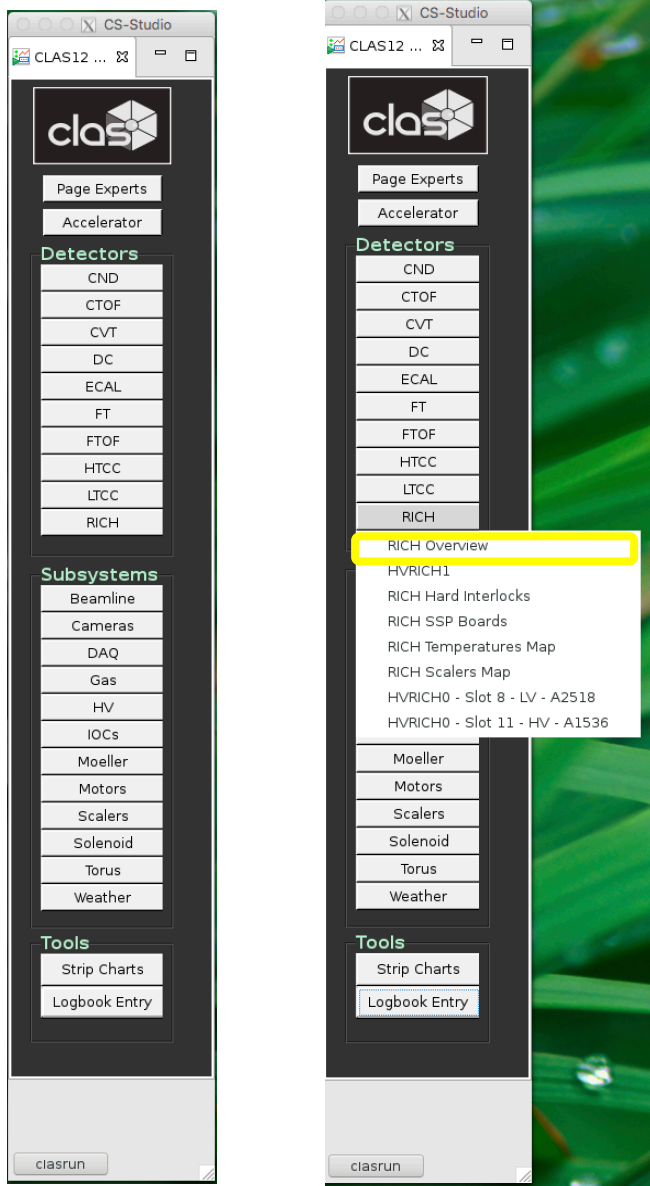


# **RICH Control Manual**

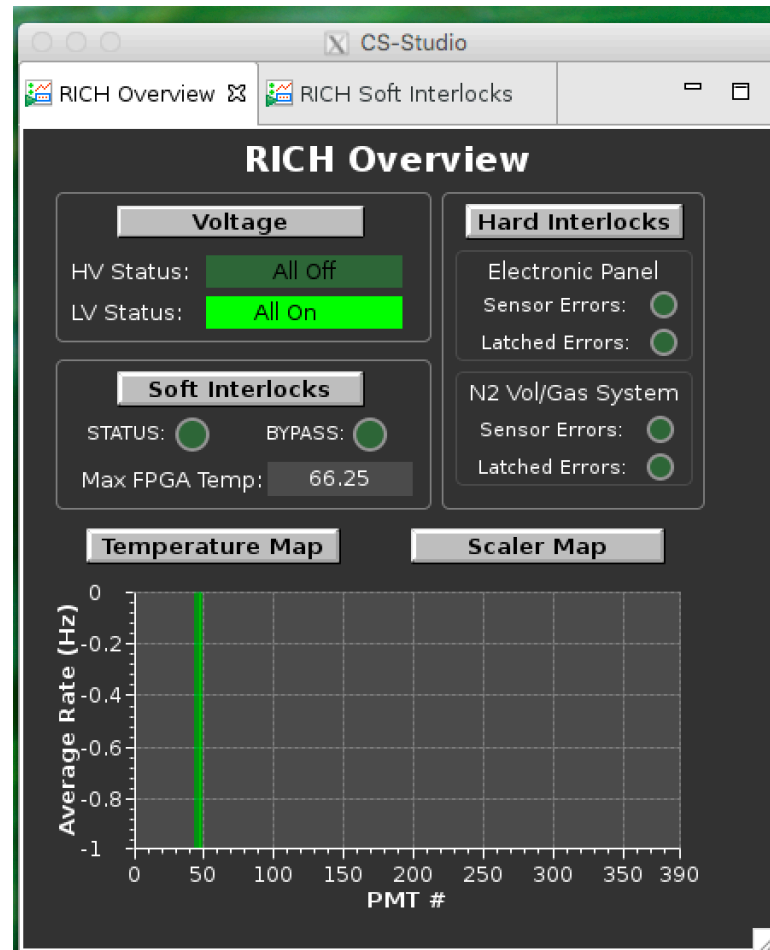
January 12, 2018

# RICH OVERVIEW CONTROL PANEL

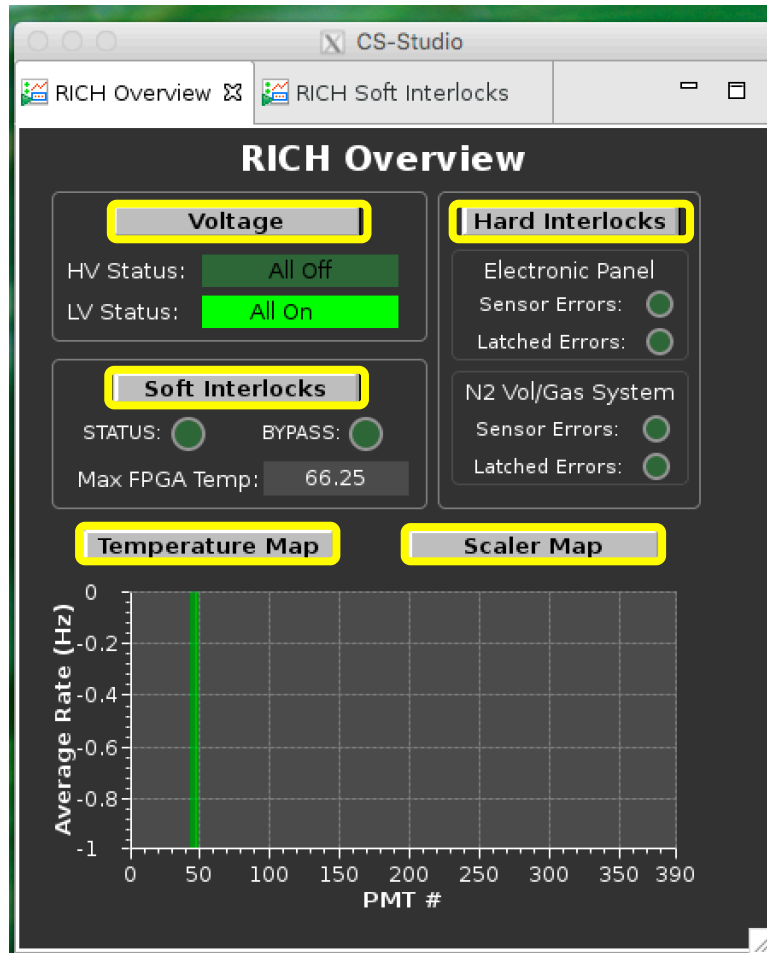


To access RICH controls

- Press RICH on clascss menu
- Chose RICH Overview



# RICH OVERVIEW CONTROL PANEL



## USER DIALOGs

- **Voltage**

Control RICH HV and LV

- **Temperature Map**

Check the temperature of the RICH electronic boards

- **Scaler Map**

Check the rate of the MAPMT pixels

## EXPERT DIALOGs

- **Hard Interlock**

Control the RICH interlock

- **Soft Interlock**

Control the temperature of the RICH electronic boards

# VOLTAGE CONTROL DIALOG

## TURN ON SEQUENCE

Turn LV ON:

Select ALL LV ON from Voltage submenu  
Open Temperature Map (next page)

all tiles should read temperatures within limits  
some tile could take more than  
others and up to 1 minute

Turn HV ON:

