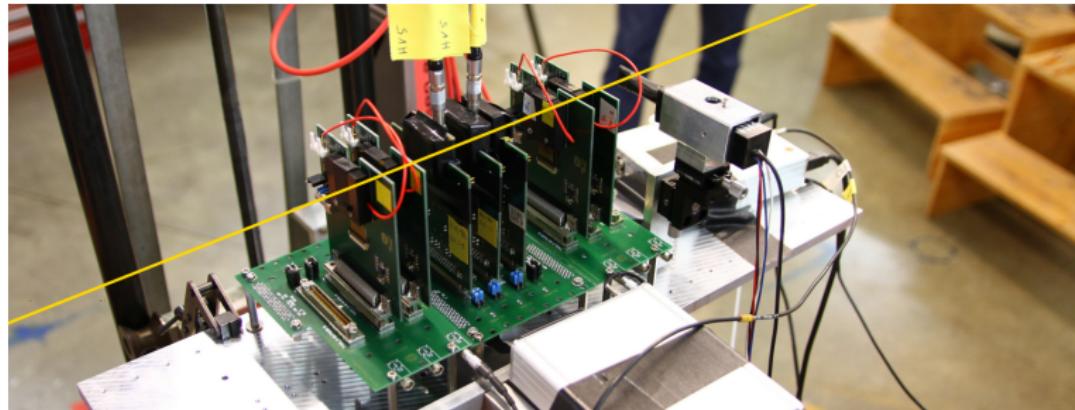


-
-
-
-
-

-
-

-
-
-

-
-
-



ETH High Rate Beam Telescope

presented by: Michael Reichmann
coauthors: Felix Bachmair, Dmitry Hits

Motivation	The Telescope	Commissioning	Datataking	Analysis	Conclusion	Outlook
	○	○○	○	○○		
	○	○	○	○		
	○		○			
	○○			○		

Table of contents

1 Motivation

2 The Telescope

3 Commissioning

4 Datataking

5 Analysis

6 Conclusion

7 Outlook

Motivation	The Telescope	Commissioning	Datataking	Analysis	Conclusion	Outlook
	○	○○	○	○○		
	○	○	○	○		
	○		○			
	○○			○		

Motivation

Motivation	The Telescope	Commissioning	Datataking	Analysis	Conclusion	Outlook
	○	○○	○	○○		
	○	○	○	○		
	○		○			
	○○		○	○		

Conditions:

- testing of diamond pad and pixel detectors for rate dependence
- continuous pion beam with a flux of up to 100 MHz/cm^2 and momenta of 100-500 MeV

Requirements:

- small, flexible and modular system
- high rate continuous data taking
- adjustable trigger area to reduce pedestal events

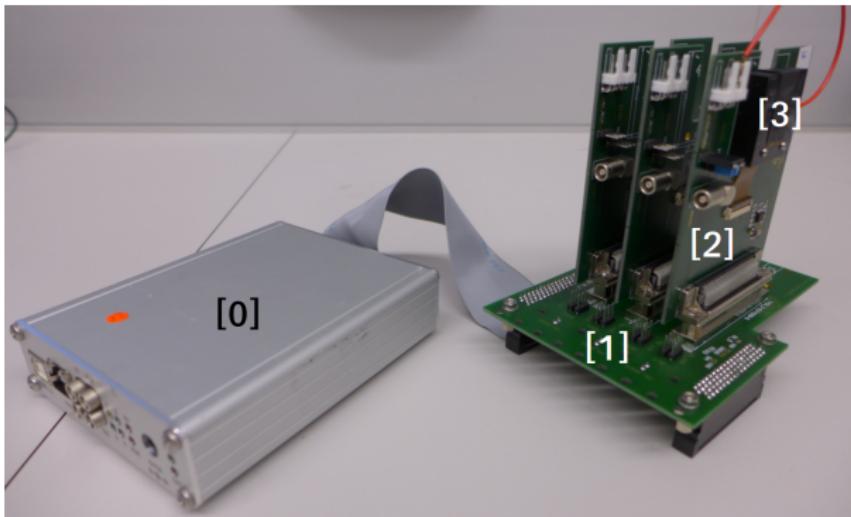
Motivation	The Telescope	Commissioning	Datataking	Analysis	Conclusion	Outlook
	○	○○	○	○○		
	○	○	○	○		
	○		○			
	○○		○			

The Telescope



General Setup

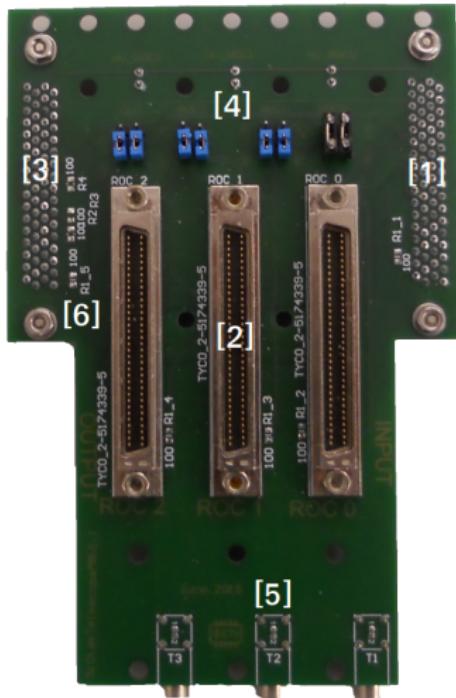
General Setup



- [0] DTB (Digital Test Board): interface to a computer
- [1] Motherboard: main frame of the telescope
- [2] Adapter Planes: mounting framework for the single pixel chips
- [3] CMS Pixel Chip (analogue or digital)

