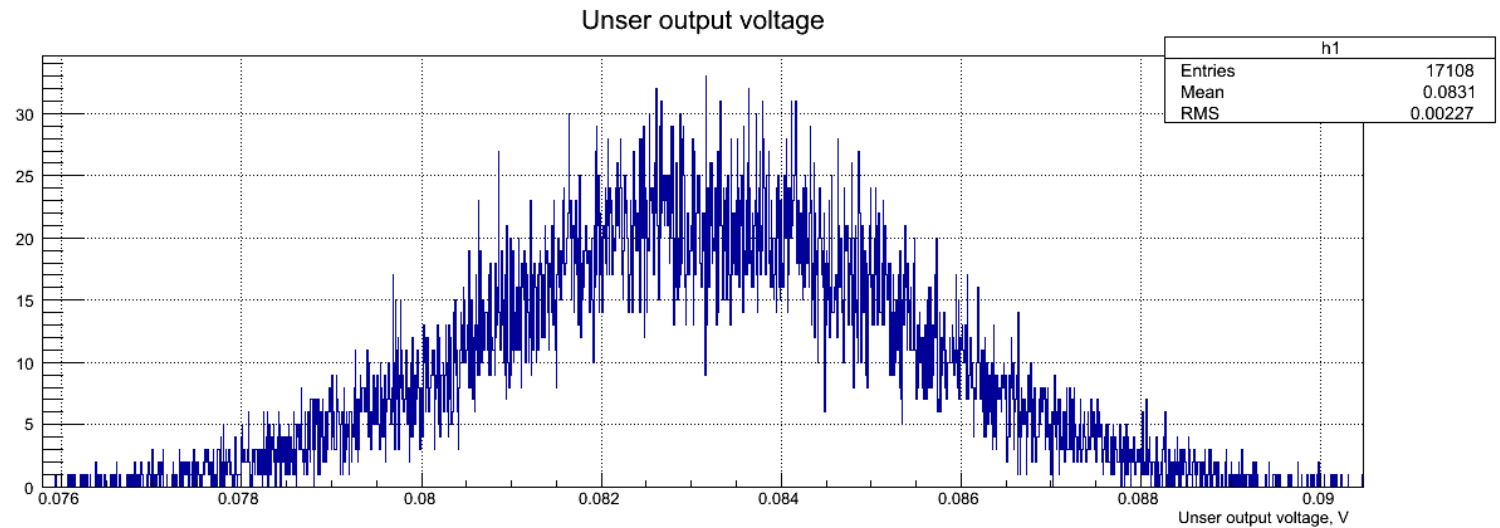
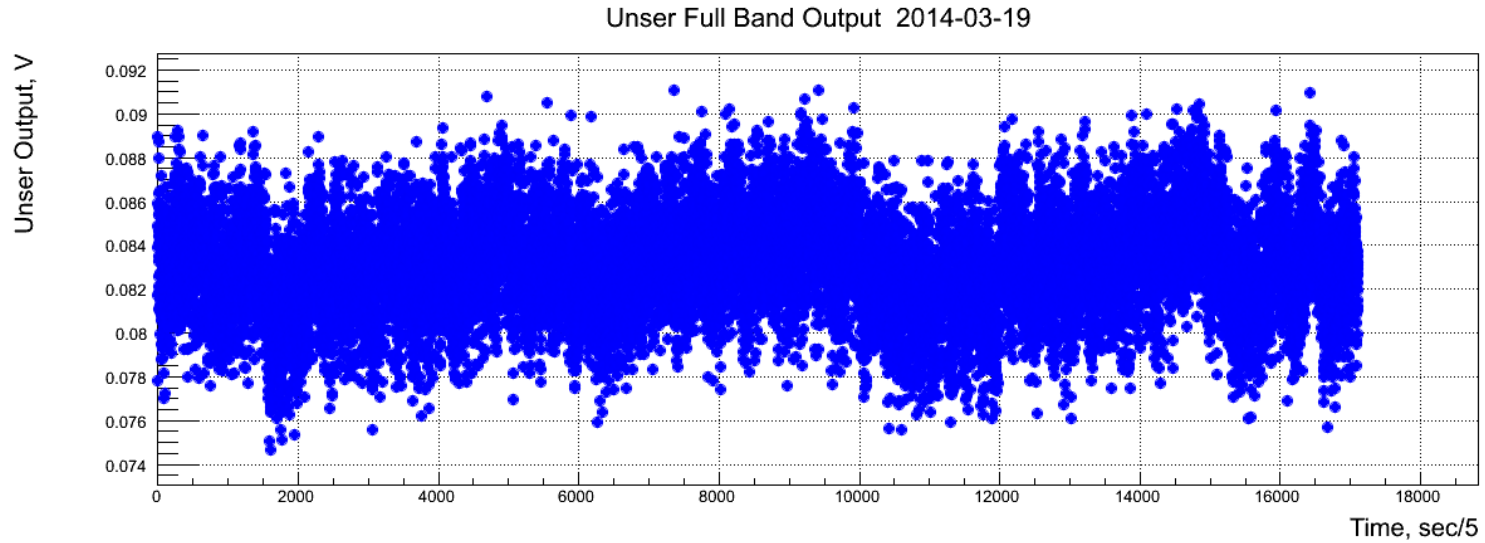
# BCM Digital Readout block diagram (one of solution)