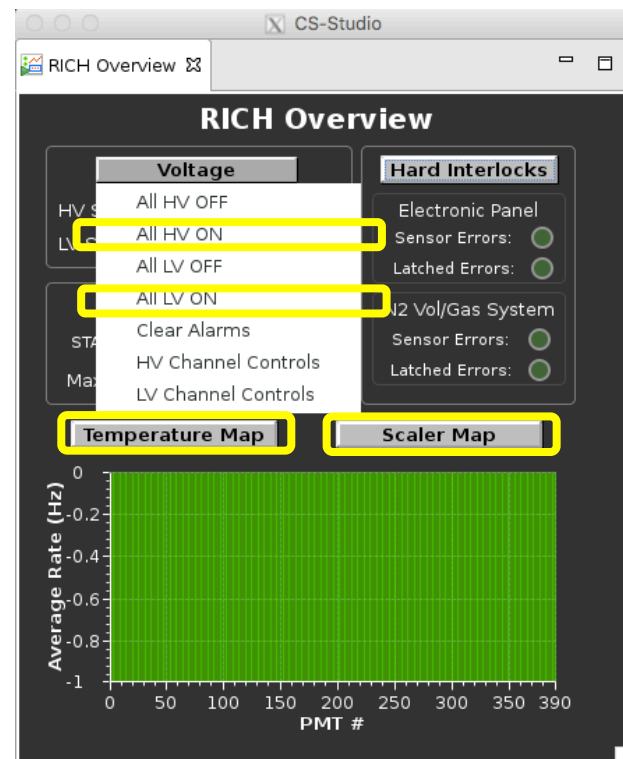
Select ALL HV ON from Voltage submenu  
Configure the RICH scalers

```
ssh clarun@rich4
```

```
run rich_init
```

Open Scaler Map (next page)

all PMTs should read values within limits



# VOLTAGE CONTROL DIALOG

## TURN OFF SEQUENCE

Turn HV OFF:

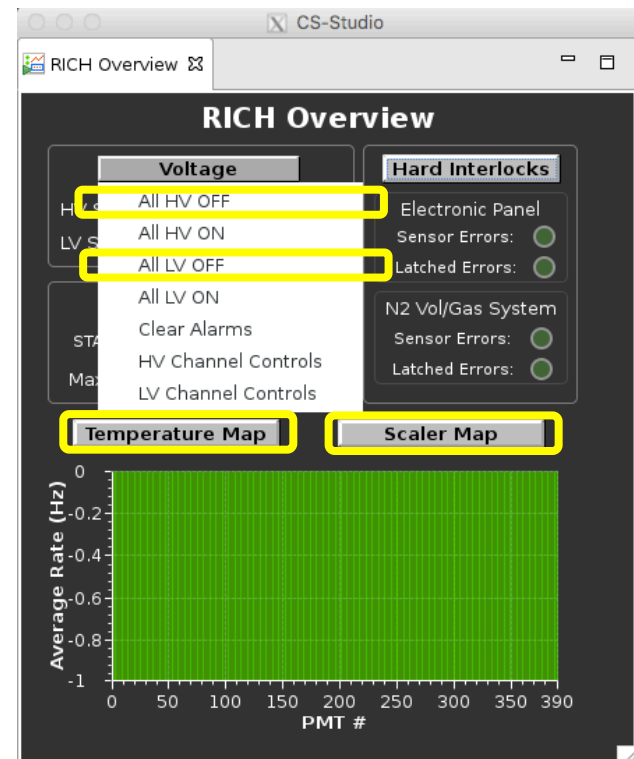
Select ALL HV OFF from Voltage submenu  
Open Scaler Map (next page)

all PMTs should read -1

Turn LV OFF:

Select ALL LV OFF from Voltage submenu  
Open Temperature Map (next page)

