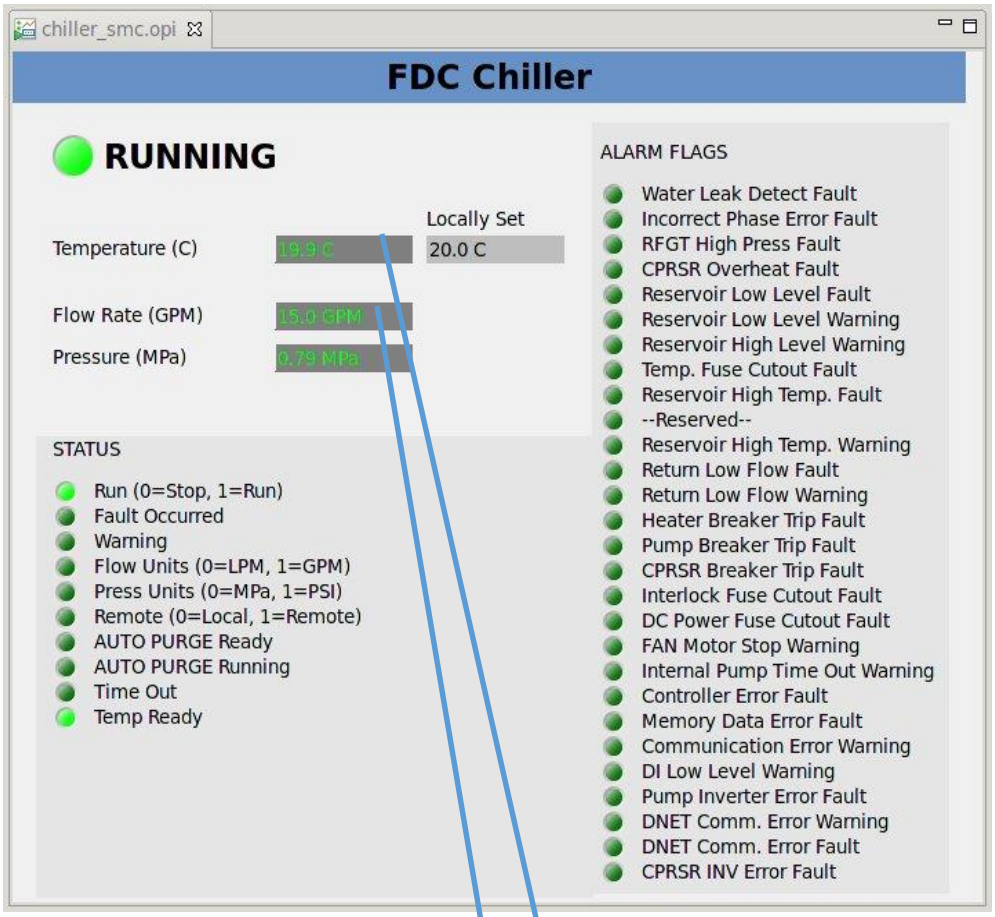
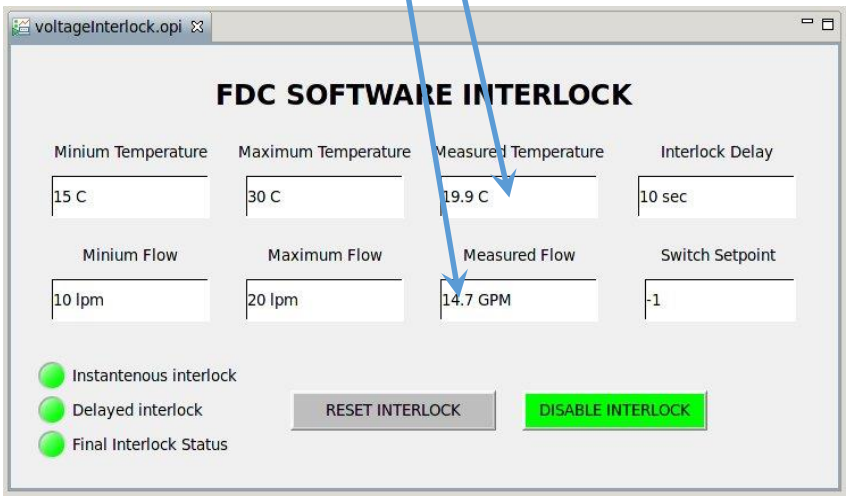
FDC EPICS INTERLOCK

