

Trigger Tree and expconf2

Jordi Aguilar
Roberto Homs
Oriol Vallcorba
at ALBA

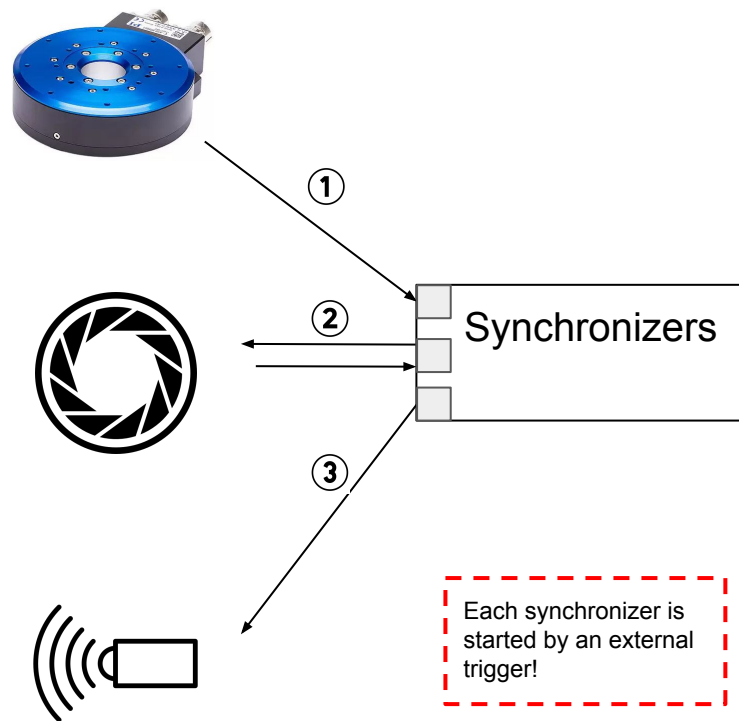
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Motivation

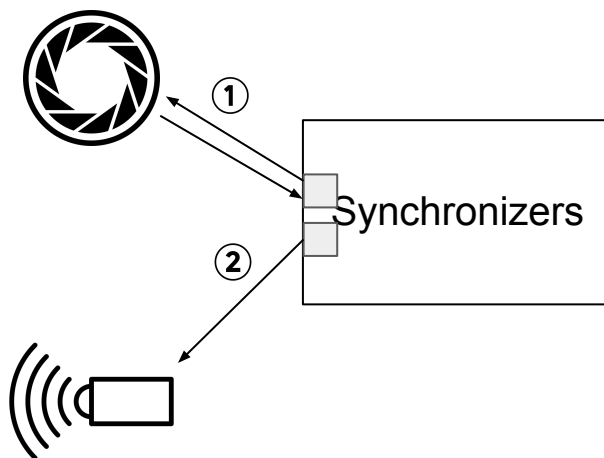
Tomographies: three different configurations

	Darkfield	Flatfield	Gonio Scan
Gonio	✗	✗	✓
Shutter	✗	✓	✓
Detector	✓	✓	✓



Feature 1: Trigger tree

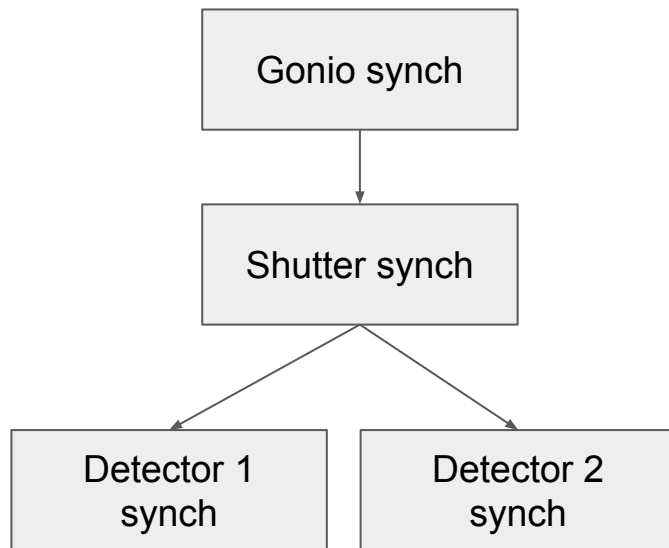
Pain: Synchronizer Channels *starting order* matters



If shutter signal (1) is sent and received before detector's *synchronizer channel* is ready, this channel will never send a trigger signal (2)

Feature 1: Trigger tree

Solution: Trigger tree defines hierarchy. *Start* command is called up-stream.