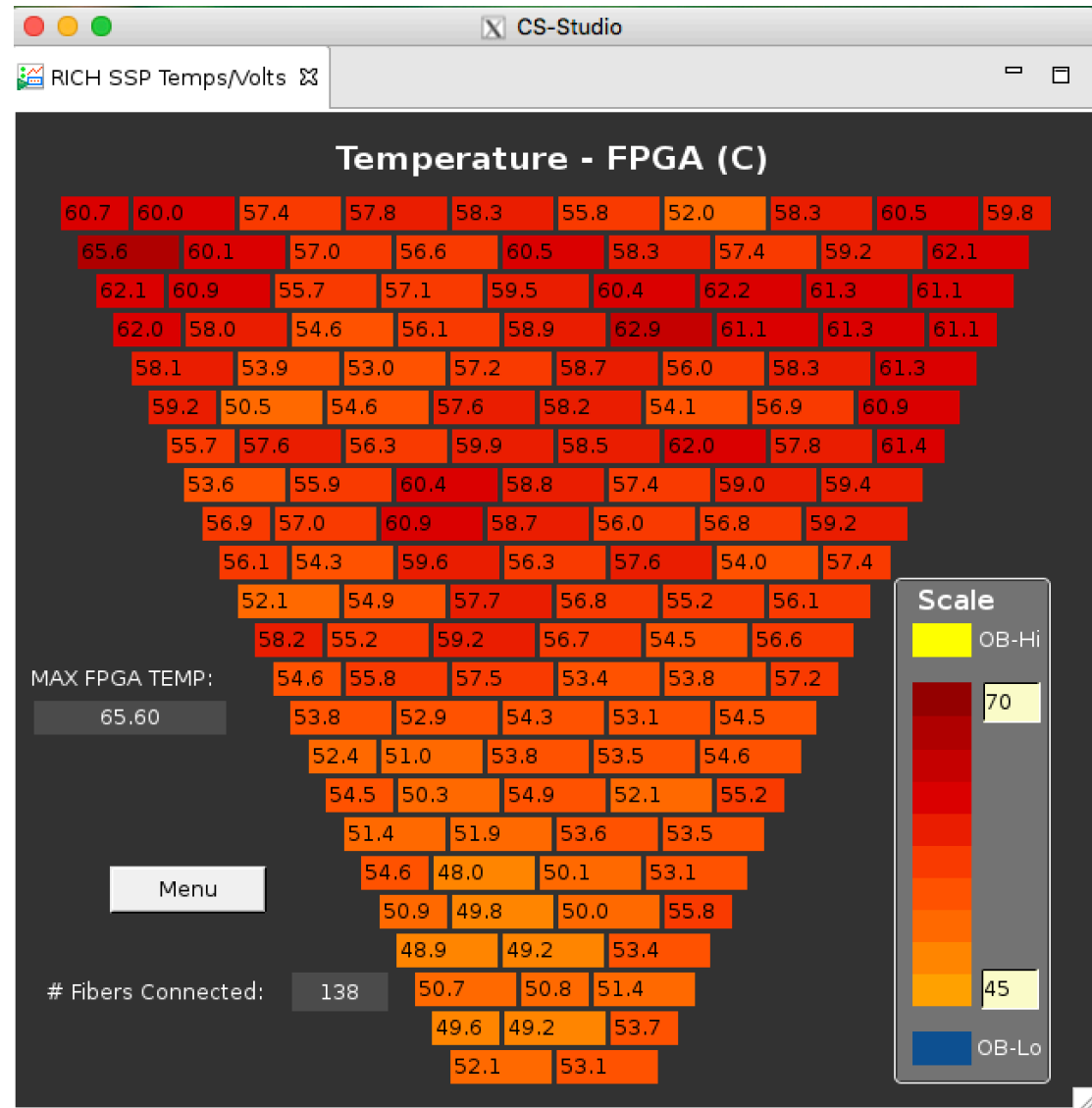
all tiles should read -0.0



# TEMPERATURE MAP

- The plot shows the temperature measured at the FPGA chip
- Max temperature has to be less than 75 C<sup>0</sup>
- Typical hottest point
- Soft interlock switches OFF the RICH HV and LV if  $T > 75\text{ C}^0$
- All 138 tiles have to be present whit LV ON