Hovanes Egiyan

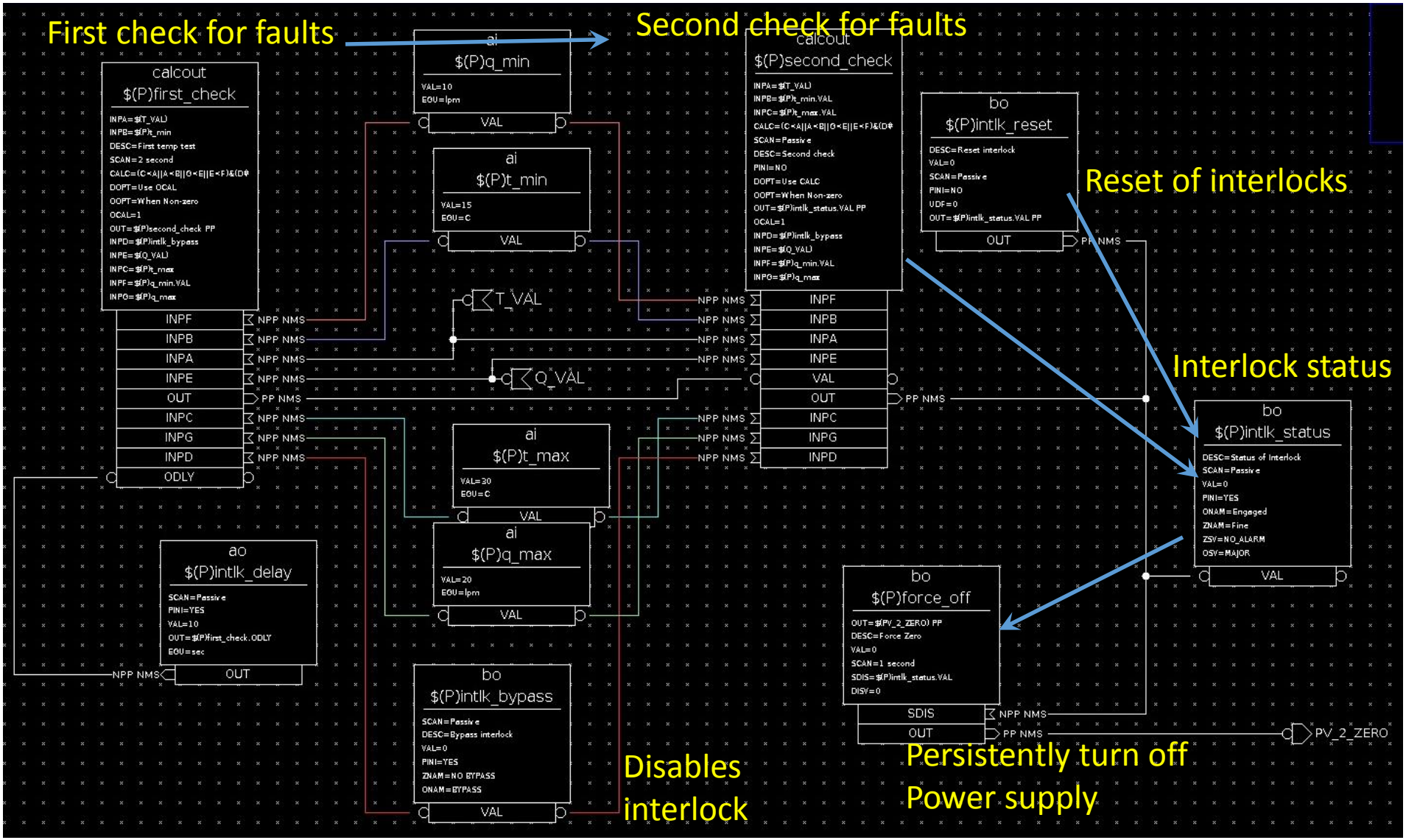
Introduction

- There is a FDC hardware interlock that shuts off the MPOD power supply when the chiller status is OFF
  - Read from a relay on the FDC chiller
- No interlock on any temperature to shut off either the chiller or the FDC MPOD.
- We saw FD chiller run at temperatures above 30 ^{o}C and below freezing without getting shut off when temperature went above 30^{o}C.
  - There was an alarm on the chiller when
- No interlock on any temperature to shut off either the chiller or the FDC MPOD.
- Need an interlock on actual temperatures to shut off the power supply, preferably in PLC.
- Quickly wrote an EPICS software interlock to shut off the power supply when the flow or the temperature as reported by the chiller is out of specified range.
  - Uses FDC chiller software developed and installed by Wesley.





- Limits are settable
  - Persistent using autosave module
- Interlock can be enabled/disabled
- Interlock latches
- Once engaged, the interlock needs to be reset by clicking a button on a GUI.
- Need to add the temperature, flow rate and the software interlock status to the FDC voltage GUI


First check for faults
Second check for faults
Reset of interlocks
Interlock status
Disables interlock
Persistently turn off Power supply
