# A model for collecting,archiving and online analysis of EDD slow parameters

PANDA Collaboration meeting November 2019

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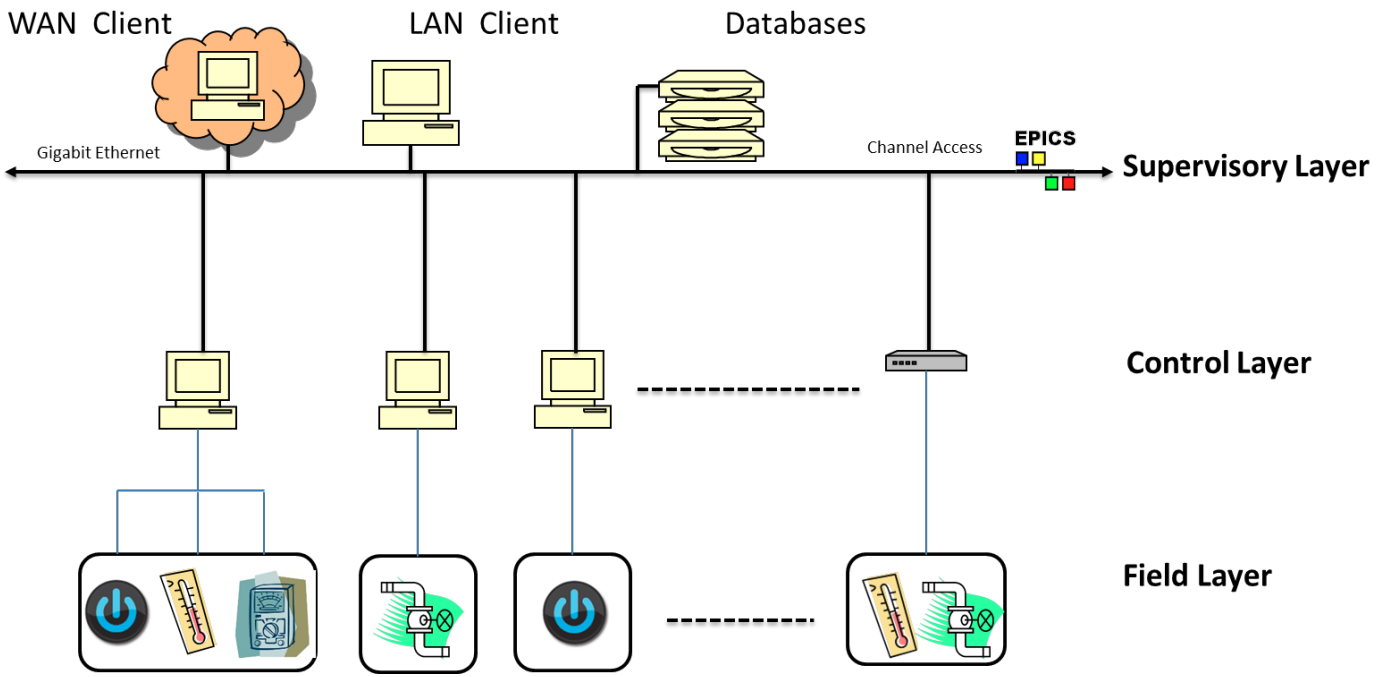
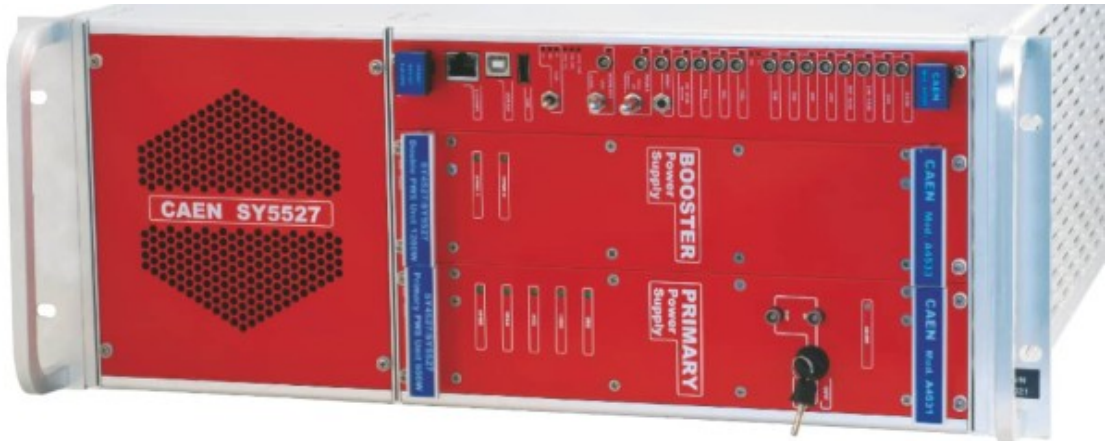
IPII JLU Gießen