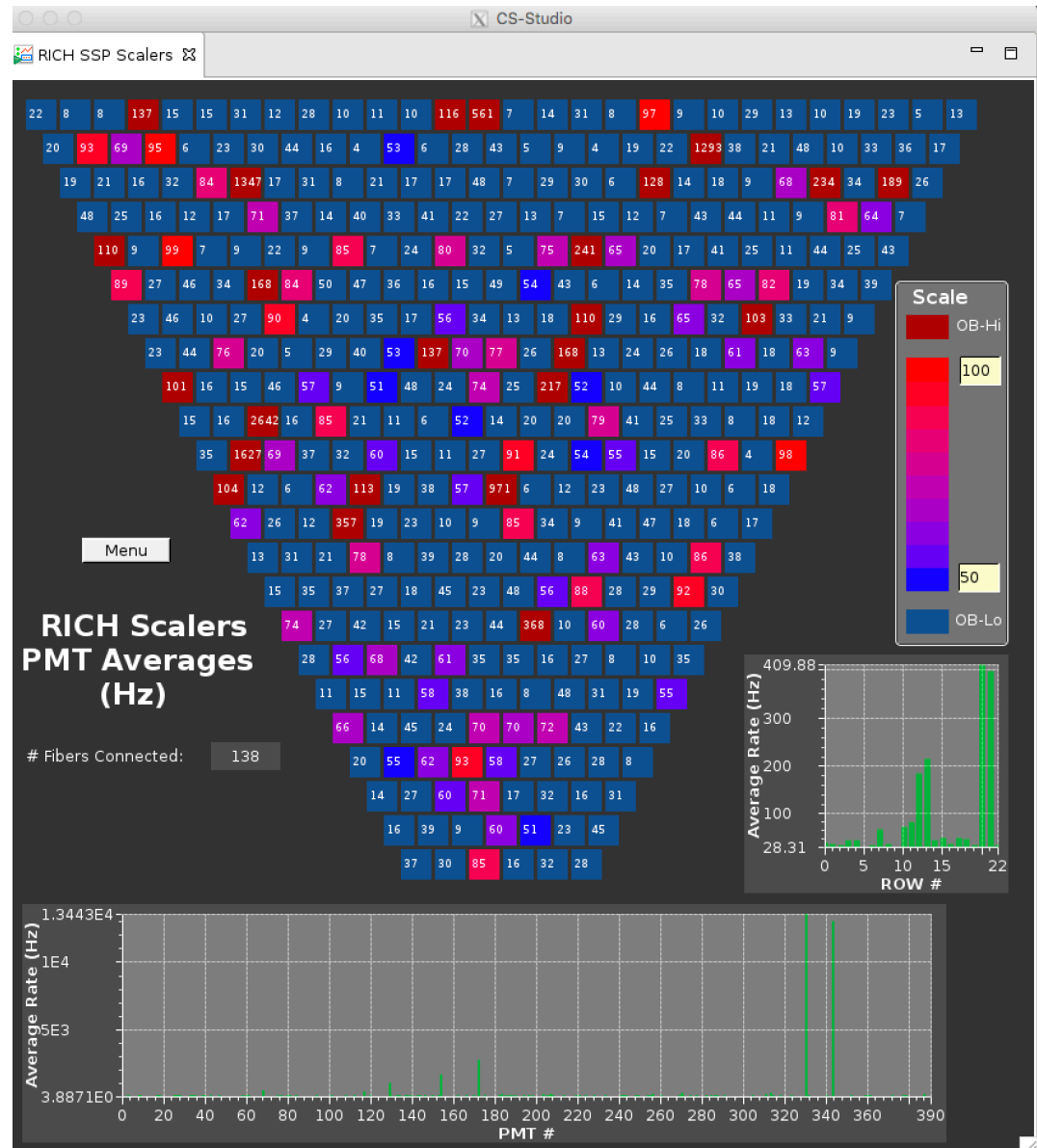
CALL the EXPERT if something is wrong



# SCALER MAP

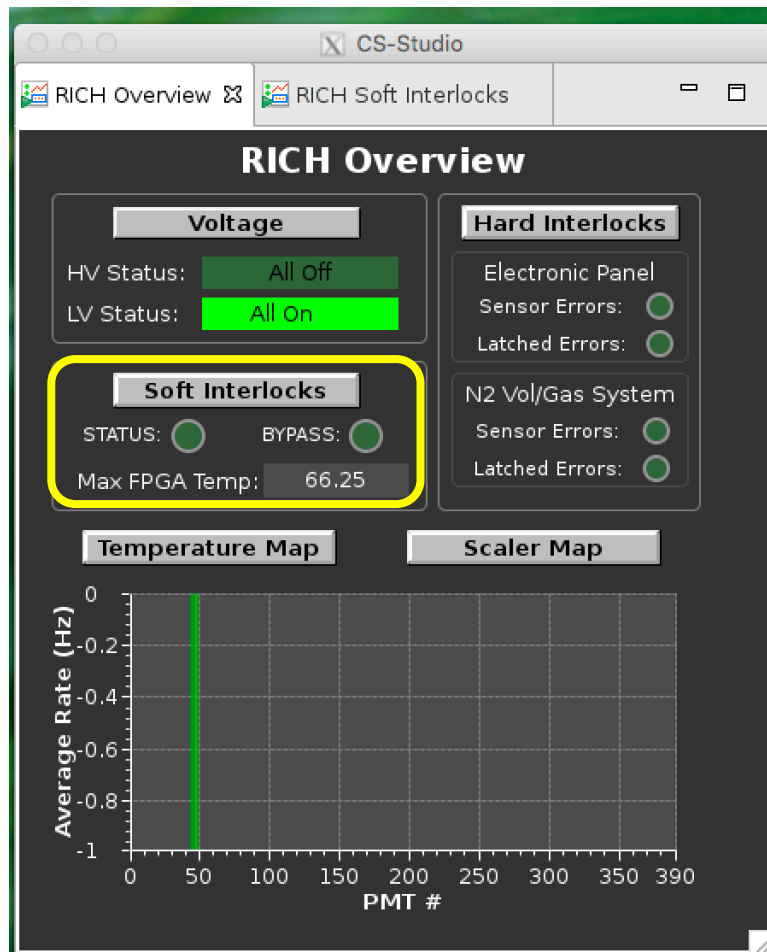
- The plot presents the average rate of the MAPMT pixels
- ALL MAPMTs have to be present whit HV ON