calcout $(P)first_check
INPA=$(T_VAL)
INPB=$(P)t_min
DESC=First temp test
SCAN=2 second
CALC=(C<A||A<B||G<E||E<F)&(D#
DOPT=Use OCAL
OOPT=When Non-zero
OCAL=1
OUT=$(P)second_check PP
INPD=$(P)intlk_bypass
INPE=$(Q_VAL)
INPC=$(P)t_max
INPF=$(P)q_min.VAL
INPG=$(P)q_max
INPF
INPB
INPA
INPE
OUT
INPC
INPG
INPD
ODLY
NPP NMS
PP NMS
ai $(P)q_min
VAL=10
EGU=lpm
VAL
ai $(P)t_min
VAL=15
EGU=C
VAL
T_VAL
Q_VAL
ai $(P)t_max
VAL=30
EGU=C
VAL
ai $(P)q_max
VAL=20
EGU=lpm
VAL
ao $(P)intlk_delay
SCAN=Passive
PINI=YES
VAL=10
OUT=$(P)first_check.ODLY
EGU=sec
OUT
bo $(P)intlk_bypass
SCAN=Passive
DESC=Bypass interlock
VAL=0
PINI=YES
ZNAM=NO BYPASS
ONAM=BYPASS
VAL
calcout $(P)second_check
INPA=$(T_VAL)
INPB=$(P)t_min.VAL
INPC=$(P)t_max.VAL
CALC=(C<A||A<B||G<E||E<F)&(D#
SCAN=Passive
DESC=Second check
PINI=NO
DOPT=Use CALC
OOPT=When Non-zero
OUT=$(P)intlk_status.VAL PP
OCAL=1
INPD=$(P)intlk_bypass
INPE=$(Q_VAL)
INPF=$(P)q_min.VAL
INPG=$(P)q_max
INPF
INPB
INPA
INPE
VAL
OUT
INPC
INPG
INPD
bo $(P)intlk_reset
DESC=Reset interlock
VAL=0
SCAN=Passive
PINI=NO
UDF=0
OUT=$(P)intlk_status.VAL PP
OUT
bo $(P)intlk_status
DESC=Status of Interlock
SCAN=Passive
VAL=0
PINI=YES
ONAM=Engaged
ZNAM=Fine
ZSV=NO_ALARM
OSV=MAJOR
VAL
bo $(P)force_off
OUT=$(PV_2_ZERO) PP
DESC=Force Zero
VAL=0
SCAN=1 second
SDIS=$(P)intlk_status.VAL
DISV=0
SDIS
OUT
PV_2_ZERO