# The scheme and advice from PANDA DCS web

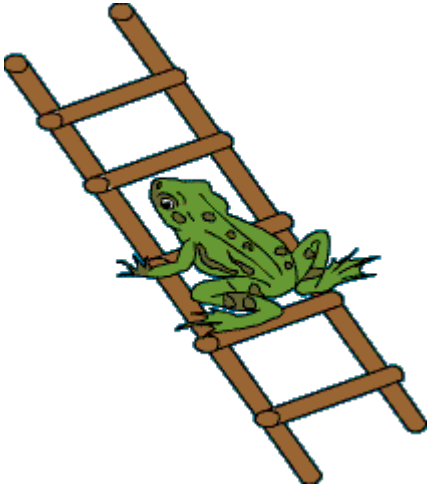


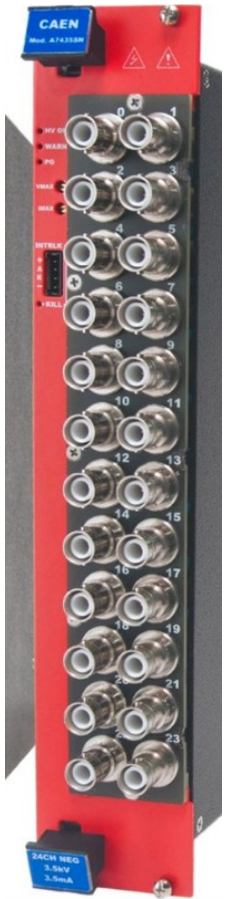

- Because the device driver software support in EPICS is limited, the software development tools used to control the lowermost layer (Field Layer) are at the free choice of the developer. The only constrain here is that the software must be integrated in the control layer with the EPICS system. However, the recommendation is that the developer, in the early stages of design, should try implement, were is possible, the same hardware and software, with EPICS support, realized by other PANDA sub-systems.

# The first final EDD device's




CAEN
create
SY 5527B





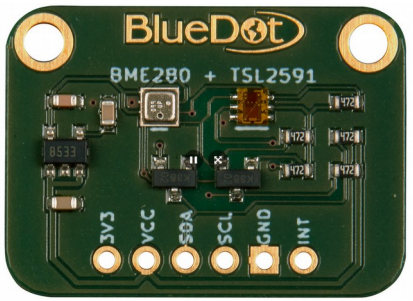

AG 7435SN


A 2519

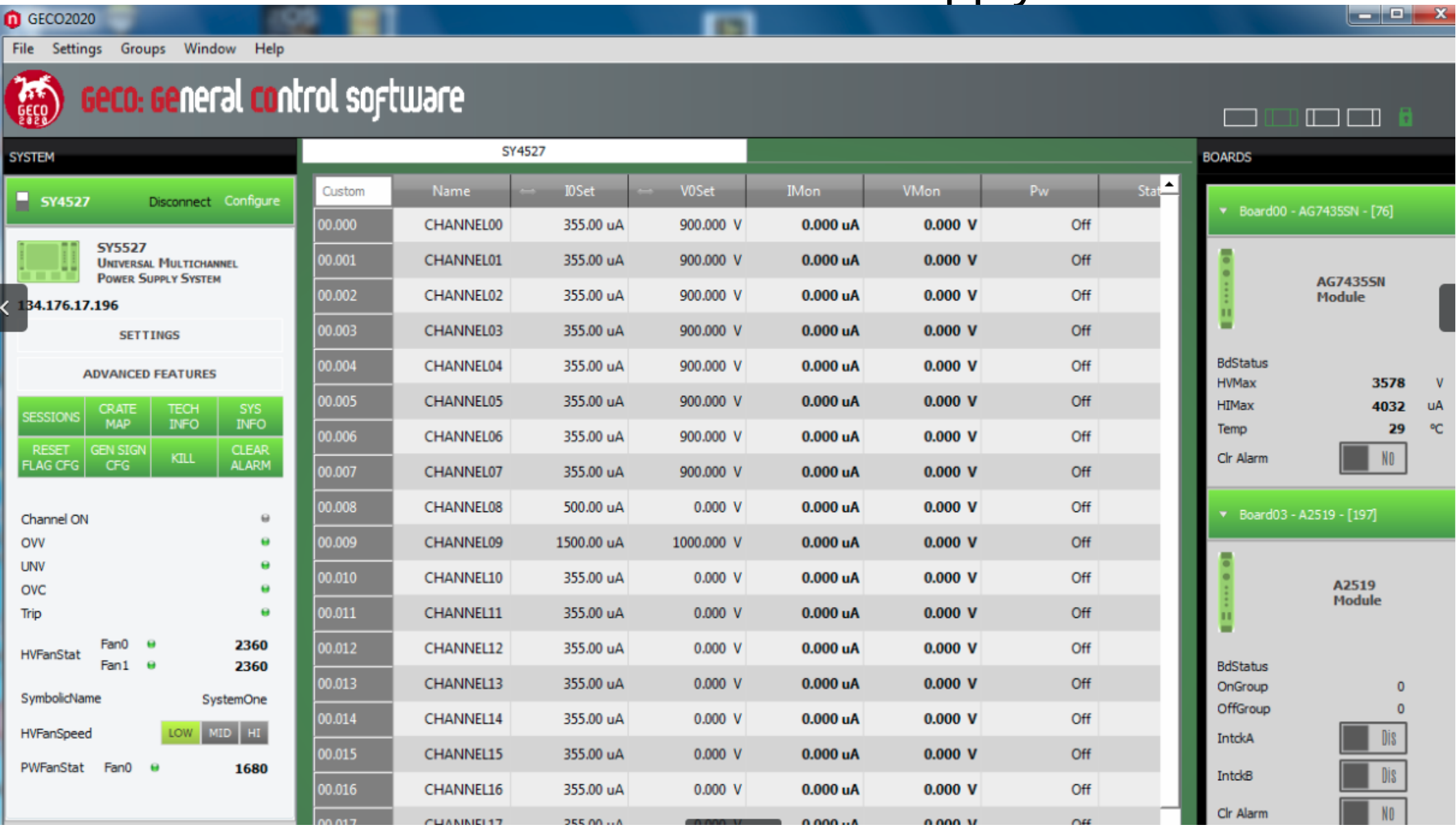
We can supply the GCS
PMT's(~1kV) or
MCP's(up to 3.5kV)
and this
Module could supply 1 EDD
quadrant

