EPICS Also For Small And Medium Sized Experiments

MAX PLANCK GESELLSCHAFT

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FRITZ-HABER-INSTITUT
MAX-PLANCK-GESELLSCHAFT

Measurement @ 20 kV

raspPi-Zero W
on top of Fluke 287
True RMS Multimeter

- Raspberry Pi Zero W (802.11 b/g/n WLAN)
- Runs an EPICS IOC, on top of Fluke 287
- Communication with the device via Infrared Connector
- Battery of multimeter powers the IOC.

Small, but fine devices

phoebus display

- Operator interface with phoebus
- ArchiverAppliance monitors PV
- IOC configuration versioning with mercurial

Thanks to the main developers of EPICS :
A.N. Johnson, G. Shen, S. Veseli, Argonne National Laboratory, Lemont, Illinois
K. Shroff, Brookhaven National Laboratory, Upton, Long Island, New York
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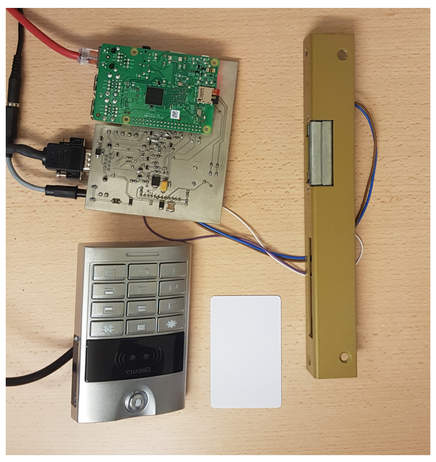
M.A. Davidsaver, Osprey DCS LLC, Ocean City, Maryland
M.R. Kraimer, Osseo, Michigan
K. Kim, SLAC National Laboratory, Menlo Park, California

Devices @ facility



- Access control FHI campus
- Door controller based on Raspberry Pi 3
- Mifare, Wiegand card reader
- Runs an EPICS IOC
- Trainee project

- Management via Web interface
- Logging by rsyslog to Mongo db
- Administrative data and audit log in mysql db
- Operating states monitored by alarmHandler (alh)
- Gateway to building automation system (BacNet)
- IOC configuration versioning with mercurial

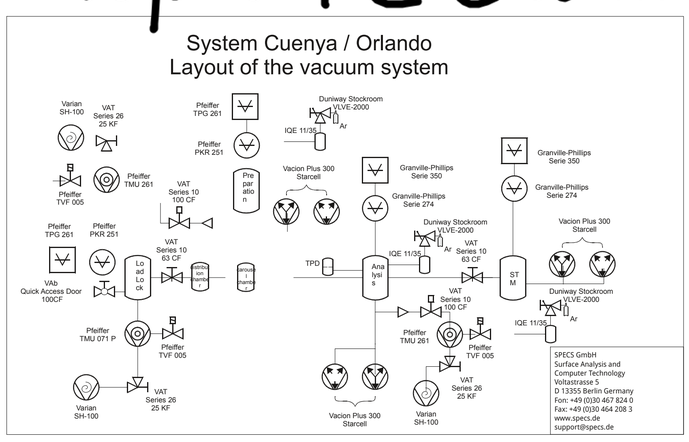
Devices @ industry

- Industrial PC based on the Raspberry Pi
- Slim DIN-rail housing
- 24V powered
- Industrial suitability to EN 61131-2

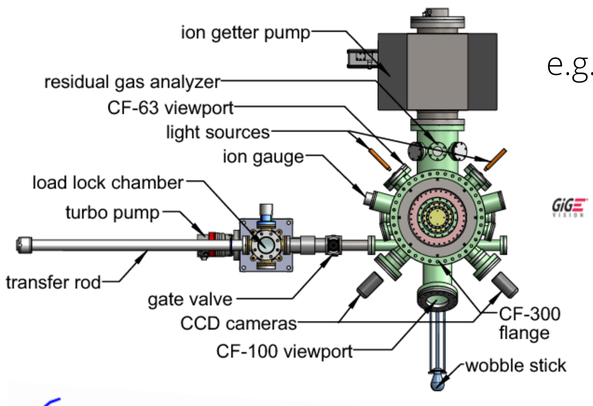
- Suitable I/O modules and fieldbus gateways
- Runs EPICS IOC with support for asyn, modbus, BacNet, ...
- IOC configuration versioning with mercurial

Equipment in "normal" research facilities

Default @ chemistry



- Read out temperature
- Read out pressure
- Control temperature (oven)
- Switch valves
- Interlock / machine protection
- Control / read out devices (GC, RGA, ...)
- Read out cameras



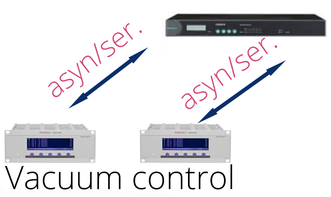
e.g. Video-LEED

areadetector
with GeniCam

e.g. SRS SR860 LockIn-Amplifier

asyn/IP with streamDevice

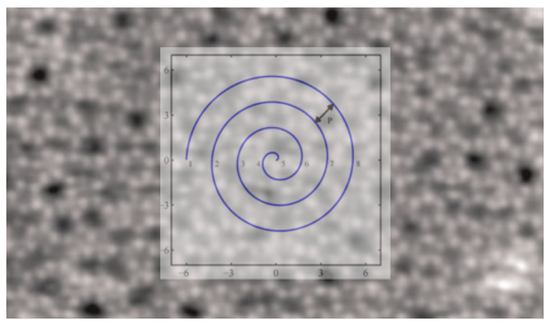
e.g.Terminalserver



Vacuum control

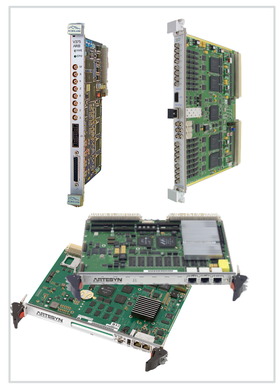
Realtime @ physics

E.g. atomically resolved STM image of the vitreous silica film revealing the Si positions



- Fast data aquisition
- Tight synchronization
- High data rate
- Event driven
- High density I/O
- Very fast interlock / machine protection

VME hardware/software



MVME6100
MVME2500
SIS3316
V375
RTEMS 5
EPICS 7
PVA/QSrv

Somewhat larger experiments

FEL @ FHI