

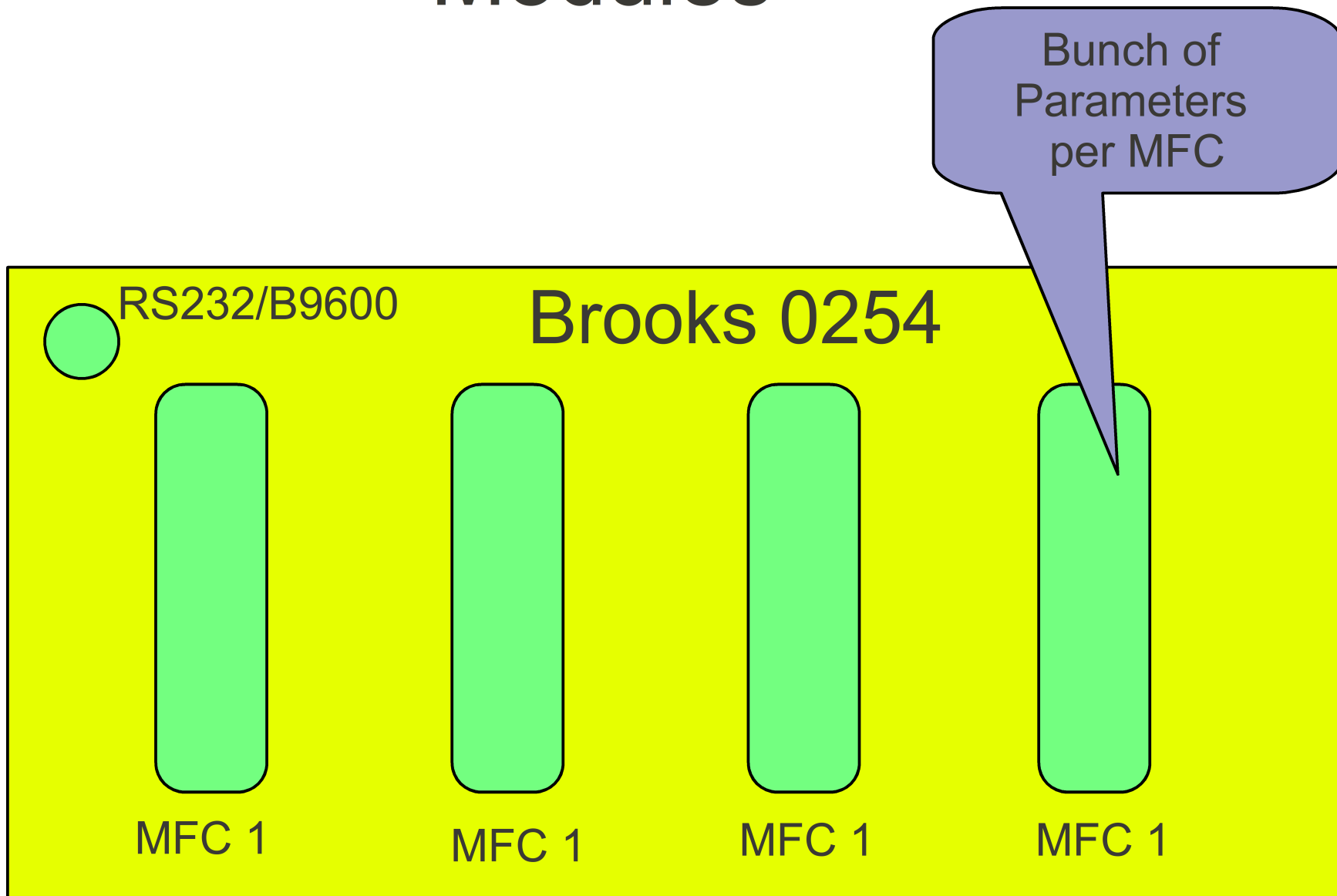
EPICS Support for Brooks0254

Hovanes Egiyan

Introduction

- Brooks0254 is the control/programming module for Brooks MFC for FDC and CDC gas systems.
- Each module controls maximum of 4 MFC using for different control cards.
- Modules have RS232 interface, 9600 baud rate.
- The best way to control it is to directly from EPICS.
- EPICS interface is needed.
- Sandbox for CAN-bus support for FCAL bases.