We use this module
To supply the TofPET
DAQ and our homemade
Modules 5-15V

And Marc Wetter-station
P,T,Humidity,Light,Motion
Installed in clean room
Using RasPI

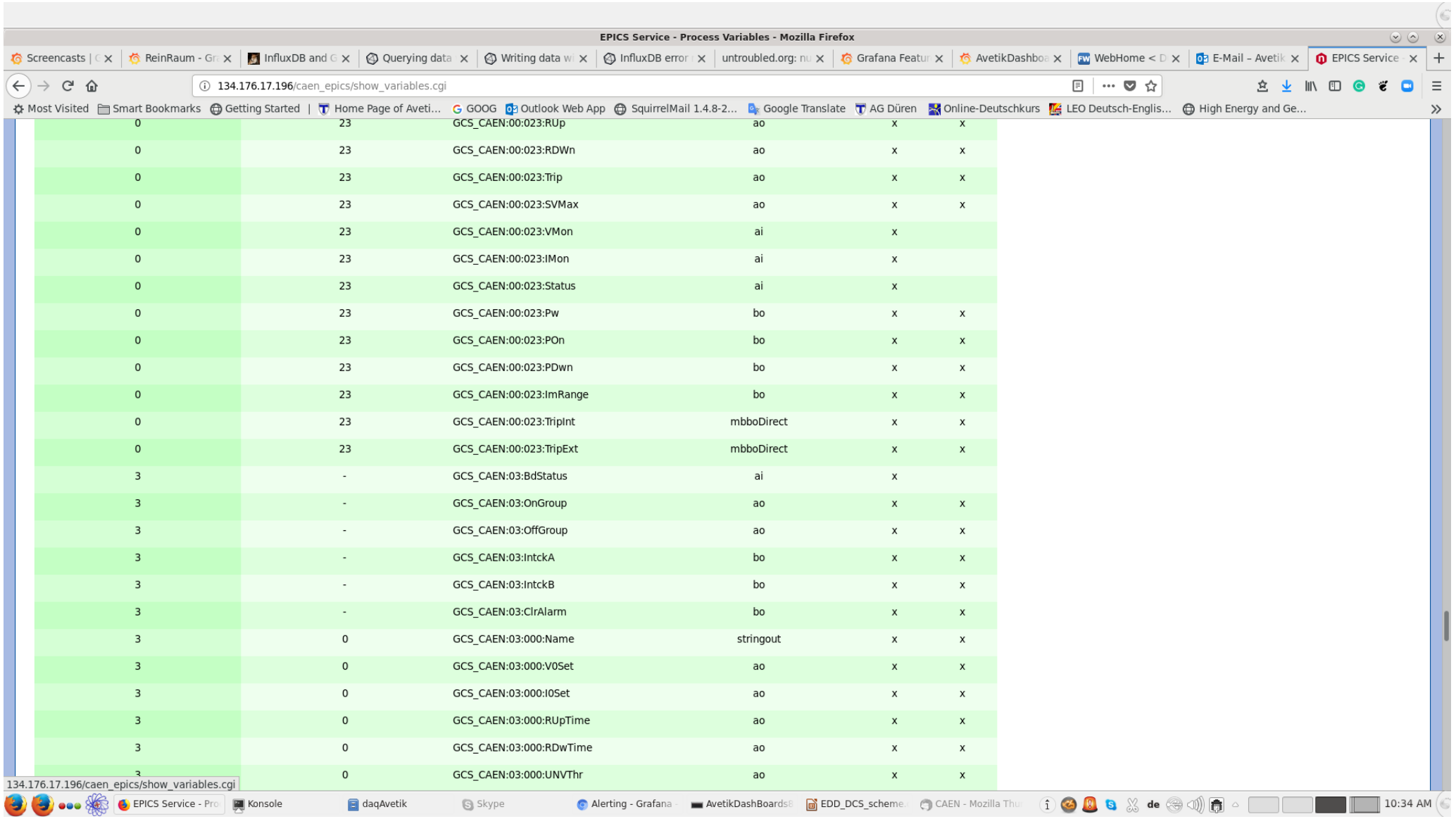


# EDD yet only final hardware
# CAEN SY5427 Power supply




The Control layer of our system.

# EDD yet only final hardware
# CAEN SY5427 Power supply




| | | | | | |
|---|---|---|---|---|---|
| 0 | 23 | GCS_CAEN:00:023:RUp | ao | x | x |
| 0 | 23 | GCS_CAEN:00:023:RDWn | ao | x | x |
| 0 | 23 | GCS_CAEN:00:023:Trip | ao | x | x |
| 0 | 23 | GCS_CAEN:00:023:SVMax | ao | x | x |
| 0 | 23 | GCS_CAEN:00:023:VMon | ai | x | |
| 0 | 23 | GCS_CAEN:00:023:IMon | ai | x | |
| 0 | 23 | GCS_CAEN:00:023:Status | ai | x | |
| 0 | 23 | GCS_CAEN:00:023:Pw | bo | x | x |
| 0 | 23 | GCS_CAEN:00:023:POn | bo | x | x |
| 0 | 23 | GCS_CAEN:00:023:PDwn | bo | x | x |
| 0 | 23 | GCS_CAEN:00:023:ImRange | bo | x | x |
| 0 | 23 | GCS_CAEN:00:023:TripInt | mbboDirect | x | x |
| 0 | 23 | GCS_CAEN:00:023:TripExt | mbboDirect | x | x |
| 3 | - | GCS_CAEN:03:BdStatus | ai | x | |
| 3 | - | GCS_CAEN:03:OnGroup | ao | x | x |
| 3 | - | GCS_CAEN:03:OffGroup | ao | x | x |
| 3 | - | GCS_CAEN:03:IntckA | bo | x | x |
| 3 | - | GCS_CAEN:03:IntckB | bo | x | x |
| 3 | - | GCS_CAEN:03:ClrAlarm | bo | x | x |
| 3 | 0 | GCS_CAEN:03:000:Name | stringout | x | x |
| 3 | 0 | GCS_CAEN:03:000:V0Set | ao | x | x |
| 3 | 0 | GCS_CAEN:03:000:I0Set | ao | x | x |
| 3 | 0 | GCS_CAEN:03:000:RUpTime | ao | x | x |
| 3 | 0 | GCS_CAEN:03:000:RDwTime | ao | x | x |
| 3 | 0 | GCS_CAEN:03:000:UNVThr | ao | x | x |

And its Supervisory layer….with EPICS running server and PV's
(for the moment we name our PV's GCS, not as a PANDA_EDD,
naming scheme  DCS require, but the change is straightforward)