# Unser Status

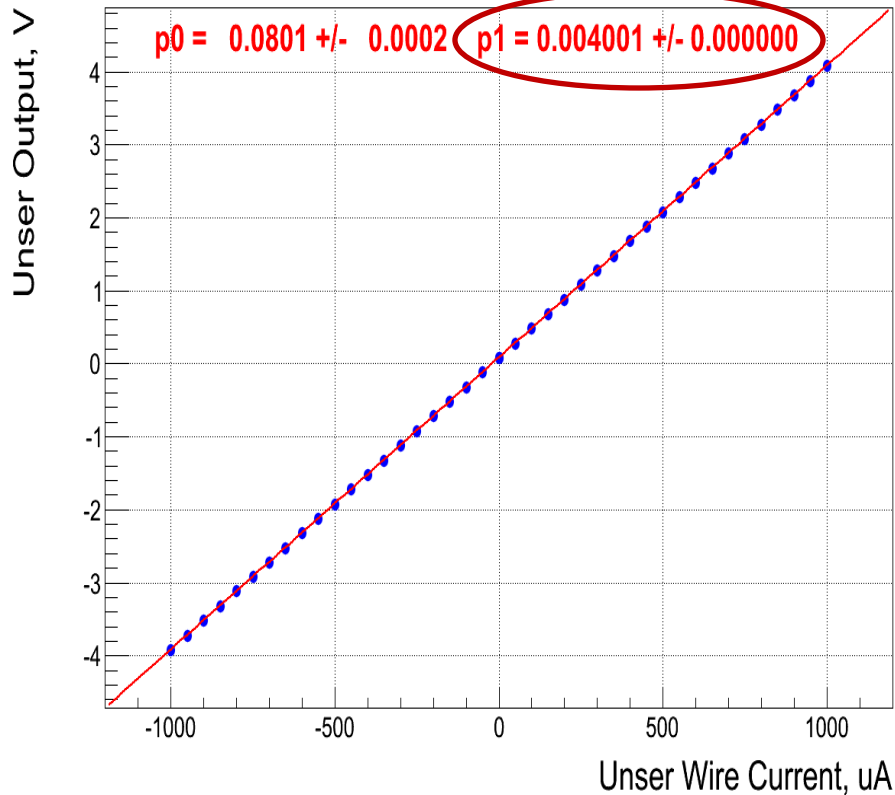
- Epics control of Current Source K224;
- DVM for Unser readout has been replaced ( due to “error” generation);
- Scripts for BCM data logging and Unser wire calibration is ready.