Start order:

1. Start Detector 1 synchronizer
2. Start Detector 2 synchronizer
3. Start Shutter synchronizer
4. Start Gonio synchronizer

Feature 2: Automatic configuration

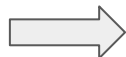
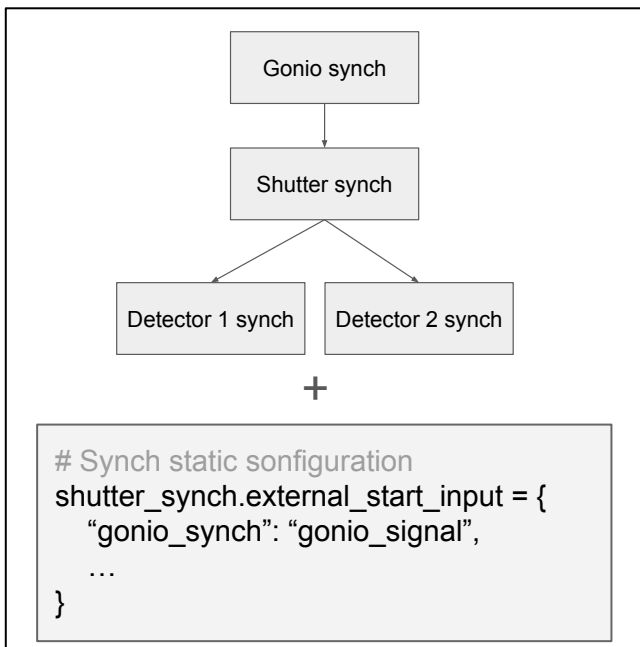
Pain: Synchronizers need to be explicitly configured in the macros

```
# Tomography scan macro
measurement_group.enable("shutter")
measurement_group.enable("gonio")
shutter_synch.slave = True
shutter_synch.input = "gonio_signal"
detector_synch.slave = True
detector_synch.input = "shutter_signal"

timescan(50, 0.1, 0.1) # Acquisition
```

Feature 2: Automatic configuration

Solution: Synchronizers configured through “start_input” axis parameter

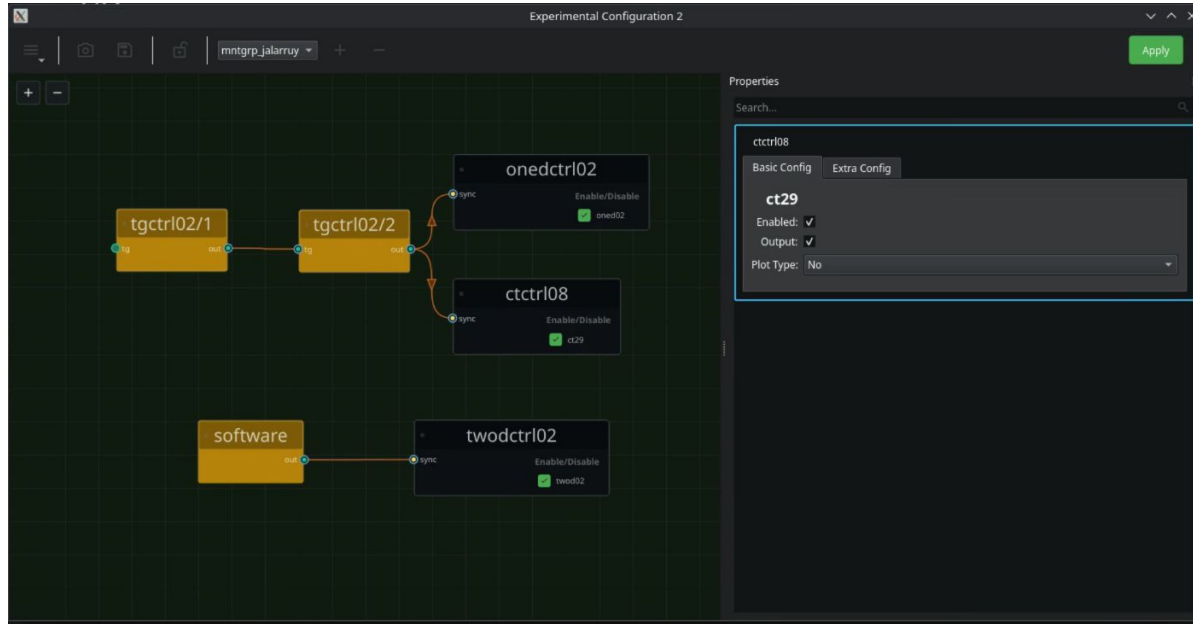


```
# TriggerGateController plugin
def SetAxisPar(self, axis, par, value):
    if par == "start_input":
        if value is None:
            self.synchronizer.DeactivateStartInput(axis)
        else:
            self.synchronizer.SetStartInput(axis, value)
```

Following previous example:
axis = *detector* or *shutter synch*
value = “shutter_signal” or “gonio_signal”

How: expconf2

New expconf GUI: reduces complexity and adds trigger tree functionality



Demo

References

- [expconf2 MR \(draft\)](#)
- [trigger tree MR \(merged\)](#)
 - Documentation in *How to write a trigger/gate controller* and *Measurement group overview* (develop)