# DAPHNE
# Voltage monitoring

JAVIER CASTAÑO

UAN

On Behalf of DUNE-PDS

# VOLTAGE MONITORING



WR VBIASCTRL V xx: set the General Bias to XX (from 0 to 1000), referred to DAC output from 0 to 1 V (DC-DC converter)

WR AFE X BIASSET V YY: set voltage on AFE X (from 0 to 4) to YY (from 0 to 4095 referred to DAC output),

RD VM ALL: measurement of the VBias (from 0 to 4) in volts, power supplies (-5V, 2,5 V, Cold electronics) and microcontroller temperature
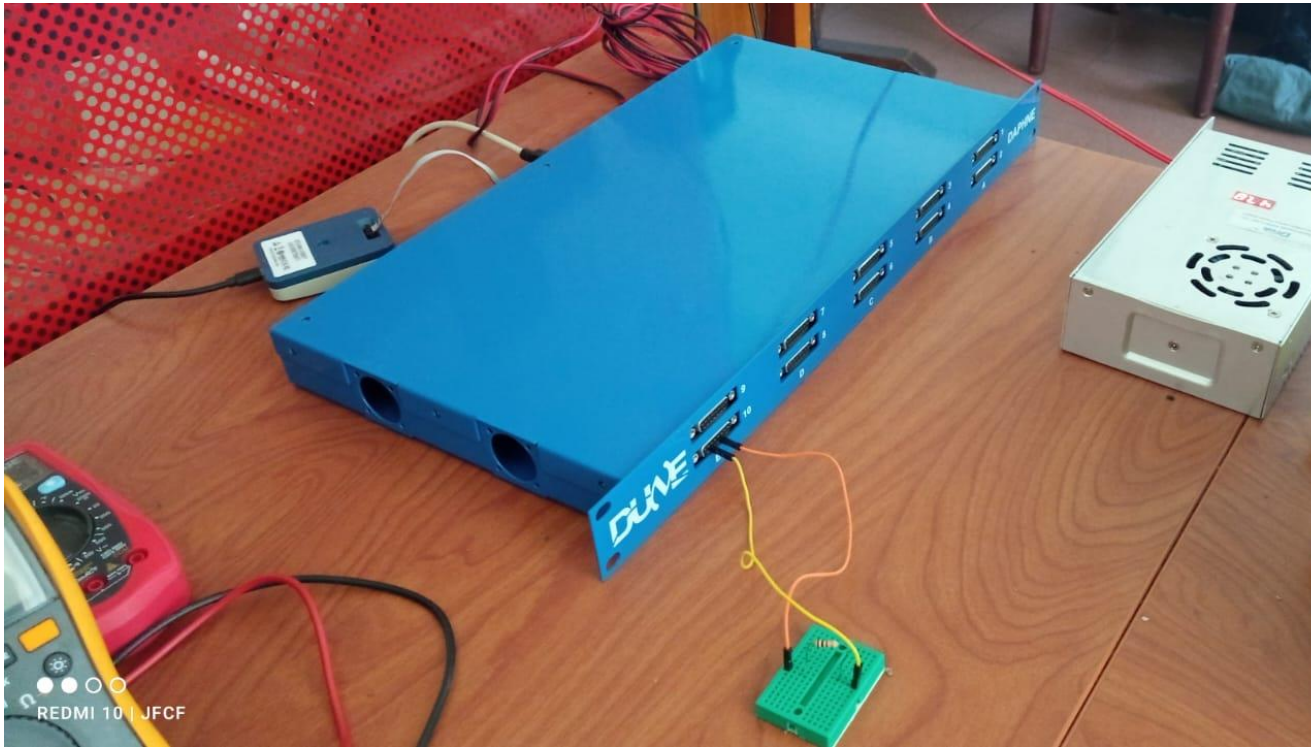
# EXPERIMENTAL RESULTS/V2



Tested all the options: set general Bias, set AFE Bias to different values followed by a RD VM ALL command

# ONGOING WORK

- Calibration of the Voltage monitoring

- Improvement of the uC temperature measurement (calibration, mathematical model, etc) according to the uC datasheet

- Verification and calibration of the CM analog multiplexing circuit (originally designed by Sten H. for Mu2E FEB)

- Calibration of the PGA-ADC by using the internal ADS1259 modules

- Suggestions from Esteban (Milano): commands for each measurement in the VM, microcontroller control to generate I-V curves and measurements (with a command)

# THANKS

# CURRENT MONITORING



Tests performed on DAPHNE V1 at UAN and Fermilab

Firmware: last version of V2 (GitHub)