# Unser zero drift ( 24 hours, 5 sec sample rate)

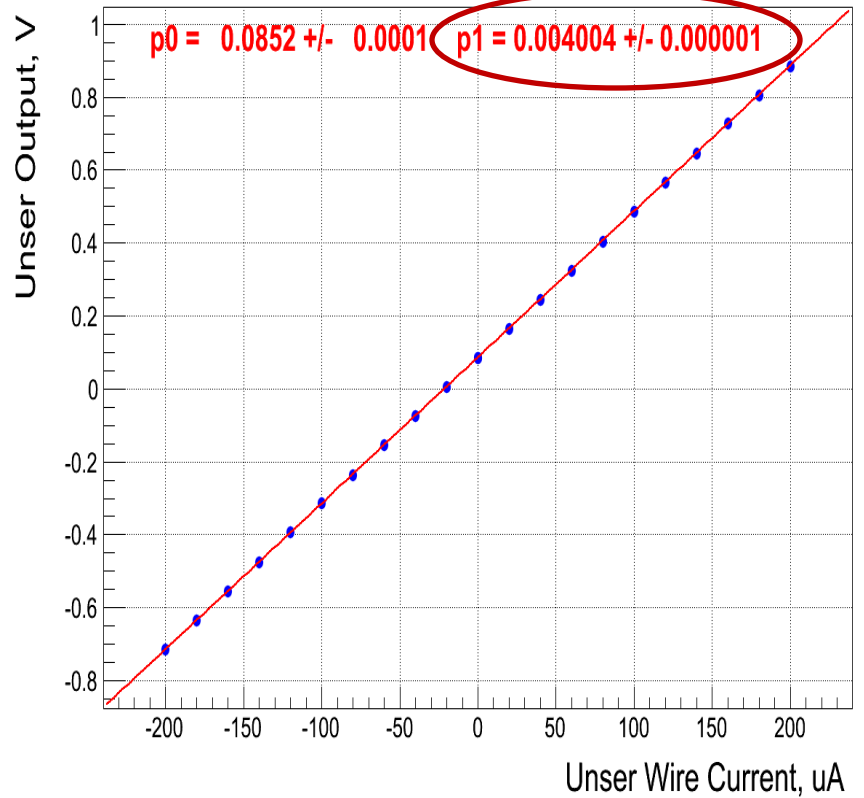


# Unser Wire Calibration

Unser I to V (Full Band Out) 2014-03-21



Unser I to V (Full Band Out) 2014-03-24



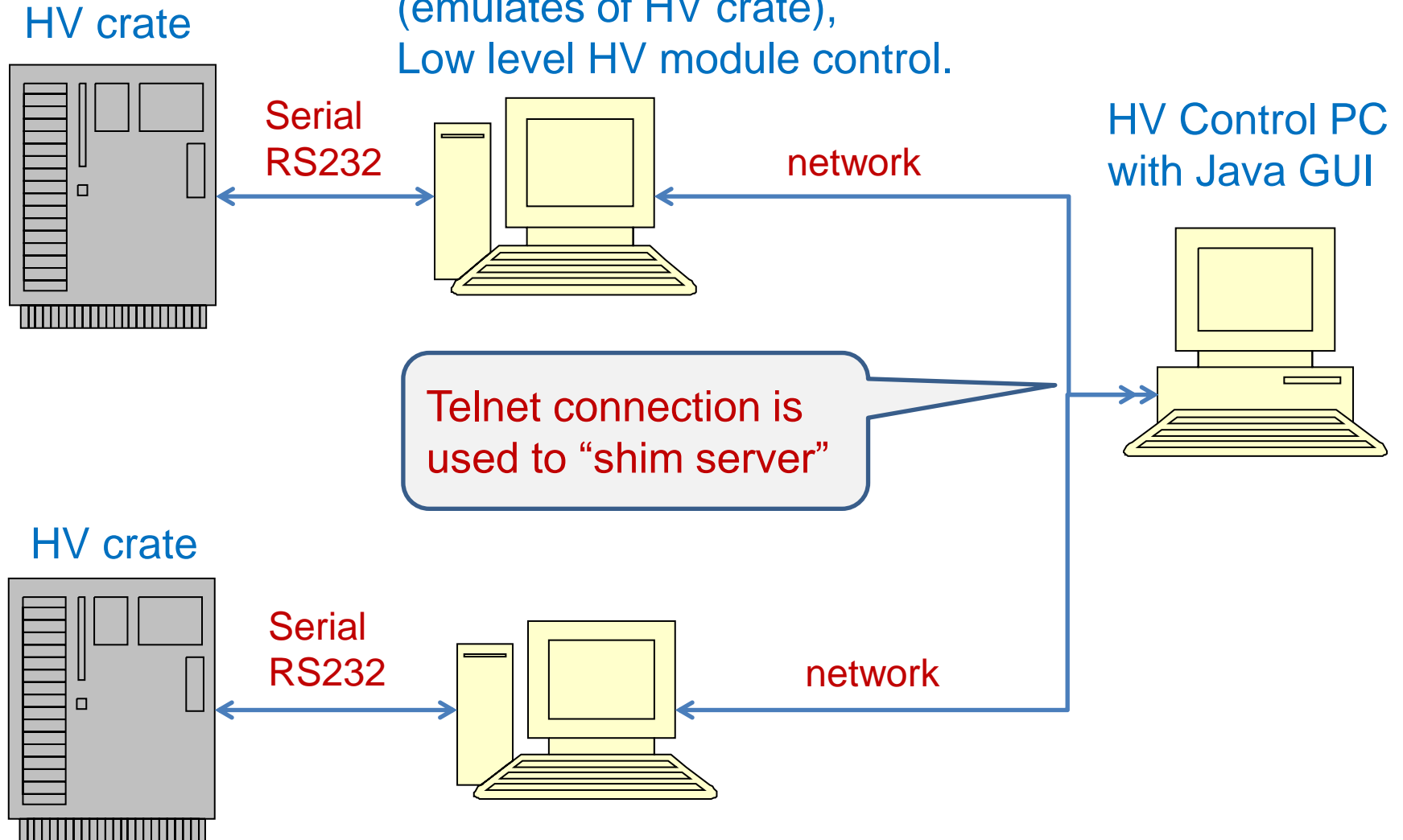
# New controller for Moller target

- Old controller VME44 from Oregon Micro Systems is not supported with new version of EPICS
- New one is MAXnet controller with Ethernet port from the same company and with similar interface to step motors.
- Controller box with terminal and cable are ready to connect to target motion control. (Thanks to Chuck)
