

# DAQ and Slow Control preparation for LIME

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# Software Status (I)

- DAQ for 2 digitizers + photo camera has been implemented:
  - CAEN V1742: fast digitizer (up to 5 GS/s) with short waveforms (1024 samples) for PMTs
  - CAEN V1720: “slow” digitizer (250 MS/s) with long waveforms (up to ms) for GEM signals (adequate for slow amplifiers)
- Debugging completed with V1761 instead of V1720 waiting for procurement
  - same behavior from the software point of view
- Dumping of run information (run log) into MySQL DB have been implemented and tested
  - details of DB structure and variables to be stored to be defined with use
- Large dead time due to the very slow rolling shutter of the ORCA Fusion (180 ms to fully expose the chip):
  - radical change of the DAQ sequence to be considered

# Software Status (II)

- HV handling through MIDAS implemented and debugged
  - extensive use needed in order to completely test all the features

### High Voltage Control Page

#### Electric Fields

	Input	Set
Drift field [kV/cm]	0	-0.063
Transfer field 1 [kV/cm]	0	0.100
Transfer field 2 [kV/cm] <input type="checkbox"/>		0.100
VGEM 1 [V]	50	50
VGEM 2 [V] <input type="checkbox"/>		50
VGEM 3 [V] <input type="checkbox"/>		50
Offset [V]	2800	2800

SET ALLSET ZERO

#### Readings

	Demand [V]	Read [V]	Current [μA]		
HV0	2800.000	0.000	0.000		
HV1	50.000	0.000	0.000		
HV2	20.000	0.000	0.000		
HV3	50.000	0.000	0.000		
HV4	20.000	0.000	0.000		
HV5	50.000	0.000	0.000		
HV6	0.000	0.000	0.000		
HV7	ODB key "/Equipment /CATHODE /Variables /Demand[0]" not found	ODB key "/Equipment /CATHODE /Variables /Measured[0]" not found	ODB key "/Equipment /CATHODE /Variables /Current[0]" not found		