Motherboard

Motherboard

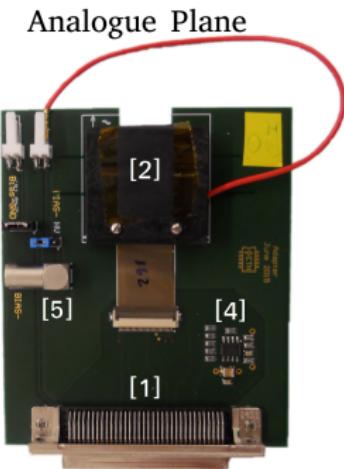


- [1] input: SCSI connector to the DTB
- [2] sockets for the adapter planes
- [3] output (optional): SCSI connector to another motherboard
- [4] token jumpers: (blue = plane active, black = plane inactive)
- [5] output of the fast-OR trigger signal
- [6] termination of the signals

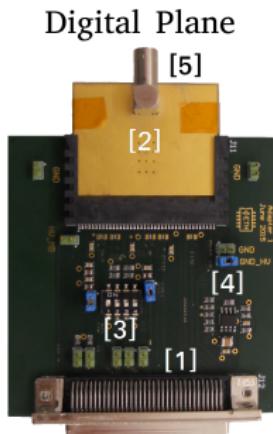


Adapter Planes

Adapter Planes



Analogue Plane



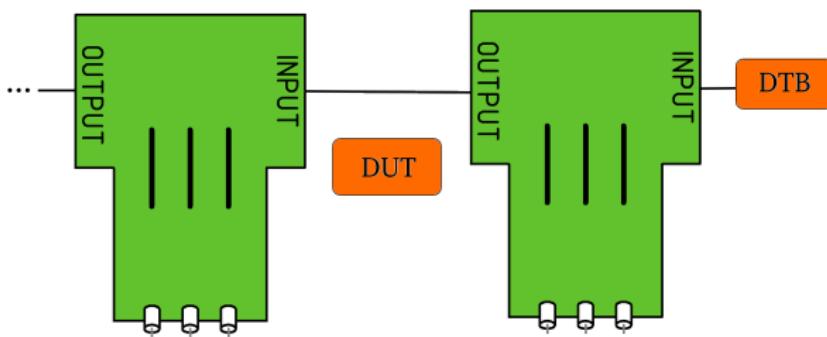
Digital Plane

- [1] SCSI connector to MB
- [2] CMS pixel chip
- [3] bit switch for I²C address
- [4] amplifying circuit
- [5] sensor bias input



Modularity

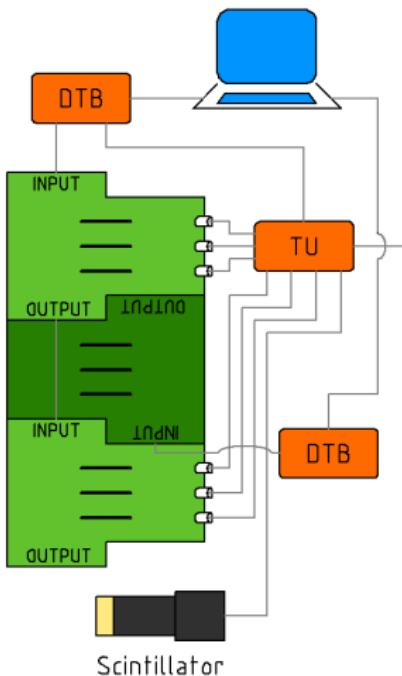
Modularity



- chain several motherboards together into a single big telescope
- number of planes per motherboard is also variable



Diamond Pixel Setup



- telescope: two motherboards with analogue chips
- DUT: single motherboard with diamonds sensors on digital chips
- Scintillator: precise trigger timing



Commissioning



Inclusion of the analogue pixel chip

Inclusion of the analogue pixel chip



Inclusion of the analogue pixel chip

Trigger and clock timing



WBC scan

WBC scan



Datataking



EUDAQ

EUDAQ



PXAR

PXAR



Trigger logic

Trigger logic



Analysis



Alignment

Plane alignment

Alignment

Event alignment



Tracking

Tracking



Diamond Pads

Diamond Pads



Conclusion



Motivation	The Telescope	Commissioning	Datataking	Analysis	Conclusion	Outlook
	○	○○	○	○○		
	○	○	○	○		
	○		○			
	○○			○		

Outlook