- Weiwei (William) is working on EPICS software for new controller.



# HV Control (used today)

Perl “shim server” PC  
(emulates of HV crate),  
Low level HV module control.



# Raspberry Pi

The *Raspberry Pi* is a credit-card-sized single-board computer developed in the UK

The Raspberry Pi has a ARM 700 MHz processor, VideoCore IV GPU, 512 megabytes of RAM.

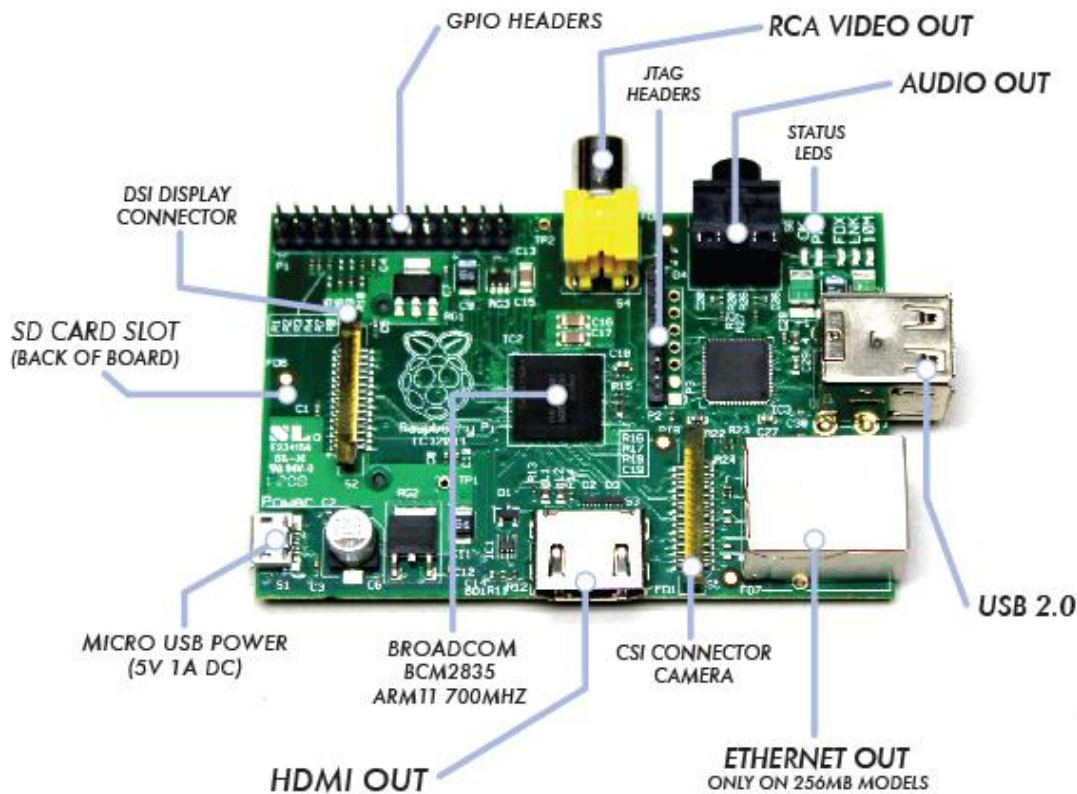
It uses an SD card for booting and persistent storage.

The Raspberry Pi runs Linux kernel based operating systems (Debian, Fedora, ...).