# WEB based tools for EPICS embedded systems

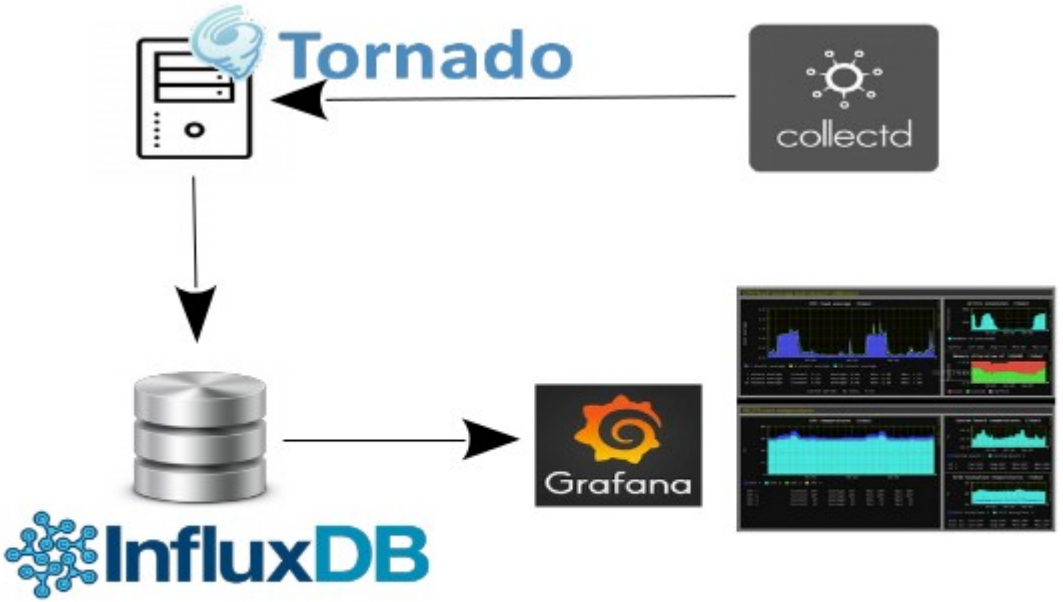



Figure 2: Data publishing architecture for EPICS PVs.

This scheme was/is successfully
Operational at BELLE2
For example ECL monitoring

Our tested scheme on GCS is also similar to this one:

Telegraf
Collect Data from
Control layer

→

TSDB---InfluxDB
Databases

→

Web based
Graphic analysis
Grafana

Doi:10.18429/JACoW-ICALEPC52017

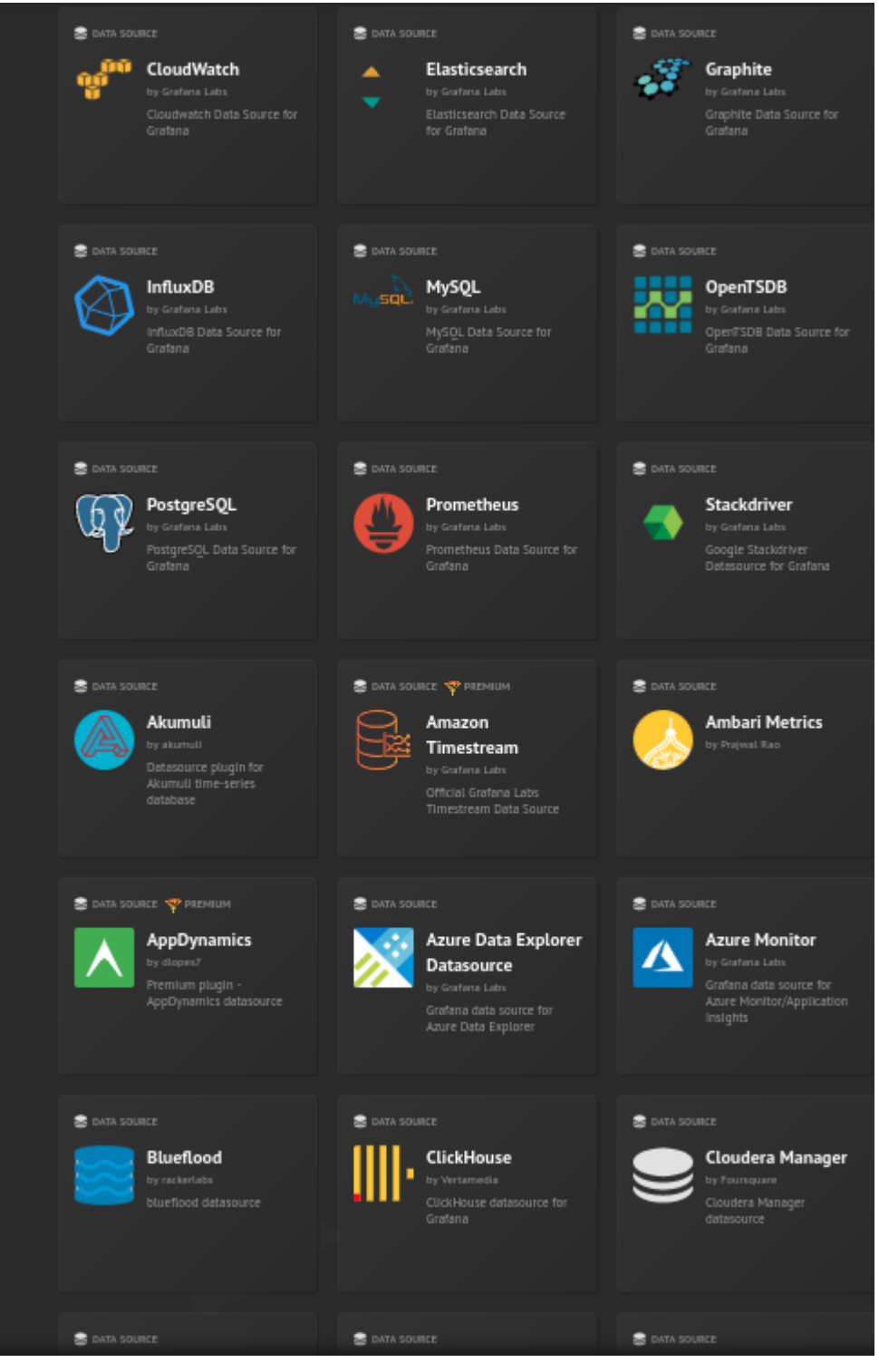
# Collecting data Telegraf

- Telegraf is an agent for collecting, processing, aggregating, and writing metrics.
- Design goals are to have a minimal memory footprint with a plugin system so that developers in the community can easily add support for collecting metrics.
- Connect to datasources like MongoDB, MySQL, Redis, and others to collect and send metrics.
- Systems: Collect metrics from your modern stack of cloud platforms, containers, and orchestrators.
- IoT sensors: Collect critical stateful data (pressure levels, temp levels, etc.) from IoT sensors and devices.

**Any Software we us should be open source!!!**

**https://www.influxdata.com/time-series-platform/telegraf/**

# TSDB DataBases-InfluxDB




From all possible DB, btw all are open source
Our choice is InfluxDB  which offers