1k resistor connected between Trimm 2 (pin 11) and AGND (using the Cold Electronics VR pin 14), E-10 connector

DEEP UNDERGROUND NEUTRINO EXPERIMENT

# EXPERIMENTAL RESULTS/V1



WR TRIM CH xx V yy: set Trimm Voltage on cannel xx to yy value (from 0 to 4095 referred to DAC output). We will implement a command that take this value in Volts

RD CM CH X: measurement of the current con channel X (in mA)

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# CURRENT MONITORING
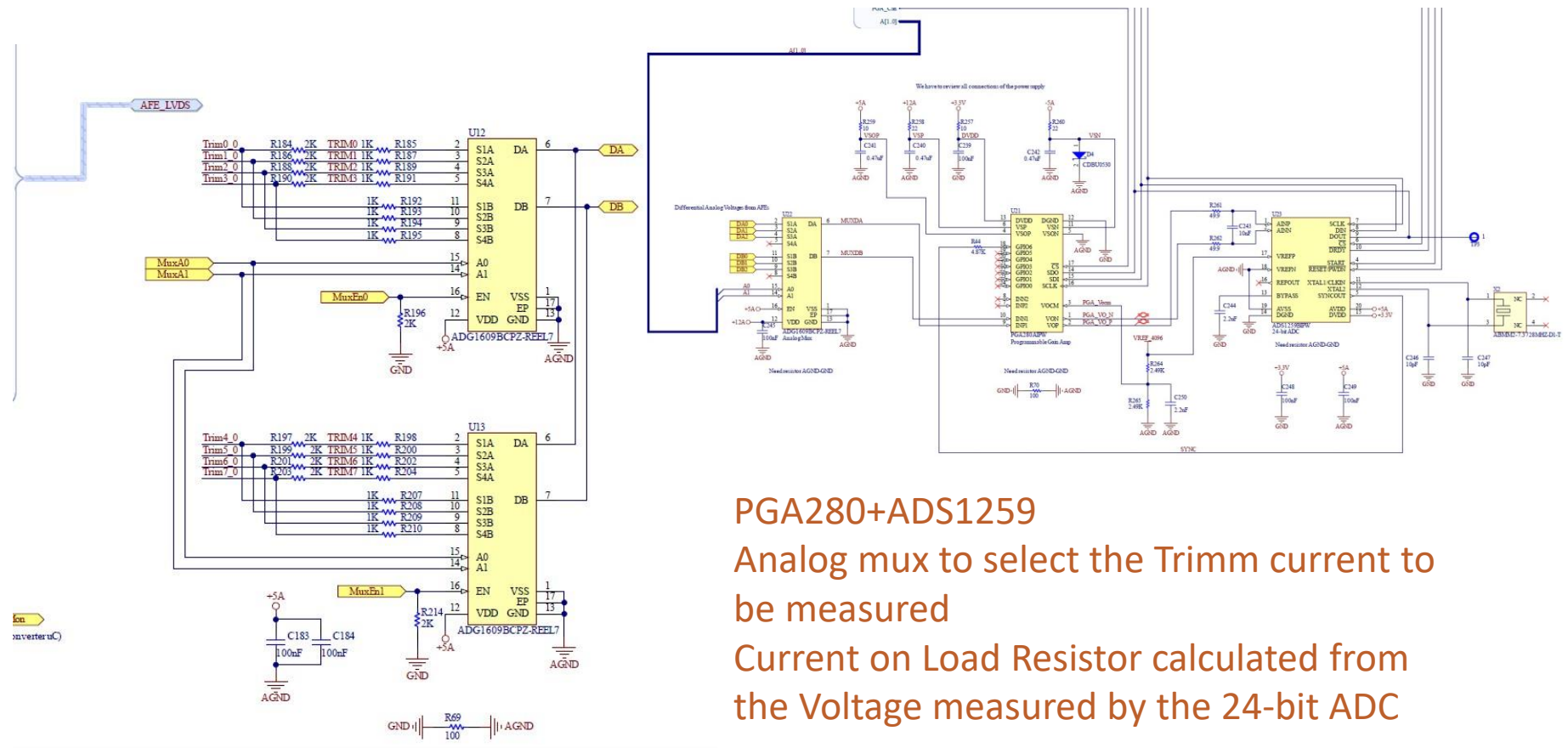


PGA280+ADS1259

Analog mux to select the Trimm current to be measured

Current on Load Resistor calculated from the Voltage measured by the 24-bit ADC

# EXPERIMENTAL RESULTS/V2



1K resistor connected to CH24

Current monitoring reports 0.504911 mA

Voltage measured with multimeter on the resistor: 500 mV