CALL the EXPERT if something is wrong



# SOFT INTERLOCK

- The software interlock controls the temperature measured by the front-end electronics and readout by the RICH DAQ crate



- The submenu shows the maximum temperature measured at the FPGA chip

If temperature goes above 75 C<sup>0</sup>

STATUS turns to RED

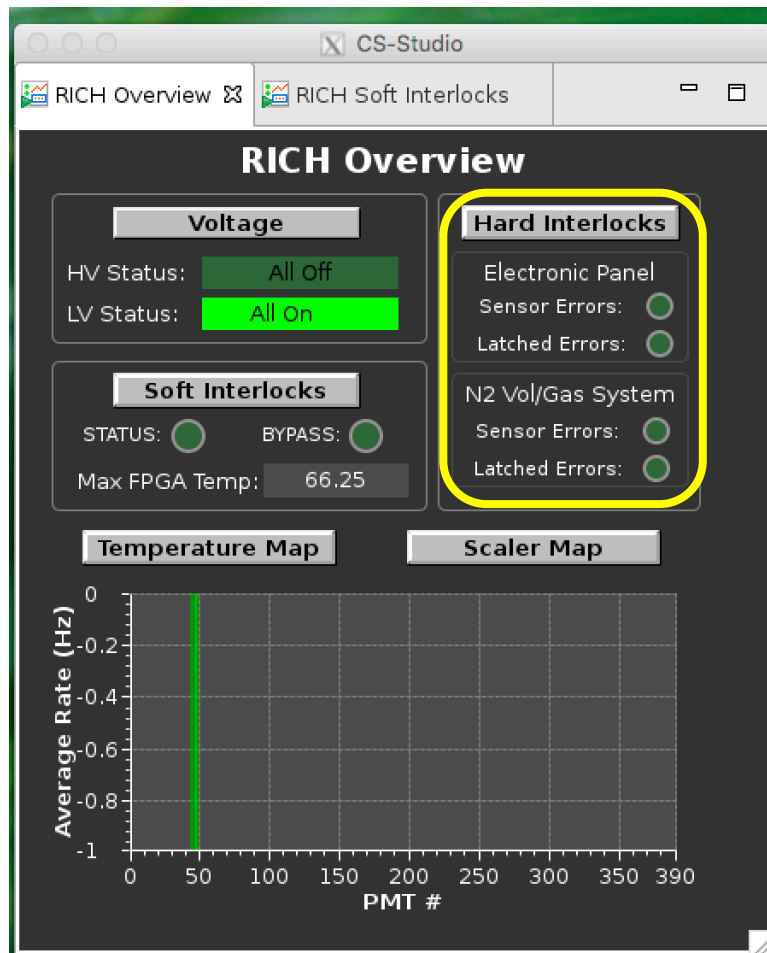
Power is switched OFF

CALL the EXPERT if  $T > 75 \text{ C}^0$



# HARD INTERLOCK

- The hardware interlock control the temperature and humidity measured by specific sensors distributed in the RICH nitrogen volume and electronic panel together with the flow and pressure of the gas lines



- The submenu shows the status

If a measured value goes out of limits

Sensor Errors turns to red

Latched Errors turns to red  
and stays red till a reset

Power is switched OFF

CALL the EXPERT if anything is red