**Real-time visibility**

**into stacks, sensors and systems**

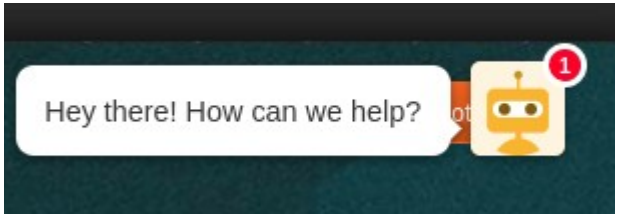
https://www.influxdata.com/

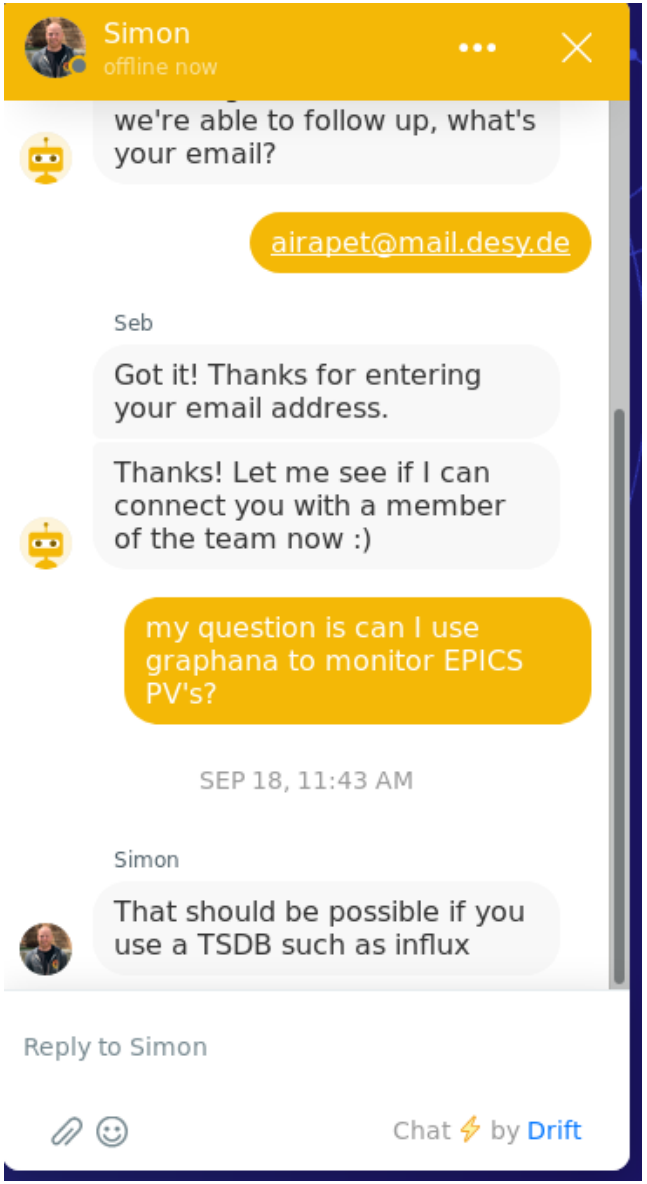
# Graphical representation
# Grafana

## The open observability platform

**Grafana is the open source analytics &**

**monitoring solution for every database**

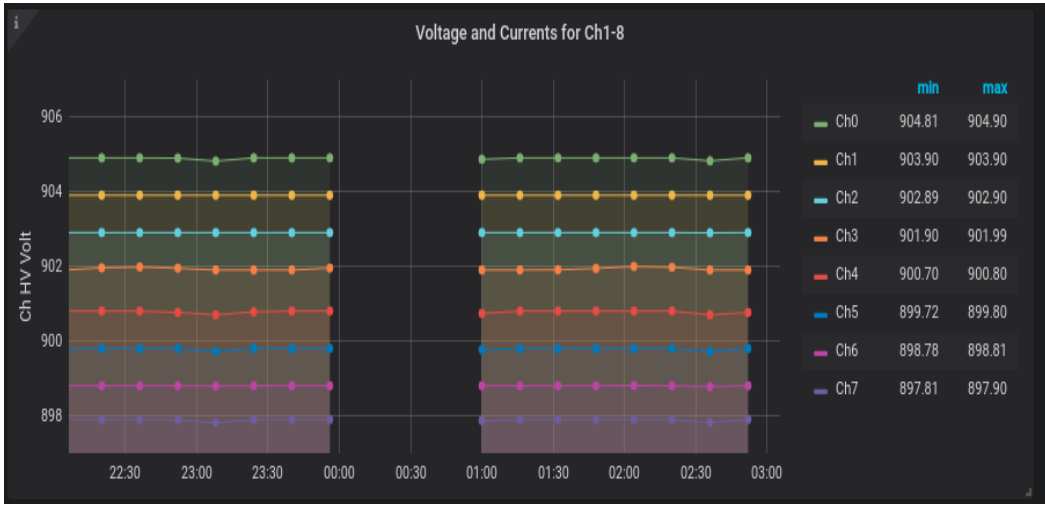