On board: 10/100 Ethernet, HDMI, GPIO, serial, (2) USB 2.0, RCA video, 3.5 mm audio out jack, SD card socket;

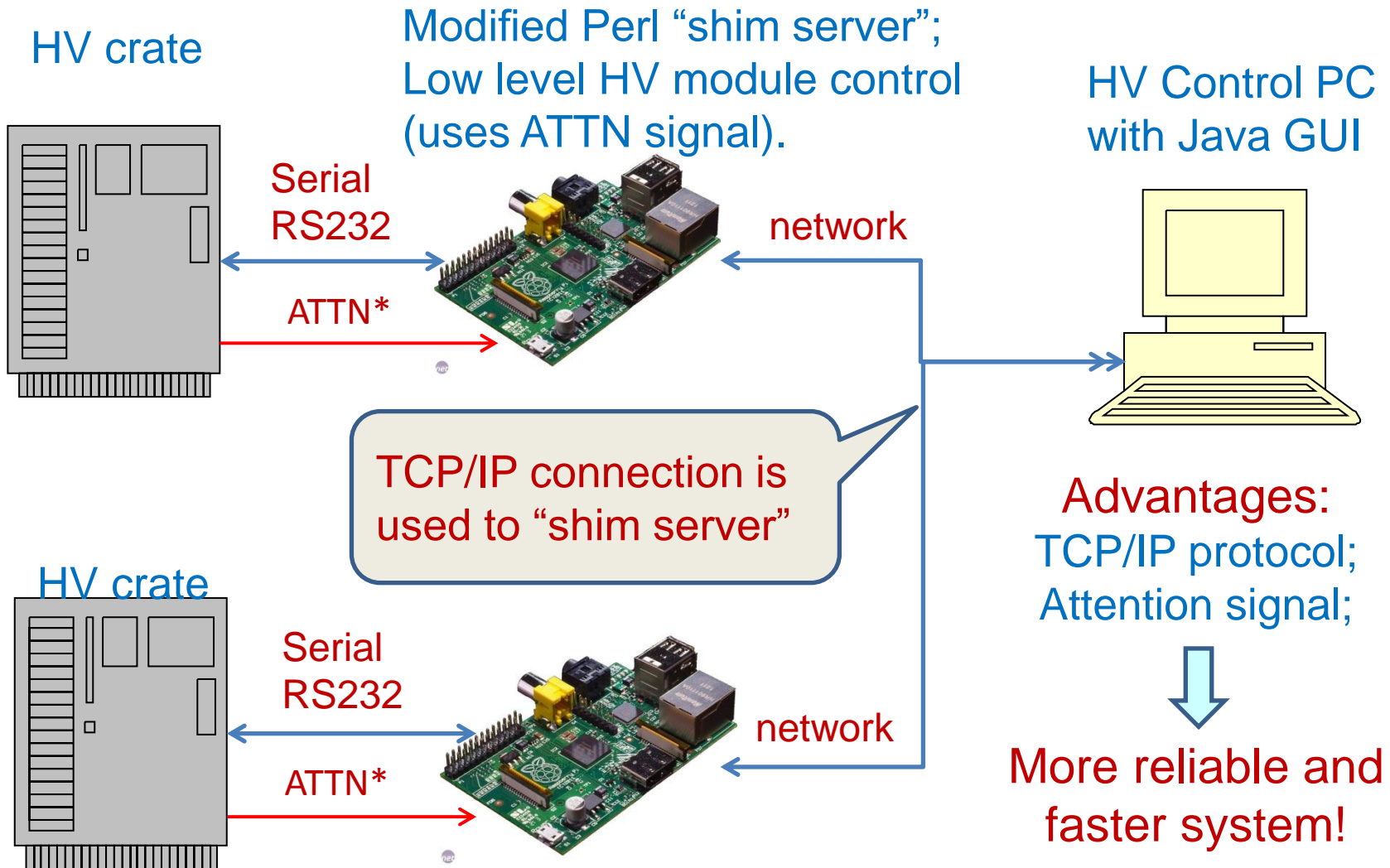
Size: 85.6 x 56 x 21 mm.

Cost: ~\$40



# HV Control on Raspberry Pi

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## To Do and Summary

- Solution for BCM/BPM digital readout is under discussion, it has to be found and implemented
- Tools to analyze BCM/Unser calibration data
- Testing of new controller with Moller target
- Simple GUI running on Raspberry Pi to control of just one HV crate (useful for one HV crate setup).

**Thanks to All who supports these projects!**