Modules

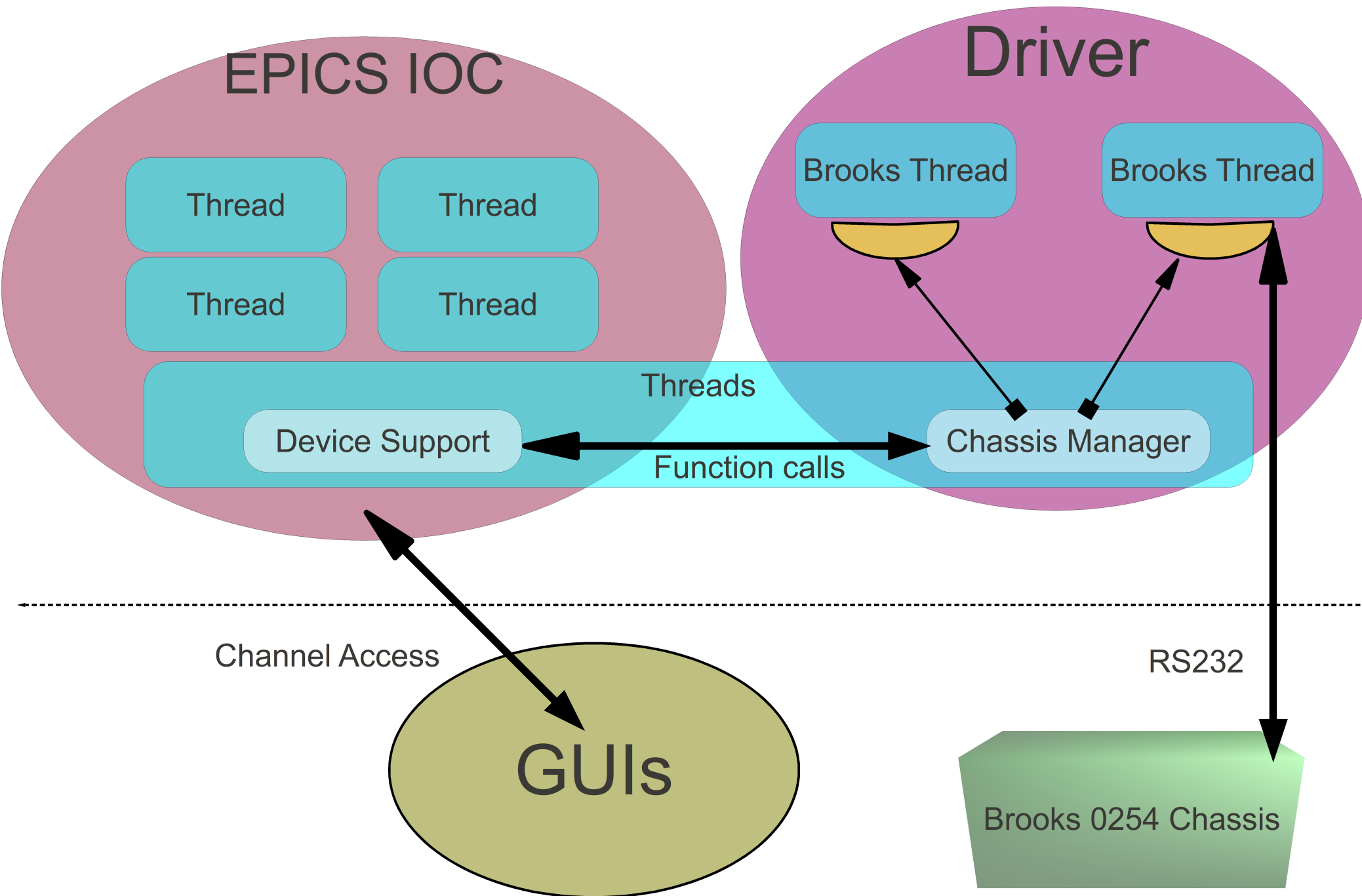


Goals

- There is no intention to control the valves, it will be done in the hardware, with exception of emergency shutdown of valves.
- Run EPICS IOC on Linux platform, embedded PC104+, allowing for configuring and continuous monitoring and control of parameters of Brooks0254.
 - Can only be interrupted by loss of serial communication or Linux failure.
- At this point IOC runs on MSI netbook with Atom processor.
- Use CSS display management BOY for control screens for evaluation and proactice

Principle

- There are multiple ways of creating EPICS support:
 - I Direct synchronous interface ($\Delta t < 10$ ms)
 - II Asynchronous interface ($\Delta t > 100$ ms)
 - III Continuously scanning buffer layer ($\Delta t > 100$ ms)
- Used scheme III for this application since the RS232 takes ~ 20 ms to request and get parameters from the Brooks module.
- The values which EPICS record access can be delayed.
- The requests to change the hardware parameters can be delayed



EPICS Support Structure

- EPICS Brooks0254 controls consist of two pieces
 - Driver - Synchronizing software hardware parameters.
 - Device Support - connection to EPICS PVs.EPICS application and GUIs
- Driver part is made independent of EPICS, but it provides hooks for Driver Support.
 - It synchronizes all parameters independent of what PVs are initialized on IOC.
 - Does not lock chassis or channel during synchronizations. Mutex locking is only to avoid conflicting accesses.
- Device support requests for values from the buffer and assigns them to PVs.
- EPICS application is a set of EPICS records using Brooks0254 Device Support.

Conclusions

- New EPICS support for Brooks0254 module
 - Can be used in FDC and CDC
 - Also can be used for BCAL nitrogen flow control
- Prototype framework for CAN-bus bases EPICS support exist:
 - General structure can be maintained; classes for the modules can be similar, but the parameters would be completely different
 - Need to only synchronize parameters connected to EPICS PVs.
- First Hall D application to use CSS, a sandbox for working out some of the P6 schedule items.