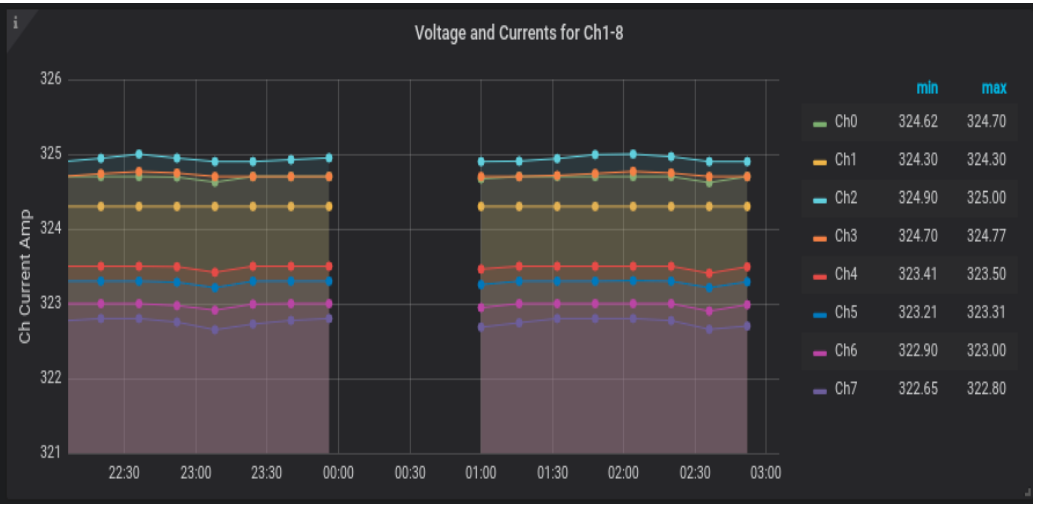




https://grafana.com/

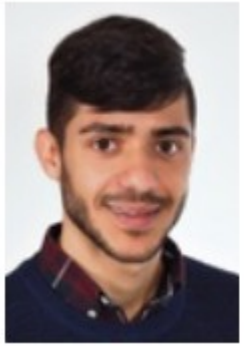
Show online ongoing….

# The reason to create an Alert




At 23:50 Alert was created and sent to
Jhonatan Pereira de Lira: “Jhonatan, the HV for the Trigger counters does not have a data, maybe they are OFF pls come and check the situation. GCS duty cycle is low.”