ON ALLOFF ALL

DRIFT	ONOFF
TRANSFER	ONOFF
GAIN	ONOFF

#### Settings

☒ HV0☐ HV1☐ HV2☐ HV3☐ HV4  
☐ HV5☐ HV6☐ ALL CAEN  
☐ ISEG HV

Ramp Up Speed [V/s]100

Ramp Down Speed [V/s]100

Trip Current [μA]10

Trip Time [s]1

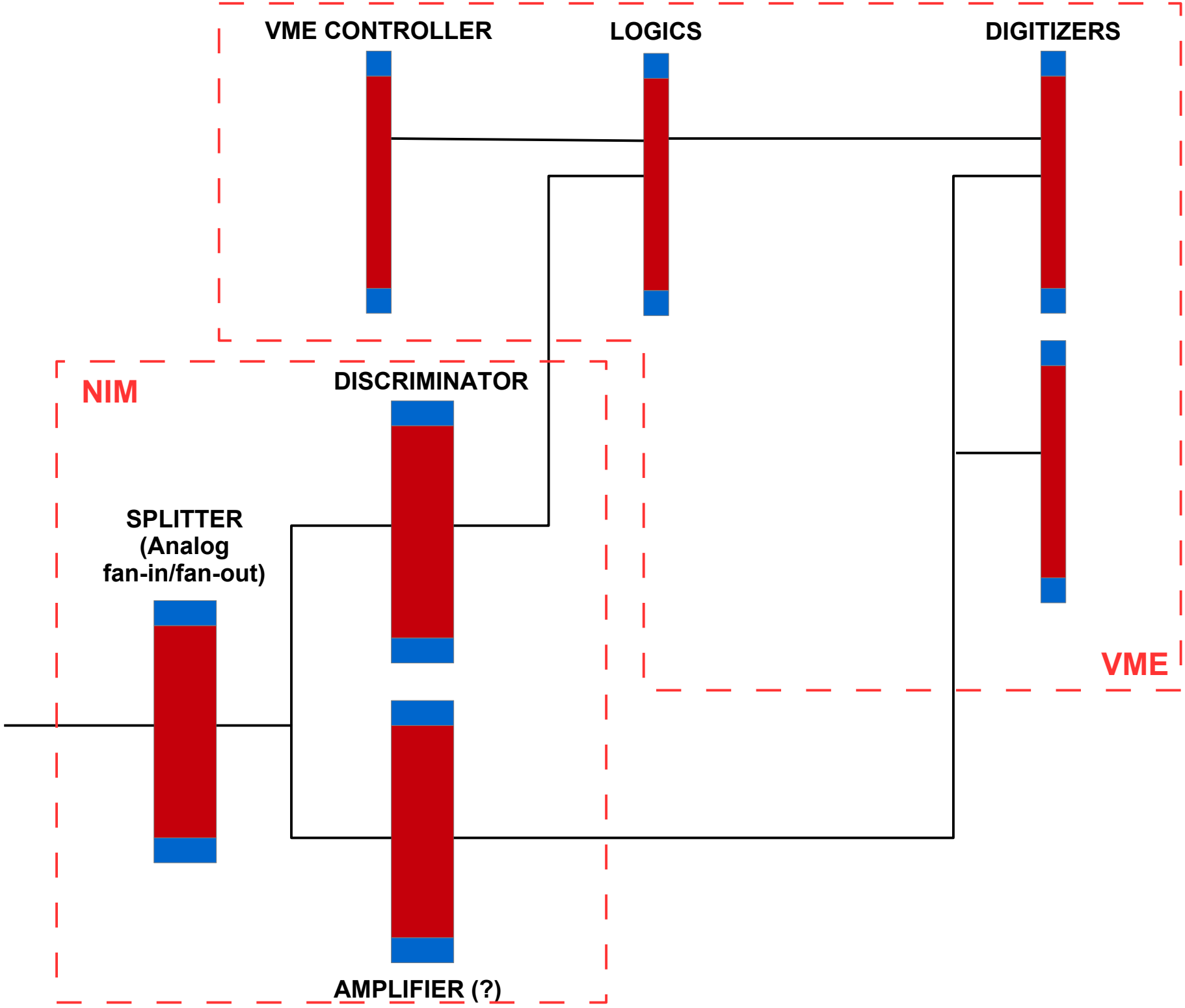
Hot Spot Current [μA]10

# Hardware Status (I)

- For LIME-underground we plan to have a DAQ system based on USB for the camera + NIM and VME modules for analog signals:
  - Splitting, discrimination and amplification (if needed) on NIM
  - Logic, digitization and control signals on VME
- Considering boards we already own and others we are currently buying, we will have one full system underground and at least 1 spare for each board either at LNF, GSSI or Rome
- Along with additional boards that we already own or we can recycle from other groups, we should be able to maintain functionally equivalent systems at least at GSSI and Rome/LNF:
  - lower number of digitization channels and some difference in board models

# Hardware Status (I)

- Order sent for MIDAS-specific electronics for slow control of environmental conditions, readout of filter pressure gauges, etc.
  - delivery expected in a few weeks
  - integration in MIDAS should be very easy



# Catalogue of modules

Model	Standard	Function	Spare	Alternatives
N625	NIM	Analog fan-in/fan-out	Rome	GSSI (LeCroy), LNF (N978)
N840	NIM	Discriminator	Rome	GSSI (N???), LNF (LeCroy)
V1718 V3718	VME	Controller	LNF (0/1), GSSI (1), Rome (1/0 + 1)	-
V976	VME	Logic	LNF (1), GSSI (1), Rome (1)	-
V1742	VME	Fast digitizer	GSSI (1), LNF/Rome (1)	Rome (V1761, 2ch)
V1720	VME	Slow digitizer	LNF/Rome (1)	-

RED: non exclusive availability