Jhonatan Pereira de Lira

**Bachelorstudent**

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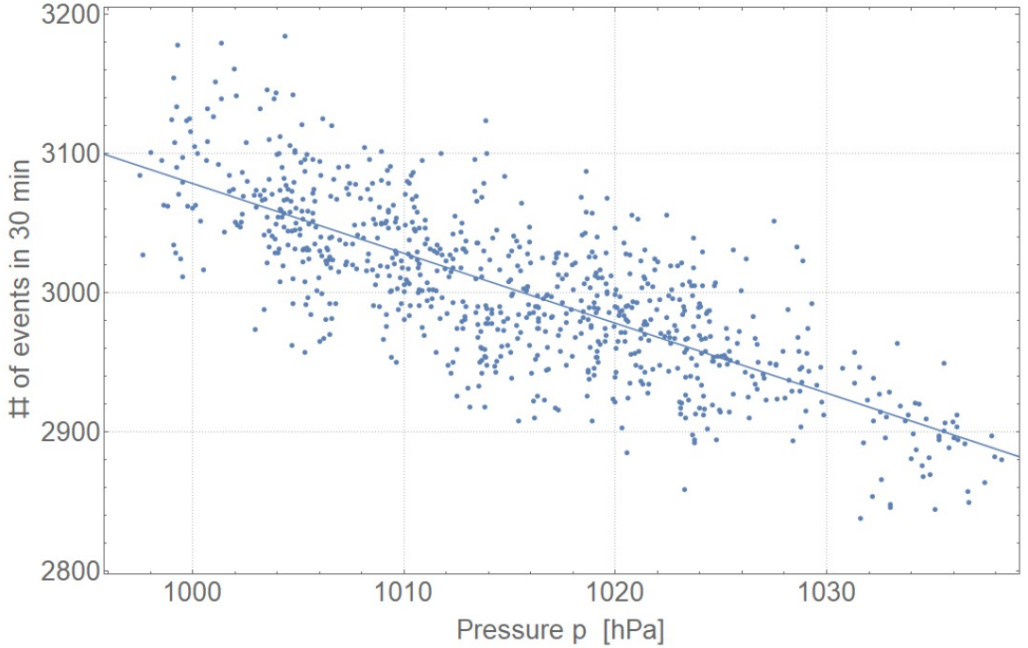
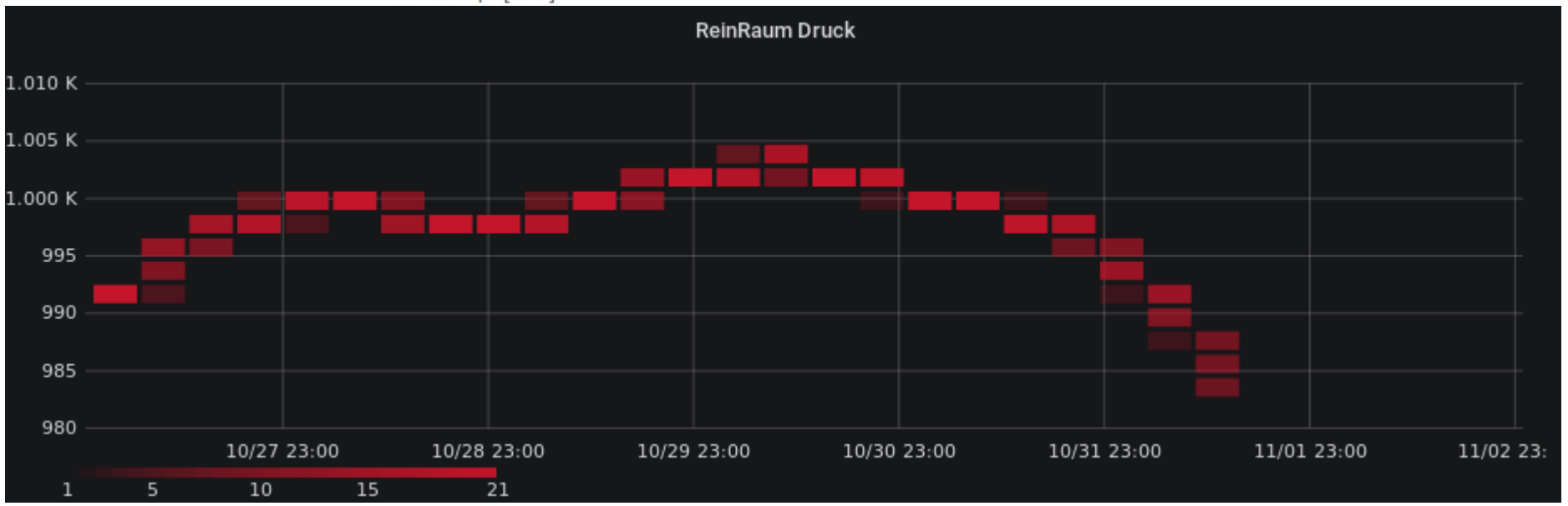
# The reason to create an Alert




At 23:00 Alert was created and sent to Simon Bodenschatz: “Simon, the air pressure is low enough, we can get thousands of Muons, come and start GCS measurement”




http://www.uni-giessen.de/fbz/fb07/fachgebiete/physik/institute/iipi/arbeitsgruppen/ag-dueren/aktuelles/DIRC2019/slides/slidesbodenschatz

# Next steps

- Complete the DB parameters
- Include TofPET slow readings
- Define more slow parameters from DAQ
- Test RUN for a Month
- Read the “books” not only in Armenian but… also
- go,R,python,SQL….languages

# Backup...in case online does not work.GCS Monitoring Trigger HV and Current

# GCS Monitoring Trigger HV and Current

# GCS Monitoring Reinraum

# GCS Monitoring Reinraum